

THE PERMANENT PEOPLE'S TRIBUNAL

SESSION ON

AGROCHEMICAL TRANSNATIONAL CORPORATIONS



PAN International

December 3-6, 2011
BANGALORE, INDIA

THE PERMANENT PEOPLE'S TRIBUNAL
SESSION ON
AGROCHEMICAL TRANSNATIONAL
CORPORATIONS:
INDICTMENT AND VERDICT



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THE PERMANENT PEOPLE'S TRIBUNAL SESSION ON AGROCHEMICAL TRANSNATIONAL CORPORATIONS

INDICTMENT AND VERDICT

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THE PERMANENT PEOPLE'S TRIBUNAL ON AGROCHEMICAL TRANSNATIONAL CORPORATIONS

INDICTMENT

Victims of Human Rights Violations by Agrochemical Transnational Corporations (TNCS)
at the suit of Pesticide Action Network International (PAN International)

PLAINTIFFS

versus

1. Syngenta International AG
2. Monsanto Company
3. Bayer CropScience AG
4. BASF Group
5. Dow Chemical Company
6. DuPont
7. The Government of the United States of America (USA)
8. The Government of the Swiss Confederation (Switzerland)
9. The Government of the Federal Republic of Germany (Germany)
10. The World Trade Organization (WTO)
11. The International Monetary Fund (IMF)
12. The World Bank (WB)

DEFENDANTS

SESSION ON AGROCHEMICAL TRANSNATIONAL CORPORATIONS

For:

1. Gross, widespread and systematic violations of the right to health and life
2. Gross, widespread and systematic violations of economic, social and cultural rights
3. Gross, widespread and systematic violations of civil and political rights
4. Gross, widespread and systematic violations of women's and children's rights

1 THE PARTIES

This Indictment is brought by the survivors and victims of human rights violations: rural communities, peasants, agricultural workers, indigenous people, fisherfolk, migrant workers, small-scale farmers, women, men, girls, boys, youth, activists, scientists, consumers and the future generations who as individuals and/or as a group of people or community are physically, mentally, spiritually, emotionally, economically, socially and politically harmed by the said gross violations of their human rights perpetrated directly or through being complicit by one or more of the Defendants jointly and/or severally. These victims and survivors are without effective recourse to legal avenues for justice, due compensation and remediation.

The Indictment is brought through Pesticide Action Network International (PAN), which is a global network of more than 600 organisations in over 90 countries, that has been working for nearly three decades to protect the people's right to health, a safe environment and livelihood by eliminating the use of highly hazardous pesticides and promoting resilient, regenerative agriculture and food sovereignty with a vision for a society that is truly democratic, equal, just, culturally diverse, and based on food sovereignty, gender justice and environmental sustainability.

Following a request to the Permanent People's Tribunal (PPT) from PAN International to hold a session on agrochemical corporations, the PPT convened in Bangalore, India, from 3-6 December 2011 (see Appendix 1 for programme and list of witnesses and Appendix 2 for list of jurists). The submission to the PPT, made in the opening statement, is set out in Appendix 3. The experience of witnesses and scientific research substantiated the allegations made in the indictment; these witness submissions are reflected in Sections 2-4 below and their written submissions are reproduced in Appendix 5. A list of 40 further written submissions submitted in preparation for the case is provided in Appendix 6.

An examination of the laws violated is provided in Section 5. The verdict of the jurors forms Section 6 of this report.

This Indictment is against the following Defendants:

1. The First Defendant, Syngenta International AG (Syngenta), is a corporation with the status of a legal person and with limited liability headquartered at Syngenta World Headquarters, Rosentalstrasse, Basel, Switzerland and listed in SIX Swiss Exchange and the New York Stock Exchange (NYSE). It is a global agribusiness company and an organ of society with a duty to respect human rights.
2. The Second Defendant, Monsanto Company (Monsanto), is a corporation with the status of a legal person and with limited liability headquartered at 800 North Lindbergh Boulevard, St. Louis, Missouri 63167, USA and listed in the New York Stock Exchange. It is a global agribusiness company and an organ of society with a duty to respect human rights.
3. The Third Defendant, Bayer CropScience AG (Bayer), is a corporation with the status of a legal person and with limited liability headquartered at Alfred-Nobel-Strasse 50, Monheim am Rhein 40789, Germany and listed in the German Stock Exchange. It is a global agribusiness company and an organ of society with a duty to respect human rights.

4. The Fourth Defendant, BASF Group (BASF), is a corporation with the status of a legal person and with limited liability headquartered in Ludwigshafen, Germany at Carl-Bosch-Strasse 38, Ludwigshafen, OH 67056, Germany. It is a global group of companies and an organ of society with a duty to respect human rights.
5. The Fifth Defendant, Dow Chemical Company (Dow), is a corporation with the status of a legal person and with limited liability headquartered at 2030 Dow Center, Midland, Michigan 48674, USA and listed in the New York Stock Exchange. It is a global agribusiness company and an organ of society with a duty to respect human rights.
6. The Sixth Defendant, DuPont, is a corporation with the status of a legal person and with limited liability headquartered at DuPont Building, 1007, Market Street, Wilmington, Delaware 19898, USA. It is a global agribusiness company and an organ of society with a duty to respect human rights.
- 7-9. The Seventh, Eighth and Ninth Defendants are the legitimate governments of sovereign States (United States of America, Switzerland and Germany) and are accordingly members of the United Nations Organisation (UN) and State Parties to various human rights instruments.
10. The Tenth Defendant, the International Monetary Fund (IMF), is a specialised agency of the United Nations with its own charter, governing structure and finances. It provides policy advice and financing to members in economic difficulties in line with neo-liberal economic policies.
11. The Eleventh Defendant, the World Bank, is headquartered in Washington, D.C., USA and is made up of two development institutions, the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA).
12. The Twelfth Defendant, the World Trade Organization (WTO), is a global international organisation dealing with the rules of trade between nations through agreements negotiated, signed and ratified by the bulk of the world's trading nations. They also define and limit the obligations of member states and provide mechanisms for settling disputes.

2 INTRODUCTION: ESTABLISHING CONCERNS

2.1 TRANSNATIONAL CORPORATION (TNC) DOMINATION AND AGGRESSION

The concentration of corporate power in food and agriculture is enormous. Agrochemical and seed corporations influence the strategies for growing most of the world's food and fibre. Six corporations control 75 per cent of the global pesticides market. The top three (Syngenta, Bayer and BASF in 2010) accounted for 49 per cent of the pesticide market and are followed in order by Dow, Monsanto, DuPont with 26 per cent.¹ The worldwide market for agrochemicals was US \$38.6 billion in 2007, an increase of 8.4 per cent over the previous year. By 2009, the market value had reached US \$41.53 billion² and it continues to rise.

The top ten seed companies control 67 per cent of the global proprietary seed market,³ valued at US \$22 billion in 2007, and four of these⁴ are also in the top six agrochemical corporations.⁵ According to a 2008 report, the top three companies (Monsanto, DuPont, Syngenta) together accounted for 47 per cent of the worldwide proprietary seed market, that share worth US \$10 billion. Monsanto alone accounted for 23 per cent. ETC Group conservatively estimated that the top three seed companies controlled 65 per cent of the proprietary maize⁶ seed market worldwide, and over half of the proprietary soybean⁷ seed market.⁸ Monsanto's genetically engineered seeds and traits accounted for 87 per cent of the total world area devoted to GE crops in 2007.⁹

This handful of transnational agribusiness corporations¹⁰ wield excessive power and influence and, in many cases, determines the trajectory of national and international food and farming policies and practices, consistently advancing their corporate agenda – profits, market domination, liberal trade policies and corporate globalisation.

In the process they have violated, and continue to violate, the spectrum of basic human rights and commit crimes against humanity with impunity. These include their violations of economic, social and cultural rights and civil and political rights – in particular, the right to life; right to health; right to livelihood; right to food; right to self-determination; right to a healthy environment; right to safe

¹ PAN. 2011. Calculated from figures in Agrow World Crop Protection News. August 2008.

² Sirur G. 2011. Global Crop Protection Market Back in Growth Mode in 2010. *Agrow World Crop Protection News* 595, July 9.

³ Proprietary seeds are brand-name seed that is subject to exclusive monopoly through forms of intellectual property rights (IPR) protection.

⁴ Monsanto, DuPont, Syngenta, Bayer.

⁵ ETC Group. 2008. Who Owns Nature? Corporate Power and the Final Frontier in the Commodification of Life. *Communiqué Issue 100*. November.

⁶ Maize is known as 'corn' in some countries notably the US, Canada, Australia and New Zealand. Elsewhere 'corn' means the commonly-grown grain (e.g. wheat, barley etc). 'Sweet corn' is early harvested maize for eating; maize is harvested at maturity for grain or storage. Known as 'maize' in Africa and Latin America (Mexico is the centre of origin), where it is widely grown, this publication favours that term, but uses corn when quoting sources and where geographically appropriate.

⁷ 'Soybeans' are known as 'soya beans' in the UK; this publication uses the term 'soybeans' throughout.

⁸ ETC Group 2008, *Op Cit*.

⁹ *Ibid*.

¹⁰ A TNC can consist of a single corporation (or company) or a group of companies operating in two or more countries. Its decision making process is centralised in a board of directors spearheaded by a Chairperson. TNCs can locate headquarters in one country and operate across borders through subsidiaries, joint ventures, local contractors or nominees. The parent or holding company maintains financial control. Shareholders are in law not directly liable for the violations of the corporation. Corporations have the fluidity to restructure their business empires with relative ease.

working conditions; rights over natural resources; rights of human rights defenders; and inter-generational rights and right to equity.

The victims and survivors of TNC aggression are poor peasants; small-scale farmers; agricultural workers; fisherfolk; rural women, men and children; and indigenous and agricultural communities around the world. These small food producers are at the mercy of the expanding power of the agrochemical TNCs, losing their control over their seeds and knowledge, and suffering debilitating physical and chronic effects of pesticide poisoning, as well as coping with the destruction of their children's health. They are losing their livelihoods, suffering increased hunger and malnutrition, and having their means of survival threatened. Children carry the legacy of pesticide poisoning in their bodies, passing it on to their descendants. Accurate statistics on the health effects of pesticides are not available, but the estimates range from one million to 41 million people suffering health effects around the globe.¹¹

Since the mass introduction of pesticides into agriculture 70 years ago, control over the knowledge and tools needed to grow food has been shifting from farmers to laboratories and marketing divisions of TNCs. These TNCs control an increasingly alarming percentage of seeds and germplasm, an important link in the food chain. Intellectual property rights (IPRs) such as patents, plant variety protections (PVPs) and seed laws have allowed the TNCs to further entrench their control of the global food system through their patent-protected seeds, including the products of genetic engineering.

The restrictions on the use of seeds, brought about by IPRs, force small food producers into dependency on purchased seeds while driving up the price. In addition, the licensing contracts between farmers and corporations prevent seed saving and sharing, as seeds remain the property of the companies. Such licensing contracts, and the patents on the seeds, have serious ramifications for farmers' ability to save seed, select and breed locally-adapted plant varieties. Meanwhile, farmers' (particularly women's) local knowledge, skills and innovation are being ignored and lost, as is their self-sufficiency and ability to control their costs. The introduction of GE crops is increasingly narrowing agro-biodiversity¹² in the field, and reports of health impacts and environmental contamination of GE crops are very worrying.

Agrochemical TNCs insist that chemical pesticides and GE are required to 'feed the world'. These hazardous technologies have become the dominant production strategies because of the power of agrochemical corporations to promote their products and influence governments – this despite the existence of sustainable alternatives that have successfully demonstrated chemical intensification and GE crops are unnecessary for food production, aside from being detrimental to global food security. The real way to ensure sustainable food and agricultural production is through agroecological practices, which can increase incomes of small food producers, address human health and environmental sustainability concerns, and are compatible with the right to food. The UN Special Rapporteur on the right to food, Olivier de Schutter, in his 2010 report to the UN Human Rights Council,¹³ made a strong case for agroecological production. Using examples of agroecology practised globally, he showed that it is *"highly productive, highly sustainable and it contributes to the progressive realization of the human right to adequate food"*.

¹¹ PAN International. 2007. Position of Synthetic Pesticide Elimination: Position Paper – Working Group 1.

¹² Agrobiodiversity is defined by FAO as the variety and variability of animals, plants and microorganisms that are used directly or indirectly for food and agriculture, including crops, livestock, forestry and fisheries. It comprises the diversity of genetic resources (varieties, breeds) and species used for food, fodder, fibre, fuel and pharmaceuticals. It includes the diversity of non-harvested species that support production (soil microorganisms, predators, pollinators), and those in the wider environment that support agro-ecosystems (agricultural, pastoral, forest and aquatic) as well as the diversity of the agro-ecosystems.

¹³ De Schutter O. 2010. Report submitted by the Special Rapporteur on the right to food, Human Rights Council, 16th Session (A/HRC/16/49). December 20.

In spite of all these concerns, over the last 40 years agrochemical TNCs have consolidated their resources and entrenched control over food and agricultural markets. They have done so by calculated mergers and acquisitions of agrochemical and seed companies. These mergers have attempted to erase toxic legacies and notorious pasts and present a 'green' facade to the public.

Agrochemical TNCs are highly influential in their home countries, and beyond. Officials from regulatory bodies or government posts often leave their positions to join TNCs for lucrative appointments, and vice versa. The practice of industry representatives moving between government and corporate posts is known as the 'revolving door'.¹⁴ It has allowed agrochemical TNCs to shape national and international policies to their advantage and expand their markets worldwide. In the US, hundreds of men and women have moved in and out of positions as federal regulators, directors, commissioners and scientists of companies they are meant to regulate. This symbiotic relationship between the regulators and the regulated furthers the interests of the companies and minimises the risk of prosecution. Similar influence is exerted outside the home country through trade treaty negotiations, international organisations and in other jurisdictions. The World Bank has facilitated appointments of industry personnel as consultants in food and agriculture programmes in developing countries.

The agricultural trade policies and neoliberal globalisation facilitated by the international financial institutions (IFIs) including the World Bank and International Monetary Fund (IMF) through Structural Adjustment Programmes, and later by the World Trade Organisation (WTO), benefit TNCs. These policies impose liberalisation, deregulation and privatisation on LICs thus undermining state control and policies to safeguard people's rights to health, environment and livelihoods. They require government reduction of public spending on social services, such as health and education.

Bilateral and multilateral trade agreements and national laws on food and agriculture take obligations for IPR protection beyond WTO requirements, increasing the protection to corporations, to the detriment of farmers who have selected, bred and conserved genetic resources for centuries.

Governments of some developing countries have been complicit in the activities of agrochemical TNCs. Dependent on foreign investment and aid, and saddled with foreign debt, economic and political instability, food insecurity, and at times poor governance, they have collaborated in the imposition of policies and practices that violate the human rights of their people. The effects of the neo-liberal policies described above have greatly contributed to a state of abject vulnerability for rural and poor communities.

It is truly a travesty of justice that the defendant agrochemical TNCs, which market a package of hazardous agricultural products and technologies, have been able to acquire such immense levels of power and wealth globally. The existing state of law has provided TNCs with legal loopholes and safe havens to facilitate evasion of accountability.

TNCs have the status of a 'legal person' in most legal systems.¹⁵ The identity of such 'legal persons' needs to be clarified in international law. A company operating across borders, through subsidiaries,

¹⁴ For example, Monsanto has consistently lobbied the US Congress and the US Dept. of Agriculture about regulations that would propel production and distribution of genetically engineered produce. A number of people who have held positions at Monsanto, also have held position in important US government agencies such as the Food and Drug Administration (US FDA), Environmental Protection Agency (US EPA) and the US Supreme Court.

¹⁵ Clark RC. 1986. *Corporate Law*. Little, Brown.

joint ventures, or other structures, often appears as different distinct 'legal persons' in one country. The parent company and its subsidiary are regarded as distinct and separate 'legal persons'; in law, they are two different 'people', and one cannot be punished for the wrongs committed (directly) by the other. This presents difficulties for those seeking redress for corporate wrongs. If, for example, a subsidiary in Country X breaks international laws, should the parent company domiciled in Country Y be morally and legally culpable for the acts of its subsidiary? How can wronged citizens initiate legal action to hold the corporation accountable either in its 'home' state or through the subsidiary? (See 3.5.1 for further discussion.)

Foreign citizens who seek redress for crimes, misconduct or harms caused by a TNC or its subsidiary face a further hurdle in the legal principle of *forum non conveniens*. Under this principle, courts may decline to hear or take up jurisdiction of a case when more appropriate venues are deemed available. Corporations can argue that the most 'convenient forum' is in the state where they consider they will achieve the most favourable outcome, whether this is in its 'home' state or the state where the harm occurred. For example, in the case of the Bhopal disaster, Union Carbide argued that the case be heard in India, most likely assuming that damages awarded there would be lower. A US judge agreed with the company.

There is a lack of political will by states to hold TNCs legally accountable even for horrific wrongs. TNCs wield great economic, financial and political power and are capable of exerting undue influence over governments, particularly in developing countries, to advance their business interests.

While the obligations of states are stipulated in most current international human rights laws, international means of redress only deal with failures by states to recognise their citizens' rights as defined by specific human rights conventions. They do not address violations by corporations and other legal persons. There is no international forum to administer international human rights law in relation to violations committed by agrochemical TNCs for actions brought directly by individual victims or groups of victims or their next of kin.

Victims and survivors are dependent on the state for justice and redress. International legal bodies beyond the state do not hear cases against corporations. For example, the International Court of Justice, which is the judicial arm of the UN, has jurisdiction over disputes between member states but only member states have the right to invoke its jurisdiction. Non-state actors can be neither complainant nor defendant. The International Criminal Court, on the other hand, has jurisdiction only over natural persons, not legal persons. Corporations cannot be prosecuted in this court for gross violations of human rights that amount to crimes under international criminal law.

There is a lack of political will by states to hold TNCs legally accountable even for horrific wrongs. TNCs wield great economic, financial and political power and are capable of exerting undue influence over governments, particularly in developing countries, to advance their business interests. Such a state of affairs has enabled agrochemical TNCs, such as the Defendants named in this indictment, to commit violations of human rights with impunity, evading legal accountability. Thus this PPT session is the people's recourse to justice.

2.2 CORPORATE CONTROL OVER FOOD AND AGRICULTURE

Globalisation and control over food and agriculture began with colonisation. Colonisers took over land and converted forests to profit a limited number of individuals and companies while using people in colonised lands as cheap labour. Estates and plantations grew into powerful companies while other companies controlled aspects of the supply chain, often integrating links in the chain. Some major pesticide products were developed from nerve gases made for chemical warfare. At the end of World War Two (WW2), some of the chemical warfare production facilities were converted to produce commercial agrochemicals for modern-day agriculture, beginning a process of monopoly control, integration, concentration and expansion of agrochemical TNCs. Their position and power were entrenched by further global changes, including the Green Revolution, Structural Adjustment Programmes imposed by World Bank and IMF policies which highly influenced national policies, and trade liberalisation and globalisation policies that opened markets, initially through the General Agreement on Tariffs and Trade (GATT) and then through the WTO.

Pesticides: Rooted in weapons of mass destruction

Sarin, an extremely potent chemical weapon, was developed and manufactured by the German chemical industry conglomerate I.G. Farbenindustrie AG (I.G. Farben) This nerve gas was employed by Hitler's Germany during WW2 in experiments on human subjects at the concentration camps. I.G. Farben later split into four of its largest original constituent companies, including BASF, Bayer and Hoechst. Bayer CropScience AG, and other companies, then commercially exploited the neurotoxic properties of nerve gases to make organophosphate insecticides.¹⁶ These descendants of nerve gases are some of the most acutely toxic chemicals used in agriculture: methyl parathion and monocrotophos, for example, are classified as extremely and highly hazardous (respectively) by the World Health Organisation (WHO), yet are still used in the Global South with little or no protection for the workers and farmers who apply them.

Monsanto and Dow manufactured and supplied to the US government the herbicides 2,4-D and 2,4,5-T (known as Agent Orange). 2,4,5-T could not be produced without the impurity dioxin, which is regarded as one of the most toxic chemicals known to humankind; 2,4-D also contained some dioxin. It is estimated that 12 per cent¹⁷ of the land mass in Vietnam was drenched with 76 million litres¹⁸ of Agent Orange from aerial spraying between 1961 and 1971, with devastating effects on people and the environment. The effects are still felt today by the second and third generations of survivors of Agent Orange, which include the Vietnamese people and war veterans from the US, Australia and New Zealand, and their children. Potential effects on future generations remain a risk.

¹⁶ GM Watch. Undated. Bayer: a history. <http://www.gmwatch.org/articles/gm-firms/bayer-a-history>

¹⁷ International Association of Democratic Lawyers. 2009. Judgment of the International People's Tribunal of Conscience in Support of the Vietnamese Victims of Agent Orange. May 15-16).

¹⁸ Tran Dinh Thanh Lam. 2004. Vietnamese fight back on Agent Orange. Asia Times Online. February 27.

The 'Green Revolution' and the destruction of agriculture

The Green Revolution introduced High Yielding Varieties (HYVs) of a range of staple food crops, initially wheat and later rice. Before this, crops were open-pollinated and farmers saved seeds for sowing next year's crop. However, HYV varieties are hybrids and do not produce seeds true to type, so they must be purchased each year to maintain yields. HYVs require intensive external inputs in order to produce well, and were effectively the means through which agrochemical corporations promoted and sold synthetic fertilisers and chemical pesticides in developing countries establishing their economic and political influence worldwide, and expanding their control over agriculture. Green Revolution technologies were promoted initially through free supplies of chemical pesticides, HYV seeds and synthetic fertilisers, as well as incentives, loans and subsidies to ensure that peasant farmers adopted the 'package'.

The adoption of genetically uniform HYVs has resulted in the loss of about 75 per cent of plant genetic diversity since the 1900s; and since that time more than 90 per cent of crop varieties have disappeared from farmers' fields, according to the Food and Agriculture Organization of the United Nations (FAO).¹⁹ About 75 per cent of India's rice production may be cultivated with just 12 varieties,²⁰ compared with the 30,000 pre-Green Revolution varieties²¹. With this loss of rice biodiversity has come the loss of traditional sources of nutrients and vitamins for communities.

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The performance of HYVs depends on the application of fertilisers, pesticides, irrigation, and mechanisation. The intensive cultivation strategies led to serious and sometimes fatal health effects from pesticide exposure, massive reductions in water tables, salinisation and erosion of soils, the massive displacement of peasants from productive to marginalised land,²² the concentration of land in fewer hands, and the acceleration of rural migration to cities and industrialised countries where rural people make up the bulk of cheap labour.

By the 1990s, an estimated 40 per cent of farmers in the Global South were using Green Revolution seeds, primarily in Asia followed by Latin America.²³ In Asia, the Green Revolution has had devastating impacts on agriculture and small farming communities. It has destroyed traditional and

sustainable systems of small rice farming; impoverished small rice farming communities; endangered human health; and harmed the environment. Peasant and small-scale farmers have been driven into debt, bankruptcy, and suicide by rising production costs and reliance on costly external inputs. Farmers in Punjab, India, among the first in Asia to implement Green Revolution technologies, now apply three times the amount of fertilisers that they used to before the invasion of Green Revolution technologies.

¹⁹ FAO. Undated. What is Happening to Agrobiodiversity? <http://www.fao.org/docrep/007/y5609e/y5609e02.htm>

²⁰ FAO. Undated. Towards a New Green Revolution. <http://www.fao.org/docrep/x0262e/x0262e06.htm>

²¹ Heal G, Walker B, Levin S, Arrow K, Dasgupta P, Daily G, Ehrlich P, Maler K-G, Kautsky N, Lubchenco J, Schneider S, Starrett. 2004. Genetic diversity and interdependent crop choices in agriculture. *Resource and Energy Economics* 26:175-184.

²² Holt-Gimenez, E. 2008. The World Food Crisis – What's Behind It and What We Can Do About It (Policy Brief No. 16). Food First, Institute for Food and Development Policy, US.

²³ Kwa A. 2001. Agriculture in Developing Countries: Which Way Forward? Trade-Related Agenda, Development and Equity (T.R.A.D.E.) Occasional Papers 4. South Centre.

IMPACTS OF THE GREEN REVOLUTION

The Green Revolution was launched in Asia in the 1960s, led by the International Rice Research Institute (IRRI), following Mexico's development of high yielding varieties (HYV) of wheat. It was funded by private and public institutions including governments, and was celebrated as a miracle for food production in the developing world. The US-based Ford and Rockefeller Foundations set up IRRI in the Philippines in 1960 to spearhead adoption. Governments encouraged farmers to adopt high-input technologies with free starter supplies of seeds, fertilisers and pesticides. Irrigation facilities were built, and credit and loans made available. For example, in the Philippines until 1981, government loans were given only to farmers who planted one of the ten approved HYVs.

Harm to human health

One of the worst legacies of the Green Revolution has been the widespread use of highly hazardous pesticides in agriculture with devastating effects on human health. An estimated 355,000 people are killed annually due to unintentional poisoning every year, with about half these deaths occurring in agriculture.²⁴ In developing countries, where at least two thirds of the deaths occur,²⁵ up to 41 million people may suffer health effects from pesticides,²⁶ with children and infants affected disproportionately.²⁷

Destruction of land and water resources

As water resources were depleted and irrigation increased, soil salinity worsened and land became unusable for agriculture. Soil biota diminished and soil fertility decreased, leading to increased use of fertilisers. The International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD)²⁸ reported that the abuse of synthetic fertilisers has created large dead zones and the abuse of chemical pesticides has led to groundwater pollution and the loss of biodiversity.

Vulnerability to pest attacks

Pests flourish under HYV monoculture cultivation, encouraging greater use of pesticides. Over several generations, pests develop resistance to pesticides; secondary pests can become dominant; and beneficial insects are killed. Without training and knowledge on how to manage

²⁴ WHO. 2003. Shaping the Future.

²⁵ WHO, UNEP 2011. 'Priority Risks', The Health and Environment Linkages Initiative (HELI).

²⁶ PAN International, 2007, Op cit.

²⁷ UNEP Chemicals. 2004. Childhood Pesticide Poisoning: Information for Advocacy and Action. Chatelaine, Switzerland.

²⁸ McIntyre BD, Herren HR, Wakhungu J, Watson RT (eds). 2009. *Agriculture at a Crossroads*. IAASTD International Assessment of Agricultural Knowledge, Science and Technology for Development Global Report. UNDP, FAO, UNEP, UNESCO, The World Bank, WHO, GEF. Island Press, Washington, D.C. <http://www.unep.org/dewa/Assessments/Ecosystems/IAASTD/tabid/105853/Default.aspx>.

IAASTD was initiated in 2002 by the World Bank and six UN agencies as a global consultative process to provide decision makers with the information they need to reduce hunger; improve rural livelihoods, human health and nutrition; and promote equitable and socially, environmentally and economically sustainable development. It involved over 400 of the world's scientists and development experts, including from the UN Agencies, civil society, academia, research institutes and industry.

pests, farmers use more and stronger pesticides, stepping onto a 'pesticide treadmill'. While yields initially increase, they often drop as pests flourish. Crop genetic diversity is the best protection against pests and pathogens.

Loss of community wisdom and sustainability

The so-called success of the Green Revolution is often misrepresented. For example, an Indian peasant in Chiapas, Mexico, produces about two tons of maize per hectare compared with six tons per hectare in large Mexican farms. However, the peasant grows a mixture of crops: squash, tomatoes, vegetables and medicinal herbs. Corn stalks serve as support for climbing beans. Domestic animals are fed from the farm. In all, Mexican Indian peasants grow around 14 tons per hectare of food without fertilisers or pesticides.

Women farmers have for thousands of years selected and saved seeds, and created a multitude of varieties adapted to local conditions and cultural preferences. Traditional farming knowledge and the role of women as seed savers were eroded or erased as local seed varieties were abandoned and HYVs adopted. A study in Andhra Pradesh, India, found that 95 per cent of traditional rice varieties had disappeared without being collected and/or documented. In the 1970s, an Indian rice scientist, R.H. Richharia, collected more than 19,000 rice cultivars and wild rice samples.

It is easier for larger-scale farmers to obtain credit to buy inputs. As a result, land became concentrated in fewer hands. Millions of small-scale farmers went bankrupt when crop yields were too low to enable them to repay their loans. Farming on fragile hillsides and marginal lands accelerated, which increased poverty and deforestation. Many displaced farmers emigrated to cities or industrialised nations where they became undocumented and low-paid workers. An estimated 3.5 million agricultural workers in the US originate from rural areas of Mexico and Central America.

Environmental damage, loss of agrobiodiversity²⁹ and illnesses brought about by pesticides have lowered the living standards of rural communities. Seventy per cent of developing countries are now net food importers. In 2009, after almost five decades of the Green Revolution, the FAO declared that the number of hungry had risen to over one billion.

²⁹ Agrobiodiversity broadens the scope of agrobiodiversity to include variability in farm and crop management (technologies, cultivation and breeding practises), biophysical diversity (biodiversity, natural resources, landscape, climate), and social organisations that support agricultural production

Structural Adjustment Programs facilitate global corporate control over agriculture

At the beginning of the global debt crisis in the 1980s, the Bretton Woods institutions (the IMF and World Bank), implemented Structural Adjustment Programs (SAPs) with stringent 'conditionalities' attached to their loans to LICs. The 1980s and 1990s conditionalities forced an export-led model of growth on LICs to address fiscal imbalances. For many developing countries, this meant increasing production and export of cash crops as their area of 'comparative advantage'. This not only led to faster adoption of the corporate agricultural model, but also tied countries to imports of industrial goods from the North with unequal terms of trade. No consideration was given to the industries, or processed products from crops, that would add value to exports. SAPs opened agriculture and services to TNCs. These processes extended the impacts of the Green Revolution, entrenching the power of agrochemical TNCs over food production systems (see box).³⁰

THE SAP TRAP³¹

In the 1970s, oil-exporting countries accumulated wealth because the Organization of Petroleum Exporting Countries (OPEC) doubled the oil price. Large sums of oil money were funnelled to banks in the US, Europe and Japan leading to lower interest rates and increased bank lending. Oil-importing countries, facing higher oil prices, experienced a shortage of funds and sought international loans. Banks from industrialised nations offered loans at low interest rates and many governments in the South borrowed heavily and increased their spending. Elite segments became rich, not much attention was given to public services, and little or no benefits reached the poor. Encouraged by the industrialised countries whose industries sought agricultural raw materials, agricultural investment in some countries was directed to cash crops – bananas, cocoa, coffee, and palm oil. Increased exports of natural resources and cash crops created a glut of these products, lowering commodity prices, which in turn affected the repayment of loans by the debtor countries. A second oil price rise set by OPEC in 1979 precipitated a deep recession that led to reduced imports and a sharp decline in the demand for tropical cash crops. Many governments from the South faced high interest rates, drastically reduced export earnings and soaring external debts. Imminent massive defaults threatened the global financial system.

To ensure payment from Southern governments, the World Bank and the IMF imposed stringent SAPs as conditions for further loans (conditionalities), ostensibly to facilitate debt repayment by increasing export earnings and foreign investment through the restructuring of national economies and social systems. In the 1980s-90s, SAPs opened up national industries and natural resources to foreign corporations, dismantled marketing boards, eliminated price guarantees, closed entire research and extension systems, lowered tariffs for imported products, and deregulated agricultural markets.³² The programmes varied but the main themes remained the same. Again, cash crops were favoured, as basic food was available 'cheaply' from the developed

³⁰ Paul H, Steinbrecher R. 2003. Hungry Corporations: Transnational Biotech Companies Colonise the Food Chain, Zed Books, London.

³¹ Paul & Steinbrecher, 2003, *Op. cit.*

³² Holt-Gimenez E. 2008. The World Food Crisis – What's Behind It and What We Can Do About It (Policy Brief No. 16). Food First, Institute for Food and Development Policy.

countries. In the US and Europe, heavy subsidies for agriculture resulted in huge food surpluses which needed to be disposed of, distorting world food trade. With the advent of the WTO, SAPs were incorporated into international treaties that overrode national laws. WTO regulations, like Trade Related Intellectual Property Rights, consolidated the grip of agrochemical TNCs over the food system.

The policy shift from food self-sufficiency and local production to export crops made countries dependent on food imports.³³ Haiti was self-sufficient in rice until US imports destroyed domestic production in the early 1990s. In 2008, food riots toppled its government. In the mid-1980s, Ghana was forced to scrap its rice self-sufficiency policy, stop subsidies and price support to rice farmers, and close its food distribution and seed production units. Honduras offered price support to protect its rice farmers, built up grain stocks and set up a marketing board to regulate imports. In the early 1990s, SAPs 'restructured' the marketing board and privatised grain storage. By the mid-1990s, there was an influx of subsidised rice imports which depressed the price of local rice. Small-scale farmers went into debt and many stopped growing rice. The emphasis on export crops concentrated land for large-scale export farming, consequently increasing landlessness. Instead of providing better food security through trade, these policies increased hunger among the rural and urban poor.

The policy shift from food self-sufficiency and local production to export crops made countries dependent on food imports.

Poverty Reduction Strategy Paper – Further prescriptions from the IMF and World Bank

The IMF and World Bank, following the adverse effects of the SAPs on the lives of the poorest – and in particular small scale farming communities – introduced new conditions for loans and debt relief in the form of Poverty Reduction Strategy Papers (PRSP). A PRSP is a national-based development programme focused on poverty reduction, conceived and drawn up by the borrowing country with public involvement taking into consideration particular circumstances and local conditions (economic, social and political), thus supposedly vesting ownership with the government. In reality, the IMF and the World Bank will endorse and accept a PRSP only if it meets their lending policies. These policies remain anchored to rigid macro-economic and structural standards of the SAPs era (conditionalities), which promote privatisation, liberalisation and a reduced role for the state – conditions that negatively impact on the poor. Borrowing countries abdicate sovereignty, governance and independent national development policies in preparing PRSPs that are IMF and World Bank compliant. When they occur, consultations with civil society are dictated by political considerations and determined by government objectives. Thus PRSPs are not necessarily supportive of the poor or of sustainable, ecological development.

33 Holt-Gimenez E, 2008, *Op. cit.*

2.3 CORPORATE CONTROL OF GENETIC RESOURCES

Whilst the HYVs were developed and distributed under government control through the Consultative Group on International Agricultural Research (CGIAR)³⁴ and National Agricultural Research Systems (NARS), the extension of intellectual property rights on life forms via the International Union for the Protection of New Varieties of Plants (UPOV)³⁵ and World Trade Organization's Trade-Related Aspects of Intellectual Property Rights Scheme (WTO-TRIPS), has put the TNCs firmly in control of plant genetic resources, particularly through the application of modern biotechnology, or genetic engineering, which for the TNCs has become the centre of agricultural crop development.

From hybrid seeds to Intellectual Property Rights

Property rights on seeds have been conferred through Plant Breeders' Rights (PBRs) or Plant Variety Rights (PVR) – a form of intellectual property rights used by plant breeders to protect their new varieties – and, since the 1990s, through patents which further limit farmers' rights to seed saving and breeding.³⁶ Attempts to control seeds date back to the 1920s when the US seed industry initiated a programme for hybrid maize. First generation hybrid seeds (F1) are produced by crossing two specific and distinct, inbred, pure homozygous parental lines. Because second generation saved seeds (F2) from these plants do not produce predictable results, farmers have to buy new seeds every planting season. The hybrid seed industry was in part protected by the USDA, the Secretary of which was president of a leading US corn seed company, Pioneer (now Pioneer Hi-Bred International owned by DuPont).³⁷

When the genetically identical HYVs were developed, the seed industry tried to take out patents on them. This was unsuccessful, but a separate system of legal protection for plant breeders was proposed, leading to the Union for the Protection of New Varieties of Plants (UPOV). UPOV became a legally binding convention in 1961. The most recent UPOV agreements were drawn up in 1991 and came into effect in 1998. UPOV awards the breeder full commercial control of the reproductive material. Farmers are prohibited from selling harvested seeds for reproductive purposes and prohibited from saving seeds except under highly restricted conditions.³⁸

Historically, patent laws were not applied to living entities or organisms because they were considered a 'product of nature'. This changed with the 1980 US Supreme Court ruling on the case *Diamond v. Chakravarty* by a narrow 5-4 decision, that a strain of bacteria which had been modified by the insertion of new genes was patentable because it was not naturally occurring. The GE bacteria had the ability to break down hydrocarbons and potentially could be used to clean up oil spills. Until then, no corporation, institution, or individual could own the rights to an entire strain or species, nor could they own components of living material, such as cells, genes, or proteins.³⁹ Ensuing case law

³⁴ CGIAR is a global consortium of 15 agricultural research centres, such as IRRI, that work in close collaboration with hundreds of partners, including national and regional research institutes, civil society organizations, academia, development organizations and the private sector (<http://www.cgiar.org/who-we-are/>).

³⁵ UPOV is an intergovernmental organization with headquarters in Geneva (Switzerland), established by the International Convention for the Protection of New Varieties of Plants. The Convention was adopted in Paris in 1961 and it was revised in 1972, 1978 and 1991.

³⁶ 3D. 2009. Seeds of Hunger: Intellectual Property Rights on Seeds and the Human Rights Response. Executive Summary. 3D - Trade - Human Rights - Equitable Economy.

³⁷ Paul & Steinbrecher, 2003, Op cit.

³⁸ Gaia Foundation/GRAIN. 1998. Ten Reasons Not to Join UPOV. Global Trade and Biodiversity in Conflict, Issue 2.

³⁹ Council for Responsible Genetics. 2000. DNA Patents Create Monopolies on Living Organisms. [Position paper]. Reprinted in ActionBioScience.

has permitted the patenting of genetic sequences, and the US case *Ex parte Hibberd* (1985) extended patent protection to new plant varieties.⁴⁰ (See box: Patenting Life). These decisions paved the way for the agricultural biotechnology industry to achieve intellectual property protection of more complex genetic material. The hunt for new genes to exploit for profit has been regarded as a vast new frontier in science and industry.⁴¹

PATENTING LIFE: A BRIEF HISTORY

Over the last two decades, rapid developments in biotechnology have expanded the boundaries of what can be patented. Historically, life forms were excluded from patent laws based on the common belief that they were creations of nature. The US Plant Patent Act of 1930 rejected the notion that sexually reproducing plants should be subject to patent protection. A proposed amendment to this Act was again defeated in 1968. But following this defeat Congress decided that some form of protection was warranted. In 1970, Congress enacted the Plant Variety Protection Act (PVPA), an alternative form of plant variety protection for sexually reproducing plants. The act grants a 20-year term of protection for most crops, and grants the owner exclusive rights to multiply and market the seed of that variety. Two exemptions allowed (a) researchers to use PVPA-protected varieties for free exchange of germplasm within the research community, and (b) farmers to save patented seed for re-planting.

*The first patent on life was awarded in 1980 under a Supreme Court ruling in *Diamond vs. Chakrabarty*, that living organisms (in this instance a bacterium) could be patented. This decision paved the way for the US Patent and Trademark Office (US PTO) to decide in the 1985 case *Ex parte Hibberd* that sexually reproducing plants are patentable. Following that decision, the US PTO began accepting patent applications for such plants, despite the fact that Congress had not conferred authority on the US PTO to do so. Unlike the statutory exemptions included in PVPA, the plant utility patent allows its holders to exclude others from using the patented variety for research or agriculture. In 2001, the Supreme Court decision in *J.E.M Ag Supply v. Pioneer Hi-Bred International* upheld the patenting of plants, concluding that Congressional failure to explicitly exclude plants in the provision of the Patent Act did not imply that extending patents to plants was contrary to its intent. Section 2483 of the PVPA states, "Every certificate of plant variety protection shall certify that the breeder has the right, during the term of the plant variety protection, to exclude others from selling the variety, or offering it for sale, or reproducing it, or importing it, or exporting it, or using it in producing a hybrid or different variety therefrom, to the extent provided by this Act." *Ex Parte Hibberd* established the right of plant breeders to patent their plant materials under Section 101 of the Patent Act. This provided new opportunities and possibilities for plant breeders and seed companies to protect their products.⁴²*

*Reproduced with permission of the Centre for Food Safety (2005) *Monsanto vs. US Farmers**

40 Pray C, Oehmke JF, Naseem A. 2005. Innovation and dynamic efficiency in plant biotechnology: An introduction to the researchable issues. *AgBioForum* 8(2&3), 52-63.

41 Council for Responsible Genetics, 2000, *Op cit*.

42 *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred International Inc.*, 534 US 124, 127 (2001).

Intellectual property law in the international trading system

In 1994, an international agreement on intellectual property, the Trade Related Intellectual Property Rights (TRIPs), was added to the GATT at the end of the Uruguay Round of trade negotiations. GATT became the basis for establishing the WTO in 1995. The WTO governs multilateral trade and administers the implementation of trade agreements, including TRIPs. To join the WTO, countries must ratify these agreements by developing national laws or face trade sanctions.⁴³ TRIPs introduced intellectual property law into the international trading system for the first time.⁴⁴ TRIPs have been crucial in the spread of IPRs in agriculture. Under the WTO, all member countries must revise their national IPR laws to conform to certain provisions of the TRIPs Agreement. TRIPs requires developing countries to provide either patents or *sui generis* (unique) protection for the ownership of plant varieties. UPOV has promoted itself as the ready-made solution for compliance with TRIPs. Under TRIPs, developing countries are told that patents and other forms of IPRs will attract investment and technology to uplift their economies and provide food security. In reality, global IPRs on plant genes increase profits for TNCs, as described in the section below on genetically engineered (GE seeds).^{45, 46}

Centuries of innovation by indigenous farmers created most of the food crops grown today. But under current IPR regimes, modifications by agribusiness entitle TNCs to claim a plant as their own invention, and receive all profits from seed sales. This 'bio-colonialism' enables a few TNCs to profit at the expense of large numbers of indigenous farmers. The seed and agrochemical TNCs have attained unacceptable influence over national and international agriculture and food policies in many countries. At times corporations resort to unethical and illegal means to gain influence. Monsanto, for instance, has been implicated in bribing officials in Indonesia, and Dow for bribing officials in India (see section 4.2.3).

Introducing genetic engineering in agriculture

The 1990s saw the gradual introduction of genetic engineering in varieties of seeds, in particular in staple foods maize and rice, in industrial food crops soybean and canola (oilseed rape)⁴⁷ and in cotton. Genetically engineered (GE) seeds were created by TNCs, in particular the Defendant TNCs. GE seeds are legally protected by intellectual property rights that prohibit farmers from saving or replanting them. Farmers growing GE crops are under contractual obligation to honour this restriction or face legal prosecution. One example is Monsanto's glyphosate-resistant or Roundup Ready (RR) seeds (soybean, corn and canola) which are resistant to Monsanto's Roundup. Farmers must buy seeds from the patent owner, Monsanto. They must sign a 'technology agreement' when they purchase Monsanto GE seeds, and must follow Monsanto's *Technology Use Guide* annex. The contract allows Monsanto to make incursions onto the farmers' private property and allows them to access records of farmers' activities held by third parties, such as the US government.⁴⁸

As additional 'security' to eliminate seed-saving, TNCs have invented a 'terminator technology', a genetic manipulation that renders harvested seed sterile. Protests by civil society have so far blocked the deployment of this technology. Monsanto purchased the seed company, Delta and Pine Land,

⁴³ 3D, 2009, *Op. cit.*

⁴⁴ Kamath GB. 2007. Trade Related Intellectual Property Rights (TRIPs): A primer. ICFAI Business School. Mumbai, India.

⁴⁵ Gaia Foundation/GRAIN. 1998. Ten Reasons Not to Join UPOV. Global Trade and Biodiversity in Conflict, Issue No. 2.

⁴⁶ 3D, 2009, *Op. cit.*

⁴⁷ Canola is a cultivar of rapeseed (or oilseed rape) widely grown in the US and Canada for edible oil and other uses. This publication therefore keeps the term as used in the source.

⁴⁸ CFS. 2005. Monsanto vs US Farmers.

which holds several major terminator patents (together with the US Department of Agriculture [USDA]). Although Monsanto has pledged not to deploy terminator, it has clearly stated that the pledge is revocable at any time.⁴⁹

The promotion of GE crops is termed the 'Gene Revolution', or as IRRI prefers to call it, the 'Second Green Revolution'. Although there are different types of GE crops, the two main types marketed by the TNCs are insect-resistant and herbicide-tolerant varieties. The latter, such as the RR varieties referred to above, are usually tolerant to herbicides sold by the respective TNC, for the obvious reason of creating a profitable package of seeds and herbicides. Not surprisingly, the herbicide-tolerance technology has promoted the increased use of herbicides. In the US alone, for instance, the adoption of RR crops increased the glyphosate use on major field crops by more than 15-fold from 1994 to 2005.⁵⁰ In 2008, about 80 per cent of GE crops grown globally were herbicide-tolerant or resistant, mainly Monsanto's RR crops.^{51, 52}

TNCs have patented more than 900 rice genes. Defendants Monsanto, DuPont and Syngenta control 47 per cent of the proprietary seed market.⁵³ Ownership over life forms including seeds is a gross infringement of the intrinsic rights and food sovereignty of farmers to save and use their own seeds. GE is the epitome of corporate greed, falsely promoted as a means of ending hunger. The cases in this indictment will show how GE crops have brought suffering and loss to farming communities and how farmers have been unfairly sued and harassed by the Defendant TNCs over patented GE seeds. This indictment will also show how international instruments such as TRIPs, created by Defendants like the WTO, facilitate corporate ownership over seeds.

GENETICALLY ENGINEERED CROPS

Genetic engineering involves the manipulation of an organism's genome using recombinant nucleic acids (such as DNA or RNA) to arrive at a desired trait or traits. This is done at the cellular or molecular level, thus overcoming the species barrier that otherwise limit genetic improvement through natural reproduction. Its earliest application in agriculture dates back to 1980s with the development of antibiotic, insect and herbicide resistant tobacco.^{54, 55}

Since 1996, there has been commercial use of GE crops⁵⁶ with large-scale production of GE soybean, corn, canola and cotton. RR sugar beets, introduced by Monsanto, were grown commercially in 2007 and by 2010 accounted for 95 per cent of the US sugar beet.⁵⁷ On 20 May 2010, the US Court of Appeals ordered the USDA to prepare a rigorous review of the impacts of RR sugar beets, before

⁴⁹ Freese B. 2011. Why GM crops will not feed the world. Council For Responsible Genetics.

⁵⁰ Friends of the Earth International. 2008. Who benefits from GM crops? The rise in pesticide use. Executive Summary. Agriculture and Food. Issue 112.

⁵¹ Davis C. 2007. Genetically Modified Crops Threatened As Herbicide Resistant Weeds Evolve. World Resource Institute.

⁵² PAN UK. 2008. Who benefits from GM crops? The Rise in Pesticide Use. *Pesticides News* 79.

⁵³ ETC Group. 2008. Who Owns Nature? Corporate Power and the Final Frontier in the Commodification of Life. Communiqué Issue 100.

⁵⁴ Fraley, RT et al. 1983. Expression of bacterial genes in plant cells. *Proceedings of the National Academy of Sciences* 80:4803-4807.

⁵⁵ James, C. 1996. Global Review of the Field Testing and Commercialization of Transgenic Plants: 1986 to 1995. The International Service for the Acquisition of Agri-biotech Applications.

⁵⁶ *Ibid.*

⁵⁷ GMO Compass. 2010. Cultivation of GM plants: Rapid increase worldwide, cautious start in Europe. *Field Areas* 2009. GMO Planting. Agri-Biotechnology.

deciding whether to allow future commercial use.⁵⁸ Certain GE crops, including Golden Rice, Bt brinjal, and others, have been blocked from the market following strong objection and action by civil society in India. A moratorium was imposed on Bt brinjal (developed by Mahyco–Monsanto, India) in February 2010; but the crop is being field tested in the Philippines.

Liberalised trade agreements and IPRs have made possible the rapid advancement of GE food in developing countries. These seeds threaten agrobiodiversity, farmer livelihoods, human health, and the environment. The agrochemical industry argues that GE crops will solve the challenges of climate change and feed the world. The IAASTD report countered these claims. It documented how global and national food insecurity is likely to worsen if market driven industrial agricultural production systems continue to grow in 'a business as usual mode', while neither environmental sustainability nor social equity will be achieved, continuing the cycle of hunger and poverty.⁵⁹

Genetic engineering in agriculture and health impacts

In 2007, nearly 90 per cent of the world's biotechnology acres were confined to six countries in North and South America, with the US, Argentina and Brazil accounting for 80 per cent. GE soybeans, corn (maize),⁶⁰ cotton and canola (oilseed rape) comprised virtually 100 per cent of world biotech crop acreage.⁶¹ North America had the largest share of GE crops covering 64 million hectares, but the area in developing countries is also increasing. In 2009, 21.3 million hectares of GE cotton, maize and soybean were grown in Argentina, 21.4 million hectares of the same crops in Brazil, and 8.4 million hectares of GE cotton in India.⁶²

Consumption of GE food raises safety concerns for human health, related to toxic or allergic reactions and other unexpected adverse effects (see also 3.5.4.2, 4.2.1.1).^{63, 64, 65, 66, 67} The regulatory systems that allow GE food on the market are not based on rigorous precautionary science. For instance, scientists do not always know how many copies of the transgene (modified gene) are lodged in the plant cells or whether it is expressed properly, nor do they know how the new genetic material is going to behave in the future as the plant is exposed to stresses in its environment, such as drought, excess water, pests and so on. They do not know if the promoter gene which has been inserted into the plant to turn on the

⁵⁸ Center for Food Safety [CFS]. 2011. Court of Appeals Dismisses Monsanto's Appeal of Biotech Beets Case, Preserves Victory for Farmers, Environment. [Press Release, May 20].

⁵⁹ McIntyre et al, 2009, *Op cit.* p257.

⁶⁰ For the purpose of this document, corn and maize will be used interchangeably.

⁶¹ ISAAA. 2007. Global Status of Commercialized Biotech/GM Crops, Brief 37-2007.

⁶² GMO Compass. 2010. Cultivation of GM plants: Rapid increase worldwide, cautious start in Europe. Field Areas 2009. GMO Planting. Agri-Biotechnology.

⁶³ Ewen SWB, Pusztai A. 1999. Effect of diets containing genetically modified potatoes expressing *Glycine max* lectin on rat small intestine. *Lancet* 354:1353-1354.

⁶⁴ Smith JM. 2007. Genetic Roulette: The Documented Health Risks of Genetically Engineered Foods. Yes! Books, USA.

⁶⁵ Strodthoff H, Then C. 2003. Is GM maize responsible for deaths of cows in Hesse? Greenpeace e.V. 22745. Hamburg, Germany.

⁶⁶ Malatesta M, Caporaloni C, Gavaudan S, Rocchi MBL, Serafini S, Tiberi C, Gazzanelli G. 2002. Ultrastructural morphometrical and immunocytochemical analyses of hepatocyte nuclei from mice fed on genetically modified soybean. *Cell Structure and Function* 27(4):173-180.

⁶⁷ Tudisco R, Lombardi P, d'Angelo D, Cutrignelli MI, Mastellone V, Terzi V, Avallone L, Infascelli F. 2006. Genetically modified soya bean in rabbit feeding: detection of DNA fragments and evaluation of metabolic effects by enzymatic analysis. *Animal Science* 82:193-199.

new genetic material will influence another biochemical pathway, turning on other natural processes in the plant that would not naturally be turned on. They do not know how stable the expression of the transgene is, whether it could change in the third generation or how it is going to evolve.⁶⁸

The promise of greater yields and disease resistance has encouraged farmers to adopt GE varieties but crops do not always live up to the promise.

The promise of greater yields and disease resistance has encouraged farmers to adopt GE varieties but crops do not always live up to the promise. Insect-resistant cotton (engineered with a *Bacillus thuringiensis* [Bt] endotoxin gene) was said to successfully cut insecticide use and increase productivity in India. However, Keshav Kranti, an Indian entomologist and Acting Director of India's Central Institute of Cotton Research told the Indian government that the rapid adoption of GE cotton has coincided with the rise of

unknown insect pests, increased pesticide applications and declining productivity over the past three years.⁶⁹ Bt cotton makes up 90 per cent of the crop in some areas, but pests not previously known on cotton (e.g. mealybug) have spread, causing significant economic losses.⁷⁰

The situation appears to be worsening with pesticide applications on Bt cotton significantly overtaking those on conventional cotton.⁷¹ In China, seven years after commercialisation of (the more expensive) Bt cotton seeds, farmers' expenditure on pesticides was more or less the same as for non-GM growers.⁷² Although Bt cotton has reduced the need to spray against bollworm, other pests have increased with an overall rise in pesticide usage and no increase in or less profits for farmers.

Data from the USDA on GE corn, soybean and cotton show herbicide use increased by about 173.7 million kg (383 million lbs) in the first 13 years of their commercial release (1996-2008). RR soybean accounted for 92 per cent of the increase. A number of weeds have become resistant to glyphosate as a result of the excessive use of this herbicide. Weed control is now widely acknowledged as a serious management problem with GE crops. Farmers and weed scientists are struggling to devise affordable and effective methods to deal with resistant weeds. Glyphosate-resistant weeds were previously practically unknown. Insect-resistant Bt-corn and -cotton brought about reductions in insecticide use of about 29 million kg (64.2 million lbs) in this period, but this is outweighed by far greater herbicide use.⁷³

The CGIAR, notably IRRI, and TNCs in calling for a 'Second Green Revolution' or 'Gene Revolution' to feed the world's hungry ignore the many adverse impacts of pesticide poisoning and increased poverty for millions and the threats – real and potential – of GE technology.

⁶⁸ Mangan A. 2006. An Interview with Charles Benbrook on Genetic Engineering. *Synthesis/Regeneration* 40, Bioneers Conference, October 20-22.

⁶⁹ Mudur, GS. 2010. Cotton lessons for Bt brinjal. *The Telegraph*, February 15.

⁷⁰ *Ibid.*

⁷¹ GM Watch. 2010. Bt cotton boosting pesticide use. February 16.

⁷² Wang S, Just DR, Pinstrup-Andersen P. 2006. Tarnishing Silver Bullets: Bt Technology Adoption, Bounded Rationality and the Outbreak of Secondary Pest Infestations in China. Selected Paper prepared for presentation at the American Agricultural Economics Association Annual Meeting Long Beach, CA. July 16-22.

⁷³ Benbrook C. 2009. Impacts of Genetically Engineered Crops on Pesticide Use: The First Thirteen Years. The Organic Center.

THE GENE REVOLUTION IN AFRICA

Having introduced commercial GE crops in industrialised nations, Asia and Latin America, Africa has become a focus for expanding GE crops. Africa was a target of the first Green Revolution but the complexity of farming systems and social relations limited its imposition.⁷⁴ In 1999, the Rockefeller Foundation launched the New Green Revolution for Africa; in 2006, it was joined by the Bill and Melinda Gates Foundation to form the Alliance for a Green Revolution in Africa (AGRA). AGRA promotes 'public-private partnerships' with private investments to supposedly stimulate economic growth. At the 2006 Africa Fertilizer Summit, sponsored by the Rockefeller Foundation, 40 African governments committed to lift cross-border taxes and tariffs on chemical fertilisers.

AGRA is focusing on conventional breeding techniques given that the current regulatory infrastructure in most African countries favours this, assuring rapid dissemination of new varieties to farmers. While not directly distributing GE seeds in Africa, AGRA is training its scientists and setting up the infrastructure for their distribution.

AGRA claims to be a farmer-led African initiative, but all its institutional structures and decision-making processes were developed without consulting Africa's farmers' organisations. AGRA's technical paradigm privileges the science of molecular biology with crop scientists directing agricultural innovations from the labs. AGRA has situated itself to replicate the Green Revolution model in Africa following market-driven development strategies to open the smallholder sector to the world market where they must compete with subsidised agricultural produce from developed countries. This pattern is familiar: land concentrates in fewer hands, rural poverty rises and migration accelerates.

2.4 CORPORATE GLOBALISATION AND THE WTO

From the mid-1990s to the 2000s, corporate globalisation has been primarily implemented through the mechanisms of the WTO. IFIs have obliged countries to follow WTO requirements, for example to reduce tariffs and subsidies and promote privatisation and deregulation, as conditionalities for loans. Official development assistance (ODA) has also included conditionalities related to investment liberalisation in natural resources, water privatisation, promotion of high value crops and other contentious areas.

In agriculture, the WTO's Agreement on Agriculture (AoA) required the reduction and eventual elimination of tariffs on agricultural products, domestic support and export subsidy. But even as they aggressively push for the implementation of the AoA in poor countries, the US and Europe continue to subsidise their domestic agriculture, and developing countries cannot compete in either domestic or global markets.⁷⁵ Subsidies have led to dumping of surplus agricultural products in developing countries. These policies have also hurt small- and medium-scale farmers in the Global North, including hundreds of thousands in Europe and the US who had been forced to quit farming by low prices and heavy debts since the 1980s.⁷⁶

⁷⁴ Keressen, 2009, *Op. cit.*

⁷⁵ Smaller C. 2010. Planting the rights seed: a Human Rights perspective on agriculture and the WTO. Excerpt from *Sailing Close to the Wind: Navigating the Hong Kong WTO Ministerial*. Institute for Agricultural and Trade Policy, Minneapolis.

⁷⁶ Paul & Steinbrecher, 2003, *Op. cit.*

In 2008, talks on the AoA stalled. Since then developed countries – led by the US, European Union (EU) and Japan – have been pursuing bilateral trade and investment agreements (bilaterals) with developing country governments to further the process of trade liberalisation. Agricultural and food imports and foreign investments in agriculture and natural resources are among the sectors being liberalised, and industrialised countries are demanding strong IPR protection through bilaterals. The US has concluded bilateral free trade agreements (FTAs) with a number of countries in Asia, including Thailand, Malaysia and South Korea. *“While bilateral agreements make sense when participating countries are at the same level of development, there are problems when the members are at vastly different levels”,* says Bhagirath Lal Das, former Director of the International Trade Programmes in the UN Conference on Trade and Development (UNCTAD). He added *“there is a danger in this trend of creating innumerable ‘mini-WTOs’ because they are being used by the developed countries to get concessions that they have not been able to extract at the WTO”.*⁷⁷

Besides extracting concessions for greater market access, the US uses FTAs to push GE crops and impose crop-IPRs in developing countries. Under the regional North American Free Trade Agreement (NAFTA) that Mexico signed with the US and Canada in 1994, national food production was undermined. The agreement emphasised a shift from the production of staple crops (to be imported) to export crops. A flood of cheap US corn and other staple crops into Mexico caused local prices to fall dramatically. The bulk of the 2.5 million small- and medium-scale farmers were bankrupted and driven from the land⁷⁸. Nearly 1.3 million farm workers lost their jobs between 1995 and 2002, and farm wages dropped sharply (because of the 1994-95 currency crisis and NAFTA)⁷⁹. Only a section of the large-scale farmers, producing fruits and vegetables for exports, gained.

Subsidies have led to dumping of surplus agricultural products in developing countries.

The overall impact of globalisation in agriculture and food production in developing countries has been severe. After 30 years of IFI policies and more than 10 years of the WTO, 105 of 149 Third World countries have become net food importers, the number of rural poor (at US \$1 a day) has remained at 2.6 billion, and small farmers now comprise 80 per cent of the world’s one billion hungry.⁸⁰ These unfair agricultural and trade policies have been creating a crisis for small-scale and peasant farmers who are the primary and largest sector of producers in the developing world, growing much of the world’s staple food (rice, wheat and corn). These policies are the root cause of farmers’ loss of livelihoods and land. The ‘free market’ has turned food, a basic biological need, into a commodity for profiteering, speculative trade and investment to benefit TNCs.

Food crises and trade liberalisation

In 2008, a global food crisis fuelled food riots in Haiti, Mexico, Cameroon, Indonesia, Bangladesh and elsewhere. Most riots took place in underdeveloped countries where workers and peasants had been affected by skyrocketing food prices. Droughts and floods were one factor, and the rising cost of petrol led many governments to encourage conversion of land for agrofuel production. However,

⁷⁷ Das BL. 2005. Multitude of mini-WTOs. *Economic and Political Weekly* 40(4):4668-4670.

⁷⁸ Public Citizen. Undated. Failed Trade Policy & Immigration: Cause & Effect.

⁷⁹ Polaski S. 2004. Jobs, Wages, and Household Income. Chapter 1 from NAFTA’s Promise and Reality: Lessons from Mexico for the Hemisphere. Carnegie Endowment for International Peace.

⁸⁰ Guzman RB. 2007. The Global Food Crisis: Hype and Reality. *Special Release 7*. Penang, Malaysia. PANAP and PCFS

paradoxically, there was no global food shortage and – with the exception of wheat and maize – production of most food items was above consumption. The NGO Grain reported: “Stocks are at their lowest level in 30 years, it’s true, but the bottom line is that there is enough food produced in the world to feed the population. We have allowed food to be transformed from something that nourishes people and provides them with secure livelihoods into a commodity for speculation and bargaining.”⁸¹ Food shortages are largely a function of affordability and distribution rather than availability.

Another contributing factor to the food crisis was the billions of dollars in speculative investment that was poured into food commodities to escape the 2007 sliding stock markets and the credit crunch. Investment funds now controlled up to 60 per cent of the wheat traded on the world’s biggest commodity markets. This made prices more volatile and divorced prices from the realities of production. During the food shortages, giant agribusiness grain traders such as Cargill and Archer Daniels Midland (ADM) increased profits from commodity trading. In the first quarter of 2008, their profits rose by 86 per cent and 67 per cent, respectively. Agrochemical TNCs also made huge profits. For example, Monsanto which ran a loss of US \$2.3 million in 2003, made a profit of US \$1 billion in 2007 (44 per cent more than in 2006) while Syngenta made US \$1 billion in 2007 (75 per cent higher profits).⁸²

The response of the IFIs, regional banks such as the Asian Development Bank, FAO, and the WTO was to prescribe the same policies as in the past: greater liberalisation, resumption and completion of the WTO-AoA, and expansion of cash cropping and corporate agriculture. These factors had aggravated the global food crisis and intensified TNC profits. Developing countries had been forced to follow the advice to dismantle their public food stocks and rely on the world market for food security. Nearly 70 per cent of developing countries – areas most vulnerable to spiralling food prices – became net food importers.

2.5 THE CORPORATE PUBLIC RELATIONS SPIN

Industry claims run counter to reality. The FAO estimated that in 2010, 925 million people were undernourished; 98 per cent of them lived in developing countries and two-thirds lived in seven countries (Bangladesh, China, the Democratic Republic of Congo, Ethiopia, India, Indonesia and Pakistan).⁸³ Hunger is most severe among farmers and rural communities. Against this backdrop, agrochemical TNCs spend millions on advertising, lobbying, advocacy and public relations to claim that their products are not harmful to human health and the environment. As individual companies, and through their representative body CropLife International, TNCs present themselves as critical for hunger eradication, claim that plant biotechnology will help farmers withstand the effects of climate change, and assert that GE varieties can withstand drought or flooding. In fact, GE varieties (under IPR regimes) remain largely herbicide-tolerant or insect-resistant. Agrochemical TNCs public relations’ images associate their products and brands with nurturing, sustaining and protecting. Advertising shows images of a healthy and pollution-free world. Glossy public relations and advertising presentations combine with

⁸¹ GRAIN. 2008. Making a killing from hunger: We need to overturn food policy, now!

⁸² Prabhakar N. 2008. The politics of hunger: when policies and markets fail the poor. Penang, Malaysia. PANAP.

⁸³ FAO. 2010. The State of Food Insecurity in the World.

careful attention to language using concepts and goals like 'sustainable', 'dialogue', 'transparency', and 'respect' that have been co-opted from NGOs. This is at odds with the reality of pesticide products.

Advertising claims can be false and fraudulent. Monsanto's Chief Executive Officer in Thailand claimed in a 1999 newspaper interview that glyphosate, the main ingredient of its weed killer Roundup, was safer than salt. In 2009, Monsanto was found guilty by a French Court of false advertising⁸⁴ for claiming that Roundup was biodegradable and left 'the soil clean'. Glyphosate is classified in Europe as 'dangerous for the environment' and 'toxic for aquatic organisms'.

Agrochemical TNCs spend millions on advertising, lobbying, advocacy and public relations to claim that their products are not harmful to human health and the environment.

Corporations utilise the mass media and lobbyists to influence policy makers, regulators, politicians, scientists and academicians. They provide funds to universities, support government projects and form alliances with other TNCs, for example the plantation industry, to promote their interests. They fund scientific research projects, including those of Nobel laureates, noted scientists, and professors to encourage support for their products from the scientific establishment. The industry supports lobby groups such as Cropgen UK as a mouthpiece for biotech public relations.⁸⁵ These initiatives create a climate in which independent research studies are dismissed as unscientific, and that can lead to personal attacks on scientists, NGOs and environmentalists who criticise GE developments. At the same time, companies involve themselves in programmes and platforms originally intended to provide alternatives to industrial agriculture. For example, Syngenta markets its pesticides promotion as a training course on Integrated Pest Management (IPM). While NGOs and others concerned with the impacts of pesticides and GE undertake influencing, their perspective is independent and free of vested interests, and their budgets are miniscule compared to those of TNCs.

2.6 TIME FOR JUSTICE AND ACCOUNTABILITY

Better solutions are essential to alleviate poverty and achieve food security while protecting human health and environmental sustainability. Agroecological practices⁸⁶ offer a more sustained and equitable strategy than reliance on GE crops and agrochemical inputs, as described by the Special Rapporteur on the Right to Food, de Schutter in his 2010 report to the Human Rights Council.⁸⁷

In 2008, 400 experts from all over the world delivered the final report on the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD). Among its main conclusions, the report stated that the emphasis on increasing yields and productivity had had negative consequences on environmental sustainability, the paradigm of industrial energy-intensive

⁸⁴ BBC News. 2009. Monsanto guilty in 'false ad' row. October 15.

⁸⁵ Paul & Steinbrecher, 2003, *Op. cit.*

⁸⁶ *Ibid.*

⁸⁷ De Schutter, 2010, *Op cit.*

and pesticide-dependent agriculture was outdated, and that small-scale farmers and agroecological methods provided the way forward.⁸⁸ The IAASTD found that 1.9 billion hectares (involving 2.6 billion people) had been affected by land degradation. In particular, the abuse of fertilisers had led to the formation of large dead zones; the abuse of (chemical) pesticides had led to groundwater pollution and loss of biodiversity; and 70 per cent of the world's freshwater was withdrawn globally for irrigation, which in turn caused salinisation in some areas.⁸⁹

Over 500 million small farms contribute to the bulk of global food production.⁹⁰ There is evidence that small-scale biodiversity-based ecological farming can feed the world. It can bring about stable yields, better water retention, higher net incomes, improved nutrition, and better health for farming communities. Small farms can achieve higher productivities with lower capital intensities than large farms.⁹¹ A University of Michigan study reported that organic methods could produce enough food to sustain the current human population and potentially an even larger population without increasing the agricultural land base while reducing the detrimental environmental impacts of conventional agriculture.⁹²

Although the World Bank was one of the parties that initiated the IAASTD, the Bank and agrochemical TNCs have disregarded the report, along with other evidence pointing towards truly sustainable solutions to end world hunger. Instead, the TNCs continue to promote GE technologies with more intensive production and external inputs. Policies on market liberalisation remain unchanged, facilitating more corporate-driven products, services and TNC control over agriculture. This irresponsibility is tantamount to a crime against humankind. It is time that the Defendants were called to justice and accountability not only for the sake of those directly affected, but also for the future of humanity.

⁸⁸ McIntyre et al, 2008, *Op Cit.* (Synthesis report.)

⁸⁹ *Ibid.*

⁹⁰ Hazell P. 2011. Five Big Questions about Five Hundred Million on Small Farms, Conference on New Directions for Smallholder Agriculture. International Fund for Agricultural Development, Rome, Italy. January 24-25.

⁹¹ *Ibid.*

⁹² Badgley C, Moghtader J, Quintero E, Zakem E, Chappell MJ, Aviles-Vazquez K, Samulon A, Perfecto I. 2007. Organic agriculture and the global food supply. *Renewable Agriculture and Food Systems* 22(2):86-108.

3 GENERAL ALLEGATIONS OF THE ACTS OR OMISSIONS OF THE RESPONDENTS WHICH CONSTITUTE THE OFFENCES CHARGED

3.1 AGROCHEMICAL TNCs AND HUMAN RIGHTS VIOLATIONS

Agrochemical TNCs commit human rights violations in their regular course of business – each year, every day. The Universal Declaration of Human Rights (UDHR) clearly states that “every individual and every organ of society” shall strive to promote respect for the rights and freedoms set out therein. The Declaration imposes a duty on all, including corporations, to meet its obligations. The Special Representative of the Secretary-General further emphasised this duty of TNCs and other business enterprises in 2008⁹³ in a policy framework that comprises three core principles:

- the State duty to protect against human rights abuses by third parties, including business;
- the corporate responsibility to respect human rights;
- and the need for more effective access to remedies.

Furthermore, the “corporate responsibility to respect human rights ... exists independently of States’ human rights duties” and includes the responsibility to protect and provide remedy.⁹⁴ These obligations require corporations to: prevent human rights violations; positively and proactively work towards avoiding practices and processes that constitute violations; and take immediate action to address problems arising from violations.

The UDHR recognises the right to life (Article 3), and the rights to just and favourable working conditions (Article 23), a standard of living favourable to health and well-being (Article 25), and freedom from arbitrary interference in the home (Article 12).

The International Covenant on Civil and Political Rights 1966 (ICCPR) recognises the right to life (Article 6) and prohibits arbitrary or unlawful interference with privacy, family, and the home (Article 17). The International Covenant on Economic, Social and Cultural Rights 1966 (ICESCR) includes the rights to safe and healthy working conditions, protects children from hazardous working conditions and exploitation, and requires steps to improve health and living conditions.⁹⁵

Since all human rights are indivisible, interdependent, and interrelated, the violation of one right may have impact on and impair the enjoyment of other rights and therefore they are of equal importance

⁹³ Human Rights Council. 2007. Implementation of General Assembly Resolution 60/251 of 15 March 2006, “Business and Human Rights: Mapping International Standards of Responsibility and Accountability for Corporate Acts”. Report of Special Representative of the Secretary-General on the issue of human rights and TNCs and other business enterprises. (A/HRC/4/035).

⁹⁴ Human Rights Council. 2010. Report of the Special Representative of the Secretary General on the issue of human rights and transnational corporations and other business enterprises, John Ruggie. Business and Human Rights: Further steps toward the operationalization of the “protect, respect and remedy” framework. (A/HRC/14/027).

⁹⁵ Dinham B, Malik S. 2003. Pesticides and Human Rights. *International Journal of Occupational and Environmental Health* 9(1):40-52.

for human dignity. Given this fundamental precept, the Defendant agrochemical TNCs are charged with violating the following:

- the right to health and life which includes the right to safe working conditions and the right to a healthy environment, and failure to support a precautionary approach (3.1.1)
- economic, social and cultural rights, particularly the right to livelihood, right to food and food sovereignty, and right to freedom from interference with the family and home (3.1.2)
- civil and political rights, particularly the right to self-determination of peoples, the right to participation and information, and the rights of human rights defenders, and (3.1.3)
- the rights of women and children (3.1.4)

3.1.1 VIOLATIONS OF THE RIGHTS TO LIFE, HEALTH, SAFE WORKING CONDITIONS AND A HEALTHY ENVIRONMENT

3.1.1.1 *Violations of the right to life and to health*

The right to life enunciated in Article 3 of UDHR and Article 6 of the ICCPR is a 'supreme right', without which no other rights would be meaningful. The 'right to life' is interpreted as a prohibition on the State not to take life intentionally or negligently. Article 6 reiterates that 'inherent right to life' cannot properly be understood in a restrictive manner and that it also covers proactive measures including "*measures to reduce infant mortality and to increase life expectancy, especially in adopting measures to eliminate malnutrition and epidemics*".⁹⁶ In addition, the Constitution of the WHO calls for "*the enjoyment of the highest attainable standard of health as one of the fundamental rights of every human being*".⁹⁷

In the context of chemicals management, States and corporations have the obligation to ensure that chemicals are used in such a manner that they are not a threat to human health and the environment. Moreover, the realisation of the right to health requires proactive action to eliminate risks to health (and health risks from their presence in the environment) posed by chemicals and pesticides in their production, use, release, and incorporation into products. This realisation requires the elimination of pesticides that are known to cause cancer and other chronic, irreversible effects and the distribution of information about these to the general public. This is further emphasised in the International Code of Conduct on the Distribution and Use of Pesticides (International Code),⁹⁸ which states that corporations have the responsibility to ensure pesticides are handled safely during their life cycle⁹⁹ and disposed of in such a way that they do not constitute a threat to human health or communities living in their proximity.

The right to life, to health, and to a healthy environment must take precedence over corporate and proprietary rights. The right to engage in a profit-making venture (selling a chemical) is a derogable,

⁹⁶ Office of the High Commissioner for Human Rights. 1982. The right to life (Art 6). 04/30/1982. CCPR General Comment No. 6 (General Comments).

⁹⁷ http://www.who.int/governance/eb/who_constitution_en.pdf

⁹⁸ FAO. 2003. International Code of Conduct on the Distribution and Use of Pesticides (revised edition), FAO, Rome. The Code, originally an FAO document, is now a joint initiative of FAO and WHO.

⁹⁹ The life cycle covers a product from 'cradle-to-grave' including research and development; raw materials; manufacture, transport and distribution; use, re-use and maintenance; to final disposal. The approach is a tool for systematic analyses to estimate the environmental consequences of products and processes to establish the true cost and identify alternatives.

conditional right, while the right to health is a non-derogable, fundamental human right. The rights of natural persons, communities and the environment must be asserted over the corporate 'rights' as 'legal persons' which are attained when the company is incorporated. Agrochemical TNCs profit from the sale of pesticides that are inherently poisonous while the world's rural populations face the daily hazard of pesticide poisoning.

Common practices of agrochemical TNCs

- Selling pesticides in LMICs that have been banned or restricted in their home countries
- Untruthful and misleading marketing and promotion through spokespersons who defend the safety of pesticides and advertisers who release promotions in LMICs with claims of agrochemical effectiveness; claims are often untrue, exaggerated or trivialise potential harm of pesticides on the environment and the community
- Weakening or skirting regulations particularly by drafting individual sets of social standards to argue against the need for international and government regulations and external monitoring
- Illicit transboundary movement of hazardous products¹⁰⁰
- Relocating agrochemical products, research, testing and production to countries that have lax environmental laws
- Marketing hazardous pesticides knowing fully that these pesticides are being used in a manner that is a threat to human health and the environment
- Organising misleading public relations campaigns
- Harassing and discrediting scientists and public interest activists who reveal the dangers of their products or their science and who disagree with the TNCs

The acts and omissions of the Defendant TNCs give rise to the following harms in general:

Adverse impacts of pesticides on health

- Exposure to pesticides can result in acute and/or chronic poisoning. Symptoms of acute poisoning are often similar to common illness, such as vomiting, headaches, respiratory problems, eye and skin irritation and stomach troubles. These effects mask the link to a specific pesticide and acute pesticide poisoning is frequently refuted by the manufacturers. Symptoms of chronic poisoning manifest over time, generally years after exposure and thus are difficult to link to pesticide exposure, particularly to specific pesticide active ingredients. These inherent characteristics allow

¹⁰⁰ The UN Special Rapporteur on the adverse effects of the illicit movement and dumping of toxic and dangerous products and wastes on the enjoyment of human rights has developed comprehensive definitions of 'hazardous products' and 'toxic wastes' based solely on their potential adverse human rights impacts. The Special Rapporteur considered 'transboundary' to include the transfer of polluting industries, industrial activities and/or technologies that generate hazardous products and wastes to developing countries. The Special Rapporteur considered that the term 'illicit' encompassed not only activities carried out in violation of national or international norms and standards on the sound management and disposal of toxic and dangerous products and wastes, but any movement and dumping of toxic and dangerous products and wastes that have a harmful or a potentially harmful impact on the enjoyment of human rights. In Sensi S. 2009. *The Adverse Effects of the Movement and Dumping of Toxic and Dangerous Products and Wastes on the Enjoyment of Human Rights at High Level Expert Meeting on the New Future of Human Rights and Environment: Moving the Global Agenda Forward.*

producers to claim lack of proof of effect and to deny harm. However, the circumstances of constant and prolonged exposure, and similar effects in different areas, make it probable that symptoms experienced are a result of pesticide poisoning. Effects are exacerbated in developing countries where conditions of use are inappropriate and personal protective equipment is unavailable and/or ineffective (see 4.1.1).

- Hundreds of millions of people are exposed to pesticides every year, primarily through agriculture. Globally 36 per cent of waged workers are employed in agriculture; that figure rises to almost 50 per cent in South Asia, South-East Asia and the Pacific and to 66 per cent in Sub-Saharan Africa¹⁰¹. Others are exposed through non-agricultural occupational uses (such as fumigation) and many more are exposed indirectly through contamination of food and water, household dust, spray drift, use on aircraft and in homes.¹⁰² According to WHO, an estimated 355,000 people are killed annually due to unintentional poisoning with about half occurring in agriculture.¹⁰³
- However, the true extent of the effects of pesticides is most likely greater than current estimates as little systematic health monitoring on the impact of pesticides is undertaken in developing countries. Underreporting is endemic in all countries but especially in the poorer ones where few workers have access to medical personnel, and symptoms are not associated with pesticides by either victims or medical personnel. In Central America a survey found that 98 per cent of pesticide poisonings went unreported, and an estimated 400,000 poisonings (1.9 per cent of the population) occur per year.¹⁰⁴ The figures do not include chronic effects.
- According to the WHO, acute pesticide poisoning will affect three million people, however, other estimates range suggest up to 41 million people are affected every year,¹⁰⁵ and 99 per cent of acute poisoning deaths occur in developing countries. In some countries more deaths result from pesticide poisoning than from infectious diseases.¹⁰⁶ In Sri Lanka, pesticide poisoning is considered serious and endemic because of the permanently high incidence of acute and chronic health effects in occupational exposure.¹⁰⁷ In a cotton growing region in South India, 10 per cent of the spray sessions were associated with three or more neurotoxic or systemic signs and symptoms, a functional definition of acute poisoning. None sought medical care or was hospitalised. Low-income marginal farmers were more often subjected to severe poisoning than landlords.¹⁰⁸
- Acute health effects of pesticide exposure range from skin disorders to death, and include respiratory, gastrointestinal, circulatory, and neurological effects. Chronic health effects include cancer, reproductive problems, birth defects, developmental and behavioural impacts and effects on the immune, endocrine and neurological systems.¹⁰⁹ All humans now carry a body burden of persistent pesticides, many of which are linked to chronic health effects. Behind the poisoning statistics and effects is the human tragedy of women, men, girls and boys suffering irreversible and

101 Watts M. 2010. *Pesticides: Sowing Poison, Growing Hunger, Reaping Sorrow*. PAN AP, Penang, Malaysia

102 *Ibid.*

103 WHO. 2003. *Shaping the Future*.

104 Murray D, Wesselling C, Keifer M, Corriols M, Henao S. 2002. Surveillance of pesticide-related illness in the developing world: putting the data to work. *International Journal of Occupational and Environmental Health* 8(3):243-248.

105 PAN International, 2007, *Op Cit.*

106 *Ibid.*

107 Pronczuk de Garbino J, Besbelli N, Ruse M. 2003. High-risk exposure: gender, age and poverty. In M Jacobs & B Dinham (Eds). *Silent Invaders: Pesticides, Livelihoods and Women's Health*. Zed Books, London.

108 Mancini FA, Van Bruggen AHC, Jiggins JLS, Ambatipudi AC, Murphy H. 2005. Acute pesticide poisoning among female and male cotton growers in India. *International Journal of Occupational and Environmental Health* 11:221-232.

109 Watts MA, 2010, *Op cit.*

intergenerational impacts of pesticides. Exposure of parents to certain highly hazardous pesticides, such as endosulfan, can result in children being born with physical and mental impairments, as has happened in Kasargod (see 4.3.1.1). Exposure to pesticides (notably endocrine disruptors) can cause ill effects that can be passed down through many subsequent generations. This has been demonstrated in laboratory studies.¹¹⁰

- Medical costs due to pesticide exposure are high, and often out of reach for small-scale farmers and agricultural workers. The costs to individuals and households are not taken into account by governments and statisticians when calculating the 'return' from crop sales.

Women and children: Reproductive health and intergenerational impacts of pesticides

- There is a demonstrated link between exposure to pesticides and a number of reproductive problems including birth defects, infertility, delayed time to pregnancy, spontaneous abortion and still births, preterm birth, intrauterine growth retardation, perinatal mortality, endometriosis, and lowered sperm counts. Occupational studies have reported adverse reproductive effects linked to pesticide exposure in banana workers in Central America,¹¹¹ grape workers in India,¹¹² women in the Colombian flower industry,¹¹³ and rural California women.¹¹⁴
- Many pesticides can cross the placenta and affect the embryo during its most vulnerable period of development, the first three months of pregnancy, and particularly between days 15 and 60 after conception; those that are teratogenic, (i.e. alter normal development, including causing birth defects) include organophosphate insecticides.^{115, 116}
- Worldwide, women's breast milk is contaminated with a number of pesticides, exposing the newborn child at a critical period of development; oestrogenic pesticides, in particular, can have a profound life-long impact.¹¹⁷
- The developing foetus and small child are especially vulnerable to the effects of pesticides, as the rapidly developing brain and endocrine, reproductive, and immune systems are extremely susceptible to disruption from minute amounts of chemicals, resulting in effects that are often permanent. More than 125 pesticides are suspected endocrine disruptors, i.e. alter the normal functioning of the endocrine system, potentially causing disease or deformity in the exposed person and/or their offspring.¹¹⁸ Endocrine disruptors act on the body's hormonal system and

¹¹⁰ Anway MD, Cupp AS, Uzumcu M, Skinner MK. 2005. Epigenetic Transgenerational Actions of Endocrine Disruptors and Male Fertility. *Science* 308(5727):1466-1469.

¹¹¹ Wesseling C. 2003. Multiple health problems in Latin America. In: Jacobs M, Dinham B (eds.). 2003. *Silent Invaders: Pesticides, Livelihoods and Women's Health*. Zed Books, London. pp32-47.

¹¹² Rita P, Reddy PP, Reddy SV. 1987. Monitoring of workers occupationally exposed to pesticides in grape gardens of Andhra Pradesh. *Environmental Research* 44(1):1-5.

¹¹³ Restrepo M, Munoz N, Day NE, Parra JE, de Romero L, Nguyen-Dinh X. 1990. Prevalence of adverse reproductive outcomes in a population occupationally exposed to pesticides in Colombia. *Scandinavian Journal of Work and Environmental Health* 16(4):232-238.

¹¹⁴ Pastore L, Hertz-Picciotto I, Beaumont J. 1997. Risk of stillbirth from occupational and residential exposures. *Occup Environmental Medicine* 54(7):511-8.

¹¹⁵ Garcia AM. 2003. Birth defects in an agricultural environment. In: Jacobs M, Dinham B (eds.). 2003. *Silent Invaders: Pesticides, Livelihoods and Women's Health*. Zed Books, London. pp159-66.

¹¹⁶ Watts, 2010, *Op. cit.*

¹¹⁷ *Ibid.*

¹¹⁸ McKinlay R, Plant JA, Bell JN, Voulvoulis N. 2008. Endocrine disrupting pesticides: implications for risk assessment. *Environment International* 34(2):168-183.

can cause a wide variety of adverse health outcomes—including reduced fertility and fecundity, spontaneous abortion, skewed sex ratios within the offspring of exposed communities, male and female reproductive tract abnormalities including genital deformities, other birth defects and impaired nervous systems including neurobehavioural deficits in children.^{119, 120}

Pesticides and poverty

- Pesticide-affected communities are largely poor and disadvantaged, exposed to the worst pesticides, and suffer the worst adverse effects. The poor lack influence over policy and decision makers, and lack access to justice when harm occurs. There is less ability to take action e.g. to seek treatment for health effects, or switch to safer methods of pest management.
- Where there is poverty, there is often malnutrition, which can worsen the effects of pesticides. For example, low levels of protein resulting in low enzyme levels enhance vulnerability to organophosphates and increase the toxicity of pesticides such as diuron, monocrotophos, hexachlorocyclohexane (HCH) and endosulfan.¹²¹ Pesticide poisoning aggravates the cycle of poverty and ill-health and the malnourished become less able to provide food for themselves.¹²²
- The problems of pest resistance and resurgence intensify heavy reliance on pesticides. Farmers resort to more toxic pesticides, to increased spraying, or to dangerous cocktails, intensifying health impacts. Many fall into debt and poverty to keep up with this increasing chemical use and crop loss. Toxic pesticides also cause losses of biodiversity which are the sources of food, health and livelihoods for many rural communities.
- Chronic impacts seriously threaten rural communities' long-term survival. Endocrine disruption can particularly affect unborn babies, causing systemic and functional deficiencies like lowered IQ, susceptibility to disease, behavioural problems, and effects on future fertility.¹²³ These impacts on children seriously threaten the future of whole communities, and could mire communities in more social and economic disintegration, greater poverty and suffering.
- Heavy pesticide use has killed and continues to threaten the health of many farmers and their families. In many regions of the world, as diverse as the Punjab in India and Lake Apopka in the USA, people have suffered from acute poisoning and chronic illnesses (see 4.7.6 and 4.7.2). Villagers in India, the Philippines, California and New Zealand developed illnesses as a result of the contamination of air, soil and water due to aerial spraying of pesticides near or over their communities.
- Use of hazardous pesticides can be substituted by inexpensive non-chemical techniques and practices that ensure minimal health risks for people, women, children, workers and communities.

119 Pronczuk de Garbino J, Besbelli N, Ruse M. 2003. High-risk exposure: gender, age and poverty. In: Jacobs M, Dinham B (Eds.). 2003. *Silent Invaders: Pesticides, Livelihoods and Women's Health*. Zed Books, London. pp104-16.

120 Watts, 2010, *Op. cit.*

121 *Ibid.*

122 *Ibid.*

123 *Ibid.*

Summary

Agrochemical TNCs profit from the use, production and marketing of highly hazardous pesticides known to cause acute, chronic and irreversible health impacts. They sell products in countries and regions where poverty and malnutrition exist, compounding the extent and seriousness of pesticide poisoning. Exposure to certain endocrine disrupting pesticides even at ultra-low levels may cause intergenerational impacts and the repercussions will be suffered by future generations. Exposure and poisoning of rural communities and the environment with pesticides is a violation of the precepts of the UDHR and ICESCR, and the fundamental right to health embodied in the Constitution of the WHO. The products and practices of TNCs are responsible for widespread and systematic violations to present and future enjoyment of the right to health and a safe environment.

3.1.1.2 Violations of the right to safe working conditions

The International Labour Organisation (ILO) Convention 184 gives workers the right to:

- be informed and consulted on the application and review of safety and health matters
- participate in safety and health measures
- select health and safety representatives and representatives on joint worker-management health and safety committees, remove themselves from danger where there is a serious and imminent risk, and not be penalised for these actions

The ILO Convention 155 covers occupational health and safety of workers and calls for States to formulate, implement and periodically review a coherent national policy on occupational safety, occupational health and the working environment. The ICESCR Articles 6 and 7 recognise the right to fair wages and safe and healthy working conditions.

Working conditions on plantations are dangerous and inhumane. Serious violations of the rights of workers include over-exploitation and prohibition on labour unions and on the right to organise. The use of pesticides by workers on plantations and farms clearly violates the principles of ILO Convention 184, as agricultural workers are rarely provided training on safety and health measures and/or effective and appropriate personal protective equipment (PPE). In developing countries, PPE is not available or not affordable, but even if available it is inappropriate for use in a hot and humid tropical climate. Studies have shown that hazardous pesticides cannot be applied safely by unprotected workers. Such hazardous conditions are normal in developing countries.

Wages of agricultural workers are low to keep down costs of production and to benefit owners, landlords or the plantation industry. Cheaper, older and more hazardous pesticides are used in farms and plantations to reduce the cost of production whilst there is a failure to provide training or information on the dangers of these pesticides, resulting in the exposure of agricultural workers to highly hazardous pesticides. The case of oil palm plantation workers in Malaysia and Indonesia demonstrates the problems. Workers are exposed to dangerous conditions (see 4.1.1.3). Corporations have used their power to prevent a government ban on paraquat, the pesticide of major concern on these plantations. When pesticide regulatory agencies ban a particular pesticide, the agrochemical TNCs will challenge the decision through litigation, public relations exercises, a media blitz, and political influence, and generally succeed in overturning the ban. For example, the paraquat ban in Malaysia has been systematically challenged by Syngenta, the main producer of paraquat. This is a further burden on regulatory agencies especially in developing countries that have limited resources to carry out their work.

3.1.1.3 Violations of the right to a healthy environment

The ICESCR confers the right to a healthy environment (Article 12[2]) and calls for improvement of all aspects of environmental and industrial hygiene to achieve the full realisation of the right to health. The 1992 UN Conference on Environment and Development (UNCED) explicitly recognised the right to a healthy environment. The Aarhus Convention contains a right to an environment adequate for human health and well-being and emphasises three key aspects: access to information, public participation, and access to justice. The 1992 Convention on Biological Diversity (CBD) managed by the UN Environment Programme (UNEP) focuses on conservation of biological diversity for sustainable, fair, and equitable use and benefits of genetic resources. The 1994 Report on Human Rights and the environment links the right to a safe and healthy environment to the right to life. This report insists that those who cause serious threats to the environment or serious environmental hazards that pose grave dangers to life, whether they are State or responsible entities (corporations or individuals), may be responsible under international human rights law. This responsibility should arise irrespective of whether the act or omission in question is deliberate, reckless or negligent.¹²⁴

Loss of biodiversity and agricultural biodiversity

All societies and people, but in particular poor people in rural areas, benefit from the richness and diversity of their environment. Traditional cultures recognize the importance of biological and agricultural diversity on which they depend, at least in part, for their livelihood and survival. The spread of commercial seed varieties has negatively impacted crop genetic diversity. For thousands of years, peasants have developed incalculable numbers of breeds for about 5,000 domesticated crops and 40 livestock species.¹²⁵ Almost 1.9 million plant varieties bred by peasants are now in the world's gene banks. This ensures stability in the world's food production, with diverse traits to enhance, for example, productivity, taste, resistance to pests and diseases and the ability to survive extreme climates (droughts, floods). The focus of commercial breeders and agrochemical TNCs is on a limited number of HYV crops. Now, only 150 species and about 12 plant species are cultivated. The four biggest staple crops (wheat, rice, maize and potato) account for most of these.¹²⁶ In Senegal, promotion of commercial crop varieties threatened the extinction of a traditional cereal called fonio (*Panicum laetum*), which is highly nutritious as well as robust in lateritic soils.¹²⁷

The crops now widely grown have been bred with a dependence on high levels of water (irrigation), fertilisers, pesticides and other inputs, as discussed in Section 2. The pesticides and fertilisers applied affect non-target species and upset the ecological balance. The chemicals destroy the diverse supplementary food crops and the edible wild crops that grow on the periphery of the farms. Aquatic life such as crabs, shellfish and other fish that were important sources of protein and that thrived in rice fields and in streams and ponds are affected, and in some areas have disappeared. The impacts of toxic chemicals on the environment can have severe consequences for the livelihood and health of peoples and communities. The narrowing of the genetic pool due to genetic erosion is serious and increases the vulnerability of the crops to climate change, pests and diseases and other stresses; and it undermines the stability of agriculture and farmers' livelihood and survival.

¹²⁴ UN Sub-Commission on Prevention of Discrimination and Protection of Minorities. 1994. Report on Human Rights and the Environment. (E/CN.4/Sub.2/1994/9).

¹²⁵ ETC Group. 2009. Who will feed us? Questions for the food and climate crisis. Communiqué Issue 102.

¹²⁶ Thrupp LA. 1997. Linking biodiversity and agriculture: Challenges and opportunities for sustainable food security. Cited in Agrobiodiversity loss: Conflicts and effects. World Resources Institute, Washington, D.C., USA.

¹²⁷ *Ibid.*

Certain practices have particularly devastating effects on the environment and biodiversity. For example, aerial spraying of pesticides (see 4.3.1) and the build-up of pesticide stocks which become obsolete and can leach into the environment (see 4.7.5) contaminate air, water, soil, and food and affect the well-being of those exposed. Livestock and beneficial insects including honeybees are killed off or disappear, affecting the livelihoods of communities (see 4.3.2). These practices not only affect the environment, but also deprive communities of their livelihoods as a result of impacts on fish, bees and other resources.

Furthermore, certain pesticides, notably organochlorines known as Persistent Organic Pollutants (POPs), leave residues (see 4.7.1) in human tissues. About 200 highly hazardous pesticides and industrial chemicals have been detected in the bodies of the Arctic's indigenous people and animals, acquired through the processes of bioaccumulation and biomagnification.¹²⁸ Agrochemical TNCs continue to produce and market chemicals that threaten the environment, and try to prevent their inclusion in international conventions such as the Stockholm Convention on POPs (Stockholm Convention) and Rotterdam Convention on the Prior Informed Consent Procedure (PIC) for Certain Hazardous Chemicals and Pesticides in International Trade (Rotterdam Convention).

The spread of GE crops poses a grave risk to the environment. The engineered genes can migrate to wild plants and local farmed varieties, and gene transfer can contaminate centres of origin and biodiversity of related crops. TNCs have wilfully released or collaborated in the release of GE seeds in such centres (see for example 4.2.1.2).¹²⁹ Herbicide tolerant GE crops have transferred resistant genes to weed species, leading to greater use of herbicides and the creation of 'superweeds'.¹³⁰ Glyphosate, the main pesticide in the GE herbicide-resistant regime, is toxic to many non-target species, including soil microorganisms, 'beneficials' such as spiders, beetles, earthworms, as well as aquatic organisms such as tadpoles and fish.¹³¹ Environmental concerns about GE crops include the heightened accumulation of Bt toxin in the soil where it remains active (with unknown risks to beneficial organisms), the creation of new species of pathogens, and development of resistance to *Bt*.

Taken as a whole, the environmental consequences of pesticides and GE crops – loss of agrobiodiversity, pesticide contamination of natural resources, GE contamination – have had serious impacts on living organisms, the integrity of biological systems, and the sustainability of food production systems. Agrochemical TNCs influence and maintain monopoly control of proprietary commercial seeds and, aided by national government regulatory bodies, have released GE crops with undue care as to the impact on the local environment. They have benefited financially while contributing to the destruction of the agrobiodiversity on farms and polluting the environments fundamental to human survival.

3.1.1.4 Precautionary principle

The Precautionary Principle achieved global consensus at the 1992 UNCED, where governments established 27 principles to guide environmental and development policies. Principle 15 of the Rio

¹²⁸ Cone M. 2005. *Silent Snow: The Slow Poisoning of the Arctic*. Grove Press, New York, USA.

¹²⁹ The centre of biodiversity of plants refers to a geographic area where the highest number of gene variants, cultivated and wild types are found. Nikolai Vavilov (1887-1943) hypothesised that these regions of high variability were most likely the centres of origin of these plants, i.e. where the domestication of these plants originated. A plant may have several centres of biodiversity or origin and the centre of diversity need not always be the centre of origin.

¹³⁰ Altieri M A. 2009. Green deserts: Monocultures and their impact on biodiversity. In Emanuelli, MS, Jonsén J, Monsalve S (Eds.). 2009. *Red Sugar, Green Deserts: Latin America report on monocultures and violations of the human rights to adequate food and housing, to water, to land and to territory*. FIAN International, Sweden. (pp. 67-76).

¹³¹ Watts, M. 2009. *Glyphosate*. PAN AP.

Declaration on Environment and Development¹³² recognised that data submitted for regulation can lack scientific certainty and directed that: *in order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.*

In 1998, the Wingspread Statement on the Precautionary Principle proposed an expanded definition to include human health and specified some criteria under which the principle can be invoked: *When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically. In this context the proponent of an activity, rather than the public, should bear the burden of proof. The process of applying the precautionary principle must be open, informed and democratic and must include potentially affected parties. It must also involve an examination of the full range of alternatives, including no action.*¹³³

The precautionary approach puts the protection of health and the environment above business interests. It suggests that 'risk management' is an inadequate response to profound risks. It recognises that long-term impacts of toxic chemicals are difficult to predict and often impossible to prove. The precautionary approach puts the burden of proof of safety on the polluter; advocates prevention rather than mitigation; and suggests that exposure must be avoided rather than relying on risk assessments to define the limits of exposure. The question asked is not how much exposure is allowable but whether the exposure is necessary. Unlike risk assessment procedures where uncertainty is given the benefit of the doubt, the precautionary principle considers uncertainty as a potential threat. While the risk assessment paradigm can consider absence of evidence as evidence of absence of harm, the precautionary principle considers absence of evidence as no evidence of absence of harm. An assessment process should consider uncertainties as a warning signal. Infinitesimal uncertainty factors often preclude demonstration of cause and effect relationships and probabilistic characterisation of risks. Addressing the knowledge gaps should be made obligatory for the chemical manufacturer before any chemical is allowed to be released into the environment. Where scientific data is lacking, inappropriate or impractical to generate, precautionary action should prevent release of the chemical. Regulation must make use of best available knowledge and take into account both scientific and socio-cultural factors. Regulation should not wait for rigorous scientific studies to provide evidence of harm; action must be taken on evidence of harm in pre-clinical studies and other sound information.

In the case of POPs, governments agree that the risks are unmanageable and can only be removed by elimination. Very low levels of POPs can cause significant reproductive, developmental, neurological, immunological and other disorders directly or indirectly due to endocrine-disrupting effects. Research reveals that previous assumptions about tolerable levels based on risk assessments are incorrect. Increasingly, toxic chemicals characterised as persistent, bioaccumulative and transported over long distances are now allocated a zero level of tolerance. The benefits of any chemical released into the environment must be clear and outweigh potential threats of harm. Such an evaluation process would be based on the best available scientific evidence and guided by technically sound analytical procedures.

The precautionary principle must be supported by the right to information (see 3.1.3) to limit corporate rights to privacy and commercial confidentiality. Citizens should use the precautionary principle to push

¹³² UNEP. 1992. Rio Declaration on Environment and Development.

¹³³ Wingspread. 1998. Statement on the Precautionary Principle. See Wingspread website.

for preventive action and policies and resist the corporate push for hazardous chemicals. Community monitoring data and people's testimonies of harm must be given due importance and should be sufficient to form the basis of a precautionary action.

The current risk assessment paradigm largely ignores the potential to regulate for substitution of non-chemical alternatives. Pest problems can be addressed effectively and more safely over the long term by non-chemical alternatives. Current practices of measuring yield based on single, rather than multiple, yields from a given area, skews results in favour of industrialised agriculture. Yields can be sustained through an integrated, ecological approach to plant, soil and pest management.

3.1.2 VIOLATIONS OF ECONOMIC, SOCIAL AND CULTURAL RIGHTS

3.1.2.1 *Violations of the right to livelihood*

ICESCR and the ILO Convention No.122, the Employment Policy Convention (1964), recognise the right to work to ensure an adequate standard of living in order to make reasonable provision for domestic needs. Efforts to support the right to livelihood require a focus on marginalised groups and those currently deprived of this right, a category that includes many women and men small-scale food producers and agricultural workers.¹³⁴ The right to livelihood is intrinsically connected to the right to food. At least 1.5 billion people depend on small-scale farming for their livelihoods. For many, the right to livelihood depends on both access to food and control of seeds. These small food producers feed at least 70 per cent of the world's population¹³⁵.

This right to a livelihood, or to 'earn a living', of small food producers is being violated by the agrochemical TNCs through patents and plant variety protection (PVP). Patents and PVPs are obstacles to the adoption of policies that encourage and protect agrobiodiversity. Agrobiodiversity conservation is crucial to building community resilience to climate change and to the long-term sustainability of food production. Farmers' innovations in breeding and seed conservation have produced varieties that survive and reproduce in different ecological zones and environmental conditions. Patents and PVPs curtail these innovations since they prevent farmers from saving seeds and breeding traditional with modern seeds to develop varieties that perform better in local conditions. Farmer innovation over thousands of years has created a huge diversity of plants and livestock, which is being eroded at a rapid rate.

The expansion of patents and PVPs promotes variety uniformity and monocultures that are vulnerable to pests, diseases and climatic changes. Farmers are vulnerable to arbitrary price changes because of the virtual monopoly control of TNCs. This was seen during the food crisis in 2008 when Monsanto increased the average price of some of the company's GE (triple-stack) maize varieties by 35 per cent¹³⁶ and later announced an increase in the price of its GE beet seeds¹³⁷.

¹³⁴ Small food producers include the peasants, small-holder farmers, agricultural workers, rural women, indigenous peoples, fisherfolk, pastoralists and rural informal workers.

¹³⁵ ETC Group. 2009. Who will feed us? Questions for the food and climate crisis. Communiqué Issue 102.

¹³⁶ ETC. 2008. Who Owns Nature? Corporate Power and the Final Frontier in the Commodification of Life.

¹³⁷ Food Freedom. 2010. GMO beet yield drops in US; Monsanto raises seed price 22 pct.

Protected by IPRs and licensing mechanisms, corporations can sue farmers for infringing their patent rights over GE seeds, even if fields have been contaminated by these patented GE crops against the farmers' will. For example, Monsanto has taken farmers to court for IPR infringements and the US courts have ruled in favour of the corporation. Hundreds of farmers in the US have been sued and have paid Monsanto tens of millions of dollars in settlements of 'seed piracy' matters (see 4.2.2).

Farmers once grew multiple crops to insure their livelihood if one crop failed. Now livelihoods are threatened by potential failure of monocultures, where the combined problems of pest resistance (tolerance to a pesticide) and pest resurgence (increases due to natural predators being killed by pesticides) have increased crop losses. The continuous use of pesticides has brought about resistance in at least 542 insects, 196 plant diseases and 185 weeds.¹³⁸ The spiralling dependence on chemical solutions depletes the meagre incomes of rural communities, yet this dependence is unnecessary. In the case of Bt cotton in India, the farmers were promised higher yields and savings from reduced use of pesticides, but yields were unrealised and pesticide use increased (see 4.2.1.4). More than 200,000 farmers have committed suicide in India since 1997¹³⁹, a problem not confined to this country alone. Cotton farmers take out loans for their inputs of pesticides, fertilisers, seeds and water). Low yields or failed crops mean they cannot repay the loans and often they lose their lands, homes and family assets. In India, and elsewhere, farmers may then become agricultural workers or are forced to become migrant workers in cities or other countries.

Farmers also lose out when their GE-contaminated crops are rejected by markets: US farmers and the food industry lost almost US \$520 million due to the rejection of rice exports contaminated with Bayer's LibertyLink rice, whose active ingredient glufosinate, was not registered for use in the US at the time of contamination (see 4.3.3).

Honeybees are important pollinators for at least 30 per cent of the world's crops and 90 per cent of wild plants. But they have been disappearing across the world, and pesticides are implicated in their loss (see 4.3.2). Loss of pollinators costs US \$5.7 billion globally, in terms of declining crop yields and increased production costs. In the US alone, crops worth more than US \$15 billion a year are pollinated by bees; US honeybees produce honey worth US \$150 million annually¹⁴⁰.

Overall, the agrochemical TNCs have, wilfully and with full knowledge of the impacts of their products on the livelihoods of small food producers, continued the violations of the people's right to a livelihood.

3.1.2.2 Violations of the right to food and food sovereignty

The right to food is enshrined in the UDHR (Article 25) and ICESCR (Article 11). This right establishes that all people should have: *... the capacity to feed themselves in dignity and that hunger and famine are not inevitable - they are a violation of human rights*¹⁴¹. *... the obligation to fulfil [the right to food] is a positive obligation, as this means that the Government must proactively seek to identify vulnerable groups and implement policies to improve those people's access to adequate and culturally acceptable food and*

¹³⁸ Watts M, 2010, *Op. cit.*

¹³⁹ BBC News. 2009. Punjab suicides cast shadow on polls.

¹⁴⁰ NRDC. 2011. Why We Need Bees: Nature's Tiny Workers Put Food on Our Tables

¹⁴¹ Ziegler J. 2006. The right to food, Report of the Special Rapporteur on the right to food, Commission on Human Rights. Sixty-second session (E/CN.4/2006/44).

*their ability to feed themselves. This can be achieved by improving employment prospects by introducing an agrarian reform programme for landless groups or promoting alternative employment opportunities.*¹⁴² The progressive realisation of this right as outlined in the Voluntary Guidelines¹⁴³ includes access to resources and assets that are important for people's livelihoods with special attention provided to indigenous people and pastoralists. The Guidelines emphasise that women should be provided with secure and equal access to, control over, and benefits from productive resources.

The combined impact of the Green Revolution, SAPs and neo-liberal policies has been detrimental to small food producers and consumers. A small number of crops dominate food production: corn (maize), soybeans, rice and wheat. These and other food and fibre crops (e.g. oil palm, cotton, bananas, tea, coffee, sugar) are grown in monocultures in 91 per cent of the world's 1.5 billion hectares of farmland. Small food producers caught up in the cash cropping system have found this leads to reduced diversity in food production and consumption and increased dependence on the market to provide necessary food requirements and nutrition. Many farmers have become poorer but continue to farm, while landlessness or near landlessness and unemployment are major problems in many developing countries. Pesticide contamination of resources hampers production of safe and adequate food. Contamination by GE (*Bt*) seeds of farmer-bred varieties throughout the world has infringed access to safe food. Wages of agricultural workers remain low, which violates the rights of workers and their access to food.

Industrialisation of agriculture has undermined people's traditional knowledge, skills and capability in food production. The methodology of intensive production via packages of seeds, fertilisers and pesticides undermined problem-solving approaches towards food production. The loss of biodiversity on farms reduced the availability of fish and wild fruits and berries and other food sources important for rural communities. As a result of these and related changes *two billion people consume diets that are less diverse than 30 years ago, leading to deficiencies in micronutrients.*¹⁴⁴

In more recent developments, the global energy crisis has brought about incentives for agro-fuel production. Agrochemical TNCs such as DuPont, Syngenta, Monsanto and BASF¹⁴⁵ are collaborating with the oil and petrochemical industry to exploit this demand. Forests and agricultural land are being diverted to produce agro-fuels. This was a contributing factor in the 2008 food crisis. The UN Special Rapporteur on the right to food called this move 'irresponsible' and a *scandal that only serves the interests of a tiny lobby.*¹⁴⁶ Agroecology scientist Michel Altieri wrote this is an *assault against the food sovereignty ... land for food production is increasingly designated to feed the automobiles of the peoples of the North.*¹⁴⁷ A further effect is to raise the price of food.

All these developments contribute to the displacement of rural communities and indigenous peoples, cause food shortages, increase hunger and malnutrition and raise food prices. Food sovereignty represents the freedom of people and their communities to assert and realize the right to produce food for their own consumption and to challenge the power of corporations and other forces who destroy

¹⁴² *Ibid.*

¹⁴³ FAO. 2004. Voluntary Guidelines to support the progressive realization of the right to adequate food in the context of national food security.

¹⁴⁴ Paul & Steinbrecher, 2003, *Op. cit.*

¹⁴⁵ Emanuelli, MS, Jonsén J, Monsalve S (Eds.). 2009. Red Sugar, Green Deserts: Latin America report on monocultures and violations of the human rights to adequate food and housing, to water, to land and to territory. FIAN International, Sweden.

¹⁴⁶ Agence France Press. 2008. Food Crisis Payback for 20 years of Mistakes. May 2

¹⁴⁷ Altieri MA, 2009, *Op. cit.* (pp. 67-76.)

people's food production systems. Food sovereignty must be respected. TNCs drive for profit from agro-industries contributes to the overall violations of the right to food of people and communities and fail to contribute to a progressive realisation of the people's right to food.

3.1.2.3 Violations of the right to freedom from interference with the family and home

The UDHR states, in Article 12, *No one shall be subjected to arbitrary interference with his [her] privacy, family, home or correspondence ... Everyone has the right to the protection of the law against such interference or attacks.* The ICESCR states, in Article 10.1: *The widest possible protection and assistance should be accorded to the family, which is the natural and fundamental group unit of society, particularly for its establishment and while it is responsible for the care and education of dependent children.*

The right of freedom from interference with the family and home is closely associated with the rights of communities and peoples. These rights are violated by invasive hazardous practices, technologies and legacies of pesticide production and spraying. These include unsafe sites of hazardous pesticide waste, aerial spraying, exposure through spray drift, or poisoning by proximity to locations where pesticides are manufactured, stored or applied. Spray can drift hundreds or even thousands of metres onto neighbouring properties, and can enter homes, schools, and businesses causing adverse human health and environmental impacts. Spray drift on non-target areas damages gardens, crops, wildlife and water quality. The knowing use of children as pesticide sprayers and in the production of GE seeds violates this right (see 4.7.10). The health, well-being and social integrity of families become compromised as a result of spray drift. The release of deadly methyl isocyanate in Bhopal remains the most egregious example of this rights violation (see 3.5.4.1).

3.1.3 VIOLATIONS OF CIVIL AND POLITICAL RIGHTS

3.1.3.1 Violations of the right to self-determination of peoples

The right to self-determination of peoples (Article 1 of ICESCR and ICCPR) entails people's access to and control over their territory, land and all the natural resources in it. These common assets provide the basis for people to freely exercise their right to livelihood, right to food, right to engage in socio-cultural activities according to their traditions, and all other rights encompassed by the ICESCR. This right is violated when governments fail to involve peoples in meaningful participation in crafting development policies and undertakings directly affecting them.

Agrochemical TNCs violate the right to self-determination of peoples by forcing agricultural practices, products or technologies directly or indirectly through collusion with national governments or international organisations. Monsanto's attempts to subvert regulatory processes and influence government policy and officials in India to ensure the commercial production of Bt brinjal (case 4.2.1.3) provide one example of this TNC activity. Syngenta has subverted public interest and governance through collusion with policy-makers and regulators to promote and protect its herbicide atrazine (cases 4.1.2 and 4.7.9.2).

Rights of indigenous peoples

Indigenous peoples have had collective rights recognised by international treaties and governments. The International Cancun Declaration of Indigenous Peoples (2003) outlines the struggles of indigenous peoples. The 2007 UN Declaration on the Rights of Indigenous Peoples (UNDRIP) affirms the indigenous people's *right to maintain, control, protect and develop their cultural heritage, traditional knowledge and cultural expressions... including human and genetic resources, seeds, medicines, knowledge of the properties of fauna and flora...* The trade and liberalisation policies imposed by the WTO with the support of the World Bank and the IMF, and embraced by governments, have undermined the rights to self-determination, and other rights, of indigenous peoples. Specific factors undermining indigenous peoples' rights are documented below.

The dumping of agricultural surpluses made possible by trade agreements has resulted in severe financial losses for indigenous peoples. Governments did not engage in discussion, participation, or consultation with their citizens or those affected. In Mexico, exports from the US not only inflicted losses on maize growers because of subsidies, but also contaminated maize in the centre of biodiversity, maintained and developed by indigenous peoples for centuries, with Monsanto's GE seeds (see 4.2.1.2).

The CBD recognises the intricate dependence of indigenous peoples and local communities on biological resources. Under Article 8(j), contracting Parties shall *respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity ...* indigenous peoples depend on their ecosystem and its biodiversity for provisions (e.g. food, medicine, fuel), cultural and spiritual sustenance (arts, religion, social traditions), biological and ecological roles (pollination, balance of species populations, water and air purification) and as an indicator of seasonal weather or climate changes.

These impacts on livelihood undermine indigenous peoples' right to self-determination. In Alaska, the source of livelihood and food for the Arctic Tribal Nations has been threatened with the pollution of the Arctic by POP pesticides manufactured and sold by agrochemical TNCs (see 4.7.1). In New Zealand, Maori spiritual belief systems and traditional way of life are threatened by aerial spraying of pesticides that contaminate food and threaten the lives of humans, livestock, and wild flora and fauna (see 4.7.4.2). In Malaysia and Indonesia, the expansion of oil palm plantations and the use of pesticides have led to a massive loss of forests which were home to sacred areas and sites of biological resources important for indigenous peoples' spiritual and cultural ceremonies.

Rights of rural communities

Rural communities are often poor and marginalised and lack collective rights that defend their interests, and through which they can pressure governments to act, over those of the agrochemical industry and other big corporations. Of the more than one billion people subsisting on one dollar a day, about three quarters live in rural areas where agriculture is the main source of livelihood. Land grabbing occurs through direct state appropriation (e.g. for IRRI in the Philippines, see 3.5.4.4), or is facilitated through long-term leases under disadvantageous terms, driving more people to hunger and poverty.

In particular, introduction of pesticide and GE seed packages undermined communities' traditional resources, knowledge and way of life. The use of non-native varieties and the imposition of the IPR regime led to the loss of local seed cultures and breeding techniques particularly affecting the traditional role of women. Toxic chemicals altered local biodiversity – decimating non-pest insect and

plant populations, destroying microbial health of the soil and facilitating the emergence of pesticide-resistant varieties.

Monsanto, in an act that clearly undermined Indonesia's sovereignty, bribed government officials to overturn regulatory policies unfavourable to them (4.2.3). Through acts of bio-piracy, agrochemical TNCs try to patent rice varieties, such as Basmati rice, that had been cultivated in South Asia for hundreds of years. They introduced GE seeds such as LibertyLink rice (4.3.3) and Bt corn (4.7.7, 4.2.1.2)

3.1.3.2 Violations of the right to participation and information and the right to freedom of expression

The first session of the UN General Assembly in its resolution 59(I) establishes that freedom of information is a fundamental human right and is the touchstone of all the freedoms to which the United Nations is consecrated.¹⁴⁸ Freedom of information confers the right to gather, transmit and publish information, ideas and opinions. The right of access to information is based on Article 19 of the UDHR and ICCPR. Freedom of information is critical for public participation in decision-making and policy development. Public participation in environmental matters is defined by three 'pillars': (1) access to information, (2) access to decision-making, and (3) access to justice.

These rights have been further elaborated. Agenda 21 and Principle 10 of the Rio Declaration established the framework for states to adopt the principle of public participation, which implies public education and awareness, and effective access to judicial and remedial measures. The Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (of the UN European region) provided comprehensive development of Principle 10 and establishes provisions for public access to environmental information, for states to set up systems for information distribution, participation in decision-making processes and access to justice.

The Charter of European Security recognises the right to information as essential for the functioning of a democratic and free society. This can be interpreted to cover access to any government-held information that does not violate the rights to privacy of other persons. However, some countries narrowly construct this right to mean only a right to access personal information stored by government.

The precautionary principle also addresses access to information, requiring disclosure and accessibility of information relevant to the appraisal of potential threats that a chemical brings to human health and the environment. In relation to pesticide regulation, the right to information is the basis for ensuring and defending the rights to health, the right to a safe environment and the right to livelihood. Failure to make available and accessible all relevant information would make the public interest subordinate to corporate interests. A risk appraisal system based on the precautionary principle should be an open, democratic and participatory process and would not be the preserve of the chemical industry, the regulatory authorities and scientists. People have the right to scrutinise steps being taken to protect them from hazardous chemicals. People have the right to participate in the decision-making processes relevant to the protection of their health and their environment. The people have the right to determine for themselves what chemicals they need and what they do not need; what risks are acceptable and what are not acceptable. These rights require access to information.

¹⁴⁸ UN General Assembly. 1946. Resolution 59(I) [Calling of an international conference on freedom of information]. 1st Session, December 14.

The right to know

In 2000, the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, Abid Hussain, endorsed¹⁴⁹ the principles on the public's right to know developed by Article 19, a global campaign for free expression based on Article 19 of the Universal Declaration of Human Rights.¹⁵⁰ The principles were developed through study, analysis and global consultation and were adopted by the Commission on Human Rights in its resolution 2000/38 on the *right to freedom of opinion and expression*.¹⁵¹

The lack of effective access to information laws means that the dossiers in support of pesticide registration, and other corporate risk studies, are not subject to public oversight. Pesticide registration regulations have become more stringent and industrial countries (notably the EU, USA, Canada, Australia and others) employ teams of government scientists to review the corporate data packages and risk assessments. Such reviews however may not be comprehensive; one example of this was the approval of paraquat as an active substance by the Commission of the European Communities in the EU.¹⁵² This decision was subsequently challenged by the Swedish government and later annulled by the Court of First Instance on the basis that reported adverse effects in three crucial areas had been ignored in the approval process.¹⁵³ In many developing countries, a severe lack of resources for pesticide regulation means it is impossible to adequately review all risk assessment documents and government toxicologists may only be able to look at summary results. They may rely on assessments from industrial countries where different conditions prevail. For example, industrial countries may regulate for use only when using certain PPE, may require buffer zones around water sources and fragile ecosystems that would be difficult to enforce in developing countries and may require tests on flora and fauna native to their regions, amongst other things.

Studies conducted by corporations to support their products may include biased or false data (see for example the Monsanto promotion of GE brinjal in India [4.2.1.3] and Syngenta's defence of atrazine [4.1.2]). While the public should not pay for such studies, an alternative would be for industry to be required to pay for risk studies which are conducted independently, and subject to an independent peer review process.

The principles of freedom of information in legislation (outlined by the global campaign, Article 19) should incorporate the following:¹⁵⁴

Principle 1. Freedom of information in legislation should be guided by the principle of maximum disclosure.

Principle 2. Public bodies should be under an obligation to publish key information.

Principle 3. Public bodies must actively promote open government.

¹⁴⁹ Hussain A. 2000. Report of the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression. Commission on Human Rights. Submitted in accordance with Commission resolution 1999/36. January 18.

¹⁵⁰ Article 19. 1999. The public's right to know: principles on freedom of information legislation.

¹⁵¹ Commission on Human Rights. 2000. The right to freedom of opinion and expression, Resolution 2000/38. April 20.

¹⁵² The Commission of the European Communities. 2003. Commission Directive 2003/112/EC. *Official Journal of the European Union* L321/32.

¹⁵³ European Court Reports. 2007. Sweden v Commission T-229/04. Judgement of the Court of First Instance. p. II-2441. July 11.

¹⁵⁴ Article 19, 1999, *Op Cit*.

Principle 4 Exceptions should be clearly and narrowly drawn and subject to strict ‘harm’ and ‘public interest’ tests.

Principle 5. Requests for information should be processed rapidly and fairly and an independent review of any refusals should be available.

Principle 6. Individuals should not be deterred from making requests for information by excessive costs.

Principle 7. Meetings of public bodies should be open to the public.

Principle 8. Laws which are inconsistent with the principle of maximum disclosure should be amended or repealed.

Principle 9. Individuals who release information on wrongdoing – whistle-blowers – must be protected.

The right of TNCs to commercial confidentiality keeps aspects of documents submitted to government authorities confidential. Given the hazardous nature of pesticides and GE technology, the public has the right to access information on matters posing inherent and unmanageable risks to their health or environment.

Under Principle 2, regulatory bodies are obliged to publish information pertinent to decisions affecting the public. This should include the right to access studies used to approve the manufacture and sale of toxic products. There are numerous cases where this has not occurred:

- Monsanto’s GE Bovine Growth Hormone (rbGH) was approved and advertised as safe even when their internal studies indicated potential hazards were leaked to a US-based group by an unknown source¹⁵⁵.
- Risk assessment studies and other documents related to the approval and regulation of pesticides and genetically-modified organisms are not accessible to the public.
- Many Vietnam-war veterans were denied compensation based on industry-funded and manipulated studies that concluded Agent Orange (dioxin-contaminated 2,4,5-T and 2,4-D) did not cause cancer, despite knowledge of the adverse effects of dioxin exposure (see 4.2).
- Using laws to protect trade secrets, Bayer refused to provide full genetic characterisation of its GE rice variety, LLRICE601, to facilitate testing^{156, 157, 158}.

3.1.3.3 Violations of the rights of human rights defenders

Human Rights Council Resolution 13/13 called for the *Protection of human rights defenders*. It established the responsibility of the state to *promote a safe and enabling environment in which human rights defenders can operate free from hindrance and insecurity*. It reiterated the responsibility of all organs, including

¹⁵⁵ Smith J.M. 2003. Seeds of Deception: Exposing Industry and Government Lies about the Safety of the Genetically Engineered Foods You’re Eating. Yes Books, IOWA, US.

¹⁵⁶ GM Free Cymru. 2006. EFSA safety statement was issued without sight of crucial GM rice data [Press Notice, September 21].

¹⁵⁷ Kreimeier L. 2011. Florida professor: Bayer responsible for contamination. Daily Leader. February 28.

¹⁵⁸ Greenpeace, 2007. Bayer CropScience contaminates our rice.

'corporations' to promote and protect universally recognised human rights and fundamental freedoms. The Human Rights Council later emphasised specifically that TNCs and other business enterprises have a responsibility to respect human rights, which implies a responsibility to respect the rights of human rights defenders.

Agrochemicals TNCs have systematically harassed and discredited human rights defenders who have exposed negative impacts of their practices and products on human health and the environment. They are guilty of hiring security forces that shot into a group of peaceful protestors and killed an activist (see 4.1.3).

Scientist Ignacio Chapela objected to huge donations by Syngenta to the University of California (UC), Berkeley, citing that these donations would undermine the independence and direction of the research. Syngenta organised a campaign to deny him tenure at the University (4.2.1.2). Monsanto harassed and tried to discredit Chapela for exposing the contamination of Mexico's corn varieties by GE corn (4.7.8.1). The harassment by Syngenta of scientist Tyrone Hayes, following his work on the causal links between atrazine and endocrine disruption in frogs, exposed the extent of the company actions to stop negative studies being publicized on this pesticide (4.1.2.2, appendix 5.9). When medical doctor Romeo Quijano and journalist Ilang Ilang Quijano publicized a study of the poisoning of Kamukhaan, a community in the Philippines situated next to a banana plantation and suffering severe health and environmental impacts as a result of regular aerial pesticide spraying, the company sued them for libel (4.7.9.3). Although aware of these actions by the plantation, the agrochemical TNCs remained silent, or participated and benefited from the sales of their pesticides. Agrochemical TNCs have taken violent measures to prevent activists from protesting against the illegal planting of GE crops. In Brazil, in October 2007, activists and peasants occupied land where Syngenta was conducting its illegal experiments to field test GE crops. The company responded by hiring a 'security' company, which shot and injured the occupiers (4.1.3).

3.1.4 VIOLATIONS OF THE RIGHTS OF WOMEN AND CHILDREN

3.1.4.1 Violation of women's rights

The Convention on the Elimination of all Forms of Discrimination against Women (CEDAW) provides the underpinning for women's equality in political and public life, the right to equal access to education, and the right to health and employment including the right to equal wages and free choice of profession and employment. The Convention is the only human rights instrument that affirms the reproductive rights of women and emphasizes (Article 11) that States should ensure *the right to protection of health and to safety in working conditions, including the safeguarding of the function of reproduction and that States should take appropriate measures to provide special protection to women during pregnancy in types of work proved to be harmful to them*. It also calls on State parties to take appropriate measures against all forms of exploitation of women (Article 12).

Women in developing countries play significant roles in maintaining the three pillars of food security: food production, economic access to available food, and nutritional security.

Women in developing countries play significant roles in maintaining the three pillars of food security: food production, economic access to available food, and nutritional security. They undertake these roles in the face of enormous social, cultural, and economic constraints as a result of their low status and lack of anti-discrimination policies. Women are often the poorest of the poor and lack access to

information crucial for survival. Disempowerment of women is the root of many injustices that deny them access to justice, a life free from harm and opportunities to seek fulfilment and to achieve their potential. Women face the daily grind of subordination:

- at home where women's multi-dimensional role in the family includes both reproductive and productive work and where they are subjected to spousal abuse
- at work where they are exposed to occupational hazards and harassment and lack control over their lives
- in the community where they have limited opportunities for self-improvement and exposure to the outside world

Women are a significant workforce within plantations and as farmers, and work in agriculture on top of domestic obligations. Women comprise over 40 per cent of the workforce but their contribution is often ignored. Women agricultural workers work longer hours for lower pay than their male counterparts. Their jobs can include general field upkeep, fertiliser application, harvesting or loose fruit collection, sorting and packing fruit for distribution, and in some countries pesticide spraying. Even when they do not apply pesticides, women are often exposed through other work activities, yet they are less likely to have their health monitored. Women's traditional role as seed caretakers in many societies was supplanted by modern agricultural practices, depriving them of prominence in socio-cultural affairs.

Women farmers and agricultural workers are particularly susceptible to pesticide exposure due to physiological characteristics and socio-cultural and economic circumstances. Pesticide exposure can lead to the acute or chronic poisoning. Many women may suffer from cancer, neurological or reproductive effects in the long term. These impacts on the health of women, and on children, are largely underestimated. Women have thinner skin, which increases absorption of pesticides, and they have more fat cells particularly in the breast and abdominal area because of their reproductive system. These fat cells store toxic pesticides. Many pesticides are endocrine disruptors: they mimic hormones and can seriously affect foetal development and the subsequent development of the child, even causing diseases in adulthood such as cancer and effects on successive generations. Pregnant and lactating women should not carry out work that exposes them to hazardous pesticides. Yet in many countries including Malaysia, Indonesia, and Sri Lanka, women plantation workers apply pesticides while pregnant.

Women are responsible for 90 per cent of seed conservation and selection in South Asia and Sub-Saharan Africa, largely focusing on minor crops which are important sources of food and nutrition. Seed exchanges between rural women ensured free flow of genetic materials that contributed to the development of locally appropriate seeds and crop diversity. Patents, PVPs and seed laws, driven by agrochemical TNCs, have jeopardised systems of selection and conservation which most farmers in developing countries still rely on as a source of economic independence and agricultural resilience, a violation of women's rights.

3.1.4.2 Violations of children's rights and intergenerational rights

The vast majority, 70 per cent, of the world's working children are engaged in the agricultural sector. Studies in Africa and Asia indicate children work in agriculture including as sprayers.¹⁵⁹ The case

¹⁵⁹ Dinham & Malik, 2003, *Op. cit.*

presented here demonstrates how children working on hybrid cottonseed production are unprotected, underpaid, and are required to work extensive hours (4.7.10). Although the TNCs are not directly involved in hiring children, their practices encourage child labour, they benefit from lower labour costs, and they fail to insist that their suppliers adopt international standards enforced in their home states.

The concept of inter-generational equity was adopted at UNCED in 1992. In respect of chemicals management, Chapter 19 of Agenda 21 notes that chemical contamination causes *grave damage to human health, genetic structures and reproductive outcomes*. UNCED noted that the effects of certain chemicals are irreversible and have potential to compromise the health and well-being of future generations. The preamble of the Stockholm Convention raises similar concerns over the impact of POPs on human health particularly on women and, through them, the health of future generations.

Exposure to pesticides that are mutagenic and/or reproductive toxins, and are transmitted either across the placenta to the foetus or through breast milk to infants, pose developmental risks to children. Exposure can occur directly or through a contaminated environment. Nearly 30 years after the Bhopal tragedy, deformities and other development problems are still observed among children (see 3.5.4.1). In Vietnam, years after the spraying of Agent Orange ended, stillbirths and forced abortions were reported, while surviving children have suffered health problems. The aerial spraying of endosulfan, a known neurotoxin, endocrine disruptor and mutagen, for 20 years over cashew nut plantations in Kerala resulted in a large number of serious neurological, developmental, reproductive and other diseases, including cancer, in the vicinity of the plantation, particularly affecting children (4.3.1.1).¹⁶⁰ For over 50 years, the environment and the farmworker community of Lake Apopka in Florida, USA were exposed to highly toxic chemicals, including the POP pesticides aldrin, dieldrin, chlordane, DDT and toxaphene. Children from the second and third generation of those who were exposed now suffer chronic diseases (4.7.2).¹⁶¹ Atrazine can travel 600 to 1000 miles after application,¹⁶² putting untold millions at risk. It can stay in the soil for up to 100 days.¹⁶³ Atrazine is a potential endocrine disruptor. Stockpiles of obsolete pesticides in Africa, Asia and other regions, from legal activities or illegal trafficking, burden future generations with clean-up costs and health and/or environmental impacts (4.7.5).

The destruction of ecosystems deprives succeeding generations of rich natural resources; it threatens their livelihood, production of safe food and general well-being. GE-contamination of traditional crops and gene piracy threatens highly diverse genetic resources and exploits indigenous technical skill without acknowledgment. The introduction of Bt brinjal in India poses a serious and irreversible risk of genetic contamination of the natural varieties and, possibly, of their extinction (4.2.1.3).

¹⁶⁰ National Institute of Occupational Health [NIOH]. 2002. Final report of the Investigation of Unusual Illnesses Allegedly Produced by Endosulfan Exposure In Padre Village of Kasargod District (N Kerala).

¹⁶¹ Farmworker Association of Florida. 2006. Lake Apopka Farmworkers Environmental Health Project Report on Community Health Survey.

¹⁶² Land Stewardship Project, PAN North America. 2010. The Syngenta Corporation & Atrazine: The Cost to the Land, People & Democracy.

¹⁶³ *Ibid.*

3.2 GOVERNMENT RESPONSIBILITIES

Governments of the home states of the defendant agrochemical TNCs actively promote human rights. Nevertheless, they remain silent on violations committed by TNCs with headquarters in their countries and in some instances support or participate in the commission of violations. Defendant governments encourage the global expansion of those TNCs whose activities reflect national interests in relation to trade and economic or political dominance. Their economic and political power, and role as donors, allows industrialised country governments to influence the policies of many intergovernmental institutions, and facilitate the adoption of programmes favourable to them and their national TNCs.

3.2.1 THE GOVERNMENT OF THE UNITED STATES OF AMERICA

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3.2.1.1 US Agency for International Development and food aid to Africa

In the spring of 2002 a food crisis struck Southern Africa encompassing Zambia, Zimbabwe, Malawi, Mozambique, Swaziland and Lesotho and 14 million people were threatened with famine. In response to an appeal by the World Food Programme (WFP), the US through its main humanitarian aid arm US Agency for International Development (USAID) gave assistance in kind in the form of GE maize (corn) grown in America, largely by corporate farmers, and transported by American companies.

Although many of the population were at risk of starvation, African governments rejected the food aid because of the threat to their national economies and concern with health and environmental risks of GE food. The agricultural economies of these countries consist mainly of small-scale and subsistence farmers and maize is a major crop. The EU, which did not allow imports of GE food, is a key export market for the region. Some farmers export organic produce to the EU. USAID refuted concerns about contamination of local maize. The US State Department argued that the GE food meets rigorous food safety standards and had been consumed by Americans since 1996 without adverse effects. This argument wantonly failed to take into consideration that maize only forms a small portion of the general American diet, but is a staple food in Southern Africa. USAID rejected countries' request to ship only milled maize to avoid contamination with local varieties. Aid agencies strongly advise that food aid should be in the form of cash rather than surplus food, which undermines local or national production. (See also 4.7.7)

Diplomatic cables have revealed US policy efforts to push foreign governments to approve GE crops, promoting the interests of GE corporations, in particular Monsanto and DuPont.¹⁶⁴ With taxpayers'

¹⁶⁴ Ludwig M. 2011. New WikiLeaks Cables Show US Diplomats Promote Genetically Engineered Crops Worldwide. Truthout. August 25.

money, the government subsidises production and buys surpluses. The cables show US pressure on Spain and France, where anti-GE movements are strong.¹⁶⁵ The US advocates modern biotechnology as the means to prevent food crises and eradicate hunger. These strategies undermine small-scale farmers and can destroy livelihoods and food security. Organic farmers could lose their foreign markets. The US policies threaten biodiversity, agricultural biodiversity, and traditional knowledge and wisdom. It undermines the right of sovereign states to determine their own agricultural, economic, and development policies. It violates significant rights: to safe, appropriate, and adequate food; to health and life; to the enjoyment of the highest attainable standard of physical and mental health; to self-determination; to a safe environment; to self-governance; and intergenerational rights and equity.

3.2.1.2 *The US Environmental Protection Agency in collusion with Syngenta*

Atrazine is a known endocrine disruptor (chemical that interferes with the hormonal system) and has been linked to non-Hodgkin's lymphoma and breast cancer. Atrazine is very persistent in water; and successive applications can accumulate in groundwater. According to Dr Paul Wotzka, former hydrologist with the US State of Minnesota, atrazine and its metabolic by-products are the most commonly detected pesticides in southeast Minnesota groundwater (see in 4.1.2.2).¹⁶⁶ Dr Wotzka found samples that contained 10 times maximum residue limits (MRL) allowed by the US Environmental Protection Agency (US EPA)¹⁶⁷. The Ecological Watershed Monitoring Program monitored 40 watersheds and found detectable levels of atrazine in every sample; many were tens of times above the EPA standard. The US EPA held a series of closed-door meetings with Syngenta Corporation. The Natural Resources Defence Council (NRDC) requested details of the meetings under the Freedom of Information Act but the EPA failed to respond. The NRDC pursued court action, forcing the EPA to hand over documents that showed its officials held approximately 50 private meetings with officials of Syngenta. The US EPA established advisory committees comprised solely of representatives of Syngenta and relied on these committees to determine how atrazine should be regulated.

3.2.2 THE GOVERNMENT OF THE SWISS CONFEDERATION

Syngenta AG, manufacturer of atrazine, paraquat and many other pesticides, is a Swiss-based TNC. Atrazine and paraquat are both extremely hazardous pesticides which affect non-target organisms, including humans. Among the adverse effects on humans are cancer, birth and developmental defects and death. Both these pesticides are banned in Switzerland. While neither atrazine nor paraquat are manufactured in or exported from Switzerland, the government has international obligations to prevent a Swiss corporation from committing human rights' violations outside the country (see 4.1). These obligations apply particularly in developing countries where government regulations cannot be easily enforced and people lack resources to seek justice. The government of Switzerland is complicit with acts of Syngenta to produce and sell harmful chemicals that have severe adverse impacts on human health and the environment. The government of Switzerland has failed to regulate businesses adequately and to prevent human rights abuses by Syngenta.

¹⁶⁵ *Ibid.*

¹⁶⁶ Land Stewardship Project, PANNA. 2010. *The Syngenta Corporation & Atrazine: The Cost to the Land, People & Democracy*. January 10.

¹⁶⁷ *Ibid.*

3.2.3 THE GOVERNMENT OF THE FEDERAL REPUBLIC OF GERMANY

Germany is the home state of Bayer and BASF. These companies have developed, produced and marketed organochlorine, organophosphate and other harmful pesticides. While the German government protects workers with stringent health and safety regulations, such pesticides have been, and continue to be, exported and marketed widely in developing countries where pesticide users (agricultural workers and small-scale farmers) cannot adequately protect themselves from harmful exposure. In some instances, pesticides that have been banned in Germany continue to be exported to developing countries. The government of Germany is liable, with Bayer and BASF, for gross violations of human rights that result from the adverse effects of these products (see 4.3 and 4.6).

Aerial spraying is a form of 'chemical trespass' and is banned in Europe. Bayer's pesticides sprayed on banana plantations in the Philippines have had devastating impacts on the health and livelihoods of residents of Kamukhaan village (see 4.7.4.1). The BASF insecticide fipronil was aeri ally sprayed in Madagascar, covering almost the entire country, with severe ecological impacts (see 4.7.8.1). The German government has not ensured that regulatory measures in developing countries match its national standards.

Bayer manufactures the neonicotinoid insecticides imidacloprid and clothianidin, which are linked to bee colony collapse disorder in Europe. The death of more than half of the cultured and wild bee populations in Europe has brought about a decline in the yields of crops and fruits in plant species pollinated by bees, affecting major food sources for humans and animals, both domesticated and wild. The German government has not intervened to prevent its national companies from manufacturing and exporting these chemicals causing devastating human and ecological impacts, to developing countries.

3.3 INTERNATIONAL MONETARY FUND AND WORLD BANK

The IMF and World Bank facilitate concentration of power of agrochemical TNCs

Household food security has been undermined by the IMF and World Bank imposition of SAPs on developing countries (see 2.2). The rural poor have been marginalised by trade liberalisation and agricultural reforms, which reduced cultivation of crops for the local market, led to increased food prices and undermined food security (see 2.2).¹⁶⁸ Countries that had traditionally been food-exporters became net food importers as agricultural growth was stunted or land once used for staple crops was converted to grow fruits, flowers, vegetables, tobacco or other crops for export. Fertile farmland was converted for industrial developments, urban infrastructure, recreation centres, golf courses and special economic zones. Many farmers have been displaced and available arable land to expand agricultural production has been lost. A study by Michael Chossudovsky shows that these policies have affected *the*

¹⁶⁸ Christian Aid. 2004. Taking liberties – poor people, free trade and trade justice, London, UK.

*livelihood of more than 80 per cent of the world's population ... At no time in history has the 'free market' – operating in the world through the instruments of macroeconomics – played such an important role in shaping the destiny of 'sovereign' nations.*¹⁶⁹

The impact of these IMF and World Bank policies drove down real incomes of farmers, particularly small-scale food producers. Combined with reduced domestic production of food and general inflation, this led to a *general deterioration of food security nearly everywhere for the poor.*¹⁷⁰ In the Philippines, IMF-imposed budget constraints reduced government support for rice cultivation creating lower incomes and food insecurity for rice farmers. Policies encouraged production of high value crops and intensive shrimp farming for export, both practices leading to severe environmental damage.

SAP conditionalities were a lynchpin for agrochemical TNCs to influence agricultural policies in developing countries and to profit from the agricultural inputs. The World Bank directly supported and facilitated the expansion of the agrochemical TNCs in Africa by providing funds for the procurement of pesticides, seeds and fertilisers. Between 1988 and 1995, the Bank financed US \$250.75 million worth of pesticides, predominantly for inputs in developing countries.¹⁷¹ Two World Bank projects in Nigeria provided contracts to French and German companies to procure almost US \$120,000 of the highly hazardous herbicide paraquat. The World Bank has provided extensive funding for biotechnology in developing countries including Kenya, Zimbabwe, Indonesia and Mexico. The Bank funded a public-private partnership, the International Service for the Acquisition of Agri-biotech Applications (ISAAA) to promote biotechnology in the developing countries.¹⁷²

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The World Bank has entered into partnerships with agrochemical TNCs. Historically, personnel exchanges routinely occurred via the staff exchange programme between the World Bank and major pesticide companies such as (then) French TNC Rhône-Poulenc (incorporated into AgrEvo → Aventis → Bayer), AgrEvo, Novartis (now Syngenta) and Dow AgroSciences. During one exchange, a World Bank staff member placed in Rhone-

Poulenc facilitated partnerships between the company and rural development institutions in West African countries. During this period, Cameroon, Cote d'Ivoire and Ghana submitted proposals to the World Bank with an agricultural extension role for Rhone Poulenc. This conflict of interest gave an unfair advantage to the company and clearly favoured the pesticide industry over sustainable options. The action did not comply with the World Bank's Safeguard Policy OP 4.09 on pest management, which requires lending to help borrower countries reduce reliance on synthetic chemical pesticides and promote farmer-driven ecologically based IPM. The Bank failed to act as an honest broker in decision-making and to provide assistance to small-scale farmers in developing countries.

¹⁶⁹ Chossudovsky M. 1997. Globalisation of Poverty – Impacts of IMF and World Bank Reforms. Third World Network, Penang, Malaysia.

¹⁷⁰ Paul & Steinbrecher, 2003, Op. cit.

¹⁷¹ *Ibid.*

¹⁷² *Ibid.*

3.4 WORLD TRADE ORGANISATION

The liberalisation of global trade led to major policy shifts, many of which adversely impacted on developing countries in general, and small-scale farming in particular. They did not advance the interests of the rural poor, agricultural workers and subsistence farmers, or indigenous peoples. Identifiable trends included:

- imports of subsidised food ('dumping') that undermined domestic production and depressed local prices. In developing countries cheap imported food and the poor terms of trade for agricultural exports exacerbated neglect of agriculture and intensified the agrarian crisis. The loss of income, jobs, and land resulted in food insecurity and hunger.
- liberalisation and globalisation facilitated the 'entrenchment' of the corporate sector, particularly TNCs, in agriculture. TNCs began to expand in vital areas of agriculture to benefit their own profitability, representing a *fundamental shift in the international political economy of food*.¹⁷³
- governments acceded to pressure from big land owners and corporations seeking control of agricultural land and relaxed, scrapped or reversed agrarian reform programmes that could have helped provide food security and better livelihoods for peasants and farm workers.
- with the new IPRs regime under TRIPs, agrochemical TNCs gained greater control of seeds directing new crop developments and promoting research and development in agriculture that benefited their commercial needs. This has serious implications for future food supplies and food security.

The introduction of TRIPs in the WTO extended patents to cover genetic material, benefiting the six companies that control 98 per cent of patented GE crops.¹⁷⁴ Market dominance allows companies unprecedented control over farm practices and pricing; in the US Monsanto announced in 2008 a 35 per cent increase in average price of its GE (triple-stack) maize varieties.¹⁷⁵ In India, Monsanto has been collecting an 'exorbitant' royalty for its *Bt* cotton seeds.¹⁷⁶ These practices undermine farmers' rights to save, use and share seeds, fundamental to independent livelihoods and survival of smallholder farmers. Women farmers and indigenous peoples in particular have played an important role in seed saving, selection, use and sharing. Developing countries operating within the IPR regime will experience a resource outflow in royalties to these corporations. WTO through TRIPs has facilitated the consolidation of power over seeds and genetic resources by the agrochemical TNCs.

3.5 COLLUSION AND EVASION OF CORPORATE ACCOUNTABILITY

The power of the Defendant agrochemical TNCs has been advanced and supported through collusion with governments, international financial institutions, international governmental institutions and other national or international agencies. This collusion can take many forms, such as private-public

¹⁷³ Mehta J. 2003. *Changing Agrarian Structure: Liberalisation sans Social Justice in Alternative Economic Survey 2002-03*. Rainbow Publishers, India.

¹⁷⁴ Tansey G, Rajotte T (Eds). 2008. *The Future Control of Food: A Guide to International Negotiations and Rules on Intellectual Property, Biodiversity and Food Security*. Earthscan, London, UK.

¹⁷⁵ ETC Group. 2008. *Who Owns Nature? Corporate Power and the Final Frontier in the Commodification of Life*. Communiqué 100.

¹⁷⁶ Mitta, M. 2006. *Monsanto Get Notice over 'exorbitant' royalty*. The Times of India. January 29.

partnerships, 'revolving doors' and illegal means such as bribery. Agrochemical TNCs use 'connections' to consolidate their power and evade corporate accountability. Governments and other national or international institutions such as the WTO, IMF, World Bank, regulatory agencies, and research institutions, are at times partners in collusion and complicit in the lack of corporate accountability. International and national law has facilitated TNCs' evasion of accountability through legal loopholes and safe havens. The cases presented in this section will demonstrate how collusion between government authorities and agrochemical TNCs condones wrongful acts and omissions, and the failure to provide effective avenues of redress for those harmed by TNC conduct.

3.5.1 THE CURRENT STATE OF LAW: SAFE HAVENS FOR TNCs AND NO REDRESS FOR VICTIMS

International human rights law addresses the obligations of states to protect the rights of their own citizens. Existing international models of redress include complaints to UN convention bodies, such as the new Human Rights Council, and litigation in regional courts, such as the Inter-American Court of Human Rights and the European Court of Human Rights. These mechanisms address failures by states to recognise and respect their citizens' rights under specific human rights conventions. They do not address violations by private actors and remedies do not include protection or compensation from TNCs.

Litigation against TNCs is conducted on behalf of plaintiffs in the nation where harm is suffered (host states) and/or nations in which the TNCs have their headquarters (home states). No international forum exists to administer international human rights law for individual victims or groups of victims or their next of kin who suffer violations or impairments committed by agrochemical TNCs.

Two international legal bodies have been established: the International Court of Justice (ICJ) and the International Criminal Court (ICC). The ICJ is the judicial arm of the UN with jurisdiction over disputes between member states; only member states have the right to invoke its jurisdiction. Non-state actors can be neither complainant nor defendant, thus action taken is dependent on the state. The ICC has jurisdiction only over natural persons and not over 'legal persons' such as corporations and companies. Thus corporations cannot be prosecuted at the ICC for gross violations of human rights that amount to crimes under international criminal law. Furthermore, the ICC will only exercise jurisdiction over persons where states are unwilling or unable to take action over crimes specified in, and in accord with, the principle of complementary jurisdiction stipulated in its statute.¹⁷⁷ Host states compete to attract foreign direct investment by TNCs and are unwilling or unable to protect their own populations against human rights transgressions by TNCs. Home states are generally reluctant to provide remedies to non-national victims or to impose obligations on parent corporations to ensure compliance with human rights law and norms in the operations of the transnational group.

The home states of the agrochemical corporations – the US (Monsanto, Dow and DuPont), Germany (BASF and Bayer) and Switzerland (Syngenta) – are not hospitable to claims against national TNCs by foreign citizens who have been harmed by their crimes and other misconduct. National courts of home

¹⁷⁷ Article 1, The Court, An International Criminal Court ('the Court') is hereby established. It shall be a permanent institution and shall have the power to exercise its jurisdiction over persons for the most serious crimes of international concern, as referred to in this Statute, and shall be complementary to national criminal jurisdictions. The jurisdiction and functioning of the Court shall be governed by the provisions of this Statute, Rome Statute of the International Criminal Court 2002.

states where a foreign national has sought redress against a TNC have generally refused to hear the case on grounds that the case is best heard in the host countries where the alleged violation and harm has taken place. This legal doctrine is called *forum non conveniens*¹⁷⁸ and favours TNCs. In cases where redress has been sought in home states, practical, substantive and procedural barriers preclude relief in all but a very few cases. This reflects not only the dearth of effective legal mechanisms for access to justice but also the lack of political will by home countries to create legal structures and procedures that might be seen to threaten the operations of transnational corporations in the host states.

The host states of developing countries, and particularly the least developed countries, are characterised by judicial systems that are slow and weak. The compensation levels are generally lower than those of the home states and other industrialised countries. TNCs wield great economic, financial and political power and are capable of exerting undue influence over developing country governments to propagate their business interests. This influence is replicated in the judicial process. These structures reflect inherent imbalances between TNCs and victims and survivors. This state of law has created a situation where agrochemical TNCs named in this indictment, and other TNCs, are able to commit violations of human rights with impunity and can escape justice, liability and accountability.

GENERAL EXTRATERRITORIAL OBLIGATIONS AND LEGAL PERSONS TRAP

Legal entities that operate internationally, such as TNCs, international organisations and international financial institutions are increasingly criticised for being complicit in, if not perpetrators of, international crimes or human rights violations. National legal frameworks and judicial precedents often do not recognise crimes or entertain civil suits for actions committed outside national territory. In recent decades, there have been efforts particularly on paedophilia, illegal human trafficking and terrorism to enact that allow the State to hold a legal entity accountable for crimes committed abroad. Although the UDHR calls for every 'individual and organ of society' to respect human rights, there are no international laws that impose direct obligations on transnational legal entities that are legally binding and compulsory.

The identity of legal persons needs to be clarified in international law. A company operating several subsidiaries often appears as different distinct legal persons in one country alone. The difficulty is compounded when the company operates across borders in different countries with their own incorporation laws. Subsidiaries can be organised as an offshore office or as a separate corporation with the parent company retaining either majority or management control along with a different set of investors and stockholders. Thus, if a subsidiary in Indonesia breaks international laws, should the parent company domiciled in the US be morally and legally culpable for the acts of the subsidiary? Even though a subsidiary is a distinct legal person, the operational and financial targets are set by the parent company through its control of or influence over management and the Board of Directors. The International Commission of Jurists¹⁷⁹ has developed criteria under

¹⁷⁸ *Forum non conveniens* is the legal principle whereby courts may decline to hear or take up jurisdiction of a case where more appropriate venues are deemed available.

¹⁷⁹ The International Commission of Jurists is a non-governmental organisation devoted to promoting the understanding and observance of the rule of law and the legal protection of human rights throughout the world. It is headquartered in Geneva, Switzerland, and has 85 national sections and affiliated organisations. It enjoys consultative status in the United Nations Economic and Social Council, UNESCO, the Council of Europe and the African Union. It maintains cooperative relations with various bodies of the Organization of American States.

which, complicity with the perpetrator can be established on the basis of proximity (e.g. the business relationship between a parent company and its subsidiary).

As nationality plays an important role in Extraterritorial Obligations (ETO), the nationality of legal persons should be uniformly determined in international law. Due to the diverse origins of corporate stockholders, a practical approach had been to attribute the nationality of a corporation to the place where it had been incorporated.

Despite the lack of an international forum with jurisdiction over, and the absence of state obligations to enforce, ETOs the most practical venue to prosecute international crimes, at this time, would be national states. Enactment of national laws to proscribe behaviour and impose obligations on the behaviour of legal persons beyond the national borders is the easiest and the least threatening to the sovereignty of other states. ETOs relating to ESCR should be accorded the same importance as territorial obligations. Expanding coverage of existing laws to extraterritorial jurisdictions is a big step in enforcing the home state laws on transnational corporations and international organisations but this approach has not yet been fully pursued for human rights violations. Nevertheless, international cooperation is encouraged under Article 2(I) of the Covenant on Economic, Social and Cultural Rights to progressively achieve the full realisation of rights under the Covenant.

*Another approach that would provide prescriptive standards on corporate behaviour goes beyond the classical practice or interpretation of ETO. The recent conventions establishing the principle of *aut dedere, aut judicare*¹⁸⁰ are not deemed conclusive. An international treaty that imposes universal direct obligations on states and international organisations to respect human rights wherever they operate without compromising the integrity of the territorial state should be considered. Where conflict may arise between the territorial state and prosecuting state as a result of how a universal human right is prescribed or adjudicated in their respective countries, questions of jurisdiction can be resolved by an international panel or court.*

3.5.2 COLLUSION: COSY RELATIONS AND REVOLVING DOORS

Collusion between government officials and corporations can work in many different ways. Two are described here. To achieve wider influence, the agrochemical industry operates under an international organisation and lobbies, or 'sells' its agenda to government to become part of the agricultural policy or practice. The second described as the 'revolving door' sees government employees take up positions in industry and vice versa.

CropLife International represents major agrochemical companies and is present in 91 countries through eight different regional associations.¹⁸¹ Its members, the Defendants and others, control 80

¹⁸⁰ This principle of 'extradite or prosecute' obliges state parties to allow prosecution on the basis of national law before national jurisdictions, where the accused cannot be extradited such as in the case of legal persons, and even where there is no link between the crime and the obliging state.

¹⁸¹ CropLife International. Undated. CropLife Fast Facts Database.

per cent of the world pesticide market. CropLife portrays its members as ‘the crop protection industry’, the ‘plant science industry’ and the industry that works for sustainable agriculture and mitigation of climate change. CropLife lobbies governments and international bodies on behalf of its members. Other activities include support for its members’ products through trainings in developing countries, often run through extension services, in ‘safe use’ of pesticides. The goal is to promote pesticides and expand the market base in low and middle income countries (LMICs). While trainings reach a limited number of those spraying pesticides, they have a high profile and promote an image that pesticides are safe to use. In its 2002 revisions, the International Code removed reference to ‘safe’ use of pesticides in preference for the term ‘less hazardous’.

‘Revolving door’ refers to a practice whereby agrochemical industry representatives are appointed to, or take up, important government positions; and the reverse where government employees take up lucrative positions in industry and can use insider knowledge to benefit industry (see also 2.1). This practice is particularly common in, but not limited to, the US, where a report by the Edmonds Institute lists hundreds of names of those who ‘revolve’ between federal regulators and directors, commissioners and scientists and the companies they are supposed to regulate.^{182, 183} The following are examples:

- **Islam Siddiqui, former Vice President of Science and Regulatory Affairs at CropLife America, appointed US Chief Agricultural Negotiator:**^{184, 185} From 2001 to 2003 Siddiqui was a registered lobbyist with CropLife, which spent just over US \$2 million on lobbying the federal government in 2008, and just under US \$1.9 million in 2007 on issues such as registering pesticides for use in schools, limiting the Endangered Species Act so that it does not inhibit agricultural pesticide use, revision of EPA pesticide registration fees, and fighting the EPA on restrictions to the use of fumigants. CropLife and Siddiqui lobbied for extending trade authorities’ procedures with respect to reciprocal trade agreements. According to the Progressive Government Institute: *the Chief Agricultural Negotiator conducts critical trade negotiations and enforces trade agreements. ... This includes multilaterally in the WTO, regionally in the Free Trade Area of the Americas, and bilaterally with various countries and groups of countries ... The ambassador also resolves agricultural trade disputes and enforces trade agreements, including issues related to new technologies, subsidies, and tariff and non-tariff barriers and meets regularly with domestic agricultural industry groups to assure their interests are represented in trade.*¹⁸⁶ The WTO is a key platform for the agrochemical industry to push for trade agreements that maintain US subsidies, lower tariffs on chemicals, promote GE crops, and benefit agrochemical companies. Another part of the job description is that he or she coordinates closely with the US government regulatory agencies to assure that rules and policies in international trade are based on sound science. Someone with Siddiqui’s background will equate ‘sound science’ with high-cost, high-input (and high profit, for CropLife’s members) agricultural practices for developing countries.
- **Michael R. Taylor, former Monsanto Vice President for Public Policy, appointed Deputy Commissioner for Foods at the US Food and Drug Administration (FDA):** Taylor was appointed in January 2010 to his position at the FDA.¹⁸⁷ He had previously worked for five years at the FDA after graduating from law school, before becoming a Washington lobbyist on food regulatory issues.

¹⁸² Smart Publications. 2010. Lies and Deception: How the FDA Does Not Protect Your Best Interests. Smart Publications, Petaluma, CA, USA.

¹⁸³ Revolving Door. Undated. Retrieved from Center for Responsive Politics website Open Secrets.

¹⁸⁴ Siddiqui I. 2011. Chief Agricultural Negotiator. Office of the US Trade Representative, Executive Office of the President.

¹⁸⁵ The New York Times. 2009. Questions for a Trade Official. November 3. New York, USA.

¹⁸⁶ Crossfield P. 2009. Obama’s Chief Agricultural Negotiator Nominee a Pesticide Pusher. WeeksMD. September 24.

¹⁸⁷ US Food and Drug Administration. 2010. Meet Michael R Taylor, JD, Deputy Commissioner for Foods.

Among his Washington clients was Monsanto, and Taylor helped win FDA approval for its GE Bovine Growth Hormone (rBGH). Taylor then rejoined FDA and wrote the guidelines on labelling of milk containing rBGH – guidelines which allow companies not to specify which milk contains rBGH.¹⁸⁸ Taylor was the Monsanto Vice-President for Public Policy, or chief lobbyist, from 1998-2001.¹⁸⁹ With the Rockefeller and Bill and Melinda Gates Foundations, he acted as go-between for Monsanto and the US government to open African markets for GM seeds and associated agrochemicals. In 2003 he wrote *American Patent Policy, Biotechnology, and African Agriculture: The Case for Policy Change*, stating: *The Green Revolution largely bypassed sub-Saharan Africa. African farmers often face difficult growing conditions, and better access to the basic Green Revolution tools of fertilizer, pesticides, improved [GE] seeds, and irrigation certainly can play an important role in improving their productivity.* He writes of the need to replace *archaic, near-subsistence agricultural economies with a market-oriented approach and the promotion of thriving agribusinesses.* Taylor downplays the adverse impact of liberal agricultural policies and US subsidies on millions of African farmers and maintains *the financial impact of US domestic cotton subsidies on Mali farmers dwarfs the impact of development assistance from USAID and other agencies.* Taylor was responsible for the decision to treat genetically modified organisms (GMOs) as *substantially equivalent* to the natural plants they are derived from. This removed government responsibility to determine whether GMOs were safe for human consumption.¹⁹⁰

- **Rajiv Shah, USAID Administrator:** On 31 December 2009, Rajiv Shah was sworn in as the 16th Administrator of USAID. Shah was the agricultural programs director for the pro-biotechnology Bill & Melinda Gates Foundation and is on the board of the Alliance for a Green Revolution in Africa (AGRA). AGRA and the Gates Foundation have been criticised for working closely with Monsanto and its non-profit research arm, the Danforth Center, and promoting GMOs. Links and collaborations include project partnerships, hiring each other's employees and making donations to each other's projects. At the Gates Foundation, Shah supervised Lawrence Kent, who had been the director of international programs at the Danforth Center, and Monsanto vice-president Robert Horsch, a scientist who led genetic engineering of plants at the seed giant. From 2 June 2009 until taking up his present post, Shah worked in the USDA as Under-Secretary for Research, Education and Economics and held the position of USDA's Chief Scientist. In his short tenure, he used connections at the Gates Foundation to fill the USDA's Research, Education and Economics mission area with biotech scientists and advocates. These include Roger Beachy of the Danforth Center, Maura O'Neill who ran a public-private venture to draw biotech companies to the Seattle area (where the Gates Foundation is based) and Rachel Goldfarb, another former Gates employee. Shah used his USDA post to champion GE and other controversial technologies. In a report to Congress in 2011 on programs delivered by his mission area, Shah said: *We can build on tremendous recent scientific discoveries – incredible advances in sequencing plant and animal genomes, and the beginnings of being able to understand what those sequences actually mean. We have new and powerful tools in biotechnology and nanotechnology.*¹⁹¹ Shah is well positioned as USAID Administrator to promote the Gene (Biotech) Revolution in Africa and across the developing world.

¹⁸⁸ Hightower J. 1994. Monsanto, BGH, Michael Taylor and the FDA's Revolving Door. May 2.

¹⁸⁹ Philpott T. 2009. Monsanto's man Taylor returns to FDA in food-czar role. *Grist Magazine*.

¹⁹⁰ Frompovich C J. 2010. Economic Issues Surrounding Genetically Modified Foods. *Infowars*. June 23.

¹⁹¹ Baden-Mayer A. 2010. DuPont, Monsanto, and Obama Versus the World's Family Farmers. *Organic Consumers Association*. July 7.

- ***Dr Suzy Renckens, Official of European Union Food Safety Authority hired by Syngenta:*** Suzy Renckens was head of the EU Food Safety Authority (EFSA)'s unit responsible for the risk assessment of GE plants for five years until 2008. EFSA is the EU agency responsible for overseeing food safety and protecting consumers. Less than a year after leaving, Renckens officially represented Syngenta in an expert hearing at EU level in 2008. She now holds a Syngenta position as Head of Biotech Regulatory Affairs for Europe, Africa and the Middle East.¹⁹² EFSA allowed Renckens to move to Syngenta without the required two-year period for EU employees to take up positions where there may be a conflict of interests with EU authorities or other restrictions.^{193,194} The conflict of interest was confirmed in a ruling by the European Ombudsman that *EFSA should acknowledge that it failed to observe the relevant procedural rules and to carry out a sufficiently thorough assessment of the potential conflict of interests arising from the move of a former member of its staff to a biotechnology company.*¹⁹⁵

3.5.3 AGROCHEMICAL AND BIOTECH COMPANIES SHAPE INTERNATIONAL ACCORDS

The WTO was established following the round of negotiations (1986-1994) on the GATT. The AoA has become one of the most contentious issues sealed at these negotiations. Its provisions prevent LMICs from protecting national agriculture, such as by subsidies to farmers, while allowing developed country governments to continue allocating subsidies. At the start of the Uruguay Round, the US negotiator appointed to head the delegation on what became the AoA was the late Dan Amstutz, former Vice-President of agribusiness giant Cargill, later to head USAID's reconstruction of Iraq after the US invasion in 2003. Robert Shapiro was chair of Monsanto while also leading the President's Advisory Committee for Trade Policy and Negotiations. Mickey Kantor, US Trade Representative (USTR) for much of the Uruguay Round, subsequently became a Monsanto board member. Clayton K. Yeutter, a former secretary of agriculture and USTR, who led the US team in negotiating NAFTA and helped launch the GATT Uruguay Round, joined the board of directors at Mycogen Corporation. Mycogen's majority owner is Dow AgroSciences, a wholly owned subsidiary of the Dow Chemical Company.¹⁹⁶

3.5.4 CASES DEMONSTRATING COLLUSION AND EVASION OF CORPORATE ACCOUNTABILITY

Agrochemical corporations have evaded responsibility for major human rights abuses. This section presents four examples: the leak of methyl isocyanate (MIC) from the Bhopal plant of Union Carbide, now owned by Dow Chemicals, which has killed over 20,000 people; the use of Syngenta's herbicide paraquat on Malaysian plantations with adverse health consequences; Syngenta collusion with the US EPA to maintain registration of atrazine; and the actions of IRRI. A fifth case, that of contamination from Bayer's LibertyLink rice is documented under specific company acts (see 4.3.3).

¹⁹² Testbiotech. 2009. Leading European Food Safety Authority Staff Member Moves Into Industry. November 10.

¹⁹³ Testbiotech. 2010. EFSA's revolving door to biotech industry unacceptable. March 24.

¹⁹⁴ SP International. 2010. Explanation Demanded Over Lobbying by Biotech Firm. January 25.

¹⁹⁵ Then C, Cann V. 2011. European Ombudsman demands EFSA admits failure on revolving door. Corporate Europe Observatory. December 8.

¹⁹⁶ Choudry A. 2007. Not Under the Same Sky: Bilateral Free Trade Agreements (FTAs), Agriculture and Food Sovereignty. PAN AP Special Release Issue No. 3, Penang, Malaysia.

3.5.4.1 Dow and the Bhopal tragedy

The Bhopal tragedy is a stark symbol of the failure of existing legal systems to address a disaster considered the worst in industrial history, to penalise the primary actors and to provide justice to the victims. More than 20 years of legal engagement have revealed how existing jurisprudence, practice, laws and statutes were used by governments and a TNC to serve their interests above those of the victims.

Developing countries like India readily embraced application of chemical inputs to attain self-sufficiency in food and to increase productivity of cash crops like cotton. To preserve foreign exchange and develop its own chemical industry, India offered low labour and operating costs and encouraged agrochemical TNCs to invest. The limited environmental and safety regulations and enforcement allowed companies to avoid investing in the highest safety standards, equivalent to those in their home countries. In 1969, Union Carbide Corporation (UCC), through its Indian subsidiary Union Carbide India Ltd (UCIL) (51 per cent owned by UCC), set up a plant in Bhopal, Madhya Pradesh, to manufacture the pesticides carbaryl and aldicarb for use in cotton production. Both pesticides require use of the highly toxic chemical methyl isocyanate (MIC) as an intermediate.¹⁹⁷ On the night of 2-3 December 1984, about 40 tonnes of MIC leaked and spread into the city killing at least 8,000 people over the next three days¹⁹⁸ and causing injuries and disabilities to hundreds of thousands up to this day; over 20,000 have now died from related injuries. Thousands of animals died and within days the leaves fell off trees. Despite the deaths and serious health problems, UCC claimed the MIC is merely a 'mild throat and ear irritant' and did not provide information to local hospitals and authorities on the chemical composition, risks and antidotes for the poisoning.¹⁹⁹

By early 1985, India enacted the Bhopal Gas Leak Disaster Act that enabled the government to act as the legal representative of survivors. In 1987, the US courts ruled that all litigation relating to the Bhopal tragedy be transferred to India as the accident occurred on Indian soil and UCIL was not a US company (in spite of 51 per cent UCC ownership), being fully managed and operated by Indian citizens. The plant had a consistent record of accidents and documentation showed that UCC had cut safety standards. Nevertheless, UCC claimed the leak was due to sabotage by an unnamed disgruntled employee. The Indian government initially demanded over US \$3 billion for damages, but in 1989 accepted an out-of-court settlement of US \$470 million. The payment was approved by the Indian Supreme Court as full and final settlement of all civil and criminal claims saying: *This court considered it a compelling duty, both judicial and humane, to secure immediate relief to the victims.*²⁰⁰ The settlement was condemned by the victims. The settlement meant UCC avoided a damaging legal precedent. After repeated appeals by the survivors to overturn the settlement, in 1991 the Supreme Court offered UCC immunity from all future suits. This further outraged the survivors, proving the government was more willing to protect TNC investments than represent their cause. The settlement was reaffirmed with finality in 2007.²⁰¹ The chronic disabling effects are on-going, and suits have been filed and are still being filed in US courts. So far, all motions and claims have been denied.

¹⁹⁷ An intermediate is a derivative of a raw material before the final product is formed in a chemical process.

¹⁹⁸ Greenpeace International. Undated. Disaster in Bhopal.

¹⁹⁹ Sriramachari S. 2004. The Bhopal Gas Tragedy: An environment disaster. *Current Science* 86(7):916-918.

²⁰⁰ Muralidhar S. 2004. Unsettling Truths, Untold Lies. International Environmental Law Research Centre, Switzerland.

²⁰¹ Bhopal Gas Peedith Mahila Udyog Sagathan & Anr. vs Union of India. 2007. Judgement Information System. Appeal (civil) 3187-88 of 1988.

In 1994, UCC sold its shares in UCIL to McLeod Russel India Ltd and the company was renamed Eveready Industries India Limited. McLeod Russel and Eveready subsequently merged, and in 2004 demerged with UCIL remaining in Eveready.²⁰² In 2001, UCC was bought by Dow Chemical Company.

Criminal charges and legal loopholes

The Bhopal tragedy highlights the difficulties in prosecuting TNCs in traditional courts. TNCs take advantage of weak governments and manipulate the legal protection afforded to corporations to escape accountability. UCC was responsible for global operations, and 'safety' standards at the Bhopal plant were far below those of a nearly identical factory in the US (West Virginia). UCC utterly disregarded responsibility for safety and emergency mechanisms, allowing cheaper but more risky alternatives made possible by lax enforcement by the Indian government.²⁰³ Export of hazardous industries to countries with less stringent laws and compliance is one way TNCs evade their accountability.²⁰⁴

The parent company UCC invoked the legal doctrine of *forum non conveniens* to refuse to entertain damage claims on US soil. The US judicial system agreed and the prosecution took place in India. UCC's CEO Warren Anderson flew to India right after the leak and was initially placed in custody but then released on bail giving him a chance to leave. In 1987, with other company officials, he was charged with homicide, but UCC denied the request for court appearance, saying the company was not under Indian jurisdiction. The local government of Bhopal similarly filed criminal charges against Anderson in 1991 and pressed for extradition proceedings to no avail.

The issue of jurisdiction is a core legal impediment as no effective international instrument covers crimes committed by TNCs or its subsidiaries. There is growing recognition that the UDHR should be binding with direct obligations on both states and private enterprises, but effective enforcement mechanisms or guidelines are currently limited to states. Two instruments – the ILO Tripartite Declaration of Principles Concerning Multinational Enterprises and Social Policy and the Guidelines for Multinational Enterprises of the Organisation for Economic Cooperation and Development (OECD) – have scrutiny over the conduct of companies in respecting human rights. Both are enforced by national governments but are weak and not legally binding, as they rely on the voluntary cooperation of companies. The issue of extra-territorial jurisdiction over TNCs has been gaining international attention, as violations of human rights or crimes against humanity are committed in territories where human rights are less respected.

Liability of corporations is limited to tort law claims or civil and punitive damages even when committing blatant criminal acts. A TNC can easily settle cases out-of-court with the support of compliant governments. In the case of Bhopal, government financial institutions had direct interest through stock ownership in UCIL. The totally inadequate settlement was based on gross underestimates that about 33,000 people were affected (in fact over 600,000 claims were registered), and took no account of impacts on future generations. Furthermore, owners can be immune from legal action arising out of acts committed by the corporation. Legal action can only pursue those in control at the time of the event; thus the Indian courts could take action against Anderson, but not new appointees to its board.

²⁰² Bhopal Information Center. Undated. Statement of Union Carbide Corporation Regarding the Bhopal Tragedy.

²⁰³ Rundown to Disaster. Undated. International Campaign for Justice in Bhopal.

²⁰⁴ Centre Europe – Tiers Monde. 2005. TNCs and Human Rights. Geneva, Switzerland.

When buying UCC, Dow claimed it was free from any further legal obligation due to the settlement between UCC and the Indian government. Several new damage suits have been filed against Dow in the US, though a court has yet to exercise jurisdiction. The survivors' organisations claim that Dow's actions in refusing the existence of criminal charges are tantamount to sheltering a fugitive. While UCC has no assets left in India, Dow has substantial assets.

The nature of a corporation provides management with incentives to boost profits and share values. Its structure and the lack of appropriate international legally binding instruments, perpetuate company policies and practices that disregard and endanger public welfare and the interests of employees.

3.5.4.2 Syngenta and paraquat in Malaysia

The Pesticide Act 1974 is the principal legislation for pesticide control in Malaysia. It is implemented through the Pesticide Board, which comprises heads of government agencies, and is under the jurisdiction of the Department of Agriculture. Due largely to a campaign by citizens' groups from the 1980s, the Pesticide Control Division under the then Agriculture Ministry, imposed a ban on paraquat, a Syngenta herbicide, on 27 August 2002.²⁰⁵ The ban was based on evidence of paraquat toxicity and harm to human health, especially under conditions of use in tropical countries where PPE is impractical and unbearable to wear. The ban was an acknowledgment of the availability of less risky alternatives. It was to take effect in 2005. The phase-out period was extended to 2007 after appeals by the industry.

Syngenta initiated a range of actions in a bid to overturn the ban, including approaches to the country's political leadership. Following an EU decision not to ban paraquat, articles appeared in all major Malaysian papers indicating this as proof that paraquat was 'safe'. For example on 6 November 2003, the *New Straits Times*, one of the largest-selling English newspapers, covered a Syngenta Crop Protection Sendirian Berhad²⁰⁶ press conference which urged the Malaysian government to lift the ban on paraquat *based on the EU's findings that the pesticide no longer posed a danger to health*.²⁰⁷ At the same time, the pesticide and palm oil industries formed an alliance. Paraquat is widely used on palm oil plantations as a 'cost-effective' herbicide ('cost' excludes impacts on health and the environment). The government-supported Malaysian Palm Oil Association (MPOA)²⁰⁸ placed full-page 'advertorials' in newspapers in October and November 2003 promoting the 'safety' of paraquat.²⁰⁹ These extensively quoted the European Commission (EC) Standing Committee on the Food Chain and Animal Health (SCFA) approval as evidence for continued registration, stating that the *decision is relevant to the Malaysia use situation because the extensive database reviewed included an occupational health survey conducted in Malaysia*. In addition, Syngenta hosted many 'Round Tables' to inform the media that paraquat was not harmful.

²⁰⁵ Rajah D, Surin, JA. 2002. Government Bans Paraquat Herbicides. *The Star*, Malaysia. September 19.

²⁰⁶ Under Malaysian law, this is similar to UK Private Limited Company.

²⁰⁷ Rengam SV, Bhar RH, Mourin J, Ramachandran R. 2007. *Resisting Poisons, Reclaiming Lives*. PAN AP, Penang, Malaysia. P 107.

²⁰⁸ Malaysian Palm Oil Association (MPOA) is a government-supported industry association that represents the palm oil industry at both domestic and international levels, lobbies for special interests and needs of the industry, provides long-term strategic thinking and direction, shapes R & D policies and priorities, supports national marketing and promotion efforts and disseminates industry-relevant information to members.

²⁰⁹ Rengam *et al*, 2007, *Op. cit.* pp107-8.

Paraquat is not authorised for use in the EU

The Swedish government objected to the EU approval of paraquat. It brought a suit before the European Court of Justice to overrule the Commission's approval of paraquat. Further, Sweden spearheaded a legal challenge to revoke approval of paraquat, supported by Denmark, Austria and Finland. The challenge was successful; on 11 July 2007 the EU's second highest court, the Court of First Instance of the European Community, ruled to annul the Commission Directive (2003/112/EC of 1 December 2003) which included paraquat in Annex I to Council Directive 91/414/EEC. This Annex contains the list of pesticides approved for use in the EU. The court ruled that the EC 2003 approval of the pesticide did not satisfy the requirements relating to the protection of human health.²¹⁰

Government influence

Malaysia accounts for 41 per cent of global palm oil production and 47 per cent of world exports, equivalent to 11 and 25 per cent respectively of global production and exports of oils and fats. The Malaysian government promotes private enterprise and ownership and provides the economic direction through five-year development plans. The government influences the economy through such agencies as the Economic Planning Unit and government-linked wealth funds or investment vehicles such as Khazanah Nasional Berhad,²¹¹ Employees Provident Fund²¹² and Permodalan Nasional Berhad (PNB).²¹³ These vehicles invest in and sometimes own companies in major sectors of the Malaysian economy, for example the large oil palm companies. The Malaysia government has given PNB the green light to merge three large oil palm corporations Sime Darby, Kumpulan Guthrie and Golden Hope. Not surprisingly, with government support for the oil palm industry, in 2009 the Pesticide Board allowed again the use of paraquat. The Board indicated it would make a final decision after completion of a study by CABI on Integrated Weed Management commissioned by the Round Table on Sustainable Palm Oil (RSPO).²¹⁴ No decision has yet been made. Syngenta continues to sell paraquat to Malaysian plantations and farms.

3.5.4.3 US EPA colludes with Syngenta to re-register atrazine

Syngenta is the world's major producer of the herbicide atrazine, an endocrine disruptor that negatively affects reproductive health. Since its release in 1956, atrazine has been a driver of the company's growth. Syngenta undermined a transparent and democratic process at US EPA to protect this top-selling pesticide in spite of scientific evidence of human health and ecosystem harms (see 4.1.2).

²¹⁰ *Ibid.*

²¹¹ Khazanah Nasional Berhad was established in 1993. Its objective is to help shape selected strategic industries in Malaysia and develop those investments for the benefit of Malaysia. It is estimated that the fund size stands at around US \$19 billion.

²¹² Employees Provident Fund is owned by the Malaysian government and reputed to be the fourth largest state-run pension fund in Asia. EPF invests and owns several major companies in Malaysia. Fund size in 2007 is estimated at US \$100 billion.

²¹³ Permodalan Nasional Berhad is a major fund manager controlled by the Malaysian Government. As of April 2008, it managed MYR 120 billion of funds (US \$36 billion).

²¹⁴ RSPO was formed in 2004 with the objective of promoting the growth and use of sustainable oil palm products through credible global standards and engagement of stakeholders. RSPO is a not-for-profit association that unites stakeholders from seven sectors of the palm oil industry - oil palm producers, palm oil processors or traders, consumer goods manufacturers, retailers, banks and investors, environmental or nature conservation NGOs and social or developmental NGOs - to develop and implement global standards for sustainable palm oil.

The EPA re-registered atrazine as an approved pesticide in the US in 2003, with no meaningful changes in regulation. As noted above (3.2.1.2), the NRDC found that the EPA held around 50 closed door meetings with Syngenta, and established advisory committees composed solely of representatives from Syngenta.

3.5.4.4 Collusion with IRRI: Pushing Corporate Agriculture

The Defendant TNCs gained their foothold in the agricultural sector, particularly rice, in Asia through the International Rice Research Institute, IRRI, which is based in the Philippines. IRRI became a focus for the US agenda to avert political and economic unrest and peasant rebellion in Asia and to open new markets for US business and trade.²¹⁵ It is supported by many countries and private donors including the Defendants Bayer and Syngenta (Syngenta Asia Pacific Pte. Ltd, Singapore, and the Syngenta Foundation for Sustainable Agriculture).

IRRI spearheads the Green Revolution

IRRI, which describes itself as ‘the Home of the Green Revolution in Asia’, spearheaded a capital-intensive model of agricultural development based on ‘modern’ technologies of HYVs in monocrops, fertilisers, pesticides, mechanisation and irrigation. With IRRI, TNCs have propagated this model and are liable for its adverse impacts. The resulting problems include widespread destruction of traditional systems of small rice farming, impoverishment and hunger in small rice farming communities, harm to human health and harm to the environment. Failures of the Green Revolution have been noted by many studies – most compellingly the IAASTD.²¹⁶ The defendant corporations and others have profited by billions of dollars at the expense of poor rice farmers who have been driven deeper into poverty. Monsanto declared a 44 per cent increase in overall profits in 2007 while Syngenta reported a rise in profits of 28 per cent in the first quarter of 2008; these profits coincided with the Food Crisis in Asia.²¹⁷

Hybrid rice: Paving the way for corporate gene control

In 2007, IRRI formed the Hybrid Rice Research and Development Consortium (HRDC), a public-private partnership that aimed to speed up development and distribution of hybrid rice to farmers in Asia. HRDC consists of paying members from the private sector, public sector and NGOs.²¹⁸ IRRI claims the primary beneficiaries will be national public programs working on hybrid rice, however the funds go entirely to IRRI. The Institute will keep the information on parental lines, which can be bought by seed and agrochemical TNCs. The private sector makes up almost half of the HRDC’s Advisory Council; companies (including Bayer) occupy three out of seven seats.²¹⁹ In 2008, IRRI gave US-based seed company, DuPont, privileged access to its hybrid rice breeding lines. Simultaneously, DuPont forged a partnership with Balai Besar Penelitian Padi, Indonesia’s premier hybrid rice breeding programme, which entrusts the company with the marketing of new varieties.²²⁰ Hybrid rice has not met its claims

²¹⁵ Perlas N, Vellvé R. 1997. *Oryza Nirvana*. An NGO Review of the International Rice Research in Southeast Asia, SEARICE, Philippines.

²¹⁶ McIntyre et al, 2008, *Op cit*.

²¹⁷ GRAIN. 2008. Making a killing from hunger: We need to overturn food policy, now!

²¹⁸ IRRI. Medium – Term Plan 2009-2011 Overview.

²¹⁹ GRAIN. 2008. Bayer and other companies to oversee IRRI’s hybrid rice consortium. September 23.

²²⁰ GRAIN. 2009. DuPont Makes Its Move. March 25.

of higher productivity. GRAIN reported that, in the Philippines, farmer drop-out rates from national hybrid rice programmes have been as high as 50-60 per cent, despite heavy subsidies.²²¹ In 2007, Indonesian farmers burned their fields in despair after the hybrid rice programme failed.²²²

The Second Green Revolution: Advancing corporate control through GE

The promotion of GE rice is termed the Gene Revolution (or according to IRRI a 'Second Green Revolution'). Many studies show the dangers of GE food and crops to human health and the environment. IRRI has collected more than 100,000 varieties of rice germplasm stored in an international rice gene bank. The gene bank is a great attraction to seed TNCs which have registered over 900 patents on rice genes (including indigenous varieties of India and Pakistan, such as Basmati).²²³

In 2001, IRRI entered into partnership with Syngenta to research a GE rice variety called Golden Rice which contains beta-carotene and aims to address Vitamin A Deficiency. In 2003, IRRI appointed a former Monsanto executive, Dr Gerard Barry, to head efforts to 'facilitate the development and deployment' of Golden Rice in Asia.²²⁴ IRRI is a member of the ProVitaMinRice Consortium to promote Golden Rice, where decision-making authority is delegated to a Steering Committee of which a Syngenta official is a member. Bayer has begun to sell flood- and drought-resistant rice varieties that IRRI helped develop.²²⁵ IRRI has led a consortium effort to genotype 20 rice lines, and is proposing to genotype 2,500 more.²²⁶

IRRI in the Philippines – outstanding land claims

IRRI's research and operational centre is based in Laguna, Philippines. The peasants of the land IRRI occupies were forced to sell their lands to it for less than their worth.²²⁷ IRRI rice trials in Laguna exposed its workers to highly toxic pesticides. Among the pesticides applied were endrin, paraquat (Syngenta), endosulfan (Bayer), glyphosate (Monsanto), benomyl (DuPont) and chlorpyrifos (Dow).²²⁸

A study in 2000 found that approximately 70 per cent of former IRRI workers suffered illnesses, including cancer, diabetes, lymphoma, Parkinson's disease and thyroid, liver and kidney diseases, attributed to their exposure to pesticides.²²⁹ Eight such workers have died. Five hundred employees were unfairly dismissed by IRRI through its Staff Adjustment Program from 1990 to 2006. The workers who objected to this scheme were the first to be sacked. Cases filed at the Department of Labor and Employment were dismissed because IRRI has political and legal immunity in the Philippines under a Presidential Decree. In 2006, the first Asian People's Tribunal indicted IRRI and the Governments of the Philippines and the US on several charges.²³⁰

221 GRAIN. 2007. Philippines: Who's Really Benefiting from Hybrid Rice Subsidies? April 19.

222 Quijano I. 2009. More Angry at IRRI! PAN AP Rice Grains. PAN AP, Penang, Malaysia.

223 Choudry A. 2007. Intellectual Property Rights and Rice. Rice Sheets. PAN AP, Penang, Malaysia.

224 IRRI, Rockefeller Foundation, Syngenta AG. 2001. Golden Rice Arrives in Asia. March 23.

225 Bayer Crop Science. 2009. Rice- Food for the World. Bayer CropScience Editorial Service, Issue 6. February 19.

226 IRRI Medium – Term Plan 2009-2011.

227 Verdict from the First Asian People's Tribunal against the International Rice Research institute. 2007. In Lopez VM, PAZ dela Cruz, JL Benosa, FP Concepcion (Eds.). The Great Rice Robbery – A Handbook on the Impact of IRRI in Asia (pp.167-177).

228 Quijano R, Adapon S. 2007. Pesticides and the Plight for Former IRRI Workers. In Lopez VM, PAZ dela Cruz, JL Benosa, FP Concepcion (Eds.), The Great Rice Robbery – A Handbook on the Impact of IRRI in Asia. pp89-106.

229 *Ibid.*

230 Verdict from the First Asian People's Tribunal against the IRRI, 2007, *Op cit.*

Violation of rights

The collusion and complicity among IRRI, the Defendant TNCs, and the Government of the US have succeeded in promoting corporate control over agriculture with negative consequences. The human rights violations include right to life, right to food, right to health, right to a safe environment, right to livelihood, right to self-determination and the rights of women and children as described in the cases in this indictment. The Defendant TNCs are complicit in IRRI's human rights violations in the Philippines.

3.6 LIABILITY THROUGH COMPLICITY

The corporate agenda for profits and control of productive resources has driven globalisation and expansion of international trade. Corporations have committed gross human rights abuses by being complicit in violations committed by other actors. Corporations yield immense influence and economic power over developing countries where they operate. The victims and survivors of the human rights abuses and the international community have called for justice, redress and accountability.

In response, the International Commission of Jurists has developed criteria to establish civil liability and criminal culpability in existing international and national law for corporate conduct – i.e. cases of corporate complicity in gross human rights abuses. This initiative aims to address and fill the governance and enforcement gaps existing in current international human rights laws and mechanisms, which permit TNCs to abuse human rights at home and abroad with impunity. The criteria were based on the provisions of prevailing laws and the need for accountability in cases of complicity, while

Ordinary business transactions where corporations receive economic benefits can attract liability if the circumstances surrounding the transaction have enabled, exacerbated or facilitated specific human rights abuses.

drawing on available impartial jurisprudential expertise and experience. The criteria set out and clarify the conduct (acts or omissions) that corporations should avoid in order not to be legally complicit in gross human rights abuses and from resulting sanctions. These criteria represent a progressive and fundamental step forward in the promotion and fulfilment of the right to justiciability,²³¹ and are an invaluable tool for victims of human rights abuses and defenders of human rights in their pursuit for justice and redress. Corporations, or any legal entity for that matter, which have acted with impunity can now be held accountable for being complicit in human rights abuses perpetrated by a third party. The criteria are stated in terms of two elements that must be present together for liability to arise, i.e. causation and state of mind (actus reus and mens rea). Causation is established if it can be shown that the act or omission of the corporation has enabled, exacerbated or facilitated the gross human rights violation/s.

The state of mind required to accompany an act or omission is 'intent', i.e. that the corporation (director/employee) knew or ought to have known that the violation/abuse would take place. A corporation can be deemed to have this state of mind in cases where it employed a 'don't ask, don't tell' approach.

²³¹ Justiciability refers to the types of matters that the federal courts can adjudicate. If a case is 'non-justiciable', a federal court cannot hear it. To be justiciable, the court must not be offering an advisory opinion, the plaintiff must have standing, and the issues must be ripe but neither moot nor violative of the political question doctrine. (Source: Cornell University Law School).

Furthermore, close proximity determined by way of geographic closeness; the duration, frequency, intensity and/or nature of the connection; or interactions or business transactions can also lead to complicity, i.e. an act or omission of the company enabled, exacerbated or facilitated the violation/abuse. This would be the case where a company or its individual officials exercise influence, weight and authority over the principal perpetrator/s such that their silent presence would be taken by the principal perpetrator/s to communicate approval and moral encouragement to commit the gross human rights abuses. Ordinary business transactions where corporations receive economic benefits can attract liability if the circumstances surrounding the transaction have enabled, exacerbated or facilitated specific human rights abuses. These criteria are applied in this indictment to establish liability where agrochemical TNCs have been complicit in gross human rights abuses perpetrated by another actor.

3.7 NEED FOR EFFECTIVE LEGAL REDRESS

There is no international forum to administer and enforce international human rights law against TNCs for actions brought by individual victims or groups of victims or their next of kin. The International Court of Justice (ICJ) is the judicial arm of the UN with universal jurisdiction over disputes between member states. Non-state actors can be neither complainant nor defendant. Victims and survivors are dependent on the state for justice and redress; and in most cases this does not happen. Those suffering gross human rights violations by TNCs do not, in most instances, have knowledge, standing, resources or ability to take their case to such courts. On the other hand, the International Criminal Court (ICC) only has jurisdiction to try crimes committed by individuals (natural persons) and not corporations (legal persons).

Voluntary codes of conduct that impose minimum standards have proved futile in preventing TNCs violating basic human rights and have been used as a tool for public relations. Minimum standards can be manipulated to appear to meet required standards when they do not. These codes are not subject to formal enforcement. They lack independent monitoring mechanisms. National, regional and international forums and mechanisms for redress have been unsatisfactory and ineffective.

There are no clear and direct legally binding obligations on corporations to respect human rights under present international human rights law, although the UDHR, through the UN General Assembly has proclaimed that organs of society have the duty to uphold human rights. This is supported by the Committee on Economic, Social and Cultural Rights (CESCR). In its General Comment (GC) 14, the CESCR stresses such an obligation: *States parties have to respect the enjoyment of the right to health in other countries, and to prevent third parties from violating the right in other countries, if they are able to influence these third parties by way of legal or political means, in accordance with the Charter of the United Nations and applicable international law.* The CESCR in GC 15 (and similarly in GC12 and GC19) says that states should *take steps to prevent their own citizens and companies from violating the right to water of individuals and communities in other countries.*

The Plaintiffs therefore come before this Honourable Tribunal for justice and redress for the harm caused by the Defendants through their gross violations of human rights. This Honourable Tribunal, being a tribunal of people's opinion and conscience committed to upholding human rights and empowering people's movements, has jurisdiction and a moral duty to hear the charges against the Defendants and the power to make its findings and deliver judgment.

4 SPECIFIC CASES OF THE WRONGFUL ACTS OR OMISSIONS BY THE DEFENDANTS

4.1 SYNGENTA INTERNATIONAL AG

Syngenta is an incorporated company, publicly listed in Switzerland and the USA. It is a legal entity under the national laws of Switzerland. Syngenta has the capacity to transact business directly and indirectly through its subsidiaries and to create legal relations subject to applicable national and international law. As an organ of society it has the duty to respect human rights and refrain from committing human rights abuses in conducting its business operations at home and abroad.

The following three cases demonstrate the harm to humans and the environment resulting from the manufacture, marketing, sale and use of pesticides and the failure by Syngenta to respect human rights. These cases indicate the harm caused by paraquat and atrazine usage around the world. Both pesticides are banned in Switzerland. The cases establish the failure of the government of Switzerland to prevent Syngenta from manufacturing and selling these products or to adequately regulate and prevent human rights abuses committed by Syngenta in contravention of its international human rights obligations.

The first case demonstrates the state of paraquat poisoning of people and the environment, and the consequent impacts on lives and livelihoods. The case cites studies from a range of countries and evidence from Malaysia, China and Burkina Faso.²³² It demonstrates the failure of governments to protect the welfare and human rights of plantation workers. The second case provides evidence from the US of contamination and persistence in water of the herbicide atrazine, which has been identified as an endocrine disruptor. The third case presents evidence that Syngenta engaged armed security guards in Brazil who shot and killed protesters at a peaceful event which aimed to protect environment and biodiversity from illegal activities.

4.1.1 THE PARAQUAT CASES

4.1.1.1 Health concerns and actions to ban or restrict paraquat

Syngenta is the world's largest producer of agrochemicals and the third largest producer of commercial seeds. Paraquat, a fast-acting herbicide, is a flagship product marketed under the brand name Gramoxone in formulations ranging from 24-36 per cent active ingredient. Paraquat is acutely toxic; the World Health Organization (WHO) classifies it as Class II (moderately hazardous); Malaysia classifies it as Class I (extremely hazardous). Paraquat is widely used by farmers in developing countries.

Ingestion of a single teaspoon of liquid paraquat concentrate can cause pulmonary oedema, cardiac failure, renal failure, liver failure, convulsions and death due to its effect on the central nervous system²³³. There is no antidote to counter the effects of ingestion, and death from multiple organ

²³² Burkina Faso, for example, has brought cases of paraquat poisoning to the Chemical Review Committee of the Rotterdam Convention to request the listing of a formulation as a 'severely hazardous pesticide formulation causing problems under conditions of use in developing countries'.

²³³ Watts M. 2010. Paraquat Monograph. PAN AP, Penang, Malaysia.

failure may follow within hours or days. Sprayers have died after sucking blocked spray nozzles to clear them. Paraquat is corrosive to the skin, and damaged skin will aid absorption of the chemical into the body. Paraquat sprayers generally wear cotton clothing, which soaks up the herbicide.²³⁴ Sprayers have died after applying pesticides with a leaky knapsack sprayer, or from splashes of concentrate on their bodies. Sprayers often suffer skin damage, burns, eye injuries including blindness, nail damage including discolouration and loss of nails,²³⁵ nose bleeds and respiratory problems. Wind direction during spraying is beyond the control of the sprayers and headwinds result in them being dangerously exposed through inhalation and skin and eye contact. It is not uncommon for equipment to be washed in streams and rivers thus contaminating the water.

Paraquat is registered for use in more than 100 countries and, in most, without restriction.²³⁶ However, some governments have imposed a ban or severe restriction. Paraquat has not been approved for use in Switzerland – the Syngenta home-base – since 31 December 1989. The German federal biological institute (BBA) asserted in 1983 that repeated treatments of paraquat products led to an accumulation in the soil and damage to crops. It refused to re-register paraquat but was challenged by ICI (now Syngenta)²³⁷. In 1992, the Court ruled that the BBA was justified but also ruled that the registration should be granted to a new formulation of 10 per cent, which was re-approved later that year²³⁸. Wider registrations were refused because of effects on the environment. The EC approved paraquat for re-registration in 2003; however the Swedish government, which had banned paraquat, challenged this ruling. On 11 July 2007 the European Court of First Instance ruled that approval did not satisfy requirements for protection of human health and the Court overturned Directive 2003/112, thereby annulling the authorisation of paraquat across the EU – an effective ban²³⁹.

Sri Lanka had a very high number of paraquat-related deaths and on 9 November 2007 the Pesticide Technical and Advisory Committee ruled that paraquat posed unacceptable risks. Under the Control of Pesticides Act No 33, 1980, the Committee imposed restrictions. It reduced the allowable concentration of paraquat ion in formulations to 6.5 per cent from 1 January 2008; use was to be phased out in three years; total annual paraquat formulations sold in 2008 should not exceed present levels; and existing stocks with formulations higher than 6.5 per cent could deplete through the regular sales.²⁴⁰ Paraquat was due to be phased out by the end of 2009 after re-evaluating the risks of the lower formulation.²⁴¹

In addition to health concerns, agronomic and environmental problems associated with paraquat have led to bans or severe restrictions. Twenty-two species of weeds in 13 countries have become resistant.²⁴² It has been labelled a potential groundwater contaminant by the California Department of Pesticide Regulation on the basis of potential to move into groundwater based on water solubility,

234 Isenring R. 2006. Paraquat. Unacceptable health risks for users (2nd Rev.). Berne Declaration, PAN UK & PAN AP. p11.

235 Watts M. 2010. Paraquat Monograph. PAN AP, Penang, Malaysia.

236 *Ibid.*

237 PAN UK. 1996. Pesticides News No.32, June 1996, p20-21

238 *Ibid.*

239 Judgment of the Court of First Instance in Case T-229/04 Kingdom of Sweden v Commission of the European Communities. The Court of First Instance Annuls The Directive Authorising Paraquat As An Active Plant Protection Substance Press Release No° 45/07. 11 July 2007

240 Manuweera GK. 2009. Paraquat. Annex: Notification of final regulatory action on paraquat, Sri Lanka. Rotterdam Convention, Chemical Review Committee, Fifth meeting, Rome, 23-27 March, 2009. (UNEP/FAO/RC/CRC.5/8).

241 CRC. 2009. Report of the task group on paraquat. Rotterdam Convention, Chemical Review Committee, Fifth meeting, Rome, 23-27 March. (UNEP/FAO/RC/CRC.5/CRP.9/Rev.1).

242 Watts, 2010, *Op. cit.*

243 Madeley J. 2002. Paraquat – Syngenta's controversial herbicide. Berne Declaration, Swedish Society for Nature Conservation, PAN UK, PAN AP & Foro Emaús.

ability to bind to soils and long half-life (16 months to 13 years).²⁴³ Studies indicate that aquatic plants can have high concentrations of paraquat. Tadpoles died after feeding on aquatic plants exposed to paraquat, or displayed abnormalities, atypical swimming behaviour and feeding activity.²⁴⁴

4.1.1.2 Studies of paraquat exposure and impacts

In the US, paraquat drift from spraying has caused health and environmental problems. In Hollister, California, drift from a diluted paraquat mixture applied to two fields in April 1991 passed directly over community residences and an associated complex. A survey found an increase in coughs, eye problems, diarrhoea, irritation, headache, nausea, rhinitis, throat infections, breathing problems, unusual tiredness and wheezing.²⁴⁵

In Edinburgh, UK, between 1981 and 1986 paraquat accounted for 26 of 54 admissions to the poison treatment centre. Two cases were occupational exposure, one due to a leaking back canister and one to inhalation during spraying. A further case involved accidental ingestion when trying to remove the bottle top with the teeth.²⁴⁶

In Central America, surveillance of pesticide-related illnesses found that exposure to chemicals, particularly pesticides, was one of three priority health issues (others were water and air pollution).²⁴⁷ Paraquat was foremost among twelve pesticides most frequently reported by the surveillance systems for acute poisoning.²⁴⁸ In Costa Rica, from 1996 to 2001, paraquat accounted for 898 cases (35 per cent) of the 2,579 poisonings where the agent was identified (followed by carbamates, 31.5 per cent, organophosphates, 21 per cent, and other pesticides, 12.5 per cent).²⁴⁹

In Brazil, potential dermal exposure of agricultural workers to paraquat was found to be unacceptably high.²⁵⁰ Field studies in the US found that margins of exposure for those using low-pressure or backpack sprayers were unacceptable and the practicality of additional PPE to reduce health risks was a matter of concern.²⁵¹

In South Africa, a study of 126 workers on fruit farms in the Western Cape used a new test for measuring respiratory effects on the lungs of workers with long-term exposure to paraquat. The study eliminated confounding factors and found that lung capacity of these workers was consistently 10–15 per cent lower than a reference population. The effects were apparent even though none of the workers

²⁴⁴ Bauer Dial CA, Dial NA. 1995. Lethal effects of the consumption of field levels of paraquat-contaminated plants on frog tadpoles. *Bulletin of Environmental Contamination and Toxicology* 55:870. In Watts, 2010, *Op. cit.*

²⁴⁵ Madeley J. 2002. *Op. cit.* Cited from Ames RG, Howd RA, Doherty L. 1993. Community exposure to a paraquat drift. *Archives of Environmental Health* 48(1):47-52.

²⁴⁶ Isenring, 2006, *Op. cit.* p. 28. Cited from Proudfoot AT, Dougall H. 1988. Poisoning treatment centre admissions following acute incidents involving pesticides, *Human & Experimental Toxicology* 7(3):255-258.

²⁴⁷ *Ibid.* p8. Cited from Pan American Health Organization and WHO. 2002. 130th Session of the Executive Committee. Washington, D.C., USA.

²⁴⁸ *Ibid.* Cited from Pan American Health Organisation and World Health Organization. 2001. Fichas técnicas de plaguicidas a prohibir o restringir incluidos en el Acuerdo no. 9 de la XVI Reunión del sector Salud de Centroamérica y República Dominicana, San José, Costa Rica.

²⁴⁹ *Ibid.* p23. Cited from Pan American Health Organisation and World Health Organization. 2002. Proyecto PLAGSALUD Costa Rica: Memoria fase II, San José, Costa Rica.

²⁵⁰ *Ibid.* p17. Cited from Machado-Neto JG, Matuo T, Matuo YK. 1996. Semiquantitative evaluation of dermal exposure to granulated insecticides in coffee (*Coffea arabica* L.) crop and efficiency of individual protective equipment. *Bulletin of Environmental Contamination and Toxicology* 57(6):946-951.

²⁵¹ *Ibid.* Cited from US EPA. 1997. Reregistration Eligibility Decision (RED): Paraquat Dichloride, Washington, D.C.

reported that they had been poisoned by paraquat, and only four had a history of skin burns (back, hands or other) from paraquat use. *The main finding is a small but significant effect*, says the study's authors.²⁵²

In Thailand, a study of 14 workers who used knapsack sprayers or low-volume spinning disc applicators (with spray concentration 0.15 per cent and 0.2 per cent) measured urinary paraquat levels of 0.73-10.21 mg/l after 14 days spraying. Levels were significantly higher in unprotected men. And levels in urine increased as the trial progressed. Irritation of unprotected skin was severe (caustic burns to the feet) in workers who used low-volume applicators (higher concentration).²⁵³

4.1.1.3 Paraquat on plantations – sale and application under known hazardous working conditions

Paraquat is not safe under conditions of use in LMICs. The majority of the paraquat deaths occur following ineffective or insufficient precautions during handling and spraying. Accidents and deaths arise from exposure, accidental spillages, leaking or poorly insulated knapsack sprayers, spraying in open air and consumption of contaminated food. Unsafe working conditions – lack of sanitary and washing facilities, and lack of clean water and soap at the worksite compound the problems. Hazards are further aggravated by diseases, poor sanitation, illiteracy, lack of knowledge and training and poverty. Insufficient nutrition lowers immunity to disease and infections. Communities living on plantations are exposed to spray drift and residues, whether or not they directly apply pesticides.

PPE is rarely provided by employers, or may be supplied only once; workers may be expected to purchase subsequent PPE – impossible on plantation wages. Additionally, under hot and humid tropical conditions the discomfort of PPE becomes unbearable. PPE is not sold in many places where paraquat is used and the relatively high cost deters the small-scale and peasant farmers from using it. In Malaysia, there have been instances where workers are financially penalised for not wearing PPE, placing the burden of protection on them so that the company is seen to comply with national laws on occupational safety and health. In some instances (again in Malaysia), workers were also expected to purchase and maintain the knapsack spray pump to encourage them to take care of equipment.²⁵⁴ Some agricultural workers store spray equipment at home, endangering family members and others. In numerous surveys conducted by civil society organisations (CSOs) in Malaysia, workers complain of leaking backpack sprayers and of experiencing spillages while mixing and/or spraying²⁵⁵.

Communities living on plantations are exposed to spray drift and residues, whether or not they directly apply pesticides.

The majority of farm or plantation workers are illiterate or unable to understand complex label instructions. It is not uncommon for labels to be in a foreign language or to be deliberately removed.

²⁵² Watts, 2010, *Op. cit.* Cited from Dalvie MA, White N, Raine R, Myers JE, London L, Thompson M, Christiani DC. 1999. Long term respiratory health effects of the herbicide, paraquat, among workers in the Western Cape. *Occupational and Environmental Medicine* 56(6):391-396.

²⁵³ Isenring, 2006, *Op. cit.* pp19-20. Cited from Howard JK. Proceedings of the 10th Asian Conference on Occupational Health, pp. 1-7, Singapore 1982. Paraquat spraying: comparative risks from high and low volume application methods.

²⁵⁴ Fernandez JM, Bhattacharjee RB. 2006. The Politics of Paraquat. Tenaganita & PAN AP, Malaysia.

²⁵⁵ Tenaganita, PAN AP. 2002. Poisoned and Silenced: a study of pesticide poisoning in plantations. Penang, Malaysia.

Treatment for poisoning is hampered by many factors: the remoteness of plantation areas; low allocation of funds for medical treatment by estates; poor training for hospital attendants; restrictions placed on the number of medical certificates or referrals that medical personnel on estates can issue to workers; and low wages which prevent workers from seeking treatment at private clinics. Those unable to work because of pesticide poisoning can be sacked and lose their income (and on plantations their homes). These conditions deny workers the fundamental right to health.

Workers are caught in a web of poverty, ignorant of the dangers of pesticides and untrained in proper use. They are forced to spray pesticides of the employers' choice or face losing their jobs. The majority of employers refuse to acknowledge the dangers of paraquat and to use less hazardous alternatives, in particular non-chemical weed management practices.

The majority of employers refuse to acknowledge the dangers of paraquat and to use less hazardous alternatives, in particular non-chemical weed management practices.

Plantations purchase pesticides that have mostly been developed by agrochemical TNCs. These TNCs have full knowledge of the inherent hazardous nature of their product, as well as of the poor conditions of use on plantations, and of the daily exposure of plantation workers to pesticides. They continue to collaborate with plantation companies and have enabled and facilitated the violations of workers' rights to a safe working environment even as they reap huge economic benefits from their pesticides. It is possible to substitute paraquat by inexpensive techniques that imply minimal risks for workers. At least one plantation company aimed to phase out paraquat use on oil palm plantations by 2011.²⁵⁶

Conditions on Malaysian and Indonesian oil palm plantations

Pesticides commonly used on Malaysian and Indonesian oil palm plantations include paraquat (Syngenta), glyphosate (Monsanto) and glufosinate (Bayer). It has been estimated that 30,000 women are employed to spray paraquat on a regular basis in Malaysia.²⁵⁷ In surveys conducted by Tenaganita, a Malaysian CSO, symptoms of poisoning reported by women workers include nosebleeds, excessive tearing of eyes, contact dermatitis, skin irritation and sores, discoloration and loss of nails, joint swelling, abdominal ulcerations, general deterioration of muscles and bone, and blindness due to chemical spills. The box below provides testimony of working conditions and the harm caused by paraquat, exacerbated by geographical and socio-economic conditions.

Workers complaining of pesticide poisoning are often treated callously by medical personnel, and they can be prescribed only paracetamol for pain and creams for skin irritation. Plantation healthcare workers have little information on, or training in, identifying or treating poisoning from widely-used pesticides. Workers are reluctant to report pesticide poisoning for fear of losing their jobs or of retaliation, or because they cannot afford the time off or medical costs (see box). If workers fall ill and are unable to work they are often sacked, losing both their income and housing. The agrochemical TNCs make huge profits on pesticides; for example, the Malaysian agrochemical market in 2004 was RM 323 million (US \$85 million) and pesticides use grew by 3.5 per cent in 2004 over the previous year. Yet the plantation workers who use them, and are poisoned by them, remain impoverished.

²⁵⁶ RSPO. 2010. Wilmar launches first sustainability report, CSR Tribune.

²⁵⁷ Tenaganita, PAN AP. 2002. Poisoned and Silenced: a study of pesticide poisoning in plantations. Penang, Malaysia. p20.

Testimony of Nagama

Nagama began working, aged 15, on a rubber plantation in Malaysia. Her parents were rubber tappers, typical estate workers whose children must work to supplement family income. At 21, Nagama married and moved to Kapar district in central Selangor state. She took a job as a paraquat sprayer on an oil palm plantation, one of the few paying jobs available to an unskilled woman. Pesticide sprayers were required to dilute the paraquat concentrate with water before filling four-gallon canisters with the solution. Nagama said: "I used to mix the paraquat with my bare hands. I was not aware of what this would do to me..." She began to experience fatigue, poor vision and sores in the genital area. Worried, she sought treatment at a private clinic outside the estate. "The doctor asked whether I was a pesticide sprayer, and when I said 'yes', he told me to find other work." As this was not an economic option, Nagama took up workers' health problems with her supervisor. She urged him to repair the leaking tanks. He dismissed her complaints, and in response transferred her to fertiliser application, a heavy-duty job normally assigned to able-bodied men. Nagama was later transferred back to the pesticide sprayers' gang ... Eventually battery-operated pumps with shower nozzles replaced the heavy metal spray tanks. But in the frequent windy conditions pesticide drift from the nozzle would blow into the workers' faces, choking them and causing the eyes to smart and tear freely. Nagama had to resign aged 45 because of ill-health due to paraquat poisoning. She said: "Paraquat is banned in Switzerland, why then is it still sold and used in Malaysia." ²⁵⁸

The case of Mardiah

Mardiah began her working life at an early age, helping her mother as a weeder on a palm oil plantation. At 16, she joined the sprayers' gang on the estate. "My problems began when I started spraying that strong medicine, 'kopi O' (black coffee)', as sprayers called paraquat. "I remember one bad accident. The nozzle of the spray tank had become clogged with grass, so I tried to open and clean it. But the spray mixture splashed into my eyes and they began smarting." As there was no water for washing nearby her co-workers used the water from their drink bottles to wash out her eyes. "The next morning my eyes were swollen and I could not see." ²⁵⁹

Breaking global standards

The International Code specifies that *pesticides whose handling and application require the use of personal protective equipment that is uncomfortable, expensive or not readily available should be avoided, especially in the case of small-scale users and farm workers in hot climates.* That means such pesticides should not be marketed and sold under these conditions. Syngenta has knowledge of the conditions of use in developing countries, and of the harm that paraquat inflicts on people and the environment. Its culpability is exacerbated by its insistence that the product is safe when used according to label instructions, in denial of conditions of use. Through the manufacture, distribution and sale of paraquat

²⁵⁸ Fernandez, 2006, Op cit. pp10-15.

²⁵⁹ *Ibid.* pp16-17

in LMICs Syngenta has enabled gross violations of human rights to occur. These conditions constitute violations of the right to health and life, the right to safe working conditions, and the right to a healthy environment.

4.1.2 ATRAZINE CONTAMINATION IN THE US MIDWEST

4.1.2.1 Health and environmental impacts of atrazine

Atrazine is a triazine herbicide which has been sold in over 80 countries. It was banned in Syngenta's home country of Switzerland and in the EU in 2004.^{260,261} In the US atrazine is found more regularly than any other pesticide in groundwater and residues are found in lakes, streams and drinking water at levels that make a difference to the ecosystem and to human health. Scientists have linked exposure to increased risk of birth defects, infertility and possibly cancer.^{262, 263, 264, 265, 266} Atrazine is one of the most widely used weedkillers in the US. More than 76 million pounds are used each year, mostly on corn fields. Smaller quantities are used on a wide variety of crops, for example sugarcane, cauliflower and Christmas trees. To protect its products, Syngenta has exerted pressure on scientists and regulators and is alleged to have put forward faulty studies.

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Studies indicate that atrazine is a potent endocrine disruptor^{267, 268, 269} as acknowledged by the US EPA.²⁷⁰ This means that micro-doses can have significant, irreversible effects, such as:²⁷¹

- **Birth Defects:** Infants conceived during atrazine spray season are more likely to be born with birth defects. Research shows that even low levels of exposure during pregnancy may be problematic; the third trimester appears to be most critical.²⁷²

²⁶⁰ EUR-Lex. 2004. Commission Decision concerning the non-inclusion of atrazine in Annex I to Council Directive 91/414/EEC and the withdrawal of authorisations for plant protection products containing this active substance, 2004/248/EC. March 10.

²⁶¹ Sass JB, Colangelo A. 2006. European union bans atrazine, while the United States negotiates continued use. *International Journal of Occupational and Environmental Health* 12(3):260–267.

²⁶² Mattix KD, Winchester PD, Tres Scherer LR. 2007. Incidence of abdominal wall defects is related to surface water atrazine and nitrate levels. *Journal of Pediatric Surgery* 42(6):947-949.

²⁶³ Tukey P. 2011. Is Common Pesticide Responsible for Rare Birth Defect? *Pesticide Toxicity*. May 13.

²⁶⁴ Swan SH. 2006. Semen quality in fertile US men in relation to geographical area and pesticide exposure. *International Journal of Andrology*. 29(1):62-68.

²⁶⁵ Cox C. 2002. Group uncovers study linking atrazine with prostate cancer. *Journal of Pesticide Reform* 22(2).

²⁶⁶ Duhigg C. 2009. Debating how much weed killer is safe in your water glass: Toxic waters. *New York Times*. August 22.

²⁶⁷ Hayes TB, Collins A, Lee M, Mendoza M, Noriega N, Stuart AA, Vonk A. 2002. Hermaphroditic, demasculinized frogs after exposure to the herbicide atrazine at low ecologically relevant doses. *Proceedings of the National Academy of Sciences* 99(8):5476–5480.

²⁶⁸ Fan W, Yanase T, Morinaga H, et al. 2007. Atrazine-Induced aromatase expression is SF-1 dependent: implications for endocrine disruption in wildlife and reproductive cancers in humans. *Environmental Health Perspectives* 115(5):720-727.

²⁶⁹ Cragin LA, Kesner JS, Bachand AM, Barr DB, Meadows JW, Krieg EF, Reif JS. 2011. Menstrual cycle characteristics and reproductive hormone levels in women exposed to atrazine in drinking water. *Environmental Research* 111(8):1293-1301.

²⁷⁰ US EPA. 2007. Atrazine, Chemical Summary. Toxicity and Exposure Assessment for Children's Health.

²⁷¹ PANNA. 2011. Health Effects of Atrazine. Fact Sheet. PAN North America.

²⁷² Villanueva CM, Durand G, Coutté M-B, Chevrier C, Cordier S. 2005. Atrazine in municipal drinking water and risk of low birth weight, preterm delivery, and small-for-gestational-age status. *Occupational and Environmental Medicine* 62: 400-405.

- **Infertility:** Documented reproductive harms include male infertility, increased risk of miscarriage and low infant birth weight.^{273, 274, 275}
- **Cancer:** Atrazine may increase risk of breast and prostate cancer. Though some studies have not found a link, the 2010 Presidents Cancer Panel Report calls atrazine a possible carcinogen.²⁷⁶

Scientists report that for atrazine, *timing* of exposure may be more important than levels of exposure, and interaction with other pesticides may make health harms more severe. Recent studies show that atrazine causes male frogs to become anatomically female through a ‘chemical castration’ effect.

4.1.2.2 Chemical castration – atrazine ubiquity and hormone disruption

In frogs, atrazine switches on internal bodily mechanisms that convert testosterone, the male hormone, into the female hormone oestrogen, resulting in chemical castration, or feminisation, of males exposed to this chemical at fairly low doses.²⁷⁷ Dr Tyrone Hayes of the Department of Integrative Biology, University of California, has conducted extensive studies on the impacts of atrazine on frogs. In testimony to the PPT, Dr Hayes stressed that it must be a matter of concern that male frogs develop eggs in their reproductive organs when exposed to one of the most ubiquitous pesticide contaminants in US waterways. The US EPA acknowledges concerns but to date has ruled that there are insufficient data to determine whether atrazine affects amphibian development.

Atrazine is persistent in soils and can remain there for up to 100 days, below the soil surface.²⁷⁸ This stability is a desirable characteristic for a weedkiller, but a problem for the environment. Once it leaches into groundwater, atrazine can remain there for decades. According to a 2010 report,²⁷⁹ about 227 tonnes of atrazine is deposited in rainwater every year and can travel from 600 to 1,000 miles. According to Paul Wotzka, former hydrologist with the State of Minnesota, atrazine and its metabolic by-products are the most commonly detected pesticides in southeast Minnesota groundwater.²⁸⁰ It is commonly found in streams, aquifers, and lakes, in rainfall, in surface- and drinking-water, and in urban storm runoff that flows into water bodies. Dr Wotzka found samples with 10 times the amount of atrazine allowed by EPA. The Ecological Watershed Monitoring Program found that all of the 40 watersheds monitored had detectable levels of atrazine, many containing levels dozens of times higher than the EPA standard.²⁸¹ In the Midwest, atrazine is detected in wells in agricultural communities and in pristine

273 Swan SH, Kruse RL, Liu F, Barr DB, Drobni E, Redmon JB, et al. 2003. Semen Quality in Relation to Biomarkers of Pesticide Exposure. *Environmental Health Perspectives* 111:1478-1484.

274 Narotsky, MG, Best, DS, Guidici DL, Cooper RL. 2000. Strain comparisons of atrazine-induced pregnancy loss in the rat. *Reproductive Toxicology* 15(1):61-69.

275 Chevrier C, Limon G, Monfort C, Rouget F, Garlantézec R, Petit C, et al. 2011. Urinary Biomarkers of Prenatal Atrazine Exposure and Adverse Birth Outcomes in the PELAGIE Birth Cohort. *Environmental Health Perspectives* 119:1034-1041.

276 Reuben SH. 2010. Reducing environmental risk: What we can do now. For the President’s Cancer Panel, 2008-2009 Annual Report. US Department of Health and Human Services, National Institutes of Health, National Cancer Institute.

277 Hayes TB, Khoury V, Narayan A, Nazir M, Park A, Brown T, Adame L, Chan E, Buchholz D, Stueve T, Gallipeau S. 2010. Atrazine induces complete feminization and chemical castration in male African clawed frogs (*Xenopus laevis*). *Proceedings of the National Academy of Sciences* 107(10):4612-4617.

278 Cox C. 2001. Atrazine: Environmental Contamination and Ecological Effects. Herbicide Factsheet. *Journal of Pesticide Reform* 21(3).

279 Land Stewardship Project, PANNA. 2010. *The Syngenta Corporation & Atrazine: The Cost to the Land, People & Democracy*. January 10.

280 *Ibid.*

281 *Ibid.*

lakes and rivers. Drinking water contamination levels typically spike in spring²⁸² and early summer, as rains flush freshly applied herbicide. One recent study shows that atrazine evaporates into the air after application; in a process called volatilisation drift – it can then settle back into waterways.^{283, 284}

USDA scientists found atrazine in 94 per cent of the drinking water tested in 2008.²⁸⁵ In spring 2010, the NRDC released a new analysis of the water monitoring study that the EPA required Syngenta to undertake as a condition for allowing atrazine to remain on the market. Examining recent data, NRDC found: *of the 153 water systems that were sampled between 2005 and 2008, 100 ... had spikes of atrazine in their untreated water that exceeded [the federal standard] of 3 ppb. Two-thirds of these 100 systems had spikes of atrazine greater than 3 ppb in the treated water.*²⁸⁶ Atrazine contamination in water kills plants susceptible to its mode of action and can seriously disrupt aquatic ecosystems. US EPA has found that the effects of atrazine on aquatic ecosystems may lead to the loss of 60-95 per cent of the vegetative cover that conceals fish and aquatic invertebrates from predators. This assessment notes that numerous studies have described the ability of atrazine to inhibit photosynthesis, change community structure, and kill aquatic plants at concentrations between 20 and 500 ppm.²⁸⁷ The US Geological Survey (USGS) found atrazine in rivers and streams, as well as groundwater and detected it in rain at nearly every location tested.^{288, 289} The box below presents farmer actions to find alternatives.²⁹⁰

FARMERS' EXPERIENCES – REJECTING ATRAZINE AND FINDING ALTERNATIVES

Paul Sobocinski: *A south-west Minnesota farmer, Paul Sobocinski started using atrazine in 1987. He liked its ability to control grass and broadleaf weeds at relatively low cost. In particular, he appreciated its residual quality — atrazine could be applied after corn was planted and stay in the soil long enough to kill weeds well into the growing season. Shortly before the 2007 growing season, Sobocinski was sitting in on a legislative hearing where he heard biologist Tyrone Hayes talk about his research, which showed that low levels of atrazine caused major health problems in frogs. "Tyrone's research got me to thinking about how farmers like me are being put on the front line when it comes to the health risks of a chemical like atrazine," says Sobocinski. "It made it clearer than ever to me that farmers needed more information on the chemicals they were handling." That spring, Sobocinski directed the co-op that applies his chemicals to take atrazine out of the tank mix. He later learned that in fact atrazine had been included. This is a common problem in the Corn Belt. Because of complications and risks associated with applying chemicals, a growing number of farmers hire professional applicators to spray, which makes it harder to*

282 USGS. 2007. The Quality of Our Nation's Waters: Pesticides in the Nation's Streams and Ground Water, 1992–2001, Circular 1291.

283 Gish T, Prueger JH, Daughtry CST, Kustas WP, McKee LG, Russ AL, Hatfield JL. 2011. Comparison of Field-scale Herbicide Runoff and Volatilization Losses: An Eight-Year Field Investigation. *Journal of Environmental Quality* 40(5):1432-1442.

284 USDA, Agricultural Research Service. 2011. Pesticide pathways into the atmosphere. *ScienceDaily*. July 12.

285 USDA. 2009. Pesticide Data Program: Annual Summary, Calendar Year 2008. Science and Technology Programs, Agricultural Marketing Service.

286 Wu M, Quirindongo M, Sass J, Wetzler A. 2010. Still Poisoning the Well: Atrazine Continues to Contaminate Surface Water and Drinking Water in the US. Natural Resources Defense Council.

287 US EPA. 2006. Atrazine: Finalization of Interim Registration Eligibility Decision and Completion of Tolerance Reassessment and Reregistration Eligibility Process.

288 USGS. 1999. The quality of our nation's waters-nutrients and pesticides. Circular 1225, pp. 60-61.

289 USGS. National Water Quality Assessment (NAWQA) Program. 1998-2000. Circulars 1144, 1150, 1155-1171, 1201-1216.

290 Land Stewardship Project & PANNA, 2010, *Op. cit.*

control what is sprayed. "There was no intention on the part of the co-op manager to deceive me," says Sobocinski, adding "I learned you need to communicate with the applicator and get the message across."

Greg and Jeanne Erickson: Several years ago, the Ericksons had the well on their south-east Minnesota dairy and crop farm tested for contaminants. The results were not good: the nitrate readings were quite high with trace amounts of pesticides such as atrazine. Greg, who at the time used atrazine on corn, decided to spend US \$23,000 to drill a 550-foot well 200 feet deeper than the existing borehole. Tapping into a deeper aquifer put the family's mind somewhat at ease. "Problem solved. I drilled a new well and now I can keep using chemicals." ... "But problem not solved because my neighbour across the road has a 280-foot well and he's still drinking my chemicals. I decided this wasn't acceptable." So in 2000 the Erickson family started weaning their farm off of chemicals entirely. This was no easy task: Greg bought the farm from his father in 1978 and had for years relied on intensive conventional methods.

Loretta and Martin Jaus: Flame weeding is just one of the strategies that Loretta and Martin Jaus use to control weeds without herbicides like atrazine. Their farm has a long history of utilizing as few chemicals as possible. In the mid-1960s, Martin's father, Roman, started using atrazine on the farm. He noticed almost immediately that when he fed atrazine-treated corn to his milk cows, they experienced an unusually high abortion rate. "Even though there was no official connection, in his mind the abortions and the atrazine were related," says Loretta. Martin's father decided that pesticides were not worth the risk they posed to animal and human health. Over the years mechanical cultivation and diverse crop rotations began to replace chemicals to keep weeds in check. Agrochemicals were used only sparingly on the farm by the time Martin and Loretta took over in 1980. By 1990, the Jaus farm's crop acres and dairy herd were certified organic. Mechanical cultivation and soil-building crop rotations that include alfalfa and small grains like oats and barley continue to play key roles in controlling weeds. In addition, they plant corn two to three weeks later than normal for the region. During that delay, the first flush of weeds comes along, making it easier to control them and giving corn a jump-start once it's planted.

4.1.3 VIOLENCE AND KILLING IN BRAZIL

Syngenta Seeds is a Brazilian subsidiary of the Swiss company Syngenta. The PPT heard allegations which include: supporting murder; carrying out physical and moral violence against landless rural workers; maintaining armed private militias; contaminating soil with pesticides; disrupting agrobiodiversity with GE seeds; and criminalising social movements.²⁹¹ A session of the PPT in Lima, Peru in May 2008 recognised the responsibility of Syngenta Seeds Ltd for the violation of Human Rights for this action against the community and activists. (See also Witness Statement, Appendix 5.5)

Syngenta Seeds holds a 127-hectare test site in Santa Tereza do Oeste, 6km from the Iguazu National Park. In violation of Brazil's biosecurity laws, the company was experimenting with GMOs.²⁹² Law

²⁹¹ MST. 2010. In the matter of Syngenta: GMOs, Pesticides and Violence, Brazil.

²⁹² Terra de Direitos, Via Campesina, MST. 2008. The case of Syngenta: Human Rights Violations in Brazil.

10.814/2003 prohibited planting of GE crops within a 10km buffer zone²⁹³ of conservation areas. The Brazilian Institute of Environment and Renewable Natural Resources (IBAMA), prompted by neighbouring farmers and a human rights organisation, conducted a visit of 18 properties in the vicinity of the Park. IBAMA verified that Syngenta had planted over 12 hectares of GE corn and soybean²⁹⁴ and in 2006 fined Syngenta one million reais for planting GMOs within the buffer zone. The company appealed. In 2007, the Federal Court in Cascavel upheld the fine, finding that the company's conduct was prohibited under national laws (Article 2 of Law 11.460/2007). Syngenta has not paid the fine.

To draw attention to these environmental crimes and disrespect for Brazilian law, peasants associated with Via Campesina and the Movement of Landless Rural Workers (MST) twice occupied Syngenta's test site, on 14 March 2006 and in October 2007. The first occupation took place during a meeting in Brazil of the Conference of the Parties (COP) of the Cartagena Protocol (to the Convention on Biological Diversity) and was supported by the international community. Environmentalists from over 15 countries visited the site. The occupation drew worldwide attention to Syngenta's actions and its global implications. Families remained until November 2006, when the State of Paraná instated a possession order. Families returned when the area was expropriated to create an Agroecology Centre to undo the environmental harms created by Syngenta. Syngenta obtained a preliminary ruling from the Justice Tribunal of Paraná, which temporarily suspended this expropriation decree. On 18 July 2007 the 70 families relocated to a temporary site on the Olga Benário settlement next to the company site. In January 2008 the decree was annulled.

The occupation followed rumours that Syngenta would resume illegal experiments and again expose the park and nearby conventional crops to GM contamination.²⁹⁵ In the early morning of 21 October 2007 around 200 workers from Via Campesina peacefully reoccupied the site to establish the Agroecology Center for native seeds, family farming and agrarian reform. The workers set off fireworks and the security guards left.²⁹⁶ At approximately 1 pm the same day a minibus stopped close to the front gate followed by a four-door car. About 50 men emerged heavily-armed with pistols, revolvers and rifles; they forced open the gate and began shooting. Some workers were inside a sentry building near the main gate and had little chance to protect themselves. The militiamen shot Valmir Mota (known as Keno) in the leg, then killed him with a shot in the chest at point-blank range. They shot Isabel Nascimento de Souza through the eye, then beat and dragged her. Isabel lost vision in one eye and has permanent health problems. Three other workers were injured during the attack.

The militia's objective was to kill three Via Campesina leaders in the region—Célia Aparecida Lourenço, Celso Barbosa and Keno²⁹⁷. The militia had mistaken Isabel for Célia Lourenço. Keno was 34, married and a father of three. He had been a militant in the MST and Via Campesina for 20 years. He was widely respected and 1,500 people attended his funeral including politicians, social movement representatives, peasants of Santa Tereza do Oeste and members of Via Campesina. One of the militia died in the attack by other militiamen who were firing in all directions. The militiamen fled, but police apprehended four armed men. The militia had been contracted by NF Security, in turn contracted by

²⁹³ Buffer zones were established by Resolution No. 13/1990 of the National Environment Council (CONAMA) and consisted of a 10km strip bordering conservation areas. Because activities within these buffer zones can affect the conservation area ecosystem, they must be licenced by the jurisdiction's environmental agency, in consultation with the area's technical team.

²⁹⁴ Terra de Direitos et al, 2008, *Op cit.*

²⁹⁵ MST, 2010, *Op. cit.*

²⁹⁶ Terra de Direitos et al, 2008, *Op. cit.*

²⁹⁷ Terra de Direitos et al, 2008, *Op. cit.*

Syngenta in conjunction with the Rural Society of the West (SRO – an association of large landowners opposed to agrarian reform who carry out violence against social movements seeking land rights) and the Movement of Rural Producers (formed by SRO in 2007 to raise money and hire militias).

Syngenta admits that it contracted NF Security, but denies responsibility for the illegal use of guns. Syngenta claims that it neither knew of nor ordered the militia and that its contract with NF Security stated guards were not to bear arms on the property. However, the human rights' organisation Terra de Direitos had complained to the Federal Police and to Syngenta that NF security was using guns. The police had arrested a woman owner of the company for holding illegal arms. While Syngenta denies ordering the attack, clause 2.1bb of the contract it signed with NF says that where there is a *case of invasion, NF must dispatch to Syngenta's site, within one hour, a quantity of men at least equal to or as many as double the amount contracted by Syngenta at the time of the occurrence.*²⁹⁸ Clause 12.2.2 of the contract specifies that for hours of additional work, NF should make a request, up to four hours in advance through an administrative letter signed by two of Syngenta's legal representatives, but that *in case of an invasion, a Syngenta employee could carry out the contracting of extra NF security guards, without needing to contact Syngenta's legal representatives first.* It is clear that under the contract Syngenta authorised NF to hire new security guards in case rural workers returned to the area.

There are clear indications from the police investigation that Syngenta knew the guards were armed.²⁹⁹ The office of the public prosecutor established, in Case 2007.3982-4 of the Criminal Court of Cascavel, that NF Security is an armed gang. In September 2007, a Federal Police operation seized illegal arms, and arrested one of the directors, while the owner fled. The company is a front with few employees; when hired to carry out operations it illegally hires more 'security guards', creating an armed militia. After the conclusion of the investigation, the police chief sent the report to the judge and to a public prosecutor. Shortly afterwards, the Public Ministry made a public accusation against eight militants from Via Campesina (Celso, Celinha, Izabel, Alcides, Barreto, Gilmar, Vanderlei and Joce), holding them responsible for what happened, including the deaths. The investigation is currently underway and will go to the jury. No charges were brought against Syngenta.

The violent response to the occupation and murder of Keno demonstrate an unsettling disregard for law and government by the SRO, NF Security and Syngenta. It highlights the increasing number of conflicts between agribusiness and rural civil society sweeping Latin America. It is a matter of intense concern that this death may be a signal of continental violence as powerful agribusiness interests come up against the progressive social movements that are shaking the Americas. On 7 March 2008, Rudolf Bärffuss, Switzerland's ambassador to Brazil, met with Keno's widow, Iris Oliveira. Bärffuss apologised on Switzerland's behalf for the murder on Syngenta's property³⁰⁰.

²⁹⁸ Ribeiro S. 2007. Syngenta: murder and private militias in Brazil. Via Campesina.

²⁹⁹ The public prosecutor's office established, in Criminal Case No. 2007.3982-4 of the Criminal Court of Cascavel, that NF Security is an armed gang. In September 2007, a Federal Police operation seized illegal arms from NF Security. In reality, NF Security is a front company with few employees; when hired to carry out operations it illegally hires more 'security guards', thereby forming an armed militia which carries out violent evictions and attacks on encampments in the region.

³⁰⁰ Terra de Direitos et al, 2008, *Op. cit.*

4.1.4 OTHER CASES AGAINST SYNGENTA

Syngenta is also charged in the following cases with multiple offenders:

1. Pollution and endangerment of Arctic tribal nations and their environment
2. Lake Apopka
3. Organophosphates
4. Aerial Spraying
5. Toxic Dumps of Obsolete Pesticides
6. Cancer in Punjab
7. Suppression, corruption, manipulation and distortion of science
8. Children's rights
9. Kamukhaan: A poisoned village

4.2 MONSANTO COMPANY

Monsanto, the world's leading agricultural biotechnology company, has a history of developing and marketing dangerous pesticides and hazardous chemicals. Among these are dichlorodiphenyl-trichloroethane (DDT),³⁰¹ 2,4,5-trichlorophenoxyacetic acid (2,4,5-T) and polychlorinated biphenyls (PCBs). The company has been associated with fraud, manipulating scientific studies and failing to reveal data demonstrating the hazards of its products. As far back as 1949 an explosion at its Nitro plant exposed workers to 2,4,5-T (a component of Agent Orange). All 2,4,5-T is contaminated with the extremely toxic dioxin (2,3,7,8-tetrachlorodibenzo-p-dioxin, also known as TCDD).³⁰² From 1980 to 1984, Monsanto studies claimed that dioxin exposure did not show significant long-term effects. Legal action following a chemical spill in Missouri revealed that studies had been deliberately skewed by omitting health cases and inappropriately reclassifying the level of workers' exposure.^{303, 304, 305} Monsanto knew of the ill-effects of dioxin and Agent Orange decades before it was used during the Vietnam War, endangering the lives and health of American soldiers³⁰⁶ and the Vietnamese people.³⁰⁷ A 1990 leaked memo from the EPA supported this finding on Monsanto's falsification of research establishing *a long pattern of fraud*.³⁰⁸

The cases considered by the PPT focus on the shift in Monsanto's pesticide research from the late 1980s to the development of GM plant cells and GE crops. Monsanto GE crops are of two basic types: those designed to encourage pesticide use, namely the herbicide glyphosate, marketed as Roundup, and

³⁰¹ More correctly, DDT's IUPAC name is 1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane.

³⁰² Dioxins are a group of chemicals. TCDD is the most extensively studied and considered the most hazardous.

³⁰³ Environmental Research Foundation. 1990. Dioxin—Part 1: Dioxins and Cancer: Fraudulent Studies. Rachel's Hazardous Waste News No. 171.

³⁰⁴ Combat Monsanto. Undated. Corrupt Research, How the toxicity of dioxin was concealed. Retrieved 3 July 2011.

³⁰⁵ Lester SU. Undated. Industry's 'True Lies': The politics behind the scientific debate on dioxin. Cited as originally appearing on Everyone's Backyard Vol 13, No 3. Also in Alexander Hawes, LLP.

³⁰⁶ As well as those of allies, including Australia and New Zealand.

³⁰⁷ Francis E. Undated. A Planet Waves Special Report: The Kemner Brief. Retrieved 3 June 2011.

³⁰⁸ Jenkins C. 1990. Memo to John West and Kevin Guarino: Criminal Investigation of Monsanto Corporation Cover Up of Dioxin Contamination in Products Falsification of Dioxin Health Studies; from Organic Consumers Association. November 15.

seeds that express the gene *Bacillus thuringiensis* (*Bt*) to kill insect pests. Use of patents to enforce IPRs on seed varieties led to the commercialisation of Monsanto's GE crops in the mid-1990s. In the US, GE crops increased pesticide use by 55 million kg from 1996 to 2004,³⁰⁹ and from 2005-2008 by a further 93 million kg.³¹⁰ Monsanto dominates the global biotechnology market. Its patented GE traits can be found in more than 90 per cent of the soybean and cottonseed, and more than 80 per cent of corn sold in the market. The company's grip on the market is through licensing agreements (i.e. traits developed by Monsanto are licensed to other companies for the development of their own varieties) rather than direct seed sales.³¹¹ Monsanto promotes its GE products around the world, including by unethical and illegal strategies, in complete disregard of the precautionary principle. This is illustrated in the following cases: (1) manipulation of science and collusion with government authorities to facilitate approval of *Bt* brinjal in India, despite accounts pointing to the potential adverse impacts of *Bt* crops; (2) expansion and control of GE seeds in the US and persecution of farmers whose crops are unwittingly contaminated with GE crops; (3) bribery of government officials in Indonesia; and (4) toxicity of *RR* soybean seeds and pesticide package leading to illness and death. These representative cases demonstrate Monsanto's violations of human rights worldwide.

4.2.1 MONSANTO'S *Bt* CROPS

Monsanto has patented technology that builds in the bacterium-based insecticide *Bt* to a range of seeds to control lepidopteran insects (such as corn borers, corn earworm and cornstalk borer). Three cases demonstrate the risks to people and contamination of natural varieties of these crops: *Bt* maize in Mexico, *Bt* brinjal (aubergine/eggplant) in India, and *Bt* cotton in India. Mexico and India are the centres of origin and biodiversity of maize and brinjal respectively; *Bt* cotton was marketed supposedly to reduce dependence on pesticides but instead farmers spent more on inputs and were burdened by insurmountable debts that threatened their right to livelihood.

4.2.1.1 Summary of health and environmental hazards of *Bt* crops

*Genetic engineering and the health hazards of *Bt**

The potential dangers of genetically-modified food in the diet have been documented. In 1994, Monsanto released the GE rBGH hormone to increase milk production in cows. An association was found with increased risks of colon, breast and prostate cancer in humans.³¹² Research found that a gene present in GE soybeans could transfer to the gut bacteria in humans.³¹³ The symptoms of illness arising from consumption of GMOs may take years to manifest.³¹⁴ (See also Appendices 5.1 and 5.2)

³⁰⁹ Benbrook C. 2004. Genetically engineered crops and pesticide use in the United States: the first nine years.

³¹⁰ Benbrook, 2009, *Op. cit.*

³¹¹ Hubbard K. 2009. Out of Hand: Farmers Face the Consequences of a Consolidated Seed Industry. A Report by the Farmer to Farmer Campaign on Genetic Engineering. National Family Farm Coalition. p19.

³¹² Hansen M, Halloran JM, Groth III E, Lefferts LY. 1997. Potential Public Health Impacts of the Use of Recombinant Bovine Somatotropin in Dairy Production. Consumers Union, New York, US.

³¹³ Food Standards Agency. 2002. Technical Report on the FSA project Evaluating the risks associated with using GMOs in human foods. Also published as Netherwood T, Martín-Orúe SM. *Et al.* (2004). Transgenes in genetically modified Soya survive passage through the human small bowel but are completely degraded in the colon. *Nature Biotechnology* 22(2):204-209.

³¹⁴ Physicians and Scientists for Responsible Application of Science and Technology. 2010. The Showa Denko Tryptophan disaster reevaluated.

The biotechnology industry argues that GE in agriculture is akin to natural or traditional breeding and that *Bt* crops are safe as *Bt* genes occur naturally in bacteria. But GE technology involves inserting a number of genes: the gene to produce the desired protein; a promoter gene to enable the target organism to produce a protein it previously did not, free from normal cellular controls; and a marker gene to identify individual organisms with the gene that produces the desired protein. Effects can be unpredictable. In an experiment to produce GE rice containing the carotenoid lycopene, two carotenoid biosynthesis transgenes *psy* and *crt1* were inserted in rice endosperm; however, instead of producing lycopene, beta-carotene was produced via an unexpected biochemical pathway in the endosperm.³¹⁵ GE can precisely cut a desired gene from one organism using biochemical enzymes, but it cannot precisely insert this gene into another organism. The target organism may produce unexpected, and thus undetected, chemicals or toxins leading to allergic reactions or unpredictable side effects, potentially fatal. Because the presence of these toxins is unexpected and undetected, they are not covered by government-mandated safety testing.

Soybean allergies in the UK jumped from 10 to 15 per cent of a sample group shortly after GE soybean was introduced³¹⁶. A GE food supplement was linked to the death of some 100 people and to illness in 5,000-10,000.³¹⁷ Workers handling GE cotton in India have reported allergic reactions.³¹⁸

Plants containing the *Bt* gene have caused serious adverse health effects on humans and animals eating these crops: impairment of the immune system, gastrointestinal problems, infertility and changes to major organs. In Madhya Pradesh, India, farm and factory workers exposed to *Bt* cotton developed allergies, skin eruptions, swollen faces and other symptoms.³¹⁹ A 1998 study demonstrated that *Bt* toxins survive digestion in functionally or immunologically active form.³²⁰ Another study found *Bt* toxin Cry1Ac to be a potent stimulator of the immune system and to have other adverse impacts.^{321, 322} Researchers found unintended side-effects in GE maize marketed by Monsanto.³²³ The *Bt* gene in food can transfer to the DNA blueprint of the bacteria living in human intestines and assisting in the digestive processes. Toxicity studies by Maharashtra Hybrid Seeds (Mahyco) on *Bt* brinjal showed it *can adversely affect the immune response of the body, cause liver damage and lead to reproductive disorders if eaten regularly*.³²⁴ An independent study in Quebec detected the *Bt* toxin Cry1Ab protein in blood serum of pregnant and non-pregnant women, and in umbilical cord blood.³²⁵ There is sufficient scientific evidence of actual and potential adverse health impacts of *Bt* crops to merit the application of the Precautionary Principle.

315 Schaub P, Al-Babili S, Drake R, Beyer P. 2005. Why is golden rice golden (yellow) instead of red? *Plant Physiology Preview* 138:441-450.

316 Institute of Responsible Technology. 2007. Genetically Engineered Foods May Cause Rising Food Allergies (Part One).

317 Smith JM. 2007. Genetic Roulette: The Documented Health Risks of Genetically Engineered Foods. Yes! Books, USA.

318 Gupta A. 2005. Impact of Bt cotton on farmer's health (Birwani and Dhar Districts, Madhya Pradesh) Investigative Report.

319 Gupta, 2005, *Op cit*.

320 Fares H, El-Sayed AK. 1998. Fine structural changes in the ileum of mice fed on delta-endotoxin-treated potatoes and transgenic potatoes. *Natural Toxins* 6:219-233.

321 Vázquez RI, Moreno-Fierros L, Neri-Bazan L, De la Riva GA, López-Revilla R. 1999. Bacillus thuringiensis Cry1Ac protoxin is a potent systemic and mucosal adjuvant. *Scandinavian Journal of Immunology* 49(6):578-584.

322 Vázquez-Padrón RI, González-Cabrera J, García-Tovar C, Neri-Bazan L, López-Revilla R, Hernández, M, De la Riva GA. 2000. Cry1Ac protoxin from Bacillus thuringiensis sp. kurstaki HD73 binds to surface proteins in the mouse small intestine. *Biochemical and Biophysical Research Communications* 271(1):54-58.

323 Zolla L, Rinalducci S, Antonioli P, Righetti PG. 2008. Proteomics as a Complementary Tool for Identifying Unintended side-effects occurring in transgenic maize seeds as a result of genetic modifications. *Journal of Proteome Research* 7(5):1850-1861.

324 Sharma DC. 2011. *Bt* Brinjal can damage liver, hit immunity: study. India Today. January 17.

325 Aris A, Leblanc S. 2011. Maternal and fetal exposure to pesticides associated to genetically modified foods in these Eastern Townships of Quebec, Canada. *Reproductive Toxicology* 31(4):528-33.

Genetic engineering and the environmental hazards of Bt

Plants are naturally pollinated by insects, animals or the wind, in a manner that cannot be regulated. GMO contamination of conventional and endemic breeds through natural processes is very real and has already happened; it threatens livelihoods, food sovereignty and biodiversity and could alter entire ecosystems. The behaviour of the GMO in the field is inherently impossible to predict as they can reproduce, crossbreed, migrate and mutate. Once genetic contamination has taken place, it cannot be recalled or cleaned-up.³²⁶

The bacterial toxin in *Bt* may affect non-target species. A 1999 study indicated that pollen from *Bt* corn caused the mortality rates of monarch butterfly caterpillars to increase.³²⁷ *Bt* cotton was initially successful in combating bollworms. However, it gave rise to the dominance of new pests (in particular sucking pests) and farmers were forced to use additional pesticides to control these.³²⁸ As the interdependence of different species in an ecosystem is intricate and not well understood, it is impossible to determine the full impact of the *Bt* toxin. If the emergence of secondary pests or development of pest resistance becomes widespread, there is a real possibility that agrochemical TNCs will introduce more toxic pesticides. Several studies have demonstrated that the *Bt* corn protein persists and remains biologically active in soil.³²⁹ Accumulation in soil of these toxins can potentially severely impact microbial health crucial to the health of soil ecosystems and agricultural productivity.

IMPACT OF *Bt* CORN ON PRODUCTION COSTS OF US FARMERS

In the 1970s, expenditures for seeds and pesticides accounted for less than 10 per cent of the farmer's gross income. The surplus production in the US supported by government subsidies and other adverse economic conditions drove corn prices from a profitable US \$2.79 per bushel to less than US \$2.00 per bushel by 1998. The major jump in seed and chemical cost coincided with the introduction of Bt corn between 1994 and 1996. It now accounted for about 20 to 25 per cent of the gross income. This is one major reason why the seed and agrochemical industry continued to reap financial gains while the income of corn farmers has been continuously eroded.

Benbrook CM. Premium Paid for Bt Corn Seed Improves Corporate Finances While Eroding Grower Profits, Benbrook Consulting, February 2002

4.2.1.2 *Bt* maize in Mexico

In the 2008 IAASTD report, experts stressed the importance of Latin America as a centre of origin of worldwide relevant crops, such as corn, potato and tomato, and drew attention to concern about gene pollution if transgenic crops are introduced in these centres of origin, such with the potato in Bolivia

³²⁶ Claire H.C. 2008. *Uncertain Peril: Genetic Engineering and the Future of Seeds*. Beacon Press.

³²⁷ Losey JE, Rayor LS, Carter ME. 1999. Transgenic pollen harms monarch larvae. *Nature* 399:214.

³²⁸ Wang S, Just DR, Pinstrup-Andersen P. 2006. Tarnishing Silver Bullets: *Bt* Technology Adoption, Bounded Rationality and the Outbreak of Secondary Pest Infestations in China. Selected Paper prepared for presentation at the American Agricultural Economics Association Annual Meeting Long Beach, CA. July 22-26.

³²⁹ Cotter J. 2006. GE insect resistant (*Bt*) maize in Europe: an unnecessary threat to wildlife and GE-free choice. Greenpeace Research Laboratories (Technical Note 03/2006).

or the transgenic corn in Mexico. Rapid introduction of *Bt* corn (maize) between 1996 and 1999 in the US posed threats to biodiversity in Mexico, which is the global centre of biodiversity of maize. Maize diversity is a crucial source of natural genetic traits to improve quality and productivity worldwide, and is directly related to food security and sovereignty of farmers. Contamination will endanger this reservoir. The Mexican diet is based on a number of maize varieties, such as cacahuazintle, and corn-based products, such as the delicacy huitlacoche (galls formed by the disease corn smut), tamales, tortilla, and the beverage atole, among others.

The Mexican government banned cultivation of transgenic maize in 1998 and field tests in 1999.^{330, 331} In May 1999, Greenpeace Mexico presented evidence to the government that maize imported from the US contained transgenic seeds.³³² It warned that: *Our maize could become contaminated through these imports and this contamination could have serious effects and consequences. This means that these imports have to be stopped.* The government was aware that *Bt* maize could be planted, but continued to allow imports. However, in June 1999, it recognised the risks to native maize varieties and established a moratorium on transgenic maize seed for experimental purposes.

But the Greenpeace prediction became a reality. In 2000, David Quist and Dr Ignacio Chapela discovered the presence of transgenes on Mexican maize landraces (see also 4.7.9).³³³ The study showed that the promoter CaMV 35S gene³³⁴ and terminator *nos* codon³³⁵ from *Bt* corn were present in samples of native maize in the state of Oaxaca. By September, Mexican government officials reported contamination of indigenous varieties of maize with GM varieties in the states of Oaxaca and Puebla.³³⁶ The Ministry of the Environment and Natural Resources (Semarnat) confirmed that *a sample taken from the warehouses of Diconsa³³⁷ in the town of Ixtlan de Juarez showed that approximately one-third of the grain was contaminated.*³³⁸ By January 2002, the government reported that 15 of 22 sites tested revealed contaminated maize seeds; from May to September 2008, 25,000 hectares of maize were contaminated in Cuauhtémoc in the northern state of Chihuahua. The government has never allowed commercial growing of *Bt* maize. Virtually no measures have been adopted to stop or reverse the contamination.

This high risk of contamination of non-*Bt* maize from cross-pollination has significant implications for farmers and undermines their right to reject *Bt* varieties. The risk of gene flow is a particular threat to organic maize growers. Organic certification prohibits GE in production and processing, and its presence may prevent crops being marketed. No federal statutes protect organic growers against GM gene contamination. One specialist maize researcher noted that *if the transgene contaminating the native varieties of maize gives ... characteristics which are not acceptable to the farmers and the contamination continues for generations, the farmers will stop sowing the contaminated variety which would mean that valuable genetic information would be lost.*³³⁹ Research results³⁴⁰ from the National Institute of Ecology

330 Poitras M. 2008. Social Movements and Techno-Democracy: Reclaiming the Genetic Commons. Chapter II in: Food for the Few: neoliberal Globalism and Biotechnology in Latin America. Otero G (Ed.), University of Texas Press, Austin, Texas.

331 Nadal A, Wise TA. 2004. Working Group on Development and Environment in the Americas, The Environmental Costs of Agricultural Trade Liberalization: Mexico-US Maize Trade Under NAFTA, Discussion Paper No 4.

332 Greenpeace International. 2003. Maize Under Threat. GE Maize Contamination in Mexico.

333 Quist D, Chapela IH. 2001. Transgenic DNA Introgressed into Traditional Maize Landraces in Oaxaca, Mexico. *Nature* 414(6863):541-543.

334 To facilitate transcription and expression of another part of the genome; CaMV 35S comes from Cauliflower mosaic virus.

335 A sequence of DNA to terminate the expression of an inserted gene; originally extracted from *Agrobacterium tumefaciens*.

336 Yoon CK. 2001. Genetic Modification Taints Corn in Mexico. The New York Times. October 2.

337 The Mexican government food distribution agency - supplies basic consumer products to remote, poor rural communities.

338 Greenpeace International, 2003, *Op cit*.

339 Paczka RO. 2003. Autonomous University of Chapingo. In Greenpeace International, 2003, *Op cit*.

340 Greenpeace International, 2003, *Op cit*.

and the Commission Nacional para el Conocimiento y Uso de la Biodiversidad presented at a seminar *En Defensa del Maíz* in Mexico City in 2002 concluded:

- the original results of Quist and Chapela were correct (see 4.2.1.2 and 4.7.9.1)
- the contamination by transgenes in the Sierra Norte de Oaxaca was not an isolated incident and could have occurred in other regions of Mexico
- the contamination of native varieties of maize by transgenic sequences is a serious problem as native maize varieties contain the genetic memory of traditional agriculture, history and identity
- damage to the original gene sequences of native maize could cause irreparable damage to the natural heritage of the country
- this situation contradicts official national policy with respect to the moratorium on the planting of transgenic maize. It could have legal consequences for the country.

Conflicts over protection of native varieties from Bt maize can have tragic consequences. In October 2007, Armando Villareal, a farm leader in the border state of Chihuahua, was gunned down after a farmers' meeting in Nuevo Casas Grandes where he had denounced the illegal planting of GMO corn.³⁴¹

Contamination of local corn in Mexico by *Bt* varieties demonstrates that the introduction of GE crops has uncontrollable and unpredictable consequences outside the laboratory. While serving the economic interest of Monsanto, the technology violates farmers' rights to self-determination, livelihood and food.

4.2.1.3 *Bt Brinjal in India*

Monsanto has a significant presence in India, with implications for brinjal (and cotton, 4.2.1.4). Monsanto bought shares in, and established joint ventures with, local seed companies, and by 2011 operated three Indian subsidiaries: Monsanto India Limited (formerly Monsanto Chemicals of India Limited), Monsanto Holdings Private Limited (a merger of Monsanto Enterprises and Monsanto Holdings Private Limited focused on Paras hybrid seeds with GE cotton technologies) and Mahyco Monsanto Biotech (India) Limited.³⁴² Early in 1998, Monsanto acquired a 26 per cent share in the Maharashtra Hybrid Seeds Company (Mahyco). It established a separate 50:50 joint venture company called Mahyco Monsanto Biotech (India) Limited with the Mumbai-based licensee Mahyco. In March 2002, Hindustan Lever Limited transferred its seed business to its subsidiary company Paras Extra Growth Seeds Limited (Paras). Hindustan Lever Limited later transferred 74 per cent of its share interest in Paras to Mauritius-based and Emergent Genetics associate, India Seeds Holdings Limited, effectively forming a joint venture partnership.³⁴³ Emergent Genetics Incorporated, including Emergent Genetics India Private Limited, was acquired by Monsanto in 2005.³⁴⁴

Brinjal (also called aubergine or eggplant, *Solanum melongena*) originated from India.³⁴⁵ India has about 2,500 varieties and is the second largest producer after China. In 2009, India produced 10,378,000 tonnes on 600,000 ha,³⁴⁶ mainly grown by small family farms. Brinjal is a popular ingredient in Indian

³⁴¹ Ross J. 2008. Biotech's Assault on Mexico: Killing farmers with killer seeds. Counterpunch. June 23.

³⁴² Monsanto India Limited. Undated. Retrieved Oct 12, 2011.

³⁴³ The Financial Express. 2002. India Seeds acquires 74 per cent in Paras Extra. March 31.

³⁴⁴ Emergent Genetics. 2005. Monsanto completes acquisition of Emergent Genetics, Inc. Emergent Genetics News & Media Archives. April 5.

³⁴⁵ Bhat RV, Vasanthi S. 2008. Antiquity of the Cultivation and Use of Brinjal in India. *Asian Agri-History* 12(3):169-178.

³⁴⁶ FAOSTAT. Retrieved December 2010 from <http://faostat.fao.org>

cooking.³⁴⁷ It can self-pollinate, but is classified as cross-pollinated because the extent of the later can range from 2 to 48 per cent.³⁴⁸ The fruit and shoot borer (FSB), *Leucinodes orbonalis*, is its most damaging pest and can reduce yields by 50-70 per cent,³⁴⁹ even after repeated insecticide spraying. *Bt* brinjal was developed in partnership with Cornell University and USAID in a Public-Private Partnership Programme (PPP) under the Agriculture Biotechnology Support Project, a consortium supporting agricultural biotechnology, allegedly to address FSB infestation. Under this programme, the technology was given free to Tamil Nadu Agricultural University, University of Agricultural Sciences and the Indian Institute of Vegetable Research.³⁵⁰ *Bt* brinjal has three foreign genes inserted into it: 'Cry1Ac', 'nptII' and 'aad'. The Cry1Ac gene, driven by the promoter CaMV, codes for the Cry1Ac Bt toxin. The genes nptII and "aad" are selective antibiotic markers derived from bacterial transposons Tn5 and Tn7 respectively.^{351, 352}

BT BRINJAL TIMELINE

1980s	<i>India sets up Department of Biotechnology (DBT)</i>
2001-2002	<i>Greenhouse study on efficacy of Bt brinjal</i>
2002-2004	<i>Confined field trials to study pollen flow. Review Committee on Genetic Modification (RCGM) approves research trials of 8 hybrids</i>
2004-2007	<i>Monsanto-Mahyco conduct open air field trials with Indian Council of Agricultural Research</i>
2005	<i>Public Interest Litigation on GM crops filed with the Supreme Court</i>
2006	<i>DBT clears field trials. Monsanto-Mahyco submits biosafety data to GEAC for permit to conduct large scale trials. Protests by Indian people and NGOs become widespread. Supreme Court stops large scale trials</i>
2006 July	<i>GEAC convenes an Expert Committee (EC-I) to review submissions from independent scientists and NGOs</i>
2007	<i>EC-I recommends more studies. Supreme Court allows the field trials</i>
2008	<i>Central Information Commission and Supreme Court favours RTI suit and orders GEAC to release biosafety data. Union Health Minister endorses health concerns raised by the public</i>
2009 Jan	<i>Second Expert Committee (EC-II) convened</i>

³⁴⁷ Centre for Environment Education. Undated. National Consultations on Bt Brinjal: A primer on concerns, issues and prospects. Ministry of Environment and Forests, Government of India.

³⁴⁸ Centre for Environment Education, undated, *Op cit*.

³⁴⁹ Savvy Soumya Misra, Kirtiman Awasthi. 2009. Test tube Brinjal. *Down to Earth* 15th April.

³⁵⁰ Centre for Environment Education, undated, *Op cit*.

³⁵¹ Chee PP, Slightom JL. 1995. Chapter 11: Transformation of Soybean (*Glycine max*) via *Agrobacterium tumefaciens* and Analysis of Transformed Plants. In Gartland K, Davey M (Eds) *Agrobacterium Protocols. Methods in Molecular Biology* 44:110.

³⁵² Fling ME, Kopf J, Richards C. 1985. Nucleotide sequence of the transposon Tn7 gene encoding an aminoglycoside-modifying enzyme, 3''(9)-O-Nucleotidyltransferase. *Nucleic Acids Research* 13(19):7095-7106.

Stressing the importance of native varieties, food security expert Devinder Sharma said: *brinjal is a traditional crop in India, and the Cartagena Protocol on Biosafety has provisions that discourage genetic modification of crops in their land of origin.*³⁵³ However, through its subsidiary Mahyco, Monsanto has actively lobbied the Indian government for commercial production of *Bt* brinjal, ignoring risks to native varieties and demonstrating contempt for national food cultures and food sovereignty.

Corruption of scientific principles – Monsanto influence

The Genetic Engineering Approval Committee³⁵⁴ (GEAC) entrusted the conduct of biosafety studies of *Bt* brinjal to Mahyco. The company's studies did not report adverse health and environmental risks. Studies were not released to the public and there was no independent scrutiny of Mahyco's results.

In 2006, Aruna Rodrigues and others brought a case against Mahyco in the Supreme Court under Public Interest Litigation. The petition addressed concerns that GMOs were released without publication of the results of safety trials. Expert witness Robert Mann from the University of Auckland gave evidence that the *Bt* brinjal field trial proposal was *one of the most ill-conceived he had encountered in three decades.*³⁵⁵ In October 2006, the court directed the release of the technical data. In a suit brought by Greenpeace and others under the Right to Information (RTI) Act, the regulatory bodies GEAC and Department of Biotechnology supported Mahyco's contention that the trials were confidential business information and making results public would jeopardise its commercial interest. However, the Central Information Commission ruled that *public interest is greater than private commercial interest.*³⁵⁶

The studies obtained through the RTI Act were sent for independent scrutiny. Two analyses of the biosafety studies revealed major discrepancies. Dr Gilles-Eric Seralini, a biochemist with the Committee for Independent Research and Information on GE, found that Mahyco misreported its findings on test animals.^{357, 358} Dr Judy Carman, director of the Institute of Health and Environmental Research in Australia, criticised the methodology.³⁵⁹ These reports were submitted to the GEAC and were considered for evaluation by a Second Expert Committee (EC-II). One-third of the members of EC-II were associated with Mahyco or pro-Mahyco organisations.³⁶⁰ The committee reaffirmed Mahyco's findings. More recent studies support the independent research and show that Monsanto-Mahyco's data indicated serious health impacts, including organ and system damage; these studies were not disclosed.³⁶¹ The Supreme Court appointed an independent observer Dr Pushpa Bhargava, former director of the Centre for Cellular and Molecular Biology, to GEAC. He reported that of nearly 30 tests needed to assess GM crops, only six to seven had been conducted for *Bt* brinjal.³⁶² However, he had no voting rights in the Expert Committee. He recommended more safety tests and protocol, supported

353 Devraj R. 2009. Controversy rages over genetically modified 'brinjal'. Inter Press Service. October 22.

354 Formerly called the Genetic Engineering Approval Committee, the change came into force on July 2010. Ministry memo.

355 Mann LRB. 2006. Statement for the Supreme Court of India on the Writ Petition of Aruna Rodrigues.

356 Greenpeace India. *Bt Brinjal – The truth behind it.*

357 Seralini G-E. 2009. Effects on health and environment of transgenic (or GM) *Bt* brinjal. Committee for Independent Research and Information on Genetic Engineering, CRIIGEN.

358 Misra SS, Awasthi K. 2009. Test tube brinjal. *Down To Earth*. April 15.

359 Carman, Judy. 2009. A Review of Mahyco's GM Brinjal Food Safety Studies. Institute of Health and Environmental Research, Inc.

360 Misra SS. 2009. All Mahyco's Men. Cited in Sharma, D. (2009). Indian Parliament misled by Ministry for Environment on *Bt* brinjal issue.

361 Gallagher L. 2010. *Bt Brinjal* event EE1. The scope and Adequacy of the GEAC Toxicological Risk Assessment.

362 Raveendran R. 2009. 'There is scientific evidence to prove GM crops have harmful effects'. *Indian Express*. October 23.

by the Indian Council of Medical Research, but these were not included in the EC-II guidelines. Other reports had criticised the GEAC risk assessment.³⁶³

Monsanto influence on research is through joint projects or funding. Mahyco-Monsanto conducted confined and open field trials in cooperation with the Indian Council of Agricultural Research and universities under the PPP programme. The majority of scientists involved supported the approval of Bt brinjal. In India, the Ministry of Agriculture and the Department of Biotechnology supported and facilitated GM field trials and the approval process. The Minister of Environment and Forests, Jairam Ramesh, took a precautionary approach and imposed a moratorium on cultivation of Bt brinjal. He commissioned India's top six science academies to conduct a review of the feasibility, safety and regulation of GM crops.³⁶⁴ This inter-academy report recommended GM crops for sustainable agriculture and upheld the safety of Bt brinjal.³⁶⁵ However, the Coalition for GM-Free India found that it had lifted text from an article by P Kumar from a report of the ISAAA (the biotech lobby group). In April 2011, Minister Ramesh convened a new Expert Panel with the GEAC to review the matter with Mahyco. The composition of the new panel was again questioned by NGOs.³⁶⁶ Without presenting evidence on its safety, the new 2011 panel recommended a partial release and parallel testing which Minister Ramesh supported: *There is no present danger of partial release ...*³⁶⁷

A new draft Biotechnology Regulatory Authority of India (BRAI) bill in 2010³⁶⁸ planned to take regulatory control of GM crops from the more precautionary approach of the Ministry of Environment and Forests and place it under the Department of Biotechnology. The draft bill contained draconian measures, such as penalising 'unfounded' criticism of GM crops and exemption of GE studies from the RTI Act. Following opposition from civil society organisations, the bill underwent several revisions. However, the latest draft³⁶⁹ would: (1) provide a single-window clearance for GM crops under the Ministry of Science and Technology, which promotes GM technology; (2) remove constitutionally-mandated State powers over agriculture and health, (3) override other Acts, such as the Biological Diversity Act, that conflict with its provisions, (4) undermine people's right to information and meaningful participation as well as prevent civil courts from any jurisdiction over the Act.³⁷⁰ The bill was drafted without public consultation, and distributed to Members of Parliament only hours before it was introduced in Parliament.³⁷¹

4.2.1.4 Bt Cotton in India

Cotton production in India is problematic in a range of ways. High levels of debt have led to farmer suicides. Monsanto's GE cotton seeds have been marketed and controlled through a regime of IPRs to protect the company's interests over those of farmers. Debt bondage has secured child labour in

³⁶³ Several reports by eminent scientists questioned Mahyco's experiment protocols as well as their interpretation of the data collected from trials. For example see Carman, 2009, *Op cit*; Seralini, 2009, *Op Cit*; Gurian-Sherman, (2009); Heinemann (2009). In particular, the Seralini report found numerous discrepancies in Mahyco's reporting of statistically significant data. References: Gurian-Sherman D. 2009. Comments on Possible Consequences of Gene Flow from Bt Brinjal to Brinjal Wild Relatives in India, and the Inadequacy of the Current Risk Assessment; Heinemann J. 2009. Summary of Analysis of Mahyco Fruit and Shoot Borer Tolerant Brinjal". Centre for Integrated Research in Biosafety.

³⁶⁴ Jishnu L. 2010. How competent is Indian science? Down To Earth Special Report. October 31.

³⁶⁵ Inter-Academy Report on GM Crops 2010. Prepared at the request of Shri Jairam Ramesh.

³⁶⁶ Chauhan C. 2011. New Bt brinjal panel has conflict of interest: NGOs. Hindustan Times. April 24.

³⁶⁷ Bhuchar P. 2011. Bt brinjal gets fresh push for clearance. India Today. May 16.

³⁶⁸ BRAI Bill (2009) (draft). Draft copy leaked 2010.

³⁶⁹ BRAI Bill (2011). Bill No. 54 of 2011.

³⁷⁰ Coalition for a GM-Free India, Biotechnology Regulatory Authority of India Bill, 2011: A Critique.

³⁷¹ Singh RP. 2011. Raghuvansh Prasad Singh: BRAI Bill – Bulldozing public opinion. Business Standard. September 17.

the manufacture and production of GE cottonseeds (see 4.6). Its corporate structure of subsidiaries, partnerships and joint ventures give Monsanto a key influence on *Bt* cotton (see 4.2.1.1). The subsidiaries Monsanto Holdings Private Limited and Mahyco Monsanto Biotech (India) Limited focus on GE cotton technologies and marketing.³⁷² This case shows that while *Bt* cotton was purported to reduce heavy reliance on pesticides and increase yields, the technology has not been sustainable.

Monsanto patents – IPR, accompanying legal frameworks and profits

Monsanto controls almost the entire global crop of *Bt* cotton through its 'brands' *Bollgard* and *Bollgard II* (which produces two toxins, Cry2Ab2 and Cry1Ac).³⁷³ The company is guaranteed high profits through licensing the *Bt* technology to other seed companies. In 2004, Dow AgroSciences introduced the GE cotton *Widestrike* while Syngenta introduced *VIPcot* in June 2010 and gained the approval from the US EPA.³⁷⁴ Monsanto's *Bollgard 3*, bred from *Bollgard 2* and the VIP 3A gene from Syngenta, will be introduced in 2014. Bayer is developing *TwinLink*[®] based on the Cry 1Ab and Cry 2Ae genes.³⁷⁵

In India, Monsanto has exclusive technology sub-licensing agreements on *Bollgard* with five leading seed companies: Rasi, Ajeet, Krishi Dhan, Ankur and Emergent Genetics. When *Bollgard* was introduced in 2002, roughly two-thirds of the seed cost was due to royalty fees.³⁷⁶ Since then Monsanto licensees have earned around Rs 1,500 crore (about US \$295 million). Despite protests from governments and farmers, the royalty rate was raised annually. Monsanto contended that the trait value should be relative to the additional income generated from the increased production made possible by the technology, including supposed savings from lower pesticide usage.³⁷⁷ This is an abuse of monopoly control of the *Bt* market. As national laws incorporate IPR regimes, the patents for transgenic crops remain the intellectual property of the companies. These laws favour TNCs and threaten farmers' access to local varieties.

Monopoly control of the seed supply

In 2006, disputes arose over the price of *Bt* cotton in several Indian states. In January, the Andhra Pradesh government asked the Monopolies and Restrictive Trade Practices Commission (MRTPC) to prevent Monsanto from imposing an 'exorbitant royalty of Rs 1250 on each 450-gram packet of *Bt* cotton.'³⁷⁸ The MRTPC directed the company to charge 'reasonable prices'; in May, the Andhra Pradesh government filed a contempt petition against Mahyco for not obeying the order directing it not to charge a trait value of Rs 900 per 450-gram seed packet. Monsanto moved the Supreme Court against the MRTPC order.^{379, 380} Tamil Nadu, Andhra Pradesh, Gujarat, Maharashtra and Karnataka jointly fixed the price at Rs 750.³⁸¹ Monsanto-Mahyco filed petitions against the Tamil Nadu and Karnataka governments, defending its stand and questioning the power of state governments to set seed prices.³⁸²

372 Monsanto India Limited. Undated. From Monsanto website.

373 Cry2Ab2 has been inserted into the genome in addition to the Cry1Ac gene.

374 Syngenta. 2010. EPA Approves VipCot™ Cotton for Natural Refuge [News Release, June 1].

375 Forrester N. 2009. Changing the Cotton Landscape in Pakistan. Ali Tareen Farms, Pakistan.

376 Jishnu L. 2010. Battle Royal Over *Bt* Cotton Royalty. Business Standard. May 28

377 Ibid.

378 Mitta M. 2006. Monsanto Gets Notice Over 'Exorbitant' Royalty. The Times of India. January 29.

379 NERVE. 2006. Monsanto moves Supreme Court against MRTPC order. May 16.

380 Venkatesan J. 2006. AP Files Contempt Application Against Monsanto at MRTPC. The Hindu.

381 The Hindu. 2006. *Bt*. Cotton seed price is Rs. 750 for 450 gm. June 29.

382 The Financial Express. 2006. Mahyco Monsanto Biotech (India) Limited moves SC over *Bt* cotton pricing. August 30.

Bt cotton farmers usually buy their supply of seeds in local seed and agrochemical shops. Reports in 2010^{383, 384} revealed that shops in Andhra Pradesh now only carry *Bt* cotton seeds as seed companies no longer supply conventional seeds. Organic farmers can only obtain seeds through special orders with farmers' groups, NGOs and some companies, and about a year in advance. This severely limits seed choice and seed security of farmers, threatening their economic livelihood and self-determination.

False promises and misleading campaigns

Monsanto made misleading and false claims for *Bt* cotton. Reliance on these seeds have left farmers severely indebted.^{385, 386, 387} The alleged advantages of *Bt* cotton as advertised in marketing campaigns included: lower cost for cultivation with decreased use of pesticides, increased yield and better livelihoods. While these positive outcomes were initially reported, the eventual failure and inconsistency in yield of *Bt* cotton, along with higher seed and cultivation costs, increased the burden on farmers. With a disastrous harvest, farmers would end up with huge amounts of debt.^{388, 389} Monsanto continued to portray positive results in marketing and advertising campaigns and downplayed reports on the failure of *Bt* cotton; this violated farmers' right to information and right to livelihood.

Bt cotton farmers continue to use a large quantity and variety of chemical pesticides, especially insecticides, and spray as 'preventive' measures even when there are no pests. The seed vendors and companies tell farmers that they must apply pesticides for *Bt* seeds to work; predictably, spraying led to the emergence of new and secondary pests, like mealybugs.³⁹⁰ *Bt* cotton plants became more susceptible to certain diseases, such as fungal root attacks.³⁹¹ In March 2010, Monsanto announced that pink bollworm had developed resistance to a *Bt* cotton in Gujarat.³⁹² They introduced *Bollgard II* (with two genes, see above). An internal note from the Ministry of Environment and Forests obtained by the *Times of India* said: *It appears that this (failure of Bt cotton) could be a business strategy to phase out single gene events ... and promote double stacked genes which would fetch higher price especially with the court order on Monsanto to lower the price for Bt cotton.*³⁹³

Farmers must sign contracts that protect the seed company's rights, frame the context within which disputes may be settled, and limit the liability of the company. Contracts prohibit growers from saving and/or reusing seed from GM crops. A binding arbitration clause in the contract precludes farmers from filing lawsuits arising from the performance of the seed (or technological traits within the seed). In contrast, organic cotton has generated higher net income for organic cotton farmers; the yields are not

383 Nemes N. 2010. Seed security among organic cotton farmers in South India. Cited in Tirado R. 2010. Picking cotton. Greenpeace.

384 Tehelka. 2010. Cotton fields back home. Cited in Tirado R. 2010. Picking cotton. Greenpeace.

385 Greenpeace India, Centre for Sustainable Agriculture. 2005. Marketing of *Bt* cotton in India – Aggressive, Unscrupulous and False, India.

386 Tirado R. 2010. Picking Cotton: The Choice Between Organic and Genetically-engineered Cotton for Farmers in South India. Greenpeace Research Laboratories (Technical Notes 03/2010).

387 Qayum A, Sakhari K. 2007. False Hopes Festering Failures. *Bt* Cotton in AP – 2005-2006. Fourth Successive Year of the Study Reconfirms the Failure of *Bt* cotton. Deccan Development Society, Andhra Pradesh Coalition in Defense of Diversity and Permaculture Association of India.

388 Tirado, 2010, *Op cit*.

389 Hayee A. 2005. Cultivation of *Bt* cotton – Pakistan's Experience. ActionAid Pakistan.

390 Tirado, 2010, *Op cit*.

391 *Ibid*.

392 Monsanto. 2010. Cotton in India.

393 Sethi N. 2010. *Bt* cotton failure a profit ploy? The Times of India. March 12.

significantly different from *Bt* cotton yields³⁹⁴ and cultivation costs are lower with less or no pesticide use and lower seed costs. A comparative analysis of the farming practices and the economic livelihood between conventional cotton and *Bt* cotton farmers in Andhra Pradesh³⁹⁵ found that:

- cultivation is almost twice as costly for *Bt* cotton farmers as for organic cotton farmers;
- *Bt* farmers use many pesticides (23 were classified extremely or highly hazardous by the WHO) but suffer more pest damage; organic farmers use less-costly bio-pesticides and natural controls;
- yields did not differ significantly between the two approaches in 2008/2009; but *Bt* cotton yields fell drastically by 50 per cent in 2009 and 2010;
- net income from cotton was 200 per cent higher for organic farmers in drought-affected 2009/2010 and not significantly different in the favourable rainfall year 2008/2009;
- net income from the farm as a whole was 90 per cent higher for organic farmers in the dry year 2009/2010, and similar for both groups in the favourable 2008/2009 period;
- In the dry year 2009/2010, the economic livelihood (net return after repaying debts) for *Bt* cotton farmers was negative; at the end of the season they owed on average Rs. 7136 per acre.

Cotton-related farmer suicides

Reports suggest that farmer suicides have increased in Andhra Pradesh, Karnataka and Maharashtra, belying the effectiveness of *Bt* cotton. Farmers often use cotton insecticides to take their lives. Indebtedness was frequently a reason resulting from higher cultivation costs than for organic farmers and loans at interest rates of 60-80 per cent. Indebtedness is exacerbated by the general decline in the price of cotton (US \$1.10 in 1994; 54 cents in 2006). The Indian Ministry of Agriculture has confirmed that the majority of small farmers *seem to be badly trapped in poverty and indebtedness*.³⁹⁶ This is a sharp contrast to the scenarios painted by lobbyists and politicians who promoted GM crops.³⁹⁷ Monsanto and *Bt* cotton seed companies are protected from losses.

Threats to livestock and human health

Reports of livestock deaths and toxic or allergic reactions of animals grazing on *Bt* cotton have raised bio-safety concerns over the health impacts of *Bt* toxin on humans. Dr Sagari R. Ramdas reported in a letter to the Indian Environment Minister that, since 2005, shepherds and farmers have observed cattle falling sick or dying after grazing on *Bt* cotton plants or seeds³⁹⁸. She noted that guidelines do not require new risk assessment tests. Public research institutions and regulatory bodies such as GEAC are not required to investigate field observations and have conducted no field-based studies. These bodies have dismissed the reports as 'unsubstantiated', 'exaggerated and unscientific'. The Indian Veterinary Research Institute (IVRI) and other bodies have admitted their inability to conduct *Bt* toxin testing in a

³⁹⁴ Tirado, 2010, *Op cit.*

³⁹⁵ *Ibid.*

³⁹⁶ Friends of the Earth International. 2007. Who Benefits from GM Crops? An Analysis of the Global Performance of GM Crops (1996-2006) Executive Summary.

³⁹⁷ Ho M-W. 2010. Farmer Suicides and *Bt* Cotton Nightmare Unfolding in India. ISIS report.

³⁹⁸ Ramdas SR. 2010. *Bt* Cotton and Livestock: Health Impacts, Bio-safety Concerns and the Legitimacy of Public Scientific Research Institutions. GM Watch. January 28.

post mortem although histo-pathological reports demonstrated similar lesions to those observed in rats fed on *Bt* corn.^{399, 400, 401} These deaths following grazing on *Bt* cotton demonstrate the toxicity of *Bt* toxin not only to insects but also to mammals.⁴⁰² In the absence of any meaningful investigation of *Bt* cotton, the potential health hazard to humans is a risk that should not be taken lightly.

Threats to the environment and self-determination – biological contamination

National laws are now modified to adhere to international agreements protecting transgenes and to establish corporate rights under IPR laws. If crops of farmers who have rejected GE, and not planted *Bt* cotton, become contaminated, they will be threatened with legal action for copyright infringement.⁴⁰³

4.2.2 MONSANTO'S SEED MONOPOLY IN THE US

4.2.2.1 Patenting and restrictive contracts give excessive power to Monsanto

Over the past two decades Monsanto has fundamentally altered the way many American farmers farm. It has changed the foundations of farming practices and traditions, in particular the right to save and replant seed. Monsanto has monopolised and concentrated seed germplasm and seed markets, patented and controlled GE seed varieties and breeding techniques, and insisted on binding contracts with farmers who purchase its seed.

Monsanto's seed control

Monsanto now has unprecedented control over the sale and use of major crop seed in the US. The four main commercial crops are soybean, cotton, corn and canola and GE varieties now make up the vast majority of these; for example, 93 per cent of US soybeans planted are GE varieties.⁴⁰⁴ As a result of US Supreme Court and Patent Office rulings concerning patents on life, Monsanto has obtained patents on all its GE techniques and GE seed varieties.^{405, 406, 407, 408} Throughout the 1980s and early 1990s,

³⁹⁹ Ramdas SR. 2010. Science Adulterated! Combat Law: The Human Rights & Law Bimonthly, April 2010.

⁴⁰⁰ GM Watch. 2010. *Bt* Cotton and Livestock Deaths: Letter from Sagari R Ramdas to Environmental Minister. January 28.

⁴⁰¹ Ramdas SR. 2010. *Bt* Cotton and Livestock: Health Impacts, Bio-safety Concerns and the Legitimacy of Public Scientific Research Institutions. GM Watch. January 28.

⁴⁰² Ho M-W. 2010. Mass Deaths in Sheep Grazing on *Bt* Cotton. ISIS report.

⁴⁰³ Kuruganti K, Ramanjaneyulu GV, Killi J. 2008. Cotton, Contaminated? Centre for Sustainable Agriculture.

⁴⁰⁴ USDA. 2010. Adoption of Genetically Engineered Crops in the US: Soybeans. USDA.

⁴⁰⁵ *Diamond v. Chakrabarty*, 447 US 303 (1980): In this 5-4 *Chakrabarty* ruling, the Supreme Court widened the scope of patent protection by holding that, as a matter of statutory interpretation, living organisms may be patented under the Utility Patent Statute. 35 U.S.C. § 101 (2010). The Court affirmed the US Court of Customs and Patent Appeals ruling in favor of granting a patent for a GE, living bacterium capable of breaking down crude oil. Four dissenters argued that Congress clearly intended to exclude such living organisms from the scope of patent protection, and that Congress should define the scope of patent law.

⁴⁰⁶ US Supreme Court. 1980. *Diamond v. Chakrabarty*, 447 US 303 (1980).

⁴⁰⁷ *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred International, Inc.*, 534 US 124 (2001): in this decision, the Supreme Court held that sexually reproductive plant breeds are patentable subject matter under 35 U.S.C. § 101. Relying on the broad construction of 35 U.S.C. § 101 in *Diamond v. Chakrabarty*, the Court affirmed the Federal Circuit and District Court rulings upholding a § 101 utility patent for inbred and hybrid corn seed products. Two dissenters argue that reliance on *Chakrabarty* is misplaced because 35 U.S.C. § 101 does not cover plants. Instead, the dissent argues that Congress intended to govern plant patents with more specific statutes, the Plant Patent Act of 1930, 35 U. S. C. §161 *et seq.* (1994 ed. and Supp.V), and the Plant Variety Protection Act (PVP), 7 U. S. C. §2321 *et seq.*

⁴⁰⁸ Justia US Supreme Court Center. 2011. October Term 2001: *J.E.M. Ag Supply, Inc., DBA Farm Advantage, Inc., et al. v. Pioneer Hi-Bred International, Inc.*

Monsanto built its GE capacity and patented all new technologies and products. In 2003, Monsanto held 647 biotech patents, more than any other biotech company, and had a 30 per cent share of all biotech industry research and development.⁴⁰⁹ Between 1996 and 2008, Monsanto bought out, or established relationships with, most of the major US and international seed companies, including Calgene Inc., Asgrow Agronomics, Asgrow and Stine Seed, Agracetus, Holden's Foundation Seeds Inc, Delta and Pine Land, Monsoy (a Brazilian soybean company), Cargill's international seed divisions, Plant Breeding International, and De Kalb Genetics (the world's second largest seed company).⁴¹⁰ US farmers now struggle to find conventional, non-GE seed. Market concentration and alleged abuse of this market power is now so severe the US Justice Department is investigating possible violations of antitrust law.⁴¹¹

Monsanto is largely responsible for the prevalence of GE organisms in the environment through its insect-resistant (*Bt*) or its herbicide-resistant (RoundUp Ready) crops engineered to withstand glyphosate application. The latter led to an increase in herbicide use between 1996 to 2008 by 144,424 tonnes.⁴¹² Ingestion of some forms of the *Bt* toxin can kill butterflies, moths, and beetles. *Bt* is one of the most effective natural pesticides for organic growers. Widespread plantings of *Bt* crops could see resistance building up in populations of the target pests, and threaten to reduce the effectiveness of this natural pesticide for all users. Resistance to *Bt* corn by Western corn rootworm was reported in 2011.⁴¹³

Monsanto requires farmers to sign its technology use agreement when purchasing patented seeds. These contracts stipulate that farmers must buy new seed every season, prohibiting saving and replanting.⁴¹⁴ Contracts allow Monsanto to conduct property investigations, subject farmers to potentially huge financial liability, bind farmers to Monsanto's oversight for multiple years, and impose a variety of other conditions that essentially define obligations regarding planting, harvesting, and selling GE seed. Violating these agreements by planting saved patent-protected seed or transferring patent-protected seed to others for planting is an unauthorised federal patent infringement. Monsanto calls such actions 'seed piracy'.⁴¹⁵ Monsanto controls the seed even after harvest, an unprecedented level of control that has a profoundly negative impact on the livelihoods of many American farmers.

Monsanto's farmer persecution

Monsanto follows up infringements by litigation or out-of-court settlements if it believes farmers are in breach of contract or engaged in patent infringement.⁴¹⁶ The company admits to aggressive investigations which can initially include trespass, surveillance, harassment, threats, entrapment and intimidation tactics. Thousands of investigations reach a second stage where Monsanto pressures farmers into out-of-court settlements for undisclosed sums of money, requirements to buy further GE

409 Graff GD, Newcomb J. 2003. Agricultural Biotechnology at the Crossroads: The Changing Structure of the Industry. BioEconomic Research Associates, pp 23-25.

410 Hubbard, 2009, *Op. cit.* pp14-15.

411 Whoriskey P. 2009. Monsanto's Dominance Draws Antitrust Inquiry. Washington Post. November 29.

412 Benbrook, 2009, *Op. cit.*

413 Gassmann AJ, Petzold-Maxwell JL, Keweshan RS, Dunbar MW. 2011. Field-Evolved Resistance to *Bt* Maize by Western Corn Rootworm. *Plos One* 6(7):e22629.

414 Monsanto. 2008. 2008 Monsanto Technology/Stewardship Agreement.

415 *Ibid.*

416 CFS. 2005. Monsanto v. US Farmers: A Report. p23.

seeds, or other confidential terms.^{417, 418} As of June 2006, Monsanto had instituted an estimated 2,391 to 4,531 lawsuits on 'seed piracy matters' against farmers in 19 states, with farmers' settlements for 'seed piracy' amounting to an estimated US \$85.6-\$160.5 million. By 13 January 2010, Monsanto had filed 136 lawsuits against farmers for alleged violations of its use contract and/or its patents on GE seeds.⁴¹⁹ These cases involved 400 farmers and 53 small farm businesses in half the US States. Odds are stacked against the farmer: Monsanto devotes 75 employees and an annual budget of US \$10 million dollars to investigating and prosecuting.⁴²⁰ The largest recorded judgment made to date in favour of Monsanto is US \$3 million. By February 2010, 70 recorded judgments against farmers brought settlements of US \$23.3 million for Monsanto (a mean of US \$171,660). Many farmers have to pay additional court and attorney fees and some are forced to pay Monsanto's investigation and litigation costs. Further, it pursues accidental contamination and other circumstances beyond farmer-control; for example, a field contaminated by pollen or seed from another GE crop, or GE seed which has sprouted from a previous year's crop or 'volunteered' in fields planted with non-GE varieties the following year.

Monsanto has pursued farmers who purchase 'too much pesticide' for growing non-GE crops, on the grounds that they may be planting the proprietary RR seed which they have not purchased from it. In one example, David Runyon, an Indiana farmer, endured years of harassment and investigations due to the company's allegations of patent infringement.⁴²¹ In 2003, two men arrived at David and Dawn Runyon's house presenting McDowell & Associates business cards and asking questions about his crops. They

Odds are stacked against the farmer: Monsanto devotes 75 employees and an annual budget of US \$10 million dollars to investigating and prosecuting.

did not indicate they were Monsanto investigators. Four months later Runyon received a letter from Monsanto's attorneys demanding production records. Although he had no relationship with the company, Runyan sent the records; Monsanto then accused him of purchasing too much glyphosate for conventional soybean and asserted he must be planting RR soybean. Runyon was in fact planting public, non-patented seed from two local universities. He hired an attorney and demanded an explanation. Monsanto insisted Runyon was violating federal patents. Monsanto's attorney claimed it had an agreement with the Indiana Department of Agriculture granting permission to search Runyon's land. At the time, the 'Indiana Department of Agriculture' did not exist. Runyon and his attorney requested a copy of this agreement, but never received it. The Runyon family spent years defending themselves against Monsanto's baseless harassment. Finally, even though Monsanto could not prove their allegations, the company blacklisted Runyon from purchasing their products.⁴²²

⁴¹⁷ *Monsanto v. McFarling* is an example of attempts to enforce patent rights against farmers for 'seed-saving'. A farmer initiated a legal challenge to seed patents. Monsanto claimed around \$400,000 in damages and costs, treble damages for 'wilful infringement' and attorneys' fees – nearly \$ 1 million. The Missouri District Court denied the case as "unnecessary at best, inequitable at worst."

⁴¹⁸ FindLaw. 2011. *Monsanto Company v. McFarling*. Monsanto Company, Plaintiff-Cross Appellant, v. Homan McFarling, Defendant-Appellant, Nos. 05-1570, 05-1598. May 24, 2007. US Court of Appeals, Federal Circuit.

⁴¹⁹ Unless otherwise noted, these statistics were compiled by CFS from public court records accessed using the PACER database. Figures current as of January, 2010.

⁴²⁰ CFS, 2005, *Op Cit.* p 23.

⁴²¹ *Ibid.*

⁴²² Interview by Paige Tomaselli with David Runyon, Farmer (Feb. 2010); see also *Seed giants vs. U.S. farmers : a report by the Center for Food Safety & Save Our Seeds*. Washington, DC : Center for Food Safety, 2013.

4.2.2.2 Crop Contamination with genetically modified organisms

GMO contamination can occur in any crop.^{423, 424, 425} Farmers and researchers have documented contamination including but not limited to alfalfa, canola, corn, rice⁴²⁶ and sugar beet.⁴²⁷ The most serious problems by 2011 involved corn and canola, the two main open-pollinated GE crops cultivated in North America. Contamination can persist in canola for over 16 years.⁴²⁸ This violation of farmers' right to plant a conventional or organic crop can threaten their livelihoods. Contamination from GE crops may cause irreparable damage to the country's genetic commons and ecological diversity of natural systems in the US, including public and private farmlands.

Monsanto is aware that farmers who actively choose not to plant GE crops are at risk of biological pollution as pollen flow is unavoidable. Its 2005 Technology Agreement states, *[s]ince corn is a naturally cross-pollinated crop, a minimal amount of pollen movement ... between neighbouring fields is well known and is a normal occurrence in corn seed or grain production.*⁴²⁹ Commenting on a Draft Environmental Impact Statement on deregulation of herbicide-tolerant alfalfa, the Center for Food Safety (CFS) cited studies relating to gene flow and contamination.⁴³⁰ The US Fish and Wildlife Service noted in a draft of a Biological Opinion on the effects of RR creeping bent grass: *Recent escape of GM sugar beets into compost sold to homeowners illustrates the potential for products to move outside of their intended market. Sugar beets are ... wind-pollinated and were thought to be well controlled by the growers using the product. Despite best management practices, escape of the transgenes occurred.*⁴³¹ GE bentgrass contamination was discovered in Ontario four miles from a 2005 Idaho field trial location. Five years later, contamination was widespread and rampant, covering an estimated 27 square miles.⁴³²

The Union of Concerned Scientist (UCS), in the report *Gone to Seed*, presented evidence that about 50 per cent or more of the certified non-GE corn, canola, and soybean seed has been contaminated with transgenes.⁴³³ The level of contamination was typically 0.05 to 1.0 per cent, far greater than the minimum detectable levels. *Gone to Seed* demonstrated that the frequency and levels of contamination of soybean seed was roughly equivalent to that of corn. As soybeans are largely self-pollinating, contamination is most likely to occur from seed mixing or human error, and suggests that these sources may be at least as important as cross-pollination. In another report UCS, with academic experts in agricultural sciences, examined whether GE pharmaceutical-producing crops could be kept out of food. The authors examined field separation, farm equipment cleaning, seed segregation and other practices.⁴³⁴ UCS concluded that, while it may be theoretically possible to prevent contamination

423 Combat Monsanto. 2011. Fighting GMO contamination around the world.

424 Friends of the Earth Europe. 2011. The tip of the iceberg!

425 GM Contamination Register. 2011. FP967 ('Triffid') flax has been grown illegally in Canada and exported around the globe. GeneWatch UK and Greenpeace International.

426 The contamination in GE rice stemmed from improper management of field trials. See Section 4.3.3.

427 Based on written testimony submitted by Center for Food Safety on September 26, 2013 in opposition to Legislative Concept 5 (Preemption of Local Laws Regulating Agriculture) addressed to Oregon State Legislature Joint Interim Committee on Special Session. http://www.centerforfoodsafety.org/files/final-written-testimony-for-9-26-13-hearing_29276.pdf

428 Squire GR, Begg GS, Askew M. 2003. The potential for oilseed rape feral (volunteer) weeds to cause impurities in later oilseed rape crops. Department for Environment. Food and Rural Affairs.

429 Monsanto. 2005. Technology Use Guide. p17.

430 CFS. 2010. Comments to USDA APHIS on draft environmental impact statement (DEIS) for the determination of regulated status of glyphosate-tolerant alfalfa events J101 and J163. Docket No. APHIS-2010-0044, pp 11-21. March 3.

431 US Fish and Wildlife Service. 2009. FWS Draft Biological Opinion, Roundup Ready Bentgrass. July 2009.

432 Lies M. 2010. Agencies Refused to Publicize Spread of Biotech Bentgrass, Capital Press. November 11.

433 Mellon M, Rissler J. 2004. *Gone to Seed: Transgenic Contaminants in the Traditional Seed Supply*. UCS.

434 Andow D, Lamkey K, Daniell H, Nafziger E, Gepts P, Strayer D. 2004. *A Growing Concern: Protecting the Food Supply in an Era of Pharmaceutical and Industrial Crops*. UCS.

by taking extreme measures, these would not be economically feasible. Two academic ecologists addressed contamination of non-GE or food crops via human error and, citing many instances, concluded this has occurred numerous times and is likely to continue.⁴³⁵ Thus, biological contamination through human error and human behaviour, such as composting and exchanging seeds, must be addressed in Environmental Impact Studies (EIS).

The USDA is aware of the potential for gene flow and other biological contamination to occur. In 2005, when it granted Monsanto's 'Petition to deregulate GE alfalfa', it stated that RR alfalfa can be pollinated at distances of up to two miles.⁴³⁶ Despite well-documented evidence of incidences of contamination, USDA bowed to industry pressure and deregulated RR alfalfa.

Activists, non-profit organisations, farmers and government agencies have submitted data to USDA and Monsanto about the potential for gene flow and other avenues of biological contamination. Monsanto has taken no action to improve relations with farmers and the public. USDA and Monsanto both ignore scientific and practical evidence and continue to introduce GE crops. This will lead to further lawsuits against farmers, continue to inhibit their right to grow non-GE crops and violate their right to land and productive resources.

4.2.3 MONSANTO'S BRIBERY OF GOVERNMENT OFFICIALS IN INDONESIA

Monsanto has been found guilty of offering bribes in Indonesia to encourage favourable approvals to grow its GE crops. On 6 January 2005, the US Attorney Criminal Division charged Monsanto Company with violating the Foreign Corrupt Practices Act (FCPA) in connection with an illegal payment of US \$50,000 to a senior Indonesian Ministry of Environment official and falsely certifying the bribe as 'consultant fees' in their records.⁴³⁷ The bribe had been approved by a senior Monsanto official in the US and delivered by a consultant working for the company's Indonesian affiliate. Monsanto admitted it paid US \$700,000 in bribes from 1997 to 2002 to several government officials in Indonesia.⁴³⁸ During this time, Monsanto and its Indonesian affiliates lobbied for legislation and ministerial decrees favourable to GE crops. At least four Indonesian officials received bribes.

In February 2001, Monsanto obtained limited approval from Indonesia's Ministry of Agriculture for farmers in South Sulawesi to grow GE Bollgard Cotton. Later in 2001, the Ministry of Environment issued a decree requiring an environmental impact assessment (EIA) for GE crops prior to approving cultivation; Monsanto tried unsuccessfully to have the decreed repealed or amended. Following this, a Monsanto employee in the Asia Pacific region arranged for the illegal cash payment of US \$50,000 to a senior environment official to 'incentivise' him to approve sales. The official received the payment but never repealed the EIA requirement for Monsanto's crops.⁴³⁹

⁴³⁵ Marvier M, Van Acker R. 2005. Can crop transgenes be kept on a leash? *Frontiers in Ecology and the Environment* 3(2):95-100.

⁴³⁶ USDA/APHIS. 2005. Monsanto Company and Forage Genetics International Petition 04-110-01p for Determination of nonregulated status for roundup ready alfalfa events J101 and J163: USDA/APHIS Environmental assessment and finding of no significant impact.

⁴³⁷ US Department of Justice. 2005. Monsanto Company Charged with Bribing Indonesian Government Official: Prosecution Deferred for Three Years.

⁴³⁸ GMWatch. 2005. Monsanto fined \$1.5 over Indonesia bribes. January 6.

⁴³⁹ ENS. 2005. Monsanto Charged With Bribing Indonesian Environment Official. Washington D.C., USA: Environment News Service.

4.2.4 THE CASE OF SILVINO TALAVERA IN PARAGUAY

Monsanto's RR soybean seeds, accompanied by regular applications of glyphosate, dominate production in Argentina, Paraguay and parts of Brazil on large ranches.^{440, 441} One consequence is that communities living in the vicinity are under constant threat of spray drift. Many households are only 15 metres from areas where spraying occurs without safety measures. While farm owners are directly responsible, Monsanto – which developed RR soybean and held the glyphosate patent until it expired in 2000 – is complicit. One known instance of violation had a deadly outcome. In Paraguay, 11-year-old Silvino Talavera died after being exposed to a mixture of pesticides used on RR soybean monoculture. Glyphosate was identified by toxicologists in judicial hearings as the cause of his death.⁴⁴² (See box and witness testimony of Silvano's mother, Appendix 5.4).

The case of Silvino Talavera

On 2 January 2003, in Edelira, Paraguay, Silvino Talavera had purchased food for lunch. Walking past a farm, he was sprayed with pesticides. The food was cooked for lunch and at about 3pm the children, Silvino, his sister Sofia, a cousin, and the rest family were all affected by stomach ache and vomiting. Two days later they felt better. At around 12.30 pm on 6 January a neighbour sprayed his soybean crops during a strong wind and the spray drift reached their home, approximately 15 meters from the field. From midnight on 7 January Sofia and Silvino again felt very sick. They looked grey and presented paralysis. At 8 am on 7 January they were taken to the nearby health centre, where a doctor diagnosed poisoning and sent them to a centre with better medical equipment. This centre confirmed pesticide poisoning and they were directed to another health centre.

Silvino was dehydrated, had a 39°C fever, tachycardia and marble skin. He died from heart-respiratory failure at 3pm the same day. The death certificate cited organophosphorus poisoning. One month after his death, an autopsy was performed. It detected the presence of glyphosate, carbamates and phenol. These pesticides were also present in Sofia and their cousin. Pesticides cited as associated with Silvino's death were cypermethrin (Cyperfertil from Tecnomyl), and glyphosate (Roundup Max from Monsanto). Soybean farmers do not register use of carbamate pesticides in their books.

The family's chickens, pigs, rabbits, and pond fish died, as did fruit on the trees. The plantation owners were brought to court, found guilty of involuntary manslaughter and sentenced to two years in prison. The farmers appealed, and while the Supreme Court upheld the charges, they remain free.⁴⁴³

Soybean production is important to the Paraguayan economy and the government does not consider the overuse of pesticides to be a problem.⁴⁴⁴ Thus TNCs, in this case Monsanto, continue to produce and sell RR seeds and deadly pesticides.

⁴⁴⁰ GM Freeze. 2010. Thirteen Reasons Why the Roundtable on Responsible Soy Will Not Provide Responsible or Sustainable Soya Bean Production [Briefing].

⁴⁴¹ La Soja Mata - Soy Kills. A court case on (in) justice for Silvino Talavera. La Soja Mata – Soy Kills.

⁴⁴² PANNA. Undated. The Poisoning of Silvino Talavera.

⁴⁴³ *Ibid.*

⁴⁴⁴ BASE-IS, Paraguay and GRR Argentina. 2006. Peasant Family in Paraguay Condemned by Agrottoxins. Upside Down World.

4.2.5 OTHER CASES AGAINST MONSANTO

Monsanto is also charged in the following cases with multiple offenders:

1. General Allegations
2. Collusion with Governments
3. Cases with Multiple Offenders
 - 3.1. Pollution and Endangerment of Arctic Tribal Nations and their Environment
 - 3.2. Lake Apopka
 - 3.3. Aerial Spraying: Chemical Trespass
 - 3.4. Toxic Dumps of Obsolete Pesticides
 - 3.5. Food Aid and the GMO push in Africa
 - 3.6. Suppression, corruption, manipulation and distortion of Science
4. Children's Rights

4.3 BAYER CROPSCIENCE AG

Bayer CropScience AG (Bayer), a German-based company, is the world's largest producer of insecticides and the seventh largest seed company. With Syngenta, it is the biggest agrochemical corporation. Three cases cited here focus on the company's human rights violations.

The first case demonstrates the irreparable harm to human health from Bayer's insecticide endosulfan with evidence from India, Africa, the Philippines and Uruguay. This case shows collusion between governments and Bayer to delay and resist restrictions and bans on endosulfan. The second presents evidence of mass deaths of bees in Europe, Canada, North America and Brazil by two chemicals produced by Bayer and considers the consequences for food production. The third case presents evidence of Bayer's link to contamination of local rice varieties from its GE rice variety, LibertyLink Rice 601 (LLRICE 601). Contamination affected rice stocks in the US and 32 other countries. At the time, LibertyLink rice was not approved to be grown for human consumption.

4.3.1 ENDOSULFAN AND RELATED POISONINGS

Endosulfan has been widely used on tea, coffee, cotton, fruits, vegetables, rice and other crops. This organochlorine insecticide kills not only pests but also non-target and beneficial insects, with ramifications for species higher up the food chain. Responsible for innumerable incidents of acute poisoning worldwide, it persists in the environment, bio-accumulates through the food web, is capable of long-range transport and is toxic to humans and wildlife.⁴⁴⁵ Endosulfan has caused the death of cattle, fish and other aquatic resources, and contaminated aquifers on which communities depend for their livelihood.⁴⁴⁶ A study found endosulfan, with other pesticides, in eight national parks in the US,

⁴⁴⁵ What are POPs? 2011. Stockholm Convention.

⁴⁴⁶ PANNA. 2010. Endosulfan Around the World. Pesticide Action Network North America.

risking health impacts on consumers relying on fish and food from these areas.^{447, 448} Endosulfan acts primarily on the nervous system and is known to disrupt hormonal and immune systems; it is linked to permanent neurological and reproductive problems and to cancer. All routes of exposure pose a health hazard: it is readily absorbed by the stomach and lungs, and through the skin.⁴⁴⁹ There is evidence that it passes through the placental barrier to expose the foetus *in utero*, with intergenerational health impacts.⁴⁵⁰

Endosulfan was developed in the early 1950s by Hoechst AG and registered in 1954 in the US. As companies merged, ownership was transferred to AgroEvo, then to Aventis CropScience, and finally to Bayer. Bayer announced it would stop sales by the end of 2010 and ended production in 2007.⁴⁵¹ It was marketed by many companies under a variety of names, of which the most common was Thiodan. Bayer remains responsible for endosulfan-linked cases of accidental and non-accidental deaths across the globe, the impairment of the health of entire communities, and intergenerational health impacts on children including a high incidence of deformities and diseases. The brunt of these impacts has been borne by agricultural workers, peasants, and rural communities with the worst cases in developing countries.

The WHO has classified endosulfan as 'moderately hazardous' (Class II), but other agencies have assigned a higher level of hazard. The US EPA classified it as 'highly hazardous' (Category 1b) and indicated short- and intermediate-term risks for mixers, loaders and applicators; it required users to adopt maximum PPE and engineering controls.^{452, 453} According to the EPA even maximum PPE cannot protect from risks to handlers.⁴⁵⁴ In 2010, the EPA ended all uses of endosulfan citing unacceptable neurological and reproductive risks to farmworkers and wildlife and environmental persistence.^{455, 456, 457}

Over 80 countries have banned it,⁴⁵⁸ and in April 2011 the Fifth Conference of the Parties (COP) (known as COP5) to the Stockholm Convention added endosulfan (with time-limited exemptions) to the list of banned substances (Annex A),⁴⁵⁹ a first step to global elimination.⁴⁶⁰ In June 2011, governments at COP5 of the Rotterdam Convention added endosulfan to the list of chemicals requiring prior informed consent before export (Annex III).^{461, 462}

447 Landers DH, Simonich SM, Jaffe D, Geiser L, Campbell DH, Schwindt A, Schreck C, Kent M, Hafner W, Taylor HE, *et al.* 2010. The Western Airborne Contaminant Assessment Project: An Interdisciplinary Evaluation of Impacts of Airborne Contaminants in Western US National Parks. *Environmental Science and Technology* 44:855-859.

448 Science Daily. 2010. Studies Confirm Presence, Severity of Pollution in US National Parks. June 23.

449 Watts MA. 2009. Endosulfan Monograph. PAN Asia and the Pacific, Penang.

450 Torres MJ, Folgoso CC, Reche FC, Velasco AR, Garcia IC, *et al.* 2006. Organochlorine pesticides in serum and adipose tissue of pregnant women in Southern Spain giving birth by caesarean section. *Science of the Total Environment* 372(1):32-38.

451 Coalition Against Bayer Dangers. 2009. Bayer to Stop Selling Endosulfan [Press Release, July 23].

452 US EPA. 2007. Pesticide News Story: Endosulfan Updated Risk Assessments Available; Usage Information Requested.

453 US EPA. 2007. Endosulfan Updated Risk Assessments, Notice of Availability, and Solicitation of Usage Information. Federal Register 72:221.

454 US EPA. 2007. Note to reader. Endosulfan Readers Guide. EPA-HQ-OPP-2002-0262-0057.

455 US EPA. 2010. EPA Moves to Terminate All Uses of Insecticide Endosulfan to Protect Health of Farmworkers and Wildlife [News Release, June 9].

456 Lubick N. 2010. Proposed US Ban on Endosulfan May Be its Exit Cue. Science Insider. June 10.

457 Block B. 2010. US Agency Phasing Out Insecticide Endosulfan. Worldwatch Institute. June 10

458 Hirata F. 2010. Brazil Bans Endosulfan. Farm Chemicals International. October.

459 Stockholm Convention. 2011. Endosulfan Included Under the Convention. 5th COP, April 25-29. Geneva, Switzerland.

460 Stockholm Convention. 2010. UN chemical body recommends elimination of the toxic pesticide endosulfan. October 19.

461 Rotterdam Convention. 2011. CRC recommended chemicals for inclusion in Annex III.

462 UNEP 2010. New Chemicals Recommended for Listing Under the Rotterdam Convention [Press Release, March 19].

4.3.1.1 Endosulfan Poisoning, Kasargod, Kerala

For over 20 years, cashew nut plantations of the State-owned Plantation Corporation of Kerala, in the district of Kasargod, were sprayed by air with endosulfan. Experimental spraying began in 1976. From 1979, local farmers and doctors observed deformities in animals and an unusually high incidence of severe human health problems.^{463, 464} Impacts included congenital and reproductive health problems and long-term neurological damage.⁴⁶⁵ A monitoring report by local NGO, Thanal found that endosulfan had caused death and permanent disabilities, including severe birth defects.⁴⁶⁶

During the 1980s, local journalists, community organisations and residents began to take legal and political action against aerial spraying. In 1999, environmental groups filed a petition in the High Court, and further suits followed. A series of environmental and human testing and monitoring studies were undertaken by an NGO, Centre for Science and Environment, as well as by industry-affiliated and academic institutions.⁴⁶⁷ In 2001, the National Human Rights Council commissioned a National Institute of Occupational Health (NIOH) study. After examining children in Padre Village (the worst affected area in Kasargod) and a non-exposed control group, the study concluded that: *there is significantly higher prevalence of neurobehavioural disorders, congenital malformations in female subjects and abnormalities related to male reproductive system in the study group ...*⁴⁶⁸ In 2002, a Fact-Finding Mission, commissioned by Thanal and PANAP, and undertaken by medical toxicologist Dr Quijano, found that almost all households had one member who had suffered from pesticide poisoning, and concluded that these illnesses and disabilities were due mainly to endosulfan.⁴⁶⁹ There was also a wider impact on livelihoods for families exhausted by caring for the ill and disabled.

A government committee published a report with similar conclusions, adding that in all houses visited, it observed more than one member with mental retardation, epilepsy, stunted growth, physical deformities, history of repeated abortions, psychiatric illness, sterility etc. Such problems created social stigma and had led to many divorces. The committee attributed the health problems to endosulfan and recommended a permanent ban.⁴⁷⁰ Endosulfan was banned in Kerala State in 2002, and in 2006 relief and remediation for communities affected was announced.⁴⁷¹ Documentation confirms significant congenital, reproductive, long-term neurological damage and other symptoms are a consequence of the aerial endosulfan spraying.^{472, 473} Children have serious congenital anomalies, mental retardation, physical deformities, cerebral palsy, epilepsy and hydrocephalus. In 2009, it was reported that, officially, 500 deaths were acknowledged; unofficial estimates suggest 4,000. More than 9,000 people were

463 Thanal. 2002. Long Term Monitoring: The Impact of Pesticides on the People and Ecosystem (LMIPPE). Part II Report: Preliminary findings of the survey on the impact of aerial spraying of Endosulfan on the People and Ecosystem in Kasargod, Kerala, India.

464 Down to Earth. 2001. Special Report: Children of Endosulfan. February 28.

465 E.J.F. 2002. End of the Road for Endosulfan: A call for Action Against a Dangerous Pesticide. Environmental Justice Foundation, London.

466 Thanal, 2002, *Op cit*

467 Thanal, 2002, *Op cit*

468 NIOH. 2002. Final report of the Investigation of Unusual Illnesses Allegedly Produced by Endosulfan Exposure In Padre Village of Kasargod District, India. National Institute of Occupational Health.

469 Quijano R. 2002. Endosulfan Poisoning in Kasargod, Kerala, India. Report of a Fact Finding Mission, PAN AP, Penang.

470 Government of Kerala. 2003. Health Hazards of Aerial Spraying of Endosulphan in Kasargod District, Kerala. Report of the Expert Committee, Government of Kerala, August 2003.

471 Chelaton J, Sridhar R. 2006. Long struggle against endosulfan poisoning wins relief in India. Pesticides News 73. London.

472 NIOH, 2002, *Op cit*.

473 Government of Kerala Expert Committee, 2003, *Op cit*.

reported to have had health problems from the exposure. More than 1,000 were still suffering long-term health problems.⁴⁷⁴

Recent reports show that similar problems have been experienced in the neighbouring state of Karnataka. On 18 February 2011 the Karnataka government banned the use of endosulfan.⁴⁷⁵ On 13 May 2011, the Supreme Court of India banned the manufacture, sale, and use of endosulfan in the country for eight weeks while waiting for a report from an expert committee on its harmful effects⁴⁷⁶, that ban later confirmed.

Exposure and poisoning by endosulfan is an on-going reality in many farming communities in India. In 2010, PAN AP documented the use of endosulfan amongst cotton farmers in Orissa and agricultural workers in Andhra Pradesh. In these communities precautions such as PPE were lacking, and poisoning symptoms are evident.⁴⁷⁷

EXPERIENCES OF KASARGOD RESIDENTS LIVING NEAR CASHEW PLANTATIONS⁴⁷⁸

***Narayana Shastri** said his wife, aged 43, was diabetic, asthmatic and afflicted with skin disease. She was diagnosed with endometriosis. A study by the Centre for Science and Environment study (CSE) in 2001 found a very high level of endosulfan in her blood (114 ppm). Mr Shastri's son suffered from a skin ailment. The family cow and buffalo died from liver problems.*

***Narayana Bhatt** disclosed that his father died of abdominal cancer and his mother of uterine cancer. His sister, 43 was epileptic and had severe learning disabilities. A nephew, Vishnu, 26, was epileptic, had breast enlargement and severe learning disabilities. The CSE study found 108.9 ppm endosulfan in Vishnu's blood.*

***Sheena Shetty** disclosed that his eldest daughter became epileptic soon after endosulfan spraying started and died six years later. His son, Kittanna, whose blood test showed 109.5 ppm endosulfan, suffered from severe cerebral palsy. Sridhara, 25, had learning disabilities. His wife, Mukthaka Shetty, had 196.47 ppm of endosulfan in the CSE study. The family cow began bleeding and vomiting after endosulfan spraying and died eight days later.*

***Udaya**, aged 18, had cerebral palsy. His mother was exposed to endosulfan in early pregnancy. There is no history of difficult delivery or physical trauma; or of smoking, drinking alcohol, drug intake or exposure to other chemicals.*

***Shruthi**, aged 18, had congenitally deformed hands and legs. Each hand was bifid with four fingers. The severely deformed right lower limb was recently amputated to enable fitting of a prosthesis. Her mother was exposed to endosulfan spraying during pregnancy. There was no history of drug intake or exposure to chemicals other than endosulfan. Shruthi's mother died of cancer six years ago.*

⁴⁷⁴ Mathew R. 2009. Endosulfan trauma still haunts them. The Hindu. October 26.

⁴⁷⁵ The Hindu. 2011. Karnataka bans use of endosulfan. February 18.

⁴⁷⁶ The Hindu. 2011. Supreme Court bans endosulfan across the country for 8 weeks. May 13.

⁴⁷⁷ PAN AP. 2010. Communities in Peril: Asian regional report on community monitoring of highly hazardous pesticide use.

⁴⁷⁸ Quijano R. 2002. Endosulfan Poisoning in Kasargod, Kerala, India. Report of a Fact Finding Mission, PAN AP, Penang.

Balakrishnan, aged 14, was diagnosed with a brain tumour (neuroblastoma). He had only one round of chemotherapy as the family could not afford to finish the treatment. The family were repeatedly exposed to aerial spraying of endosulfan. There was no history of exposure to any other chemical.

Rishana, aged 11, had serious growth retardation and delayed mental and psychomotor development. She could hardly speak and started to walk only recently. Her mother had no history of difficult delivery and took no medication during pregnancy. Her family lived within the plantation and aerial spraying of endosulfan was their only chemical exposure.

Subramanian died in 2001; he had cerebral palsy, severe mental retardation and was epileptic from birth. He could not perform simple tasks or respond to questions. His mother had no history of difficult delivery or trauma, and took no medication in pregnancy. The drinking water for the family was an open well, which was exposed to aerial spraying of endosulfan.

Studies of environmental impacts are fewer, but interview-based research in Kasargod recorded that at least 29 of 35 interviewees reported widespread and immediate death of bees during spraying.⁴⁷⁹

4.3.1.2 Endosulfan in Africa

Studies in Africa have reported numerous poisonings and deaths amongst cotton farmers using endosulfan. The prevailing conditions of use in cotton-growing areas, including inability to use suitable PPE, mean that endosulfan cannot be used safely. Environmental contamination and wildlife poisonings have also been reported. Endosulfan was registered only for use on cotton but there is evidence of its use on vegetables. Obsolete stockpiles of endosulfan are a legacy of its use in the region.

Impacts on human health

In Burkina Faso, surveys of 100 producers in the cotton growing area of Gourma found that those applying pesticides suffered numerous adverse effects. The most frequent symptoms were severe headaches (92 per cent of respondents) followed by dizziness (83 per cent), hand tremors (54 per cent), nausea or vomiting (21 per cent), blurred vision (21 per cent), excessive sweating (13 per cent), staggering (8 per cent) and excessive salivation (8 per cent). Most of these symptoms (46 per cent) occurred a few hours to a few days after pesticide use. Some incidents (13 per cent), however, occurred during application and these were the most serious. Although surveys could not identify pesticides responsible for each symptom, endosulfan was used by all cotton farmers in the area.⁴⁸⁰

A 2001 survey in Mali, carried out by PAN Africa in 21 villages of Kita, Fana and Koutiala regions, found 73 pesticide poisoning cases associated mainly with endosulfan. PAN Africa surveys in 2003-2004 in Senegal, mainly in the cotton-growing Velingara area, identified endosulfan in 31-40 per cent of the

⁴⁷⁹ Thanal. 2011. Case study of socio-economic impact of endosulfan use on bee keeping and honey collection.

⁴⁸⁰ Glin LC, Kuisseu J, Thiam A, Vodouhe DS, Dinham B, Ferrigno S. 2006. Living with Poison: Problems of endosulfan in West African cotton growing systems. PAN UK, London.

162 poisoning cases, including 20 deaths. Most of cases (73 per cent) occurred during endosulfan application.⁴⁸¹

In Bénin, 37 people (including farmers) died between May and September 1999, while 36 others suffered severe poisonings from Callisulfan (endosulfan) in the Borgou department, according to the Regional Action Centre for Borgou Rural Development.⁴⁸² These poisonings were either direct (exposure during use) or indirect (consumption of contaminated food, mainly vegetables). In northern Bénin there were 100 cases of endosulfan poisoning with 20 deaths.⁴⁸³ Other sources revealed 347 poisonings and 53 deaths in a single year.^{484, 485, 486} A study in the Tchaourou district in the centre of Bénin between May 2007 and July 2008, found that 162 people had been admitted to hospitals and health centres with pesticide poisoning. Twelve people died. Endosulfan was implicated in the poisonings.⁴⁸⁷

In Togo, studies by ANCE-Togo in 2003 found more than 500 endosulfan-related poisoning cases recorded each year by the Public Hospital Toxicology Division of Lomé-Tokoin.⁴⁸⁸ In 2008, the Bénin-based Group of Action for the Promotion of Fauna and Flora (GAPROFFA) surveyed 130 cotton growers, 50 in northern Bénin (Kandi), and 80 in northern Togo (Oti). Kandi is important for organic cotton, but some farmers grow conventional cotton and

These poisonings were either direct (exposure during use) or indirect (consumption of contaminated food, mainly vegetables).

apply endosulfan. Oti is known for intensive use of endosulfan. Of those interviewed, 60 per cent in Bénin and 61 per cent in Togo used endosulfan. Burning, skin irritation, nausea and vomiting were the most frequently reported health effects, followed by agitation, dizziness, tiredness, memory loss, loss of consciousness, respiratory problems and stomach ache, with long term vision and sexual problems. Inquiries carried out by Organisation Béninoise pour la Promotion de l'Agriculture Biologique (OBEPAB) in Dridji (Bénin) on producers' perceptions of the effects of chemical pesticides on human and animal health and environment revealed that 67 per cent of farmers recognised itches, burns, diarrhoea, miscarriage and food poisoning related to pesticide exposure.⁴⁸⁹ In northern and central Bénin community health centres in the cotton producing areas reported dermatoses, headaches, dizziness and eye problems.^{490, 491}

481 *Ibid.*

482 Ton P, Tovigan S, Voudouhe SD. 2000. Intoxications et morts au Bénin par l'endosulfan. Pesticides & Alternatives. PAN Africa Newsletter. N° 10.

483 PAN UK 2003. Effects of pesticides on the health of cotton-growing families in West-Africa. Comic Relief Mid-term report.

484 PAN UK. 2001. Rapport d'enquête sur l'effet de l'utilisation des pesticides chimiques sur l'homme en Afrique de l'Ouest.

485 PAN Africa. 2002. Rapport d'enquête sur l'effet de l'utilisation des pesticides chimiques sur l'homme au Mali et au Cameroun. Dakar.

486 OBEPAB. 2003. Rapport d'enquête sur l'effet de l'utilisation des pesticides chimiques sur les producteurs de coton au Bénin.

487 Assogba MR. 2009. Contribution à la réduction de intoxications dus aux pesticides chimiques de synthèse dans la Commune de Tchaourou. Mémoire pour la Licence professionnelle en agronomie. Abomey – Calavi.

488 Kodjo EA. 2007. ANCE fights for the prohibition of the use of Endosulfan in Togo. International POPs Elimination Network, ANCE Togo.

489 OBEPAB. 2007. Rapport d'activités sur l'information et sensibilisation des producteurs et autres acteurs de développement sur les dangers liés à l'utilisation de l'endosulfan en production agricole au Bénin.

490 Loumedjion S. 2002. Impact des traitements phytosanitaires du niébé sur l'environnement et la santé au Bénin: perception des paysans dans les départements du Borgou et de l'Alibori. Mémoire de fin de formation pour l'obtention du Diplôme d'Ingénieur des Travaux. CPU/ UAC, Abomey-Calavi, Bénin.

491 Fanou JS, Voudouhe DS, Assogba G. (in press). Les processus de prise de décision dans le choix des cultures et l'utilisation des produits chimiques de synthèse à Dridji. Article accepted by Annales des Sciences Agronomiques, FSA/UAC. Cotonou, Benin.

EXPERIENCES OF AFRICAN FARMERS WITH ENDOSULFAN

Belko Amadou, In August 2008, Amadou, aged 70, was returning from the field after spraying endosulfan for his cotton plants near Kandi in Benin. He suffered a poisoning crisis and was taken to the village health centre. Although immediately transferred to hospital in Kandi, he died before reaching it. Such tragedies have further consequences. Mr Amadou had insisted his son Ramatou (now 12) attend school. Normal practice in his Peulh community is for children to supervise animals and not attend school. After his father's death Ramatou was removed from school.

Tamou Yaro Orou Boko, aged 29, grows cotton in Kassakou, Benin. In August 2004, he drank from a bowl of water near his aunt's house: "... she told me that it was the rest of the treatment for the crops. She alerted everyone and I was given indigenous treatments. A year later, the symptoms began – hot flushes, dizziness, vomiting blood, among others. I was sent to the area hospital in Kandi. The care I received saved my life. But the after effects are still present. Today, the slightest smell of chemicals makes me fall into a coma-like state."

Impacts on the environment

A number of studies have examined the fate of endosulfan in soils, air and plants in West Africa. In Burkina Faso, the University of Ouagadougou found endosulfan could pose a risk to water sources if rain followed within two weeks of application on a soil poor in organic matter.⁴⁹² The elevated levels in soils contaminated water resources through high runoff and seepage in the wet season. In dry periods, endosulfan residues declined, but persisted. In Côte d'Ivoire, a study detected endosulfan in 85 per cent of wells at rates exceeding the standard recommended for drinking water of 0.1 ug/l. Maximum concentrations measured were 25.28 ug/l for α -endosulfan and 13.74 ug/l for the β isomer. Average residue levels in contaminated water wells were 3.21 ug/l for α - and 2.18 ug/l for β -endosulfan.⁴⁹³ In Senegal, a study on POPs contamination of groundwater in the Niayes zone of Dakar, where vegetable production occurs, found endosulfan residues in seven out of 38 samples, with concentrations greater than 100 ug/l.⁴⁹⁴

Incidents of high fish mortality related to endosulfan use have been recorded. In 1995, after aerial spraying of endosulfan on tomato fields at Dagan in the Senegal River valley, fish died along several kilometres of the river.⁴⁹⁵ A study on the impacts of pesticides, in the Pendjari reserve area in Bénin and the biosphere reserve of the border region of 'W' (which covers more than one million hectares in Bénin and Burkina Faso), found endosulfan in almost all water samples. Levels recorded were 23-460

⁴⁹² Sawadogo PW, Traoré O, Topan M, Tapsoba KH, Sedogo PM, Bonzi-Coulibaly LY. 2006. Variation de la teneur en résidus de pesticides dans les sols de la zone cotonnière du Burkina Faso. *Journal de l'Africain Sciences de l'Environnement* 1, 29-39.

⁴⁹³ Traoré SK, Mamadou K, Debmbale A, Lafrance P, Mazellier P, Houenou P. 2006. Contamination de l'eau souterraine par les pesticides en régions agricoles en Côte d'Ivoire (centre, sud et sud ouest). *Journal de l'Africain Sciences de l'Environnement* 1, 1-9.

⁴⁹⁴ Cissé I, Fall ST, Badiane M, Diop Y, Diouf A. 2006. Horticulture et usage des pesticides dans la zone des Niayes au Sénégal, ISRA/LNERV, EISMV, LACT / Faculté de Médecine Pharmacie / UCAD, document de travail Ecocité n°8.

⁴⁹⁵ Glin et al, 2006, *Op cit*.

ng/l in the 'W' reserve and 46-430 ng/l in Pendjari reserve.⁴⁹⁶ A study by OBEPAB in cotton-growing areas of Central Bénin found alpha endosulfan residues in aquatic animal species (fish, crab, toads and frogs) in the rivers of Dridji at levels as high as 75 ng/g.⁴⁹⁷ The GAPROFFA survey found that more than half the producers in Bénin (57 per cent) and Togo (66 per cent) think that endosulfan has a negative effect on soil fertility.⁴⁹⁸

4.3.1.3 Endosulfan spill in the Philippines

In 1991, the National Poison Control Centre noted that endosulfan was the most frequent cause of death among pesticide poisoning cases reported.⁴⁹⁹ The government banned endosulfan in 1994 with exemptions for TNCs like Dole and Del Monte. (An earlier attempt by the Fertilizer and Pesticide Authority to ban endosulfan was blocked by the then manufacturer.⁵⁰⁰) In 2008, the pineapple producer Del Monte Philippines Inc was importing 10,000 kg of endosulfan from the Israeli company Makteshim Agan, without knowledge of the Philippine government regulatory bodies. The shipment was on board the MV Princess of the Stars, a passenger vessel, which capsized off Sibuyan Island in central Philippines in the height of a typhoon, seriously threatening the regional marine environment and communities who depend on it for their livelihoods.^{501, 502} In October 2008, the drums containing endosulfan were recovered from the sunken ferry without apparent leakage. In March 2009, the government imposed a temporary ban on import, distribution and use of endosulfan. In 2011, a petition letter signed by politicians and environmental groups asked the government to make the ban permanent.⁵⁰³

4.3.1.4 Cattle and fish deaths in Uruguay

Soybean production in Uruguay has expanded dramatically along with associated endosulfan use. Endosulfan is imported mainly from Argentina and Brazil from different companies, including Bayer. It has been found as a contaminant in soil, water and fish, and is responsible for a number of serious poisonings of human beings and animals.⁵⁰⁴ In March 2007, numerous fish appeared dead in the river Buricayupi in Paysandu. Nearby school children investigated the cause with the help of agronomists from the Ministry of Livestock and the Mayor's office and found that endosulfan used on nearby soybean plantations was the cause.⁵⁰⁵ On 9 April 2009, a plane accidentally dropped an unknown quantity of endosulfan on a field where cattle grazed; the following day 50 young animals died.⁵⁰⁶

⁴⁹⁶ Soclo HH, Azontonde AH, Dovonon LF, Djibril R, Sagbo AU. 2003. Etude de l'impact de l'utilisation des engrais chimiques et des pesticides par les populations riveraines sur les écosystèmes (eaux de surface, végétaux et faune) des Aires Protégées (Parcs Nationaux et Zones cynégétiques) du Bénin, Rapport Final. World Bank, GEF, Ministère de l'Agriculture, de l'Élevage et de la Pêche, Centre National de Gestion des Réserves de Faune, Parcs nationaux du Bénin (CENAGREF).

⁴⁹⁷ Glin *et al*, 2006, *Op cit*.

⁴⁹⁸ OBEPAB, 2007, *Op cit*.

⁴⁹⁹ National Poison Control and Information Service. 1991. Report on poisoning cases. Philippine General Hospital, Manila. Cited in Quijano 2000. Risk Assessment in a Third World Reality: An Endosulfan Case History. *International Journal of Occupational and Environmental Health* 6(4):312-317.

⁵⁰⁰ Quijano, RF. 2000. Risk Assessment in a Third World Reality: An Endosulfan Case History. *International Journal of Occupational and Environmental Health* 6(4):312-317.

⁵⁰¹ BBC News. 2008. Toxic find halts Philippine dive. June 27.

⁵⁰² Manila Standard Today. 2008. Toxic cargo? return to sender. October 3.

⁵⁰³ Mayuga J. 2011. Eco groups: Permanently ban endosulfan use in agriculture, *Business Mirror*. April 11.

⁵⁰⁴ RAPAL Uruguay. 2009. Organochlorine forbidden in Europe causes high death toll among cattle in Paysandu.

⁵⁰⁸ El Telegrafo. 2007. Rodolfo Nin Novoa recibió a niños ganadores de 'Clubes de Ciencia'. *El Telegrafo Digital*. November 18.

⁵⁰⁶ Vega LO. 2009. Avión Fumigador Provocó un desastre in Guichón. *Diario La Republica*. April 12.

4.3.1.5 Collusion between, endosulfan manufacturers and governments

Endosulfan manufacturers have colluded with government representatives to block the inclusion of endosulfan in international regulations, in particular the Stockholm and Rotterdam Conventions. Participants and observers at meetings of the Conventions' technical committees, POPRC and CRC, have reported that Indian government members of the Committees were frequently accompanied by a representative of the Indian Chemical Council.^{507, 508} The Indian delegation led opposition to the listing of endosulfan, obstructing the necessary consensus for action otherwise widely supported.⁵⁰⁹

In the case of endosulfan spraying on the Kasargod cashew nut estates (4.3.1.1 above) the plantation company, Plantation Corporation of Kerala (PCK), is owned by the State of Kerala. The Indian companies which produced and supplied endosulfan included Hindustan Insecticides Limited (HIL), owned by the Government of India⁵¹⁰ and Excel Crop Care. These companies, as well as Bayer and Syngenta, are members of the Pesticide Manufacturers and Formulators Association of India (PMFAI). Endosulfan manufacturers have consistently lobbied key government officials to influence policies. For example, the PMFAI and Excel Crop Care organised dinners in Kerala at five-star hotels for government officials and scientists in an effort to lift the State ban.⁵¹¹

Endosulfan manufacturers have also attempted to conceal evidence of severe health impacts of exposure. In one case, which demonstrated their influence on government, the PCK commissioned the Fredrick Institute of Plant Protection and Toxicology (FIPPAT) to conduct a study on endosulfan and the crippling diseases found in and around the Kasargod plantations. FIPPAT's conclusions were favourable to endosulfan and the report was released at a press conference organised by the PMFAI.⁵¹² The CSE obtained a copy of the original FIPPAT report, which showed that higher levels of endosulfan were found but not disclosed. The sampling methods of the study were also questioned by the NIOH,⁵¹³ whose studies found endosulfan residues in water and in children's blood samples.⁵¹⁴ In 2002, an eight-member expert committee (known as the Dubey Committee) was appointed by the Central Insecticides Bureau's Registration Committee to examine the reports on endosulfan poisoning. Its members included heads of Excel and Aventis CropScience (now Bayer). The closed-doors Dubey Committee relied on the residue analysis conducted by FIPPAT and concluded that *there is no link between the use of endosulfan in PCK plantation and the health problems reported from Padre* (the worst affected Kasargod village).⁵¹⁵

After Kasargod's tragedy became national news, the Endosulfan Manufacturers and Formulators Association and the PMFAI initiated a disinformation campaign, covered by the national media, aimed at preventing a national ban. PMFAI published a newspaper advertisement stating that the health problems were not due to endosulfan; and that endosulfan was registered for use and was a 'safe' pesticide. Articles promoting endosulfan appeared in magazines like *Agriculture Today*.⁵¹⁶ By 2011, only the states of Kerala and Karnataka had banned endosulfan. Bayer India remained silent during the

⁵⁰⁷ Watts M. Personal communication. 2011. PAN International.

⁵⁰⁸ E.J.F. 2010. Endosulfan – inching towards justice in India. Environmental Justice Foundation, London.

⁵⁰⁹ Watts M. 2011. Defending the Indefensible: Endosulfan and the Indian Chemical Industry. PAN Asia and the Pacific.

⁵¹⁰ HIL. 2011. Hindustan Insecticides Limited, Udyogamandal Unit.

⁵¹¹ CSE. 2002. Endosulfan Conspiracy. Down to Earth 11(4). New Delhi, India. July 15.

⁵¹² PMFAI. 2011. Members, Pesticide Manufacturers and Formulators Association of India.

⁵¹³ Down to Earth. 2004. Disclosed – Lies About Endosulfan. CSE, New Delhi, India. April 15.

⁵¹⁴ NIOH, 2002, *Op cit*.

⁵¹⁵ NewsCAPE. 2005. A Will to Kill – Role of Pesticide regulators in the Endosulfan Tragedy in Kerala. Vol. 2, Issue 1.

⁵¹⁶ CSE, 2002, *Op cit*.

20-year aerial spraying of endosulfan on Kasargod villages and when evidence of health impacts made national news.

In West African cotton-growing countries, endosulfan, initially voluntarily withdrawn in the 1980s, was reintroduced after 1998 in spite of evidence of human and environmental harm.⁵¹⁷ The reintroduction followed advice from national cotton research institutes, a French cotton company, the French agricultural research institute, and the Insecticide Resistance Action Committee of CropLife International (then Global Crop Protection Federation) that represents the world major agrochemical companies.⁵¹⁸

After endosulfan was banned in the EU in 2005, most German production (4,000 tonnes) was exported to Southeast Asia, Latin America and the Caribbean. Bayer announced it would cease production (in 2007) and distribution (2010), and replace endosulfan with safer chemicals.⁵¹⁹ Thus, the company had continued sales and defended registration of endosulfan knowing it could supply less hazardous alternatives. Bayer CropScience remained silent while other endosulfan manufacturers presented false information to, and obstructed action by, the Stockholm and Rotterdam Conventions. The company did not acknowledge the devastation caused by endosulfan in Kerala, West Africa, or other parts of the world experiencing problems. The company has not acknowledged that endosulfan can cause birth defects, intellectual impairment, cancer and other adverse health effects. Bayer CropScience took over the assets of the original endosulfan producer in a merger, but was not prepared to take over liabilities. Over eighty countries have now banned endosulfan. In April 2011, at COP5 of the Stockholm Convention, governments added endosulfan to its Annex A, the list of globally banned substances.⁵²⁰

Summary of rights violated

The cases presented in 4.3.1 present evidence of acute and chronic impacts of endosulfan and impacts on the unborn foetus that violate the right to health and children's rights. The inability of small-scale farmers and agricultural workers, particularly in developing countries where PPE is unavailable, unaffordable and impractical, has violated the right to safe working conditions. Bees, cattle, fish and other aquatic biota have died from direct exposure to endosulfan or contaminated aquifers, violating the right to a healthy environment and the right to livelihood.

4.3.2 BEE COLONY COLLAPSE FOLLOWING EXPOSURE TO IMIDACLOPRID

Bayer CropScience AG manufactures and sells the pesticide imidacloprid. First produced in 1991, it is now out of patent protection and is also sold by other companies. A neonicotinoid insecticide,⁵²¹ imidacloprid is marketed under a variety of trade names, most commonly *Gaucho*. First used in 1994,⁵²² it is now widely used worldwide for field and horticultural crops, particularly as a seed-dressing for maize, sunflower and rapeseed/canola. Bayer developed a second neonicotinoid insecticide,

⁵¹⁷ IPEN, PAN Africa. 2009. Endosulfan in West Africa: Adverse Effects, its Banning, and Alternatives.

⁵¹⁸ Glin et al, 2006, *Op cit*.

⁵¹⁹ Coalition Against Bayer Dangers [CBG]. 2009. Bayer to Stop Selling Endosulfan [Press Release, July 23].

⁵²⁰ Stockholm Convention. 2011. Endosulfan Included Under the Convention, 5th COP, Geneva, Switzerland.

⁵²¹ Neonicotinoids are systemic chemicals that work their way from seed through the plant and attack the nervous system of any insect in direct contact. The substances remain in pollen and nectar and can damage beneficial insects such as bees.

⁵²² US EPA. Undated. *Gaucho* (Insecticide).

clothianidin, which it launched on the American market in 2003⁵²³ and the German market in 2006.⁵²⁴ Initial applications of imidacloprid coincided with large numbers of bee deaths, first in France, followed by Italy, Spain, Switzerland, Germany, Austria, Poland, England, Slovenia, Greece, Belgium, Canada, the US and Brazil.⁵²⁵

Following extensive use of imidacloprid as a seed dressing on sunflowers, a third of honeybees died in France;⁵²⁶ approximately 90 billion bees died within ten years, and honey production dropped by up to 60 per cent.⁵²⁷ Yields of apples, pears and oilseed rape⁵²⁸ decreased. The pesticide reduced the populations of natural pollinators and adversely affected the livelihood of beekeepers. Clothianidin (product names *Elado*, *Poncho*) is also highly toxic to honeybees.

In May 2008, in Baden-Wuerttemberg, Germany, beekeepers reported that two thirds of their bees died while some beekeepers lost all their hives. The loss for the affected beekeepers was on average about 17,000 Euros.⁵²⁹ Tests on the dead bees showed that 99 per cent⁵³⁰ had a build-up of clothianidin, which had been applied to seeds of sweetcorn planted along the Rhine River.

In Japan, there have been reports of losses of 700 swarms of honeybee due to the use of clothianidin to control shield bugs, and similar reports of losses in Hokkaido and Nagasaki prefectures⁵³¹.

In the US, beekeepers called on the EPA to pull immediately from the market a neonicotinoid pesticide linked with Colony Collapse Disorder (CCD).⁵³² CCD describes the global decline of honeybee populations since 2006. In the US, one-third of the honeybee population die or disappear each winter. Suspected causes are exposure to pathogens, stress from industrial beekeeping and habitat loss. Many scientists believe that sub-lethal pesticide exposures are a critical factor.^{533, 534}

Regulatory concern and action

In his witness statement (see details in Appendix 5.7), Philipp Mimkes detailed regulatory action that had been taken. France banned imidacloprid as a seed dressing for sunflowers in 1999, and five years later banned it for sweet corn treatments.^{535, 536} French authorities rejected Bayer's appeal for clothianidin registration.⁵³⁷ The German Office for Consumer Protection and Food Safety ordered immediate suspension of approval for eight Bayer seed treatment products. In 2008, the Italian Agriculture Ministry

523 US EPA. 2003. Pesticide Factsheet. Office of Prevention, Pesticides Environmental Protection and Toxic Substances Agency (7501C).

524 Bayer CropScience. 2008. Bienensicherheit von Clothianidin. Bayer CropScience. September 1

525 US EPA. Undated. Gaucho (Insecticide).

526 Wikipedia. Undated. Imidacloprid effects on bee population. Retrieved May 23, 2011.

527 US EPA, undated, *Op cit*.

528 The terms 'oilseed rape', 'rapeseed', 'rape', are widely used interchangeably. 'Canola', is related (and widely used) as this is a cultivar of oilseed rape widely grown in the US, Canada and GE varieties (see reference 29).

529 Beekeepers' Association. 2008. Letter to Mr. Peter Hauk, Minister for Food and Rural Affairs, Baden-Württemberg. May 5.

530 Nachtigall G. 2008. Presseinformation, Mit Clothianidin gebeiztes Saatgut ist nach Untersuchungen des Julius Kühn-Instituts Ursache für aktuelle Bienenschäden in Baden-Württemberg. May 16

531 Japan Endocrine-disruptor Preventive Action. 2010. The threat of neonicotinoid pesticides on honeybees, ecosystems and humans. Japan.

532 PANNA. 2010. Beekeepers call for immediate ban on CCD-linked pesticide. PAN North America. December 9.

533 *Ibid*.

534 Kaplan JK. 2008. Colony Collapse Disorder: A complete buzz. USDA Agricultural Research Service.

535 Wikipedia, undated, *Op cit*.

536 PANNA, 2010, *Op cit*.

537 Benjamin A. 2008. Pesticides: Germany bans chemicals linked to honeybee devastation. The Guardian, UK. May 23.

suspended clothianidin, imidacloprid and thiametoxam as a precautionary measure. Following this suspension, the 2009 corn sowing resulted in no cases of widespread bee mortality around the crops for the first time in ten years.^{538, 539} The pesticide fipronil was also implicated in bee mortality. Moreno Greatti, from the University of Udine, stated: *beekeepers from Northern Italy and all over the country are unanimous in recognizing that the suspension of neonicotinoid- and fipronil-coated maize seeds needs to be thanked and praised for this. Even in Germany and France, in a similar context, bees have been 'restored to health'. In our region during March and April 2009, no cases of bee mortality were reported at all to the Regional Bee Laboratory.*⁵⁴⁰

Bayer has extended its sales of neonicotinoid insecticides through the production and sale of clothianidin, showing a disregard for environmental safety. State authorities have allowed sales and use to continue. The NGO Coalition against Bayer Dangers (CBG) sued Bayer CropScience AG for knowingly endangering bees and demanded that the state attorney in Freiburg (south-western Germany) investigate the approval process. The request was denied, and the authorities refused to publish the documents that led to the authorisation of these pesticides. The authorities put the company's right to 'commercial confidentiality' above the public 'right to know', demonstrating collusion between Bayer and the authorities. (See box for stories of two beekeepers in Germany.)

Stories from beekeepers in Germany

Manfred Gerber: *For several years I have witnessed the mysterious death of bees in one of my outdoor apiaries in Viernheim. So far 60 colonies have been decimated though nothing happened in other locations. I suspected imidacloprid poisoning because the bees died after rapeseed or mustard blooms in late October treated with this pesticide. Bees of other beekeepers within a radius of about three miles from my apiary also died. All bees had been treated against varroa, the parasitic mite that has been implicated in Colony Collapse Disorder (CCD). Despite repeated requests, national associations refused to investigate bee-deaths. I have learned that since 2004, clothianidin was used to treat carrots on the fields around the bee location. In September 2007, all colonies in this apiary died one month after the varroa treatment. Within a few days, 30 colonies were destroyed. The poisonings always occurred after bees foraged on green manure crops (mustard). Meanwhile, we have almost no insects around here. Only two species of butterfly are seen; lacewings and hoverflies are virtually extinct.*⁵⁴¹

Fritz Hug: *This beekeeper from Simonswald showed CBG one of his apiaries in the Riparian forest. CBG found an apiary with 30 colonies, with almost no flying bees. The flight boards were littered with dead and struggling bees. In the hive, bees in the pupal stage were no longer in the honeycomb centre, suggesting they had been fed with contaminated pollen and nectar and had no chance of survival.*⁵⁴²

538 PANNA, 2010, *Op cit.*

539 European Research Media Centre. 2010. Bees *restored to health* in Italy after this spring's neonicotinoid-free maize sowing.

540 *Ibid.*

541 Gerber M. 2008. Letter. Translated from German. July 18.

542 Abridged from translation of German article provided by Coalition against Bayer Dangers. [Private Communication].

Testimony from beekeeper in the UK

Graham White (beekeeper, see appendix 5.8): *I have managed 10 hives since about 1996 and averaged 30-40lbs of honey per hive from 1994 until about 2004, when the harvest began to decline. Around 2000, British beekeepers became aware that in France over 500,000 bee colonies had died in 1998. Following some studies at Montpellier University, the French government banned Bayer's imidacloprid insecticide for use on sunflowers and oilseed rape. But the British Beekeeping Association (BBKA) repeatedly said there was no issue in the UK. In 2003, BBKA members learned that in 2000, without consultation, the Executive had created a company, BBKA Enterprises, which received £17,500 annually in return for endorsing four pesticides as 'bee-friendly'. The Durham Beekeepers Association identified the products and companies involved. A later report confirmed that these four insecticides were all in the top ten most deadly insecticides affecting bees in the UK. Despite all objections, the contract lasted until 2011 and paid £175,000 in total. Hundreds of BBKA members resigned. In 2011, after a massive campaign in the press and media, the Executive finally agreed to cancel the endorsement of pesticides.*

Many beekeepers are convinced that Bayer and Syngenta have a strategy to co-opt beekeeping associations by funding conferences, research and partnership-projects. The result in the UK has been that our national association has ignored all of the bee-research from Europe, as well as bans imposed on neonicotinoids by the French, German and Italian governments. The 'official position' of the BBKA is that: "there is no evidence of poisoning of bees by neonicotinoids in the UK."

4.3.3 LIBERTYLINK RICE 601 IN THE US

Aventis CropScience, acquired by Bayer CropScience AG in 2001, was the original producer of the GE rice variety called LibertyLink Rice 601 (LLRICE601). It tested LibertyLink rice in open fields in Louisiana and Arkansas between 1999 and 2001, but stopped in 2001 for unspecified reasons. LLRICE601 is genetically engineered to be tolerant to the herbicide glufosinate-ammonium. Glufosinate-ammonium has been found to have acute and long-term toxic effects on humans and adverse environmental effects.⁵⁴³ The risks to humans include acute toxicity with symptoms such as gastrointestinal effects (nausea, vomiting, abdominal pain and diarrhoea), neurological symptoms (convulsions and coma) and respiratory failure. There is associated reproductive damage. Death results from circulatory failure.⁵⁴⁴ There is no specific antidote. Glufosinate-ammonium threatens biodiversity, agricultural biodiversity and the environment.⁵⁴⁵ Formulations are more toxic to humans and the aquatic environment than the

⁵⁴³ Watts M. 2007. Glufosinate-ammonium monograph. PAN AP. Penang, Malaysia.

⁵⁴⁴ *Ibid.*

⁵⁴⁵ Glufosinate-ammonium threatens various aspects of biodiversity and the environment as it compromises the natural structure and evolution of plant and animal communities and their interactions. In terms of agricultural biodiversity, this has corresponding impacts on the availability of ecological goods and services such as natural pest and pathogen controls. Reduced weed diversity due to constant use of herbicide resistant crops could lead to higher pest damage because of the resulting resource concentration that in turn impoverishes population of natural enemies. At the same time, this could affect bird populations that feed on seeds of, or various arthropods that take refuge in, otherwise diverse weed communities (Garcia & Alteri, 2005). Horizontal gene transfer could also occur (see gene pollution), potentially narrowing agricultural crop diversity while giving rise to more herbicide resistant weeds (Jarvis & Hodgkin, 1999). References: Garcia MA, Altieri MA. 2005. Transgenic Crops: Implications for Biodiversity and Sustainable Agriculture. *Bulletin of Science, Technology & Society*, 25(4):335-353.; Jarvis DI, Hodgkin T. 1999. Wild relatives and crop cultivars: detecting natural introgression and farmer selection of new genetic combinations in agroecosystems. *Molecular Ecology* 8:S159-S173.

active ingredient alone.⁵⁴⁶ Bayer owns the IPRs to LLRICE601 and is a major producer of glufosinate-ammonium.

In 2006, LLRICE601 had not been approved for commercial cultivation by the USDA and was regulated as a plant pest under the Plant Protection Act.⁵⁴⁷ However, weak regulations did not require companies to provide locations of field trials or to test neighbouring fields for contamination. The body responsible, the Animal and Plant Health Inspection Service (APHIS) did not detect the contamination. In January 2006, Riceland Foods found contamination had spread throughout the southern rice-growing states of Arkansas, Missouri, Mississippi, Louisiana and Texas.⁵⁴⁸ LLRICE601 and LLRICE604 affected rice and planting stock of popular non-GE long-grain rice varieties Cheniere and Clearfield 131, implying wider risks.⁵⁴⁹ Almost all samples of long-grain rice tested by the Arkansas Department of Agriculture contained traces of LLRICE601.⁵⁵⁰ Louisiana State University found LLRICE601 had contaminated a publicly-developed foundation rice seed line.^{551, 552} In November 2007, Greenpeace reported that LL-contaminated rice and rice products had been found in 32 countries including 23 European countries.⁵⁵³ Neither Riceland nor Bayer announced the contamination until the rice planting season was over. Bayer reported test results to USDA on 31 July 2006, which took another three weeks to make this public. The USDA and FDA declared the rice safe based on Bayer's assurances, despite the lack of safety testing.⁵⁵⁴ In Riceland's court case against Bayer in February 2011 for losses incurred, expert witness Professor Harry Klee of the University of Florida read thousands of internal Bayer documents and testified that the company was responsible for the contamination and did not comply with reasonable standards.⁵⁵⁵

Cover-up, collusion and lack of accountability

Bayer CropScience AG knew of the contamination in January 2006 when one of Riceland Foods' export customers detected LLRICE601 in the long grain rice consignment from the US through independent testing. Yet it only informed the USDA six months later. This delay was deliberate, highly irresponsible and is evidence of Bayer's bad faith.

Bayer refused to provide reference materials or genetic characterisations for LLRICE601 to facilitate testing⁵⁵⁶. Instead, on 22 August 2006, Bayer applied to the USDA pursuant to the Plant Protection Act to retrospectively deregulate (i.e. approve) LLRICE601 as an extension of its petition 98-329-01p, granted in 1999, for non-regulated status for LibertyLink Rice 62 (LLRICE62) and LibertyLink Rice 06 (LLRICE06). Bayer sought 'deregulation' of LLRICE601 even though it did not intend to commercialise this variety. This represents an abuse of USDA's deregulation process. The tactical move demonstrates how law and regulations can be manipulated with cooperation and consent of regulatory authorities to protect corporations. The application was approved within months and LLRICE601 was deregulated in spite

⁵⁴⁶ Watts, 2007, *Op cit*.

⁵⁴⁷ The US Plant Protection Act specifies that a 'plant pest' is any living organism that can directly or indirectly injure, cause damage to, or cause disease in any plant or plant product and a plant product includes any part of a plant or any manufactured or processed plant or plant part.

⁵⁴⁸ Pollack A. 2006. Unapproved Rice Strain Found in Wide Area. The New York Times. August 22.

⁵⁴⁹ Shumaker L. 2007. US GMO Rice caused \$1.2 bln in damages - Greenpeace. Reuters. November 5.

⁵⁵⁰ CFS. 2006. USDA Urged to Deny Approval of Illegal Genetically Engineered Rice Found in Food Chain [Press Release, September 14].

⁵⁵¹ *Ibid*.

⁵⁵² Foundation seed is the genetically pure breeder stock from which all commercial lines of the same variety are derived.

⁵⁵³ Biosafety Information Centre. 2007. Unapproved GE Rice from US Found in China. Letter by the Third World Network Biosafety Information Service. November 23.

⁵⁵⁴ USDA. 2006. Genetically Engineered Rice (Release No. 0306.06) [Fact Sheet].

⁵⁵⁵ Kreimeier L. 2011. Florida professor: Bayer responsible for contamination. Daily Leader. February 28.

⁵⁵⁶ *Ibid*

of the illegal contamination, and of the opposition by CSOs and NGOs, and of a citizens' petition filed by the CFS to the USDA⁵⁵⁷ to reject Bayer's request to approve LLRICE601, and to rescind the already-granted approvals of LLRICE62 and LLRICE06. CFS provided evidence that LLRICE would: 1) hybridize with weedy red rice, making this serious weed still harder for farmers to control; 2) promote greater use of the toxic herbicide glufosinate; 3) foster the evolution of resistant weeds through the overuse of glufosinate; and 4) cause further economic losses to rice farmers through more contamination of commercial rice. All reasons were rejected by USDA. The USDA approval violated the precautionary principle by failing to determine the exact manner of contamination and to regulate and prevent future contamination. It failed to obtain the necessary reference material and genetic characterisation from Bayer.

Collusion across borders

The cover up continued across US borders and beyond the Atlantic. The Canadian Food Inspection Agency and Health Canada, in consultation with the USDA and Bayer, conducted only preliminary assessments of the risks of contamination and concluded that it was unlikely that low levels of LLRICE601 posed a risk to human health, livestock or the environment.⁵⁵⁸

The EU, a major market for US rice, took steps to impose compulsory testing of imports for GE rice⁵⁵⁹, but failed to carry out any independent assessment of contamination and its risks to human health and the environment, or to impose penalties on Bayer.⁵⁶⁰ The EFSA, taking a more cautious stand and admitting to insufficient data for a full risk assessment on the rice, nevertheless declared that consumption of the long-grain rice containing trace levels of LLRICE601 was not likely to pose an imminent safety concern to humans and animals.⁵⁶¹ The GM Free Cymru group revealed that EFSA's assurance was based on highly selective data provided by Bayer. The company had redacted 30 pages of its dossier containing crucial data on the molecular characterisation and other characteristics of LLRICE601 on the grounds of 'confidential business information'.⁵⁶²

Although the EC reported that contaminated rice had been found in 33 out of 162 samples from rice consignments imported by the European Federation of Rice Millers,⁵⁶³ more extensive testing (on rice and rice-based products) was carried out by concerned social and environmental groups and retailers. These groups forced national regulators to conduct more rigorous testing of samples and impose mandatory withdrawals of contaminated rice and rice-products from the shelves.

The British Food Standards Agency (FSA) ruled the presence of GM material in rice sold in the UK was illegal under European law and that retailers were responsible for ensuring food they sold did not contain unauthorised GM material.⁵⁶⁴ However it went on to say that the FSA did not expect companies to trace products and withdraw them.⁵⁶⁵ FSA ordered stores to remove from sale rice containing GE

⁵⁵⁷ CFS. 2006. USDA urged to deny approval of illegal genetically engineered rice found in food chain. September 14.

⁵⁵⁸ Lawsuits against Bayer. Undated. Our Food: Database of Food & Related Sciences.

⁵⁵⁹ Friends of the Earth Europe. 2006. EU clamps down on GM Rice [Press Release, August 23].

⁵⁶⁰ Greenpeace International. 2006. EU restrictions on illegal US rice imports inadequate [Press Release, August 23].

⁵⁶¹ Food Navigator. 2006. EFSA: 'Insufficient data' for full GM risk assessment. September 15.

⁵⁶² GM Free Cymru. 2006. EFSA safety statement was issued without sight of crucial GM rice data [Press Notice, September 21].

⁵⁶³ GMWatch.org. 2006. EU confirms presence of tainted GMO rice. September 11.

⁵⁶⁴ Food Standards Agency [FSA]. 2006. Testing to be carried out for unauthorised GM rice [Press Release, September 1].

⁵⁶⁵ Lean G. 2006. GM: The cover-up. The Independent. September 17.

strains only after Friends of the Earth tests found GE-contamination in rice on sale in Britain's fourth largest supermarket chain (Morrisons) and mounted a legal challenge.⁵⁶⁶ The scandal demonstrated the pro-industry stance of the regulatory bodies, which fail to exercise the precautionary principle and discharge their duty to protect public health, safety and welfare. There is no satisfactory control over how and where GE products enter the food chain and no proper monitoring and recall system.

Health and environmental consequences of contamination

LLRICE601 contaminated other local rice varieties and rice products and as a result, exposed thousands of consumers in 32 countries to potential adverse health impacts; it damaged the livelihoods of rice farmers and traders, resulted in environmental harm to local rice biodiversity; and cost countries money and time in handling and containing the contamination at the national level.⁵⁶⁷ Traces of glufosinate ammonium applied on plants can remain in food, with potential health consequences.⁵⁶⁸ Biodiversity and stable ecosystems are threatened, as contamination of local varieties of rice by GE rice is irreversible. It is impossible to identify contaminated plants from a visual examination. LLRICE varieties will pass their resistance trait to weedy red rice, which is already a difficult 'weed' to control; use of glufosinate may foster herbicide resistance in other weeds.

Economic consequences of contamination – legal battles

LL-tainted rice triggered the largest financial and marketing disaster in US rice history. Within four days of the 2006 announcement, a decline in rice futures had cost US growers about US \$150 million.⁵⁶⁹ Futures prices fell approximately 14 per cent, and US rice exports fell. Japan, Korea and other countries suspended import of long-grained rice from the US. Ebro Puleva, a Spanish food group and the largest rice processing company in the world stopped imports of US rice into the EU in August 2006.⁵⁷⁰ Greenpeace estimated the economic cost of the contamination to be US \$1.2 billion, including losses of up to US \$253 million from food-product recalls in Europe, US export losses of US \$254 million in the 2006/07 crop year and future export losses of US \$445 million.⁵⁷¹ In its court case against Bayer in February 2011, Riceland claimed the negligence of Bayer in the handling of LLRICE601 cost them US \$379.93 million in projected future losses and losses since 2006.⁵⁷²

The courts rejected the farmers' application to take class action lawsuits against Bayer, forcing each farmer to file an individual suit and making cases costly and difficult to pursue.⁵⁷³ It has put a heavy toll on public funds and court services. By October 2008, 1,200 suits had been filed against Bayer by farmers for damages caused by temporary bans on long-grain rice varieties from the US, export restrictions, low prices, loss of markets, damage to property and equipment and other costs.⁵⁷⁴ Arkansas farmers

⁵⁶⁶ Friends of the Earth Europe. 2006. Friends of the Earth finds illegal GM rice in UK supermarket [Press Release, September 17].

⁵⁶⁷ Ermakova I. 2006. Genetically modified soy leads to the decrease of weight and high mortality of rat pups of the first generation. Cited in Smith JM. 2007. Genetic Roulette: The Documented Health Risks of Genetically Engineered Foods. Yes! Books. Fairfield, USA.

⁵⁶⁸ Watts, 2007, *Op cit*.

⁵⁶⁹ Harris A, Fisk MC. 2008. Bayer Avoided Class Actions, Faces 1,200 Rice Suits (Update1). Bloomberg. October 15.

⁵⁷⁰ Greenpeace International. 2006. World's largest rice company halts all imports from USA: Bayer's illegal GE rice continues to inflict damage on US rice industry [Press Release, September 29].

⁵⁷¹ Shumaker L. 2007. US GMO Rice caused \$1.2 bln in damages - Greenpeace. November 5.

⁵⁷² Kreimeier L. 2011. Florida professor: Bayer responsible for contamination. Daily Leader. February 28.

⁵⁷³ Associated Press. 2008. Judge denies class-action for biotech rice suit. Cited in Farmers Sue over GM Rice. August 14.

⁵⁷⁴ Harris & Fisk, 2008, *Op cit*.

claimed they could not find sufficient unaffected planting seed and thus could not plant rice on all their available land.⁵⁷⁵ European businesses handling the contaminated rice sued for losses. Bayer admitted contamination but refused to admit negligence or liability, claiming this was an 'Act of God'.⁵⁷⁶ Some US rice farmers have won their case and received partial compensation.^{577, 578} Bayer had paid nearly US \$200 million to farmers and rice companies in court decisions and out-of-court settlements by October 2010. The company lost all court cases and, in a settlement announced on 1 July 2011, agreed to pay US \$750 million to about 11,000 farmers who had suffered losses from the LLRICE debacle.⁵⁷⁹

4.3.4 POISONING OF 50 CHILDREN IN TAUCAMARCA, PERU WITH METHYL PARATHION

Bayer demonstrated negligent and irresponsible behaviour by marketing a deadly pesticide in a Quechua community in Peru, where most residents were illiterate. Quechua Indians, besides facing a language barrier, were unaware of the dangers of an unlabelled plastic bag without visible warnings of its fatal content. This is a violation of the Code of Conduct, with which the agrochemical corporations have pledged compliance.⁵⁸⁰

In 1999, the Taucamarca community was the scene of a disaster: 50 boys and girls from the Educational Centre were poisoned when their breakfast was polluted by methyl parathion. Twenty-four out of the 50 children lost their lives and the rest suffered neurological damage and other health problems. On 22 October, Isaac Villena Nuñez, the only teacher from the Educational Centre N° 50794 in the Community of Taucamarca (District of Cay-Cay, Province of Paucartambo, Cuzco Department), gave 14-year-old student Julián Manottupac Chile two bags of cereals 'Foncodito' to prepare breakfast. His wife Kelma Tapia Vásquez considered it would not be enough so mixed in a bag of cereals 'from the previous day' which was already opened and with the packaging torn. Almost all the 50 students, aged from 3-14, were served school breakfast at 12:45 pm. After twenty minutes they started to feel abdominal pain, convulsions, muscle contractions, vomiting and fainting. The teacher immediately informed their parents, assisted the children and gave them oil and soapy liquid. Some died quickly and others went to the medical centre of Cay-Cay (one hour on foot). The antidote atropine was not available; 24 children died and 18 were hospitalised, diagnosed with poisoning by an organophosphate.⁵⁸¹ Later, surviving children underwent examinations which revealed chronic neurological damage, important neuropsychological alterations and a deficit in speed and motor coordination.⁵⁸² These effects are consistent with the damage induced by OP substances.

The police report (number 207-99 X RPND/DIVINCR) determined that the poisoning was caused by an OP substance in the school breakfast, resulting in brain oedema, bleeding pancreatitis, asphyxia because of the obstruction of the respiratory tracts and visceral congestion. Subsequent police and

575 King R. 2008. County Farmers Sue over Genetically Modified Rice. Pine Bluff Commercial. August 8.

576 Weiss R. 2006. Firm blames farmers, 'Act of God' for rice contamination. Washington Post. November 22.

577 BigClassAction.com. 2010. Farmers Win Against Bayer Crop Sciences, Jury Awards \$48M Settlement. April 16.

578 Gray Reed & McGraw P.C. 2010. Rice Farmers Win Second Critical Verdict In Case Against German Maker Of Genetically Modified Rice. February 5.

579 Bloomberg News. 2011. Bayer settles with farmers over modified rice seeds. The New York Times. July 1.

580 FAO. 2005. International Code of Conduct on the Distribution and Use of Pesticides, Rome.

581 CBG. 2002. Peruvian Congressional Investigative Committee finds Bayer Responsible in the Pesticide Poisoning Deaths of 24 children in the Andean Village of Taucamarca. Coalition Against Bayer Dangers, 27 August 2002.

582 Wesseling C, Boluarte A, Sanchez D. 2001. Efectos neuroconductuales y neuropsicológicos en niños intoxicados con el plaguicida organofosforado paratión. Taucamarca, Cuzco, Perú., Red de Acción Alternativas al uso de Agroquímicos (RAAA).

judicial investigations determined that the massive poisoning was caused by direct consumption of a powdered milky substitute (distributed by Fondo de Cooperación para el Desarrollo Social), accidentally mixed with a deadly powdered pesticide. The official version of the Directorate General of Environmental Health initially declared the breakfast had been poisoned with ethyl parathion, banned since 1998, but it was subsequently accepted that the more widely-available methyl parathion was responsible.⁵⁸³ The government appointed a high level Commission composed of Secretaries of the Presidency and Health, the Attorney General and the Director of the National Police of Peru to investigate. Later, the then Secretary of Health presented his report before the Commission of Health, Population and Family.⁵⁸⁴

The families wrote to then UN Secretary General Kofi Annan requesting that he exclude Bayer from the UN Global Compact, a UN partnership with corporations who pledge to abide by human rights and environmental principles, based on Bayer's actions and inactions with regard to their children's deaths and poisonings.⁵⁸⁵ The Secretary of Agriculture definitively prohibited any commercialisation of parathion in Peru in October 2000.⁵⁸⁶

Bayer imported methyl parathion into Peru and commercialised it specifically for Andean cultivation by small and medium-sized farmers. Bayer knew that this pesticide would be used by Quechuas, Quechua-speaking and illiterate people, and that the users were likely to use the product wrongly because of their difficulty in understanding pesticide labels. Bayer knew that, due to its high acute toxicity, the product had been registered 'for restricted use' only in accordance with the *Regulations of the Registry, Commercialization and Control of Agricultural Pesticides and Similar Substances*, and was thus limited to users who received technical advice from an agronomy engineer. In practice it was marketed without any post-registration control from the authorities and was sold freely in rural areas. Bayer should have foreseen the wrong use of the product because of the social and cultural conditions. The pesticide was packed in a plastic bag without indicating its highly dangerous content. The toxicity warning was not prominent on the label and the package had a simple picture of beans, carrots and potatoes. Bayer was negligent in the following ways:

The pesticide was packed in a plastic bag without indicating its highly dangerous content. The toxicity warning was not prominent on the label and the package had a simple picture of beans, carrots and potatoes.

- wrong use of the product could have been foreseen due to the well-known social and economic conditions where it was marketed, including poor literacy
- the label was only in Spanish, not widely read in Quechuan areas
- the packaging was highly unsuitable
- Bayer was aware that the pesticide looked like powdered milk
- packaging was highly misleading with visual representation of food
- toxicity warnings were lacking
- insufficient care was taken in marketing the product.

⁵⁸³ Red de Acción en Agricultura Alternativa (RAAA). 2011. Caso Taucamarca, Ayuda Memoria – 22 October 1999.

⁵⁸⁴ Diario El Sol. 1999. 28 October.

⁵⁸⁵ CorpWatch. 2002. Bayer Responsible in Pesticide Deaths of 24 children in Peru.

⁵⁸⁶ SENASA. 2002. Departmental Resolution n° 182-2000-Ag.

The marketing practices failed to meet Bayer's internal obligations of responsible and ethical production and marketing which state that: the market has to be observed to assure clients are handling products correctly; customers have to be warned about risks; and each product must have a warning label.

The company's *Responsible Care* rules assure that: distributors and users must get the necessary information and advice to safely carry, keep, handle, use and dispose of products; and if health or the environment could be threatened by a potential risk, according to scientific evidence, Bayer will inform both customers and the public and take suitable action including the removal of the product. Bayer states that it offers users training about risks and hazards of using pesticides, especially in those rural communities where a lack of education, restricted access to information, and scarce infrastructure for the assistance of emergencies promote high-risk conditions for health.

4.3.5 OTHER CASES AGAINST BAYER

Bayer is also charged in the following cases with multiple offenders:

1. Pollution and Endangerment of Arctic Tribal Nations and their Environment
2. Organophosphates
3. Aerial Spraying
4. Toxic Dump of Obsolete Pesticides
5. Cancer in the Punjab
6. Fipronil: Unsafe impacts of a "modern" insecticide
7. Suppression, corruption, manipulation, and distortion of science
8. Violations against Women
9. Violations against Children

4.4 DOW CHEMICAL COMPANY

Dow Chemical Company is the largest chemical company in the US and the second largest worldwide. It is a leading producer of pesticides, plastics, hydrocarbons and other chemicals. Dow is a Delaware-based corporation with headquarters in Midland, Michigan. In the past, Dow has produced extremely hazardous chemicals, including Agent Orange and napalm (sole producer) used during the Vietnam War, and DDT. It continues to produce the highly toxic organophosphate insecticide chlorpyrifos.

In 1999, Dow acquired Union Carbide, whose pesticide plant in Bhopal, India, released methyl isocyanate and other chemicals in 1984, causing one of the worst industrial disasters in history (see 3.5.4.1). Dow has refused to clean up the Bhopal factory site, which continues to contaminate local groundwater with mutagenic and carcinogenic chemicals. Dow is now one of five corporations dominating the GE seed market. Dow exerts considerable political and social influence; through the 'revolving door' practice, several former US high-level government officials have become top executives in the company. The case presented below documents Dow's involvement in bribery in India.

4.4.1 DOW – INVOLVEMENT IN BRIBERY IN INDIA

Bribery is a form of corruption and corruption is a catalyst for human rights violations. This case is a summary of an Order against Dow Chemical Company dated February 2007. The full Order is available from the Accounting and Auditing Enforcement arm of the Securities Exchange Commission (SEC) of the USA.⁵⁸⁷

Under the US 1977 Foreign Corrupt Practices Act (FCPA), public companies must keep books, records and accounts in reasonable detail and maintain internal accounting controls to provide assurances that: *(i) transactions are executed in accordance with management's general or specific authorization; and (ii) transactions are recorded ... in conformity with generally accepted accounting principles.*

The Dow subsidiary in India that produces and markets pesticides was established as DE-Nocil in 1994 when a Dow subsidiary, DowElanco, acquired 51 per cent ownership in a local Indian company, National Organic Chemicals Industry Ltd. (Nocil). In 1997, DowElanco became a wholly-owned subsidiary of Dow and was re-named Dow AgroSciences LLC (DAS). In March 2001, DAS held a 75.7 per cent stake in DE-Nocil. In January 2005, Dow attained 100 per cent ownership of DE-Nocil, and in March changed the name of the subsidiary to Dow AgroSciences India Pvt. Ltd.

Under Indian law, DE-Nocil was required to obtain government registration for its pesticide products at the federal and state levels. At the federal level, the principal regulator was the Central Insecticides Board (CIB), comprising 29 officials charged with examining safety and health issues related to agricultural chemicals. The Registration Committee of CIB was composed of six persons that recommended pesticide registrations. One influential member of this committee was able to determine if and when a company's agricultural chemical product would be registered and, *in fact ... would refuse or delay registrations unless he received financial payments.* This individual left the CIB in 2000.

At state level, government inspectors have an enforcement role and could prevent the sale of a product by drawing samples and falsely claiming that the samples were misbranded or mislabelled. Misbranding or mislabelling carried significant potential penalties. Such accusations could be challenged in court, but some companies would make petty cash payments to state inspectors.

DE-Nocil's improper payment practice and improper accounting

DE-Nocil's commercial Vice-President and Technical Development Leader *developed an improper payment practice to facilitate the registration of DE-Nocil's products to the CIB.* Improper payments were made through consultants and unrelated companies. Beginning in 1996, DE-Nocil personnel began accumulating funds off its books to be available to pay the CIB Official when making product registration applications. Company personnel enlisted one of DE-Nocil's contractors to accumulate funds on its behalf and in turn the contractor agreed to add *fictitious charges called 'incidental charges' on its bills to DE-Nocil.* These funds were accumulated to disburse as *directed by DE-Nocil. DE-Nocil made approximately US \$20,000 in improper payments to the CIB Official through this contractor.* DE-Nocil also made an improper payment to the CIB Official through a second contractor. In this case, and in agreement with DE-Nocil, the contractor issued a *false invoice for US \$12,000 in capital equipment ... (the payment) was then delivered to the CIB Official.* It was authorised by DE-Nocil's Managing Director.

⁵⁸⁷ Taken from: ORDER INSTITUTING CEASE AND DESIST PROCEEDINGS in the matter of DOW Chemical Company SECURITIES EXCHANGE ACT OF 1934 Release No. 55281 / February 13, 2007 ACCOUNTING AND AUDITING ENFORCEMENT Release No. 2555 / February 13, 2007 ADMINISTRATIVE PROCEEDING File No. 3-12567.

The payments expedited registration of three DE-Nocil products, including pesticides containing chlorpyrifos and cypermethrin. *As a result of the expedited registrations, Dow estimated that DE-Nocil generated US \$435,000 ... US \$329,295 of which, based on Dow's ownership interest, went to Dow.*

DE-Nocil also made improper payments at the state level. It routinely used money from petty cash to pay state officials in order to distribute and sell its products. Although these payments were small they were numerous and frequent. Dow estimates that from 1996 to 2001 the company paid US \$87,400 to state inspectors and other state officials and none was properly recorded in DE-Nocil's books.

Over a six-year period, DE-Nocil distributed an estimated US \$200,000 in improper payments through federal and state channels in India. ... *an estimated US \$39,700 was used by DE-Nocil to register its products and an estimated US \$87,400 was paid to state level agriculture inspectors.* The remainder included payments for gifts, travel and entertainment, and payments to government officials (customs, tax). The proceedings state: *payments were made without knowledge or approval of any Dow employee.*

None of the payments was properly recorded in the company books, records and accounts, and did not comply with FCPA requirements. *Further, Dow's system of internal accounting controls failed to prevent the payments.*

These violations led to cease-and-desist proceedings against Dow by the SEC pursuant to Section 21C of the Securities Exchange Act of 1934. Dow submitted an Offer of Settlement, which the SEC accepted, and issued an order that Dow cease and desist from committing further violations. In February 2007, the SEC filed a complaint in the US District Court for the District of Columbia against Dow (*SEC v. The Dow Chemical Company*, Case No. 07CV00336 [D.D.C.]) alleging violations of Section 13(B) (2)(A) and 13(b)(2) (B) of the Exchange Act and seeking a civil penalty. Without admitting or denying the allegations, Dow consented to the Court's judgment and paid a US \$325,000 civil penalty.

Summary of violations

The Dow acts of bribery and collusion with public officials prevented the due process of regulation and necessary safeguards to protect the public from being implemented. These acts constitute a violation of the right to health and safety and the right to information. Bribery as a means of obtaining support for illegal actions is tantamount to a criminal activity. The government of USA has failed in its obligation to respect, protect and fulfil the provisions in the UN Convention against Corruption and the OECD Convention against Corruption by not criminalising the act of bribery. This case is to be read with the case entitled Monsanto's Bribery of Government Officials in Indonesia (see 4.2.3).

4.4.2 OTHER CASES AGAINST DOW

Dow is also charged in the following cases with multiple offenders:

1. Pollution and Endangerment of Arctic Tribal Nations and their Environment
2. Lake Apopka
3. Organophosphates
4. Aerial Spraying: Chemical Trespass
5. Cancer in Punjab
6. Suppression, corruption, manipulation and distortion of science

4.5 DUPONT

DuPont is a US corporation and the third largest chemical producer globally, following Dow and ExxonMobil Chemicals. DuPont is a significant producer of pesticides and GE seeds. DuPont is responsible for producing a wide-range of highly toxic pesticides that have harmed communities and the environment globally, including DDT, the herbicide diuron and fungicide mancozeb (the latter two are known to cause cancer). In 1999, DuPont acquired Pioneer Hi-Bred, a top producer of GE seeds, transforming the company into the largest seed supplier in the world. DuPont's current biotechnology products include GE insect-resistant soybeans, corn, and canola. The case presented here documents the impact of DuPont's herbicides on communities and the environment in Costa Rica.

4.5.1 WATER CONTAMINATION BY HERBICIDES IN COSTA RICA

Costa Rica is the world's leading producer of pineapples. With a cultivated area that may reach 60,000 hectares,⁵⁸⁸ pineapples have overtaken bananas to become the country's largest export crop. Sales are mostly to the US and Europe.⁵⁸⁹ Large-scale pineapple production began in the 1980s when Del Monte subsidiary, Pindeco, introduced a technological package that relied on high inputs of pesticides and fertilisers. The environmental and social impacts of the pineapple expansion brought drastic changes to land use. Among these impacts are the invasion and destruction of protected areas and water sources; soil erosion; replacement of basic grain crops by pineapples; disruption of livestock-raising activities; land grabbing from peasants and indigenous peoples; depreciation of land and housing near the pineapple plantations; and proliferation of the stable fly (*Stomoxys calcitrans*), which infests cattle, due to improperly disposed pineapple waste.⁵⁹⁰

Pineapple monoculture plantations have greatly expanded in Central American countries. These large-scale industrialised agricultural schemes have proliferated in many countries under neoliberal economic policies. Their growth strips small-scale and medium-size producers of protection against large agricultural companies. The production methods employed are developed with the agrochemical corporations that benefit from pesticide sales.

In 2007, rural communities in Costa Rica created the National Front of Sectors Affected by the Pineapple Production (FRENASSAP in Spanish) to demand solutions to the problems created by the pineapple agricultural industry, and to denounce the human rights violations and breaches of national and international regulations. Pineapple monoculture has affected areas in the north, south and Caribbean areas of Costa Rica. These plantations surround entire towns. Their water sources have been contaminated and diminished as water from the aquifers is used for washing and cleaning the fruit for export. Agricultural workers in the pineapple plantations suffer from asthma, allergies, skin rashes, chronic gastritis, frequent colds and respiratory problems, among other illnesses. Most agricultural workers are contracted by third party companies, a system employed by the plantations to avoid compliance with labour regulations and to detach themselves from direct responsibility to the

⁵⁸⁸ Ramirez F. 2011. Instituto Regional de Estudios en Sustancia Tóxica, Universidad Nacional de Costa Rica (pers. comm).

⁵⁸⁹ Cuadrado G, Castro S. 2009. Costa Rica: La expansión del monocultivo de piña en detrimento de los derechos humanos. In: Azúcar roja desiertos verdes, edited by Emanuelli MS, Jonsén J, Suárez SM. Published by FIAN Internacional, FIAN Sweden.

⁵⁹⁰ *Ibid.*

workers.⁵⁹¹ Thousands of workers labour in the pineapple plantations. Union representation does not even reach five per cent and unionised workers are persecuted, often losing their jobs.⁵⁹²

In Costa Rica, pineapple monoculture has nearly destroyed small-scale pineapple production, which is unable to compete with large corporations. Thousands of small-scale farmers have been displaced from their land, or are forced to sell when their domestic animals, crops and family became ill from pesticides. The land is often sold at a loss. Pineapple plantations in some places were as close as 20 meters from water drinking sources and the affected communities were successful in their demands to the government that plantations retreat to a 100-meter distance, as stipulated by the law.⁵⁹³ Plantations apply large amounts of herbicides; bromacil and diuron are generally applied on newly-planted fields and paraquat is applied after the pineapple harvest to desiccate the plants. Bromacil and diuron are known to be very soluble in water; bromacil is a possible carcinogen and both pesticides are suspected endocrine disruptors.⁵⁹⁴

The case of Siquirres and communities surrounded by pineapple plantations

Since 2004, a community of 6,000 people in Siquirres has had the water of their aqueducts contaminated with the herbicides bromacil and diuron. For years, the community unknowingly consumed water contaminated with these and other pesticides applied at the pineapple plantation Hacienda Ojo de Agua. Emergency measures by the government included provisioning water in tankers for Siquirres' residents.⁵⁹⁵ The community had worked hard to build aqueducts to get water to their homes, but have had to rely on tankers for about five years. Many people have continued to use the tainted water for drinking and cooking as no solution is in sight.

Spray drift is a further problem, and residents are often forced to leave their homes for days on end during night pesticide-applications when the wind carries the chemicals into their homes. Siquirres is one example, and many communities living near plantations have bromacil and diuron in their drinking water. Costa Rica does not have regulations on minimum residue levels (MRLs) for pesticides in drinking water. The 0.5 mg/l found in El Cairo and 0.4 mg/l in the Milano communities are above the MRL European regulation of 0.0001 mg/l for an individual pesticide and 0.0005 mg/l for the sum of various pesticides.

The company Duwest Costa Rica, S.A., a subsidiary of DuPont, sells most of the herbicides bromacil and diuron in Costa Rica. The health and well-being of Siquirres and other affected communities has been seriously compromised by the contamination of their drinking water, and this contamination is a violation of their right to water and right to a healthy environment. Their right to health has also been violated by the exposing of entire rural communities to hazardous pesticides, while their right to food has been violated by replacing basic food production by a cash-for-export crop system, which has brought them food insecurity.

591 *Ibid.*

592 *Ibid.*

593 Ramirez, 2011, *Op. cit.*

594 PAN Pesticide Database. 2011. (www.pesticideinfo.org)

595 Lawrence F. 2010. Bitter fruit: the truth about supermarket pineapple. *The Guardian*, UK. October 2.

4.5.2 OTHER CASES AGAINST DUPONT

DuPont is also charged in the following cases with multiple offenders:

1. Pollution and Endangerment of Arctic Tribal Nations and their Environment
2. Lake Apopka
3. Toxic Dumps of Obsolete Pesticides

4.6 BASF

BASF is a German-based company. It is a major producer of pesticides and the world's largest chemical company. BASF produces a range of extremely toxic chemicals and is responsible for environmental disasters. In 1996, BASF released 8 million kgs of toxins in Texas making it the second largest polluter in the state. BASF ventures in agricultural biotechnology involve the development of herbicide tolerant rice varieties, which were being tested in Malaysia. The cases documented here demonstrate the company's undue influence over corn production systems in the US, its collusion with authorities to introduce GE potatoes, and related environmental contamination.

4.6.1 BASF – CLEARFIELD STRANGLEHOLD

In 1992, BASF introduced what it called its 'Clearfield Production System' (CPS) for corn in the US. Since then, Clearfield lines have been developed and sold, through worldwide partnerships with over 100 seed companies, for other crops in particular wheat, rice, sunflower and canola.⁵⁹⁶ CPS crops are tolerant to the imidazolinone class of herbicides, which were brought onto the market in the 1980s. These herbicides work by inhabiting the acetolactate synthase (ALS) enzyme in plants, and consequently starving the sprayed plants.⁵⁹⁷ They are sold by BASF under a range of trade names, along with the CPS herbicide-tolerant seeds.

Exchanging weeds for pesticides, patents and worse weeds

A 2009 investigation into the 13 years of GE crops⁵⁹⁸ analysed non-GE herbicide tolerant crops and reported that: a) herbicide-tolerant crops were planted on roughly six million acres (as at 2007);⁵⁹⁹ b) weeds resistant to ALS inhibitors were more prevalent than any other class of herbicide-resistant weeds in the US, greatly limiting the usefulness and acreage planted to non-GE crops;⁶⁰⁰ c) one factor

⁵⁹⁶ Clearfield Production System. BASF.

⁵⁹⁷ The acetolactate synthase (ALS) enzyme (also known as acetoxy acid synthase, or AHAS) is a protein found in plants and micro-organisms. Inhibitors of ALS are used as herbicides that slowly starve affected plants of these amino acids, which eventually leads to the inhibition of DNA synthesis. They affect grasses and dicotyledons. The ALS inhibitor family includes sulfonylureas, imidazolinones, triazolopyrimidines, pyrimidinyl oxybenzoates and sulfonylamino carbonyl triazolinones (Wikipedia).

⁵⁹⁸ Benbrook, 2009, *Op. cit.*

⁵⁹⁹ Doane Market Research and Biotech Traits Commercialized: Outlook 2010, as cited in USDA APHIS (2008). "Finding of No Significant Impact on Petition for Nonregulated Status for Pioneer Soybean DP-356043-5," USDA's Animal and Plant Health Inspection Service, July 15. Response to Comments. p26.

⁶⁰⁰ Resistant to a major class of ALS inhibitors called sulfonylureas.

driving the adoption of Roundup Ready (RR) crops was the prevalence of weeds resistant to ALS inhibitors (common water hemp in the Midwest and many others). A pesticide-treadmill effect has developed with the use of herbicide-tolerant crops, whether GE or not. Weed scientists are increasingly concerned about the emergence of multiple herbicide-resistant weeds. In 2008, up to 9.9 million acres in the US had been infested with weeds resistant to atrazine (a Syngenta herbicide), related herbicides, and ALS inhibitors.⁶⁰¹

Farmers who purchase Clearfield seeds have to sign a 'stewardship agreement', which BASF actively enforces.⁶⁰² In Arkansas, the company sued 25 farmers for US \$2.5 million, which it claimed the farmers saved in 2005 by planting CPS seeds kept from the previous harvest. In 2006, BASF successfully sued a father and son for US \$400,000 for sharing seeds with each other without its authorisation.⁶⁰³ The Clearfield system was designed for industrial monoculture, not small traditional mixed farming systems.

Patented seeds, either GE or non-GE, may not be saved by farmers but must be bought every cropping season. This is counter to seed-rights, and long-held cultures of seed-saving and exchange.

Patented seeds, either GE or non-GE, may not be saved by farmers but must be bought every cropping season. This is counter to seed-rights, and long-held cultures of seed-saving and exchange. Non-GE herbicide-tolerant technologies like Clearfield carry almost all of the risks of GE counterparts, but are not subject to the same scrutiny because they are developed by mutagenesis⁶⁰⁴ in a process that is not regarded as genetic engineering. BASF and other companies producing these seeds enjoy the same intellectual property rights (IPRs) protection as those attached to GE crops, but without the same regulatory constraints or public scrutiny.

Dangers of imidazolinones

The limited data available already suggests that imidazolinones can pose risks to human health and the environment. They can cause severe eye injury.⁶⁰⁵ Although industry data claims that they are non-carcinogenic, studies show genotoxic risks.⁶⁰⁶ The metabolites can be more toxic than the parent compound. One of these, quinolinic acid, a primary breakdown product in soil is a neurotoxin, causing nerve lesions and symptoms similar to Huntington's disease.⁶⁰⁷ Imazapyr, an imidazolinone herbicide, has been found to contaminate water bodies, including groundwater, and persists in the soil.^{608, 609} Imazapyr kills almost all plants on contact, making spray drift on non-target species a particular concern; residues in soil could have a negative impact on intercropping.⁶¹⁰

⁶⁰¹ Benbrook, 2009, *Op. cit.*

⁶⁰² Cox S. 2003. Aimin' at the Public's Stomach. Crop Choice. tinyurl.com/y7u6d7. April 23.

⁶⁰³ BASF. 2005. BASF continues stewardship of Clearfield technology with Louisiana injunction. Research Triangle Park, North Carolina. January 5.

⁶⁰⁴ A process by which the genetic information of an organism is changed, resulting in a mutation. It may occur spontaneously in nature or as a result of exposure to mutagens such as chemicals or radiation. (Definition adapted from Wikipediaedia).

⁶⁰⁵ Cantox Environmental. 2007. Final Report. B25-1.0 Imazapyr.

⁶⁰⁶ Fragiorge EJ, de Renzende AA, Graf U, Spanó MA. 2008) Comparative genotoxicity evaluation of imidazolinone herbicides in somatic cells of *Drosophila melanogaster*. *Food and Chemical Toxicology* 46(1):393-401.

⁶⁰⁷ Northwest Coalition For Alternatives To Pesticides. 1996. Herbicide Factsheet: Imazapyr. *Journal of Pesticide Reform*. 16(3).

⁶⁰⁸ Börjesson E, Torstensson L, Stenström J. 2004. The fate of imazapyr in a Swedish railway embankment. *Pesticide Management Science* 60(6):544-9.

⁶⁰⁹ Ramezani M. 2010. Environmental fate of imidazolinone herbicides and their enantiomers in soil and water. PhD Thesis, University of Adelaide.

⁶¹⁰ GRAIN. 2006. Swapping striga for patents. October 26.

The Clearfield market

The R&D strategies for herbicide-tolerant crops enable companies to build a new market from an existing one. Strategies include partnerships to strengthen and expand their market share. For example, in 2000, BASF and Dow AgroSciences signed an agreement for the latter to market and sub-license BASF CPS herbicide-tolerant trait to the seed corn industry. Other agreements with Dow included: in 2001, the right to develop new Nexera canola varieties for CPS;⁶¹¹ and in 2004, the right in Brazil to market corn hybrids tolerant to the CPS herbicide OnDuty.⁶¹² In 2005, BASF joined forces with two non-profit agricultural centres, the International Wheat and Maize Improvement Centre and the African Agricultural Technology Foundation, to introduce Clearfield maize seeds called StrigAway or Ua Kayongo (Swahili for 'Striga killer'), to African farmers. The aim was purportedly to combat the striga weed in Africa's corn fields.⁶¹³

Rice is the major staple food of Malaysia. In 2003, BASF (BASF Sdn Bhd, Malaysia) entered a joint venture with the Malaysian Agricultural Research and Development Institute (MARDI) to develop two herbicide-resistant rice varieties called MR220-CL and MR220-CL2.⁶¹⁴ Like other CPS crops, these will be tolerant to BASF herbicides and would be promoted as a package to get rid of 'weedy' rice.⁶¹⁵ In July 2010, MARDI and BASF announced that the two rice varieties would be field tested in the state of Perak, making Malaysia the first to grow these varieties in the Asia Pacific Region under BASF's CPS.⁶¹⁶

In other developments, BASF, a leading producer of dicamba,⁶¹⁷ has collaborated with Monsanto on GE dicamba-resistant soybean^{618, 619} which is awaiting approval by the USDA.⁶²⁰ BASF is also awaiting the approval of a GE version of imidazolinone-resistant soybean that is likely to be resistant to higher rates of application.⁶²¹ BASF's commitment to biotechnology is emphasised through its membership of EuropaBio, which describes itself as *the voice for the biotech industry at the EU level*.⁶²²

The Clearfield system will encourage farmer-reliance on purchasing BASF seeds and herbicides. It will increase the use of herbicides with consequent adverse effects on human health and the environment. BASF has failed to take a precautionary approach and these actions violate the right to health, to a healthy environment and to safe food; they also jeopardise farmers' rights to livelihood and self-determination.

611 News Release. 2001. Dow AgroSciences and BASF announce global technology agreement for CLEARFIELD canola.

612 BASF. 2004. BASF and DOW Agrosciences announce partnership in the CPS in Brazil [News Release, November 24].

613 GRAIN, 2006, *Op cit*.

614 See RW. 2011. No padi angin means more rice. The New Straits Times. Kuala Lumpur, Malaysia. January 31.

615 Bernama News Agency. 2010. New padi strains will save RM100mln. Malaysia. July 9.

616 *Ibid*.

617 Dicamba is a chlorinated benzoic acid herbicide similar in structure and mode of action to 2,4-D, and is used in agriculture (e.g. corn, wheat) and on lawns. In 2001, the National Cancer Institute (NCI) found that farmers exposed to dicamba were nearly twice as likely to contract non-Hodgkin's lymphoma. Another NCI study reported associations between dicamba exposure and higher incidence of lung and colon cancer in pesticide applicators. Sources: (1) McDuffie HH, Pahwa P, McLaughlin JR, Spinelli JJ, Fincham S, Dosman JA, Robson D, Skinnider LF, Choi NW. 2001. Non-Hodgkin's lymphoma and specific pesticide exposures in men. *Cancer Epidemiology; Biomarkers & Prevention* 10:1155. (2) Centre for Food Safety. 2010. Dicamba Profile.

618 BASF. 2009. BASF and Monsanto formalize agreement to develop dicamba-based formulation technologies [Press Release, January 20].

619 Monsanto. 2011. BASF and Monsanto Take Dicamba Tolerant Cropping System Collaboration to the Next Level [News Release, March 14].

620 Petitions for non-regulated status granted or pending by APHIS as of October 12, 2011.

621 *Ibid*.

622 EuropaBio is the European Association of Biotech industries whose mission is 'advocating & educating on biotechnology'. In fact Dr Hans Kast, CEO from BASF is part of the Board of EuropaBio.

4.6.2 BASF AND GENETICALLY-ENGINEERED POTATOES

BASF owns the IPRs to the GE potatoes *Amflora*, *Amadea*, *Fortuna* and *Modena*. In Europe, BASF was promoting *Amflora* – developed by researchers at BASF Plant Science in Germany to alter the starch composition of the potato. By 2011, it had been planted in Germany, the Czech Republic, Sweden and Belgium. Small-scale farmers in Europe did not ask for this GE product, nor was there demand for it from traditional potato growers around the world. The International Potato Center (CIP) is a testimony to the huge diversity in naturally-occurring and traditionally-bred potatoes developed by peasants, indigenous peoples and local communities.⁶²³ *Amflora* is essentially a product for industrial use,⁶²⁴ developed for the potato starch industry in Europe. It is targeted at the paper coating, textiles processing, oil drilling mud and adhesives' industries. A larger objective is to protect the European starch business against non-European competitors that sell other starch sources. Natural potato starch comprises 80 per cent amylopectin and 20 per cent amylose but only the amylopectin part is required for many industrial uses. BASF's GE potato produces 98 per cent amylopectin. The gene responsible for the synthesis of amylose has been 'turned off'. *Amflora* will save the starch industry time and cost in of separating the two types of starch.

BASF has sought approval for the use of the potato pulp of *Amflora* as animal feed under the EU's Food and Feed Regulation.⁶²⁵ As both starches in a potato are necessary for nutrition it is not clear why the company believes this is suitable for animal feed. Profit, rather than feed safety, appears to be the motivation. BASF insists that growers maintain minimum distances from any neighbouring potato fields to prevent genetic contamination by *Amflora*, and that residues are isolated. This means that *Amflora* farmers are obliged by contract to comply with a system of identity preservation.⁶²⁶ This raises the question of why crops are allowed to be grown

Reportedly, almost a quarter of all potatoes grown in Europe are already used for non-food industrial purposes, another half for animal feed and only one quarter for human consumption, a proportion that has declined consistently since the 1980s.

for industrial uses on a large scale when the same crop is a source of food for people and livestock. Reportedly, almost a quarter of all potatoes grown in Europe are already used for non-food industrial purposes, another half for animal feed and only one quarter for human consumption, a proportion that has declined consistently since the 1980s.⁶²⁷

In April 2011, BASF announced that it had acquired rights to the Dutch company AVEBE's GE starch potato, *Modena*, a GE amylopectin potato.⁶²⁸ BASF now has ownership of this GE amylopectin potato. BASF is gearing up for its fourth GE potato – *Fortuna*. Again promoted for industrial purposes, the variety is intended for large-scale production of chips and crisps for human consumption. Small-scale farmers stand to lose from these developments. They must become contract growers and risk contaminating their lands.

623 Held in the CIP genebank.

624 BASF Products and Industries. *Amflora*, BASF website.

625 BASF Plant Science. 2005. Application for Amylopectin Potato Event EH92-527-1 according to Regulation (EC) No 1829/2003.

626 BASF. Undated. BASF website. Retrieved 16 March 2012.

627 Save Our Seeds. Undated. EU authorized BASF's Starch-potato. <http://www.saveourseeds.org/en/gvo-sorten/amflora-basfs-starch-potato.html>

628 BASF. 2011. Next step in R&D cooperation between AVEBE and BASF Plant Science [Joint Press Release, April 15].

Collusion

The EC granted approval to grow *Amflora* in March 2010, amidst widespread protests from environmental groups and voices in Europe calling for seed and biosafety.⁶²⁹ The company first requested approval from the EU to plant in Sweden in 1996. Between 1998 and 2004, however, Europe placed a moratorium on GE crop approvals. In 2003, after the EU modified its regulations, BASF resubmitted information for the cultivation of *Amflora* for industrial use and in 2005 for its use in food and feed. The EFSA concluded in February 2006 that *Amflora* does not pose a greater risk to humans, animals and the environment than conventional potatoes, *in the context of its proposed uses*.^{630, 631} This is not without controversy. A gene added to the GE potatoes renders them resistant against the antibiotics kanamycin and neomycin. The WHO has repeatedly cautioned against use of antibiotic resistant marker genes. According to EC Directive 2001/18, antibiotic resistance markers should be phased out from commercially released GMOs by 2004.⁶³² The Health Commissioner, John Dalli, with the agreement of the EC President José Manuel Barroso, used a procedural move – the so-called ‘written procedure’⁶³³ – to authorise BASF’s GE potato thereby avoiding a full-fledged debate in the EC’s College of Commissioners.

Environmental contamination

In August 2010, BASF applied to the EC for permission to grow and sell its new GE potato variety – *Amadea*. Approval had not yet been granted when *Amadea* was found growing amongst a field of *Amflora*. The illegal potatoes were growing in a field in Sweden owned and planted by Plant Science, a subsidiary of BASF.⁶³⁴ The EU issued a summons on BASF.

Summary of rights violated

GE crops pose a serious threat to agro-ecological balance. BASF could not prevent illegal *Amadea* production in Sweden demonstrating that oversight and legislative restrictions cannot prevent ‘leakage’ and contamination of nearby crops when GE crops are grown in open fields. BASF intends to expand its range of GE crops, and in 2009, the US Patent and Trademarks Office issued the trademark *AMFLORA* to BASF. The right to health is violated by the use of antibiotic marker genes in GE crops, an issue of international concern. The right to livelihood of small-farm agriculture is at risk with GE products and contractual obligations. Crops grown for industrial purposes can displace essential food production, posing a violation of the right to food.

⁶²⁹ Field Liberation Movement aimed to destroy GE potato trial in Belgium.

⁶³⁰ EFSA. 2006a. Opinion of the Scientific Panel on Genetically Modified Organisms on a request from the Commission related to the notification (Reference C/SE/96/3501) for the placing on the market of genetically modified potato EH92-527-1 with altered starch composition, for cultivation and production of starch, under Part C of Directive 2001/18/EC from BASF Plant Science. *The EFSA Journal* 323:1-20.

⁶³¹ EFSA. 2006b. Opinion of the Scientific Panel on Genetically Modified Organisms on an application (Reference EFSA-GMO-UK-2005-14) for the placing on the market of genetically modified potato EH92-527-1 with altered starch composition, for production of starch and food/feed uses, under Regulation (EC) No 1829/2003 from BASF plant science. *The EFSA Journal* 324:1-20.

⁶³² European Commission. 2001. Directive 2001/18/EC of the European Parliament and of the Council on the deliberate release into the environment of genetically modified organisms and repealing Council Directive 90/220/EEC.

⁶³³ One of four ways the Commission decides is by written procedure. A proposal is circulated in writing to all Commission members, who notify reservations or amendments. Any member can call for a debate, in which case the dossier will be included in the agenda of a Commission meeting. If there are no reservations or amendments, the proposal is tacitly adopted.

⁶³⁴ BASF. 2010. BASF Plant Science identifies case of low level comingling in *Amflora* fields in Sweden [News Release, September 6].

4.6.3 OTHER CASES AGAINST BASF

BASF is also charged in the following cases with multiple offenders:

1. Pollution and Endangerment of Arctic Tribal Nations and their Environment
2. Lake Apopka
3. Organophosphates
4. Aerial Spraying: Chemical Trespass
5. Toxic Dumps
6. Cancer in Punjab
7. Fipronil: Unsafe impacts of a “modern” insecticide
8. Suppression, Corruption, Manipulation and Distortion of Science

4.7 CASES WITH MULTIPLE OFFENDERS

4.7.1 POLLUTION AND ENDANGERMENT OF ARCTIC TRIBAL NATIONS AND THEIR ENVIRONMENT

4.7.1.1 *Production and dispersal of persistent organic pollutants*

Bayer, Syngenta, Monsanto, Dow, DuPont, and BASF manufactured and marketed POPs and other organochlorine pesticides. POPs are long-lasting, bioaccumulate through the food web, are capable of long-range transport and are toxic to humans and wildlife.⁶³⁵ Syngenta (Ciba-Geigy, now merged into this conglomerate) introduced DDT, and the chemical has also been manufactured by other agrochemical TNCs. As of 2011, DDT was being manufactured for malaria vector control by the governments of India, China and North Korea. Bayer introduced endosulfan, another POP, subsequently manufactured by several other companies.

Known as the ‘hemispheric sink’, the Arctic is one of the most contaminated parts of the world despite being located thousands of miles from industrial centres. POPs were not used in the Arctic region, but have been ‘transported’ after use in large quantities for pest control in agriculture, building maintenance and/or public health vector control. Through a process known as ‘global distillation’ POPs accumulate in temperate regions as prevailing ocean and wind currents bring contaminants to the Arctic where they are trapped by the cold climate and do not readily biodegrade. Some chemicals repeatedly evaporate in warmer climates and condense when the temperature drops during their northward journey, in a process referred to as ‘the grasshopper effect’.⁶³⁶ Hazardous waste sites left by the military since the Cold War are another source of continuing contamination of the Arctic as some POPs were used and disposed of in the Arctic by the US military.

⁶³⁵ UNEP. 2011. What are POPs? Stockholm Convention on Persistent Organic Pollutants.

⁶³⁶ Wania F. 2003. Assessing the potential of persistent organic chemicals for long-range transport and accumulation in polar regions. *Environmental Science and Technology* 37(7):1344-1351.

Such POPs bioaccumulate through the food chain, from fish to marine mammals and other components of the Arctic diet, with adverse impacts on the health of indigenous peoples. Levels of DDT, chlordane and endosulfan have been increasing even though most have been widely banned for decades (limited exceptions are DDT and endosulfan the use of which continues in some countries). Yet they continue to deposit and accumulate in the Arctic, thousands of miles from the place of application. Degradation products of chlordane are eight to 10 times higher in people in St Lawrence Island than in other US States.⁶³⁷

4.7.1.2 POPs threaten health

The highly toxic organochlorine pesticides DDT, toxaphene, chlordane, endosulfan, and lindane, and other POPs including PCBs, have been found in human and animal tissue in the Arctic at levels several times higher than in the rest of the world.^{638, 639, 640, 641, 642, 643, 644} PCB levels are eight to 12 times higher than in other US states. As presented at the PPT by Alaska Community Action on Toxics (ACAT) (Appendix 5.4), some indigenous Arctic populations have levels of contaminants in blood and breast milk higher than those found anywhere else on the Earth.^{645, 646, 647, 648} POPs chemicals are changing the DNA of people living in the region, with implications for intergenerational health effects. Contamination of human milk in Arctic mothers by POPs pesticides has been found at levels considered unsafe.^{649, 650} Bioaccumulation of organochlorine pesticides in the body can have far reaching consequences. The adverse health impacts in Alaska has been documented in St. Lawrence Island, and – consistent with scientific studies – show cancers, reproductive effects, learning and developmental problems, diabetes and heart disease.⁶⁵¹ POPs pesticides continue to build up in humans and animals. The native people of the Arctic are faced with a devastating dilemma: switch from a healthy traditional diet, essential for cultural survival, to a diet of imported foods, or risk exposing themselves to contaminants, potentially causing cancer and adverse neurodevelopmental effects.

⁶³⁷ Unpublished data, Alaska Community Action on Toxins.

⁶³⁸ UNEP, 2011, *Op cit.*

⁶³⁹ Agency for Toxic Substances and Disease Registry. 2002. Toxicological Profile for DDT, DDE, and DDD: Potential For Human Exposure.

⁶⁴⁰ Weber J, Halsall CJ, Muir DC, Teixeira C, Burniston DA, Strachan WM, Hung H, Mackay N, Arnold D, Kylin H. 2006. Endosulfan and gamma-HCH in the Arctic: an assessment of surface seawater concentrations and air-sea exchange. *Environmental Science and Technology* 40(24):7570-7576.

⁶⁴¹ Mackey N, Arnold D. 2005. Evaluation and Interpretation of Environmental Data on Endosulfan in Arctic Regions. Draft Report for Bayer CropScience Report Number CEA.107.

⁶⁴² ACAT. 2011. Endosulfan and the Arctic: Annex A for endosulfan. COP. Alaska Community Action on Toxics. April 5.

⁶⁴³ CAREX. 2012. Lindane: Pesticides – Possible Carcinogen (IARC 2B). Surveillance of environmental and occupational exposures for cancer prevention. Carcinogen Exposure, Canada.

⁶⁴⁴ ACAT. 2009. Persistent Organic Pollutants in the Arctic: A report for delegates of CoP4 of the Stockholm Convention. Alaska Community Action on Toxics.

⁶⁴⁵ *Ibid.*

⁶⁴⁶ ACAT. 2011. Global Contaminants.

⁶⁴⁷ AMAP. 1997. Arctic Pollution Issues: A State of the Arctic Environment Report. Arctic monitoring and Assessment Programme (AMAP), Oslo, Norway.

⁶⁴⁸ AMAP. 2002. Arctic Pollution 2002: Persistent Organic Pollutants, Heavy Metals, Radioactivity, Human Health, Changing Pathways. Arctic Monitoring and Assessment Programme (AMAP), 2002. Oslo, Norway.

⁶⁴⁹ ACAT, 2009, *Op. cit.*

⁶⁵⁰ Carmen A, Waghiyi V. 2012. Indigenous Women and Environmental Violence: A Rights-based approach addressing impacts of Environmental Contamination on Indigenous Women, Girls and Future Generations. Submitted to the UN Permanent Forum on Indigenous Issues Expert Group Meeting – Combating Violence Against Indigenous Women and Girls. January 18-20.

⁶⁵¹ Yupik Delegation St. Lawrence Island. 2009. Environmental Health and Justice for St. Lawrence Island, Alaska. St. Lawrence Island Yupik Delegation Statement of Purpose. September.

4.7.1.3 POPs accumulation threatens the environment

Although DDT was banned for agricultural use in the US and many other countries over 40 years ago it continues to accumulate in Arctic wildlife, for example in peregrine falcons and orcas. Migratory animals are thought to offload their body burdens into Arctic ecosystems through excretion of wastes and during decomposition.⁶⁵² The large rivers that empty into Arctic waters contribute, in a single year, hundreds of kilograms of POPs such as DDT.⁶⁵³ Once in the Arctic environment, POPs are incorporated into biological systems.⁶⁵⁴ The lipid-based food web of the Arctic protects its wildlife by maintaining a stable internal body temperature regardless of external influences⁶⁵⁵ and providing energy stores for extended fasts.⁶⁵⁶ As many POPs bioaccumulate in lipids, Arctic organisms are capable of accruing high concentrations of these chemicals. With no efficient detoxification mechanism, POPs remain in the tissues of Arctic biota.⁶⁵⁷

4.7.1.4 Livelihoods threatened – access to food and costs

The Arctic is home to approximately half a million indigenous people, who face significant food security and health challenges from global contaminants and climate change. Indigenous people of the Arctic communities depend on foods from the land and ocean, yet traditional food sources from hunting and gathering, such as fish and marine mammals, can have significantly higher levels of POPs⁶⁵⁸ than market foods. The store-bought food costs almost six times more for the same products in Alaska compared to other US states. Often struggling to survive on incomes below the poverty level, such high costs create a significant economic burden. Indigenous peoples should not be forced to choose between maintaining their traditional diet and protecting themselves from the harmful effects of POPs. In many areas, there is no alternative to the subsistence way of life as there is no cash-based economy.⁶⁵⁹ The contamination of traditional diets leads to nutritional, economic and cultural losses.

Vi Waghiyi, ACAT and Tribal Member of the Native Village of Savoonga, St. Lawrence Island (see Appendix 5.6)

Our traditional foods are highly contaminated with chemicals that are transported on wind and ocean currents into the Arctic from more southerly latitudes throughout the hemisphere. The Arctic has become a hemispheric sink for these pesticides and other industrial chemicals that now contaminate our lands, wildlife and the Indigenous ... Arctic Indigenous peoples suffer levels of contamination of these POPs in blood and breast milk that are among the highest of any population on earth, even though these chemicals have never been produced in the Arctic. These pesticides and other industrial chemicals threaten the health and survival of our Indigenous peoples of the Arctic.

⁶⁵² Alaska Department of Environmental Conservation. 2008. Clean-up Chronology Report for St. Lawrence Island Facility Wide.

⁶⁵³ Hogan M, Christopherson S, Rothe A. 2006. Formerly Used Defense Sites in the Norton Sound Region: Location, History of Use, Contaminants Present, and Status of Clean-up Efforts. Alaska Community Action on Toxics.

⁶⁵⁴ Henifin KA. 2007. Toxic Politics at 64N, 171W: Addressing Military Contaminants on St. Lawrence Island. (Graduate thesis).

⁶⁵⁵ An animal that is able to maintain a constant internal body temperature independent of the external temperature.

⁶⁵⁶ ACAT. Undated. Military Waste in Alaska.

⁶⁵⁷ *Ibid.*

⁶⁵⁸ US Department of the Interior (Alaska), Department of Environmental Conservation & Department of Health and Social Services, USEPA, National Oceanic and Atmospheric Administration, University of Alaska Institute for Circumpolar Health Studies, Alaska Federation of Natives, Alaska Native Science Commission, Alaska Inter-Tribal Council, Native American Fish and Wildlife Society, Alaska Native Tribal Health Consortium, ACAT, North Slope Borough. 2000. Contaminants in Alaska – Is America's Arctic at Risk? Interagency Collaborative Paper.

⁶⁵⁹ ACAT, 2009, *Op. cit.*

Shawna Larson, Tribal member and resident of Alaska:

It is a violation of our cultural rights – chemicals coming into the area are having a direct impact on our religious rights – which is a direct contravention of the US constitution. The chemicals are getting into the bodies of animals and killing them off, causing sicknesses like pus sacks, cancers, tumours. In combination with global warming this is dangerous. Higher temperatures due to global warming will release pesticides and other toxic chemicals trapped in the snow and this is already showing up in animals that we depend on for food and our cultural practices. These toxic chemicals trespass our bodies and enter our breast milk – our children and infants are getting these. We are seeing impacts of these through things like respiratory health and breast cancer increases. These toxic chemicals are also impacting our DNA for the future – changing us as a people. That is against all fundamental human rights.

The Convention on the Rights of the Child is being violated since our children's bodies are being contaminated against their will and knowledge with POPs pesticides which biomagnify up the food chain and bioaccumulate.

4.7.1.5 Pollution continues of Arctic tribal nations by the US government and agrochemical TNCs

US government agencies, by law, have an obligation to consult with the Sovereign Tribal Nations on government actions and policy decisions that affect their well-being under the US Presidential Executive Order number 13175. USAID, being a Federal agency, has the same obligation. Pesticide spraying of POPs in tropical areas has a direct bearing on the lives of Arctic communities. Thus the USAID funding of Indoor Residual Spraying (IRS) operations in Africa for malaria control, some of which include the use of DDT^{660, 661} (e.g. by US government contractor Research Triangle International), has violated a legal obligation and caused exposure of the Arctic Tribal Nations to POPs pesticides. Representatives of Bayer, BASF, Syngenta and other pesticide companies are members of the WHO Roll Back Malaria (RBM) Partnership, along with Research Triangle International. Several governments⁶⁶² promote the use of insecticides, including DDT for malaria control. These bodies know that DDT will end up in the Arctic environment and affect the food and bodies of Tribal Nation people. This action constitutes a threat to the health and the survival of Arctic people. The US government failed to consult and has neglected its obligation to protect the health of the Tribal Nations. It has contributed to their gradual decimation by allowing and supporting the production, marketing, and use of POPs.

An interagency paper prepared with collaboration between several Alaskan government departments and Tribal peoples highlighted the risks of exposure to POPs pesticides and other POPs chemicals to people and the environment in Alaska.⁶⁶³ The US government conducted a nutritional analysis of the typical indigenous diet as part of the 2006 North American Regional Action Plan on lindane and were in full knowledge of the nature of such a diet and its high reliance on marine mammals at the

⁶⁶⁰ van den Berg H. 2009. Global status of DDT and its alternatives for use in vector control to prevent disease. *Environmental Health Perspectives* 117(11):1656-1663.

⁶⁶¹ US President's Malaria Initiative. Indoor Residual Spraying.

⁶⁶² Roll Back Malaria. RBM Private Sector Constituency.

⁶⁶³ Hild CM. 2003. Chapter 11 Contaminants in Alaska: Is America's Arctic at Risk? (pages 95-108) for the publication *The Status of Alaska's Oceans & Watersheds 2002*. Prepared under contract by Exxon Valdez Oil Spill Trustee Council, Anchorage, AK.

top of the bioaccumulation and biomagnification chain.⁶⁶⁴ Furthermore, evidence presented to the delegates (including representatives from the US and the rest of the world) to the POPs COP in 2009, by indigenous peoples from the Arctic, gave full scientific evidence and technical analysis of the nature of POPs contamination of the Arctic biota and environment. Hence countries that use POPs pesticides do so knowing full well the harms these are causing to the people of the Arctic.

4.7.2 LAKE APOPKA, FLORIDA

4.7.2.1 *Exposure to POPs, health hazards to farm workers and communities*

For over 50 years, the environment and the farm worker community of Lake Apopka in Florida, USA have been exposed to highly toxic chemicals, including the POPs pesticides aldrin, dieldrin, chlordane, DDT and toxaphene. These pesticides were found in soil sediments and in bird tissue at Lake Apopka. The POPs insecticides and other pesticides were used on the fields that were carved out of the lake during World War II to cultivate vegetables including corn, carrots, cucumbers, radishes, cabbage, parsley, cilantro, potatoes, cauliflower, celery, broccoli, tomatoes, and lettuce. Lake Apopka's farm worker community were exposed to pesticides from direct aerial spraying or drift; from dermal contact with sprayed crops; during planting, harvesting and packing; from pesticides drifting into their homes and vehicles, including company transport vehicles; from contact with clothes and other items sprayed with pesticides or contaminated with pesticide residues; from eating fish and wild game and drinking water contaminated with pesticides; from using discarded pesticide containers for home use activities. In further contamination, in 1980 the Tower Chemical Company, adjacent to Lake Apopka, spilled a mixture of pesticides that contained DDT into a holding pond that reached the lake. The company closed and the abandoned plant is registered as an EPA Superfund site that has been only partially remediated.⁶⁶⁵

Aldrin, dieldrin, endrin, DDT, chlordane and toxaphene have been banned for decades in the USA,^{666, 667, 668} and most of the world. In an extensive study by the Centers for Disease Control and Prevention, aldrin, dieldrin, DDT and chlordane (toxaphene was not tested for) among other chemicals were found in the blood and urine of all people sampled in the Lake Apopka area.⁶⁶⁹ These 'dead chemicals' (with the exception of DDT for use in malaria control) have been banned for decades globally and are listed in the Stockholm Convention. POPs can cause severe chronic illnesses such as neurological damage, Parkinson's disease, birth defects, respiratory illness, abnormal immune system function, endocrine disruption and cancer. There is evidence that low-level exposure in the womb can irreversibly damage the reproductive and immune system of the foetus. Acute poisoning by these pesticides produces tremors, nausea, dizziness, headache, skin irritation, and seizures.

For several generations the African American farm worker community in Lake Apopka area has endured and continues to suffer from high rates of serious and often multiple chronic debilitating diseases. These include arthritis, diabetes, rheumatism, lupus, allergies, skin problems, throat problems,

⁶⁶⁴ Commission for Environmental Cooperation. 2006. North American Regional Action Plan on lindane and other HCH isomers.

⁶⁶⁵ US EPA. 2010. Tower Chemical. Region 4: Superfund.

⁶⁶⁶ US EPA. 2010. Blood Persistent Organic Pollutants Level. Report on the Environment.

⁶⁶⁷ US EPA. 1972. DDT Ban Takes Effect [Press release, December 31].

⁶⁶⁸ US EPA. 1975. Train Stops Manufacture of Heptachlore/Chlordane, Cites Imminent Cancer Risk [Press release, July 30].

⁶⁶⁹ CDC. 2009. Protecting Our Health. National Report on Human Exposure to Environmental Chemicals. Centers for Disease Control and Prevention.

asthma, congenital disorders, and learning disabilities. Second and third generation children are health impaired with chronic diseases. A 2005 student science project guided by Dr Elizabeth Guillette (who had pioneered similar studies in Mexico), on the cognitive abilities and motor skills of the 3-5 year-old children of Lake Apopka farm workers exposed to pesticides, showed that the children performed distinctly worse in all tests than children from parents with no known exposure.⁶⁷⁰

Rural, low-income families in the Lake Apopka area lack adequate health care and the economic resources to treat diseases caused by poisons introduced in their environment by distant corporations removed from their daily lives and unaccountable by current regulations. The community has consistently requested state and federal agencies to undertake health assessments of farm workers who experience debilitating illnesses and death. In 2009 the community requested the intervention of the UN Committee on the Elimination of Racial Discrimination to look at their case.⁶⁷¹

Agrochemical TNCs have remained silent and ignored the suffering of this community contaminated with their products. The original pesticide manufacturers and marketers were far away from Lake Apopka but the products of their original creation were there in massive quantities to cause disruption to wildlife and people. The pesticide manufacturers have grown into mega-corporations through the sales of POPs that continue to affect the lives of the poorest and most marginalised segment of society.

The Lake Apopka farmworkers worked to plant, harvest and pack food for the country with no knowledge of the chronic poisoning that would remain a burden in their bodies. Meaningful Worker Protection Standards for farm workers were not implemented until 1995 in the US, meaning that prior to this time, farm workers were untrained, uninformed, and unprotected about and against pesticide exposure while some of the most persistent and egregious pesticides were in use.

4.7.2.2 Long term environmental impacts at Lake Apopka

The pesticides DDT, toxaphene, aldrin, dieldrin, and chlordane were found in soil sediments and in bird tissue at Lake Apopka.^{672,673} The contamination by POPs pesticides of Lake Apopka gained international attention in the 1990's because studies revealed genetic abnormalities and low reproductive rates in the lake's alligator population and links to hormone disrupting POPs chemicals. These are the same pesticides that farm workers and rural communities have been continually exposed to for generations. According to the US Fish and Wildlife Service toxaphene, dieldrin, and DDT were responsible for the worst bird death disaster recorded in US history in the 1998-99 winter at Lake Apopka where over 1,000 fish-eating birds died.⁶⁷⁴ Breakdown components of DDT were linked to genetic mutations, abnormal hormone levels, and sexual development abnormalities of Lake Apopka's alligator population.⁶⁷⁵ The planned restoration of the north shore of Lake Apopka has been on hold for over a decade because of the persistent pesticides that remain on the former farmlands.

⁶⁷⁰ FWAf. 2006. Lake Apopka Farmworkers Environmental Health Project Report on Community Health Survey May 2006.

⁶⁷¹ Orlando Sentinel. 2008. Farmworkers want U.N. Intervention. Orlando Sentinel. March 7.

⁶⁷² US Fish and Wildlife Service. 2001. Lab Results Released from Lake Apopka Wildlife Death Investigation [News Release, June 11].

⁶⁷³ St. Johns River Water Management District. 2005. Lake Apopka North Shore Restoration Area Feasibility Study Orange and Lake Counties, Florida. Prepared by MACTEC Project No.: 609604004, Newberry, Florida.

⁶⁷⁴ *Ibid.*

⁶⁷⁵ Guillette LJ Jr, Gross TS, Masson GR, Matter JM, Percival HF, Woodward AR. 1994. Developmental abnormalities of the gonad and abnormal sex hormone concentrations in juvenile alligators from contaminated and control lakes in Florida. *Environmental Health Perspectives* 102(8):680-688.

By the 1990s all uses of aldrin, dieldrin, endrin, chlordane, DDT, and toxaphene ended in the US, although DDT was still produced for export. In banning these pesticides, US EPA referred to the ... *unacceptable risks to the environment and potential harm to human health, and the human cancer hazards.*^{676, 677, 678, 679} ... *Many of these pollutants are a serious threat, even in small amounts, because they are long-lasting...*⁶⁸⁰

This extensive contamination of the environment and living organisms, including food, has caused exposures through several generations resulting in acute and chronic toxic effects.⁶⁸¹ The African-American Lake Apopka farm worker community is an ageing community that in many cases had parents, grandparents, children and grandchildren working alongside each other in the fields. Hence, the bioaccumulative properties of these pesticides have negatively impacted multiple generations of farm workers with long-term, chronic health problems from cumulative and synergistic effects.

4.7.2.3 Effects of POPs on livelihoods in Lake Apopka

Like other communities around the world, residents in the Lake Apopka region depend on wildlife and fish as a source of nutrients and in some cases it is the most accessible food source. Fish at Lake Apopka contain such high levels of POPs pesticides that the Florida State Department of Health was forced to issue a statement discouraging people from eating too many brown bullhead catfish because they could pose a health risk. Most of Lake Apopka's former farm worker community lives below the poverty level, and fish and wildlife represent an important part of their diet.

Testimony from Lake Apopka Farmworkers

Geraldean Matthew

I grew up in the fields. It was the life I knew. My mother was a farmworker, and I remember playing in the fields as she worked. As I got older, I worked alongside her, cutting leaf stuff and packing corn. I got to be one of the fastest corn packers around. We travelled the seasons, but eventually settled and worked the vegetable fields on Lake Apopka. As I grew older, I remember planes coming overhead and spraying the fields and us. Sometimes, we would be all wet with what they sprayed. No one ever told us that they were spraying pesticides. They didn't care if they flew right over and sprayed us directly. Years later, we found out that they were not supposed to do that. But, back then, sometimes, we would see the pilots laughing as they flew over us and sprayed and they watched us duck to keep from getting wet. I remember seeing sick animals in the fields, too, like snakes that were so slow and birds that could barely fly. I did not think much about it at the time, except I remember thinking that it was unusual.

⁶⁷⁶ US EPA. 1972. DDT Ban Takes Effect [Press release, December 31].

⁶⁷⁷ US EPA. 1975. DDT Regulatory History: A Brief Survey (to 1975). Excerpt from *DDT, A Review of Scientific and Economic Aspects of the Decision to Ban Its Use as a Pesticide*, prepared for the Committee on Appropriations of the US House of Representatives by EPA, July 1975, EPA-540/1-75-022.

⁶⁷⁸ US EPA. 1975. Train Stops Manufacture of Heptachlore/Chlordane, Cites Imminent Cancer Risk [Press release, July 30].

⁶⁷⁹ Other non-pesticide POPs developed for industrial purposes are also found in the environment and in living organisms.

⁶⁸⁰ US EPA. 1997. US, Canada Move to Eliminate Toxics in Great Lakes [Press release, April 7].

⁶⁸¹ Stockholm Convention. 2011. What are POPs? Retrieved from website.

I wanted my kids to get an education and not have to spend their lives working in the crops. When my kids were very young, I would have to take them to the fields with me and they played in the car all day while I worked. I know now that they were exposed to pesticides and residues, but there was no training or education or regulations to protect us in those years – that didn't happen until the mid-1990s. Before that, we would take home empty pesticide containers and use them for our kids' trinkets, or to store flour or sugar. Some people even converted old pesticide barrels into barbecue grills or clothes' hampers. We didn't know the dangers. Pesticide containers with pretty labels were favourites among workers.

My youngest daughter had a seizure in the field when she was just three years old. In later years, she developed a brain tumour that was operated on and left her permanently disabled and she has lupus. My middle daughter also has lupus. My brother was born with a severe birth defect: he has shortened arms and hands that come from his shoulders. I am only 59 and I have diabetes, congestive heart failure, lupus and kidney failure, plus other health problems. There is a problem with there not being enough medical specialists to treat these complex health problems. The doctors like to say it is my fault because of my diet or lifestyle, but I can't help but wonder how different it might be if I had not been exposed to pesticides all those years, day after day and year after year.

What is really sad is that I see so many in my community suffering similar things. All the African-American former farmworkers are dying. And most are not that old. I go to dialysis three times a week and many of the people there getting dialysis used to be farmworkers themselves. It makes me have lots of questions. And the funerals! Seems like we are always going to funerals and I wonder how many of us will be left to tell our stories. We fed America all our lives, but we feel like we are the forgotten ones. They have spent millions of dollars to study the alligators and bird deaths on Lake Apopka, but not one red cent to help the people in our community. How can people look at the wildlife and completely overlook the people who provided the food that fed a nation?

Linda Lee

I come from a family of farmworkers. We were a strong family, and we worked hard and pulled together. My mother and father taught us kids good values of hard work, family, honesty, integrity, clean living. We were a very close family. I don't have much family left now. Just my sister and me. The others have passed on. And, I am only 58 years old, but I have so many health problems, it would take a page to list them all. I have diabetes and lupus. I had a kidney transplant, after having been on dialysis for a period of time. I have had a gall bladder operation, eye surgery, and rashes. I have arthritis that sometimes is so bad it is difficult to walk. There was a period when I could not get out of bed for weeks because of the lupus. Today, I can get around, but sometimes I have lots of pain. I have been on disability for 12 years. But, I am still alive. That is not true for too many people in my community who have suffered and died too young ... sometimes it is hard going to all these funerals. We have known too much loss.

I used to work on the farms on Lake Apopka. We picked carrots and corn and leaf stuff and other vegetables. I started when I was eight years old, putting the packing boxes down the chute. All us kids would be in the fields. Sometimes, we would see white stuff on the plants, like a powdery substance. I know now that it was pesticide residue, but in those days we did not know anything.

I remember planes flying overhead and spraying the fields. We would get sprayed, too. That was in the days when they were still using DDT. Nobody ever gave us pesticide training. Nobody ever told us to wait until the plants were dry before we went in to the fields. Sometimes they sprayed us right where we were working. Lots of women had miscarriages or gave birth to babies with low birth weights. Some would have their baby right there in the fields. There are lots of learning disabilities in our community and I wonder if it is because mothers and babies had contact with the pesticides.

The doctors like to tell us that it is our fault we have these health problems. They say we did not eat right. But, we grew vegetables and we ate fresh vegetables. My family even had their own garden where we grew our own food. Folks would fish on the lakes and canals on Lake Apopka, and some would even hunt. We ate fish and sometimes other things, like opossum or turtles. If alligators and birds on Lake Apopka have pesticides, that must mean we got them too, when we ate the fish and wildlife. I belong to the lupus support group in Apopka. It is surprising how many people in the group used to work on the farms. I think they should do a study on how many people have lupus in this community and then ask the question 'why.' It might be too late for a lot of folks that have already passed on, but we would like some help and we would like some answers.

4.7.3 ORGANOPHOSPHATE INSECTICIDES: ADVERSE IMPACTS ON HUMAN HEALTH

Companies that produced organophosphate pesticides (OPs) include Syngenta, Dow, Bayer, BASF, DuPont and others. OPs are some of the most acutely toxic chemicals used in agriculture. They are widely used and large numbers of people are continuously exposed, particularly farmers, agricultural workers and rural communities. As many organochlorines began to be phased out in the 1970s, they were replaced by massive production of OPs such as monocrotophos, methyl parathion, chlorfenvinphos, propetamphos, methamidophos, dichlorvos, diazinon, azinphos-methyl, chlorpyrifos (Lorsban and Dursban), dichlorvos (DDVP), dimethoate, ethephon, malathion, naled and oxydemeton-methyl. Many are classified by the WHO as extremely or highly hazardous. OPs were one of the the most widely used groups of insecticides in the world. For instance, in 2000-2001 about 70 per cent of insecticides used in the US were OPs.⁶⁸² In the UK, by weight of active ingredient, they represented about 60 per cent of the arable insecticide market in 1996. In LMICs OPs are still widely used because they are cheaper than the newer alternatives.⁶⁸³

Designed to attack the nervous system of insects, OPs also affect the nervous system of humans and other vertebrate animals.

Designed to attack the nervous system of insects, OPs also affect the nervous system of humans and other vertebrate animals. They inhibit important enzymes that play a vital role in the transmission of nerve impulses, such as cholinesterase which ensures that the chemical signal that causes a nerve impulse is halted at the appropriate time. Cholinesterase deficiency causes interference with nerve impulse transmission. OPs are absorbed readily by all routes — ingestion, inhalation or skin contact.⁶⁸⁴

⁶⁸² Kiely T, Donaldson D, Grube A. 2004. Pesticides industry sales and usage: 2000 and 2001 market estimates. EPA, Office of Pesticide Pro-grams, Washington, US.

⁶⁸³ PAN UK. 1996. Organophosphate insecticides.

⁶⁸⁴ Pennsylvania Department of Health. 2011. Organophosphates/Nerve Agents as a Chemical Terrorist Agent.

A major concern is their effect on brain development of children and the unborn foetus. Some are carcinogenic and are known or suspected endocrine disruptors.^{685, 686, 687, 688}

Residues of many of these compounds are excreted in breastmilk and can cross placental membranes. Researchers have found OP breakdown products in children's urine and have raised concerns about their use on food and inside homes, since OPs have been linked to behavioural problems like Attention Deficit Hyperactivity Disorder.⁶⁸⁹ Symptoms of exposure include twitching, trembling, excessive salivation, inability to breathe because of paralysis of the diaphragm, convulsions, lachrymation, nausea, vomiting, diarrhoea, abdominal cramps, general weakness, headache and poor concentration. In serious cases, respiratory failure and death can occur.⁶⁹⁰ Other consequences may follow high acute exposures. From one to several weeks after exposure, organophosphate-induced delayed neuropathy (nerve damage) may set in. This may begin with burning and tingling sensations and progress to paralysis of the lower limbs. Susceptibility to OP toxicity varies greatly among individuals of any species. Frequent repeated mild exposure results in greater susceptibility due to depletion of the body's store of cholinesterase.⁶⁹¹

OPs are also linked with psychiatric effects: research reports have suggested that exposure to their use in agriculture produces depression, a major risk factor in suicides.⁶⁹² Research from Spain has shown that suicide rates are higher in areas of greater OP use.⁶⁹³ The high suicide rate among farmers in India, associated with OPs use lends support to this theory. According to a WHO report,⁶⁹⁴ considering organophosphates only as agents for suicide rather than causal factors shifts responsibility for prevention to the individual, reduces corporate responsibility, and limits policy options for control.

Most, but not all, OP insecticides break down rather quickly and do not bioaccumulate or persist in the environment. However repeated exposure has a cumulative effect because of the progressive inhibition of the enzyme cholinesterase.⁶⁹⁵ Because of their relatively quick breakdown, the health impact of OPs is felt mostly by agricultural workers, peasants, and rural communities. However, produce consumed soon after OP application may contain residues that could also affect consumers, particularly children, and OP metabolites have been found in children's urine.⁶⁹⁶

OPs can drift through the air away from the area of application. High concentrations of OP drift can cause immediate (acute) poisonings, resulting in serious illness and, in rare cases, death. OP drift may

⁶⁸⁵ Michigan Department of Natural Resources. 2011. Organophosphate Toxicity.

⁶⁸⁶ Rauh VA, Garfinkel R, Perera FP, Andrews HF, Hoepner L, Barr DB, Whitehead R, Tang D, Whyatt RW. 2006. Impact of prenatal chlorpyrifos exposure on neurodevelopment in the first 3 years of life among inner-city children. *Pediatrics* 118(6): e1845-e1859.

⁶⁸⁷ Curtis L. 2001. Organophosphate antagonism of the androgen receptor. *Toxicological Sciences* 60(1):1-2.

⁶⁸⁸ Lacasaña M, López-Flores I, Rodríguez-Barranco M, Aguilar-Garduño C, Blanco-Muñoz J, Pérez-Méndez O, Gamboa R, Bassol S, Cebrian ME. 2010. Association between organophosphate pesticides exposure and thyroid hormones in floriculture workers. *Toxicology and Applied Pharmacology* 243 (1):19-26.

⁶⁸⁹ Bouchard MF, Bellinger DC, Wright RO, Weisskopf MG. 2010. Attention-deficit/hyperactivity disorder and urinary metabolites of organophosphate pesticides. *Pediatrics* 125(6):e1270-e1277.

⁶⁹⁰ Pennsylvania Department of Health. 2011. Organophosphates/Nerve Agents as a Chemical Terrorist Agent.

⁶⁹¹ Ehrich M, Jortner BS. 2002. Organophosphate-Induced Delayed Neuropathy. In *Handbook of Neurotoxicology*, Volume 1, Edited by Edward J. Massaro. Chapter 2, p17-27. Humana Press Inc., New Jersey.

⁶⁹² London L, Flisher AJ, Wesseling C, Mergler D, Kromhout H. 2005. Suicide and exposure to organophosphate insecticides: cause or effect? *American Journal of Industrial Medicine* 47:308-321.

⁶⁹³ Parrón T, Hernández AF, Villanueva E. 1996. Increased risk of suicide with exposure to pesticides in an intensive agricultural area. A 12-year retrospective study. *Forensic Science International* 79(1):53-63.

⁶⁹⁴ WHO. 2009. Health implications from monocrotophos use: a review of the evidence in India. World Health Organization Regional Office for South-East Asia.

⁶⁹⁵ Michigan Department of Natural Resources. 2011. Organophosphate Toxicity.

⁶⁹⁶ Curl CL, Fenske RA, Elgethun K. 2003. Organophosphorus pesticide exposure of urban and suburban preschool children with organic and conventional diets. *Environmental Health Perspectives* 111(3):377-382.

also cause birth defects, cancer, asthma, developmental disabilities and other long-term (chronic) health effects; and harm the local environment by contaminating waterways, air and soil, killing fish, birds and other wildlife.⁶⁹⁷ Hundreds of thousands of people in the rural areas of California, for example, are chronically affected by OPs and other pesticides that move through the air after application.⁶⁹⁸

OPs have a wide range of pest control applications as contact, systemic and fumigant insecticides. Widely used in agriculture, they are also used against pests in households and catering establishments, head lice in humans, and a number of ectoparasites in domestic animals. Top uses include cotton, fruits, vegetables, corn, wheat, and for termite and mosquito control.

Highly toxic OP pesticides are banned or severely restricted in the most developed countries. FAO has called for a worldwide ban on the OP methyl parathion because of the high risk to rural workers in tropical areas and has stated that its use should be considered unethical.⁶⁹⁹ Yet these hazardous chemicals are supplied in great quantities to countries unable to say no and unable to ensure safe use.

4.7.3.1 *Monocrotophos use in India*

The main producers of monocrotophos are Syngenta, Dow and BASF. Ciba-Geigy first registered monocrotophos in 1965. In 1996, Ciba-Geigy merged with Sandoz and became Novartis. In 2000, Novartis and AstraZeneca merged their agribusiness activities to form Syngenta and became the first global group focusing exclusively on agribusiness. The Indian producer of monocrotophos, Nocil, was taken over by Dow in 1994 and in 2005 became a wholly-owned subsidiary (see 4.4.1). Monocrotophos was produced by Shell Chemical Company from 1976 to 1988; Shell sold its agricultural division to American Cyanamid in 1994, which then sold it to BASF in 2000.

Monocrotophos is highly toxic by all routes of exposure. It inhibits cholinesterase and it can be absorbed through ingestion, inhalation and skin contact. Ingestion of 120 milligrams can be fatal, and the WHO classifies monocrotophos as highly hazardous (Class 1b). It is included in the Rotterdam Convention, requiring prior informed consent before export,⁷⁰⁰ and has been banned in the US, EU, Australia, Cambodia, Indonesia, Laos, Philippines, Sri Lanka, Thailand, Vietnam and many other countries.⁷⁰¹

India produces, uses, and exports monocrotophos; at one stage it accounted for about 1/3rd of pesticides sold annually in India. This OP insecticide is registered in India for use against cotton pests. In practice it is also used to control pests on rice, sugarcane, groundnuts, fruits, spices and vegetables; brinjal and tomatoes receive the greatest number of applications. In 2006, monocrotophos was banned for use on vegetables because of high residue levels; however, the government did not enforce the restriction. The highest consumption occurs in cotton growing states. Monocrotophos is out of patent and is therefore affordable despite negative impacts on human health.

Pesticide poisoning in India is greatly underreported. Several studies estimate that about 20 per cent of poisoning cases are due to pesticides. Numbers may be close to 76,000 per year, while the official figures

⁶⁹⁷ PANNA. 2009. Experts Convene to Consider Hazards of Pesticide Drift: Air monitoring documents invisible route of chemical exposure, EPA to evaluate. PAN North America.

⁶⁹⁸ Kegley S, Katten A, Moses M. 2003. Secondhand Pesticides: Airborne Pesticide Drift in California. Californians for Pesticide Reform, 2003, PAN North America.

⁶⁹⁹ Copenhagen Post. 2006. UN Criticises Cheminova. November 27.

⁷⁰⁰ Rotterdam Convention. Undated. Annex III Chemicals.

⁷⁰¹ Watts M. 2011. Monocrotophos. Highly Hazardous Pesticides: A PANAP Factsheet Series. PAN AP, Penang.

indicated 13,000 in 2006. In Maharashtra OPs were responsible for 23 per cent of hospital admissions and 43.4 per cent of total deaths. A review of hospital-based studies during 1999-2005 on pesticide poisoning showed that monocrotophos poisoning has been reported in most parts in India with a higher fatality rate than other OP pesticides.^{702, 703} It is associated with both accidental and deliberate pesticide poisonings and fatalities, and is the main agent for suicide attempts, which mostly occur in rural areas (90 per cent in 2005). According to the Ministry of Home Affairs, in 2007 24,126 persons committed suicide by ingesting pesticides (20 per cent of all suicides recorded). Between 1997-2007 approximately 183,000 farmers committed suicide by ingesting pesticides. The areas most affected are the cotton growing states of Maharashtra, Andhra Pradesh and Madhya Pradesh. An agrarian crisis attributed to the increased cost of cultivation, resulting from higher input prices, and falling prices for agricultural produce, compounded by poor soil health due to excessive use of agrochemicals and falling water tables, has distressed debt-ridden farmers.⁷⁰⁴

Some research suggests that organophosphate insecticides are not only the agents for suicide but may be part of the causal pathway. Animal studies link OP exposure to serotonin disturbances in the central nervous system, which are implicated in depression and suicide in humans. Epidemiological studies conclude that acute and chronic OP exposure is associated with affective disorders.⁷⁰⁵

The conditions of use in hot climates, where full PPE can rarely be used, increases the health risks. The risks go beyond pesticide users; for example women washing clothes of spray operators are exposed to pesticides, and are unlikely to be aware of the risks; children and bystanders are at risk because of easy access to pesticides, lack of adequate labelling and communities are exposed via spray drift.

4.7.3.2 Organophosphate exposure of sheep dip workers in the UK

Health effects largely from the OP pesticides diazinon, chlorfenvinphos, propetamphos, chlorpyrifos and mixtures of these chemicals affected sheep farmers and workers in the UK. The manufacturers were Bayer, Syngenta (formerly Ciba-Geigy) and 28 other companies. The Bayer and Syngenta sheep dips contained diazinon. In 1976, the UK government introduced the 'Sheep Scab Order', which obliged sheep farmers to dip flocks in OP insecticides to kill the ectoparasites (mites) that cause sheep scab.⁷⁰⁶ Up to this time organochlorine insecticides had been used, but these leave residues in meat and the French rejected imports. The changeover to OPs took place at short notice, but the safety advice on the OP packaging remained the same as that for organochlorines, despite the fact that the effects of OPs are different and required more stringent PPE measures.⁷⁰⁷

Companies selling sheep dip products had to satisfy government committees and oversight bodies (Veterinary Medicines Committee, Veterinary Products Committee, Health and Safety Executive and National Office of Animal Health (which represents the animal medicines industry) that their products were safe for use with recommended PPE. The safety data sheets often did not provide complete information. For example, in the data sheet for the Bayer veterinary OP product Tiguvon there was no

702 Ragunathan, V. 2011. Plant Protection Expert, Consultant to the FAO, Chennai. Testimony presented to the PPT.

703 Ragunathan, V. 2009. Plant Protection Expert, Consultant to the FAO, Chennai, India (*pers.comm*).

704 WHO. 2009. Health implications from monocrotophos use: a review of the evidence in India. WHO Regional Office for South-East Asia.

705 *Ibid.*

706 OPIN. 2007. Review Of Literature Relating To The Effects On Humans Of Exposure To Organophosphates. Organophosphate Information Network, UK.

707 OPIN. 2007. Review of Literature Relating To The Effects On Humans Of Exposure To Organophosphates. Organophosphate Information Network, UK.

information under the headings: classification of hazard, toxicity, irritancy – eye, skin and sensitisation; and the data sheet stated that Occupational Exposure Standards and Maximum Exposure Limit were not applicable. Various data sheets provided information on tests carried out into health risks relating to birds, rodents and fish, but there is rarely any mention of effects on humans. Several data sheets (diazinon, chlorfenvinphos and propetamphos) stated the products were safe if used with rubber gloves, boots and aprons. In 1981, a Health and Safety Executive leaflet, MS17, pointed out that phenols – chemicals in sheep dips – would cause rubber to deteriorate and become permeable, thus allowing the OPs to come into direct contact with the skin; it further stated that repeated exposure to OPs can cause cumulative damage. This information was not mentioned in the data sheets.⁷⁰⁸

The Organophosphate Information Network (OPIN) learnt that the testing on humans mentioned in data sheets was carried out on company employees who were wearing comprehensive protective clothing. Daily blood tests were taken and anyone showing signs of exposure (lowered blood cholinesterase levels) would immediately be taken off working with OPs. OPIN has been contacted by 800 victims of OP insecticide dips in the UK. OPIN has received requests from doctors, farmers, wool-handlers, animal health inspectors and others for information on the effects of OP exposure and effective treatment.

4.7.3.3 Chlorpyrifos Exposure of Farmworker Communities in California, USA

Developed by Dow Chemical Company in 1965, chlorpyrifos has been widely applied in over 100 countries across the world, becoming the biggest selling OP insecticide by both volume and value.⁷⁰⁹ All residential uses of chlorpyrifos were banned in 2001 in the US.⁷¹⁰ Exposure to it is associated with early childhood developmental delays.^{711, 712} However, farm workers, their families and agricultural communities still remain at unacceptably high risk of exposure. Many OP insecticides can easily move through the air and drift onto nearby workers or bystanders. A study by the California rural community of Lindsay documented the presence of chlorpyrifos in their bodies using bio-monitoring. Seven of the eight participating women were above the EPA established 'acceptable' limit for pregnant and nursing women. Air monitoring studies found chlorpyrifos was often above levels deemed 'acceptable' by the EPA.⁷¹³ One participant, Luis Medellín, indicated the family awoke one night with headaches, nausea and vomiting. Pesticide applicators were spraying the orange grove next to their trailer park, and their air-cooling system pumped the fumes directly into the bedrooms. *It shoots it into the house and it's just like you were in the orchard, just walking around smelling the pesticides*, Luis told reporters.

Immediate symptoms of chlorpyrifos exposure include headaches, inability to concentrate, weakness, tiredness, nausea, diarrhoea and blurred vision, abdominal cramps, vomiting, sweating, eye watering, muscular tremors, pinpoint pupils, low blood pressure, slow heartbeat and difficulty breathing. Chlorpyrifos may also trigger the onset of asthma in people who have never had this disease or make

⁷⁰⁸ OPIN. 2005. Organophosphate Report. Organophosphate Information Network.

⁷⁰⁹ Research and Markets. 2011. World Outlook of Chlorpyrifos 2011-2015.

⁷¹⁰ US EPA. 2011. Columbia Center for Children's Environmental Health finds Pesticide Chlorpyrifos Is Linked to Childhood Developmental Delays. [Feature Story, March 22].

⁷¹¹ Lovasi GS, Quinn JW, Rauh VA, Perera FP, Andrews HF, Garfinkel R, Hoepner L, Whyatt R, Rundle A. 2011. Chlorpyrifos exposure and urban residential environment characteristics as determinants of early childhood neurodevelopment. *American Journal of Public Health* 101(1):63-70.

⁷¹² Rauh VA, Garfinkel R, Perera FP, Andrews HF, Hoepner L, Barr DB, Whitehead R, Tang D, Whyatt RW. 2006. Impact of prenatal chlorpyrifos exposure on neurodevelopment in the first 3 years of life among inner-city children. *Pediatrics* 118(6):1845-1859.

⁷¹³ Californians for Pesticide Reform. 2007. Airborne Poisons: Pesticides in our Air and in Our Bodies.

asthmatic symptoms worse in individuals who already have it.^{714, 715} Recent studies indicate numerous long-term health impacts associated with exposure. Even low-level exposures can interfere with the development of the nervous system in mammals. Studies of pregnant women in New York City exposed to chlorpyrifos through home pesticide use demonstrate a link between exposure to chlorpyrifos and low birth weights and smaller head size of new-borns. When chlorpyrifos was taken off the home-use market, infant birth weights increased. Highly exposed children (born before the ban) also showed delays in learning and mental development, and were more likely to have attention problems and pervasive development disorder. While the US EPA does not list chlorpyrifos as a carcinogen, recent studies suggest possible links to both lung and prostate cancer.^{716, 717, 718}

4.7.3.4 Methyl parathion in Cambodia

Methyl parathion was first produced by Bayer.⁷¹⁹ It is classified as extremely toxic (Class Ia) by the WHO⁷²⁰ and is listed in Rotterdam Convention because of impacts on human health under conditions of use in developing countries.⁷²¹ As noted above (in 4.7.3) FAO has called for a worldwide ban. Severely restricted in the US, the EPA risk assessment expressed concern about the potential of methyl parathion to cause cholinesterase inhibition and peripheral neuropathy from residues in food, drinking water and through operator exposure.⁷²² It can cause death by oral, dermal or inhalation exposure. It is highly persistent in the indoor environment and it is difficult to remove residues from surfaces and workers' clothing. Acute toxicity symptoms include sweating, nausea, vomiting, dizziness, diarrhoea, pupil constriction, muscle cramps, excessive salivation, laboured breathing, convulsions, and unconsciousness.

Although Cambodia banned methyl parathion, it remained one of the most common pesticides used by farmers until the neighbouring manufacturing countries, Thailand and China, stopped production. Cambodia does not produce pesticides and all products are imported. In the case of methyl parathion this constituted illegal trafficking. The Ministry of the Environment listed methyl parathion and other banned products among the pesticides that were available in the market in 2004.⁷²³ Methyl parathion is used in pesticide cocktail mixtures, making it difficult to isolate specific harm caused by this insecticide. However, many Cambodian farmers report sickness and debilitating diseases from continued use of pesticides.⁷²⁴ A community monitoring study by PAN Asia and the Pacific⁷²⁵ reported farmers mixing pesticides with their bare hands. People in rural communities are exposed to cocktails of highly toxic

714 Right Diagnosis. 2012. Symptoms of Chemical poisoning – Chlorpyrifos.

715 PANNA. 2012. Chlorpyrifos Factsheet. Pesticide Action Network North America. October 2006.

716 *Ibid.*

717 Whyatt RM, Rauh V, Barr DB, Camann DE, Andrews HF, Garfinkel R, Hoepner LA, Diaz D, Dietrich J, Reyes A, Tang D, Kinney PL, Perera FP. 2004. Prenatal insecticide exposures and birth weight and length among an urban minority cohort. *Environmental Health Perspectives* 112(10):1125-32.

718 Berkowitz GS, Wetmur JG, Birman-Deych E, Obel J, Lapinski RH, Godbold JH, Holzman IR, Wolff MS. 2004. In utero pesticide exposure, maternal paraoxonase activity, and head circumference. *Environmental Health Perspectives* 112(3):388-391.

719 PAN UK. 1997. Methyl parathion. *Pesticides News* 36:20-21.

720 WHO. 2010. The WHO Recommended Classification of Pesticides by Hazard, International Programme on Chemical Safety.

721 Rotterdam Convention. Undated. Annex III Chemicals.

722 US EPA. 2003. Interim Reregistration Eligibility Decision for Methyl Parathion. Case No. 0153. Signed 05/2003.

723 Ministry of Environment of the Kingdom of Cambodia. 2010. Country Situation Report on chemical Accident Prevention and Preparedness in Cambodia. Phnom Penh, Cambodia, March 2010.

724 E.J.F. 2002. Death in Small Doses: Cambodia's Pesticides Problems and Solutions. A report by the Environmental Justice Foundation, London, UK.

725 PANAP. 2010. Communities in Peril: Asian regional report on community monitoring of highly hazardous pesticides use. Penang, Malaysia: PAN AP.

chemicals without being fully aware of the risks. Prevailing socio-economic conditions in Cambodia, like other developing countries, lead to pesticide poisonings, violating the rights to life and health.

4.7.4 AERIAL SPRAYING: CHEMICAL TRESPASS

Defendants Monsanto, Syngenta, Bayer, BASF and Dow are charged with gross violation of human rights for encouraging, facilitating and supporting aerial spraying by manufacturing and selling pesticide formulations for this purpose. Aerial application of pesticides is a form of 'chemical trespass' that violates the right to freedom from interference with the family and home. It significantly increases the risks of health and environmental harm. It exposes people to toxic chemicals and contaminates air, food and water resources. Two cases are presented below: the poisoning of Kamukhaan village in the Philippines; and impacts on Maori way of life in New Zealand. A third case is documented under 4.3.1.1, Kasargod cashew nut plantations in Kerala, India.

Aerial spraying (sometimes known as crop dusting) applies pesticides (including herbicides, insecticides, fungicides and vertebrate poisons) from fixed-wing aircraft or helicopters, usually over large areas. It is an invasive method of pest control that does not respect boundaries, properties, human health or the environment. Aerial spraying is banned in all countries of the EU,⁷²⁶ although it can be approved in special cases by the competent authorities. It is still widespread in other countries, including Australia, Canada, New Zealand, USA, and many Latin American, Asian and African countries. Pesticides are applied over plantations, field crops, orchards, pastures, forests; they are applied against disease-carrying vectors in urban areas, aquatic areas and open terrain. Often the pesticide is applied, or drifts, well beyond the targeted area. The spray can drift hundreds of metres onto neighbouring properties and even kilometres away, particularly in the case of volatile pesticides. It can contaminate water supplies, non-target crops, vegetable gardens and other food sources. US spray drift modelling indicates that effects on non-target plants from aerially-applied paraquat can be expected at distances of greater than 300m.⁷²⁷ Aerial spraying frequently takes place very close to homes and communities, directly exposing children, pregnant women, sick people, livestock and pets.

In addition to the cases presented below, there are many examples where people have suffered human rights abuses of aerial spraying. In Hungary, aerial spraying of dichlorvos and deltamethrin in public areas against mosquitoes has created considerable concern because of the toxicity of the sprays.⁷²⁸ Dichlorvos may cause childhood leukaemia and brain tumours,^{729, 730} and is banned in Denmark, Sweden, Indonesia and the UK. Deltamethrin poses dangers to fish, bees and aquatic organisms as well as to humans.⁷³¹ In Andalucía, Spain, aerial spraying of olive groves with dimethoate has resulted in severe health effects to nearby residents, environmental damage and economic losses to organic olive growers. Dimethoate is classified as a possible human carcinogen and an endocrine disruptor by the UK and German environmental agencies⁷³². It is a groundwater pollutant and a reproductive toxin.

⁷²⁶ *Ibid*, p. 6.

⁷²⁷ Watts M. 2011. Paraquat monograph. PAN AP, Penang, Malaysia, p 34.

⁷²⁸ Gergely S. 2005. Clean Air Action Group Hungary protests against the aerial spraying of dichlorvos in public areas. PAN Europe Newsletter No. 23.

⁷²⁹ Zahm SH, Ward MH. 1998. Pesticides and childhood cancer. *Environmental Health Perspectives* 106(Suppl 3):893-908.

⁷³⁰ Davis JR, Brownson RC, Garcia R, Bentz BJ, Turner A. 1993. Family pesticide use and childhood brain cancer. *Archives of Environmental Contamination and Toxicology* 24(1):87-92.

⁷³¹ NPIC. 2008. Deltamethrin Technical factsheet National Pesticide Information Center, USA.

⁷³² PANUK. 2004. Pesticides News No. 66, December, pages 18-19

It has been estimated that 70 per cent of the spray misses its targets.⁷³³ In New Zealand, parents despair as young children become ill, and pregnant women fear the association with birth defects. Members of Parliament proposed a bill⁷³⁴ to make spray drift illegal beyond the boundary of the target property. However, the pesticide industry and applicators opposed the bill, saying it was not possible to prevent such drift. It is almost impossible to get legal redress because of the difficulty of proving adverse health effects were caused by a particular spray. In the Philippines, some communities in plantation areas say aerial spraying feels like rain; they cannot hide and are drenched. They suffer various ailments, from skin infections to respiratory illnesses, nausea, blindness, goitre, various cancers and other afflictions, and observe neurological and developmental delays in children. Livestock get sick and die. Non-target plants and trees die. Fish, bees and butterflies die. The communities are powerless to stop this abuse.

Aerial spraying is a very high-risk technology that benefits the land owners to the detriment of people living within or nearby – and in some cases at a considerable distance from – the area being sprayed. This blanket spraying envelops everything within the exposed area. Many species are not pests, weeds or diseases and include beneficial species that contribute to the functioning and stability of the ecosystem. Aerial spreading of fertiliser is equally problematic; for example in New Zealand, it has disproportionately promoted growth of weed and algal species in streams more able to exploit the increased nutrients.

The chemical identities of many of the inert ingredients in aerial spray formulations (up to 80-90 per cent) are classified as trade secrets and are not disclosed. The US EPA has been evaluating these inert ingredients and has labelled 100 of them ‘of known or potential toxicological concern’. Some are suspected carcinogens; others have been linked to central nervous system disorders, liver and kidney damage, birth defects and some short-term health effects. When members of the community in West Auckland, New Zealand fell ill from the government’s aerial spraying of the urban area with the insecticide Foray 48B (Bt var *Kurstaki* [Btk]), the government and the manufacturer refused to release the names of the other chemicals in the product even though medical people treating the victims, and the country’s top constitutional lawyer, had asked for the information.

Toxic pesticides such as diazinon, endosulfan, paraquat, glyphosate, 2,4-D, carbofuran, chlorothalonil, mancozeb and malathion are among those sprayed by air. Many are classified as highly hazardous and have been reported to cause cancer, reproductive disorders, birth defects and congenital diseases, disorders of the immune system, blood diseases, skin diseases and other ailments. Some pesticides being aerially sprayed in countries are banned elsewhere because of health or environmental effects. For example, the fungicide tridemorph, sprayed on banana plantations in the Philippines, is not registered in the US, Canada, Denmark, Finland, Netherlands, Portugal, New Zealand, Uganda, Tanzania, Nigeria, Madagascar, Gambia, Chad, Cape Verde, Cameroon or Burkina Faso.

While TNCs and plantations profit from aerial spraying, these unwelcome pesticides invade people’s homes, pose serious threats to health, and violate the right to freedom from interference with the family and home. Government regulation, which is often influenced by TNCs, facilitates these violations.

⁷³³ Perez JC. 2004. Aerial spraying incident provokes new calls for a ban in Spanish olive production.

⁷³⁴ The Agricultural Chemical Trespass Bill.

4.7.4.1 Kamukhaan: A poisoned village

Monsanto, Syngenta, Bayer, BASF and Dow encourage aerial spraying by manufacturing and selling formulations of pesticides for this purpose in the banana plantation of Lapanday Development Corporation (LADECO). LADECO is located in Davao del Sur, a province in the southern island of Mindanao in the Philippines. The company sprays by air twice a month for one hour on its plantations. The pesticides sprayed include (among others): Dithane (mancozeb), Baycor (bitertanol, a triazole fungicide), Furadan (carbofuran), Decis (deltamethrin), Namacur (fenamiphos) and Gramoxone (paraquat).

Kamukhaan is a small village located adjacent to the LADECO banana plantation. The village has an estimated population of 150 families whose main sources of livelihood are farming and fishing. During spraying, strong, odorous fumes spread throughout the village into homes. This causes eyes to sting painfully and the skin to itch. Most people experience feelings of suffocation, weakness and nausea. Children playing in the street come in coughing and complaining that their eyes hurt. Skin diseases, abnormalities and various types of illnesses are rampant. Many claim to experience a range of body aches – stomachaches, backaches and headaches – which are aggravated during spraying. Several suffer asthma, thyroid cancer, goitre, diarrhoea and anaemia.⁷³⁵ A number of adults have been diagnosed with serious, terminal diseases such as cancer. Many have died of contracted diseases.

Dr Romeo Quijano made several investigative visits to the village and obtained testimony from some of the 150 families.⁷³⁶ His investigation of the health of 136 residents of the population of 700 found:

- 13.9 per cent of residents checked had endocrine/neurologic dysfunction
- diseases atypical in quality e.g. severe anaemia in young males and blood dyscrasia⁷³⁷
- signs and symptoms suggestive of endocrine disruption
- infants are often born sick, and with abnormalities ranging from cleft lip and palate to badly disfigured bodies
- several children have been born with severe skin abnormalities
- it is not rare for infants to die at birth or shortly after.

Medical researchers concluded that the intrinsic hazardous character of pesticides, the clear temporal relationship and the empirical evidence, including testimonial and physical evidence, show that pesticide exposure is a strong causative factor of the high occurrence of diseases among residents in Kamukhaan. The presence of confounding variables, such as malnutrition and genetic predisposition, constitute a very small contribution to the causative factors.⁷³⁸ A Department of Health study, *Health and Environmental Assessment of Sitio Camocnaan in Hagonoy, Davao del Sur*, indicated that a majority of residents are exposed to pesticides.⁷³⁹ The study found high levels of ethylenethiourea (ETU) in blood samples indicating exposure to ethylenebisdithiocarbamate (EBDC) fungicides such as mancozeb. Mancozeb is listed as a known carcinogen to humans by the Swedish pesticide regulatory authority and the US State of California. In Southern Mindanao, mancozeb is routinely aerielly sprayed by big banana plantations. Dr Quijano's investigation found that pesticide spraying had polluted the soil and

⁷³⁵ Quijano I. 2002. Kamukhaan: Report on a Poisoned village. PANAP, Penang, Malaysia.

⁷³⁶ Quijan, 2002, *Op cit*.

⁷³⁷ Non-specific disease attributed to the loss of homeostasis of or balance in the blood.

⁷³⁸ Hernandez *et al.* 2003. Medical findings on the Health Effects of pesticides on the village of Kamukhaan, Davao del Sur.

⁷³⁹ Dionisio *et al.* 2006. Health and Environment Assessment of Sitio Camocnaan, Hagonoy, Davao del Sur.

the sea, killing trees, crops, animals and fish, and destroying the livelihood of farmers and fishermen over the years.

The Fertilizer and Pesticide Authority of the Department of Agriculture provided a list of registered pesticides used by LADECO in the banana plantation.⁷⁴⁰ The pesticides and manufacturers are as follows:

Brand name	Active ingredient	Producers in the 80s	Current producers
BASTA 20 SL	glufosinate	Aventis	Bayer
BASUDIN EC	diazinon	Novartis	Syngenta
BAYCOR 300 EC	bitertanol	Bayer Philippines	
CALIXIN 75 EC	tridemorph	Aventis	BASF
DECIS EC	deltamethrin	Aventis	Bayer
GRAMOXONE	paraquat	Jardine Davies	Syngenta
ROUNDUP EW	glyphosate	Monsanto Philippines	
TILT 250 EC	propiconazole	Aventis	Syngenta
DIURON 80 WP	diuron	Bayer Philippines	
CONFIDOR 100 SL	imidacloprid	Bayer Philippines	
GESAPEX	ametryne	Novartis	Syngenta
ROVRAL 50 WP	iprodione	Aventis	Bayer
AGRI-MEX 1.8 EC	avermectin	Novartis	Syngenta
INDAR 2F	fenbuconazole	Rohm and Hass	Dow
VONDOZEB	mancozeb	Aldiz	Syngenta
FURADAN	carbofuran	Bayer Philippines	
BUMPER 25 EC	propiconazole	Leads Agri Product	Syngenta
DACONIL	chlorothalonil	Aventis	Syngenta
BANKIT 25 EC	azoxystrobin	Jardine Davies	Syngenta
DITHANE F 448	manvozeb	Rohm and Hass	Dow
TOPSIN M 70 WP	thiophante methyl	Trans World Trading	Nippon Soda

⁷⁴⁰ Certification from Fertilizer and Pesticide Authority on June 2000.

Testimonies from Kamukhaan⁷⁴¹

Edgar: *A man in his early 30s has white spots on his skin and has difficulty in breathing. He suffers from severe cough and is unable to sleep at night.*

Linda: *(mid-40s) has a large lump on her neck, which had been growing for a long time. She believes her weariness and the growth on her neck resulted from pesticide exposure.*

Lilibeth: *(eight years) is constantly rushed to the hospital because of diarrhoea. She was born very small, and did not start to speak until she was four. She has great difficulty in understanding.*

Leonardo: *Testified that in one month alone five people died because of diarrhoea and fever.*

Michael: *Explained that his mother constantly complained of pesticide fumes. Her stomach became enlarged, and she became weak. The hospital diagnosed it as a complicated disease and she died two weeks later.*

Nanette: *(late 30s) Testified: Several people have died and many became sick, so we appealed to the manager of the plantation. But they refused to pay hospital bills if the illnesses are caused by our water and not by the pesticides, even when hospital doctors say that our water supply is contaminated by the pesticides that seep into our soil. That's also the reason why so many people get sick and spend so much (for medical bills).*

Ramil: *(25) Joined the banana plantation in 1996 working on canals or ditches. Pesticides were aerielly sprayed while he was working or eating. At each instance, he would notice yellowish powder on his skin causing itchiness and a burning sensation in his eyes. He experienced headaches and nausea, difficulty breathing, exhaustion, sleep problems, frequent thirst and yellowing of the skin. He quit his job due to his illness and went to the Davao Medical Centre for consultation where a doctor told him he had anaemia and needed blood transfusion. He was admitted to the Davao del Sur Provincial Hospital where he received six bags of blood. A plantation official asked that he be transferred to another hospital and said the company would shoulder medical costs. He refused, saying he would be discharged soon and preferred they helped many others who had yellow skin and needed medical help.*

Rolando: *(23) Worked for Lapanday-owned plantation MVPI, packing and spraying bananas – including mixing chemicals with water. As a worker in the plantation, he was exposed to aerielly sprayed pesticides. He suffered from burning sensations in the eyes, headaches and regular fever, fainting, skin itchiness and difficulty breathing. The symptoms remain.*

Sotero: *(66, resident of Kamukhaan for 44 years) Observed how natural bounty became scarce after aerial spraying started in LADECO. He worked at Lapanday for three months repairing banana tree supports. He quit because he could not endure the foul smell of the chemical Mira (isazophos)l. His wife worked at the Lapanday nursery for two months. She quit because of effects on her health and because her thumb was severed while working. Her illnesses started when she suddenly fainted and lost consciousness because of toxic fumes on the plantation. Afterwards, she started experiencing fuzziness, chronic fatigue, headache, frequent vomiting. She became pale and swollen. Her neck and stomach became enlarged. She was hospitalised three times, but died.*

⁷⁴¹ Quijano, I. 2002. Kamukhaan: Report On a Poisoned Village. PANAP. Penang.

Impacts on food supplies

Kamukhaan was previously rich in natural resources. Trees and vegetation were abundant and marine life was plentiful. The villagers either fished or planted crops for a living and always had more than enough to sustain a comfortable lifestyle. Dr Quijano says: *All that remains is barren land, a poisoned sea, and 700 sick and impoverished people breathing toxic air.*⁷⁴² The soil became arid; growing crops was no longer an option. Plant life in the village was seriously stunted. Coconut trees stopped bearing fruit.⁷⁴³ Waters were now heavily polluted. Fishermen recalled that 30 years ago they would catch up to 200 kilos of fish a day. Now two kilos are considered 'lucky'. They have observed the regular occurrence of fish kills. Extreme poverty means people eat contaminated fish, and consequently become ill.

Complaints have repeatedly been brought to the plantation owners but they refuse to take responsibility for contamination of water sources and the sea. The fishermen appealed to provincial authorities. They took samples of the dead specimens, water and soil to the town hall, but no definite action has been taken. Dr Quijano added: *With pesticides destroying the life from their land and water, villagers who never went hungry now go to bed with empty stomachs.*⁷⁴⁴

4.7.4.2 The Maori people of New Zealand

The pesticides 2,4-D (Dow), glyphosate (Monsanto) and sodium monofluoroacetate or 1080 (Tull Chemical Company), are commonly applied by air in New Zealand. The pesticide 1080 is classified by WHO as extremely hazardous (Class Ia). In recent years the insecticide Foray 48B (*Btk*) was aerially sprayed over several cities; and in the past there was widespread aerial spraying of 2,4,5-T and the highly persistent organochlorine pesticides DDT and dieldrin.

A Maori guardian of the land, when asked about 1080, said: *Aerial 1080 is culturally offensive to Maori as the mauri (life force) of wild life is indiscriminately and cruelly attacked. Traditional kai (food) suffers secondary poisoning. Our water is also sacred and all the resource consents to drop the toxin 1080 from helicopters state clearly that they are free to drop onto land where it may enter waterways.*⁷⁴⁵

Aerial application of pesticides is so common in New Zealand that it is widely accepted. Farmers and the government spray liberally to control or eradicate pests – from plant pathogens, weeds, insects and rats to bigger animals like stoats, rabbits, possums and wallabies.^{746, 747} In the past, it was chosen as the best way to dispose of obsolete stocks of dieldrin by aerially spraying it over vast tracts of pastureland.⁷⁴⁸ The herbicide 2,4,5-T, a product of ICI (now Syngenta) and Dow Chemical Company, was widely used in the 1960s and 1970s but was eventually 'voluntarily withdrawn' in 1989 after it was blamed for causing birth defects. The related herbicide 2,4-D is still commonly sprayed aerially. It is reported to have caused a number of illnesses: skin disease and irritations, severe headache and

⁷⁴² Quijano I. 2002. Kamukhaan. Report on a Poisoned village. PAN AP, Penang, Malaysia. p2.

⁷⁴³ *Ibid*, p. 4

⁷⁴⁴ *Ibid*, pp. 4-5

⁷⁴⁵ Robinson R. Email to Watts M, dated 15 July, 2010. Port Charles, New Zealand.

⁷⁴⁶ Watts MA. 2000. Ethical Pesticide Policy: Beyond Risk Assessment. PhD Thesis. University of Auckland.

⁷⁴⁷ Agrichemical Trespass Ministerial Advisory Committee. 2002. Final report to the Minister for the Environment. Ministry for the Environment, Wellington, New Zealand.

⁷⁴⁸ Northland Regional Council. 2002. State of the Environment Report, Ch. 16: Hazardous substances and contaminated sites.

nausea, panic attacks and other emotional disturbances, extreme fatigue and loss of appetite, multiple chemical sensitivity, Parkinson's disease and even heart complications.⁷⁴⁹

Foray 48B (*Btk*), manufactured by Valent Biosciences Corporation, was aerially sprayed by the government in urban areas of Auckland and Hamilton, starting in 1996, to eradicate moth infestations. Aerial spraying of this chemical covered some 20,000 hectares of urban areas, exposing at least a quarter of a million people over a period of eight years (1996-2004). Foray 48B reportedly caused respiratory diseases including asthma, eye, skin, throat and digestive disorders, and even neurological complaints and miscarriages. Despite numerous reports linking these human illnesses to the Foray 48B spray, the government concluded that *no adverse health patterns were found, once patterns were examined at a population level*,⁷⁵⁰ and that *the spray was safe*.⁷⁵¹ In late 2007, two independent reports from the Parliamentary Ombudsman⁷⁵² and the independent Peoples' Inquiry⁷⁵³ concurred that Foray 48B was not benign or harmless and that thousands of people in New Zealand experienced adverse health effects that were neither minor nor transient. These conclusions led to strong recommendations to the government to conduct further health research into the effects of the spray. Through its Health Research Council, the government continued to maintain that the effects on human health are minimal.

The pesticide 1080 is a vertebrate poison and was first imported to New Zealand in 1954 to control rabbits. It is now used, by aerial application, to kill possums to stop the spread of bovine TB and prevent damage to native flora. It is also aerially dispersed to kill wallabies, rats and stoats. The product is manufactured by the Tull Chemical Company in the US. New Zealand uses around 80 per cent of the total world production. The quantities involved are huge: it is estimated that sufficient 1080 is dropped over New Zealand each year to kill every person eight times over. The country consumes up to 4,000 kg of 1080 each year. In contrast, the Canadian Wildlife Service allows British Columbia to use only 2 kg per year and Canada's total annual use is 200 kg.⁷⁵⁴

For more than 20 years the New Zealand government has aerially broadcast this poison. In addition to target 'pests' (possums), it has killed dogs, sheep, cows, horses, deer, wild pigs, bats, native invertebrates and birds. People speak of silent forests after a '1080 drop' because so many birds have been killed. In 2008, 41 per cent of the native Kea parrot (an endangered species) population in the Fox Glacier area were accidentally killed in one aerial operation.⁷⁵⁵ Many of the aerial dispersal programmes have resulted in baits dropped accidentally into rivers, on private farmland, on public walking tracks, and recently into a lake, through pilot error or equipment malfunction.⁷⁵⁶ Dogs are particularly susceptible to secondary poisoning and agonising death from eating contaminated carcasses. In 2008 alone, at least seven dogs were killed.⁷⁵⁷ In 1994, a trucking operator got 1080 on his hands, and suffered headache,

⁷⁴⁹ Watts, 2000, *Op. cit.* Citing Donohoe M. 2000. Medical Report Mr Lawrence Newman (DOB: 30/10/49). Dr Mark Donohoe Mb Bs, Environmental & Nutritional Medicine, Mosman, New South Wales, Australia.

⁷⁵⁰ Office of the Ombudsmen. 2007. Report of the Opinion of the Ombudsman Mel Smith on Complaints Arising from Aerial Spraying of the Biological Insecticide Foray 48B on the Population of Parts of Auckland and Hamilton to Destroy Incursions of Painted Apple Moths, and Asian Gypsy Moth, Respectively During 2002-2004, Wellington.

⁷⁵¹ Sutton J. 2002. Press Release, Minister of Agriculture, Wellington.

⁷⁵² Office of the Ombudsmen, 2007, *Op. cit.*

⁷⁵³ Goven J, Kerns T, Quijano R, Wihongi D. 2007. Report of the 2006 People's Inquiry into the Impacts and Effects of Aerial Spraying Pesticide over Urban Areas of Auckland.

⁷⁵⁴ Whiting-O'Keefe P, Whiting-O'Keefe Q. 2007. Aerial Monofluoroacetate in New Zealand's Forests: An Appraisal of Scientific Evidence.

⁷⁵⁵ ERMA. 2009. Environmental Risk Management Authority Annual Report on the Aerial Use of 1080 for the year ended 31 December 2008; Pietak AM. 2010. A Critical Look at Aerial-Dropped, Poison-Laced Food in New Zealand's Forest Ecosystems.

⁷⁵⁶ Poisoning Paradise. DVD by the Graf Brothers.

⁷⁵⁷ ERMA, 2009, *Op cit.*

aching body, heart spasms, and altered memory and coordination.⁷⁵⁸ In 2001 a woman whose heart rate reached 190 was rushed to a hospital after being bitten by a 1080-frenzied dog.⁷⁵⁹

Companies involved in facilitating and encouraging the use of aerial spraying are Bayer, Syngenta, BASF, Monsanto and Dow. They benefit from sales and economic relationships with companies applying pesticides by aerial application. These companies are charged with violations of the rights to freedom from interference with the family and home, life and health, food and livelihood as well as self-determination.

4.7.5 TOXIC DUMPS OF OBSOLETE PESTICIDES

A study by the FAO⁷⁶⁰ in 2001 found that stocks of deadly, obsolete pesticides were five times larger than previous estimates and constitute a toxic 'ticking time bomb' in Africa and other developing regions. The figures set the amount of prohibited and outdated pesticides at 100,000 tonnes in Africa and the Middle East; 200,000 tonnes in Asia; and 200,000 tonnes in Eastern Europe and the former Soviet Union. Stockpiles are often stored in deteriorating and leaky containers without adequate safeguards for people and the environment.⁷⁶¹ (see also witness testimony, Appendix 5.10)

In Africa, chemicals have been the main weapon against locusts and other migratory pests.⁷⁶² When pest invasions occur, the response has been to spray millions of litres of insecticide over large areas. In 1986, in West Africa, three million ha were sprayed to fight a locust outbreak. During the 2003-2005 locust invasion, 13 million ha were treated, an area four times greater. There was an inevitable impact on the Sahelian ecosystem. For 30 years, until banned in the 1980s, the extremely persistent organochlorine dieldrin was widely used (as were other POPs). Sahelian countries eventually stopped its use because of high toxicity and bans in many countries. In the early 1990's, there remained nearly 200,000 litres of dieldrin scattered throughout the Sahel.

During a spray campaign, considerable, sometimes excessive, amounts of pesticides are purchased or donated.^{763, 764} Donations can be poorly coordinated, not requested, or delivered after the pest invasion. Past locust control policies facilitated the storage of large quantities of pesticides in African countries in the event that a plague might occur and thus many of these stocks remained unused. They pose extreme harm to health and the environment, and their presence is catastrophic for the African continent.⁷⁶⁵

Countries with stockpiles generally lack the infrastructure and controls to manage pesticides properly.⁷⁶⁶ Containers have deteriorated and are torn or damaged. Floors of storage facilities are often porous and pesticides leach into the ground. Facilities are not secure. Many stockpiles are outdoors, exposed to weather and sun. They are near houses, drinking water wells and food stores in both rural and urban areas. This can lead to human exposure and environmental contamination. Thus, people living near

⁷⁵⁸ Watts MA. 2002. 1080 Incidents, accidents, poisonings. Soil & Health Association, unpublished paper.

⁷⁵⁹ *Ibid.*

⁷⁶⁰ FAO. 2001. 5th FAO Consultation on Obsolete, Unwanted and banned pesticide stocks, Rome 10 – 11 May 2001.

⁷⁶¹ Africa Recovery. 2001. Library and Information Resources Division of UN Department of Public Information. 15(1-2):42.

⁷⁶² Thiam A. Pesticide Action Network Africa. Testimony submitted.

⁷⁶³ FAO. 2001. 5th FAO Consultation on Obsolete, Unwanted and banned pesticide stocks. Rome. May 10-11.

⁷⁶⁴ FAO. 2004. FAO warns of pesticide waste time bomb in poor countries.

⁷⁶⁵ Africa Recovery, Pesticide 'time bomb' ticking in Africa

⁷⁶⁶ FAO. 2001. Baseline Study On The Problem Of Obsolete Pesticides Stocks.

toxic sites often complain of headaches, nausea, dizziness, and other diseases. African countries lack equipment, and human and financial resources to investigate impacts on health and the environment. The limited data available are scattered and ad hoc, and do not give a picture of the magnitude of the problem. Few data are available on the impact of chronic toxicity of pesticides in locust-sprayed areas.

The obsolete pesticides, which include DDT, dieldrin and other POPs, were originally produced and introduced by TNCs headquartered in the USA and Europe.⁷⁶⁷ Dieldrin was manufactured and marketed by the TNC Shell. In 1939, J R Geigy (later Ciba Geigy, now part of Syngenta) discovered the toxicity of, and marketed, DDT; Monsanto and DuPont also manufactured DDT (most agrochemical TNCs represent a merger of corporations).⁷⁶⁸

Clean-up efforts of obsolete pesticides – The Africa Stockpiles Programme

The options available for the safe management and destruction of obsolete pesticides are limited.⁷⁶⁹ Removal is essential but is technically complex and expensive as no African country has disposal facilities; stocks must be safely packaged, safeguarded and shipped to appropriate facilities. By 2000, it became clear that a broad approach was needed to accelerate clean-up efforts. In December 2000, the African Stockpiles Programme (ASP) was designed, with the ultimate goals to: eliminate POPs and other stockpiles; prevent future stockpiles; and build pesticide-management capacity in affected countries. Financial, technical and management support was required. The main ASP partners were the FAO, World Bank, CropLife International and NGOs (for local support and awareness building). The programme was to involve all African countries over 12-15 years. The ASP was finally launched in September 2005, starting in seven countries. Total cost was estimated at US \$250 million. CropLife committed US \$30 million but limited its 'responsibility' to pesticides that could be traced back to its TNC members. The ASP encountered institutional, financial and governance difficulties, and the main partners eventually established separate programmes. It is difficult to assess results, but appears that in 10 years less than five per cent of estimated stocks have been eliminated and the major effort still lies ahead.

Two cases illustrate the problems for countries involved. In the case of Tanzania, the stockpile is one of the few that have now been safely removed; but in the case of Mali, citizens are still living with the problem.

*4.7.5.1 The case of Old Korogwe in Tanzania*⁷⁷⁰

Tanzania has approximately 300 sites containing obsolete pesticides. The site at Old Korogwe, situated near a farming community, was among the worst. Local NGO AGENDA documented the problem.⁷⁷¹ Concerns included contamination of the agri-ecosystem, pesticides residues in food, and contamination of the adjacent land and water through leaching into groundwater or surface water run-off. The smell of DDT nearby indicated that the shelter did not prevent dispersion of dust by wind and vaporisation. The stockpile had affected some traditional sources of livelihood such as farming, livestock keeping and

⁷⁶⁷ Environmental News Service. 2001. Pesticides Sent as Aid to Nepal Now Toxic Waste. October 18.

⁷⁶⁸ Bernstorff A, Stairs K. 2001. POPs in Africa: Hazardous Waste Trade 1980 – 2000 Obsolete Pesticide Stockpiles A Greenpeace Inventory. Greenpeace International.

⁷⁶⁹ Africa Stockpiles Programme. see website www.africastockpiles.net

⁷⁷⁰ Tanzania acceded the Basel Convention on 7 April 1993 and ratified the Stockholm Convention on 30 April 2004.

⁷⁷¹ Agenda for Environment and Responsible Development. 2005. Hotspot report for a Contaminated Site: Old Korogwe DDT Site in Tanzania. The International POPs Elimination Project (IPEP).

fishing. According to residents, there was some decrease in income for vegetable-growers who used water from the tributaries of the Pangani River. Customers were sometimes reluctant to buy vegetables grown from the land near the contamination. The AGENDA report found that 12 out of 20 people interviewed (60 per cent) complained of the irritating smell from DDT at a distance of more than 100 meters; on windy days the smell could reach 600 metres. Several cases of skin and respiratory diseases were reported, which they attributed to the pesticides. There appeared to be damage to the nervous system in adults and children. Health officers from the Korogwe District Hospital acknowledged they had received complaints from the area. The community leaders believed that some adverse health effects occurred in the village as a result of either direct exposure to DDT or through other means of transfer, such as through water and food. The site was cleaned up by the German Technical Cooperation Agency (GTZ) in 2009. The operation removed 86 tons of DDT and 20 tons of DDT-contaminated construction material and shipped them to Germany for incineration in line with international safety regulations.⁷⁷²

4.7.5.2 Mali: Stockpiles contaminate the village of Kara⁷⁷³

The villages of Kara and Diafarabé lie in the southern-central area of Mali about 540 km east of Bamako, the capital. Diafarabé is on the Niger River and is the most important river crossing site for thousands of head of cattle taken to the north of the river in the November-December rainy seasons to save them from floods. The nearby Central Niger Delta is a significant bird sanctuary, and very important for livestock and agriculture. Kara lies just over 1km from Diafarabé with a population of about 100 people in 24 households. Although tiny, from 1930 to 1950 Kara was the main base in Mali for the fight against locust invasions. Subsequently, from 1950-1984, it became the first base camp in West Africa for the activities of the International African Migratory Locust Organisation to fight locusts and avian invasions. From this base, unquantifiable tonnes of pesticides – organochlorine, organophosphorus, carbamate and others – were routed, transhipped, prepared and distributed throughout the Sahel: to Mali, Mauritania, Niger, Chad, Cameroon and other countries.

The Kara camp was officially closed in 1984, leaving behind a large stock of pesticides, primarily dieldrin (then made by Shell) in a pit. No accurate inventory was taken, but at least 2000 litres remain. The pit covers about 800 m² and it was thought that approximately 2,000 m² were severely contaminated. Apart from the nuisance caused by fumes in warm weather, there is a real danger to the community from soil taken, and blowing, from the site, regular exposure (the school is nearby) and animals grazing on grass in the contaminated area. No assessment of the health, environmental or socio-economic impacts had been carried out in the area of Kara since the closure of the chemical depot in 1984. Furthermore, the first national inventory of sites contaminated with POPs, in 2004, by Mali's Ministry of the Environment and Sanitation and with the support of the FAO, did not mention the existence of this site at Kara.

Residents of Kara, especially former workers at the camp, exhibit an unusual frequency of diseases, in particular asthma, respiratory infections, oedema, headaches and dizziness, bleeding and dermatitis. No medical follow-up had been conducted. No investigation had taken place of the impacts on children. No epidemiological studies had looked at residues of organochlorines in breast milk and in body tissues.

⁷⁷² GTZ. 2009. Twelve cases of clean up and success: Disposing of DDT, Old Korogwe, Tanzania.

⁷⁷³ Ba I. 2009. Rapport de synthèse finale du Projet ECOTOX à KARA, PAN UK, ASP, AMEN (Alliance au Mali pour Développement), June-December. Case submitted to PPT.

No action had been taken to protect the population of Kara and others in the region from the effects of the remaining stockpiles on the environment. The effort to redress this balance was left to NGOs: the Malian group AMEN (Alliance au Mali pour l'Environnement), with support of PAN, began an investigation in September 2005. Their efforts have pressured the government to place Kara on the list of priority sites for decontamination under an ASP project. The AMEN study has highlighted the need for complete disinfection and clean-up, safeguarding of pits containing chemicals, prohibition on using soil from the pits, and an assessment of the presence of pesticides residues in soil and drinking water to determine the impacts on human and animal health and the environment. Although some progress has been made, funding is lacking to safeguard the site. If the contaminated soil cannot be removed, the most practical solution is considered to be to contain the area in an impermeable concrete cask.⁷⁷⁴

TNCs supplying pesticides, governments and locust control agencies have taken no responsibility for the contaminated area. Pesticide spills and contamination from chemical stockpiles left without safeguards for over 35 years have put at risk public health, threatening the right to health. As a POPs pesticide, dieldrin leaking into the environment will persist for many more decades. The area is a site of enormous economic importance for cattle herders in Mali, and has some importance for bird migrations. The neglect threatens the right to a healthy environment of the inhabitants of Kara and of cattle-herders.

4.7.6 CANCER IN THE PUNJAB

4.7.6.1 Pesticides and cancer

Many pesticides are a contributing risk factor to cancer and other chronic diseases (see table). Exposure to a number of pesticides has been linked to higher risks of breast cancer⁷⁷⁵ and Parkinson's disease.⁷⁷⁶ Other studies have shown links to higher incidence in leukaemia and non-Hodgkin's lymphoma.⁷⁷⁷ DDT, monocrotophos and malathion induce damage in DNA increasing risks of mutagenesis.^{778, 779, 780} In rat studies, malathion has been linked to the development of mammary tumours.⁷⁸¹ Increased birth defects among children born to mothers living in pesticide-contaminated areas are reported.⁷⁸² Many published scientific studies support a relationship between pesticides and a number of cancers.⁷⁸³

⁷⁷⁴ Rachadi T et al. 2010. Etude de décontamination du de l'ancien site de l'OICMA à KARA, Mali, 29 November-6 December.

⁷⁷⁵ Watts, M. 2007. Pesticides and Breast Cancer, A Wake Up Call. PAN AP. Penang, Malaysia.

⁷⁷⁶ Fleming L, Mann JB, Bean J, Briggie T, Sanchez-Ramos JR. 1994. Parkinson's disease and brain levels of organochlorine pesticides. *Annals of Neurology* 36(1):100-103.

⁷⁷⁷ Dich J, Zahm SH, Hanberg A, Adami HO. 1997. Pesticides and cancer. *Cancer Causes Control* 8(3):420-443.

⁷⁷⁸ Yáñez L, Borja-Aburto VH, Rojas E, de la Fuente H, González-Amaro R, Gómez H, Jongitud AA, Díaz-Barriga F. 2004. DDT induces DNA damage in blood cells. Studies in vitro and in women chronically exposed to this insecticide. *Environmental Research* 94(1):18-24.

⁷⁷⁹ Mahboob M, Rahman MF, Danadevi K, Banu BS, Grover P. 2002. Detection of DNA damage in mouse peripheral blood leukocytes by the comet assay after oral administration of monocrotophos. *Drug and Chemical Toxicology* 25(1):65-74.

⁷⁸⁰ Réus GZ, Valvassori SS, Nuernberg H, Comim CM, Stringari RB, Padilha PT, Quevedo J. 2008. DNA damage after acute and chronic treatment with malathion in rats. *Journal of Agriculture and Food Chemistry* 56(16):7560-7565.

⁷⁸¹ Cabelo G, Valenzuela M, Vilaxa A, Duran V, Rudolph I, Hrepic N, Calaf G. 2001. A rat mammary tumor model induced by organophosphorus pesticides parathion and malathion, possibly through acetylcholinesterase inhibition. *Environmental Health Perspectives* 109(5):471-479.

⁷⁸² Garry VF, Harkins ME, Erickson LL, Long-Simpson LK, Holland SE, Burroughs BL. 2002. Birth defects, season of conception, and sex of children born to pesticide applicators living in the Red River Valley of Minnesota, USA. *Environmental Health Perspectives* 110(Suppl 3):441-449.

⁷⁸³ Unless indicated, the information is based on PAN's Pesticides Database hosted by PAN North America and the PAN International List of Highly Hazardous Pesticides. 2011.

Pesticide	Carcinogenicity			Other
	US EPA	EU	IARC	
aldrin	probable/likely	carcinogen		genotoxic, endocrine disruptor; tumour promoter ⁷⁸⁴
chlordane	probable/likely	carcinogen	possible (1991)	possible endocrine disruptor; genotoxic
chlorpyrifos				
DDT	probable/likely	carcinogen	possible (1991)	endocrine disruptor
dieldrin	probable/likely	carcinogen		
endosulfan				probably carcinogenic and/or genotoxic, mutagenic and a tumour promoter, ⁷⁸⁵ endocrine disruptor
HCH	possible		possible (1982)	carcinogenic to liver ⁷⁸⁶
heptachlor	probable/likely (1997)	carcinogen	possible (1991)	
lindane	possible		possible (1982)	
malathion	possible			genotoxic ⁷⁸⁷
monocrotophos				genotoxic ⁷⁸⁸
phosphamidon	possible			genotoxic ⁷⁸⁹
quinalphos				a metabolite is genotoxic, ⁷⁹⁰ synergistic genotoxicity with cyoermethrin, ⁷⁹¹ endocrine disruptor

⁷⁸⁴ Watts, 2007, *Op. cit.*

⁷⁸⁵ Yadav AS, Vashishat RK, Kakar SN. 1982. Testing of endosulfan and fenitrothion for genotoxicity in *Saccharomyces cerevisiae*. *Mutation Research* 105(6):403-407.

⁷⁸⁶ US National Toxicology Program. 1997.

⁷⁸⁷ Ma TH, Anderson VA, Harris MM, Bare JL. 1983. Tradescantia-Micronucleus (Trad-MCN) test on the genotoxicity of malathion. *Environmental Mutagenesis* 5(2):127-137.

⁷⁸⁸ Saleha Banu B, Danadevi K, Rahman MF, Ahuja YR, Kaiser J. 2001. Genotoxic effect of monocrotophos to sentinel species using comet assay. *Food and Chemical Toxicology* 39(4):361-6. Monocrotophos has been known to be genotoxic since 1982: de Kergommeaux DJ, Grant WF, Sandhu SS. 1983. Clastogenic and physiological response of chromosomes to nine pesticides in the *Vicia faba* in vivo root tip assay system. *Mutation Research* 124(1):69-84.

⁷⁸⁹ Khan PK, Sinha SP. 1993. Antimutagenic efficacy of higher doses of vitamin C. *Mutation Research* 298(3):157-161.

⁷⁹⁰ Riediger S, Behrends A, Croll B, Vega-Naredo I, Hänig N, Poeggeler B, Hardeland, R. 2007. Toxicity of the quinalphos metabolite 2-hydroxyquinoxaline: growth inhibition, induction of oxidative stress, and genotoxicity in test organisms. *Environmental Toxicology* 22(1):33-43.

⁷⁹¹ Chauhan LK, Chandra S, Saxena PN, Gupta SK. 2005. In vivo cytogenetic effects of a commercially formulated mixture of cypermethrin and quinalphos in mice. *Mutation Research* 587(1-2):120-125.

Pesticide	Carcinogenicity			Other
	US EPA	EU	IARC	
fenvalerate				endocrine disruptor ⁷⁹²
dimethoate	possible			genotoxic ⁷⁹³
imidacloprid				genotoxic ⁷⁹⁴

4.7.6.2 Incidence of cancer in the Punjab – high pesticide Use on cotton and staple crops

Cases of cancer among farmers, their communities and surrounding villages are widespread in Punjab State, along with pesticide contamination of food and water resources. Punjab accounts for 18 per cent of pesticide consumption in India,⁷⁹⁵ though it makes up only 2.5 per cent of agricultural land. Pesticide usage of 154 tonnes, in 1954, rose to 88,000 tonnes in 2000-2001.⁷⁹⁶ From the 1960s, pesticides were widely used on cotton and on wheat as part of the 'Green Revolution'; previously DDT was widely used, particularly on cotton. Malwa, a significant cotton-growing area, which includes districts from both Punjab and Haryana,⁷⁹⁷ accounts for 75 per cent of pesticide consumption in the region.⁷⁹⁸

In 2008, the agrochemical industry experienced the highest sales growth in India since 1976. Commonly used pesticides in cotton cultivation include monocrotophos, endosulfan, quinalphos, fenvalerate, chlorpyrifos, dimethoate and imidacloprid;⁷⁹⁹ and in other crops acephate and cypermethrin.⁸⁰⁰ TNCs selling pesticides in the State include: Syngenta, Monsanto, Dow, DuPont, Bayer and BASF (DDT); Bayer (endosulfan and imidacloprid); BASF (aldrin and dimethoate); and Dow (chlorpyrifos, and monocrotophos). Pesticides use is particularly intense on cotton and, with about 10 million cotton farmers,⁸⁰¹ India now produces more than the US.⁸⁰² It is likely to overtake China in 2015.⁸⁰³

Riding the cancer train

In the early 2000s, civil society groups revealed increasing incidence of cancer and other serious illness in Giana and Jajjal villages in Talwandi Sabo block of Bathinda. Although government statistics indicate Bathinda had 711 cancer cases or 59 per 100,000 in 2007, lower than the national average of 70 per

⁷⁹² Garey J, Wolff MS. 1998. Estrogenic and antiprogesterone activities of pyrethroid insecticides. *Biochemical and Biophysical Research Communications* 251(3):855-859.

⁷⁹³ Tripathy NK, Majhi B, Dey L, Das CC. 1988. Genotoxicity of Rogor studied in the sex-linked recessive lethal test and wing, eye and female germ-line mosaic assays in *Drosophila melanogaster*. *Mutation Research* 206(3):351-360.

⁷⁹⁴ Karabay NU, Oguz MG. 2005. Cytogenetic and genotoxic effects of the insecticides, imidacloprid and methamidophos. *Genetics and Molecular Research* 4(4):653-662.

⁷⁹⁵ Cited in Kuruganti K. 2010. Ravaged by Pesticides: Punjab Reeling Under Pesticide-Related Cancers.

⁷⁹⁶ Mathur *et al.* 2005. Analysis of Pesticide Residues in blood samples from villages of Punjab. CSE, New Delhi.

⁷⁹⁷ Cotton Corporation of India, Inc. State-wise APY.

⁷⁹⁸ Punjab State Council for Science & Technology. 2007. State Of Environment Punjab – 2007. Report for the Ministry of Environment & Forests, India.

⁷⁹⁹ Environmental Justice Foundation, PAN UK. 2007. The Deadly Chemicals in Cotton, London, UK.

⁸⁰⁰ Choudhary B, Laroia G. 2001. Technological developments and cotton production in India and China. *Current Science* 80(8):925-932.

⁸⁰¹ Environmental Justice Foundation & PAN UK, 2007, *Op. cit.*

⁸⁰² FAOSTAT. Retrieved October 2011: <http://faostat.fao.org>.

⁸⁰³ Indian Express. 2011. India may topple China in cotton production. February 11.

100,000, civil society organisations dispute this. They estimate up to 10,000 cancer deaths over 10 years, compared to government figure of 2,472.⁸⁰⁴ In 2002, there were 424 cancers in Bathinda, 641 in Patiala, and 646 in Chandigarh.⁸⁰⁵ The government admits to 172 cancer deaths during 2005-06 in Muktsar. But a local legislator from Giddarbaha said he had attended 300 funerals of cancer victims from his constituency alone.⁸⁰⁶ The Malwa belt recorded 92 cases of breast cancer between 2006-09 with 131 more suspected cases from September to December 2009.⁸⁰⁷ The night train No. 339, which runs between Bathinda in Punjab and Bikaner in nearby Rajasthan, is known as the 'Cancer Train'.⁸⁰⁸ It carries roughly 60 cancer patients and their families each night; National Railways keeps an emergency quota for cancer patients.⁸⁰⁹ A 2011 survey by the Internationalist Democratic Party, involving almost 65,000 people from 23 villages in Mansa, Sangrur and Patiala, showed that cancer cases are increasing outside of the cotton belt.⁸¹⁰

Contaminated food, poisoned blood

An analysis of canal-based water samples by the Punjab Pollution Control Board found traces of DDT and BHC.⁸¹¹ Subsequently, the Board commissioned the Post Graduate Institute of Medical Education and Research in Chandigarh to conduct studies on possible links between pesticide-contaminated water and cancer. The report, published in 2008⁸¹² and which covered 39,732 families (183,243 people), confirmed a cancer incidence of 103 per 100,000 in the study location, the Talwandi Sabo block in Bathinda, compared to 71 per 100,000 in the control village of Chamkaur Sahib. There were 52 cancer deaths per 100,000 each year in Talwandi Sabo whereas 30 were reported in Chamkaur Sahib. The analysis took into account other factors such as age, diet, alcohol use and smoking. Concentration of pesticides such as heptachlor, ethion and chlorpyrifos, and heavy metals (arsenic, cadmium, chromium, selenium and mercury) in drinking water were found to be higher in Talwandi Sabo than in Chamkaur Sahib. Heptachlor and malathion both exceeded the permissible limits in Talwandi Sabo, and pesticide residues in vegetables and fruits were higher. Heptachlor, aldrin and endosulfan have been detected in the blood samples from both locations.

Blood samples taken from farmers using pesticides reveal a link with cancer. In 2005, the CSE in Delhi reported high levels of pesticides in the blood of Punjabis. This study⁸¹³ found that all the blood samples taken from Bathinda and Rupnagar contained pesticides. Of the 14 OCs tested, 11 (including HCH, lindane, DDT, endosulfan, aldrin, chlordane and heptachlor) were detected in some or all the samples; and of the 14 OPs tested, four (monocrotophos, chlorpyrifos, malathion and phosphamidon) were found in some or all of the samples. The high number of pesticides detected in blood samples from Punjab (15 of 28 pesticides analysed) indicates that each person is exposed to and carries a body burden of multiple pesticides, which might be due to a combination of direct and indirect exposure to these pesticides. OPs were the major components of the pesticide contamination. Mean concentration

804 *Ibid.*

805 Dutt U. 2006. Eco-Crisis in Punjab and governmental-toxicity. National Cancer Registry Programme.

806 Yadav S. 2007. Green revolution's cancer train. *Indian Agrarian Crisis*. January 14.

807 Dhar A. 2010. Punjab's Malwa belt has high incidence of breast cancer: study. *The Hindu*. September 28.

808 Zwerdling D. 2009. In Punjab, Crowding Onto The Cancer Train. NPR. May 11.

809 Singh P. 2010. Cancer concerns bring SAD, Congress together. *Tribune News Service*. June 6.

810 *The Times of India*. 2011. Nearly 8,000 dying of cancer every year in Punjab, reveals a survey. July 8.

811 AP Pollution Control Board. *Environmental Health Crisis in Cotton Belt of Punjab*.

812 Thakur JS, Rao BT, Rajwanshi A, Parwana HK, Kumar R. 2008. Epidemiological Study of High Cancer among Rural Agricultural Community of Punjab in Northern India. *International Journal of Environmental Research and Public Health* 5(5):399-407.

813 Mathur *et al.* 2005. Analysis of Pesticide Residues in blood samples from villages of Punjab. CSE, New Delhi, India.

of OPs was 0.2278 mg/l; for OCs it was, 0.1424 mg/l. The levels of OCs were 15-605 times higher than those found in blood samples from the USA tested by the US Centers for disease Control and Prevention.⁸¹⁴ In particular, the lindane level found in the Punjabi study was 605 times higher, while the DDT level was 188 times higher. Monocrotophos levels were four times higher than the short-term exposure limit set by WHO/FAO for humans.

Another government-funded study⁸¹⁵ taken up by the Pollution Control Board surveyed areas of maximum pesticide use in Punjab; the focus was 17 villages in the cotton-growing districts of Bathinda, Faridkot, Mansa and Muktsar. The study affirmed that heavy use of agrochemical inputs had contaminated drinking water with pesticides and heavy metals; pesticides had seeped into groundwater. It revealed that contaminated water had led to a rise in the cases of cancer and other illness such as asthma, joint pain, greying of hair (as a sign of premature aging, which occurs even among young children), skin diseases and, to an extent, cognitive impairment. Contaminated water had been revealed to be the major cause of death in Punjab.

A research study⁸¹⁶ by the Department of Human Biology in Punjabi University revealed the high rate of DNA damage, related to elevated risk of cancer, among workers occupationally-exposed to pesticides. Thirty-six per cent of blood samples taken from 210 farmers after one day of intensive spraying showed DNA fragmentation. The control group showed only eight per cent damage. A follow-up analysis six months later among the DNA-damaged farmers investigated the frequency of DNA repair. The second test found DNA damage in 15 per cent of the farmers. The worst affected were the cotton, paddy and wheat growers. The damage was also highest in those using herbicides, followed by organophosphates and organochlorines. Smoking, drinking and age were not found to be correlated with DNA damage.

Other health impacts related to cotton-pesticides

A study⁸¹⁷ of the effects of high exposure to pesticides on child development was carried out in regions of high pesticide use in cotton cultivation in India. It included the Bangi Nihal Singh, Jajjal and Mahi Nangal villages in Bathinda. In this region, children aged 1-4 had significantly lower mental ability, including memory, than children from villages with lower pesticide exposure. They similarly had lower abilities to catch a ball, do jigsaws, balance and concentrate. Similar results, with appropriate age-related skills, were also obtained for 9-13-year-olds. Other chronic health problems found in the Punjab and known to be linked to pesticide exposure, include declining reproductive health (such as increasing miscarriages and premature births), rising infertility, declining immune capacity, early ageing and increasing neurological disorders and allergies.⁸¹⁸ A similar pattern of health problems was found in domestic animals: farmers repeatedly reported that animals have become unproductive and sterile.⁸¹⁹

Defendants Syngenta, Bayer, BASF and Dow are charged with violations of the right to life and health of the Punjabi people for manufacturing and marketing, either directly or through other conduits and without due care for the consequences, highly toxic pesticides with known carcinogenic effects

⁸¹⁴ CSE. 2005. Where poison flows in the veins. June 7.

⁸¹⁵ Misra SS. 2008. Pesticide-ridden Punjab to begin cancer registration. Down To Earth. June 15.

⁸¹⁶ Kaur R. 2008. Assessment of genetic damage in workers occupationally exposed to pesticides in various districts of Punjab. Punjab University. Cited in Misra, S.S. 2008, Jun 15. Pesticide-ridden Punjab to begin cancer registration. Down To Earth.

⁸¹⁷ Kuruganti K. 2005. Effects of Pesticide Exposure on Developmental Task Performance in Indian Children. *Children, Youth and Environments* 15(1).

⁸¹⁸ Dutt U. 2010. Punjab: A Dying Civilisation? Repeat of devastation of Sindhu Valley Civilisation.

⁸¹⁹ *Ibid.*

for use in the cotton belt of Punjab resulting in the contamination of food and water resources, the accumulation of toxic chemicals in blood and increased rates of DNA damage and cancer.

4.7.7 GMOS PROMOTED THROUGH FOOD AID TO AFRICA

The bodies listed below, acting together, introduced GE maize (corn) as food aid into a number of Southern African countries: Zambia, Zimbabwe, Malawi, Mozambique, Swaziland and Lesotho. GE maize was not permitted to be grown or consumed in these countries at the time of import in 2002,^{820, 821, 822, 823} and in some cases is still not permitted. Although considered to be 'humanitarian' aid, the act demonstrated gross disregard for national laws and the wishes of local people. The government, institutions and TNC responsible were:

- The Government of the USA provided food aid in the form of GE maize to the named countries through US AID
- The IMF provided advice to various governments generally and to the government of Malawi in respect of the 2002 food crisis.
- The World Bank advised the government of Malawi to sell its surplus grains to repay their debts three months before the 2002 food crisis hit.
- Monsanto Corporation is the largest producer of GE maize (corn) seeds in the USA and globally⁸²⁴. Some or all of the GE maize supplied as food aid to the named countries would have been grown from Monsanto's Bt maize seeds.

GE food for the food crisis in Africa 2002-2003

In the spring of 2002, a food crisis struck Zambia, Zimbabwe, Malawi, Mozambique, Swaziland and Lesotho. Fifteen million people – 26 per cent of the population – were at risk of famine.⁸²⁵ In such emergencies, food aid is generally distributed by the World Food Programme (WFP), a UN body which, along with voluntary organisations working on famine relief, organises distribution of food with national governments providing food or funds. The US is the largest provider of food aid in the world and the process is administered by the USDA and the USAID.⁸²⁶ In response to an appeal by the WFP, the US government, through USAID, responded to the food crisis by providing food aid in the form of GE maize grown in America. More than 95 per cent of US maize is genetically engineered⁸²⁷ and is grown from Monsanto seeds.⁸²⁸

Mozambique banned the entry of GE maize as food aid on the grounds of biosafety and human health concerns. Zambia refused to accept GE food aid in any form while Zimbabwe, Malawi and Mozambique said they would not accept GM food aid unless it was milled (as a precaution against the risk of germination and contamination of local maize varieties). Lesotho and Swaziland allowed the

820 Zerbe N. 2004. Feeding the famine? American food aid and the GMO debate in Southern Africa. *Food Policy* 29:593-608.

821 FAO. 2002. UN Statement on the use of GM food as food aid in Southern Africa.

822 FAO. 2002. Director-General urges countries to think carefully before rejecting GM food aid.

823 ISIS. 2002. GM-free Food Aid! ISIS Report. August 7.

824 Bjerga A. 2009. Most US Farm Subsidies Go To 10 per cent of Recipients, Group Says. *Business Week*.

825 Zerbe, 2004, *Op. cit.* p.594.

826 Greenpeace UK. 2002. Bush Using Famine in Africa as GM Marketing Tool. October 7.

827 Monsanto. US Aid for Africa's famine.

828 Bjerg, 2009, *Op. cit.*

distribution of non-milled GM food, but warned its citizens that the grain should be used strictly for consumption and not for cultivation.^{829, 830} The countries were cognizant of the threat of GE maize to their own economies, and the livelihoods of mainly small-scale farmers and their exports of produce, including organic crops, to the EU.⁸³¹

The USAID refuted the health concerns raised and asserted that the GE maize was safe. The US State Department argued that the GE food had met rigorous food safety standards and had been consumed by Americans since 1996 without adverse effects.⁸³² The US claimed that it could not source non-GM maize. This was not supported by the UN figures on food availability in the region at the time, which showed that 1,160,000 tonnes of cereals were available in Kenya, Tanzania, Uganda and South Africa and more than double that amount was available on the world market.⁸³³

The request by Malawi, Mozambique and Zimbabwe for the maize to be milled prior to shipment was rejected by USAID on the grounds of increased cost.⁸³⁴ USAID insisted that the food aid be accepted *in toto* and as prescribed, otherwise they would give nothing.⁸³⁵ The US blamed the EU for their 1996 moratorium on GE food and refusal to accede that GE food was safe, as well as the governments of the Southern African countries for their refusal to accept the food aid offered. In essence, the bottom line to the countries in crisis was 'accept GM or starve'.

World Food Programme – Middleman for GE and the US

The WFP supported the US and accepted GE food rather than insist on food acceptable to the recipients or cash aid.⁸³⁶ This is contrary to its mission statement that food aid should be fully integrated into the plans and priorities of recipient countries, coordinated with other forms of assistance, and all necessary efforts should be made to avoid negative effects on local food production.⁸³⁷ Local culture and sensitivities were totally ignored. In fact, it was discovered that the WFP had been delivering food contaminated with GM to developing countries since 1996 without informing them and often in breach of local regulations. Recipient countries included India, Colombia, Guatemala, and many African countries.⁸³⁸

Cash is widely acknowledged to be the most effective form of food aid. It enables food supplies to be obtained locally and more quickly, supporting local economies and giving some possibility of ending the reliance on food hand-outs.

The 1999 Food Aid Convention stipulates that food aid should be bought from the most cost effective source, be culturally acceptable and if possible purchased locally so that regional markets do not suffer. Cash is widely acknowledged to be the most effective form of food aid. It enables food supplies to be obtained locally and more quickly, supporting local economies and giving some possibility of ending the reliance on food hand-outs.

829 UNEP. 2006. Africa Environment Outlook 2. Nairobi. Kenya.

830 *Ibid.* In 2004, Angola and Sudan introduced restrictions on GM food aid.

831 Zerbe, 2004, *Op. cit.*

832 *Ibid.*

833 Vidal J. 2002. US dumping unsold GM food on Africa. *Guardian*, UK. October 7.

834 Zerbe, 2004, *Op. cit.*

835 *Ibid.*, pp600-602.

836 *Ibid.*, pp600-601, and footnotes 6, 7, 8.

837 WFP. WFP Fighting hunger worldwide (website).

838 Pearce F. 2002. UN is slipping modified food into aid. *New Scientist*. September 19.

4.7.7.1 *The Case of Zambia*

In the northern part of Zambia, an estimated 300,000 tonnes of cassava were available at the time of the crisis. Cassava is the main staple food for 30 per cent of the population of Zambia. The Zambian government asked the WFP to use traditional food to deal with the crisis. When it refused, a coalition of church and NGO groups helped the Zambian government form an alliance to raise funds to buy cassava from areas of surplus and distribute it to food-crisis areas. The WFP refused to support the project. Because the WFP in Zambia channels financial aid from donors and coordinates all food relief efforts, its refusal prevented implementation of the project. Instead, it purchased barley from the US, which is not a staple in Zambia and was only used to make beer.⁸³⁹ The WFP's actions clearly go against the principle that food aid should be socially and culturally acceptable to recipient countries.

4.7.7.2 *IMF and World Bank advice to Malawi*

Approximately three months before the food crisis, the IMF and World Bank insisted that the government of Malawi sell its then surplus of maize/corn to repay commercial loans taken out to buy up surplus maize from previous years. This surplus was purchased by commercial traders, who hoarded supplies until prices rose. The Malawian government was then forced to take out further loans to buy grain at international market prices, higher than the price received for selling reserves and driving it deeper into debt. The IMF and World Bank are thus guilty of crippling Malawi financially and of undermining its food security.⁸⁴⁰

USAID: Aid and influence – promoting a corporate agenda

The USAID states that one of its roles is to *integrate biotechnology (GE) into local food systems and spread the technology through regions in Africa*.⁸⁴¹ It acts as a vehicle for the GE industry taking their GE agenda into the developing world.

A report from Greenpeace examining US food aid and GE food concluded:⁸⁴² (1) USAID has launched various GE programmes to persuade developing countries to accept GE technology. These include a USAID-funded organisation that has pushed African states to pass intellectual property legislation and thus clear the way for US corporations to develop markets in Africa; (2) GE companies such as Pioneer Hi-Bred and Monsanto fund numerous USAID programmes, including in Southern Africa; (3) Corporations with an interest in GE crops, such as Cargill, sponsor the WFP; and (4) the USAID was paying for US GE corporations to run research programmes in Africa with local research institutes.

The US seeks to influence the Group of Eight (G8) – the forum for governments of eight of the world's largest economies – to adopt its policies on international development aid. More appropriate action and projects would improve access to resources for the small scale and subsistence farmers and the adoption of biodiversity-based ecological agriculture.⁸⁴³

⁸³⁹ Friends of the Earth. 2005. Genetically modified crops: the African challenge.

⁸⁴⁰ Zerbe, 2004, *Op. cit.* p596-597 and footnote 1.

⁸⁴¹ Bassey N. 2009. The Introduction of Genetically Modified Crops in Africa. In *Voices From Africa – African Farmers and Environmentalist Speak Out Against a New Green Revolution in Africa*. Mittal A & Moore, M (Eds). Oakland Institute.

⁸⁴² Greenpeace. 2002. USAID and GM Food Aid.

⁸⁴³ African Civil Society Organisations 2007. Statement at World Social Forum (Africa's Wealth of Seed Diversity and Farmer Knowledge Under Threat from the Gates/Rockefeller 'Green Revolution' Initiative, Nairobi, Kenya, January 25. In Mittal A, Moore M (Eds), 2007, *Op. cit.*

In 1996, the EU put a moratorium on GE food, taking into consideration public opposition. This act blocked US export of GE foods, including maize, to European markets,⁸⁴⁴ and resulted in a surplus in the US. The surplus was further exacerbated by agricultural subsidies which enable increased production and below-cost exports of produce. Small-scale farmers in developing countries cannot compete with subsidised US agriculture. The 'dumping' of US surpluses through aid shipments skews markets and prices. The 2002 food crisis in Africa presented the US with the opportunity to offload its surplus grain, increase market access, and embark on a promotion of modern biotechnology under the guise of humanitarian food aid, disregarding local cultures and opposition. The act was also conceived as a tactical manoeuvre against the EU moratorium on GE food.

Summary of rights violated

The US government failed to apply the precautionary principle in light of the risks to human health, the environment and biodiversity; failed to acknowledge that containment against contamination of local maize varieties is impossible, particularly in countries with poor biosafety regulations and infrastructure; and failed to offer conventional food locally available as food aid. Monsanto is complicit in all these failures. US foreign policy furthered the interests of agribusiness. Using taxpayers' money, it promotes GE crops by subsidising production, distributing aid,^{845, 846} and promoting modern biotechnology to eradicate hunger. Subsidies make it impossible for small-scale and subsistence farmers to compete, thereby undermining their food security and livelihoods.^{847, 848, 849} Organic farmers with GE-contaminated maize would lose export markets to Europe and Japan through no fault of their own. This policy threatens biodiversity, agricultural biodiversity and traditional knowledge and wisdom. It subverts the democratic process of sovereign states determining their own agricultural, economic and development policies.⁸⁵⁰ These US foreign policies on food aid, together with the production of GE *Bt* maize by Monsanto and imposition of IPRs, violate the human rights of the African people. The actions have violated the right to safe, appropriate and adequate food; the right to health; the right of self-determination; and the right to a healthy environment.

4.7.8 FIPRONIL: UNSAFE IMPACTS OF A 'MODERN' INSECTICIDE

Insecticide products containing the active ingredient fipronil have been on the market since 1993.⁸⁵¹ The insecticide was developed by the French TNC Rhone-Poulenc, which later merged with AgrEvo – a joint venture of Hoechst and Schering – to form Aventis CropScience; this company was acquired by Bayer in June 2002. The US Federal Trade Commission required Bayer to divest most of its rights to fipronil to avoid unfair competition and BASF bought these in 2002. Bayer retained rights to non-agricultural uses of fipronil in many countries, and its rice seed treatment business. It subsequently bought back distribution in Latin America and Asia.⁸⁵²

⁸⁴⁴ Zerbe, 2004, *Op. cit.* p603 para 2, p606 para 4.

⁸⁴⁵ Vidal J. 2002. US 'dumping' unsold GM food on Africa'. Oct 7.

⁸⁴⁶ Bjerga, 2010, *Op. cit.*

⁸⁴⁷ Doyle L. 2007. US Food Aid is 'Wrecking' Africa, Claims Charity, The Independent, UK. August 17.

⁸⁴⁸ Hughes D. 2009. US Food Aid Contributing to Africa's Hunger? ABC News.

⁸⁴⁹ GRAIN. 2005. USAID in Africa: For the American Corporations, Seedling 331.

⁸⁵⁰ Mittal A. 2009. Hungry or not, don't force GM down our throats, The East African.

⁸⁵¹ BASF welcomes Annex 1 listing of Fipronil insecticide. BASF. 26.03-2007.

⁸⁵² Bayer. 2004. Petition for Approval of proposed License Back Agreement. Before the Federal Trade Commission, US.

Fipronil has caused a range of health and environmental problems: it is, for example, toxic to aquatic organisms and bees, and is highly persistent in soils.⁸⁵³ Two cases summarised here show (1) ecological devastation from aerial spraying in Madagascar, and (2) loss of livelihood of Louisiana crawfish farmers as the result of the fipronil-containing ICON rice seed treatment. Health concerns are documented too.

4.7.8.1 Ecological destruction from locust spraying in Madagascar

Madagascar, an island in the Indian Ocean, has a unique tropical ecosystem supporting a rich diversity of flora and fauna. In 1996, an outbreak of Madagascar Migratory Locust led the government to call for international help to protect agriculture⁸⁵⁴. The response was massive aerial spraying of pesticides, initially fipronil and later deltamethrin. Negative impacts caused by fipronil led the government to withdraw authorisation of its use against locust swarms in February 1999; despite this 213,000 litres were aerially sprayed between March and May⁸⁵⁵. An FAO report in June 1999 questioned the need for spraying, stating that the effects of the swarms on production appeared to be minor and suggesting instead prevention strategies be put in place. The World Bank withdrew its funding over concerns about the pesticide. In a two-year period, US \$35 million was spent on an aerial spray programme without considering an assessment of the environmental and health impacts. In 1998-99, 780,267 ha were treated with total spray coverage, and 2.954 million ha were 'protected' with insecticides on a 'barrier' basis, by aerial application of successive strips to kill immature locust hoppers passing through ground vegetation.⁸⁵⁶

Studies in 1998 and 1999 by the UK's Natural Resources Institute (NRI)^{857, 858} found that fipronil had had a serious impact on termites, with 95 per cent of colonies dead in barrier spraying areas and 50 per cent of colonies lost. One author pointed out that: *the ecological implications are unknown, but ... termites play a key role in the ecological functioning of the habitat and in the ecosystems food web, often fulfilling the role taken by earthworms in temperate and moist areas*. There was evidence of adverse impacts of fipronil on other non-target insects, possibly on some lizards and birds, and potential indirect effects on birds and other wildlife. A study in 2000 found the spraying caused 'massive kills' of freshwater shrimp, killed 80-85 per cent of the colonies of harvester termites, caused a significant decline in two insectivorous reptiles, and that the devastation of the termite colonies had caused a disruption of the food chain, with the consequent decline of insectivorous species.⁸⁵⁹ The fipronil manufacturer (then Rhone Poulenc, now Bayer and BASF) was aware that field trials had shown adverse impacts on a range of insects, high toxicity to certain birds, high toxicity to some fish and most aquatic invertebrates,^{860, 861} extreme toxicity to aquatic organisms and persistence in soil. Based on the company's own data, New York State denied a Rhone-Poulenc request for registration for use of fipronil in soil furrows in 2000

853 Tingle CCD, Rother JA, et al. 2000. Health and environmental effects of fipronil, Briefing Paper A1, PAN UK.

854 Dinham B. 2000. Poisoning an Island? Locust control in Madagascar. *Pesticide News* 48:3-6.

855 *Ibid*

856 *Ibid*.

857 Tingle C, McWilliam A. 1999. Evaluation of short-term impact on non-target organisms of two pesticides used in emergency locust control in Madagascar. Final Report to DFID. Unpublished Report, NRI, Chatham, UK.

858 Dobson H. 1998. Technical report on consultancy to provide training and advice on improved monitoring and quality control of spraying operations in Madagascar. Unpublished report. NRI, Chatham, UK.

859 Peveling R. 2000. Environmental Monitoring of Locust Control Operations. In Malaimbandy, Madagascar May-November 2000. Final Report. University of Basle, Switzerland.

860 Dinham B, 2000, *Op. cit*.

861 Kitulagodage M, Isanhart J, Buttemer WA, Hooper MJ, Astheimer LB. 2011. Fipronil toxicity in northern bobwhite quail *Colinus virginianus*: Reduced feeding behaviour and sulfone metabolite formation. *Chemosphere* 83:524-530.

because of the likelihood of it entering waterways and adversely affecting aquatic organisms.⁸⁶² Rhone Poulenc disputed aquatic effects but not those on beneficial insects.^{863, 864}

Despite the extent of the spraying, there was no systematic medical monitoring of exposed communities. But a survey of 100 people in one area showed 60 per cent had pesticide poisoning symptoms. Chronic health effects will not be known for years, if ever, given the lack of systematic monitoring. No studies have been conducted into incidence of cancer even though fipronil is classified by the US EPA as a possible human carcinogen.⁸⁶⁵

4.7.8.2 Destroyed livelihoods of Louisiana crawfish farmers

A lawsuit filed in 2001 alleged that Rhone Poulenc/Aventis had negligently tested, formulated and marketed ICON, a seed treatment containing fipronil that was applied by seed distributors to combat rice water weevil. More than 1,500 crawfish farmers were operating in Louisiana. Many of them also farmed rice in the same ponds or in close proximity to crawfish ponds. Water that had been used in a rice field (tailwater) was sometimes used to irrigate crawfish ponds. Tailwater was also often discharged into surrounding ditches and canals after rice planting; some downstream crawfish farmers would retrieve and introduce this water to their ponds. As a result of this water becoming contaminated with fipronil, farmers suffered tremendous crawfish losses. The industry in South Louisiana collapsed in 1999, dropping from an annual production of more than 40 million pounds to less than 18 million in a year. Production remained low and was reported to be fully recovering only in 2004.^{866, 867} Fishermen took out a class action case against the company, but as this was about to conclude the company reached a settlement of US \$45 million with farmers for loss of crawfish. The defendant was Bayer CropScience which now owned the rights to fipronil.^{868, 869} ICON seed treatment was voluntarily pulled from the market in 2004.⁸⁷⁰

Despite knowing that the pesticide is highly toxic to fish and aquatic organisms, Bayer and BASF have continued to sell fipronil for use on crops including cotton, rice, fruit, vegetables, cereals, oil-seed rape, soybean, sugarcane and tobacco; and for aerial spraying for locust control.^{871, 872} Fipronil is still sold and widely used around the world, endangering aquatic life, bees and humans.^{873, 874} As a result, fipronil is increasingly found in aquatic environments, including in urban areas.⁸⁷⁵

862 NY State Department of Environmental Conservation 2000. Fipronil. 2000. NYS DEC Letter - Denial of Applications for Registration 2/00. Letter to Ms Linda H. Aschrenner, Rhone-Poulenc Company. February 23.

863 Johnsen S, Huong LTT, Ngoc KT, Thuy TD. 1997. Some Ecological Effects of Fipronil ('Regent') and lambda-cyhalothrin ('Karate') in Vietnamese Rice Fields. DANIDA, Hanoi.

864 Tingle C. 2000. Fipronil, PAN UK, *Pesticide News* 48:20.

865 Dinham B, 2000, Op. cit.

866 Johnson W. 2004. Bayer vs. crawfish farmers: Trial ends with \$45 million settlement. Louisiana Gannett News.

867 Crawfish farmers and landowners could get payments from a \$45 million class action settlement. 27th Judicial District Court of Louisiana, St. Landry Parish.

868 Lieff Cabrasser Heimann & Bernstein. 2004. Attorneys at law. Louisiana crawfish.

869 Legal Notice. Crawfish farmers and landowners could get payments from a \$45 million class action settlement. Morrow & Morrow, Los Angeles.

870 Bennett D. 2004. Icon rice seed treatment pulled from the market. Delta Farm Press. February 6.

871 Fipronil. 2005. Worldwide Technical Bulletin. BASF the Chemical Company. Fipronil Global Marketing Team, BASF Agricultural products, North Carolina, USA.

872 Australian Plague Locust Commission. 2008. Information on the insecticide fipronil.

873 European Commission. 2010. Directive 2010/21/EU. Official Journal of the European Union. l65/27.

874 Government of India. 2009. Major use of Pesticides Registered Under the Insecticides Act, 1968.

875 Nillos MG, Lin K, Gan J, Bondarenko S, Scklenk D. 2009. Enantioselectivity in fipronil aquatic toxicity and degradation. *Environmental Toxicology and Chemistry* 28(9):1825-1833.

4.7.8.3 Human health concerns

BASF's promotional brochure in 2005 stated fipronil is not mutagenic, not teratogenic and has no effects on reproduction. Based on lifetime laboratory studies on rodents, fipronil is not considered to be a human carcinogen, according to BASF.⁸⁷⁶ However, the US EPA classifies fipronil as a possible human carcinogen.⁸⁷⁷ Other studies have shown that it has endocrine disrupting properties: it is an anti-androgen⁸⁷⁸ and decreases thyroid hormone, causes reproductive toxicity in laboratory animals⁸⁷⁹ and has the potential to cause developmental neurotoxicity.⁸⁸⁰ For their continued production, marketing and promotion of the insecticide fipronil, Bayer CropScience and BASF Group are charged with violations of human rights to life and health, including to safe working conditions and a healthy environment; and violations to economic, social and cultural rights, including the right to livelihood.

4.7.9 SUPPRESSION, MANIPULATION AND DISTORTION OF SCIENCE: HARRASSMENT OF SCIENTISTS AND HUMAN RIGHTS DEFENDERS

Defendants Syngenta, Monsanto, Bayer, Dow and BASF are charged with violating the rights of scientists acting in the public interest and violating the public's right to information by suppressing, corrupting, manipulating and distorting science. The TNCs block independent scientists and investigators from conducting tests by not granting access to patented seeds. The editors of Scientific American stated: *Unfortunately, it is impossible to verify that genetically modified crops perform as advertised. That is because agritech companies have given themselves veto power over the work of independent researchers.*⁸⁸¹ In the same article, an entomologist from Cornell University, Elson Shields, added: *it is important to understand that it is not always simply a matter of blanket denial of all research requests, which is bad enough, but selective denials and permissions based on industry perceptions of how 'friendly' or 'hostile' a particular scientist may be toward [seed-enhancement] technology.*

If independent scientists do gain access to seeds or safety studies and publish results 'hostile' to TNCs, they can find themselves objects of a campaign of threat or ridicule organised by TNCs or their front organisations. According to Dr Ignacio Chapela of University of California (UC) Berkeley, *It's very hard for us to publish in this field. People are scared.*⁸⁸² The agrochemical TNCs engage not in open scientific debate but in harassment, using their lobby influence with government policy makers to stifle research and refusing to divulge their own studies to the public. In more than one case, the TNCs' own studies have shown undeniable harm to test subjects.

Independent scientists are challenged not because of the quality of their research, but through political pressure and behind-the-scene manoeuvring. Dr Arpad Pusztai was initially praised by Rowett Institute for his studies on GM potatoes but was fired two days later after the institute director allegedly received communications from the office of UK's Prime Minister; his team was eventually dismantled. Dr Judy

⁸⁷⁶ Fipronil. 2005. Worldwide Technical Bulletin. Fipronil Global Marketing Team, BASF Agricultural products, North Carolina, USA.

⁸⁷⁷ US EPA. 2011. Fipronil Summary Document Registration Review. Docket: EPA-HQ-OPP-2011-0448. Case No. 7423.

⁸⁷⁸ Ait-Aissa S, Laskowski S, Laville N, Porcher J-M, Brion F. 2010. Anti-androgenic activities of environmental pesticides in the MDA-kb2 reporter cell line. *Toxicology In Vitro* 24:1979-1985.

⁸⁷⁹ NPIC. 2009. Fipronil Technical Factsheet. National Pesticide Information Centre. Oregon State University, USA.

⁸⁸⁰ Sidiropoulou E, Sachana M, Flaskos J, Harris W, Hargreaves AJ, Woldehiwet Z. 2011. Fipronil interferes with the differentiation of mouse N2a neuroblastoma cells. *Toxicology Letters* 201:86-91.

⁸⁸¹ Scientific American. 2009. Do Seed Companies Control GM Crop Research?

⁸⁸² Smith J. 2010. Please stop dangerous attacks on all Independent GMO researchers. Submitted to the French courts in support of Prof. Serralini.

Carman of Australia was threatened with disciplinary action and became the object of a defamatory letter upon condemning the GMO approval process. Dr Gilles-Éric Séralini and his team were vilified by Monsanto and biotechnology societies for a published criticism of Monsanto's GM products.⁸⁸³

Agrochemical TNCs defend the manufacture and sale of their products, despite overwhelming evidence of their toxicity and dangers to the environment on the basis of (1) the extensive testing their products undergo and (2) approval by government regulatory bodies using 'risk assessment' studies. TNCs attempt to control factors that can affect their market value, targeting information and research, regulatory processes and bodies, scientists and academic institutions, the legal and political systems, governments, international organisations particularly FAO and WHO [see box], and NGOs.

Corporations seek to maximise profit. Management is often held to account by stockholders on the basis of the value of their stock and investment value. There are only very limited mechanisms in the corporate structure to downplay profitability over ensuring minimal-to-nil impacts of their products and processes to health and the environment. The risk of legal and regulatory penalties resulting from law suits brought for unethical practices or damages resulting from hazardous products and industrial processes are a small fraction of the TNCs earnings. The Bhopal tragedy is an example of this.

Their studies can be skewed to obtain favourable results; results of research that undermine profitability (e.g. Hayes' research on dangers of atrazine) or information that diminishes product sales can be suppressed.

Corporate science behind the development of products to achieve financial targets is conducted in secrecy. As our cases show, TNCs seek to exclude, stifle and contradict scientific evidence that threatens their objectives. Their studies can be skewed to obtain favourable results; results of research that undermine profitability (e.g. Hayes' research on dangers of atrazine) or information that diminishes product sales can be suppressed. The burden of scientific proof to show health and environmental risks is shifted to the victims and complainants who do not have resources and/

or expertise to conduct independent studies. When faced with mounting public and legal pressure, corporations may concede an issue 'needs further study' but continue to profit from product sales.

TNCs control the scientific agenda through: (a) influence over scientific and academic institutions and processes via funding support; (b) interference in the scientific peer review process; and (c) harassment of independent scientists whose results contradict corporate science (see cases below). Three representative cases presented here illustrate the tactics and strategies employed: (a) Monsanto hid the truth of contaminated maize landraces in Mexico and attempted to discredit the published study of Drs Chapela and Quist. Their results are now supported by other independent researchers. (b) Syngenta has been wilfully hiding the threats posed by its product atrazine exposed by Dr Hayes' research. (c) Bayer, Syngenta, BASF, Monsanto and Dow as well as CropLife harassed a medical scientist who investigated and reported the impacts of aerial spraying of banana plantations on the village of Kamukhaan in the Philippines.

⁸⁸³ *Ibid.*

CORPORATE INFLUENCE ON WHO AND FAO

The WHO classified endosulfan as a Class II or 'Moderately Hazardous' pesticide based mainly on company-generated acute toxicity data. A closer examination of available data, including from independent sources, clearly shows that endosulfan should belong to at least Class Ib or 'Highly Hazardous' category since most of the LD50 values fall within this range. Other acute toxicity data (Micromedex, 1993) indicate that the acute toxicity profile of endosulfan is comparable to or worse than the toxicity profile of other pesticides belonging to Class Ib. It appears that the WHO-FAO technical committee gave more weight to company-generated data than to independent data. The studies reviewed in the document 'Endosulfan 91-115 JMPR 1989,' often cited by Hoechst (now Bayer) as the basis for their claim of low acute toxicity for endosulfan, were submitted by Hoechst. Few independent studies were included in the review. Many of the studies commissioned by Hoechst (1983) were performed by Industrial Biotest (IBT) of Chicago, which was subsequently convicted for fraudulent practices including fabrication of data that became partly or wholly the basis of approval of endosulfan in many countries. As late as the early 1990's, Hoechst was still submitting IBT data to the Philippine pesticide regulatory agency for the risk assessment review by the Pesticide Technical Advisory Committee.

Quijan, RF. 2000. Risk Assessment in a Third World Reality: Endosulfan Case Study. International Journal of Occupational and Environmental Health 6(4):312-317.

4.7.9.1 The Case of Dr Ignacio Chapela

Syngenta and Monsanto contributed to human rights abuses through corruption and manipulation of science, by subverting the public's right to information, and by smearing the integrity of Dr Ignacio Chapela and others seeking to defend human rights. Monsanto, through its public relations firm, attempted to attack scientific results showing contamination of landraces in Mexico. Syngenta funded an entire academic department and were given seats on important academic committees. These led to politically-motivated attacks and became factors denying Chapela tenure at the university.

Impact of corporate funding of academic research on academic freedom

In 1998, Syngenta (then as Novartis Agricultural Discovery Institute) offered the Department of Plant and Microbial Biology of the University of California Berkeley (UCB) a five-year US \$25 million grant (about a third of the department's research budget), in exchange for the first right to negotiate licenses on a third of the department's discoveries.⁸⁸⁴ The right covered the results of company-funded research and of research funded by state and federal sources. Under the grant, Syngenta representatives filled two of five seats on the department's research committee, which decides how research money is spent.⁸⁸⁵ Chapela was outspoken against the deal, saying it would seriously impinge on the university's commitment to research for the public good and the academic exchange of ideas.

⁸⁸⁴ Sanders R. 1998. CNR, Novartis Seal \$25 Million Biotech Research Agreement. Berkeleyan. December 2.

⁸⁸⁵ Press E, Washburn J. 2000. The Kept University. The Atlantic Monthly 285(3):39-54.

In 2002, the faculty in his department recommended Chapela for tenure with a vote of 32-1 with three abstentions;⁸⁸⁶ and a five-member ad-hoc tenure committee unanimously voted in his favour. But the nine-member Academic Senate's Budget Committee in-charge of academic appointments, promotions and resource allocation did not support the recommendation, allegedly for shortfalls in Chapela's publication record. Then Chancellor Robert Berdahl accepted the committee's recommendation in denying tenure. Professor of Insect Biology, Wayne Getz, a member of the confidential ad-hoc tenure committee, was so upset he broke protocol and identified himself⁸⁸⁷ on the overturning of their decision by the Academic Senate committee. A 2004 study⁸⁸⁸ by Michigan State University researchers later confirmed that there was 'little doubt'⁸⁸⁹ that the UCB-Syngenta research pact (and Chapela's critique of it) played a role in the denial of tenure.

Pressure on journals – the unprecedented partial retraction by 'Nature'

In 2001, Ignacio Chapela and David Quist published an article in the respected British journal, *Nature*, documenting the contamination of native varieties of maize in Mexico (see also 4.2.1.2).⁸⁹⁰ In response, Syngenta's public relations representative said that mixing genes was not a concern and could in fact be useful to the diversification of domesticated plants. *Nature* received very critical letters from scientists attacking the paper. In 2002, *Nature* bowed to pro-GM pressure and took the unprecedented step of nearly retracting Chapela and Quist's article. Printed alongside the retraction were two letters^{891, 892} from well-known scientists who had ties with Department of Plant and Microbial Biology at Berkeley and supported Novartis' funding deal with the University, or previously funded by the Novartis-founded Torrey Mesa Research Institute.⁸⁹³ *Nature's* editor claimed that the article should not have been published due to technical flaws that came to their attention after publication,⁸⁹⁴ despite the fact that it had gone through rigorous peer reviews prior to publication. The Executive Editor, Dr Maxine Clarke, in a subsequent issue, stated the paper was not formally retracted and remains citable.⁸⁹⁵ Some criticised Campbell for setting a 'dangerous precedent' of undermining the credibility of *Nature* and the peer-review process by his actions.⁸⁹⁶

⁸⁸⁶ Dalton R. 2003. Berkeley accused of biotech bias as ecologist is denied tenure. *Nature* 426(6967):591.

⁸⁸⁷ *Ibid.*

⁸⁸⁸ Busch L *et al.* 2004. External Review of the Collaborative Research Agreement between Novartis Agricultural Discovery Institute, Inc. and Regents of University of California. Institute for Food and Agricultural Standards, Michigan State University.

⁸⁸⁹ Busch, 2004, *Op. cit.* p42.

⁸⁹⁰ Quist D, Chapela I. 2001. Transgenic DNA introgressed into traditional maize landraces in Oaxaca, Mexico. *Nature* 414:541-543.

⁸⁹¹ Kaplinsky N, Braun D, Lisch D, Hay A, Hake S, Freeling M. 2002. Biodiversity (Communications arising): Maize transgene results in Mexico are artefacts. *Nature* 416(6881):601-602.

⁸⁹² Metz M, Fütterer J. 2002. Biodiversity (Communications arising): Suspect evidence of transgenic contamination. *Nature* 416(6881):600-601.

⁸⁹³ Worthy K, Strohmman R, Billings P. 2002. Conflicts around the study of Mexican crops. *Nature* 417(6892):897.

⁸⁹⁴ Environment News Service. 2002. Journal 'Nature' renounces Mexican maize article. April 4.

⁸⁹⁵ GMWatch. 2003. Immoral Maize – definitive account of Chapela affair. Extracted from: Rowell A. (2003). Don't Worry, It's Safe to Eat. Earthscan Ltd, London, UK.

⁸⁹⁶ Suarez A. 2002. Conflicts around a study of Mexican crops. *Nature* 417(6892):897.

THE SCIENTIFIC PEER-REVIEW PROCESS

Scientists usually announce discoveries and findings in scientific journals. Before a paper is accepted for publication, it undergoes a peer-review process to ensure that the paper has been thoroughly and independently reviewed. On receipt, the editor of the journal decides whether the paper deserves to be reviewed, and then sends it to other scientists working in the same field. The identity of the reviewers is not revealed to the authors and the other reviewers. The review process involves correspondence between the authors and reviewers and may take months or years. On occasion, reviewers may ask for additional experimentation or data. Reviewers make recommendations to the editor who makes the final decision. Once published, the scientific community serves as the arbiter of the importance and accuracy of the paper. When an experiment or data could not be independently verified or replicated and there is suspicion of fraud, fabrication or deceit, the journal or the scientific community convenes another review process to investigate. The authors may voluntarily withdraw their paper or the journal may publish the official retraction as a result of an investigation or the editor may issue a letter of retraction.

Although some of the Chapela and Quist research techniques and one of the conclusions were criticised, there was no challenge of the main conclusion that Mexican corn has been contaminated by transgenes.⁸⁹⁷ The original findings have since been confirmed by other studies⁸⁹⁸ including one conducted by Mexico's Ministry of Environment and Natural Resources.⁸⁹⁹

Influence on scientific debate and fora - The smear campaign in AgBioWorld

The debate over Chapela and Quist's research was driven by a smear campaign led by the Bivings Group, a public relations firm contracted by Monsanto to influence the scientific debate over the GM contamination, without publicly revealing that it was doing so. The first attacks appeared on AgBioWorld, a biotechnology forum used by thousands of scientists. Instigating the attacks were Mary Murphy and Andura Smetacek – both of whom were later determined to be 'personalities' created by Bivings as supposedly unbiased third party observers.⁹⁰⁰ The AgBioWorld forum is run by CS Prakash; he denies ties to the Bivings Group but an investigative reporter found that the Group host AgBioWorld databases. By 2002, Prakash and his group came out with a joint statement welcoming the gene flow as 'inevitable and welcome'.⁹⁰¹

4.7.9.2 The case of Dr Tyrone Hayes

Syngenta manufactures the pesticide atrazine, the use of which results in severe adverse impacts. The company exerted undue influence on regulatory agencies to have it registered, and marketed atrazine

⁸⁹⁷ Quist D, Chapela I. 2002. Brief communications. *Nature* 416(6881):602.

⁸⁹⁸ Piñeyro-Nelson A, Van Heerwaarden J, Perales HR, Serratos-Hernández JA, Rangel A, Hufford MB, Gepts P, Garay-Arroyo A, Rivera-Bustamante R, Alvarez-Buylla ER. 2009. Transgenes in Mexican maize: molecular evidence and methodological considerations for GMO detection in landrace populations. *Molecular Ecology* 18(4):750-761.

⁸⁹⁹ Stabinsky D, Sarno N. 2001. Mexico, centre of diversity for maize, contaminated. *Leisa*. December, p25.

⁹⁰⁰ Monbiot G. 2002. The fake persuaders. *The Guardian*, UK. May 14

⁹⁰¹ Joint Statement in Support of Scientific Discourse in Mexican GM maize scandal. 2002. February 4.

products with insufficient information about their dangerous nature. The company prevented release of, and contradicted, cogent scientific data that showed the dangers of exposure to this pesticide. To achieve this, the company used unfair and illegal practices such as (a) intimidation, harassment, and attempted bribery of a scientist; (b) funding skewed, haphazard or selective scientific studies; and (c) engaging in a campaign to discredit and silence their chief critic, Dr Tyrone B. Hayes (see Appendix 5.3).

In 1988, Congress updated the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), bringing atrazine, and certain other older pesticides, under review by the US EPA. The EPA failed to meet its 1997 deadline for the atrazine review. In 1999, the Natural Resources Defence Council (NRDC), with the United Farm Workers of America, the AFL-CIO and others, filed a lawsuit documenting their concerns about the environmental and human health consequences of widespread atrazine use. In a consent decree, the EPA was given until 31 October 2003 to complete the review. Novartis Agribusiness (now Syngenta), not wanting to rely on publicly funded science, began funding its own research. They hired Dr Hayes through the private environmental testing and consulting firm, EcoRisk Incorporated (Syngenta gave \$2 million to Ecorisk to fund these studies).⁹⁰²

Following a period of research, Dr Hayes concluded that male tadpoles exposed to atrazine grew to be frogs that were 'demasculinised' and 'feminised'. The disrupted endocrine system of exposed frogs converts androgens (male hormones) into oestrogens (female hormones). Exposed animals had smaller voice boxes, greatly reduced testosterone levels and many grew eggs in their testes. These effects appeared with doses of atrazine as low as 0.1 parts per billion (ppb): the equivalent of a single drop of atrazine in about 909,000 litres of water.⁹⁰³ When Dr Hayes communicated his results, the company insisted he repeat the experiments. He did so and produced the same results. Syngenta then did everything possible to obstruct experiments, including withholding funding and delaying approval of guidelines for continued research.⁹⁰⁴ Syngenta refused to allow publication, indicating the contract made his findings their private property.⁹⁰⁵ In order to make public the risks of atrazine, Dr Hayes resigned from EcoRisk and reproduced the study using his own resources. The company then offered US \$2 million in lab support to continue his research 'in a private setting'.⁹⁰⁶ Dr Hayes had no wish to keep his results private and eventually published in *Nature*, and the *Proceedings of the National Academy of Science*.⁹⁰⁷

No longer able to hide these scientific findings, Syngenta focused on undermining Dr Hayes' work. At a meeting attended by Dr Hayes' faculty mentors, deans, and students, they brought in a statistician to question his reading of the data. Syngenta funded skewed 'scientific' work that contradicted his findings. Three Syngenta-sponsored studies were published which failed to replicate Dr Hayes' results. Dr Hayes points to the dozens of studies that corroborate his results⁹⁰⁸ and other studies that confirm the same effects in rodents, and potentially in humans. Syngenta published a paper in the *Journal of Occupational and Environmental Medicine* which shows that workers in its Louisiana atrazine factory^{909, 910} have rates of prostate cancer that are significantly higher than average. The Syngenta-

⁹⁰² Land Stewardship Project, PANNA. 2010. *The Syngenta Corporation & Atrazine: The Cost to the Land, People & Democracy*. January 10.

⁹⁰³ *Ibid.*

⁹⁰⁴ Blumenstyk G. 2003. The Story of Syngenta & Tyrone Hayes at UC Berkeley: The Price of Research. *The Chronicle of Higher Education*. 50(10).

⁹⁰⁵ Land Stewardship Project & PANNA, 2010, *Op cit.*

⁹⁰⁶ Blumenstyk, 2003, *Op cit.*

⁹⁰⁷ Land Stewardship Project and PANNA, 2010), *Op cit.*

⁹⁰⁸ See bibliography on Dr Hayes website: www.atrazinelovers.com

⁹⁰⁹ MacLennan P, Delzell E, Sathiakumar N, Myers SL, Cheng H, Grizzle W, Chen VW, Wu XC. 2002. Cancer incidence among triazine herbicide manufacturing workers. *Journal of Occupational and Environmental Medicine* 44(11):1048-1058.

⁹¹⁰ Sass J. 2003. Letter to the Editor. *Journal of Occupational and Environmental Medicine* 45(4), 1-2.

sponsored studies that question Dr Hayes' results are deeply flawed. In one EcoRisk study⁹¹¹ submitted to the EPA, 86 per cent of frogs died before the effects of atrazine exposure could become manifest.

According to a *Washington Post* article, Syngenta did its best to exclude consideration of Dr Hayes' science in the US EPA review. It used EcoRisk, the same consultancy that initially hired Dr Hayes, to file a petition with the EPA asking the agency to ignore Dr Hayes' studies because they were based on hormone disruption – a mechanism that was not 'a legitimate regulatory endpoint at this time' as the government had not settled on an officially accepted test for measuring such disruption.⁹¹²

Finally, Syngenta used its corporate muscle to push Dr Hayes out of the public spotlight. In one such instance, Dr Hayes (after being initially invited) was uninvited to present the keynote address at the Minnesota Pollution Control Agency's Air, Water and Waste conference. *They've engaged in character assassination, have pressured interest groups to deny him speaking engagements, and have commissioned new studies to cast doubt on Hayes' work,*⁹¹³ says Dr Paul Z. Myers, assistant professor of biology at the University of Minnesota.

By so doing, Syngenta has violated Dr Hayes' right to free speech, the public right to information, the right to a healthy environment and the right to health and life of all those exposed to atrazine. Breast and prostate cancer, birth defects, and lower sperm counts in men, have all been linked to atrazine use. (For a complete listing of health effects and supporting scientific data see Dr Hayes' website, www.atrazinelovers.com.) Syngenta held over 50 private meetings with the EPA to re-register atrazine. Syngenta has full knowledge of the implications of atrazine use and exposure, but instead of acting on this knowledge to alter or withdraw its product, it has placed corporate profit over the public good and devoted its immense resources to corruption, distortion, and burial of the overwhelming scientific data.

4.7.9.3 The case of Dr Romeo Quijano

Bayer, Syngenta, BASF, Monsanto and Dow, as well as CropLife, contributed to human rights abuses through their harassment of Dr Romeo Quijano. The TNCs economically benefited from the continued use of the products by banana plantations. The publication of *Kamukhaan: Report on a Poisoned Village* and the ensuing lawsuits filed against the investigators were reported widely in media (see 4.7.4.1 for problems at Kamukhaan). The pesticide TNCs knew of the harassment, abetted or supported the violations and, through CropLife, were actively involved in the commission of the violations.

Prior to his investigations in the Kamukhaan village, Dr Quijano sat as a panel member on the Pesticide Technical Advisory Committee of the Department of Agriculture. In a conference on 'The Effects of Pesticides on Women' he presented the risks of endosulfan stating it *may* cause cancer. The Philippine News and Features Agency picked up the story. As a result of the statement, Hoechst filed a civil damage lawsuit of over US \$810,000 against Dr Quijano. Case was dismissed as there was a conflict of interest between the Regional Trial Judge and the lawyers of Hoechst. The Agency was charged with a similar claim. In another case, Ermina Abongan spoke in 1993 about the continuing ill effect of Brestan (triphenyltin, banned in 1990) on her health, and found herself similarly charged.⁹¹⁴

⁹¹¹ Hecker MJ, Coady KK, Giesy JP. 2003. Response of *Xenopus laevis* to Atrazine Exposure: Assessment of the Mechanism of Action of Atrazine. Ferndale (WA): Ecorisk. Interim Report MSU-04.

⁹¹² Weiss R. 2004. 'Data Quality' Law Is Nemesis Of Regulation. *Washington Post*. August 16.

⁹¹³ Myers P. 2006. Tyrone Hayes at UMM. February 6.

⁹¹⁴ Macfarlane R. 1994. Citizens Pesticides Hoechst: The story of Endosulfan and Triphenyltin. PAN AP, Penang, Malaysia. piii.

HISTORY OF HARASSMENT

1993	<i>Hoechst (now w/ Bayer) filed suit against Dr Quijano for revealing dangers of endosulfan in a public lecture. Case was dismissed.</i>
1997-99	<i>Dr Quijano conducted medical examinations and interviews</i>
2000 April	<i>Philippine Daily Inquirer (PDI) published an article on villager's complaints against aerial spraying (independent of Dr Quijano's work)</i>
2000 August	<i>Publication of "Poisoned Village". LADECO filed libel suit. Case was dismissed.</i>
2002 June	<i>LADECO filed suit for civil damages.</i>
2007	<i>Damage suit was dismissed.</i>
2007 February	<i>Davao City banned aerial spraying</i>
2007 April	<i>PBGEA questioned the constitutionality of the ban</i>
2009 January	<i>Court of Appeals overturned the local trial court's decision and the ordinance. Appeal was filed with the Supreme Court.</i>
2009 May	<i>DOH released a medical and environmental study</i>
2010 January	<i>Some residents filed complaints with the PRC against Dr Quijano and Dr Dionisio (DOH)</i>

In 2000, following publication of the article 'Poisoned Lives' in the Philippine Post about pesticide poisonings in Kamukhaan, co-written with his daughter Ilang-Ilang Quijano, Dr Quijano was sued 20 million pesos for libel by the plantation company LADECO. The case was eventually dismissed. In another instance, LADECO filed a motion to cite the Quijanos for contempt, asking that PAN AP remove an article about the poisonings from their website.⁹¹⁵ PAN Philippines called for Luis 'Cito' Lorenzo Jr, formerly adviser to the President, Agriculture Secretary and owner of LADECO, to withdraw the suit. The libel case was eventually dismissed.⁹¹⁶ In June 2002, the Quijanos were again sued for civil damages by LADECO for their exposé of pesticide poisonings in Kamukhaan.⁹¹⁷ Dr Quijano stated that LADECO coerced villagers to sign retractions of statements made in the 1997 study and recorded on videotape and that the new suit *is clearly nothing but part of the harassment LADECO has been continuously inflicting on us and the villagers of Kamukhaan.*⁹¹⁸ He further stated that LADECO conducted inappropriate laboratory tests capable of detecting only a single pesticide that was not among those named in his findings.

In 2007, the Davao Regional Trial Court dismissed the charges. *Examination and scrutiny of the questions and answers in the memorandum of plaintiff corporation through counsel are nothing but reflection of answers of defendant, Dr Romeo Quijano, without any patent evidence of malice and/or bad faith to destroy the good name and reputation of plaintiff corporation...* said the judge. The company filed an appeal to the higher court (pending at the time of writing).⁹¹⁹

⁹¹⁵ Quijano R. 2004. Kamukhaan: A Poisoned Village. University of the Philippines.

⁹¹⁶ *Ibid.*

⁹¹⁷ *Ibid.*

⁹¹⁸ PANNA. 2002. Support Philippine Activists. August 26.

⁹¹⁹ PAN Philippines. 2010. Continuing Harassment of Health Rights Defenders in the Philippines. June.

Grave threats to life

An attempt to make Dr Quijano feel unwanted within the premises of the affected communities was initiated by LADECO. At one point, makeshift banners bearing the threatening words 'Dr Quijano, keep out!' were hung in Kamukhaan. His patients were subjected to harassment and warned not to talk to Dr Quijano or to the members of the local organisation working with him. He has been the subject of vilification campaigns by the Philippine Banana Growers and Exporters Association (PBGEA) and CropLife through paid media advertisements, making libellous statements (e.g. claiming he is using the issue to gain foreign funding for personal gain and making fun of his expertise). In 2008 Ilang-Ilang Quijano, and filmmaker Jose Rojo Luneta were prohibited from photographing the plantation (including from a national highway) by company guards.⁹²⁰

On an earlier occasion Dr Quijano and a community organiser in Kamukhaan were subjected to death threats. Dr Quijano continues to initiate and participate in public awareness activities, lobbying and campaigning for a ban on aerial spraying in alliance with local people's organisations and environmental NGOs. In the congressional hearing in October, 2009, as an expert witness he discredited PBGEA's claims on the 'safety' of aerial spraying of pesticides. Dr Quijano's life may remain in danger as other social activists have been killed with impunity in the province of Davao and elsewhere in the Philippines.⁹²¹

Threats to livelihood

In January 2010, a complaint was filed with the regional office of the Professional Regulation Commission (PRC) against Dr Romeo Quijano, 10 other doctors and one engineer. The complaint was lodged ostensibly by residents of Sitio Kamukhaan (Camocnaan), Barangay Aplaya, Hagonoy, Davao del Sur who were allegedly 'greatly affected' by the *deceit, malice with intent to defraud, unethical and unprofessional conduct, and for personal gain* committed by Dr Quijano and Dr Dionisio (lead investigator in the DOH study) and others in connection with their scientific investigations on the impact of aerial spraying. The complaint lodged with the PRC was filed by attorney Leopoldo Leuterio through a 'special power of attorney'; affidavits of 16 Kamukhaan residents were represented by the village chieftain and village councillor. It was alleged that: Dr Dionisio's team did not reveal to the residents the real purpose of their visit and misrepresented their medical examinations as a 'free clinic'; that the team employed deceit in getting the blood samples; and that the results of their examinations were never given to the residents. They said that no resident of Kamukhaan ever complained of any sickness attributed to the aerial spraying of pesticides.⁹²² Dr Quijano, in his counter-affidavit, stated that the article *Poisoned Lives* was based on medical examinations and actual interviews conducted in 1997-1999. He stated: *Later, however, it came to my attention that several of the interviewees were summoned by LADECO and were made to sign statements contradicting their previous statements recorded on video. Some of those summoned reported that they were intimidated by the company, and that the company gave certain favours to obtain the signed affidavits which do not reflect the truth.* Dr Quijano then cited an article by reporter Allan Nawal, published on April 13, 2000, by the *Philippine Daily Inquirer*, to dispute the residents' claim that there have never been complaints regarding the adverse effects of pesticide use by the company. The article 'was essentially the same story' as *Poisoned Lives*, and included interviews with then Hagonoy vice-mayor Diomedes Barimbad and Nurse Ana Gilbuena that confirmed these complaints.⁹²³

⁹²⁰ *Ibid.*

⁹²¹ *Ibid.*

⁹²² *Ibid.*, pp1-4

⁹²³ *Ibid.*, pp1-2

The counter-affidavits said the health assessment was done with the knowledge of all stakeholders and the consent of pre-selected residents. They also pointed out that two of the complainants are minors, putting into question the voluntariness of the execution of their affidavits. Finally, they said that *This is a public issue with far-reaching implications. The shame, if there is [any] at all, belongs somewhere else and not to the people of Camocnaan.*

Complicity of TNCs and CropLife

Given the history and media coverage of the poisoning of Kamukhaan, Bayer, Syngenta, BASF, Monsanto and Dow as well as CropLife are aware of and know the legal actions and harassment of Dr Quijano, the DOH team and other human rights defenders. These TNCs facilitate the violation of the rights of human rights defenders. The silencing of human rights defenders and the truth on the risks of aerial spraying and pesticides on people's health and environment ensure continued markets for the toxic chemicals. These TNCs and CropLife are complicit in the commission of the violation of the rights of human rights defenders and livelihood.

4.7.10 CHILDREN'S RIGHTS – COTTONSEED PRODUCTION IN INDIA

This section focuses on child labour in the production of hybrid cotton seeds. The cottonseeds are produced for TNCs and carry company product labels. The work ... *by its nature or circumstances in which it is carried out, is likely to harm the health, safety ... of children* (Article 3, Convention concerning the Prohibition and Immediate Action for the Elimination of the Worst Forms of Child Labour, ILO Convention C182).

The introduction of hybrid cottonseeds in the early 1970s brought changes in the cotton production in India. Hybrid cottonseed production has given rise to new forms of labour exploitation with the employment and exploitation of female children as bonded labour. Hybrid cottonseed production is highly labour intensive and girls are employed in most operations, particularly the arduous work of cross-pollination.⁹²⁴ Children are extremely low paid, work long hours and are exposed to hazardous pesticides.

About 200 seed companies produce and market hybrid cottonseeds in India, including the TNCs Unilever, Monsanto, Syngenta, Advanta, Bayer and Emergent Genetics. TNCs operate through Indian subsidiaries or joint ventures with local companies including Hindustan Lever (Unilever), Syngenta India (Syngenta), Advanta India (Advanta), Monsanto India and Mahyco (Monsanto), Proagro (Bayer) and Mahendra Hybrid Seeds (Emergent Genetics). Under Indian laws companies cannot own large areas of land for cottonseed production, and they depend on local seed farmers to produce seeds. Most companies operate through intermediaries or middlemen called 'seed organisers'.⁹²⁵

Companies fail to maintain oversight of their supply chain and allow violations against children to occur. Seed producers recruit children by extending loans to the children's parents at a crucial time of summer when work is not available in the village and they are most likely to face financial problems. Parents send their daughters to work in the cottonseed fields in order to meet these financial obligations.⁹²⁶ Children are required to work on terms set by the farmer for the entire season and often for several years.

⁹²⁴ Venkateswarlu D. 2007. Child Labour and Trans-national Seed Companies in Hybrid Cottonseed Production in Andhra Pradesh, IndiaNet.

⁹²⁵ *Ibid.*

⁹²⁶ Venkateswarlu, 2007, *Op cit.*

They work long hours and are deprived of an education. They are commonly exposed to dangerous agrochemicals. Child labour cuts farmers' costs as the wages paid are far below both the market wages for adults and even further below official minimum wages.⁹²⁷

Sivramakrishna, a seed farmer in Andhra Pradesh said: *Cross-pollination is very labour intensive and a large number of labourers are required to do this work. It is also delicate work and needs to be handled carefully. We prefer young girls for this task because with their delicate fingers they can handle this work better than adults. They also work more intensively than adults. They listen to us and do whatever we ask them to do. Nearly half of our investment goes towards payment of labour costs. The wage rates for children are far lower than adult wages. We can reduce our labour costs considerably if we hire girls. If we want to hire adult labour we have to pay higher wages. With the current procurement price we get from the seed companies we cannot afford to pay higher wages to the labourers.*⁹²⁸

While working on cross-pollination, children stand among cotton plants, which reach up to their shoulders, and bend over to identify flowers ready for pollination. The work is laborious and keeps a peak of a dozen workers busy for several months on just one acre. For example, Yothi Ramulla Naga is four feet tall. From sun-up to sundown she is hunched over in the fields of a cottonseed farm in southern India, earning 20 cents an hour. Farmers in the Uyyalawada region process the high-tech cottonseeds on behalf of Monsanto. Yothi says she is 15 but looks no older than 12.

TESTIMONY FROM A CHILD WORKER (see Appendix 5.11)

Ashwini is now 15 years old and worked in cotton field until she was 11. This is her story.

I worked on a cotton field for five years from the age of six with my mother and father. My parents earned Rs.50 a day and I earned Rs.25. I would go to the cotton fields at 6.30 am. I was given the work of spraying fertiliser and picking seeds for fertilising; I was very good at it. I was given a break of 15 minutes when the sun was hottest. I would carry food from home, not even water was provided to me. Every day was long and tiresome, and the next day I would have the same routine. My wages would be spent quickly to buy groceries and food. I would work for 365 days and would not be given rest even on major festivals.

I have had lots of health problems due to my work. I started having severe back problems and was not allowed to take rests, even for five minutes. I developed kidney stones and my hair and nails fell off due to plucking of the seeds. I developed breathing problems and used to cough the whole day. Like me, other children in the village would work from the age of 5-6 and were treated inhumanely. I would face torture and physical abuse by my employer. They would beat us if we did not come to work and would make us work for hours without any food and water.

Many children in this village are sent to work because their parents owe major debts to landlords. Out of desperation, parents send their children to work to help pay the debt. If the children stopped working, interest would be charged and parents would owe even more.

On other (non-cotton) crops, on the day when pesticides are sprayed, generally no manual work is attended to in the fields (to avoid their exposure to pesticides). My employer would not give any protection against pesticides. I developed rashes and asthma ... caused by endosulfan (other pesticides) and contact with oil from the seeds.

⁹²⁷ Venkateswarlu D. 2005. The Price of Childhood – on the link between prices paid to farmers and the use of child labour in cottonseed production in Andhra Pradesh. October.

⁹²⁸ Case brief from Andhra Pradesh Vyavasaya Vruthidarula Union (pers. comm).

The wage rates for children are agreed at the time of making a loan to their parents. The rates vary from area to area depending on the scarcity of labour, but are fixed in advance for one crop season. Adults and children are recruited through this process.⁹²⁹ In Tamil Nadu, the seed farmers place their demand for labour with contractors and pay advances for these workers. The advance money includes travel costs of the labourers from their home to work and anywhere between 15-30 days of wages⁹³⁰.

These practices have an adverse impact on literacy. About 60 per cent of the children working in cottonseed fields have dropped out of school; 29 per cent never attended school. In Tamil Nadu, the cross-pollination period is adjusted to suit the school hours and children are paid a nominal amount of Rs.20 per day for this work. The daily wage rate for adult workers is Rs. 80 -100. While this appears to be part-time work, children are in the field for seven hours, longer than they spend in school. This affects school performance and pressures children to drop out and join the work force.⁹³¹

Pesticide use is excessive in commercial cotton cultivation (accounting for nearly 55 per cent of total pesticide consumption in India). The majority of pesticides used are 'Highly Hazardous' including monocrotophos, which accounts for 22 percent of the entire Indian cotton insecticides market, endosulfan, quinalphos, fenvalerate, chlorpyrifos, dimethoate, and imidacloprid. Children in the cottonseed fields are directly exposed to these pesticides⁹³². To avoid pesticide exposure in ordinary cotton production no work is carried out on the days pesticides are sprayed. In cottonseed cultivation children continue working and are directly exposed for many hours.⁹³³ This reflects the poisoning symptoms children complain of: headaches, weakness, disorientation, convulsions and respiratory problems. In the absence of long-term monitoring there is no way to assess the permanent damage such exposure has on the health of these children.⁹³⁴ Furthermore, children (generally boys) spray pesticides on cottonseed farms. Malleesh, a 13 year-old boy working in Kurnool district, was a bonded labourer who frequently sprayed cottonseed. He died due to pesticide exposure on 29 June 2004. Several days after his death, two more children, Paramesh and Bhoolakshmi, aged eight and 12, died of pesticide exposure in the same district. These examples are not uncommon. The deaths of children generally go unreported.⁹³⁵

In the absence of long-term monitoring, there is no way to assess the permanent damage such exposure has on the health of these children.

Most cottonseed farmers produce for TNCs. These corporations have substantial control over the entire production process. Company representatives make frequent visits to the farmers' fields to supervise quality.⁹³⁶ A 2010 study by Davuluri Venkateswarlu indicates that child labour has declined in recent years. But the total number of children employed in the cottonseed sector remains huge, employing approximately 169,900 children below 14. Both Gujarat and Karnataka showed significant rises in

⁹²⁹ Venkateswarlu D. 2010. 'Signs of Hope' – Child and Adult Labour in Cottonseed Production in India. India Committee of the Netherlands, Stop Child Labour campaign Hivos, International Labour Rights Forum.

⁹³⁰ *Ibid.*

⁹³¹ Venkateswarlu D. 2010. 'Signs of Hope' – Child and Adult Labour in Cottonseed Production in India. India Committee of the Netherlands, Stop Child Labour Campaign Hivos, International Labour Rights Forum.

⁹³² EJF, 2007. The Deadly Chemicals in Cotton, Environmental Justice Foundation in collaboration with Pesticide Action Network UK, London, UK.

⁹³³ Venkateswarlu D. 2004. Child Labour in hybrid cottonseed production in Andhra Pradesh: Recent Developments. September.

⁹³⁴ Venkateswarlu D. 2003. Child Labour and Trans-national Seed Companies in Hybrid Cottonseed. Production in Andhra Pradesh. April.

⁹³⁵ Case brief from Andhra Pradesh Vyavasaya Vruthidarula Union [APVVU], private communication.

⁹³⁶ *Ibid.*

child labour due to the increased acreage under cottonseed. Bayer and Monsanto have taken steps to address the child labour issues but have had limited impact on the magnitude of the problem. As of 2010, DuPont and Dow AgroSciences had not taken any serious steps to address child labour in their cottonseed supply chain.⁹³⁷

These conditions constitute a violation of: the Convention Concerning the Prohibition and Immediate Action for the Elimination of the Worst Forms of Child Labour, ILO Convention C182; the right to life under Article 6 (1) UN Convention on the Rights of the Child 1989; the right to health, Article 24 (1), Article 31 (1 & 2) Charter of Fundamental Rights of the EU 2000; and the Right to Education, Article 26 (1) Universal Declaration of Human Rights.

⁹³⁷ Venkateswarlu, 2010, *Op cit.*

5 LAWS VIOLATED

The defendant corporations are liable under international law for their continued deliberate manufacture and distribution of hazardous pesticides while knowing of their dangerous properties, the conditions of use that prevail in developing countries, and the devastating impact of their products on the lives and health of millions of human beings, animals and the environment. The TNCs named in this indictment are guilty of grievous violations of the following provisions of international law. The first provisions are drawn from international human rights conventions and provide a general description of certain rights. The subsequent articulations of human rights are derived from agreements or declarations that more specifically describe rights and obligations in relation to hazards.

5.1 THE RIGHTS TO HEALTH AND LIFE

The Right to Life

The right to life of all human beings was first protected under international law with the adoption of the International Declaration of Human Rights in 1948. Article 3 of the Declaration protects *the right to life, liberty and security of the person*. In its preamble, the Declaration obliges not only nations but *every individual and every organ of society ... to promote respect for these rights and freedoms ... and to secure their universal recognition and observance*. Corporations have been held to be 'organs of society' and are thereby bound by the Declaration. The right to life is recognised in the following:

- The International Convention on Civil and Political Rights states, in Article 6, 'Every human being has the inherent right to life.'
- The American Convention on Human Rights states, in Article 4, *Every person has the right to have his life respected*. Article 5 further declares, *Every person has the right to have his physical, mental, and moral integrity respected*.
- The African Charter of Human and Peoples' Rights states, in Article 4, *Human beings are inviolable. Every human being shall be entitled to respect for his life and the integrity of his person*.
- The Universal Declaration of the Rights of Peoples guarantees, in Article 1, *Every people has the right to existence*. The right to life is inherent in this collective right.

The Committee on Human Rights declared in its General Comment No. 6 in 1982, that the right to life has been too often narrowly interpreted. The expression 'inherent right to life' cannot properly be understood in a restrictive manner, and the protection of this right requires that States adopt positive measures. In this connection, the Committee considers that it would be desirable for States parties to take all possible measures to reduce infant mortality and increase life expectancy ... This extension of the right to life by the UN would also mandate the regulation of the use of agrochemicals in both home and host states to address the severe impacts of stillbirths and reduced life expectancy among those exposed to such hazards. (Home states are countries where TNCs are based and host states are countries where their products are used and the great majority of victims reside.)

Further, neither the initial Declaration nor the subsequent UN Conventions limit state obligations to protect the right to life to only the lives of individuals that are citizens of each state. States therefore

have the obligation to adopt measures to protect the right to life of citizens of other states. Host states would thereby have the obligation to regulate the sale and distribution of the hazardous products of their TNCs. Implicit in this mandate is the obligation not to allow the manufacture—in whatever state—and export of products outlawed in the home states.

The home states of the defendant corporations, Germany, Switzerland and the US, are all advanced industrialized nations with highly developed legal systems that are fully capable of imposing legal liability on their TNCs who violate the human rights of non-nationals in other states. None of these states has adopted a domestic legal regime that allows such victims of their TNCs ready access to remedies for rights violations and have not removed jurisdictional, substantive and procedural barriers to those victims' access to justice. Finally, the home states have not advocated for international agreements that would protect the right to life of non-nationals, through the provision of accessible remedies, from the conduct of their TNCs.

The United Nations' Rio Declaration on Environment and Development states, in Principle 1. *Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.*

The conduct of the six defendants in this action has violated the right to life of plaintiffs though the manufacture and distribution of agrochemicals that can cause acute or long-term harm, symptoms that can lead directly to death and diseases that diminish the quality of life and shorten the lives of those exposed to their products.

The Right to Health

The International Convention on Economic, Social and Cultural Rights (ICESCR) guarantees, in Article 12, *the right of everyone to the enjoyment of the highest attainable standard of physical and mental health.*

The Economic and Social Council noted in General Comment No. 14, in 2000, that the right to health was not confined to health care but extends to the right to safe and healthy working conditions and a healthy environment, as well as food and nutrition, housing and access to safe and potable water and sanitation, all of which are threatened or violated by the use of agrochemicals and GM crops.

The Council noted that Article 12.2(b) of the ICESCR, *The improvement of all aspects of environmental and industrial hygiene, mandates the prevention and reduction of the population's exposure to harmful substances such as radiation and harmful chemicals ...*

The Council, in a significant expansion of the entities obligated under Article 12, noted, in Paragraph 50 of the Comment: *Violations of the right to health can occur through the direct actions of States or other entities insufficiently regulated by States (emphasis added)...Violations through acts of commission (emphasis in original) include...the adoption of legislation or policies which are manifestly incompatible with pre-existing national or international legal obligations in relation to the right to health.* Under this provision of the Comment, TNCs, as 'entities insufficiently regulated' by many states, especially those in the South, violate the right to health by adopting policies that promote the marketing and distribution of hazardous agrochemicals, especially when they know that, under typical conditions of use, the chemicals can cause catastrophic harm to the health of individuals and communities. These defendant TNCs are also releasing GE crops that are of health concern.

UN General Assembly resolution 45/94 (1990) recognised *that all individuals are entitled to live in an environment adequate to their health and well-being.*

The African Charter on Human and Peoples' Rights states, in Article 16, *Every individual shall have the right to enjoy the best attainable state of physical and mental health.*

The Convention on the Rights of the Child states, in Article 24, *States parties recognize the right of the child to the enjoyment of the highest attainable standard of health...* Further, under Article 24.2(f), *States parties undertake to promote and encourage international cooperation with a view to achieving progressively the full realization of the right recognized in the present article. In this regard, particular account shall be taken of the needs of developing countries.* This mandate applies directly to developed countries and, at the least, requires that TNC host countries (such as the United States, Switzerland and Germany), where it is within their authority and competence, prevent harm to the health of children in developing countries. Thus host countries are obligated to prevent the export of hazardous chemicals when it is known that the inevitable result is harm to the health of the child. Further, the production of GM seeds and crops frequently involves the violation of children's rights, including that to health. Where TNCs control, directly or indirectly, the production and marketing of such products, whether or not they or their subsidiaries or partners employ children, they are complicit and culpable, and should be legally liable, for such rights violations.

The Right to Just and Favourable Working Conditions – Safe Working Conditions

The Universal Declaration of Human Rights states, in Article 24, *Everyone has the right...to just and favourable conditions of work ...*

The International Convention on Economic, Social and Cultural Rights states, in Article 7, *The States parties to the present Convention recognize the right of everyone to the enjoyment of just and favourable conditions of work and which ensure...(b) safe and healthy working conditions ...*

The African Charter on Human and Peoples' Rights states, in Article 15, *Each individual shall have the right to work under equitable and satisfactory conditions ...*

The Additional Protocol to the American Convention on Human Rights states, in Article 7, *The States parties to this Protocol recognize...that everyone shall enjoy that right [to work] under just, equitable, and satisfactory conditions...particularly with respect to...(e) safety and hygiene at work ...*

These instruments ensure the protection of workers from hazardous working conditions without exception. The use of toxic pesticides, which has led to deaths and illnesses worldwide, and the impracticality in using PPE in the tropics wantonly exposing workers to hazards, with the full knowledge of the defendant TNCs, is a gross violation of this right. Given the state of gender inequality, women workers are even more vulnerable to the ill effects particularly on their reproductive health; their problems can also impact the development of their children. It is appalling that TNCs export these technologies to countries with lax labour laws and regulation where the same have been banned in their home countries. See the cases on Paraquat, Endosulfan and Aerial Spraying of the Indictment and the health and safety provisions of the International Labour Organization below.

The Right to a Healthy Environment

In 1972, the Stockholm Conference declared, in Principle 1, *Man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being, and he bears a solemn responsibility to protect and improve the environment for present and future generations.*

The African Charter of Human and People's Rights states, in Article 24, *All persons shall have the right to a general satisfactory environment favourable to their development.*

The Additional Protocol of the American Convention on Human Rights states, in Article 11, *Everyone shall have the right to live in a healthy environment... and State Parties shall promote the protection, preservation, and improvement of the environment.*

The Rio Declaration on Environment and Development proclaims, in Principle 1, *Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.*

These declarations and regional instruments affirm the fundamental character of the right to a healthy environment towards achieving other rights. The contamination and destruction of the environment directly threatens people's well-being, health, livelihood and these same rights of future generations. The Rio Declaration is not legally binding but has been seen as morally binding, and has guided the framing of national environmental laws as well as other international conventions such as the Convention of Biological Diversity and the Cartagena Protocol on Biosafety. The TNC's emphasis on heavy chemical inputs during the Green Revolution has decimated populations of non-target species affecting the delicate balance of ecosystems. These chemicals enter the water cycle and are diffused by air so their effects can be manifested in areas far from the area of application. The aggressive marketing programmes for high yielding varieties and the neo-liberal policies on cash crops has significantly narrowed down the available gene pool and directly impacts capability of communities to respond to climate change, pests and other stress factors. The introduction of GMOs further threatens centres of origin and diversity with the contamination of natural varieties. Horizontal gene transfer of GMO traits and heavy pesticide use have resulted in the emergence of superweeds and highly resistant pests. These effects have long been known and established yet TNCs continue the unabated destruction of the environment.

In Principle 14 of the Rio Declaration, *States should effectively cooperate to discourage or prevent the relocation and transfer to other States of any activities and substances that cause severe environmental degradation or are found to be harmful to human health.* This principle directly addresses the export of dangerous industries, such as the case of the Dow plant (then UCC) in Bhopal, products and technologies, such as pesticides and genetically-modified organisms. This also covers the dumping of toxic wastes, as aid or for sale, to other countries.

In Principle 16 of the Rio Declaration, *National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.* Under this principle, the TNCs should be made accountable for the cleaning up of contaminated environments.

In Principle 15 of the Rio Declaration, *In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.*

The Convention on Biological Diversity obliges Contracting Parties, in Principle 8(g), to *regulate, manage or control the risks associated with the use and release of living modified organisms resulting from biotechnology which are likely to have adverse environmental impacts that could affect the conservation and sustainable use of biological diversity, taking also into account the risks to human health.*

The Cartagena Protocol on Biosafety, in its Preamble, reaffirms *the precautionary approach contained in Principle 15 of the Rio Declaration*. In particular, in Article 11.8, it states that *lack of scientific certainty due to insufficient relevant scientific information and knowledge regarding the extent of the potential adverse effects of a living modified organism on the conservation and sustainable use of biological diversity in the Party of import, taking also into account risks to human health, shall not prevent that Party from taking a decision, as appropriate, with regard to the import of that living modified organism intended for direct use as food or feed, or for processing, in order to avoid or minimize such potential adverse effects*.

These principles guide governments to apply the precautionary principle and the appropriate risk control systems in the deployment and use of hazardous technologies and living modified organisms. The United States has refused to apply the precautionary principle claiming it undermines their technological superiority and industrial advancement. But the risk of environmental disaster is not bound by geo-political boundaries. The contamination of natural rice and corn varieties and the pollution of the Arctic are proof of these incalculable risks.

5.2 ECONOMIC, SOCIAL AND CULTURAL RIGHTS

Right to Livelihood

The UDHR declares, in Article 23.1, that *everyone has the right to work*.

The ICESCR recognises, in Article 6.1, *the right to work*.

The ILO Convention No. 122 or the Employment Convention (1964) reaffirms this right. Every individual is entitled to this right including the freedom to choose employment, and the right to earn a living that would ensure an adequate standard of living and dignity. This right is intrinsically linked to the right to food. Focus should be given to the highly marginalised small food producers, as the failure to protect and guarantee their livelihood will detrimentally abridge the right to food of their communities.

Agrochemical TNCs violate this right with the monopoly control over seeds and GE crops through patents and PVPs. The high costs of seeds and inputs are an unnecessary financial burden on small food producers, who also have to contend with market prices subjected to speculation. IPRs over food resources, supported by the WTO, prevent small communities from adopting techniques like traditional crossbreeding practices that would enable them to protect their agrobiodiversity and build resilience in light of climate change. Such practices have enabled farmers to produce locally-adapted varieties suitable for the given ecological zone and environmental condition. The inability to save patented seeds compromises their economic position, especially for women farmers and indigenous women, as well as the long-term sustainability of their food production. Plant diversity that has been developed by farmers and their communities over generations and centuries is being rapidly eroded.

Right to Adequate Food

The right to food is enshrined in the most fundamental covenants and protected in both international and humanitarian law and is regarded as a positive obligation; noncompliance constitutes a violation of this right.

Article 25.1 of the UDHR states that *Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food...*

Article 11.1 of the ICESCR recognises *the right of everyone to an adequate standard of living for himself and his family, including adequate food...*

The Committee on Economic, Social and Cultural Rights, in paragraph 8 of its General Comments 12, notes that adequate food implies *the availability of food in a quantity and quality sufficient to satisfy the dietary needs of individuals, free from adverse substances, and acceptable within a given culture. Furthermore, the Committee adds, in paragraph 6, that the right to adequate food is realized when every man, woman and child, alone or in community with others, has physical and economic access at all times to adequate food or means for its procurement.*

The defendant TNCs have been complicit in causing hunger and malnutrition together with World Bank and the IMF through imposed conditionalities and policies promoting monocultures and plantations of export crops that displaced local food production and led to the loss of access to land and productive resources of the small holder farmers. The attendant loss of resources and agricultural productivity reduced the diversity of available food as well as the capacity to procure or produce enough food for themselves. The downward spiral of real wages of agricultural workers and workers to keep production costs low in the guise of efficiency and comparative advantage is to ensure more profits for corporations. This has meant that workers receive very low wages, so much so that they are unable to secure their food and other basic needs.

Right to Freedom from Interference with the Family and Home

The Universal Declaration of Human Rights states, in Article 12, *No one shall be subjected to arbitrary interference with his privacy, family, home or correspondence...Everyone has the right to the protection of the law against such interference or attacks.* This right, closely associated with the rights of communities and peoples, is violated when people are impacted by the placement of hazardous waste sites, exposed to aerial spraying of agrochemicals, or poisoned by their proximity to locations where pesticides are manufactured, stored or applied. Bhopal remains the most horrific example of this rights violation.

The International covenant on Economic, Social and Cultural Rights states, in Article 10.1, *The States Parties to the present Covenant recognize that ... The widest possible protection and assistance should be accorded to the family, which is the natural and fundamental group unit of society, particularly for its establishment and while it is responsible for the care and education of dependent children.* This right is flagrantly violated by the defendant TNCs' knowing of the use of children in the production of GM seeds and knowing of the exposure of children to crop production involving hazardous pesticides. Where TNCs, their subsidiaries and business partners and suppliers directly employ child labourers though the exploitation of their families' poverty the children's right to education is violated. No known efforts have been made by TNCs to, for example, adopt work schedules that would allow for the on-site continuing education of their child workers.

The American Convention on Human Rights states, in Article 11.2, *No one may be the object of arbitrary or abusive interference with his private life, his family, his home ...*

5.3 CIVIL AND POLITICAL RIGHTS

Right to Self-Determination

Self-determination of peoples is embodied in the charter of the United Nations (UN) itself as one of the main purposes for which the UN body was created. In Article 1.2, the UN is *to develop friendly relations among nations based on respect for the principle of equal rights and self-determination of peoples, and to take other appropriate measures to strengthen universal peace*. This was mainly applied to sovereign states but has been extended in later conventions and interpretations to all peoples, particularly indigenous communities.

The International Covenants on Civil and Political Rights, and Economic, Social and Cultural Rights affirm that, in Article 1, all peoples have the right of self-determination. By virtue of that right they freely determine their political status and freely pursue their economic, social and cultural development.

The UN Declaration on the Rights of Indigenous Peoples asserts, in Article 3, *Indigenous peoples have the right to self-determination. By virtue of that right they freely determine their political status and freely pursue their economic, social and cultural development*.

Principle 22 of the Rio Declaration declares that *Indigenous people and their communities and other local communities have a vital role in environmental management and development because of their knowledge and traditional practices. States should recognize and duly support their identity, culture and interests and enable their effective participation in the achievement of sustainable development*. This principle recognises the role of indigenous peoples and local communities in preserving and managing their environmental resources and for states to support their traditions and way of life. Implied in this recognition is the acknowledgement of the symbiotic dependence of indigenous peoples and local communities on their surrounding ecosystem; they often depend on these resources for their economic, cultural and spiritual sustenance. The destruction of the natural resources as a result of the Green Revolution, land grabbing and land conversion by the TNCs supported by the imperialistic desires of their home states violates this right.

The Convention on Biological Diversity, in Article 8(j), encourages Parties to *...respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices*. This is a positive obligation to state parties not only to recognise but to protect indigenous and traditional knowledge and practices. The TRIPs agreement violates the provision for just sharing of benefits. The on-going piracy of and application of the IPR regime on indigenous and traditional knowledge by the agrochemical TNCs and their home governments undermine the fundamental rights of indigenous peoples and local communities.

Rights to Participation and Access to Information

Principle 10 of the Rio Declaration states that *Environmental issues are best handled with participation of all concerned citizens... each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities*.

The Aarhus Convention asserts, in Article 3.2, Each Party shall endeavour to ensure that officials and authorities assist and provide guidance to the public in seeking access to information, in facilitating participation in decision-making and in seeking access to justice in environmental matters. This Convention, albeit regional in scope, expressly links environmental rights and human rights as well as government accountability towards achieving these rights. Thus, public participation in the decision-making process and access to information is paramount, and should be supported and encouraged in the democratic context.

Resolution 59(I) of the UN General Assembly, in 1946, recognises that *freedom of information is a fundamental human right and is the touchstone of all the freedoms to which the United Nations is consecrated*. This implies the right to gather, transmit and publish information, ideas and opinions. The rights to information and freedom of expression are twin rights declared and reaffirmed in international instruments.

The ICCPR, in Article 19.2, reaffirms these twin rights, stating that *Everyone shall have the right to freedom of expression; this right shall include freedom to seek, receive and impart information and ideas of all kinds, regardless of frontiers, either orally, in writing or in print, in the form of art, or through any other media of his choice*. However, this Covenant introduced specific restrictions in paragraph 3, when necessary, to ensure *respect of the rights or reputation of others, and for the protection of national security, or of public order and public health or morals*. The public release of full scientific and assessment studies submitted to regulatory authorities have been blocked by TNCs claiming that these are trade secrets. But legal interpretation of these restrictions is moving favouring public access to information, especially on matters affecting them such as in the case of the toxicity and environment impact assessments of pesticides and GMOs.

Right of Human Rights Defenders

Resolution 13/13 of Human Rights Council calls on states to *promote a safe and enabling environment in which human rights defenders can operate free from hindrance and insecurity*. It affirms the right of all parties to protect and promote universally-recognised human rights and fundamental freedoms. This obligation on 'organs of society' is now interpreted to apply to TNCs. The Human Rights Council specifically mentions that transnational corporations and other business enterprises have a responsibility to respect human rights which implies that corporations have a responsibility to respect the rights of human rights defenders. The harassment of scientists who expose the ill doings of the TNCs, and of activists who protest the continuing human rights violations in plantations, farms and communities is a violation of this right.

5.4 RIGHTS OF WOMEN AND CHILDREN

Rights of Women at Work

The Convention on the Elimination of All Forms of Discrimination Against Women states, in Article 11, *States parties shall take all appropriate measures to eliminate discrimination against women in the field of employment ... (f) the right to protection of health and to safety in working conditions, including safeguarding the function of reproduction*.

Article 11.2 of the above Convention contains the obligation to provide special protection to women during pregnancy in types of work proven to be harmful to them.

Article 14.1 of the above Convention states, *States parties shall take into account the particular problems facing rural women and the significant roles which rural women play in the economic survival of their families, including their work in the non-monetized sector of the economy, and shall take all appropriate measures to ensure the application of the provisions of the present Convention to women in rural areas.*

The Tribunal might consider that throughout the world women are frequently the majority of those workers employed in the application, through spraying or by hand, of hazardous pesticides on crops. They are particularly susceptible to the ill effects of pesticide use due to their physiology, and socio-cultural and economic status. Many of these pesticides mimic hormones or otherwise disrupt the normal functioning of the endocrine system. In turn, this can adversely impact the development of foetus resulting in deformities and abnormalities, if not death. The toxic effect may manifest even among children who have been unnecessarily exposed to pesticides in their mother's womb. This fact is demonstrated by the evidence in the representative cases on endosulfan and atrazine. The defendant TNCs are surely chargeable with this knowledge.

Rights of Children Who Work

The International Convention on Economic, Social and Cultural Rights states, in Article 10.3. The States Parties to the present Convention recognise that: *Special measures of protection should be taken on behalf of all children and young persons...Children and young persons should be protected from economic and social exploitation. Their employment in work harmful to their morals or health or dangerous to life or likely to hamper their normal development should be punishable by law.*

The Convention on the Rights of the Child states, at Article 32, *States parties recognize the right of the child to be protected from economic exploitation and from performing any work that is likely to be hazardous or to be harmful to the child's health or physical, mental, spiritual, moral, or social development.*

The Additional Protocol to the American Convention of Human Rights mandates that the States parties observe, through Article 7(f), *The prohibition of night work or unhealthy or dangerous working conditions and, in general, of all work that jeopardizes health, safety, or morals, for persons under 18 years of age.*

The use of child labour in cotton production is another example of how TNCs evade corporate accountability by exporting or encouraging technologies and industries that could not satisfy the strict regulations in their home countries. Child labour is the cheapest and the most compliant to company dictates taking advantage of their poor economic condition. These children work long hours and are exposed to hazardous pesticides compromising their physical and mental development.

It should be noted that none of the above provisions protect a child's right to an education or even to a childhood itself. These obligations accrue to the state. However, the defendant TNCs well know that working children are constantly exposed to their hazardous products in the typical course of crop production. The defendants have failed to exercise their influence to prevent such exposures, design programs to assure that children and their families are properly informed as to the dangers of the agrochemicals to which they are exposed, and have adopted means of agrochemical application, such as aerial spraying, that guarantees the poisoning of non-working children, including infants and their families, by their products.

5.5 NORMS ON THE RESPONSIBILITIES OF TRANSNATIONAL CORPORATIONS WITH REGARD TO HUMAN RIGHTS

The Norms on Responsibilities of Transnational Corporations and Other Business Enterprises With Regard to Human Rights (hereinafter 'the Norms'), adopted by the UN Economic and Social Council in 2003, set out the obligations of TNCs to abide by international law, including treaties and declarations, that protect human rights. The Universal Declaration of Human Rights mandates the participation of all 'organs of society,' including TNCs and other business enterprises, to *promote respect for human rights and freedoms and to secure universal and effective recognition and observance* of those rights.

Under the preamble to the Norms, TNCs and their officers are obliged to respect the responsibilities and norms in UN treaties and other international instruments including the international covenants on political, civil, economic, social and cultural rights, the conventions on genocide, slavery, racial discrimination, torture, migrant workers and civil liability for environmental damage, as well as the Rio Declaration, the UN Millennium Declaration, the regional human rights charters and conventions, and the conventions and recommendations of the International Labour Organization, among others.

The Norms also note the requirements for compliance with the Tripartite Declaration of Principles Concerning Multinational Enterprises and Social Policy and the Declaration on Fundamental Principles and Rights at Work of the International Labour Organization, the Guidelines for Multinational Enterprises of the Organization for Economic Cooperation and Development, and the UN Global Compact (GC) whose voluntary members are required to respect nine basic principles regarding human rights, including labour rights and the environment. The Dow Chemical Company, BASF AG, DuPont and Bayer AG are members of the GC.

The first general obligation of the Norms requires transnational corporations, *within their respective spheres of activity and influence*, to promote, respect and protect human rights recognised in international and national law, including the rights of indigenous people.

The seventh general obligation states: *Transnational corporations...shall provide a safe and healthy working environment as set forth in relevant international instruments and national legislation as well as international human rights and humanitarian law.*

TNCs are required, under the twelfth general obligation, to contribute, *inter alia*, to realisation of the right to the highest attainable standard of physical and mental health. The production and distribution of agrochemicals known to be hazardous to human health under common conditions of use is a direct violation of this principle.

The thirteenth general obligation requires that TNCs take *all necessary steps to ensure the safety and quality of the goods and services they provide, including observance of the precautionary principle. Nor shall they produce, distribute, market, or advertise harmful or potentially harmful products for use by consumers.* The precautionary principle mandates that complete scientific proof is not necessary to ban a practice or product if there are strong indications of its harmfulness. The production, distribution, marketing and advertising of agrochemicals is a direct violation of this principle and this violation is aggravated by the use of deceitful propaganda employed to minimise potential harm to human health.

The fourteenth general obligation requires adherence by TNCs to *international agreements, principles, objective, responsibilities, and standards with respect to the environment as well as human rights, public health and safety, bioethics and the precautionary principle ...* The obligation also addresses compliance with national laws and regulations in countries in which they operate.

Later general obligations under the Norms mandate that TNCs develop and implement internal rules in compliance with the Norms and incorporate them in their contracts and other agreements with contractors, subcontractors, licensees and distributors to ensure implementation of the Norms. Further, TNCs shall be subject to monitoring by the UN and other international or national mechanisms both extant and 'yet to be created.' The monitoring is to be transparent, open to inputs from stakeholders, including non-government organisations, regarding violations of the Norms. TNCs are also required to make reparations to individuals and communities that have been adversely affected by failures to comply with the Norms. Most importantly, *In connection with determining damages, in regard to criminal sanctions, and in all other respects, these Norms shall be applied by national courts and/or international tribunals, pursuant to national and international law.* Thus, the Norms are to be regarded as binding international law and used as standards, the violation of which is to be considered unlawful and render the civil or criminal defendant liable to parties harmed by their conduct. The adoption of these Norms has not had any noticeable impact on the operations of agrochemical TNCs.

5.6 OECD Guidelines for Multinational Enterprises

The Guidelines apply to all members of the Organization for Economic Cooperation and Development, including the US, Switzerland and Germany, the host countries for the defendants here. The provisions represent perhaps the most comprehensive collection of specific standards that the defendants egregiously violate in a wholesale fashion through their routine operations. The following are direct quotations of some of their most important provisions.

General policies

Enterprises should take fully into account established policies in the countries in which they operate, and consider the views of other stakeholders. In this regard, enterprises should:

- 1. Contribute to economic, social and environmental progress with a view to achieving sustainable development.*
- 2. Respect the internationally human rights of those affected by their activities consistent with the host government's [in this case, the United States, Switzerland, and Germany] international obligations and commitments.*
- 3. Encourage local capacity building through close cooperation with the local community including business interests, as well as developing the enterprise's activities in domestic and foreign markets, consistent with the need for sound commercial practice. ...*
- 5. Refrain from seeking or accepting exemptions not contemplated in the statutory or regulatory framework related to environmental, health, safety, labour, taxation, financial incentives, or other issues. ...*
- 7. Develop and apply effective self-regulatory and management systems that foster a relationship of confidence and mutual trust between enterprises and the societies in which they operate.*
- 8. Promote awareness of and compliance by workers ... with ... company policies through appropriate dissemination of these policies, including through training programmes.*

13. ... encourage, where practicable, business partners, including suppliers and sub-contractors, to apply principles of corporate conduct compatible with these Guidelines. [This provision would clearly include subsidiaries and distributors in every nation in which the enterprise operates or sells its products.]
15. Abstain from any improper involvement in local political activities.

V. Employment and Industrial Relations

Enterprises should, within the framework of applicable law, regulations and prevailing labour relations and employment practices:

1. c) Contribute to the effective abolition of child labour
1. d) Contribute to the elimination of all forms of forced or compulsory labour ...
4. a) Observe standards of employment and industrial relations not less favourable than those observed by comparable employers in the host country. ...
 - c) Take adequate steps to ensure occupational health and safety in their operations.

VI. Environment

Enterprises should, within the framework of laws, regulations and administrative practices in the countries in which they operate, and in consideration of relevant international agreements, principles, objectives and standards, take due account of the need to protect the environment, public health and safety, and generally to conduct their activities in a manner contributing to the wider goal of sustainable government. In particular, enterprises should:

1. Establish and maintain a system of environmental management appropriate to the enterprise:
 - a) collection and evaluation of adequate and timely information regarding the environmental, health, and safety impacts of their activities;
 - b) establishment of measurable objectives and, where appropriate, targets for improved environmental performance, including periodically reviewing the continuing relevance of those objectives; and
 - c) regular monitoring and verification of progress toward environmental, health and safety objectives or targets.
2. Taking into account concerns about cost, business confidentiality, and the protection of intellectual property rights:
 - a) provide the public and employees with adequate ... and timely information on the potential environmental, health and safety impacts of the activities of the enterprise, which could include reporting on progress in improving environmental performance; and
 - b) engage in adequate and timely communication and consultation with the communities directly affected by the environmental, health and safety policies of the enterprise and by their implementation.

3. *Assess and address in decision-making, the foreseeable environmental, health, and safety-related impacts associated with the processes, goods, and services of the enterprise over their full life cycle ... Where those proposed activities may have significant environmental, health or safety impacts, and where they are subject to a decision of a competent authority, prepare an appropriate environmental impact assessment.*
4. *Consistent with the scientific and technical understanding of the risks, where there are threats of serious damage to the environment, taking also into account human health and safety, not use the lack of full scientific certainty as a reason for postponing cost-effective measures to prevent or minimize such damage.*

The remaining important four provisions under 'Environment' continue to expand the responsibilities of multinational enterprises. A subsequent section, 'Consumer Interests,' addresses responsibilities that include meeting the *agreed or legally required standards for consumer health and safety, including health warnings and product safety and information labels and cooperation with public authorities in the prevention or removal of serious threats to public health and safety deriving from the consumption or use of their products.*

We will further cite provisions from the Universal Declaration of the Rights of Peoples, the PPT Charter on Industrial Hazards and Human Rights, the ILO Conventions, the Rotterdam Convention, the Stockholm and Berne Declarations, the FAO Code and others.

Specifically, their acts or omissions constitute violation of the following instruments of international law

- *The Universal Declaration of Human Rights (1948)*
- *International Covenant on Civil and Political Rights (1966)*
- *International Covenant on Economic, Social and Cultural Rights (1966)*
- *United Nations Convention on the Rights of the Child (1989)*
- *United Nations Declaration on Rights of Indigenous Peoples (2007)*
- *Convention on the Elimination of All Forms of Discrimination against Women (1979)*
- *The International Labour Organisation Chemicals Convention (1990)*
- *The International Labour Organisation Employment Policy Convention (1964)*
- *United Nations Declaration on the Right to Development (1986)*
- *United Nations Declaration on the Right and Responsibility of Individuals, Groups and Organs of Society to Promote and Protect Universally Recognized Human Rights and Fundamental Freedoms (1999)*
- *Rio Declaration on Environment and Development 1992 (United Nations Conference on Environment and Development)*
- *Rio Summit Agenda 21 (1992)*
- *Convention on Biological Diversity (1992)*
- *Cartagena Protocol on Biosafety to the Convention on Biological Diversity (2000)*

- *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (1989)*
- *Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (1998)*
- *Stockholm Convention on Persistent Organic Pollutants (2001)*
- *FAO International Code of Conduct on the Distribution and Use of Pesticides (2005)*
- *African (Banjul) Charter On Human and Peoples' Rights, (1982)*
- *American Convention on Human Rights (1969)*
- *Charter of Fundamental Rights of the European Union (2000)*
- *Universal Declaration of the Rights of the Peoples (1976)*
- *Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environment Matters (1998)*

which rights are universal, inalienable, indivisible, interrelated and interdependent.

6 THE VERDICT

6.1 THE FACTS – ANALYSIS BY JURISTS

The evidence presented to the PPT by witnesses and experts through oral presentations (followed by extensive question and answer period), written and visual material made available during the public hearings (see Annexes 1 and 2), and available to the Jury as support documentation, cannot be summarized here in full detail. While some of the concrete situations and cases are more explicitly examined in Section 4, this section is simply meant to focus on 'model' findings, which are representative of the major classes of violations which are then considered and qualified in the Sections which follow.

The situation presented to the Tribunal in terms of human rights violations by and through agrochemical transnational corporations (TNCs) can be summarized as follows.

Bayer, BASF, Dow, DuPont, Monsanto and Syngenta are major agrochemical TNCs, involved in the production of both agrochemicals and proprietary seeds (including hybrid seed and genetically modified seed). Combined, those six companies have a 72 per cent share of the global pesticide market, a market worth US \$44 billion in 2009. Monsanto, DuPont and Syngenta alone control 53 per cent of the global proprietary seed market, a market estimated to be worth US \$27.4 billion in 2009 ('Who will control the green economy?', ETC Group 2011, pp. 22, 25).

Linked to the power and influence of these corporations is a recurring picture of abuse of this power ranging from bribery (direct and indirect), threats, and harassment to weakening regulations, producing misleading, erroneous or even false information and data and untruthful and aggressive marketing and promotion of hazardous pesticides and of genetically modified (GM) seed. The labeling of data as 'confidential business information' is used to hide data from the public.

As a consequence, highly toxic pesticides are produced, marketed and used, resulting in great suffering and in the violations of rights, which largely affect small farmers, farm laborers, the poor and powerless. Violations of rights and suffering also occurred through the introduction and use of genetically modified crops on their own terms and in combination with the use of hazardous agrochemicals. The problem of hazardous agrochemicals in this context is worsened by the failure of glyphosate to control weeds, which enhances the use of pesticides such as 2,4-D and dicamba, and the genetic modification of crops so that they can tolerate such harmful herbicides.

According to the WHO, an estimated 355,000 people die each year from poisoning from exposure to pesticides, two-thirds of them in developing countries.⁹³⁸

⁹³⁸ It was subsequently discovered that the World Bank, in providing this figure, had misinterpreted the document it referenced, a WHO report which stated there were 335,00 accidental poisonings per year, about half in agriculture.

6.1.1 VIOLATION OF THE RIGHT TO HEALTH AND LIFE

Health, chronic and irreversible disease, injury and death

Health, chronic and irreversible disease, injury and death are being suffered due to the use, presence and persistence of single or multiple pesticides in food or in the environment.

- Acute poisoning due to tractor, and especially aerial, spraying of pesticides on glyphosate tolerant GM soybean (Monsanto) led to the rapid death of eleven-year old Silvino Talavera in Paraguay, who died of heart-respiratory failure because he lived and played close to GM soybean fields, and was sprayed while bicycling home. The toxins later found in his blood were **glyphosate, phenol and carbamates**. Glyphosate is associated with the herbicide formulation RoundupMax (Monsanto). In this instance the whole family suffered acute poisoning, leading to their hospitalisation.
- The poisoning with endosulfan, an insecticidal organochlorine pesticide (produced by Bayer). It is used on crops such as cashews, tea, coffee, cotton, fruits, vegetables, rice, and grains. The long term use and aerial spraying of endosulfan in plantations has led to severe suffering of many communities who work in these plantations or live in their vicinity. Endosulfan is a persistent organic pollutant (POP) which remains in the environment, bio-accumulates through the food web, and does not decay with long-range transport. As an immune system and endocrine disrupter it is highly toxic to humans and wildlife. Direct exposure of humans, i.e. coming in contact with the spray on the ground when applied by helicopter, has resulted in irreversible paralysis and death. Long term exposure has resulted in significant congenital, reproductive, neurological damage and other health effects. The suffering of the community in, for example, Kasargod, Kerala, India is well documented, where endosulfan was sprayed from 1976-2002. In the aforementioned health effects have been documented for over 9,000 villagers. Endosulfan-induced death has been officially documented for 500 people but real figures are thought to be around 4,000. Endosulfan has been banned in Kerala, India, since 2002, but not throughout India.
- By 2011, endosulfan was banned by more than 80 countries, but it is still used extensively in India and China, and a few other countries, such as in Uruguay with GM soybean.
- Poisoning with **atrazine**, a herbicidal pesticide (produced by Syngenta): Atrazine is another endocrine disrupter that caused severe health effects, including demasculinisation and feminisation of males both in humans as in animals. This is widely reported in animal studies internationally. Its use in areas in the US can, for example, be correlated with the feminisation of amphibians. Whilst banned in the European Union, atrazine remains a widely used herbicide in many parts of the world. Despite well documented proof to its endocrine disrupter effects in the scientific literature, Syngenta chooses to harass and discredit scientists involved in research rather than stop its production and use.
- Poisoning with **paraquat**, a herbicidal pesticide (produced by Syngenta): paraquat is a highly toxic herbicide widely used in plantations, in particular palm oil plantations. In the vast majority of cases, the spraying by hand will be carried out by women workers, as seen in Malaysia. Serious health problems among sprayers were reported, including blindness, discoloration and loss of nails, bleeding from the nose, infection of reproductive organs, and respiratory problems. Long term exposure results in such debilitating health problems that it forces women to stop working early, e.g. at age 45, as shown for Nagama.

- The exposure to multiple pesticides is suffered by people in the Arctic Circle, in particular by indigenous peoples, due to the high contamination of all their food sources. As toxins accumulate in cold regions at high altitudes or in the Arctic and Antarctic regions, POPs and pollutants that persist because of cold temperatures (and that would degrade more rapidly in warm regions of the planet) are found in fish, walrus, seals, eggs of wild birds (e.g. murre, guillemots) and in the ice itself. Toxins found include those manufactured by Bayer, Syngenta and Dow; even endosulfan can readily be found. As a consequence, the bodies of arctic indigenous peoples are continuously being poisoned and health effects are reaching increasingly high proportions, thereby causing great suffering not only to this generation but to the generations to come.
- Multiple exposure is also found in communities in Africa, where the canisters of pesticide dumps leak and pollute the ground water and the land nearby. Leaking pesticide dumps have been found near schools and wells, close to where children play, in many African countries. As compared to their purchase price, the safe decommissioning of pesticides is disproportionately expensive and, therefore, often unaffordable.
- Health problems found in people handling *Bt*-cotton in ginning factories in Madhya Pradesh strongly suggest that workers have allergic reactions to the *Bt* toxin in cotton. Symptoms range from skin itching, eye itching and swelling to respiratory tract complaints.

6.1.2 VIOLATION OF THE RIGHT TO LIVELIHOOD, RIGHT TO FOOD AND FOOD SOVEREIGNTY, INCLUDING FOOD PRODUCTION

Threat to and loss of food production, food sovereignty and livelihoods

Both use and presence of agrochemicals and GM crops have been identified as a threat to livelihoods, food production and in particular food sovereignty.

- Farmers using chemical inputs (i.e. fertilisers and pesticides) and who have switched to monoculture farming are no longer able to complement their food with non-cash-crop plants (including medicinal plants), snails, fish, ducks etc., all previously part of their farming system. Nor can neighboring farmers resort to many such food supplements if the water is contaminated with toxic chemicals.
- The widespread use of GM seeds in the US and also Canada has resulted in significant GM contamination of farmers' fields and seed supplies. This affects the livelihoods of organic farmers as well as of non-GM conventional farmers. Organic farmers lose their organic status and conventional farmers are taken to court by GM seed TNCs, in particular Monsanto, and have to pay large amounts to the companies. This is the case no matter whether the farmer has knowingly or unknowingly (i.e. by contamination) planted GM seeds. In the US, Monsanto has filed over 136 cases involving 400 farmers and 53 small businesses/farm companies for 'illegally' using patented GMO seeds. The sum rewarded to Monsanto in 70 recorded judgments against farmers totaled US \$23,345,820.99.
- Seed sovereignty - the ability to save and adapt seeds and to do so freely – is essential for food sovereignty and livelihoods. This right is violated by both hybrid and patented GM seeds.
- Pollinators, especially bees, are essential for the production of food. Bees are in drastic decline in many parts of the world, in particular in areas where pesticides are used that are toxic to bees and that are present in pollen. The death of bees started occurring in Europe in the mid-nineties at the

same time that Bayer introduced neonicotinoid insecticidal pesticides on the European market, first imidacloprid, later clothianidin (introduced into the US market in 2003). They belong to the most widely used insecticides in the world for field and horticultural crops, and are often applied as a seed-dressing, especially for maize, sunflower, and rape (canola). These pesticides are particularly harmful to bees and are now being directly linked to bee colony collapse disorder in many countries of the world, threatening the livelihood of beekeepers directly and the livelihood of farmers and communities depending on open pollinated crops indirectly. Ultimately, life on earth depends on the existence, health and work of pollinating insects. Due to protests by beekeepers, France has banned imidacloprid as a seed dressing, and never approved clothianidin.

- Farmers in Brazil have organised large protests to object to sterile seed technologies, also known as Terminator Technologies, which are genetically modified seeds that will commit suicide when replanted. Indeed, farmers and communities around the whole world are objecting to the introduction of such seeds that will drastically undermine food security in general and food sovereignty and livelihoods in particular. It is also seen as a clear violation of the principles of life itself.
- Indigenous peoples, in particular in the arctic circle, are being contaminated with toxic chemicals present in all their foods, as outlined under 'violations of rights to health and life' above.
- The aerial spraying of herbicide tolerant GM crops, such as GM soybean in Paraguay, with herbicidal pesticides have resulted in the contamination of water sources of small farmers nearby and in the contamination and even destruction of their food sources, including the death of their animals, thus bringing hardship and undermining their livelihoods.

6.1.3 VIOLATION OF THE RIGHT TO A SAFE AND HEALTHY ENVIRONMENT

Loss of biodiversity, degradation of ecosystems and environment

As outlined above, the toxicity of many agrochemicals is affecting the abundance and health of animals directly, such as bees and pollinators, amphibians, fish, as well as indirectly through the food chain, such as arthropod predators, birds, etc. Decline of species is also associated to the loss of their food source, from the disappearance of weed and wild plants (e.g. milkweed, the food source of the monarch butterfly) to the disappearance of insects – due to their eradication by pesticides (including herbicides).

6.1.4 VIOLATION OF THE RIGHTS OF INDIGENOUS PEOPLES

Threat to survival of indigenous peoples and their cultural and traditional practices

Though not being the users of agrichemicals themselves, indigenous peoples are particularly affected by persistent toxic agrichemicals which accumulate in the environment and the food chain, with devastating effects on health and the way of life of indigenous peoples. These pollutants are passively transported to their environment through air and water (see above under threats to health).

This is particularly the case for indigenous peoples living in the Arctic Circle, with a high level of pollution by POPs, as produced by Syngenta, Bayer and Dow. Not only do these chemicals accumulate in the region and hardly degrade due to the low temperatures, but everything that is linked to the lives of indigenous peoples is affected. All their ways of life, traditional practices and resources, including

their food sources and their building and working materials, are intrinsically linked with the animals of the region, all of which are accumulating toxins to an alarming rate, in particular those higher up the food chain. A continuation of their way of life and practices threatens their very own existence and survival, yet forsaking it would equally threaten their livelihoods and their survival as peoples.

The case of the arctic is also a most compelling case for the application of the precautionary principle: "The pesticides were never meant to be there, but they all ended up there."

6.1.5 VIOLATION OF THE RIGHTS OF CHILDREN AND WOMEN

Children and women are particularly affected by agrichemicals for a number of reasons. Children that run and play breathe more and inhale thus a higher dose of airborne toxins. They also are found playing near toxic dumps, as for example those in Mali, Senegal and Burkina Faso. Children's bodies are also more vulnerable, as they are still growing. This was also evident for the Paraguayan boy Silvino Talavera, who died from toxic poisoning, with others surviving. Children, especially girls, also work in plantations, especially cotton plantations, some of which are for seed multiplication. In India, some 170,000 children below 14 are estimated to work in cotton plantations. This does not only affect their schooling, but also their bodies, due to long working hours and due to exposure to agrochemicals, which they mix and spray often without any protection, or which they touch when involved in seed multiplication. In particular, exposure has been to endosulfan and monocrotophos.

Women are often preferred laborers for pesticide spraying as men are employed for other work in plantations. In fact women don't usually get any other work but spraying. Thus, women in particular are affected by pesticides like paraquat, as outlined above.

6.1.6 VIOLATION OF CIVIL AND POLITICAL RIGHTS, THE RIGHT TO SELF-DETERMINATION OF PEOPLES, THE RIGHT TO PARTICIPATION AND INFORMATION AND THE RIGHTS OF HUMAN RIGHT DEFENDERS

Threats, intimidation, imprisonment, killing and discrediting of public interest activists, medical doctors and scientists

The undermining of independent science and research and silencing of uncomfortable truth by powerful TNCs is widespread. Cases brought to the Tribunal included:

- The killing and serious injury by shooting of peasant farmer activists in Brazil when peacefully occupying a Syngenta testing site to prevent the sowing of GM seeds near the national park. 'Keno' Valmir Mota was killed (shot in the chest at point blank range) and Isabel do Nascimento de Souza was seriously injured (with a bullet in her head).
- The harassment, defamation, threatening, imprisonment and/or legal suits of, amongst others: Dr Irene Fernandez – Malaysia, human rights activist working with women plantation workers (e.g. paraquat, Syngenta); Dr Romeo Quijano – Philippines, medical doctor and toxicologist; Dr Tyrone Hayes – US, scientist on effects of atrazine; David Runyon – US, farmer; Dr Y.S. Mohankumar – India, medical doctor, working with endosulfan victims, harassed and sued by pesticide companies.
- Witnesses further testified that corporations have used personal harassment via radio; threats to life, livelihood and family spoken out loud or whispered into ears (prior to giving evidence/presentations); prevented scientists from public speaking, pressurized universities to cut funding

and dismiss scientists; paid for counter evidence and for manipulated and untruthful data; brought legal suits and counter suits to silence critics (including by imprisonment) and tied activists (including farmers) in years of litigation; pressurizing or bribing politicians and officials and acting in collusion.

- Evidence has been presented on how the introduction of GM crops with patented proprietary seed has led also in US and Canada to the destruction of community relations with farmer turned against farmer, spying on each other, living under constant threat of investigation and legal suits from corporations, mostly Monsanto.

6.2 QUALIFICATION OF THE FACTS

6.2.1 GENERAL FRAMEWORK

How can it be explained that Transnational Corporations (TNCs) in the last four decades have acquired an enormous economic and political power which allows them as private organizations to exert considerable influence on politically legitimized institutions, to interfere into the regulatory framework, to disdain cultural traditions and to ignore the customs of the daily life of peoples? One reason simply is the growth in size of many TNCs, which exceeded by far the growth of the world economy, of world trade or of other economic indicators. The economic power of TNCs in world economic affairs outweighs the political forces of nation states or international organizations. Foreign direct investments outperformed the growth rates of domestic investment in most countries, as well as those of other economic variables, with the exception of the growth of the number and volume of transactions in financial markets. The other and closely connected reason for the importance of TNCs in recent times is the liberalization of markets and the deregulation of politics since the 1970s, ideologically driven by the so called 'neoliberal counter-revolution'. The scene has been left to private economic agency, i.e. to TNCs.

On the background of these basic developments national legislation concerning labour or the environment has been deregulated. Protective rules to guarantee food security and safety – as well as other types of human security, as they have been elaborated in the context of the UNDP – have widely been dismantled. Market liberalization is good for the haves, it is bad for those people who need social protection against economic exploitation. The promise however always and everywhere was that liberalized markets are more efficient than regulated markets and that therefore the impact of liberalization and deregulation on the 'wealth of nations' is a positive one. This proved to be an illusion – Adam Smith already knew that and empirical evidence clearly demonstrates it every day. Liberalization of financial markets, from the 1980s onwards, triggered one financial crisis after the other: first the debt crisis of the Third World in the 1980s, then the financial crisis of Asian and other emerging economies in the 1990s, followed by the 'new economy'- bubble in the US and, since 2001 (due to the policy of cheap money of the US-American Fed), the subprime loan bubble which spectacularly exploded in 2008. Since then the world economy is in a deep depression.

Liberalization not only turned out to be a grand illusion, however. Free markets need a powerful and, therefore, authoritarian law-and-order state. Moreover, free markets open the doors to corporate innovations aiming at increasing corporate profits. Shareholder-value-strategies have been applied worldwide. Financial markets exert pressure on TNCs and other economic actors to constantly improve their performance, measured in terms of microeconomic criteria.

The dominant public opinion, influenced by TNC-sponsored 'think tanks', experts, the academia and the media has become more and more neoliberal and thus hostile to any kind of regulation, even protective rules to secure the health of people and of the environment. In such a business-friendly environment TNCs and other enterprises have been to a large extent free to realize profit-maximizing strategies without taking social and environmental rules, health concerns, long-term effects of short term profit maximizing strategies, cultural traditions and democratic procedures appropriately into account. This was demonstrated by the testimonies of many witnesses in the Tribunal.

At a first glance the era of free enterprise was a great success, not only for the TNCs but also for developing countries and the people concerned. Growth rates were high, the number of poor people until the middle of the first decade of the 21st Century decreased. The achievement of the Millennium Development Goals, agreed upon by the international community in 2000, appeared to be possible. New powers emerged in the economic and then also in the political realm, above all the BRIC-countries: Brazil, Russia, India and China. The power structure of the world changed in favor of the formerly so called 'Third World'. But this rapid development had a high price: Inequality in the world also grew to a politically intolerable extent and therefore the conflict within and between nations and classes also increased. Today, FAO complains that the number of hungry people in the world is crossing the one billion-threshold although the Millennium-declaration of 2000 targeted a 50 per cent reduction of hungry people by 2015. Hunger therefore is present in many parts of the world, especially in poor rural areas as many witnesses also testified.

The impact that the fast economic growth of the first decade of the new century had on the natural environment was also disastrous. It added new loads of harmful and even dangerous emissions on natural systems and it continued the plundering of natural resources. Scientific research has shown that the cumulative environmental effects of economic growth and modernization in industry as well as on the countryside (Green Revolution), have led mankind to 'planetary boundaries', some of which have been trespassed. Climate change and the foreseeable climate catastrophe are not the only boundary, although today the most important and most disputed one in the global discourse arena. A quotation from the abstract of a preliminary study of concerned scientists from different disciplines and countries on 'planetary boundaries' shows the relevance of the effects of economic growth for agriculture, the production of food in the future, biodiversity and the evolution of life on earth:

Anthropogenic pressures on the Earth System have reached a scale where abrupt global environmental change can no longer be excluded. We propose a new approach to global sustainability in which we define planetary boundaries within which we expect that humanity can operate safely. Transgressing one or more planetary boundaries may be deleterious or even catastrophic due to the risk of crossing thresholds that will trigger non-linear, abrupt environmental change within continental- to planetary-scale systems. We have identified nine planetary boundaries and, drawing upon current scientific understanding, we propose quantifications for seven of them. These seven are climate change (CO₂ concentration in the atmosphere <350 ppm and/or a maximum change of +1 W m⁻² in radiative forcing); ocean acidification (mean surface seawater saturation state with respect to aragonite ≥80% of pre-industrial levels); stratospheric ozone (<5% reduction in O₃ concentration from pre-industrial level of 290 Dobson Units); biogeochemical nitrogen (N) cycle (limit industrial and agricultural fixation of N₂ to 35 Tg N yr⁻¹) and phosphorus (P) cycle (annual P inflow to oceans not to exceed 10 times the natural background weathering of P); global freshwater use (<4000 km³ yr⁻¹ of consumptive use of runoff resources); land system change (<15% of the ice-free land surface under cropland); and the rate at which biological diversity is lost (annual rate of <10 extinctions per million species).

The two additional planetary boundaries for which we have not yet been able to determine a boundary level are chemical pollution and atmospheric aerosol loading. We estimate that humanity has already transgressed three planetary boundaries: for climate change, rate of biodiversity loss, and changes to the global nitrogen cycle. Planetary boundaries are interdependent, because transgressing one may either shift the position of other boundaries or cause them to be transgressed. The social impacts of transgressing boundaries will be a function of the social–ecological resilience of the affected societies.⁹³⁹

Several of these boundaries are violated by the activities of agrochemical TNCs. This means that they not only influence living and working conditions of local populations but also exert a considerable influence on the global environment. The statement of the so called ‘resilience alliance’ therefore can be read as an ‘early warning’ and as a hope that the ‘lessons learned’ are not coming too late. ‘Peaks’ of the availability of resources are another limit to growth. Peak oil perhaps is the most shocking one because a world without or with very expensive oil requires a deep economic, social and political transformation on a global scale – and the world is not prepared to draw the adequate conclusions. And Peak oil is approaching quickly, as the International Energy Agency (IEA) in its World Energy Report of 2011 clearly detects, years after the early warnings of scientists allied in ASPO (Association for the Study of Peak Oil and Gas).

The statement of the ‘resilience alliance’ mentions the reduction of biodiversity as a boundary. It already has been reduced to an unacceptable extent. Although less spectacular than climate change, the disappearance of bees is dramatic alike. Bees are pollinators, indispensable for eco-, and above all, food-systems to flourish. The testimonies of witnesses convincingly showed that, due to monoculture agriculture and the concomitant use of industrial machinery in agriculture along with the application of fertilizers, pesticides etc., the extinction of bees has already occurred to a large extent in many places of the world (in the USA, in Europe, in Argentina and elsewhere) and that it will continue, unless the extinction of bee-feeding plants stops.

Without bees the harvest of many marketable products, from corn to fruits, will diminish dramatically, not to mention wild flowers and plants and the long term effects on biodiversity and the evolution of life on Earth.

A technical witness who reported to the Tribunal his findings on the possible effects of an irreversible extinction of bees as a consequence of the intensive use of pesticides in agriculture, warned that tipping points of regional and even continental eco-systems can be reached unless the application of pesticides in agriculture is halted.

However, profit-related interests have priority and, concomitantly, people’s rights come second, behind property rights and the prevailing rights of appropriation. During the last decades a corporate system has been set up, which is based on so-called ‘accumulation by dispossession’ (David Harvey): appropriation of returns on capital by exploiting people and nature, violating human rights and disabling people, by disregarding and impairing nature, thereby undermining the capabilities to create a humane future. The repercussions on human rights are disastrous as nearly all witnesses explained. The effects are so serious because the economic activities of agrochemical TNCs undermine all dimensions of human security: environmental security, socio-economic security (as defined by the ILO), health security, food security and safety, shelter, public security and also political security. Without these securities human development, as it has been conceptualized by UNDP since the beginning of the 1990s, is not possible.

⁹³⁹ Rockström J *et al.* 2009. Planetary boundaries: Exploring the safe operating space for humanity. *Ecology and Society* 14(2):32.

As a result, the room for the protection and the strengthening of human rights is shrinking. When human inclusive political rights of people are challenged by powerful actors, such as TNCs, democratic participation is difficult or even impossible. Power which might be constitutionally constrained turns into violence. Many witnesses from all parts of the world complained about the rising level of violence in the countryside. The TNCs and their allied forces, such as private militias and para-military groups, parts of the police and commercial security forces, are responsible for the state of insecurity in rural areas of many countries of the world. The state apparatus very often is in collusion with TNCs and with groups responsible for the violence, not least because the state personnel is bribed or blackmailed. Petty and grand corruption alike succeed and bring the framework into perfection, whereby the wrongdoings of TNCs, broadly documented by the witnesses and summarized in the indictment, occur while impunity becomes a normal systemic reaction, so bitterly frustrating for the people concerned.

6.2.2 THE SOCIAL COSTS OF AGROCHEMICALS

The information provided by the witnesses leads to the conclusion that the key issue at stake is the continuous generation of social costs by the TNCs involved in the production of pesticides and of genetically engineered crops. The generation of social costs consists in the shifting of the corporations' private costs onto individuals, communities or humanity as a whole. The private costs that the corporations would have to incur are related to: the introduction of appropriate technologies to avoid the dramatic health effects that the production and use of pesticides and other agrochemical products has on people; the fostering of independent research to identify and prevent such effects; the giving up of all lobbying efforts that prevent public authorities from forbidding the production and use of dangerous agrochemicals.

The resulting social costs include: the undermined health that individuals have to suffer because they live near, or possibly work in, fields where pesticides are used; the physical and mental handicaps that children suffer because they are born from parents who live in the above conditions; the employment and income effects that workers - and their households - suffer because, owing to their undermined health, they cannot work anymore. The impoverishment that these effects lead to is a pressure on children to contribute to their families' income. Consequently, not only do the children directly suffer the consequences of the above costs, in that they are obliged to forsake their schooling; their communities - and their country - also lose the opportunity to upgrade their overall level of education, what is sometimes termed their 'human capital'.

Communities also suffer other social costs from agrochemicals. These costs include the disruption of the provisioning process, thus of all the traditions and culture that are associated to it. In some cases - as, for instance, in Argentina - this is the result of the substitution of a varied production of crops with monocultures. In others - as, for instance, in the Arctic regions - it is the consequence of the progressive accumulation of poisonous substances in the animals and plants that provide a people's standard diet. In others still - litigations in the USA concerning the presumed illegal use of genetically modified seeds - it is the increase in the mutual distrust among farmers and, consequently, the progressive disruption of the community.

While it is more than reasonable that diets, traditions and culture should change over time and that there is no reason to stick to the past for its own sake, it is important that these changes be chosen by the communities rather than imposed upon them by business decisions.

Social costs from pesticides also relate to humanity as a whole. The poisonous effects of pesticides act on the food chain, thereby potentially affecting anybody. While this circumstance may act on

some sections of humanity before, or rather than, others, another circumstance may have potentially dramatic consequences for everybody: it is the possible end to pollination that would result from the persistence in the decline of the bee population.

The above depicted social costs occur because the companies that produce pesticides do not care to prevent or avoid the costs of health security for people and for the eco-system in general. In some extreme cases, they may be willing to monetize the above social costs. It is, however, clear, that the loss of health and the disruption of a social environment are costs that in no way can be monetized. They preclude the possibility to live a decent life. They reduce the freedom that people have in choosing how to conduct their lives. In so doing they ultimately condemn those people to the loss of their future. When companies try to avoid legal consequences for their action by paying out sums of money, they are reasserting the view that the people involved are expendable and disposable forms of life, mere commodities.

These companies are responsible for the above actions, because they cannot be unaware of the dramatic effects that their products have on people and on nature. They are responsible because they put pressure on governments to avoid restrictions on their activities and because, when restrictions do exist, the companies involved try to bypass all regulations and, in some cases, break the law. Finally, they are responsible because they attempt in all ways to withhold whatever information concerning these matters would endanger their business.

A major problem pointed out by the witnesses was precisely the lack of information. It is of great importance to point out that information is not only at the root of any economically relevant choice. It is also a prerequisite for the freedom to choose how to conduct one's life.

Most of the people who suffered the direct consequences of pesticide poisoning were not aware of the danger that the use of those products involved. In some instances, they were precluded access to whatever information was available; in other instances, the employers took advantage of the inadequate education of the workers, who could not read or appreciate the available information. Thus, those workers were in a situation whereby they could not claim their rights or even knowingly choose whether to leave their jobs or not.

Information problems also exist for educated people. When the scientific community has produced enough evidence to ascertain the danger of a specific agrochemical product, advertising and lobbying provide a biased view so as to justify the claim that no restriction is required. When uncertainty still exists, in that not enough research is available, strategies may vary. Some companies finance researches only when they are exclusively consistent with their interests. If this is not possible, they restrict access to information in order to preclude independent research. When such a research is nonetheless carried out, they invest in 'doubt creation' by suggesting that either the scholars who conducted the research or the research itself are scientifically unreliable. In some particularly grievous cases, they harass scholars in order to 'convince' them not to persist in that field of research.

The action of the companies is often complemented by government policies. An inadequate amount of public research funding prevents independent research from being carried out. It also forces universities and research institutes to rely on private funds. The implication is that companies are willing to finance these institutions but only subject to the – not necessarily explicit – requirement that research be consistent with their interests.

The unavailability of public information makes a perverse product cycle possible. It provides the companies with enough time to produce and market a pesticide, thereby recovering the investment

they made to develop it. When enough evidence proves that the pesticide is unacceptable and must be banned, they will presumably have had enough time to devise a variant which may be even more dangerous but that can be marketed for as long as there is no reliable information to justify its restriction.

These information problems are strongly dependent on the principle whereby it is those who take action against a pesticide that must prove its harmful effects. The introduction of the precautionary principle may not be sufficient to avoid the above social costs but it is certainly a necessary requirement.

Information, however, relates not only to the nature of the products and to their effects. The lack of such information makes it ever more difficult for people to establish proper connections between the economic activity they are involved in and a range of circumstances that appear to them as independent: this is the case with the mutual spying and increasing distrust among farmers in the USA just as with farmer suicides by indebted farmers in India. The segmentation of information determines a segmentation of knowledge, i.e. of how people understand what is going on. It consequently prevents communication, sharing of understanding and collective deliberation. The resulting segmentation of society, whereby people do not understand that they are all involved in the same process and are unable to seek solutions, ultimately determines a monopoly of power.

The social costs arising from the purposeful withholding of information imply a difficulty in assessing the direct responsibilities for the negative effects of agrochemical products. While it is intuitive that the mother firms of the TNCs that produce – or simply hold the property rights to – these products are responsible, other actors may be involved. The subsidiaries of the TNCs - or firms in the host country which are not owned but nonetheless related to the multinationals - may behave in much the same way as the companies in the home countries.

Quite independently of information, the strategies of the pesticide producers may be enhanced by governments and international institutions such as the World Trade Organization, the World Bank and the International Monetary Fund. This is especially the case when they are organized in such a way that they artificially separate economic and agricultural issues from health and livelihood issues. Such a functional division of labor often reflects the idea that these issues are either independent of each other or on the same standing. It tends to neglect that output and income are, at the very least, a means to livelihood whereas health is a major dimension of livelihood. This confusion provides legitimacy to the view that there may be a tradeoff between business requirements and basic human rights, thereby allowing a market for justice and human rights to exist. It is this same confusion – which is obviously functional to the interests of the corporations – that prevents intellectual property rights from being assessed in the light of the human rights they impinge upon.

Emphasis on such a division of tasks is often coupled with a misleading emphasis on specialization, which involves that the people who are most capable to assess the appropriateness of agrochemical products are supposed to be those who work for the agrochemical industry. The ensuing 'revolving door' practice leads to the continuous defense of the vested interests of the companies, at the expense of the people who are negatively affected by their products. It also reduces the autonomy of governments, making them hostages of the companies.

The failure of governments to contrast the dominant role of corporations such as the agrochemical TNCs tends to increase distrust towards their potential role towards the polity in general. It eventually reinforces the ideology whereby governments are the problem and markets – i.e. those same corporations that originate the problem – are the solution. This aggravates dispersion within society and prevents the achievement of a common understanding.

A further element of concern has to do with the intellectual role that social scientists have in favoring, albeit in good faith, the interests of these companies. With special regard to economists, this occurs when they fail to acknowledge that actual markets are characterized by strong and persistent power asymmetries: a case which emerged from the witnesses was an individual who was sued by a pesticide producer. Although he was certain that he had abided by the law, he nonetheless ran the risk that if he lost, he would have had to pay an enormous amount of money. The suing company, on the contrary, could fairly easily afford to lose the lawsuit. This neglect of asymmetrical power leads to the corresponding neglect of the need for countervailing powers to contrast the predominant role of the pesticide producing companies.

A second issue that tends to be neglected is the merely instrumental function that economic growth has for the well-being of people. When growth is pursued at the expense of the quality of life of the people concerned, there is obviously something wrong that economists should deal with. A great deal of literature has pointed out this issue. It is remarkable that, despite the dramatic social and environmental consequences of agrochemical companies, this need be recalled.

6.2.3 THE IMPACT OF THE EXPOSURE TO PESTICIDES ON THE HEALTH AND LIFE OF INDIVIDUALS AND POPULATIONS

The overall evidence available to the PPT on the impact that the acute and chronic exposure of human beings (individuals and populations) to pesticides has on their health and lives include:

- data presented orally during the public hearings by individuals who have directly suffered and/or witnessed exposure;
- reports of technical witnesses on direct experiences, as well as on the critical analysis of data published in the international scientific literature (experimental, toxicological, clinical, epidemiological);
- written material included in the dossier made available to the PPT;
- findings of surveys of the literature conducted independently by the Secretariat of the PPT, upon the acceptance of the indictment by PAN.

The unsatisfactory and far from homogeneous characteristics of the documentation in the areas considered in the indictment clearly appear in the documents issued by international agencies (e.g. WHO, IARC) and regulatory authorities (e.g. FDA, EPA, EU; individual governments; states within countries) who have taken highly variable and contradictory decisions concerning the withdrawal or restriction of use of one or the other of the pesticides and GM modified substances specifically submitted to the attention of the PPT.

While it is clear that the available data cannot be considered sufficient to provide a quantitatively precise documentation of the casual relationship between the various types of exposures and their fatal and nonfatal effects, it is nonetheless important to point out that:

- a judgment on the existence and relevance of violations of the human rights to health and life does not depend on quantitative criteria;
- the extreme confidence intervals reported for the estimates of the world-wide extension of nonfatal and fatal events (e.g. from 1 to 41 million; an order of + or – hundreds of thousands, respectively),

de facto document 'beyond any reasonable doubt', with their dimension, the existence, the consistency and the systematic nature of a massive and dramatic impact of the overall toxicity of the substances under consideration;

- the highly variable spectrum of decisions taken by the regulatory authorities, with respect to the withdrawal or the restriction of use is a further proof that we are facing a severe public health problem, which must be matched by consistent decisions with regard to prevention, protection and the reparation of the populations and individuals exposed to an unacceptably high risk. In whatever area of public health, comparable conditions of risk would be considered unacceptable and a clear evidence that individual and collective rights to health and life security are being violated.

A further – and clearly worrying and aggravating observation has to do with the overall quality of the available technical-scientific literature, characterized by:

- an impressive proportion of data directly or indirectly sponsored and/or controlled by the producers of pesticides and GM materials;
- the difficulty, approaching the impossibility, to access the information in the hands of the producers;
- the uniquely (compared to other sector of health-related sciences) scarce availability of basic, toxicological, clinical and epidemiological research that can be considered (according to universally accepted criteria in all fields of science) independent, i.e. not substantially biased by direct or indirect conflicts of interest;
- the methodological inadequacy of most research designs and interpretative criteria for the findings. These are proposed as 'reliable proofs' or evidence, despite the absence of a truly open, multidisciplinary scientific debate, where all the concerned parties (and not only selected experts) can play a role (without the further difficulty of being directly or indirectly threatened and harassed);
- the documentation made available by the most respected international literature over the last several years, in a closely related field such as that of the exposure to drugs (which is even more significant, because much more formally 'controlled'), shows 'beyond any reasonable doubt' what the implications of a research controlled by the producers are: not only the results (even those submitted and approved by the most respected regulatory authorities) can be radically biased and misleading: they can be hidden, manipulated, proposed to the public as formally false information, thereby leading to true epidemics of fatal events, even in highly 'developed' and respected societies such as the USA and France (just to mention the most dramatic and recent events, which have led to hundreds of 'avoidable' deaths).

The overall picture which emerges from the evidence made available to the PPT may be therefore summarized in the following points:

1. Pesticides appear to be basically, when not exclusively, considered commodities, and the production, use and assessment is determined in merely market terms: their relation with human health and life is seen as an unavoidable but marginal side effect.
2. The systematic disregard of human health- and life-related effects is all the more hideous in that the individuals and populations that are almost exclusively affected are those who are already disadvantaged from the social and economic point of view: the toxicities of pesticides add to, and aggravate, the violation of their dignity, which is also threatened and affected by violations of their right to nutrition.

3. The specifically outrageous nature of the risks imposed onto individuals and populations by current pesticide-related strategies is made even more intolerable by the advertised claim that they may fulfill the basic right to food, a claim that is far from being substantiated by hard data.
4. The effects that the strategies of the agrochemical TNCs have on the health and life of individuals and populations must also be considered in relation to their broader impact on the structure, the cohesion and the security of the communities that are deprived of their rights to food sovereignty and to overall self-determination.
5. The dramatic scenario of the suicide epidemic of Indian farmers is a concrete and symbolic synthesis of all the above issues: the literature on them is immense. In the absence of a systematic and collaborative research effort to provide a comprehensive and broad understanding of this phenomenon, the priority given to research that is basically focused on biochemical mechanisms at the level of brain mediators and receptors appears to be an insulting simplification. It ultimately denies that they are dramatic 'fatal' sentinel events of the violation of individual and collective rights to a humane life.

6.3 GLOBAL JUSTICE. HUMAN RIGHTS AND JUSTICE FROM THE PERSPECTIVE OF VIOLATED HUMANS

6.3.1 PREFATORY REMARKS

The oral testimonies presented by the adversely affected persons suggest that for them human rights mean the right to *be* human and to *remain* human. This means at least a right to be recognized as fully human by states, and aggregations of techno-scientific capital - TNCs, international regional financial institutions, and direct foreign investors.

Being and remaining human means thus that persons, communities, and peoples may not be regarded as 'factors of production' or as docile and disposable bodies, or as territories and resources for global capitalist development. Indeed, witnesses claimed that such development violates their inherent dignity – an acknowledgement of their inherent worth and capabilities. It is remarkable that this understanding accords fully well the cornerstone of the Universal Declaration of Human Rights [UDHR] – the right of all those born as humans to 'inherent dignity' (Article 1).

6.3.2 TNCs AND HUMAN RIGHTS

TNCs and related business formations read human rights as creating binding obligations for states and not for non-state actors. They acknowledge that corporate governance and conduct ought to be socially 'responsible' but not in ways commensurate with internationally accepted human rights norms and standards.

Corporate social responsibility (CSR) had several *avatars*. For a long while CSR stressed that business and industry have obligations to shareholders. In recent decades, CSR speaks the language of responsibility towards 'stakeholders.' Further, CSR now also speaks of TNCs as being 'global citizens.' In sum, CSR stands for industry – specific forms of self-regulation taking often the form of codification of best industrial practice. However, and regardless of the overall efficacy of CSR, the evidence before the Tribunal overwhelmingly shows that CSR forms do not extend at all to agrochemical and agribusiness industries.

The imagery of corporate global citizenship has affected a minor change of TNC approach to human rights. We refer here to the 'Global Compact' – a form via which the United Nations seeks to persuade major TNCs to accept and adopt some human rights norms and standards in corporate governance. The way the Global Compact operates minimizes even the obligations to respect self-selected obligations because no more is required than posting on a website an annual record of compliance! This is why leading scholars in the field have used the description: '*Global Compact/Little Impact!*'

A major difficulty with the Global Compact is that it is based on the principle that human rights norms and standards do not apply to TNC conduct — a premise which has been rigorously contested before this Tribunal.

TNCs and related business entities claim access to a set of core human rights, owed to them as legal or juristic persons. They claim an exacting respect for their human right to ownership of property and freedom of contract, and other associated rights (such as the right to earn profits, and to the protection of business reputation and honour). Since the advent of global neo-liberalism the TNCs and other entities also claim some extended right to *de-regulation* (in terms of freedom from governmental interference in doing business) and also a right to *re-regulation* (a) securing a 'level playing field' for competing business interests, (b) strict protection of a right to trade secrecy and (c) the new intellectual and industrial property rights extending to genetically mutated new forms of life and artificial intelligence.

At the same moment, TNCs and related entities remain preoccupied with strategies of denial of the basic human rights and fundamental freedoms to persons/peoples adversely affected by their activities and operations. Sections 3 and 4 document the enormity of human rights violations by six indicted TNCs - the exclusion of informed consent by local and indigenous peoples in sitting ultra-hazardous manufacture, applications, process or industry; planned failures (active concealment) in disclosures about toxicological and epidemiological impacts; misleading advertisement and labeling practices; witness intimidation and harassment of dissenting scientists and human rights/social movement activists; lobbying governments for human rights development based policy and regulation.

The evidence before the Tribunal furnishes a poignant archive of acts of commission and omission via which stand denied, even negated, the basic rights of others to life, livelihoods, health and safe environment. Additionally, TNCs and allied entities continue to stifle the voices of suffering; put differently, they violated peoples' basic right to freedom of speech, association, and movement. Evidence before the Tribunal suggests however that agrochemical and agribusiness TNCs have used all manner of means to harass and intimidate dissenting scientists and to sue human rights and social movement activists for defamation via SLAPP (strategic legal action against public participation) lawsuits. The 'chilling effects' of this corporate strategy need to be studied further; yet it is clear that in the eye of the CEOs this remains a major weapon.

6.3.3 DEVELOPMENT OF THE RIGHT TO DEVELOPMENT

The UN Declaration on the Right to Development (1985) crystallizes several new human rights. It proclaims that all human beings have an 'inalienable right to development'. And by 'development' is meant a process that ought to lead to the full realization of 'all human rights and fundamental freedoms' (Article 1). Further, Article 2 (3) acknowledges that such a model of development planning remains insensible outside 'active, free, and meaningful' participative process; development conceived as an 'eradication of social injustices' by 'appropriate economic and social reforms' and further ensuring a 'fair distribution of income' (Article 8) may not be achieved outside public participation.

Further, states stand now obligated to take steps to 'eliminate obstacles to development resulting from failure to observe civil and political rights as well as economic, social, and cultural rights', since human rights form a seamless web of interdependence and indivisibility (Article 6 [2]) The Declaration further insists that individual persons and people as a whole ought to be regarded as *subjects*, not objects, of development.

It must be here noted fully that the UN has taken a further substantial step to develop the right to development. A distinguished economist (Arjun Sengupta) acting as a Special Rapporteur to the development of the right to development has developed a number of component rights and in the process has marshaled crucial consensus in the General Assembly to implement the core obligations of the Declaration as an aspect of national jurisprudence, specifically in the Global South.

We mention all this because in a remarkable sense, this is precisely what the violated peoples asked the TPP to consider. We present this convergence as follows:

- Each one of the violated persons' testimony articulated a concept of development as a process that ought to lead to the full realization of 'all human rights and fundamental freedoms' and pointed out the ways in which agrochemical and agribusiness formations transgress and de-nature this conception of development.
- They further cogently demonstrated how the overall postures of globalization and neoliberal policies effectively prevent 'appropriate economic and social reforms' and aggravate social injustices and economic inequity.
- 'Active, free, and meaningful' participative process emerged in the testimony as leitmotif of just and human development policies, and programs. This has been thoroughly negated by the indicted parties.
- Further, the right to participation was also extended in the hearing by contesting governmental and intergovernmental monopoly over definitions of public interest or common good. Like the UN Declaration on the Right to Development the affected peoples and expert witnesses before the Tribunal insisted that 'development' cruelly miscarries when not suffused with elements of 'active' and 'meaningful' public participation at all levels of development decisions, especially as concerning ultra-hazardous process, application, manufacture that not merely places human lives and livelihoods at stake but also affects future generation and the human-environment relationships.
- The testimony of affected peoples as well as expert witnesses fully interrogated the delinking between international economic law and jurisprudence and international human rights law and jurisprudence. Trade and business are *social*, not *pre-social* enterprises; further, the search for profit and power ought never to amount to *anti-social* conduct, action, or performance.

On the evidence before it, the Tribunal *finds* that global business generally, and agrochemical and agribusiness specifically, operates in a Hobbesian state of nature of war against Nature and the already worst-off humanity. The *recommendations* of the Tribunal point to a need of a new global social contract which, while respecting the rights of trade and business, seeks to set out some basic human rights thresholds which may not be said to place any unreasonable limits to research, innovation, and ways of doing global business. In this content, we also wish to draw attention to aspirational human rights declarations – from the UDHR to the Ogoni Peoples and Zapatista Declarations to the Cochabamba Declarations of the Rights of Mother Earth, 2010. Not to be ignored of course are the treaty-based international human rights regimes and the environmental human rights approach.

6.3.4 APPROACHES TO GLOBAL JUSTICE

Many testimonies spoke also in terms of *global justice*.

It was fully brought to the attention of the Tribunal that all too often suffering peoples find it difficult to articulate the violation of their human right to be and to remain human via the languages of contemporary human rights. Legalization/juridicalization of human rights, while necessary, also often means that those adversely and at times catastrophically affected by ultra-hazardous manufacture, process and industry coincide with impunity.

In many situations of mass disasters (such as Bhopal) corporations place themselves effectively out of jurisdiction of host states and in the rare event that the violated peoples invoke the home state jurisdiction of the TNCs they successfully persuade their courts that no public interest will be served by civil suits for harm and damages because the place of harm remains distant, all available lies at that place, and the responsibility, if any, belongs to their local and regional management in no way controlled by the parent TNCs. One scholar has named this approach as 'convenient catastrophe and 'inconvenient forum.' In the name of trade secrets, vital toxicological and epidemiological information is withheld from host governments and affected people, complicating legal evidence of causation of harm, suffering, and loss. Very often ludicrous settlement sums are offered (as for example in Bhopal catastrophe the initial offer of settlement was US \$100 million to a final offer of US \$240 million, even when the Government of India proceeded to sue the Union Carbide Corporation for a damage amount of US \$3 billion)! In any event, settlement negotiations and offers seem not to be guided, to say the least, by any norms and standards of the so-called corporate social responsibility.

Many studies of mass disasters describe vividly a state of affairs in which mayhem, and even killing, of people is made to go un-redressed and un-punished, TNC claims towards CSR, 'good' corporate governance, 'compliance with the 'Global Compact' stand constantly belied by the immunity and impunity they thus constantly claim. The overwhelming fact remains, according to the evidence presented to the PPT (See above Section 1. For the consultation of the full text of the relevant Verdicts/decisions of the PPT, see www.internazionaleleliobasso.it).

Further difficulties for TNC induced/caused victims/violated peoples stand posed by national legal orders unable to curb the market for legal services, which remain a sellers' market out-pricing any effective redress. TNCs which otherwise celebrate their *corporate human rights to level-playing fields remain united in denying similar advantages to the violated peoples. They claim fully due process rights which they fulsomely deny to the constituencies of peoples affected by their own pursuit of profit and power at any and all costs.* To say this is not to deny TNC legal standing or rights in situations even of mass disasters or human rights catastrophes. By the same token the question concerning denial of even tattle of justice to adversely affected persons and populations always remains. There is not a shred of justification offered, even at their very best, by CSR and 'Good' corporate governance to claim the spheres of immunity and impunity, *as if human rights languages of responsibility do not at all exist!* The PPT sessions thus far have *rightly* and *justly* contested such zones of immunity and impunity.

This raises manifold allied concerns such as:

- Forms of 'state capture' (this issue is discussed in great detail and by making reference to its different form and implications in the Verdicts/decisions of the PPT quoted above).
- TNC-friendly 24/7 type ownership of mass media.
- Ways and means of judicial globalization via especially the manifold programmes of judicial education.

- Capturing legal education and research towards hyper-globalizing ends.

Regardless, the Tribunal received articulate evidence urging that human rights languages, logics, and paralogics, may be further supplemented by recourse to those of global justice.

The Tribunal finds this appealing in the following ways:

- In a heavily globalizing world, rendering porous borders and boundaries, ‘justice’ may not any longer be conceived of in terms of state-responsibility (and domestic politics).
- Hyper-globalization creates also a ‘global risk society’ where hazards no longer respect national boundaries, ideological formations: thus within the space of 18 months occurred Bhopal, Chernobyl, and the Sandoz chemical factory fire in Basle, with long term impacts on human futures and the future of human rights.
- Global risk society now poses new threats to planetary survival.
- Contemporary human rights values, standards, and norms remain important but scarcely provide adequate conceptual languages to meet these challenges.

We heard the voices of the violated peoples as saying that we ought to interrogate the *justice-qualities of human rights claims urged by and on behalf of a newly formed ‘corporate legal humanity’*; put differently, this new ‘humanity’ now insists on a paradigm of *trade-related, market-friendly human rights of TNCs and their cohorts pitted against the UDHR paradigm urging equal respect for all human beings*.

Tasks of justice invite reflexive deliberation to justice across boundaries, especially directing attention to obligations towards intergenerational justice. The indicted corporations and governments, as well as other related parties, need to fully attend to the long term hazards now constituted by agrochemical and agribusiness corporations, as a problem of *global injustice*. Indifference to the problem of justice as a platform of rights aggravates the conversion of the entire humankind, life forms and objects in Nature, into a ‘community’ of *hurt and harm* and of *danger*. More fruitful interaction is needed between theorists of global justice and the communities of suffering individuals than now at hand. Towards this end, we make several recommendations later in this judgment.

6.4 FINDINGS

The Tribunal makes the following declaration of responsibility for the six indicted TNCs and three Governments in particular and further also declares the responsibilities of all States, international organizations, UN Specialist Agencies, all other institutions of global governance.

CONCERNING THE INDICTED SIX CORPORATIONS (BASF, BAYER, DOW CHEMICAL, DUPONT, MONSANTO)

- The Tribunal finds on all evidence presented before it, the six TNCs prima facie responsible for gross, widespread and systematic violations of the right to health and life, economic, social and cultural rights, as well as of civil and political rights, and women and children’s rights.

- The Tribunal further finds that their systematic acts of corporate governance have caused avoidable catastrophic risks, increasing the prospects of extinction of biodiversity, including species whose continued existence is necessary for reproduction of human life.

CONCERNING THE THREE SPECIFICALLY INDICTED STATES

The United States of America (USA), the Swiss Confederation (Switzerland) and the Federal Republic of Germany (Germany) have demonstrably failed to comply with their internationally accepted responsibility to promote and protect human rights, especially of vulnerable populations and their specific customary and treaty obligations in the sphere of environment protection in the following ways:

- The three States, where six corporations are registered and headquartered, have failed to adequately regulate, monitor and discipline these entities by national laws and policy; the concerned States have not as fully respected the human rights of freedom of speech, expression, and association of citizens and persons within their own jurisdictions protesting against the move toward a second Green Revolution, not having learned the lesson of the first.
- The concerned States have unjustifiably promoted a double standard approach prohibiting the production of hazardous chemicals at home while allowing their own TNCs an unrestrained license for these enterprises in other States, especially of the Global South.
- In this way, these need to respond more fully than is the case now to the imperatives of global justice that they otherwise so fulsomely promote.

CONCERNING HOST STATES

- The Tribunal finds that for technology-importing States (the Host States) there is no justification for any pursuit of accelerated economic development which puts at grave and sustained long-term risk thus grievously posed for the natural resources and the affected populations. The global South States have a remarkable record in preventing, for example, an ever more expansive regulatory presence of the WTO and in their authorship (and further development) of the UN Declaration on the Right to Development.
- The magic carpet type hospitality offered to pesticide TNCs sits in complete contrast with its otherwise progressive international leadership in some global arenas.

In particular, the Tribunal finds the Host States fully responsible for:

- Not adequately protecting human rights and social movement activists from vexation and harassment.
- Not adequately protecting independent scientists who on serious scientific research demonstrate severe future risks inherent to the development and distribution of chemical substances and process.
- Not taking all necessary steps to limit the global corporate ownership of knowledge production in universities and related research sites and not recognizing the value of indigenous knowledge and social relationships they create and sustain.

- Not fully pursuing alternative and less hazardous forms of agricultural production, having not learned the full lessons from the First Green Revolution.
- Not honoring obligations arising from ILO Conventions and Recommendations, especially concerning unfair labor practices such as avoidance of slave and slave-like employment practices, fair and living wage, decent and safe conditions of work, and the right of association, movement, and freedom of speech and expression of the organized and unorganized labor and, *further*, not repudiating, in actual effect the obligations arising from the Child Rights Convention.

CONCERNING THE UN SPECIALIST AGENCIES

The Tribunal finds that:

- Some of the policies especially of the WHO, FAO and ILO are not fully responsive to the urgency of regulation and redress, as articulated by suffering peoples, and human rights and social movement activist groups and associations. A more proactive role is especially indicated in the field of hazardous agrochemical and agribusiness TNCs. Further, the UNESCO ought to take expeditious and effective steps for protection of academic and scientific freedom of researchers and specialists who raise justifiable alarm over the long term impact of pesticides, herbicides, and other products.

CONCERNING GLOBAL GOVERNANCE INSTITUTIONS

The Tribunal finds that:

- The policies of WTO in relation to Intellectual Property Rights, especially the hard regime of patent protection, is not balanced with any sincere regard for the grave long-term hazards to humans and nature already posed by the activities of agribusiness and agrochemical industries.
- The international financial institutions have yet to develop policies concerning their support for hazardous material manufacture, application, or process: it is not entirely clear why a strict regime of human rights conditionalities is as yet not contemplated in this regard.
- Institutions of global governance have almost altogether failed to play a more proactive role in protecting human rights and social movement activists from vexation and harassment, and to be more responsive to tasks of regulation and redress as articulated by suffering peoples, and human rights and social movement activist groups and associations. These institutions ought to especially take action to restructure international law so as to make the agrochemical corporations accountable for their activity and products.
- Though not being the users of agrochemicals themselves, Indigenous Peoples are particularly affected by persistent toxic agrochemicals which are passively transported to their environment through air and water and accumulate in the environment and the food chain with devastating effects on health and the way of life. This is particularly the case for Indigenous Peoples living in the Arctic Circle, exposed to high levels of POPs, as specifically produced by Syngenta, Bayer and Dow. Institutions of global governance should be particularly sensitive and responsive to the long term effects of such accumulation.

6.5 RECOMMENDATIONS

The specific strength of the decisions of the PPT are rooted, beyond their consistency with the jurisdictions which have human rights as normative framework and guidance, on the struggles and commitments of all those who recognize that declarations without implementation of rights are the worst trap for the victims. In this sense, the recommendations which follow are a further expansion and clarification of the verdict, as they make all the mentioned stakeholders responsible for assuring the highest priority to the compliance with the duties which are underlined.

The Tribunal recommends:

TO NATIONAL GOVERNMENTS AND STATES

- Not to ratify any new trade or investment agreement proposed without regard for human rights norms, and not to renew existing agreements of this kind when they expire.
- Contractual negotiations directed towards maximizing direct foreign investment should fully avoid granting immunity to agrochemical companies from criminal liability under national law.
- Legislation and related acts of public policy should remain fully committed to an unyielding adherence to the precautionary principle.
- In thus implementing the precautionary principle, national governments should accord dignity of discourse to the voices of adversely affected communities and peoples.
- When such communities are able to demonstrate the initial threshold burden about the ways and means – the acts of TNCs commission and omission — the burden of proving otherwise must shift to the accused TNCs and their allied entities who need to fully prove why no civil or criminal liability may exist for ultra-hazardous process, application, or manufacture.

National governments owe specific human rights responsibility to prevent TNCs from directly or indirectly harassing and intimidating scientists, farmers and human rights and environmental defenders, in any form. Further, national governments should strive to innovate equitable and efficient access to judicial remedies especially for the adversely affected individuals, communities.

TO INTERNATIONAL AND INTERGOVERNMENTAL ORGANISATIONS

THE TRIBUNAL CALLS UPON

- These entities to keep in constant review the property regimes under intellectual property rights in terms of adverse impact of these on respect and upholding of human rights, the welfare of the populations and the protection of biodiversity and ecosystems.
- The United Nations Human Rights Council in any further consideration of the reports of Professor John Ruggie, the Special Representative of the UN Secretary General, to take fuller account of the UN Draft Norms Concerning Human Rights Responsibilities of MNC and related Business Entities with the wider participation of the global civil society; the findings of this Tribunal expose the unviability of the Ruggie proposals accentuating the efficacy of the model of corporate self-regulation and host state responsibility. Clearly, a superior approach stands suggested by an incorporation of

the best elements of the UN Draft Code in any instrument concerning the subject. Likewise, time is surely come for the establishment of an appropriate international mechanism - which could take the form of an International Economic Court – empowered to investigate gross, continuing, and flagrant violations of human rights by TNCs, host and home states. A body, in short, before which individual or collective victims could bring their claims and demands for justice.

- The Assembly of the States Parties to the Rome Statute of the International Criminal Court ought to consider amendments to the Statute in order to extend its jurisdiction to legal persons and include the most serious crimes against the environment, in addition to those already provided for crimes against humanity and war crimes.
- The Human Rights Council's Special Rapporteurs bearing responsibilities in the matters denounced at these hearings to intensify their activity in denouncing violations and protecting the victims.
- The EU institutions, in accordance with Article 10A of the Treaty on European Union, as amended by the Lisbon Treaty, to subject their international economic relations and decisions on economic policy and international cooperation to the international rules for the protection of human rights and the environment, with the assistance of the European Agency for Fundamental Rights, created in 2006.
- The EU institutions to amend Directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004 on environmental liability in relation to the prevention and remedying of environmental damage, so as to clarify that its obligations in preventing and remedying and the mechanisms for action foreseen under the directive are extended to the activities of corporations with registered offices in the European Union that are carried on outside of its territory.

TO SOCIAL MOVEMENTS

- That they take advantage of the possibility already offered by the Statute of the International Criminal Court to denounce before it the executives of transnational corporations who may have participated in any way in crimes under the jurisdiction of the Court, as foreseen by Article 25 of its Statute.

The Tribunal URGES SCIENTISTS, LAWYERS, ASSESSORS AND REGULATORS

- to be fully aware of conflict of interest and to respect information as a public good
- to develop a culture of empathy with suffering peoples, even within their discipline-specific boundaries and burdens.

APPENDIX 1

PROGRAMME OF PRESENTATIONS AND WITNESS SUBMISSIONS

From 3-6 December 2011, the PPT convened in Bangalore, India. The jurors heard from 19 witnesses: four technical witnesses and 15 survivors who, through experience and scientific research, substantiated the allegations made in the indictment. A further 40 made written submissions to the PPT sessions.

Day 1, 3rd December 2011 (Saturday)

Presentation	Presenter / Witness
Introduction to the Session and Members of the Jury	Dr Gianni Tognoni, Secretary General PPT
Opening statement	*Puravalen M. Raman, Chief Prosecutor
Presentation of Indictment	+ Sarojeni Rengam, PAN AP
Technical presentation: Globalisation and corporate aggression over people, land, food and resources	+ Technical Witness 1: Irene Fernandez (Tenaganita, Malaysia)
Technical presentation: The issue of genetic engineering	** Technical witness 2: Dr Michael Hansen (Consumers Union, USA)

Day 2, 4th December 2011 (Sunday)

Roundup Ready (RR) soybean case	** Witness 1: Javier Souza (RAPAL, Argentina)
Poisoning of Silvino Talavera case	** Witness 2: Petrona Villasboa (Paraguay)
Killing of Brazilian farmworker case	** Witness 3: Celso Barbosa (farm worker, Brazil)
Endosulfan poisoning: Aerial spraying case	+ Witness 4: Jayakumar Chelaton (Thanal, India)
Endosulfan poisoning case	+ Witness 5: Dr Y.S. Mohankumar (Kasargod, India)
Endosulfan poisoning case	+ Witness 6: Dr Mohammed Asheel (Kasargod, India)
US farmers vs. Monsanto	+ Witness 7: David Runyon (farmer, USA)
Presentation on the Poisoning of the Arctic case	**Witness 8: Kathryn Gilje (PAN North America, USA, on behalf of Alaska Community Action on Toxics)

Death of bees	**Witness 9: Philipp Mimkes (CBG Network, Germany)
Death of bees	**Witness 10: Graham White (beekeeper, UK)
Atrazine and harassment case	** Witness 11: Dr Tyrone Hayes (University of California, Berkeley, USA)
Obsolete pesticide dumps	**Witness 12: Abou Thiam (PAN Africa, Senegal)
Child labour case	+ Witness 13: Mr Shankar (MV Foundation, India)
Child labour case	**Witness 14 (child worker, India)
Paraquat poisoning case	+ Witness 15: Nagama Raman (pesticide sprayer, Malaysia)

Day 3, 5th December 2011 (Monday)

Technical presentation: Encounters with pesticides and agrochemical TNCs	+ Technical witness 3: Dr Romeo Quijano (PAN Philippines)
Technical presentation: Issues with intellectual property	** Technical witness 4: Shalini Bhutani (lawyer and activist, India)
Peoples submission	***Sarojeni Rengam (PAN AP)
Closing arguments	M Puravalen (Chief Prosecutor)

Day 4, 6th December 2011 (Tuesday)

Presentation of the Verdict	Members of the Jury / PPT Secretariat
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* See Appendix 3

** These witnesses presented written statements, which are included in these proceedings in Appendix 5.

+ Extracts from verbal evidence of other witnesses are reflected in relevant sections of the indictment.

*** See Appendix 4

APPENDIX 2

THE JURISTS

The jury was composed of the following members:

Upendra Baxi (India), who acted as the President of the Jury, is a legal scholar and a Professor of Law in Development at the University of Warwick, United Kingdom since 1996. He has been the Vice Chancellor of the University of Delhi (1990–1994), prior to which he held the position of Professor of Law at the same University for 23 years (1973–1996). He also served as the Vice Chancellor of the University of South Gujarat, Surat, India (1982–1985)

Elmar Altvater (Germany), economist, University Professor (tenure position) at the Free University Berlin, Department of Political Science (Otto-Suhr-Institut), and guest-professor at several Universities (Mexico, Brazil, Canada and USA). Former President of the Lelio Basso International Foundation for the Right of Peoples in Rome.

Ibrahima Ly (Senegal), Professor of Law and researcher at the Faculty of Law of the University Cheikh Anta Diop of Dakar (UCAD) since December 1986. He is the first state doctor on environmental rights in Senegal. He is a consistent advocate of environmental protection and a consultant for several national and international institutions on legal issues concerning the environment, the management of natural resources and bio-security.

Paolo Ramazzotti (Italy), Professor of Public Policy at the University of Macerata, Italy, with research activities and publications in the international literature on transnational corporations, institutions and development. He is the coordinator, for his university, of the doctoral program on “Economic Development: Analysis, Policies and Theories”, jointly carried out with the University of Camerino, Italy. He is also co-editor of the Forum for social economics.

Ricarda Steinbrecher (UK), biologist and geneticist. She has specialized in gene regulation since 1982 and has worked as a research scientist in the field of mutational analysis, gene identification and gene therapy in university and hospital settings. Since 1995 she has focused on genetic engineering in food and farming, its risks and potential consequences on health, food security and the environment. She is Director of Econexus, Oxford, and Representative of the Federation of German Scientists in biodiversity and biosafety international negotiation.

Gianni Tognoni (Italy), Medical doctor, Director of the Consorzio Mario Negri Sud, a research non-profit Institute focused on public health, clinical epidemiology, environmental science, health rights. He has been Secretary General of Permanent People’s Tribunal since 1979.

APPENDIX 3

PROSECUTOR'S OPENING STATEMENT TO THE PPT

PRESENTED BY: PURAVALEN M. RAMAN

HISTORICAL RETROSPECTIVE OF HUMAN RIGHTS

1. The Second World War showcased the depravities of humankind: the 3rd Reich's extermination of Jews and the atomic bombings of Hiroshima and Nagasaki by the United States. The outcome of this, post war, was the Universal Declaration of Human Rights (UNDHR) 1948. It defined human dignity. It was recognized as inherent in every human being. However, this document is not legally binding. The United Nations then produced 2 International Covenants: the International Covenant for Civil and Political Rights (ICCPR) and the International Covenant for Economic, Social and Cultural Rights (ICESCR). Together, they constitute the bedrock of the international normative regime in relation to human rights. These 2 Covenants incorporate the provisions of the UNDHR. The big difference is that these 2 Covenants are treaties. Therefore, they form part of international law. All 3 documents now form the International Bill of Rights. State Parties who ratify them are subject to compliance monitoring by committee mechanisms.
2. The World Conference on Human Rights in Vienna, 1993, prescribed that the 2 sets of rights were 'universal, indivisible, and interdependent and interrelated'. However, the reality was that social and economic rights were synonymously identified with the ideology of the State and thus was a casualty in observance as opposed to civil and political rights.
3. The Covenants came into force in 1976. Ten years later, a group of experts in international law came together to discuss the ICESCR and State Parties obligations. The result was the **LIMBURG PRINCIPLES**. There are 103 individual principles. It is a UN Document.
4. Another 10 years later, a further meeting was held to 'strengthen the monitoring of the ICESCR'. Amongst the objectives was to get a better understanding of the concept of violations, catalogue them and develop a set of guidelines to assist the monitoring mechanisms. This resulted in the **MAASTRICHT GUIDELINES**, 1996.
5. Earlier aspirations: The Treaty-based Committee on Economic, Social and Cultural Rights (CESCR) was established in 1987 and had as its objectives the development of the normative content of rights recognized in the Covenant, to act as a catalyst to state action in developing national benchmarks and devising appropriate mechanisms for establishing accountability and providing means of vindication to aggrieved individuals and groups at national level, and holding states accountable at the international level through examination of reports. The CESCR provides the precise framework of the State's obligations. The General Comments of the CESCR define the rights and assist the states in the realization and enjoyment of the rights by the people.

THE ROLE OF THE STATE VIS-À-VIS CORPORATE CULPABILITY

6. It is clearly recognized that in the context of global economic interdependence, business is a major actor in terms of reach and power. Complex relationships between businesses, communities and governments mean that business operations wield considerable political influence and possess more economic power than some governments. They have close business and political relationships with those in power. They operate across borders. They are implicated in harms inflicted in distant lands. This has led to a dire situation where national and international laws are seen as inadequate to provide remedies when powerful non-state actors (businesses) act in collusion with the State and are thus unaccountable in the traditional framework.
7. The concept of Complicity. This has been variously defined as one in which 'an actor becomes involved in an undesirable manner in something that someone else is doing'; conveying the connotation that someone has become caught up and implicated in something that is negative and unacceptable. In the context of business and human rights, it is a tool to capture and explain the fact that companies can become involved in human rights abuses in a manner that incurs responsibility and blame. Contextually, the companies could be direct perpetrators or in collusion with other actors both state and non-state. This leads to the question of the definition of complicity and its consequences. It must be not forgotten that criminal law will only punish natural persons and not companies in many jurisdictions, including the International Criminal Court. It must be further recognized that the nature of violations by businesses are such that they go beyond the victims or their families and impact communities and society inter-generationally.
8. International criminal law focuses traditionally on crimes against humanity, genocide, war crimes, torture, and slavery. In terms of criminal responsibility, it has been traditionally addressed from the concept of conspiracy; aiding and abetting. It is clear that no international forum has jurisdiction to prosecute a company as a legal entity. This is as opposed to corporate officials who can be subject to criminal law both under international criminal law as well as national criminal law. It is again undisputed that this conduct will also attract liability under civil law particularly in tort.
9. The International Commission of Jurists has explored the concept of complicity and has sought to define it in the following terms. It examines, firstly, the criteria of CAUSATION / CONTRIBUTION. It asks whether the company's conduct enables, exacerbates, or facilitates the gross human rights abuse. Secondly, the company's KNOWLEDGE & FORESEEABILITY ASPECT is noted objectively. Thirdly, it proceeds to examine the PROXIMITY in terms of geography, and duration, frequency or intensity of interactions or relationship. An extensive examination of the concept has been set out in the ICJ's Expert Report on Corporate Complicity and Legal Accountability, 2008.
10. International criminal law has now progressed to some extent to encompass crimes where companies work in situations of global supply chains or a global presence and find themselves in countries where gross human rights abuses occur and where they run the risk of being involved in them. The lacuna has always been the lack of a comprehensive framework to address the nature of trans-border crimes by businesses. This has further been set back by the lack of conceptual tools to examine and establish culpability using new approaches that will address challenges of evidence and forums. The first real attempt was the ICJ Report. It recognizes that prosecution under national criminal law may be lacking by reason of the State's relationship with the business (wherein the crime would be tolerated and encouraged) and the difficulty in overcoming legal doctrines of corporate shields. The requirements of intent; common intention between parties and vicarious liability doctrines have held back actions against multinationals.

CORPORATE CRIME IN THE ERA OF GLOBALISATION

11. The doctrinal basis of corporate crime has traditionally been where companies are held liable for injuries, damages, and harms that they cause and this has been predicated on where crimes of natural persons can be attributed to the company. Here, the company would be accessory or would be culpable by reason of organizational fault in failing to avert the risk. This further requires the occurrence of actual harm. Challenges lie in difficulty in tracing responsibility to an identifiable individual in the company and the shifting of criminogenic and potentially lethal aspects of a company's operations to outside the borders of the parent company to foreign subsidiaries located in developing countries where criminal laws will not be enforced rigorously. This may also limit exposure to tortious actions. Criminal prosecution in a third country has less potential for embarrassing and unfavourable attendant publicity. Public officials are more amenable to financial inducements. Global presence raises issues of where to prosecute; whom to prosecute and for what crime to prosecute. The subsidiary may be the locus of where the harm was inflicted but the harm-causing acts can be traced to the policy decisions of the parent company or a criminogenic culture that was fostered, encouraged and tolerated by the parent company.
12. Where to prosecute. It could be the host state of the subsidiary. This can be seen to be unrealistic for reasons already stated earlier. It could be the home state of the parent company. This would pose problems of evidence. It could be an international forum, but this is a legal impossibility given the present international regime of laws. Action can be taken against the State for failing to protect its citizens against human rights violations by third parties subject to their control and this includes violations by companies. The choice of jurisdiction will depend on the nexus between forum and offence; the defendant to be put on trial; and the elements of the crime to be proven. Criminal laws of both home and host states have to be taken into account to consider culpability. The State's collusion too may be relevant where it has been wilfully blind. This may bring liability in an international forum against the State.

Traditionally, human rights law has been formulated to protect individuals against abuses by the State and its actors. Treating companies as persons is uncommon. It only occurs in the South African Constitution. This is compounded by the foreign presence of the parent company as national criminal laws are typically territorially based. Collusion between state and companies becomes a norm. It is an anomaly that a state can be prosecuted but not a company!

Prosecutions, if ever, are usually preferred in states where subsidiaries are located. Laws, procedures and judges are more inclined towards corporate interests. Prosecutors and investigation persons are more amenable to corruption. If a subsidiary is prosecuted, the conviction/punishment is confined only to it. Any fine is limited to the assets of the subsidiary. The media in Third World countries is usually controlled and intimidated by the government. Corporate law can be invoked to claim that the parent company is a different legal entity and bears no responsibility. Corporate structuring by intra-company holdings will be designed to avoid liability situations. Factors used to resist liability have been the levels of autonomy in operational and policy aspects, equity shareholding, and the level of centralization in the organizational matrix.

13. Complicity. Moving away from the conventional approach of accessory capacity and vicarious liability has been the complicity approach. This requires examination of the relationship rather than the legal form. Control that the parent company has over the subsidiary needs to be looked at from the angle of the amount of power it directs to the subsidiary and how this is exercised. Deficient safety measures in production and distribution of, for example, drugs, will amount to contribution to culpability.

14. Reality on the ground. The political will to prosecute businesses is non-existent. In the modern global economy, the pursuit of justice takes a backseat to more parochial economic concerns. Businesses are powerful. Developing countries are poor. Unemployment is rampant. These countries welcome businesses that create employment opportunities that are created by locating subsidiaries in them. Competition amongst countries to attract multinationals is intense. Prospective host states are prepared to offer relative immunity from legal liability. Criminal prosecutions lie within the discretion of the State. Superior bargaining power enables businesses to extract maximum immunity concessions. The workforce and people will be the victims. The State will use its police against its citizens. Excesses will be unnoticed. It is viewed that it is in the State's self-interest not to invoke criminal law against these companies for investment reasons. In the Bhopal-Union Carbide case, the State, India, legislated itself the power to represent the victims and as part of the settlement agreed to drop all civil and criminal proceedings! Without the threat of criminal sanctions, businesses are not going to take laws seriously. It is not in a company's interests economically to obey the law when a competitor is flouting it. If the State is unwilling to protect its citizens from corporate abuses, it is necessary to search for a means to force the State to fulfil its obligations or to find an alternative legal forum in which corporate violators can be brought to justice.

To the extent that modern commerce takes place in a global market, legal challenges have to be resolved in an international forum with innovative conceptual approaches to meet the weaknesses of the present criminal jurisprudence. It is shocking that in this day and time, there are no existing sanctions in an international forum for multinational enterprises (MNEs). These have transnational implications. It is clear that MNEs will transfer the criminogenic aspects of their business operations to those states where the prospects of conviction are perceived to be the least. That host states are not inclined to take action serves to reinforce the need to address the lacunae in law and practice.

Historically, states have been responsible for protecting the human rights of its citizenry. It is held accountable in international forums. The change that has to come now is that the State has to be responsible for the violations of third parties to its citizens. A state should be held responsible for not criminalizing corporate abuse of human rights and for not prosecuting companies. The State should be held responsible for allowing the abuses to go unregulated, unchecked, undiscovered, untried and unpunished. A state has an obligation not only not to violate the rights of its citizens but also to prevent violations by third parties. The Maastricht Guidelines are clear on this: "*... State's responsibility to ensure that private entities...including transnational corporations over whom they exercise jurisdiction...*".

The European Court of Justice and the European Court of Human Rights have set the precedents for requiring states to prevent offences by third parties.

- In the '**Spanish Strawberries**' case, France was held liable for not stopping French farmers from interfering with the free movement of Spanish strawberries.
- In '**X and Y v Netherlands**', the European Court of Human Rights held that the Dutch Government had violated the privacy of a mentally challenged girl in a private nursing home where she had been sexually abused. The fault lay in failing to provide a criminal remedy to prosecute the assailant.

The above precedents deal with violations committed by individuals.

In **GUERRA v ITALY**, The European Court of Human Rights held Italy liable for not protecting the right of privacy of its citizens against toxic fumes released by a fertilizer plant. The company was not party to the case. Only sovereign states could be subject to the court's jurisdiction.

15. In the era of globalization, MNEs are able to place themselves beyond effective legal control. There is a clear mismatch between the traditional territorial bases of criminal court jurisdiction and the transnational repercussions of forces unleashed by MNEs. Host states are unwilling to prosecute for economic reasons; home states claim lack of jurisdiction; and international forums restrict themselves to human rights violations by states or individuals. There must be an international forum to prosecute MNEs in a legal framework that is innovative. The answer has been provided by the ICJ in its report.

FURTHER COMMENTS ON THE WEAKNESSES OF UN ORGANS AND INSTRUMENTS

16. World War II proved that the State's monopoly of power is dangerous in the absence of restraints. Human rights law developed to protect the individual from the State. It established the minimum rights an individual should enjoy because he/she is human and also imposed positive obligations on the State to respect those rights.
17. Now, the MNEs have changed the landscape. The State is no more in control. The de facto ownership of the economic and political landscape is now with the MNEs. The law responded to powers of the State post-WW1. The response to the change to non-state actors has not taken place. There is, in reality, no legal or moral accountability framework for MNEs. The measures that have developed merely seek to reflect the impunity of these MNEs. States were held accountable under human rights laws pushing aside their sovereignty. However, MNEs are invincible and unaccountable.
18. **Why Do We Say This?** States are not in a position to provide redress for their citizens against non-state actors through their national legislation. International law imposes duties on states. However, states cannot deliver on their responsibilities. The armoury is plenty: criminal law, consumer law, environmental law, tort law, company law, etc. Their use is ineffective. Judicial activism is weak. Litigation costs are prohibitive. Resources between the adversaries are in stark contrast. Legal aid is just that – aid. Locus standi becomes a threshold guillotine for vulnerable communities. Delays in proceedings are fatal to the disempowered. Damages and fines are mere nominal additional costs to the MNEs. Evidential, procedural and substantive law makes it illusory to pursue remedies when all evidence is peculiarly within the province of the wrongdoers. Enforcement extra jurisdictionally becomes a farce. Legal fictions such as *forums conveniens* and corporate shields make redress a non-starter.

ILLUSION AND REALITY

The United Nations

19. All member states accept the UN's founding document, the UN Charter. It provides for the promotion of respect for human rights as a key purpose of the UN. This is followed by the Universal Declaration of Human Rights which was adopted by the UN General Assembly in 1948. It has all the main human rights spelt out. It is a declaration which was adopted, not a treaty that is ratified by states.

20. Then, came the treaties: The International Covenant against Racial Discrimination (1965); International Covenant on Economic, Social and Cultural Rights (1966); International Covenant on Civil and Political Rights (1966); Convention Against Discrimination against Women (1979); Convention against Torture, Cruel, Inhuman and Degrading Treatment (1984); Convention on Rights of the Child (1989); Convention on Rights of Migrant Workers (1990).
21. Regional human rights treaties also abound: The African Charter; American Convention on Human Rights; and European Convention for the Protection of Human Rights and Fundamental Freedoms.
22. What Do These Instruments Guarantee?
 - Non-discrimination on grounds of race, religion etc.
 - Special needs of women are addressed as they suffer unequal power relationships in society. This is seen in the history, culture and traditions of society.
 - The life, liberty and physical integrity of the person.
 - Civic freedoms of expression; assembly; association.
 - Employees' rights amongst others, the rights to organize, a safe and healthy environment, and payment of living wages; the prohibition of child labour, slavery and bonded labour.
 - Rights to adequate food, education, and the highest attainable standard of physical and mental health. The right to food has been explained as having enough quantity and quality of nutritious food. It should be reasonably priced and physically available. People must have access to land, productive and natural resources. It must be sustainable for future generations. It's about entitlements, as to who controls the resources that enable food to be produced, traded or provided. Harvesting of indigenous genetic resources without sharing the equitable benefits that accrue.
 - Right to health. Poor health has many causes: poor housing; poor medical services; lack of access to medicine or medical treatment; underlying factors that affect health such as food, nutrition, water and sanitation; poor working conditions and environment; etc. The vulnerable groups include landless peasants; the rural unemployed; the urban poor; migrant workers; indigenous peoples, etc.
 - Right to information. The obligation of public bodies to disclose information.
 - Environmental rights. Mining; extraction of natural resources; oil drilling; chemical production; waste disposal that harms ecosystems or pollute indigenous lands affecting rights to privacy and self-determination.

WHO PROMOTES AND PROTECTS THESE RIGHTS AGAINST NON-STATE ACTORS?

23. The Duties. The State must **RESPECT** these rights. It must make sure nobody violates these rights. It must **FULFIL** these rights. This means it must take action to ensure people enjoy these rights. The State must **PROTECT** these rights. It must prevent anyone from abusing these rights.
24. The UNDHR in its preamble talks of '...a common standard of achievement of all peoples and all nations, to the end that every individual and **every organ** of society...'. Prof. Louis Henkin

has commented that “every individual and organ of society ... excludes no one, no company, no market, no cyberspace...”

Organs of society encompass businesses since they play a clear economic function in society. Companies are artificial constructs created in law as a way of organizing commerce. The preamble’s language exhorts. It is a declaration; there is no procedure to enforce it. However, the Proclamation of Teheran in 1968 proclaimed that ‘the Declaration constitutes an obligation for the members of the international community’. Article 30 talks of the obligation of groups and individuals to do no harm.

25. Member states of the UN (except 6) have ratified one or the other of the treaties which intrinsically refer to the preamble. The Vienna Conference in 1993 further reaffirmed the purpose and principles of the Charter and the Declaration. The above commentaries and interpretations of international law by various legal scholars and bodies can lead one to the conclusion that the MNEs are not exempt from these provisions.
26. It is also been argued that human rights are binding by norms of international customary law or *jus cogens*. These include crimes against humanity, genocide, use of force by states against one another, slavery, etc. The International Court of Justice has described these norms as deriving from ‘the principles and rules concerning the basic rights of the human person’.
27. Other considerations. Expert reports have found that various UN Committees have resolved that companies are subject to these treaties and resolutions. ECOSOC has said (May, 1999) that it applies to the “private business sector, national and transnational’ when it referred to the right to food. The Quito Declaration (1998), Ecuador, prevailed similarly. Rio De Janeiro (1992) on environment; Beijing (1993) on women; and Copenhagen (1995) on social development all referred to businesses and their responsibilities.

OTHER EXAMPLES OF THE EFFECT OF THE EVOLUTION OF PRACTICES AND LAW ON MULTINATIONAL CORPORATIONS

28. **OECD** The members produce two-thirds of the world’s goods and services. They adopted a declaration (1976) to protect the rights of investors. They produced a set of Guidelines for Multinational Enterprises. This was revised in 2000. It stipulates that enterprises should respect the human rights of those affected by their activities. The setback is that it also says that the guidelines are voluntary. They are binding on states but not enterprises.
29. **ILO Tripartite Declaration** The Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy (1997) covers a litany of rights. Again, it is not legally binding on all three parties. Article 8 talks of “all parties, governments, employers ...should respect UDHR and corresponding covenants...”.
30. **UN Commission on Human Rights** The UN has a Sub-Commission on the Promotion and Protection of Human Rights that has come up with a Set of Norms (Responsibilities of Transnational Corporations and Other Business Enterprises with regard to Human Rights). The Special Representative was asked to report to the Sub-Commission on this document (2010). Concepts of ‘complicity and sphere of influence’ have been refined here. Two Human Rights Commissioners (Mary Robinson and Sergio Mello) have said that corporations come within the definition of ‘organ of society’.

The Norms have received concerted opposition from the corporate lobby which asserts that the Norms seek to shift the focus/responsibilities away from the states to the corporations, that non-binding schemes are more effective than regulatory schemes, any UN implementation and monitoring scheme is unacceptable, and the duties defined are vague.

31. **European Social Charter** It complements the European Convention on Human Rights. It is limited to European contracting states. Individuals cannot make complaints. States can ratify the Convention on an *à la carte* basis. Reporting by states is biannual and enforcement is weak. One notable success story has been where ICJ complained about child labour in Portugal (1998).
32. **North American Free Trade Agreement (NAFTA) (1992)** This governs free trade flow. It allows victims to complain against a state where it has failed to comply with its domestic rules. It has the Environmental Side Accord and the Labor Agreement that can be the bases of complaint of the three states (USA, Mexico and Canada).
33. **Domestic litigation for violations abroad** Shell has been sued for events that led to Ken Saro Wiva being executed in Nigeria; Chevron for complicity in violent government suppression of protestors in Nigeria; Unocol for forced labour in Burma; and Exxon Mobil for complicity in suppression of union activity in Indonesia. The suits are based on the Alien Torts Act, which applies to a limited number of customary international law wrongs.
34. **World Bank** It has policy guidelines that cover environmental protection; the protection of indigenous peoples and gender equality. It has no legal force but has informal compliance mechanisms of withdrawal from participation projects.
35. **World Trade Organization (1995)** The WTO is the personification of corporate power and globalization. It accounts for 90 per cent of the world's trade. It administers international agreements that seek to remove trade barriers, tariffs and subsidies. The WTO protects the interests of companies over ordinary people. Intellectual property rights over indigenous knowledge and plant forms are patented in clear breach of the right to livelihood and right to food. It provides enforcement through trade sanctions.
36. **Ratner's Historical Perspective** Ratner posits four key actors in the international economic activity of foreign investment: the home state, the host state, the enterprise, and the affected population in the host state. The global, political and economic transformation in the last century can be reflected in the changes seen.
37. **Colonisation** In the period of European colonialism, there was direct control by the home state. Home states dictated to colonies. MNEs of that era were creatures of domestic law of the home state. European companies were principal agents in the economic exploitation of the colonies. African farmland was owned by whites; African mineral wealth was controlled by Europeans; and petroleum sources in the Middle East were granted to Western oil companies. Foreign investments were termed as 'concessions'. The populace of the host state was marginal to the whole process.
38. **Decolonisation** Independence of the colonial territories after World War II altered relationships. Greater economic equality between the North and South was the momentum premised on the sovereign and juridical equality of independent states. The UN saw the bustle of activity that proclaimed the 'New International Economic Order'. UNCTAD meetings did not result in any significant restructuring of global economic relations. The other process that came about was the elaboration of a body for international human rights law that placed direct duties on states towards their own people.

There was a shift in the dynamics of the relationship with the expropriation of foreign investments and with compensation measured through domestic law. The UN established the Center for Transnational Corporations in 1974. It drafted a code for the rights of investors in host countries. The OECD responded on behalf of the wealthy states.

39. **Globalisation** With the end of the Cold War in the 1980s, developing countries needed foreign direct investment as they could no longer depend on aid from either side of the iron curtain. Free trade and bilateral investment treaties favoured national status and the free repatriation of profits became the sign of the times. The Draft UN Code of Conduct was discarded in the 1990s. The OECD's rules allowed MNEs to bypass host states and proceed to international arbitration. The MNEs have now become embedded in the host economy and the de facto state, economically and politically. MNEs have now transformed into powerful global actors that states lack the resources or will to control.

ADDENDUM

CORPORATE CRIMINALITY: ENDANGERMENT OFFENCES

40. Conventionally, companies have been held liable for crimes committed by persons working for them or who are in some significant way connected to them and are thus imputed to them. The other is where the company is held liable for its own culpable failure to prevent a crime which it could have averted through putting in place effective systems of risk management and control, and the effective monitoring of its workforce. The weakness of this model of criminal liability is that it comes into play after the harm is done. In the context of companies, the impact of social harm in terms of the scale of consequences is immeasurable.
41. In the UK, in the case of PIPA ALPHA, 167 workers died when an oil rig exploded. Two hundred passengers and crew died when the HERALD capsized. Thousands lost their savings because of the ENRON scandal.
42. The above shows that there is a compelling case for arguing that corporate crime should be defined without regard to the outcomes by reason of its results in magnitude and extent of harm. Presently, what we do have is a regime for regulatory offences for controlling incipient corporate criminality.
43. **Regulatory Offences** The argument has been that because of the grave dangers posed when a company is allowed to conduct its business in a dangerous manner, the law should be able to intervene at a point before rather than after the harm occurs. Thus, regulatory offences are specially geared for companies. Strict liability is imposed in terms of omission to act or failure to meet standards. Liability is independent of actual harm. Health and safety acts are examples of this. This mode of compliance-oriented strategy is to effectuate change whereas the prosecution-oriented strategy is reactive and only provides for punishment for actual harm inflicted. Organizational change may be suited to a regulatory framework. Public accountability is best achieved in the criminal justice system.
44. **Endangerment Offences**
 - 44.1 These should be defined in terms of a culpable failure on the part of the company to identify, assess, and guard against serious criminal risks or to monitor those whom the company has

placed in a position to cause harm or violate the law. It does not require the causing of actual harm; the absence of harm does not preclude the finding of fault. The fault element in this context is assessed in terms of objective standards i.e., negligence, gross negligence, objective recklessness, and wilful blindness.

- 44.2 Examples of endangerment offences in the statute books include: Section 32 of the Offences Against The Person Act 1861 which provides that it is an offence for any person who places wood to do so with intent to endanger passengers; and Section 33 which provides that it is an offence to cast stones upon a railway carriage with intent to endanger the safety of any person therein.
 - 44.3 The Criminal Damage Act 1971, Section 1(2) provides for any person who destroys property '... intending by that destruction or damage to endanger the life of another....'
 - 44.4 In America, several examples of the said species of offences can be noted. The Alaska Statutes provides for reckless endangerment ('... a person commits the offence of reckless endangerment if the person....') and the Oregon Revised Statutes provide for environmental endangerment.
45. Where a company conducts its business in a negligent, reckless or grossly negligent manner or with wilful blindness, the criminal justice system should not have to await the occurrence of actual harm in order to be able to intervene. In the absence of actual harm, the crime charged would reflect the potential risks arising from the company's way of doing business.

Sources:

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APPENDIX 4

PEOPLE'S SUBMISSION

PRESENTED BY

**Sarojeni Rengam for
PAN International**

The last two days we have heard from 19 witnesses; four technical witnesses and 15 survivors (see Appendices 1 and 5) who have vividly through the experience and scientific research compelling substantiated the allegations made in the indictment.

We have submitted our indictment and testimonies against the six agrochemical TNCs charging them of:

1. Gross, widespread and systematic violations of the right to health and life which includes the right to safe working conditions and the right to a safe and healthy environment;
2. Gross, widespread and systematic violations of economic, social and cultural rights particularly the right to livelihood, right to food and food sovereignty and right to freedom from interference with the family and home;
3. Gross, widespread and systematic violations of civil and political rights particularly the right to self-determination of peoples, the right to participation and information and the rights of human rights defenders; and
4. Gross, widespread and systematic violations of women's and children's rights

We have shown through our indictment, the testimonies of technical witnesses and survivors of violations of human rights by the agrochemical TNCs that:

- ***The Agrochemical TNCs have committed and continue to commit with impunity violations of the right to life and health by directly causing death, injury and chronic and irreversible impacts on health. Their products continue to destroy the environment and biodiversity.***

In the case of the death of eleven-year old Paraguayan Silvino Talavera, who died on January 2003 because of exposure to glyphosate (Round-up Ready) being applied to Monsanto's genetically engineered RR soybeans, Petrona Villasboa, his mother said: *We have proof that there was poison in his blood. We are trying to hold Monsanto accountable for the death of my son from pesticide poisoning.*

The case of Silvino is an example of how children are more vulnerable to hazardous technologies. Today, RR soybean is widely planted in the U.S. and Latin American countries, which are among the world's top exporters of soybean.

We have heard the testimonies from Jayakumar, Dr Mohan Kumar and Dr Mohammed Asheel that endosulfan is an endocrine disruptor and highly toxic to humans and wildlife. The effects of endosulfan

are most stark in Kasargod, Kerala, India where it was aerially sprayed from 1976 to 2002. Significant congenital, reproductive and neurological damage, and other health effects, have been observed in more than 9,000 villagers. Around 500 deaths in Kasargod are officially acknowledged to be caused by endosulfan poisoning; unofficial estimates are around 4,000. Jayakumar said: *Bayer, India was culpable in these violations since they actively campaigned to stop the ban of endosulfan in Kerala.*

Dr. Tyrone Hayes showed evidence of the endocrine disruption effects of atrazine (a product of Syngenta) in not only frogs but also a wide range of animals and also effects on humans. He said: *Atrazine feminizes male frogs, males mate with males and produce viable eggs.*

Paraquat, manufactured by Syngenta, is the world's most toxic herbicide. It is used by an estimated 30,000 mostly women workers in palm oil plantations in Malaysia. Women paraquat sprayers suffer from skin damage, burns, blindness, discolouration and loss of nails, nosebleeds and respiratory problems. Nagama, a former plantation worker said: *I had to resign my job when I was 45 years old because of ill health due to paraquat poisoning.* She added: *Paraquat is banned in Switzerland (Syngenta's home state), why then is it still sold and used in Malaysia?*

In Africa, there are 50,000 tonnes of prohibited and obsolete pesticides. They are often stored in deteriorating and leaky containers without adequate safeguards. Dr. Abou Thiam said: *Obsolete dumps in Africa are like ecological bombs waiting to go off.*

- ***The monopoly control of Agrochemical TNCs in food and agriculture has led to loss of livelihoods and loss of food sovereignty.***

In the US, many agricultural farms have been contaminated with genetically engineered crops, and have lost significant access to traditional seeds. Yet, instead of recognizing that they have violated the farmers' rights to reject GE crops, Monsanto has even sued these farmers for alleged 'seed piracy'. Monsanto has taken these farmers to court for alleged intellectual property rights infringement, and forced them to pay the company millions of dollars. Farmer witness David Runyon testified that: *the Monsanto attorney had said, "taking money from a farmer is like taking candy from a baby".*

Javier Souza, Agronomist from Buenos Aires University said: *The push of Monsanto's RR soybean into Argentina has led to the loss of livelihood and food democracy.*

Graham White and Philipp Mimkes described the drastic decline of bee populations across the world, which started in the mid-1990s. At the same period that Bayer introduced neonicotinoid pesticides in the market, honeybee populations started dying everywhere in Europe, US and in other countries. This has imperilled the livelihoods of thousands of beekeepers and compromised food security and jeopardizes the ecosystem.

In 2007, farmers and activists occupied a piece of land in Brazil where Syngenta was conducting illegal field experiments of GE soybean and corn. Hours after the occupation, more than 30 heavily armed security guards arrived and fired at them. Valmir Mota was killed with a point blank shot to the chest. The guards also shot another farmer in the head, which resulted in the loss of her eye. Barbosa, who survived, said: *We [Via Campesina] were protesting sterile seeds that would make us dependent on TNCs. We decided to occupy Syngenta's fields.* He added: *the Swiss government publicly apologized for Syngenta's violence in Brazil.* But Syngenta continues to expand its market with impunity.

- **Agrochemical TNCs continue to violate the rights of indigenous peoples with impunity.**

POPs (many produced by Syngenta, Bayer and Dow) travel northwards and accumulate in the environment, contaminating the Arctic, which has devastating effects on the way of life of the Arctic tribes.

Vi Waghiyi, Yupik, succinctly described this in her statement: *The health and well-being of our Arctic indigenous peoples is connected intimately to the climate, wildlife, and the Arctic ecosystem spiritually, culturally and traditionally. The corporations are contaminating us without our consent and affecting our lands, our subsistence foods, the health and well-being of our people, our children and future generations, and our traditions and cultures. They must be held accountable and prevented from causing further harm.*

- **Agrochemical TNCs undermine science and independent research as well as harass and attempt to discredit scientists who have upheld the truth**

Syngenta has harassed and attempted to discredit Dr Tyrone Hayes, scientist who exposed the negative impacts of Syngenta's pesticide, atrazine. Dr. Hayes said: *Syngenta asked me to manipulate data, hide data or purchase my data. I refused.* Scientists like Dr Hayes who speak the truth, lose their funding and are isolated from the rest of the scientific community.

The TNCs have influenced the focus and outcome of research by donating research grants to Universities or funding research that is corporate owned, especially when universities are vulnerable due to privatisation. As Dr Quijano said: *Most toxicologists are in the employ of TNCs or TNC-influenced institutions. Most scientific journals are controlled or influenced by big corporations. UN bodies dealing with chemicals are highly influenced by big business or governments protecting big business.*

Agrochemical TNCs have used the threats of and actual legal suits and counter suits to silence critics and tie activists for years in litigation.

- **Agrochemical TNCs have violated the rights of women and children**

In India, it is estimated that 169,900 children below 14 years old, mostly girls, work in cotton plantations. In exchange for lowly wages and bonded through family debts, child labourers are exposed to highly toxic pesticides such as endosulfan and monocrotophos for long periods of time. The testimonies from Ashwini and Shankar emphasised the impact of the pesticides and the inhumane work conditions, including long hours and hazardous work with no form of protection and information.

- **Collusion between Agrochemical TNCs and governments facilitated by international institutions and aid agencies effectively developed policies, law making processes and weakened governments' protection mechanisms to increase profits and expand markets.**

In the case of paraquat, we have shown how governments repealed the ban to allow the continued use of paraquat due to a combination of pressure and public relations exercise by Syngenta and the oil palm plantation industry.

In Indonesia, Monsanto bribed the government officials to allow the field testing of GE cotton.

The 'revolving door' practice of placing agrochemical representatives in high government decision-making positions and then slipping back to their corporate posts is common. While these agrochemical representatives are in high government positions they change or enact policies that are serve their corporate interests.

In the case of the Liberty Link rice debacle, the USDA quickly registered the LLRice601 immediately after it was found that this had illegally contaminated the US rice production. This was done very speedily without the necessary process. Bayer in arrogance claimed that it was an act of God.

The policies of the institutions such as World Bank/IMF and the WTO have aided the global strategy of multinational corporate hegemony, initially through SAP and the Green Revolution and now total trade liberalisation. In fact, it is clear that the WB directly supported and facilitated the expansion of markets for the agrochemical TNCs in Africa as well as directly supported the corporations by providing funds for the procurement of pesticides, seeds, and fertilisers to developing countries. The WTO's policies of liberalisation and privatisation, particularly the TRIPs and AoA, also allows the amassing of profits for these corporations.

- ***Systematic violations and lack of accountability***

These cases of violations are not isolated. From the survivors from the Arctic to the death of bees, we have shown very clearly widespread and systematic violations of people's rights to life and health and livelihoods. These violations impact on the economic, social and cultural rights, civil and political rights and in particular the rights of women and children. The onslaught of agrochemical TNCs and the monopoly control of the means of production particularly land, water, and seeds is evident. This monopoly control has devastated farmers, local small food producers and indigenous communities who are losing their basis of survival, their culture, and identity and their knowledge and skills.

The legal and policies framework have made it impossible for communities and vulnerable groups that are the most affected to access justice. They face huge obstacles to hold these TNCs, parent company and their agents, who have contributed to death, ill health and environmental damage, liable.

The lack of corporate accountability and remedy under international and local laws as well as the deliberate failure of these agrochemical TNCs to observe the customary rights and norms under international law, has had devastating impact on people, livelihoods and environment. It has also been aggravated by the complicity of the States and their failure to protect their citizens from this onslaught. In spite of current existing international instruments, such as Conventions that define rights, it is not possible to make TNC accountable. At the global level there is lack of mechanisms for corporate accountability.

These agrochemical TNCs continue to escape liability for their unlawful and often lethal conduct outside of their host states. The United States, Germany, and Switzerland, where the headquarters of the six corporate defendants are located, bear not only responsibility but legal liability for their failure to regulate the export of dangerous agrochemicals and the genetically engineered seeds and crops that inflict great environmental harm and endanger health and lives, both directly and indirectly.

For 27 years, the survivors of Bhopal have struggled for justice – and they are still waiting. The Indian courts have failed to bring justice while the US courts using the *“forum non conveniens”* have absolved themselves from hearing the case in the courts.

The people's response in the face of the tremendous onslaught has been to continue strengthening the people's movements and consolidation of resistance against globalisation and the tyranny of the agrochemical TNCs. We continue to assert our economic, social, cultural and political rights at all levels and realise our rights to food sovereignty, through self-determination, and empowerment. However, a global mechanism is urgently needed to bring out justice.

In this regard, we ask the PPT session to consider our recommendations:

Our recommendations:

1. Eliminate Highly Hazardous Pesticides

The development, manufacture, distribution and use of highly hazardous pesticides should cease, as they are fundamentally incompatible with the inherent and universal right to life and health.

2. Protect genetic resources

The use, field testing, cultivation, production, distribution, sale, and commercialisation of genetically engineered seeds, crops and food should cease, as they contravene the right to health, healthy environment, and social and economic rights.

Patents on life forms should not be permitted. Intellectual property (IP) standards applied to all other fields of technology should not be extended to agriculture. Dismantle the IP system in relation to seeds, foods, animal breeds, medicines, etc.

Stop the privatisation of knowledge. The space has to be created where people can design their own agricultural systems and exercise their right to self-determination. Traditional knowledge has to be respected and safeguarded.

3. Advance food sovereignty and ecological agriculture

People's food sovereignty is in itself a powerful organising concept to re-build lives and communities. It provides another way forward other than trade. While the interdependence of countries and peoples for their food needs is recognised, this should be based on socially-appropriate and ecologically-sensitive models. Agricultural policies should be formulated along the principles of food sovereignty, ensuring the people's right to productive resources and self-determination. States should invest in ecological food production systems that ensure sustainability.

4. Restructure International Financial Institutions

The system of structural adjustment programmes and conditionalities for loans and aid by international financial institutions should be dismantled. Development aid should promote national sovereignty and food sovereignty.

5. Adopt the precautionary principle

The Precautionary Principle should be the basis of decision-making on policies, technology, research and regulations in the areas of food, health and environmental conservation. It should be part of jurisprudence with appropriate laws and regulatory mechanisms incorporating it developed.

More than 7,000 people and 400 people's organizations representing agriculture workers, peasants, women, indigenous peoples, fisherfolk, pastoralists and civil society groups have so far endorsed and supported the Permanent People's Tribunal Session on Agrochemical TNCs and Calls for accountability of agrochemical TNCs.

For more information, contact us at:

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Website: www.agricorporateaccountability.net

APPENDIX 5

WITNESS STATEMENTS

The following witnesses provided verbal evidence and submitted written statements, which are reproduced in full in this Appendix. Key points are included in the relevant section of the indictment. Other witnesses presented verbal evidence only and their statements are reflected in relevant sections of the indictment.

Appendix 5.1	Technical witness 2. Michael Hansen	The issue of genetic engineering
Appendix 5.2	Technical witness 4. Shalini Bhutani	Issues with intellectual property
Appendix 5.3	Witness 1. Javier Souza	RoundUp Ready soybean case
Appendix 5.4	Witness 2. Petrona Villasboa	Poisoning of Silvino Talavera Case
Appendix 5.5	Witness 3. Celso Barbosa	Killing of Brazilian farmworker case
Appendix 5.6	Witness 8. Kathryn Gilje for ACAT	Poisoning of the Arctic
Appendix 5.7	Witness 9. Philipp Mimkes	Death of bees
Appendix 5.8	Witness 10. Graham White	Death of bees
Appendix 5.9	Witness 11. Tyrone Hayes	Atrazine and harassment case
Appendix 5.10	Witness 12. Abou Thiam	Obsolete pesticide dumps
Appendix 5.11	Witness 14. Ashwini	Child labour case

The jury further considered 40 submissions of written evidence as listed in Appendix 5. This evidence is available on the website for the PPT Session on Agrochemical Transnational Corporations.

APPENDIX 5.1

TECHNICAL WITNESS STATEMENT

THE ISSUE OF GENETIC ENGINEERING

Michael Hansen, PhD

Senior Scientist, Consumers Union, US

I am a Senior Scientist at Consumers Union of US, where I work on new technologies and food safety issues. I have a PhD in Biological Sciences from the University of Michigan. I did post-doctoral work at the University of Kentucky on the impact of modern biotechnology/genetic engineering on plant breeding. I have worked at Consumers Union for the last 25 years and have been responsible for developing Consumers Union's positions on safety, testing and labeling of genetically engineered food and preparing recommendations to regulatory agencies. From 2000-2002, I was a member of the US Department of Agriculture's Advisory Committee on Agricultural Biotechnology.

I have also represented Consumers International (a global federation of 250 consumer organizations in 110 countries) at various Codex Alimentarius committees, especially the Ad Hoc Intergovernmental Task Force on Foods Derived from Modern Biotechnology, which met in Japan from 2000-2003 and 2005-2008. I served as an international expert for two different Food and Agriculture Organization/ World Health Organization (FAO/WHO) Joint expert committees on modern biotechnology. The first was FAO/WHO Joint Expert Committee on Safety Assessment of Foods Derived from Genetically Modified Animals, including Fish, held in Rome, Italy in November 2003, while the second was the FAO/WHO Expert Consultation on the Safety Assessment of Foods Derived from Recombinant-DNA Animals, held in Geneva, Switzerland in February 2007. I have also traveled extensively in Asia, Eastern Europe, Latin American and Africa helping consumer groups with capacity building and training on safety, testing and labeling of genetically engineered food.

I would like to address a series of questions on genetic engineering.

What is genetic engineering?

First, there is the question of what is genetic engineering? It should be stated that there are a number of terms that are used around the world—including genetic engineering, genetic modification and modern biotechnology—that functionally mean the same thing. The European Union uses the terminology genetic modification and genetically modified organism (GMO). The EU defines a GMO as “an organism, with the exception of human beings, in which the genetic material has been altered in a way that does not occur naturally by mating and/or natural recombination.”⁹⁴⁰

At the global level, both the Cartagena Biosafety Protocol under the Convention on Biological Diversity as well as Codex Alimentarius, the food safety standard organization of the United Nations, jointly run by WHO and FAO, use the terminology ‘modern biotechnology’, which is defined as “the application of: i) *In vitro* nucleic acid techniques, including recombinant deoxyribonucleic acid (DNA) and direct

⁹⁴⁰ The European Parliament and the Council of the European Union. 2001. *Directive on the release of genetically modified organisms (GMOs) Directive 2001/18/E*. Official Journal of the European Communities. 12 March. p17.

injection of nucleic acid into cells or organelles, or ii) Fusion of cells beyond the taxonomic family, that overcome natural physiological reproductive or recombinant barriers and that are not techniques used in traditional breeding and selection".⁹⁴¹

In more layman's terms, genetic engineering alters the genetic makeup of an organism using techniques that introduce heritable (e.g. capable of being passed on to the next generation) genetic material, prepared outside the organism, either directly into the host or into a cell that is then fused or hybridized with the host. This involves using recombinant nucleic acid (DNA or RNA) techniques to form new combinations of heritable genetic material, followed by the incorporation of that material. A gene 'gun', a bacterial 'truck', direct injection, a chemical or electrical treatment inserts the genetic material into the host plant cell and then, with the help of genetic elements in the construct, this genetic material inserts itself into the chromosomes of the host plant. A key element in the genetic construct is a 'promoter' (e.g. regulatory genetic element to turn a gene on and control its level of expression), often from a plant virus as part of the package, to make the desired inserted gene express itself. This process alone, involving a gene gun or a comparable technique, and a promoter, is profoundly different from conventional breeding, even if the primary goal is only to insert genetic material from the same species.

But beyond that, the technique permits genetic material to be inserted from unprecedented sources. It is now possible to insert genetic material from species, families and even kingdoms which could not previously be sources of genetic material for a particular species, and even to insert custom-designed genes that do not exist in nature. As a result we can create what can be regarded as synthetic life forms, something which could not be done by conventional breeding. In addition, while the present tools of genetic engineering can control relatively precisely the trait that is being inserted into a host plant genome, they cannot yet control the location where the trait is inserted into the genome with any precision, nor guarantee stable expression of the transgene, which can lead to all sorts of problems.

What kinds of GE crops are there in the world?

Currently there are six categories of GE crops that are being developed or have been commercialized: herbicide-tolerant, insect-resistant, virus-tolerant, nutritionally-enhanced, pharma and industrial crops and climate/stress-tolerant. Herbicide-tolerant (HT) crops are engineered to withstand the spraying of a company's herbicide. The two most important herbicide-tolerant crops are Roundup Ready crops (designed to tolerate use of glyphosate, originally developed by Monsanto), and Liberty Link (designed to tolerate use of Bayer's glufosinate). Examples include RoundUp Ready maize, soybean, canola, cotton, rice and wheat; and Liberty Link rice, maize, cotton, soybean, sugar beet and canola.

Insect-resistant crops are all Bt crops, and include maize, potato and cotton, with testing done on rice, brinjal and soybean lines. Virus-tolerant crops basically consist of the ringspot virus-tolerant papaya and virus-tolerant squash and zucchini. Nutritionally-enhanced crops include golden rice and omega-3 soybean, both in the testing phase. Pharma and industrial crops include Ventria (human lactoferrin and lysozyme) rice, insulin safflower and alpha-amylase maize. Climate/stress-tolerant crops include Monsanto's drought-tolerant maize.

Although there are six categories of GE crops, the HT and BT crops are responsible for 99 per cent of the global acreage in GE crops, with the HT trait found in 83.3 per cent of the global acreage.⁹⁴²

⁹⁴¹ Codex Alimentarius. 2003. Principles for the Risk Analysis of Foods Derived from Modern Biotechnology. CAC/GL 45-2003.

⁹⁴² ISAAA. 2009. Global Status of Commercialized Biotech/GM Crops: 2009 - The first fourteen years, 1996 to 2009.

What has been the performance of GE crops so far?

Do GE crops have higher yields?

GE crops so far have not lived up to the hype. The two main claims by industry have been that GE crops would increase yield and help feed the world and decrease pesticide use. Both claims have been overblown. In 2006, the US Department of Agriculture put out a publication entitled *The First Decade of Genetically Engineered Crops in the United States*, which stated, *Currently available GE crops do not increase the yield potential of a hybrid variety. In fact, yield may even decrease if the varieties used to carry the herbicide-tolerant or insect-resistance genes are not the highest yielding cultivars.*⁹⁴³ Indeed, in the only side-by-side study of yields of Roundup Ready (RR) soybean (engineered to be resistant to glyphosate) compared to their sister line published in *Agronomy Journal* in 2001 found that RR soybean had a 10 per cent lower yield compared to their non-GE sister lines, which gave rise to the RR soybean.⁹⁴⁴ Another study on RR soybean, published in 2007, found that RR soybean had a 10 per cent lower yield than their sister lines, due to the fact that the RR soybean could not adequately take up manganese from the soil.⁹⁴⁵ A study published by the Union of Concerned Scientists entitled *Failure to Yield*, published in 2009, concluded *GE soybeans have not increased yields, and GE corn has increased yield only marginally on a crop-wide basis. Overall, corn and soybean yields have risen substantially over the last 15 years, but largely not as result of the GE traits. Most of the gains are due to traditional breeding or improvement of other agricultural practices.*⁹⁴⁶

Do GE crops reduce pesticide use?

As for GE crops reducing pesticide use, data shows that, over time, pesticide use actually increases, especially for HT crops. A study of the situation in the US, utilizing data obtained from the USDA, found that between 1996 and 2008, Bt corn and cotton have reduced insecticide use by 56 million pounds, but herbicide tolerant crops have increased pesticide use by 383 million pounds, for an overall 327 million pounds increase over the 13 years.⁹⁴⁷ In the first nine years of GE in the US (1996-2004), there was an overall increase of 122 million pounds more pesticide used on GE crop compared to non-GE crops. For 2005-2008, an additional 205 million extra pounds were applied, showing that the rate of increase in herbicide use was dramatically escalating. Indeed, the same report found that, in 2008, GE crops required 26 per cent more pounds of pesticide per acre than acres planted to conventional varieties.

In China, Bt cotton was introduced in 1997. By 2004, 65 per cent of the cotton grown in China was Bt cotton. Although Chinese farmers did initially spray less pesticide on Bt cotton and made more money than growing non-Bt cotton, by 2004, however, that had changed. In 2004, Bt farmers spent 46 per cent less on bollworm pesticide, but spent 40 per cent more on pesticides for secondary pest(s), compared to non-Bt farmers.⁹⁴⁸ The main secondary pest was a sucking bug called a mirid. In the early years of Bt

⁹⁴³ Fernandez-Cornejo, Caswell. 2006. *The First Decade of Genetically Engineered Crops in the United States*. USDA Economic Research Service. p9.

⁹⁴⁴ Elmore *et al.* 2001. Glyphosate-resistant soybean cultivar yields compared with sister lines. *Agronomy Journal* 93:408-412.

⁹⁴⁵ Gordon B. 2007. Manganese nutrition of glyphosate-resistant and conventional soybeans. *Better Crops*, 91(4):12-13.

⁹⁴⁶ Gurian-Sherman D. 2009. *Failure to Yield: Evaluating the Performance of Genetically Engineered Crops*. Union of Concerned Scientists. p1.

⁹⁴⁷ Benbrook C. 2009. *Impacts of Genetically Engineered Crops on Pesticide Use in the United States: The First Thirteen Years*.

⁹⁴⁸ Wang S, Just DR, Pinstrup-Andersen P. 2006. Tarnishing Silver Bullets: Bt technology adoption, bounded rationality and the outbreak of secondary pest infestations in China.

cotton use, mirids were not a problem. By 2004, Bt cotton farmers were spraying 15-20 times more than previously to control mirids and were losing money compared to non-Bt cotton farmers. In addition, mirid bug populations exploded and not only caused problems on cotton but also led to outbreaks, which were correlated with the extent of Bt cotton planting, in other crops such as Chinese date, apple, peach, pear, and grape.⁹⁴⁹

In Argentina, where RR soybean was introduced in 1999, use of glyphosate more than tripled by 2005, with a study finding that RR soybean producers use twice as much herbicide compared to non-GE soybean.⁹⁵⁰

Risks of GE crops

The drastic increase in herbicide, and sometimes insecticide, use in GE crops has led to both environmental and human health problems. On the environmental side, HT crops led to the creation of superweeds and increased herbicide use, while Bt crops could lead to increased pesticide use to control secondary pests as well as the evolution of pest insects tolerant to the Bt toxin.

Glyphosate-tolerant crops

Overuse of glyphosate has led to the creation of superweeds, which, in turn, has caused use of herbicides to skyrocket. Roundup Ready crops facilitate season-long use of glyphosate for weed control, and are largely responsible for a ten-fold increase in agricultural use of the herbicide in the US from 1993 to 2007.⁹⁵¹ At 200 million pounds per year in the US alone (2007), glyphosate is the most heavily used pesticide in the world. The massive use of glyphosate has led to many glyphosate-resistant (GR) weeds, which have reached epidemic proportions in the US infesting over ten million acres.⁹⁵² In July 2010, a weed science expert who testified before the US House of Representatives Oversight Committee stated that there had been a fivefold increase in GR weed acreage in the last three years.⁹⁵³

Globally, GR weeds are rapidly proliferating. Data from the 2011 International Survey of Herbicide Resistant Weeds show that globally there are 21 species of GR weeds, with two new GR weeds being reported in 2010. The situation is the worst in the US, which now has 13 GR weeds in 73 locations, with each location representing from one to thousands of fields.⁹⁵⁴ Perhaps the worst GR weed is Palmer pigweed (*Amaranthus palmeri*), which first appeared in 2004 and is now a problem in maize, cotton and soybean. In North Carolina, up to a million sites have been infested with GR Palmer pigweed.⁹⁵⁵ In Georgia, some 500,000 acres of cotton were weeded by hand in 2009 to remove GR Palmer pigweed raising weed control costs from US \$25 to US \$60-100 per acre.⁹⁵⁶ Current surveys indicate that almost 20 per cent of U.S producers have found glyphosate-resistant weeds on their farms.⁹⁵⁷

⁹⁴⁹ Lu Y *et al.* 2010. Mirid Bug Outbreaks in Multiple Crops Correlated with Wide-Scale Adoption of Bt Cotton in China. *Science* 328:1151-1154.

⁹⁵⁰ Friends of the Earth International. 2009. Who Benefits from GM Crops? Feed the Biotech Giants, Not the World's Poor.

⁹⁵¹ US EPA. Pesticides Industry Sales and Usage: Market Estimates. See reports for 1998/1999 and 2006/2007, Table 3.6 in each report.

⁹⁵² USDA/APHIS. 2010. Draft environmental assessment of supplemental request for partial deregulation of sugar beet genetically engineered to be tolerant to the herbicide glyphosate, USDA APHIS. p93.

⁹⁵³ Mortenson D. 2010. Growing RoundUp-resistant weed problem must be dealt with, expert says. See www.physorg.com/news203697204.html

⁹⁵⁴ Herbicide Resistance Action Committee. 2011. Glycines (G/9) resistant weeds by species and country.

⁹⁵⁵ Powles SB. 2008. Evolved glyphosate-resistant weed around the world: lessons learnt. *Pest Management Science* 64:360-365.

⁹⁵⁶ Haire B. 2010. Pigweed threatens Georgia cotton industry, Southeast Farm Press. July 6.

⁹⁵⁷ See <http://farmindustrynews.com/crop-protection/diversification-prevents-weed-resistance-glyphosate/>

In Argentina, glyphosate-resistant Johnsongrass, one of the worst weed species in the world, appeared in 2007 on over 120,000 hectares of agricultural land. Agricultural officials suggested using a mix of herbicides other than glyphosate to control the Johnson grass.⁹⁵⁸

Scientists have noted that the primary reason for the explosion in GR weeds is the widespread use of glyphosate in RR crops of soybean, cotton and maize. As two scientists pointed out in 2008, *Most of the documented cases of evolved GR weeds in the past 6 years have been in GR crops.*⁹⁵⁹

The response to the huge increase in GR weeds is to increase the use of glyphosate, as previously noted, and to use it in combination with other toxic herbicides. Data from the US Department of Agriculture's National Agricultural Statistics Service show that 2,4-D applications on soybean more than doubled between 2005 and 2006, going from 1.73 million pounds to 3.67 million pounds.⁹⁶⁰ Indeed, the response of the pesticide/genetic engineering companies is to develop crops with engineered resistance to multiple herbicides, known as gene stacking. Monsanto's recently released SmartStax corn has resistance to both glyphosate and glufosinate (manufactured by Bayer). In the US, there are pending applications for Monsanto's soybean MON 87708-9, with resistance to glyphosate and dicamba; Dow's soybean DAS-68416-4, with resistance to glyphosate, glufosinate, and 2,4-D; Dow's maize DAS-40278-9, with resistance to 2,4-D and glyphosate; and Bayer's soybean FG72, with resistance glyphosate and glufosinate.⁹⁶¹

Thus, we see a return to more toxic herbicides such as 2,4-D, which was part of the infamous Agent Orange used during the Vietnam war, and which has been linked to non-Hodgkin's lymphoma, a cancer of the blood system.⁹⁶² Dicamba, a close chemical cousin to 2,4-D, has also been linked to both non-Hodgkin's lymphoma and to colon cancer. Glyphosate was once considered fairly benign, but epidemiology studies have linked it to non-Hodgkin's lymphoma,⁹⁶³ multiple myeloma,⁹⁶⁴ and increased levels of premature births and miscarriages in women whose husbands uses pesticides, such as glyphosate and 2,4-D.⁹⁶⁵ An epidemiological study in Ecuador found a higher degree of DNA damage in people living in an area that was aerially sprayed with glyphosate compared with those living 80 kilometres away.⁹⁶⁶ DNA damage can ultimately lead to cancer or birth defects.

There is also evidence that links glyphosate with birth defects. A rat study from 2003 found a statistically significant, dose-dependent increase in defects of the skull ('incomplete skull ossification and enlarged fontanel').⁹⁶⁷ A tadpole study from 2003 found glyphosate formulations cause craniofacial and mouth deformities, eye abnormalities and bent curved tails.⁹⁶⁸ An epidemiological study from 2009 in an area

⁹⁵⁸ Friends of the Earth International, 2009, *Op cit.*

⁹⁵⁹ Duke SO, Powles SB. 2008. Glyphosate: a once in a century herbicide. *Pest Management Science*, 64:319-325.

⁹⁶⁰ Benbrook, 2009, *Op cit.*

⁹⁶¹ See http://www.aphis.usda.gov/biotechnology/not_reg.html

⁹⁶² Eriksson M, Hardell L, Carlberg M, Akerman M. 2008. Pesticide exposure as a risk factor for non-Hodgkin's lymphoma including histopathological subgroup analysis. *International Journal of Cancer* 123:1657-1663.

⁹⁶³ *Ibid.*

⁹⁶⁴ De Roos AJD, Blair A, Rusiecki JA, Hoppin JA, Svec M, Dosemeci M, Sandler DP, Alavanja MC. 2005. Cancer incidence among glyphosate-exposed pesticide applicators in the Agricultural Health Study. *Environmental Health Perspectives* 113(1): 49-54.

⁹⁶⁵ Savitz DA, Arbuckle T, Kaczor D, Curtis KM. 1997. Male pesticide applicators and pregnancy outcome. *American Journal of Epidemiology* 146:1025-1036.

⁹⁶⁶ Paz-y-Miño C, Sánchez ME, Arévalo M, Muñoz MJ, Witte T, De-la-Carrera GO, Leone PE. 2007. Evaluation of DNA damage in an Ecuadorian population exposed to glyphosate. *Genetics and Molecular Biology* 30:456-460.

⁹⁶⁷ Dallegre E, Mantese FD, Coelho RS, Pereira JD, Dalsenter PR, Langeloh A. 2003. The teratogenic potential of the herbicide glyphosate-Roundup in Wistar rats. *Toxicology Letters* 142(1-2):48.

⁹⁶⁸ Lajmanovich RC, Sandoval MT, Peltzer PM. 2003. Induction of mortality and malformation in *Scinax nasicus* tadpoles exposed to glyphosate formulations. *Bulletin of Environmental Contamination and Toxicology* 70: 612-618.

in Paraguay where there is a lot of RR soybean (e.g. Itapua) found that women who were exposed during pregnancy to herbicides were more likely than unexposed women to deliver offspring with birth defects, particularly microcephaly (small head), anencephaly (absence of part of the brain and head) and malformations of the skull.⁹⁶⁹

Last year, a group of Argentinian scientists, headed by Professor Andrés Carrasco, Director of the Laboratory at the University of Buenos Aires Medical School and lead researcher for the National Council of Scientific and Technical Research (CONICET) published a paper that showed glyphosate-based herbicides caused malformations in frog and chicken embryos.⁹⁷⁰ The malformations found were mostly of the craniofacial and neural crest type, which affect the skull, face, midline, and developing brain and spinal cord. These kinds of birth defects are consistent with those found in the epidemiology study in Paraguay and also with a study from Argentina. In April 2010, the provisional government of Chaco, Argentina released a report analyzing health statistics in the town of La Leonesa and other areas where soybean and rice crops are heavily sprayed with herbicides such as glyphosate (over 98 per cent of the soybean in Argentina is RR soybean).⁹⁷¹ The Commission reported a tripling of the childhood cancer rate from 2000 to 2009 and a nearly fourfold increase in birth defects over the entire state of Chaco.⁹⁷²

Clearly, glyphosate is not a benign chemical, as it has now been linked to a range of health problems including multiple types of cancer as well as birth defects. Thus, the dramatic increase in glyphosate used on RR crops can lead to large human health problems.

Bt crops

After HT crops, Bt crops are the most widespread. About 35 per cent of global GE acreage in contain the Bt trait. Bt crops are engineered with δ -endotoxins produced by the soil bacterium *Bacillus thuringiensis*. δ -endotoxins are called Cry proteins and there are dozens of them. Bt crops on market include maize, potato, cotton, and poplars; many are in testing phase, including Bt rice, Bt brinjal, and Bt soybean. The major health concern of Bt crops have to do with allergenicity and immunological impacts on the gut, especially with Cry1Ab and Cry1Ac, which are found in Bt maize, Bt cotton, Bt brinjal and Bt rice.

A number of studies have found similarities between certain Cry proteins and known human allergens. A US study found sequence similarity between Cry3b (found in Bt potatoes) and a major milk allergen (beta-lactoglobulin), and between Cry1Ab and Cry1Ac (found in Bt maize, Bt cotton and Bt brinjal) and egg yolk allergen (vitellogenin) proteins.⁹⁷³ A Dutch study found sequence similarity between Cry1Ab and cedar pollen allergens.⁹⁷⁴ A US study of farmworkers found two that had circulating antibodies to Cry1Ab and Cry1Ac.⁹⁷⁵

⁹⁶⁹ Benitez-Leite S, Macchi MA, Acosta M. 2009. Malformaciones congénitas asociadas a agrotóxicos. *Archivos de Pediatría del Uruguay* 80:237-247.

⁹⁷⁰ Paganelli A, Gnazzo V, Acosta H, Lopez SL, Carrasco AE. 2010. Glyphosate-based herbicides produce teratogenic effects on vertebrates by impairing retinoic acid signaling. *Chemical Research in Toxicology* 23(10):1586-1595.

⁹⁷¹ Comision Provincial de Investigacion de Contaminantes del Agua. 2010. Primer Informe. Resistencia, Chaco.

⁹⁷² Antoniou M, Brack P, Carrasco A, Fagan J, Habib M, Kageyama P, Leifert C, Nodari RO, Pengue W. 2010. *GM Soy: Sustainable? Responsible?* GLS Bank and ARGE Gentechnik-frei. Vienna, Austria.

⁹⁷³ Gendel SM. 1998b. The use of amino acid sequence alignments to assess potential allergenicity of proteins used in genetically modified foods. *Advances in Food and Nutrition Research* 42:44-61.

⁹⁷⁴ Kleter GA, Peijnenburg AACM. 2002. Screening of transgenic proteins expressed in transgenic food crops for the presence of short amino acid sequences identical to potential, IgE-binding linear epitopes of allergens. *BMC Structural Biology* 2:8.

⁹⁷⁵ Bernstein *et al.* 1999. Immune responses in farm workers after exposure to *Bacillus thuringiensis* pesticides. *Environmental Health Perspectives* 107(7):575-582.

Mice feeding studies of Cry1Ac have found it to be a potent stimulator of the immune system and acts as an adjuvant, which increases the immune response to other proteins.⁹⁷⁶ An Egyptian mice feeding study involving Bt potatoes and the Cry1 toxin found that it caused adverse changes in the gut, leading them to conclude that *thorough tests of these new types of genetically engineered crops must be made to avoid risks before marketing.*⁹⁷⁷

A doctor's study in Madhya Pradesh on health of Bt cotton farmers and workers in the ginning factories found strong suggestive evidence of allergic response to Bt cotton.⁹⁷⁸ The scientists surveyed five villages and talked to 23 people with symptoms and exposure to Bt cotton. All had skin symptoms, such as itching, while half had eye symptoms—itching, redness and/or swelling—and 40 per cent had upper respiratory tract symptoms—runny noses and/or excessive sneezing. Roughly three quarters of the people picked cotton. Their symptoms increased in severity when they continued to work in fields and decreased when they stopped work. The symptoms started the last two years, coinciding with the time when Bt cotton was introduced. The owner of a ginning factory told the scientists that *most of the farmers and laborers were having skin related problems due to Bt cotton.* Detailed interviews with 6 workers in different ginning factories found all had itching problems on exposed parts of body (hands, legs, face), and 2 were having eruptions on their bodies. The workers had been in the factory from 2 – 7 years, but symptoms only began last year, with the introduction of Bt cotton.

A number of lab studies have also raised questions about the Bt crops. A carefully controlled molecular study by Italian scientists found that in Monsanto's Bt corn (MON 810), a gene for a known corn allergen—gamma zein—had been expressed (e.g. turned on) while the same gene was not turned on in the non-GE sister line.⁹⁷⁹ Another carefully controlled mouse feeding study by Italian scientists that looked at the effect of MON 810 on the gut and peripheral immune system in young and old mice did find adverse effects on both the gut and peripheral immune system, concluding that the *results suggest the importance of the gut and peripheral immune response to GM crop ingestion as well as the age of the consumer in the GMO safety evaluation.*⁹⁸⁰

A study published just a couple of months ago was very disturbing. The study involved 30 pregnant and 39 non-pregnant women in Quebec, Canada.⁹⁸¹ Blood was taken from women and from foetal cord blood and was tested for 3 pesticides associated with GM: glyphosate, glufosinate and Cry1Ab. The surprising finding was that Cry1Ab was detected in 93 per cent and 80 per cent of maternal and foetal blood samples, respectively and in 69 per cent of tested blood samples from non-pregnant women. The scientists noted that *trace amounts of the Cry1Ab toxin were detected in the gastrointestinal contents of livestock fed on GM corn, raising concerns about this toxin in insect-resistant GM crops; [suggesting] (1) that these toxins may not be effectively eliminated in humans and (2) there may be a high risk of exposure through consumption of contaminated meat. They concluded, To our knowledge, this is the first study to highlight the presence of pesticides-associated genetically modified foods in maternal, foetal and non-*

976 Vazquez-Padron RI, Moreno-Fierros L, Neri-Bazan L, de la Riva GA, Lopez-Revilla R. 1999b. Bacillus thuringiensis Cry1Ac protoxin is a potent systemic and mucosal adjuvant. *Scandinavian Journal of Immunology* 49:578-584.

977 Fares NH, El-Sayed AK. 1998. Fine structural changes in the ileum of mice fed on delta-endotoxin-treated potatoes and transgenic potatoes. *Natural Toxins* 6:219-233.

978 Gupta A *et al.* 2005. Investigation Report, October-December 2005. See: Impact of Bt cotton on farmers' health (in Barwani and Dhar District of Madhya Pradesh)

979 Zolla L *et al.* 2008. Proteomics as a Complementary Tool for Identifying Unintended Side Effects Occurring in Transgenic Maize Seeds As a Result of Genetic Modifications. *Journal of Proteome Research* 7:1850-1861.

980 Finamore A, Roselli M, Britti S, Monastra G, Ambra R, Turrini A, Menheri E. 2008. Intestinal and Peripheral Immune Response to MON810 Maize Ingestion in Weaning and Old Mice. *Journal of Agricultural and Food Chemistry* 56(23):11533-11539.

981 Aris A, Leblanc S. (2011). Maternal and fetal exposure to pesticides associated to genetically modified foods in Eastern Townships of Quebec, Canada. *Reproductive Toxicology*, doi:10.1016/j.reprotox.2011.02.004.

pregnant women's blood. 3-MPPA and Cry1Ab toxin are clearly detectable and appear to cross the placenta to the fetus. Given the potential toxicity of these environmental pollutants and the fragility of the fetus, more studies are needed, particularly those using the placental transfer approach.

A carefully controlled long-term mouse feeding study by Austrian scientists looked at the effect on reproduction of MON 810 X NK 603, which contains both Cry1Ab and gene for glyphosate tolerance.⁹⁸² The study found statistically significant adverse reproductive effects shown in the reproductive assessment by a continuous breeding (RACB) study. RACB is a feeding study whereby a pair of mice is fed GE maize for 140 days, during which time the female is bred so that she delivers 4 litters. RACB puts mice under stress making it easier to detect adverse effects. The main result found that all mice fed the non-GE grain delivered 4 litters while the mice fed the GE grain showed a reduction in the number of deliveries with time; by the 4th litter only 20 deliveries occurred. The average number of pups born was always lower in the GE group but not significant before the 3rd delivery. There were significantly fewer pups born in the GE group in the 3rd ($p=0.011$) and 4th ($p=0.010$) delivery and weaned in the 4th litter ($p=0.025$). *In terms of all deliveries per group more pups were born in the ISO than in the GM group (1035 versus 844). Furthermore females of the GM group always had smaller litters ($n < 8$) as compared to females of the ISO group.*

A group of French scientists, led by Dr. Giles-Eric S eralini, reviewed all the feeding studies 90 days or longer that they could find involving GE corn and GE soybean.⁹⁸³ There were 19 feeding studies in total, involving both studies in peer-reviewed literature as well as data from company submissions. A meta-analysis of all these studies found that the kidneys were particularly affected in males while the liver was specifically disrupted in females. The authors concluded *The 90-day-long tests are insufficient to evaluate chronic toxicity, and the signs highlighted in the kidneys and livers could be the onset of chronic diseases. However, no minimal length for the tests is yet obligatory for any of the GMOs cultivated on a large scale, and this is socially unacceptable in terms of consumer health protection. We are suggesting that the studies should be improved and prolonged as well as being made compulsory, and the sexual hormones should be assessed too, and moreover, reproductive and multigenerational studies ought to be conducted too.*⁹⁸⁴

Clearly, there is suggestive evidence in the scientific literature of adverse health effects from consumption of GE foods, but there is a paucity of proper longer term feeding studies, which are clearly needed.

Suppression of scientists

In early 2009, 26 public sector scientists in the US took the unprecedented step of writing to the US Environmental Protection Agency (EPA) to complain that GE crop developers were curbing their rights to study commercial biotech crops.⁹⁸⁵ The signatories to the letter were anonymous as they feared retaliation from the seed companies. As the paper noted, *Company control starts with a simple grower's contract. Anyone wishing to buy transgenic seeds has to sign what's called a technology stewardship agreement that says, among many things, that the buyer cannot conduct research on the seed, nor give it to someone else for research.* This means scientists can't simply buy seeds for their studies, and farmers can't slip them some on the side. Instead, scientists must get permission from the seed companies or

⁹⁸² Velirimov A, Binter C, Zentek J. (2008). Biological effects of transgenic maize NK603xMON810 fed in long term reproduction studies in mice.

⁹⁸³ S eralini G-E, Mesnage R, Clair E, Gress S, de Vend mois JS, Cellier D. (2011). Genetically modified crops safety assessments: present limits and possible improvements. *Environmental Sciences Europe*, 23:10.

⁹⁸⁴ *Ibid.*

⁹⁸⁵ Waltz E. 2009. Under wraps. *Nature Biotechnology* 27(10):880-882.

risk a lawsuit. *You need permission from industry and you have to specify what you want to do with the plants*, says Bruce Tabashnik, an entomologist at the University of Arizona in Tucson.

Two examples from this paper stand out. I will quote directly from the paper: *In 2001, for example, Pioneer was developing a transgenic corn variety that contained a binary toxin, Cry34Ab1/Cry35Ab1, to fend off rootworms. The company asked some university laboratories to test for unintended effects on a lady beetle. The laboratories found that nearly 100 per cent of lady beetles that had been fed the crop died after the eighth day in the life cycle. When the researchers presented their results to Pioneer, the company forbade them from publicizing the data. The company came back and said 'you are under no circumstances able to publicize this data in any way', says a scientist associated with the project, who asked to remain anonymous. Because the product had not yet been commercialized, the research agreement gave Pioneer the right to prevent publication of their results.*

Two years later, Pioneer received regulatory approval for an anti-rootworm corn variety with the same toxin—Cry34Ab1/Cry35Ab1. But the data submitted to the EPA had no sign of potential harm to lady beetles, even though Pioneer had followed common EPA testing protocols. In one study, the company fed purified toxins to the lady beetles only through the seventh day of their life cycle—one day short of what was found to be their most susceptible stage. In a second study, the company followed the lady beetles through to the end of their life cycle but used a different mode of feeding, through a homogenized powder consisting of half prey and half pollen, and didn't see any effect, according to Jim Register, a scientist at Pioneer. Register also said that although Pioneer's commercialized product contains the same toxin as the one the universities studied, it is a different construct—key genes were integrated into a different place in the genome.

The anonymous researcher maintained that Pioneer's studies were flawed. The EPA was made aware of the independently produced data, but opted not to act, according to the anonymous source. *Pioneer would also not give the scientists permission to redo the study after the crop was commercialized.*⁹⁸⁶

Companies have been known to take the confidentiality of data on their GM crops to even greater extremes. Tabashnik says a Dow AgroSciences employee once threatened him with legal action if he published information he received from the EPA. The information concerned an insect-resistant variety of maize known as TC1507, made by Dow and Pioneer. The companies suspended sales of TC1507 in Puerto Rico after discovering in 2006 that an armyworm had developed resistance to it. Tabashnik was able to review the report the companies filed with the EPA by submitting a Freedom of Information Act request. *I encouraged an employee of the company [Dow] to publish the data and mentioned that, alternatively, I could cite the data, says Tabashnik. He told me that if I cited the information ... I would be subject to legal action by the company ... These kinds of statements are chilling.*⁹⁸⁷

Regulatory issues

A large reason for the lack of regulation and proper studies of GE crops can be traced to the US, where the majority of the GE crops in the world are grown. In 1992, the US Food and Drug Administration (FDA) decided not to regulate GE crops, legally treating them no different than conventionally-bred crops, arguing that the GE techniques are just an extension of conventional breeding. Indeed, the FDA policy was announced on May 29, 1992 at a BIO (Biotechnology Industry Organization) meeting as a deregulatory initiative. Although the companies go through a voluntary safety consultation and

⁹⁸⁶ *Ibid.*

⁹⁸⁷ *Ibid.*

receive a letter from the FDA at the end of the process, the FDA makes no conclusions about the safety of any of the GE crops, with the exception of the Flavr Savr tomato. As an example, the letter sent to Monsanto on September 26, 1996 about MON 810 noted, *Based on the safety and nutritional assessment you [Monsanto] have conducted, it is our [FDA] understanding that Monsanto has concluded that corn products derived from this new variety are not materially different in composition, safety, and other relevant parameters from corn currently on the market, and that the genetically modified corn does not raise issues that would require premarket review or approval by FDA.* A version of this same sentence is in more than 90 safety consultation letters. Thus, FDA does not require premarket safety assessments and does not make conclusions about the safety of these GE crops.

Furthermore, since the FDA says that there are no real differences between GE and non GE crops, it does not require labeling of such crops. Internationally, the US urges other countries, particularly developing countries, to follow the US model. In various trade agreements, the US is pressuring countries to not require labeling of GE crops or to get rid of such labeling requirements.

At Codex Alimentarius, the food safety standard setting organization of the UN, whose standards, guidelines and other documents are considered 'trade neutral' at the World Trade Organization, the US worked with their industry allies and a few countries to block any agreement on a labeling document for GE crops. Indeed, the Codex Committee on Food Labeling (CCFL) began work on guidelines for the labeling of foods derived from certain techniques of genetic engineering/genetic modification in 1993. From 1995, when the first draft guideline was produced, the US and their allies tried for over 15 years to block any document coming out of CCFL. However, this past July, the US finally gave up and allowed a document on GE labeling to be adopted by the Codex Alimentarius Commission. As Consumers International noted, *The new Codex agreement means that any country wishing to adopt GM food labelling will no longer face the threat of a legal challenge from the World Trade Organization (WTO). This is because national measures based on Codex guidance or standards cannot be challenged as a barrier to trade.*

Contamination

Finally, another risk of GE crops is the potential for cross-contamination. A perfect example is the case of LL601, which I will cover in a few slides.

APPENDIX 5.2

TECHNICAL WITNESS STATEMENT

ISSUES WITH INTELLECTUAL PROPERTY

Shalini Bhutani,
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Shalini Bhutani is a lawyer working independently on trade, agriculture and biodiversity-related issues. She has worked in several national and international NGOs for over 15 years including the Centre for Environmental Law at WWF-India and Navdanya. Along with both these organisations she has also been involved in public interest litigation at the Supreme Court of India.

In 2001, Ms Bhutani opened and independently ran the South Asia desk of the international NGO, GRAIN, whose work on agriculture as an organisation was recognised through the Right Livelihood Award in 2011. In the course of this, she has been interacting with farmer groups and local communities to know how they deal with issues of intellectual property (IP) in the Asia region. In this context, she has also tracked how seed legislation has come to change over the last decade. Within India, along with others in the environment action group, Kalpavriksh, she initiated and has been involved in the *Campaign for Conservation and Community Control over Biodiversity* since 2004. Therein the collective concern has been on how traditional know-how and people's practices are challenged by the privatisation of knowledge. She is also associated with the Forum Against Free Trade Agreements in India. She firmly believes that our food and farm systems need to change to be both pro-people and sensitive to the planet. Her association with PAN's PPT is with the hope that we be an active part of that change and move towards a new jurisprudence of not simply 'rights' but responsibilities.

The evolution of IPRs in the area of food, seed and farm

Intellectual property (IP) rules have become tools for TNCs by which to extend their powers. Hence, the focus of this People's Tribunal on this issue is done with the hope that if we tackle the IP system, we would then find ways to put controls on their scale, operation and areas of influence.

Firstly, it needs to be said that Intellectual Property Rights (IPRs) are created by law. IP laws are made by governments and passed by legislatures, but they are influenced by transnational corporations (TNCs). Secondly, the term 'evolution' suggests that the application of IP systems to our food and farm systems happened somewhat organically. This is open to contestation.

To fully understand what we are trying to protect, it is critical to look at the history of agriculture and with it, the kind of 'rights', or rather the *relationships* local people already have with their seeds, breeds and other natural resources, which form the basis of the food and farm systems that feed the planet and nurture culture. A little more on that cosmo-vision...

Intellectual *heritage*, as against intellectual 'property' is the know-how one inherits from family and community who have been before us. It is the handing-down of knowledge. It is usually collectively held by a society, at least, that has been the case in our Asian societies. Many members of that particular society contribute to it over time, and it is modified and enlarged as it is used over time. This knowledge is transmitted from generation to generation. Societies have had their own rules by which this knowledge

is disseminated amongst community members. Traditional structures are undergoing change and this is posing new challenges. Customary laws are now confronted with an onslaught of new ideas of (their) knowledge management by the outside world. And new products protected by modern IP laws are every day finding their way into farms and fields. Given that the history of agriculture is over 10,000 years old and the workings of the IP system about 50 years, (when we look at the recent history of pre-WTO to now), then there is a case to be made for knowledge, innovation and creative enterprises to be protected by more co-operative models that are rooted in the local.

Those who live in more urban settings and who are not directly dependent on the natural-resource base directly can perhaps not easily see how intellectual heritage is deeply entrenched in people's everyday lives. What seeds a small farmer will sow, what cure a traditional healer will use, how a tribal will catch fish, which fruit a forest-dweller will eat, what a pastoralist will use to feed her herd – all of these decisions are in most part made on the basis of knowing the living world and its biological resources.

Traditional knowledge (TK) is dynamic in nature and changes its character as the needs of the people change. It is generally an attribute of a particular people, who are intimately linked to a particular socio-ecological context. Thus customary laws and traditional practices form the soft law on the subject. This is now confronted by IP laws.

Those making the laws and policies today that restrict people's use of their own knowledge, innovations and practices, are not the ones growing food! Despite talk of democracy and decentralisation, food growers are unable to seed their own rules. So the irony is that those who make our food are not able to make their laws themselves. This is made worse by the fact that both the legal texts and the processes by which the laws are made remain closed. (They are even kept out of the purview of Right to Information statutes in some countries that have such laws for transparency.)

Loss of territory also leads to a decline in TK. With corporate control expanding to all resources—natural and intellectual—the crises for local communities are on many fronts. There are some very specific crises that arise for the knowledge, innovation and practices of local peoples, indigenous communities, tribal populations, traditional healers, forest dwellers and women, particularly when all this know-how is being privatised. This is both the result and consequence of it being brought under the purview of IPR systems and of IP-protected proprietary technologies being pushed by TNCs. So *evolution* in this context has meant regression. It has made us move away from cultures of sharing.

It is important to recall that the IP system was intended to balance the moral and economic rights of creators and inventors with the wider interests and needs of society. It was never meant to give private property-like rights to the IP-holder!

But current IP laws, and in fact the extension of their application in areas hitherto unknown, such as farm and food, is creating new tensions for agriculture-based societies. There is a big gap in society that holds informal knowledge and which runs the formal R&D enterprise today. Self-determination and food sovereignty stay unrealised.

There could be two approaches to address the problems. One is to trim the IP system itself with 'adequate' human rights criteria and indicators. The other better one is to roll-back the IP system from some key areas and truly allow (non-IPR) *sui generis* ways for the protection and continuance of agriculture. And particularly the kind of agriculture that people's groups live by.

A point to be made here is that since agriculture in the global economic system is being treated as an industry, the industrial level IP 'protection' is being extended to the food and farm sector as well. What

international law and policy including that on IP does is to treat agricultural inputs and products as patentable. In the industrial revolution era, anything new, inventive and which could be industrially mass produced was eligible for IP protection.

Often the talk about the history of IPRs in food and agriculture begins with reference to the World Trade Organisation (WTO) talks. Yet going a little before and after that will help place this submission in context:

- 1961 International Convention for the Protection of New Varieties of Plants (UPOV) and its specific IP, i.e. plant variety protection
- 1967 World Intellectual Property Organisation (WIPO) set up
- 1980 US Supreme Court Decision - Diamond v. Chakraborthy case
- 1986 to 1994 the Uruguay Round - the 8th round of multilateral trade negotiations was conducted within the framework of the General Agreement on Tariffs and Trade (GATT)
- 1995 World Trade Organisation (WTO) established and its IP Agreement (TRIPS) comes in force
- 1996 WTO-WIPO Cooperation Agreement signed
- 1998 EU Biotechnology Directive under the European Patent Convention
- 2011 America Invents Act

It is through WTO's TRIPs that IP standards were globalised. Monsanto and other TNCs, collectively with industry and business associations from both Europe and Japan, have been actively part of the WTO trade talks lobbying their governments.

The TRIPS Agreement requires member countries to make patents available for any inventions, whether products or processes, in all fields of technology without discrimination, subject to the normal tests of novelty, inventiveness and industrial applicability. It also requires that patents be available and patent rights enjoyable without discrimination as to the place of invention and whether products are imported or locally produced. There are four categories of patents on life-forms and living processes covered by TRIPS:

1. Naturally occurring micro-organisms, cell lines, genomes and genes isolated from natural organisms.
2. Transgenic techniques and constructs, and the resultant transgenic organisms.
3. Processes producing extracts of plants for medical or industrial/agricultural purposes.
4. Nuclear transplant cloning and other *in vitro* reproductive technologies.

But, there are three permissible exceptions to the basic rule on patentability. One is for inventions contrary to *ordre public* or morality; this explicitly includes inventions dangerous to human, animal or plant life or health or seriously prejudicial to the environment. The use of this exception is subject to the condition that the commercial exploitation of the invention must also be prevented and this prevention must be necessary for the protection of *ordre public* or morality (Article 27.2).

The second exception is that Members may exclude from patentability, diagnostic, therapeutic and surgical methods for the treatment of humans or animals (Article 27.3(a)).

The third is that Members may exclude plants and animals other than micro-organisms and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes. However, any country excluding plant varieties from patent protection must

provide an effective *sui generis* system of protection. Moreover, the whole provision is subject to review four years after entry into force of the Agreement (Article 27.3(b)).

This review is still to be. And many countries in the 'South' have not made use of its flexibilities that they could have legitimately used as member countries. Also, the option to have an effective *sui generis* has been reduced to compliance with the other IP Convention – UPOV.

Another provision of TRIPS (Article 39.3) has particular relevance to agricultural chemicals, such as pesticides, insecticides, etc. It requires members of WTO to give mandatory protection to undisclosed information and data submitted to governments or government agencies. Proprietary data is generated by manufacturers while testing new pesticides and is submitted to regulators in support of claims for the efficacy of the product. The data is relied on by the regulators to give permission to the manufacturer to make and sell the product in the market. Increasing the monopoly period enjoyed by pesticide manufacturers over test data used to support claims for the efficacy of their products to five years or more has the effect of extending the patent period.

Property rights over creations of the mind have been made the norm ever since and non-IPRs are being regarded as the exceptions. How patent/PVP works is that the applicant seeks and gets an official license from the government to enjoy economic rights to the exclusion of others, for a period of time over the commercial aspects, i.e. the IPR-holder can prevent others from making, selling, exporting, etc. the product. This gives the IP-holder a monopoly over the product for the term of the patent, which is a minimum of 20 years and extendable. The IPR-protected 'invention' can only be used with the permission of the IPR-holder and upon payment.

The supposed logic is that since the person who got the idea gets legal protection against others using it, it would spur innovation. But what if the idea itself is stolen? — as in the case of agribusiness companies using farmers' know-how of seeds to develop new varieties, getting IPRs on them, claiming the new variety as company property and selling it back to those very people who thought of it first! IPRs are of various kinds, but those increasingly used in industrial farming and pharmaceuticals serve to essentially protect (business) investors rather than the real inventors: the small farmers, traditional healers, etc.

As a person from Asia, I can at least say with some certainty that the kind of IPR system in the world today is certainly not something that people in the region or our food growing communities asked for. Our histories bear witness to the fact that we have a long tradition of sharing. But our governments and we ourselves are forgetting that. So we carry with us our colonial past into a (neo) colonial present.

Laws made in earlier times, for example, India's Patent Act first made in the colonial era (1856) is now being re-fashioned to suit a Western-styled IP system. Unfortunately, this time round for the (farmer) freedom struggles, our own governments and our companies are against our own people! The developments in IP are only mirroring the world and the world market. This is a comment on capitalism and controls in a 'free' trade era. IP is a means for that control. Theories and philosophies of individual freedom venerate the idea of owning (to the exclusion of others), everything!

To fully understand the extent of the problem, we have to situate intellectual property rights in a much wider matrix. One has to situate the IP system in global capitalism. TNCs play an increasingly large role in the world and have been responsible for numerous human rights abuses. Although the legal and moral environment surrounding the actions of governments is reasonably well developed, that surrounding multinational companies is both controversial and ill-defined. Their conduct in the most basic of areas—seed, food, fodder— particularly needs to rein in.

The impact of the imposition of IPRs in relation to human rights

Human rights are understood as basic rights and freedoms that all people are entitled to regardless of nationality, sex, national or ethnic origin, race, religion, language, or other status, simply by virtue of being human, all people having equal rights. This puts a corresponding duty on states and governmental agencies to not only themselves refrain from doing certain acts but also to contain the private sector from doing so.

Therefore if IPRs come in the way of the enjoyment and guarantee of these rights, then there is a problem. This is manifested in many ways:

- patented medicines – health concerns, pandemics
- copyrights – digital use, photocopying books, education budgets
- technology transfers – now in the context of climate change
- economic, social and cultural rights – continuance of communities
- plant variety protection and patents on agricultural technologies
- economic development – against self-determination

The imposition of IPRs is exactly that – an imposition. They have been imposed! And there is little empirical evidence to show that R&D has increased due to IP. Yet there is much more strengthening of IP to invite more FDI and make the work environment more facilitative for investors and private enterprise. Yet corporations have made a bee-line to, for instance, Asia even though the IPR regime is not up to their standards even now. This has implications among other things for farmers' freedoms, women as knowledge keepers and food sovereignty.

Human rights law confers broad responsibilities on governments to protect against violations. A human rights framework must impose conditions on the recognition of IPRs. There is still much debate for instance on Article 27 (2) of the UDHR in the context of IP. But WIPO and proponents of IP would like to believe that even IP itself is a human right! The 'Development Agenda' of WIPO is an attempt to cloak its IP work with a more human appearance while it goes on with its business of 'rights'.

TRIPS and UPOV in the area of agriculture

UPOV predates TRIPS, yet it came into currency in the 'developing' world much after the 1995 WTO era began. Countries that did not want to provide for patents on plants were showed UPOV as a means to provide TRIPS-compliant IP protection.

TRIPS Article 27.3(b)

Members may also exclude from patentability:

plants and animals other than microorganisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes.

However, members shall provide for the protection of plant varieties

- 1 *either by patents*
- 2 *or by an effective sui generis system*
- 3 *or by any combination thereof*

UPOV is being pushed as the 'effective sui generis system' for the protection of plant varieties if a WTO member country does not provide for patents on plants. It is one of several international conventions and treaties that operate under the umbrella of the WIPO. It is the TNCs and corporate breeders that are behind the limited interpretation of the TRIPS exemption to patents.

Plant variety protection (PVP) provided by UPOV is a type of intellectual property (IP). Unlike what the term suggests, it is neither about plant protection nor about conservation of plants. PVP laws grant plant breeder rights (PBRs) to breeders for the (new, distinct, uniform and stable) varieties that they develop. PVP gives economic rights to plant breeders vis-à-vis their crop varieties. The 1991-revised UPOV strengthens the IPRs of seed developers. UPOV 1991 extends the term of plant breeders' intellectual property protection for new varieties from 15 years to 20 years. It also prohibits farmers from saving seeds, although there is an optional clause that allows member countries to exempt farmers from this restriction under certain conditions. For example, the clause says the restrictions can be waived if member countries implement other mechanisms that provide equivalent protection for the 'legitimate interests of the breeder'.

UPOV as the ready-made solution to implement WTO TRIPs explains what is happening in countries the world in name of TRIPs-compliance. A wave of new generation IPRs and seed laws has emerged across the world. This is not happening sans the complicity of the corporations. These put new restrictions on the freedoms of both small farmers and genuine research.

The 'challenge(s)'

IPRs on life can be challenged on several grounds including the following:

- All involve biological processes not under the direct control of the scientist. They cannot be regarded as inventions, but expropriations from life.
- The hit or miss technologies associated with many of the 'inventions' are inherently hazardous to health and biodiversity.
- There is no scientific basis to support the patenting of genes and genomes, which are discoveries at best.
- A range of patents is unethical; patents destroy livelihoods, contravene basic human rights and dignity, compromise healthcare, impede medical and scientific research, create excessive suffering in animals, or are otherwise contrary to public order and morality.
- Many patents involve acts of plagiarism of indigenous knowledge and biopiracy of plants (and animals) bred and used by local communities for millennia.

New emerging threats in relation to IPRs

- Free Trade Agreements and Bilateral Trade and Investment Treaties – For the TNCs, some things are moving too slowly at the WTO; some states are unilaterally going down this route.
- Memoranda of Understanding (MoU) and public-private partnerships (PPP) that are being signed between governments and these private corporations, which have norm-setting quality.
- National Agricultural Research and Extension Systems (NARES) and these wanting to 'incentivise' public breeders and develop their own IP portfolios.

- IARCs themselves changing their IPR policies to be able to service their new private partners instead of the world's farming communities.
- Seed legislation is undergoing change in several parts of Asia and the world under pressure from international organisations and TNCs.
- The distortion of the *Plant Treaty* - Farmers' rights provisions are in there but not before the Treaty gives the accessors IPRs on products they develop from material accessed from the multilateral system.
- WIPO being the forum for a traditional knowledge treaty and pushing for a World IP court.
- Anti-Counterfeiting Trade Agreement and increasing IP policing that also uses state machinery.
- Human and animal health at risk till IP issues are sorted out.
- Development and innovation policies going down the IPR-route

Conclusion

Our way forward on this is ... putting the real knowledge-holders centre-stage. We urgently need both the theoretical defence and practical counters. Human rights are classified by some into categories depending on the nature of threats and the political economy, for example:

- civil and political rights
- economic, social and cultural rights
- the right to peace and the environment

Perhaps the time is ripe to move on to a new generation of human rights, that which reinforces the old but also takes forward the idea of food sovereignty. Most of all we need a framework by which the idea of responsibility is evenly balanced with that of rights. This may entail:

- the roll-back of the IP system
- more space for truly *sui generis* ways
- the resurrection of the *public* sector
- respecting informal knowledge as is, and
- no more privatisation of life and related biological know-how.

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APPENDIX 5.3

WITNESS STATEMENT

GMO SOYBEAN EXPANSION IN LATIN AMERICA

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Explain the magnitude of RoundUp Ready (RR) soybean cultivation in Latin America

By 2010, soybean crops amounted to 148 million hectares in 29 countries. Ninety eight per cent of global crops were concentrated in just eight countries: US, Brazil, Argentina, India, Canada, China, Paraguay and Pakistan. According to available data, Argentina and Brazil control the GMO market of RR soybean, maize and cotton in Latin America.

Countries	Million ha planted	GMO Crop
Brazil	25.4	Soybean, cotton, maize
Argentina	22.9	Soybean, cotton, maize
Paraguay	2.6	Soybean
Uruguay	1.1	Soybean, maize
Bolivia	0.09	Soybean
Chile	<0.05	Maize, soybean, canola
Colombia	<0.05	Cotton

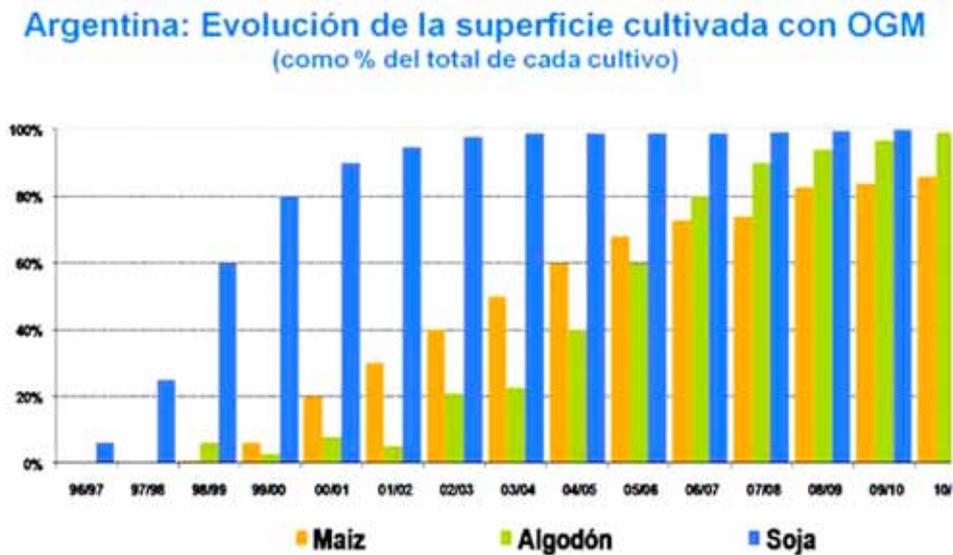
How were RR soybean crops introduced in Latin America? Which strategy was used by Monsanto?

Monsanto searched for a country in Latin America to exert influence and selected Argentina, which set no obstacles for the introduction of RR soybean. It has been recently learned that approvals were given without translating from English to Spanish the company research data. Once introduced to Argentina, RR soybean was illegally smuggled into Brazil, then to Paraguay and Bolivia.

Monsanto put direct and indirect pressure on governments to accept the release of GMO soybean seeds. The company organized pseudoscientific events to show GMOs' 'good credentials'. Argentina's was supported by state agencies, universities, media and politicians. Many Monsanto ads appeared in newspapers, radio, TV and programs related to agriculture. Monsanto gave research funds to universities, including donations for labs. To ease introduction of RR soybean crops, Monsanto chose not to ask for breeders' rights on the GMO soybean seeds. Later, when farmers could no longer purchase conventional soybean seeds, Monsanto tried to make them pay royalties for the use of GMO soybeans. However, farmers, agricultural organizations such as the Argentinian Agrarian Federation and the Argentinian government firmly opposed this plan.

Which corporations own the RR soybean technology?

Syngenta, Don Mario, and Monsanto hold the soybean breeders' rights. Monsanto owns the herbicide RoundUp [active ingredient: glyphosate]. Only Monsanto sells the herbicide under the name of Roundup. Glyphosate is also sold by other companies (see below).



[Argentina: GMO crop area over time (as per cent of the total area cultivated for each crop) for maize, cotton and soybean]

Commercial brands of glyphosate

Name	Manufacturer	Name	Manufacturer
Credit	Nufarm	Glifosato Dupont	Dupont
Deobit	Nufarm	Glifosato 48 ASP	Agroservices pampeanos
Escoba amonio	Ciagro	Glifosato zamba	Nidera
Escoba Ciagro	Ciagro	Panzer	Dow Agrosciences
Faena	Monsanto	Panzer Gold	Dow Agrosciences
Fosato	Monsanto	Potenza	Agroservices pampeanos
Garante	Chemiplant	Total	Chemiplant
Lif	Icona	Toital Super	Chemiplant
Glifoplus zamba	Nidera	Xaxon	Chemiplant
Glifos	Chemiplant	YPF Glifosato	Repsol YPF

What is soybean used for? For instance feed, fodder, other products?

Soybean is exported as oil and also as soybean flour. In Argentina it is used as feed, cooking oil; and as lecithin it is used in cookies, chocolates, pastry and so forth.

What are the health impacts of RR soybean?

Direct impacts

Neither conventional soybean nor GMO soybean are fit for human beings. Soymilk and soybean flour are not fit as food for children aged under 10. The Argentinian Paediatrics Association demanded a ban on consumption of soybeans and soybean products because they contain substances which block the intestine's absorption of Ca, Fe and other minerals, and they alter the levels of minerals in blood and bones. Flavenoid substances present in soybeans disrupt hormonal homeostasis as they behave as oestrogens breaking the delicate hormonal balance in children. Thus, first menstruation (menarche) can appear in children aged 5-6 years and gynecobstetric cancer may rise in people aged 25-30. Males may develop gynecomastias: in Malabrigo, Santa Fe province, an 11 year old boy had a bilateral mastectomy.

Russian research on RR soybean as food

Dr. Irina Ermakova, a Russian scientist, found that the mortality rate of rat offspring fed with GM soybean flour was 56 per cent whereas the mortality rate of offspring of the control group fed with conventional soybean was nine per cent. Surviving offspring of GM-fed rats had significantly lower body weight compared to control groups. This raises serious concerns for possible health risks to humans.

Food Standards Agency (FSA) trial on GMO food

The only published trial of GMO foods in humans was carried out by the University of Newcastle, commissioned by FSA, and published in 2004. The research found that in three of seven samples, gut bacteria had taken up the inserted transgenes in the GM soya, indicating that horizontal gene transfer occurs in the small intestine. It found that pieces of GMO DNA had been horizontally transferred from GMO food to human gut bacteria of some volunteers, raising potential human health questions.

When monogastric animals eat soybean grain or soybean flour without warming it, the results are pancreatic hypertrophy and growth inhibition. This situation is likely due to imbalances between methionine and cysteine in the pancreas. Soybean-based foods may present risks for children: *Soybean drinks must be avoided in small children. They are no substitute for milk and there are documented cases of severe malnutrition and rickets due to the use of these juices as a milk substitute.*

Finally, GMOs may produce different kinds of allergens in organisms not prepared to consume proteins that are different from those present in our usual food.

How can these disruptions be detected and identified in the absence of clear, sensitive and precise performance benchmarks?

It is possible that disruption cases in human metabolism due to GMOs be treated in the same way that pesticide poisoning cases are treated, focusing attention on visible signs rather than the causes. The lack of performance benchmarks means there are no real possibilities of detection.

Indirect impacts

GMO monocultures of soybean, cotton and maize demand increasing amounts of pesticides to control insects and weeds when the biological balance has been disrupted and insects and weeds become

resistant to pesticides. Pesticides such as endosulfan, chlorpyrifos and glyphosate generate severe health impacts on users and people who consume treated food or live in proximity of pesticide spray.

Impacts of RR soybean on the environment

GMO crops and the associated pesticides can affect plants that are not genetically modified. Gene drift is one example. Cross-pollination or horizontal gene transfer can occur in maize and canola (not in soybean). Genes from GMO maize can travel through pollen to plants of the same family, including wild relatives, altering their components and they can cross with wild relatives. The result can be the creation of strong weeds difficult to eradicate.

New research has shown that pollen from GMO plants can travel further than one kilometre and thus cross with other plants. The danger is that new plants may develop which cannot be controlled by humans or by natural cycles. Further new research shows that the toxic gene extracted from *Bt* produces a more aggressive toxin than the natural toxin. This GMO toxin affects a wider variety of insects than the natural *Bt*.

Impacts on other crops

Pollen from GMO plants can reach other plants and modify their structure and food quality. This can severely affect crops grown using agroecological methods. These products could not be sold as organic because they would be out of compliance with current regulations. Further, the *Bt* toxin inserted in *Bt* maize plants could have a negative impact on organic agriculture by accelerating *Bt* resistance in *Lepidoptera* larvae.

Consequently, in transitional stages from conventional agriculture to organic agriculture, use of *Bt* as a natural insecticide would become useless. Current regulations for organic products stipulate that GMO presence cannot be greater than one per cent. This accepted presence accounts for spontaneous pollination plus possible gene contamination during storage and transportation. But this margin will be surpassed due to the expansion of GMO crops. Organic certifiers from the United States have denounced that there is wide GMO pollution in soybean, maize and canola whose GMO crops are planted all over the U.S. 1

What are the impacts of RR soybeans on biodiversity?

Alleged reduction in insecticide and herbicide use

Agrochemical companies and Argentinian scientists argue that GMO crops are associated with reduced pesticide use, resulting in benefits for producers (lower production cost), for workers (fewer health risks due to pesticide handling) and environment (reduction in contamination rates). In the case of RR soybean we can find a change in the type and formulation of herbicides used.

However, there is no effective reduction in total pesticide use. Instead of using more than 60 kinds of chemical substances in pre-planting, pre-emergence and post emergence of the crop cycle, now there are only two substances: 2,4-D and glyphosate are the only tools used for weed control in all stages to control for weeds. We can see a constant increase in the number of applications and doses of pesticides. Currently every year around 270 million litres of glyphosate are used in Argentina, with two and three applications for RR soybean, meaning eight and 14 litres every hectare.

Why are they using this strategy?

Although glyphosate is a wide-spectre herbicide that can eliminate dicotyledonous (broad-leaf) and monocotyledonous (narrow-leaf) plants, some weeds have become resistant to recommended doses. This leads to two problems that have the same ecological root:

1. Emergence of new weeds – plants tolerant to the herbicide – that take the space left by the weeds killed by the herbicide. This occurs according to the ecological niche principle.
2. Emergence of genetic resistance, which can be transferred to new plant generations. This is according to the resistance principle.

For this reason several plants that were not previously a problem have become established in the Pampa region's soybean zone and now need special control. Further, some plants have become more difficult to control because of new structural traits. This genetic resistance is inherited by the next generations. The wide-spread adoption of direct seeding, adoption of soybean varieties resistant to glyphosate, expansion of soybean monocultures and the substitution of traditional herbicides by glyphosate have exerted a selection pressure on weed species relatively tolerant to glyphosate. In some cases this has generated changes in community structure in a way that weeds that were previously unnoticed are now abundant. Currently in Argentina there are nine species of weeds suspected of being tolerant to standard doses of glyphosate in the soybean production zone. Because of the resistance gained by transgenesis, the so-called 'foster soybean' (soya guacha), which grows spontaneously, has become a weed that must be controlled with stronger and ever more dangerous pesticides.

These examples make it possible to state that the strategies for insect and weed control based on GMO use have not produced the expected results.

What are the social impacts of RR soybean, including financial impacts?

RR soybean seed is more expensive, but it is interesting to highlight that the adoption of a technological package based on the increasing use of inputs, such as fertilizers, herbicides and insecticides is becoming more expensive each time. This generates a process of intensification of financial capital in order to produce, which in turn means a process of financial concentration.

Impact on actors

Bio-technology has a social impact. RR soybean, as a strategy for weed control based on pesticide application, can decrease demand for labour in: preparation of seed beds, pesticide application, mechanic control of weeds and hand work to control more resistant weeds. The decrease in labour can be seen in permanent and seasonal labour. This trend is hidden by the increase in cultivated areas. The same level of labour is now employed in a much greater rural area. In the case of family labour, although they are not expelled from the land, with the decline in labour demand they switch to low productivity activities. Outsourcing of tasks such as tillage with direct seeding machinery, application of fertilizers and herbicides means a decrease in demand for labour. These more capital-intensive strategies transfer income to other sectors of the productive chain.

What are the impacts of RR soybean for peasants livelihood? What are the impacts on seed IPRs?

There is no tradition of soybean consumption in Argentina. Meat, vegetables, grains, corn, beans and lentils were traditional foods. Soybeans were never eaten by any social group in the country. Trying to introduce soybean as food has met at least two obstacles: a) change in food habits; and b) lack of know-how in preparing foods made with soybeans. In Argentina, as has happened before, when some foods are introduced that are not part of the normal family diet, people throw them away or use them for animal feed. Cooking soybeans requires a higher amount of energy and the current economic conditions make this impossible for wide sectors of the population. Then there is a paradox: every year there is an increase in cultivated area, there are record harvests, we feed Asian and European pigs and cows, but Argentina must import lentils from Canada and dairy products from Uruguay.

Soybean crops have replaced traditional crops, which were dedicated to cattle-raising, vegetables and so forth. These products are becoming scarcer and the most vulnerable sectors of population can no longer afford them. It is possible to produce food in agro-ecological systems which are environmentally sustainable and promote people's participation and organisation. It is possible to produce healthy food by developing healthy agroecosystems.

Can you mention a case illustrating impact of RR soybean in health, or livelihood of rural producers?

There are many stories about people being poisoned by glyphosate spraying. Beekeepers have lost their beehives from pesticides used in RR soybean crops. There are real stories (e.g. Sofia Gatica and Laura Mazzitelly) of families severely affected by GMOs and the associated pesticides.

Do you want to add something?

RR soybean and its associated pesticides have negatively affected the four pillars of food sovereignty:

- Food production, because soybean replaces fruits, wheat, vegetables and meat production
- Food quality, because food is polluted by pesticides and GMOs
- Access to food, due to the economic impact caused by the soybean expansion
- Sustained access to food, because soybean replaces fruits, vegetables and other food crops, thus endangering food security and sovereignty.

APPENDIX 5.4

WITNESS STATEMENT

THE POISONING OF SILVINO TALAVERA

Pesticides used in soybean farms in Itapúa, Paraguay

***Petrona Villasboa de Talavera,
Pirapey, Itapúa Department, Paraguay. Housewife.
Mother of Silvino Talavera***

Could you explain what happened to your son Silvino?

On January 2, 2003, in Edelira town, my son Silvino Talavera and his cousin Gabriel Villasboa rode their bikes to buy some meat and noodles for lunch. When they came back from shopping, Herman Schendler, a neighbour whose farm is located about 35 meters from my home and my brother Angel Villasboa's home, was spraying highly dangerous pesticides with a tractor. The toxicity of these pesticides was proved afterwards. This activity was taking place by the road on which we walk to get home. My son Silvino and the foods he bought for lunch were sprayed with pesticides, but his cousin was not, because he waited until the tractor left the place to continue.

When Silvino got home, he gave my daughter Sofia the meat and noodles to fix lunch. That same afternoon, at about 3 pm we were all having stomach-ache and were vomiting. This was happening to my family and also to my nephew Isabelino Villasboa who had lunch with us. Two days later, my children and my nephew were feeling better, until Monday January 6, at about 12.30 pm when my neighbour Freddy Launstentslager began spraying his soybean crops. My home is located about 15 meters from those crops. There was a very strong wind, which made the pesticide drift go inside our homes.

At midnight my children Sofia and Silvino started feeling very sick, their body started to look grey and they presented paralysis. At 8 o'clock in the morning of January 7, we took both of them to Edelira's Health Center. A medical doctor told us that they probably were suffering from poisoning and recommended us to go to another center with better medical equipment. We got help with transportation to go to SOS Hohenau Village at 11.30 in the morning. There we were informed that a poisoning substance had poisoned my children. They directed us to go to the Incarnation Health Center. Silvino died there the same day, on the afternoon of January 7, 2003 at three o'clock. My daughter Sofia was admitted at the hospital with reserved prognostic.

What was the cause of Silvino's death?

According to the death certificate issued by the Health and Social Welfare Secretary, he died due to organophosphorus pesticide poisoning. He was admitted to the hospital in very bad shape, dehydrated, with 39°C fever, tachycardia and marble skin and he died from a heart-respiratory failure. One month after his death when an autopsy was done, the presence of glyphosate, carbamates and phenol was detected. These findings were also present in my other children who also were poisoned with pesticides.

Who is responsible for pesticide use that caused Silvino's death?

HERMAN SCHLENDER and FREDY LAUNSTENSLAGER, two soybean producers of Brazilian and German origin are responsible for Silvino's death.

Which corporation manufactures the pesticides that caused your son's death?

Monsanto manufactures glyphosate, one of the pesticides that was found in the autopsy. Carbamates, found in the blood and tissue analysis, were not in the farmers' books.

Were these corporations punished by this tragedy?

Those who were personally involved were judged and received a sentence, but they never fulfilled the sentence. Nobody else was judged.

What other impacts were there?

We lost our food security and livelihood: death of our pets and farm animals, and loss of staple foods: fruits, cassava. We are affected by soil pollution, air pollution and water resources pollution. We faced problems in our community because neighbours stood by the soybean producers due to their huge economic power and influence.

What other members of your family were affected by pesticides?

In addition to Silvino and Sofia Talavera, also my sons Justiniano and Juan Ignacio Talavera, my husband Juan Talavera and my nephews Lorenzo, Isabelino and Tomas Villasboa were affected by the pesticides.

Can you tell us how often these pesticides (glyphosate or Roundup) are used in your neighbourhood?

From September until January or February every 15 or 22 days soybean producers spray their soybean crops with pesticides. After that, they rotate their crops with wheat. People living in our community do not know the names and the effects of the chemical substances used by the soybean farmers.

What is the crop that uses glyphosate?

Glyphosate is used on soybean crops.

Do you have news of other people in your community being affected by this pesticide?

Yes, there are several more families affected in this community.

Do you want to state anything else when facing this jury?

I would like to state that I want Silvino's case to be known so that this does not happen to other children or to peasant families anywhere in the world. Big producers must respect the law regarding all precautionary measures, which must be upheld when spraying. I also want to state that manufacturing companies must be accountable for the consequences of the application of pesticides, such as the repeated intoxication that resulted in Silvino's death. We, the families who suffered this, received no financial help or help of any kind at all. On the contrary, we had to endure being mistreated by people in our community and also being abused by the soybean farmers' association.

APPENDIX 5.5

WITNESS STATEMENT

THE KILLING OF THE BRAZILIAN FARM WORKER

Celso Ribeiro Barbosa

Peasant farmer

Assentamento Sepe Tiaraju, City of Santa Tereza do Oeste

On March 14, 2006 around 600 families, around 2,400 people—men, women and children from Via Campesina—occupied Syngenta's property in Santa Tereza de Oeste, near the city of Cascavel in Western Paraná, Brazil. The Terra Livre Camp Site in Santa Tereza do Oeste, a small city next to Lindoeste, was born. The occupation of the multinational corporation, Syngenta, occurred during a COP of the Convention on Biological Diversity, in Curitiba, Paraná, Brazil, 13-30 March 2006.

Syngenta had been illegally testing genetically modified soybean and corn in its property, located 6 km from Iguazu National park, a UNESCO World Heritage site. Under Brazil's law all activities within 10 km of a conservation area must be in accordance with the Park's management plan, which prohibited the planting of GMO crops within the buffer zone. Syngenta also was endangering the animal and vegetal biodiversity by using toxic chemicals, such as herbicides, fungicides, insecticides and others. Syngenta was committing an environmental crime not only against Brazil, but against the whole world. After all, this was Iguazú National Park. On 16 March 2006, the Terra Livre Camp received an international delegation from Via Campesina, and a ceremony in support of the camp took place with many politicians and authorities from Paraná State.

The Terra Livre Camp had installed canvas tents in a communal shelter so that people could sleep, eat and attend their families' needs until they could build their own shelters. Seventy-five families stayed in the camp and planted organic crops. The camp had several community achievements, like land areas where families could plant their own food and experiment with 'crioulas' seeds. Some of the produced food was shared with another close camp nearby.

The families in Terra Livre camp produced almost everything for their own consumption. They grew organic food including manioc, rice, cucumber, corn, beans, corn, watermelon, okra, chayote, pumpkin, banana, peanut and sunflower. Also, they used green fertilizer like grey mucuna, dwarf mucuna, pig beans, 'crotalaria', fava and more. The act of saving the seeds reflected the strong peasant culture of the Terra Livre community.

Via Campesina organized the 5th Journey of AgroEcology at the Convention Center in Cascavel, from July 11 - 14, 2006, that ended in the Terra Livre Camp. Here, political figures participated and Via Campesina explained the reason of the occupation and what they proposed to do. During this time, 5,000 native tree seedlings of the region were planted. The peasants distributed crioulas seed, among them beans, corn, sunflower, pig beans, mucuna, crotalaria, corn for all the people in the event.

The occupation of Syngenta's property was not just for land, but was the occupation of an unproductive estate. This occupation had special characteristics, for example the social aspect represented the class

struggle of the poor masses who hold as a principle protection of the environment, fauna, flora, crioulas seeds, native animals race, organic production and production of food destined for the internal market.

A rich minority owns the means of production, which is oriented towards the external market with profits as the only target. They dominate the mass media and use it to advertise their model of production, and to defame their enemies, who are the poor people. Between these two classes there is a big divergence of ideas.

Using Syngenta's facilities, the camped families built a vegetable garden inside two greenhouses that before were used to experiment with transgenic soybean. After being transformed into a vegetable garden, the structure guaranteed the production of vegetables to the Terra Livre camp school that had around 50 children. The camp built an aviary with the capacity for 600 birds. The camp reserved an area for cattle and pigs to increase the self-sufficiency of the families.

The camp established an itinerant Terra Livre School, which ran from first to fourth grade. The community built the school to ensure that their kids studied nearby and did not dislocate to the city, where they felt discriminated by the others because they are homeless and live in a Peasants' Camp. The educators live in the camp and know the reality of the students. The model of education is based on the method of Paulo Freire.

The Camp organized a 20-day training course for militants; around 60 young people from other camps came to participate. As a result of this course, many people are working as educators, in theatre groups, and taking professional courses, university courses, developing political ideas and helping inside the organizations they live in.

The Camp was then evicted. The camp stayed in front of Syngenta Company for about 120 days. After the peasants left Syngenta's experimental site an official from Syngenta called me, Celso Barbosa, several times to request that Via Campesina not occupy its site anymore and offered me money as an incentive. I refused Syngenta's offers.

In March, 2007 Syngenta's area was reoccupied peacefully. The people in the Camp stayed inside the area for several months until July, 2007. Then, there was another eviction and the camp settled next to Syngenta in the Olga Benário settlement. Constantly the families from this settlement were threatened by members of an armed militia, represented by the security company NF, which had done many violent evictions in the region. Besides the threats, the members of these militias invaded the settlement and shot towards the families' houses.

This militia also had a relationship with the president of the Rural Association of the West of Paraná, Alessandro Meneguel, who had made before several death threats to members of Via Campesina, including through a local newspaper. In the same month the 6th AgroEcology Journey took place and ended in the Olga Benário Settlement, where they held a community lunch and closing ceremony for the Journey. In this period, Syngenta was the owner of the property previously occupied by the landless peasants, and everything that was built by the families was destroyed. Native trees were destroyed, and the company applied poison in all the areas and planted oats.

Syngenta hired a security company to 'protect' its property, which was watched day and night by 10 people/security guards. On 21 October 2007, the area was re-occupied by members of Via Campesina at about 6 am in the morning, taking the guards by surprise. One of the guards shouted and threatened the occupiers *We are going to come back and kill you all ...*

The militants of Via Campesina thought that the guards would return at night to scare them, but they came back around 1pm. It was raining a lot. They arrived with an armed militia of about 50 people and did not arrive to talk, but arrived shooting everywhere and nobody had time to escape. At this moment there were 13 people from Via Campesina in the watchtower and one more in a car parked nearby. The shots caught the people in the watchtower by surprise and they tried to escape through the window and the door, and the ones who could not escape hid themselves in the bathroom.

The militia's attack lasted 10 minutes and resulted in two dead people (one member of Via Campesina and another from the militia) and four injured, one of them in a serious state because she was shot in the eyes. This was Izabel, a member of Via Campesina. Another member was shot in the foot, another in the belly, and another in the genital parts. During the attack the car was shot at several times and the occupier was dragged out and punched, kicked and hit with the butt of a pistol. The majority of the victims were taken to the Regional Hospital of Cascavel City, and one of them died in the hospital: Valmir Motta de Oliveira, known as Keno, a leader of Via Campesina. Others victims were taken to the Nossa Senhora Salete Hospital in Cascavel City.

Keno's funeral took place in the Primeiro de Agosto Camp attended by 1.500 people, with the presence of politicians, social movement leaders, peasants of Santa Tereza do Oeste and members of Via Campesina. We said farewell to Keno, in the same place of the conflict and everybody went by bus, truck, cars and motorcycles to the cemetery of Guarujá in Cascavel. Keno was 34 years old; he was married and a father of three kids. He was a militant in both the Landless Peasant Movement (MST) and Via Campesina for 20 years and worked in the western region of Paraná State.

On 28 October 2007 there was an Ecumenical Act in Terra Livre Camp in honour of Keno, with around 1,000 people from different camps, social movements, and members of Via Campesina. A month later, another Ecumenical Act took place to honour this comrade that died fighting for our struggle.

A police investigation into the incident ordered by the governor of Paraná lasted 30 days. At a press conference the police chief managing the case announced that the security company NF was responsible for the two deaths and the injured people. The police chief sent the report of the investigation to the judge and to a public prosecutor. A few days later, the Public Ministry accused eight militants from Via Campesina (Celso, Celinha, Izabel, Alcides, Barreto, Gilmar, Vanderlei and Joce), holding them responsible for what happened, including the deaths. There is an on-going investigation, which will go to the jury. No charges were brought against Syngenta.

On 7 March 2008, Rudolf Bärffuss, Switzerland's ambassador to Brazil, met with Keno's widow, Iris Oliveira. Bärffuss apologized on Switzerland's behalf for the murder on Syngenta's property. These acts were followed by a public outcry and pressure to make right the wrongs done to the peasant people.

APPENDIX 5.6

WITNESS STATEMENT

POISONING OF THE ARCTIC

Evidence presented by Kathryn Gilje, PANNA, for:

Vi Waghiji

Yupik, Tribal Member of the Native Village of Savoonga on St. Lawrence Island

Environmental Health and Justice Program Director

Alaska Community Action on Toxics (ACAT), Alaska, USA

I am a Yupik Eskimo, born in Savoonga on St. Lawrence Island, Alaska, and also a wife and mother of four boys and a grandmother. ACAT is a civil society non-profit, non-governmental environmental health and justice organization that works with communities to protect health.

Our St. Lawrence Island villages are Arctic communities located in the northern Bering Sea off the coast of Alaska and the Chukotkan Peninsula of Russia. Our people have relied on the land and ocean for many generations for our spiritual and physical sustenance. In our Arctic communities, traditional foods are fundamental to the health and well-being of our Yupik People, our traditional cultures, and subsistence way of life which have been passed down for many generations. We rely on our traditional foods including greens, berries, fish, reindeer, walrus, seals and whale to sustain us. Our traditional foods are indispensable for cultural unity, social and economic means.

Within the community, fishing, hunting and food sharing are essential elements of the social well-being of our entire community. Traditional foods are key to our cultural values, which ensure that our people are not only a central part of the community, but provide for everyday use as well as in times of need. The health and well-being of our Arctic indigenous peoples is connected intimately to the climate, wildlife, and the Arctic ecosystem spiritually, culturally and traditionally. The role of subsistence food is essential to the identity of our culture. The sharing of traditional foods plays a role in the maintenance of our community and relationships. Traditional foods are nutritionally, culturally and economically important for the survival and perpetuation of Arctic communities. With respect to the high cost of living in Arctic communities, traditional foods promote health and integrated well-being for individuals as well as communities that cannot afford over-priced market foods that are flown into our rural communities. Canned and processed foods are not economically viable or healthy for us. Often, subsistence food substitutes may not be locally or feasibly available, and there is no way to ensure that they would be sufficiently nutritious or affordable. Often, there are no other options or are even considered in most communities that tie subsistence foods with their survival as a people and culture. Traditional foods are the fundamental components of our Arctic cultures, but now also the major source of exposure to pesticides and other industrial chemicals.

Our traditional foods are highly contaminated with chemicals that are transported through the wind and ocean currents into the Arctic from more southerly latitudes throughout the hemisphere. The Arctic has become a hemispheric sink for these pesticides and other industrial chemicals that now contaminate our lands, wildlife and the indigenous peoples of the north. The chemicals are trapped in the cold environment and concentrate in the bodies of Arctic wildlife and people. These pesticides

are not manufactured in the Arctic, yet they are arriving at our doorsteps. Most of these pesticides are carried through the wind and ocean currents from the areas where they are manufactured or used into the Arctic. Arctic indigenous peoples suffer levels of contamination of these POPs in blood and breast milk that are among the highest of any population on earth, even though these chemicals have never been produced in the Arctic. These pesticides and other industrial chemicals threaten the health and survival of our indigenous peoples of the Arctic. Hazardous waste sites left by the military since the Cold War are also a source of continuing contamination of the Arctic, because some of these pesticides were used and disposed in the Arctic by the U.S. military.

We now know that many POPs pesticides including DDT, HCB, chlordane, dieldrin, toxaphene, lindane and endosulfan are contaminating our Arctic environment, our traditional foods and our bodies. Levels of these pesticides are still rising in the Arctic although some have been banned or restricted through the Stockholm Convention on POPs. Dioxins, which are often produced as a by-product of pesticide manufacturing, also contaminate the Arctic. Currently used pesticides including chlorpyrifos are also contaminating the Arctic and found pervasively in the air, water, and fish. Other currently used pesticides that have been found through studies of the Arctic Monitoring and Assessment Programme (AMAP) include atrazine, chlorothalonil, dacthal, diazinon, dicofol, methoxychlor and trifluralin.

All of the implicated corporations manufacture or have manufactured pesticides that contaminate the Arctic. Syngenta (formerly Ciba-Geigy) introduced DDT and chlordane (Velsicol was the original manufacturer, which through mergers became Syngenta). DDT is currently manufactured for malaria vector control by the governments of India, China and North Korea. Bayer introduced endosulfan, which at present is manufactured by several other companies, including the government of India. In addition to the legacy of pesticides that are still accumulating in the Arctic, currently used pesticides that are contaminating the Arctic, include chlorpyrifos, manufactured by Dow; and atrazine, manufactured by Syngenta.

I want to share with you an example of changes happening to our cultural dynamics and adaptations from our traditional lifestyle. My sons are young men and are hunters and food gatherers. During the murre (a seabird) egg-harvesting season, my son Qaayaq climbs down steep cliffs to collect murre eggs, a dangerous feat in itself. We now know that these seabird eggs, a valued subsistence food, are contaminated with pesticides such as endosulfan. Therefore, these contaminants are more dangerous to his health and future well-being. Our teething babies are given frozen whale, walrus and seal blubber to sustain them and protect their health. Now, mothers must make a choice to continue this ancient tried and true tradition, or find another method to soothe her baby's teething. Choices are now forced on our people by the production and use of pesticides. These corporations are contaminating our bodies without our consent and threatening our very survival. We are suffering unprecedented illnesses such as reproductive problems, thyroid and heart disease, diabetes and the main cause of death in our people, cancer. The vital foods that sustained our people for many generations are now killing us.

The US government and the other signing nations made an assurance to the people *to monitor the levels of, and assess the effects of, anthropogenic pollutants in all components of the Arctic environment and take preventive and other measures directly or through competent international organizations regarding marine pollution in the Arctic irrespective of origin.* The government has an obligation and responsibility to protect its people from harmful contaminants. The Stockholm Convention on POPs explicitly acknowledges that *Arctic ecosystems and Indigenous communities are particularly at risk.* The governments and corporations of the world must protect the health and human rights of indigenous peoples. The US signed the UN Declaration on the Rights of Indigenous Peoples. Our human rights are

being violated. We have human rights to food and subsistence, health, clean air, clean water and toxic-free food. We need to protect the health and well-being of our indigenous peoples, our children and future generations who deserve to gain the cultures and traditions passed on for generations from our ancestors.

We are up against powerful multi-national corporate interests. The chemical industry is big business and profit drives their decisions. The monetary gains of the few must not drive their interests. These decisions disproportionately harm the indigenous peoples of the Arctic. I call on you to address the environmental health injustices done to my Yupik People of St. Lawrence Island and the indigenous peoples of the Arctic. The production and use of these harmful pesticides must end. The corporations are contaminating us without our consent and affecting our lands, our subsistence foods, the health and well-being of our people, our children and future generations, and our traditions and cultures. They must be held accountable and prevented from causing further harm.

Igamsiiqayugviikamsii,

Vi Waghiyi (**November 16, 2011**)

APPENDIX 5.7

WITNESS STATEMENT

NEONICOTINOID PESTICIDES AND BEE DEATHS

Philipp Mimkes, Coalition against Bayer Dangers

Germany

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Bayer managers have known the environmental risks of neonicotinoid pesticides since the early 1990s. The company downplayed risks, submitted deficient studies to authorities and viewed the massive decline of honeybees and pollinators in many parts of the world as 'collateral damage'. These actions have led to the loss of the right to livelihoods, self-determination and a safe environment.

Introduction

Bayer CropScience, a subsidiary of the German company Bayer AG, and Syngenta are the world leaders in agrochemicals. Bayer's pesticide sales amounted to 5.5 billion Euros in 2010. Since 1991, Bayer has produced imidacloprid, which belongs to the neonicotinoids class, chemically related to nicotine. Sold under the trade names 'Gaucho', 'Confidor', 'Chinook', 'Antarc' and 'Imprimo', imidacloprid is one of the most used insecticides in the world for field and horticultural crops. It is often applied as a seed-dressing, especially for maize, sunflower and canola. Bayer exports over 1,000 tonnes annually to more than 120 countries. Imidacloprid is Bayer's best-selling pesticide, with 2010 sales of €597 million.

Since patent protection for Imidacloprid expired in most countries, Bayer brought a similar neonicotinoid to the market in 2003. Sales of clothianidin (product names: 'Elado', 'Poncho') amounted to €192 million last year. The substance is mainly used for seed coating of maize and canola.

Neonicotinoids are systemic chemicals that spread from the seed throughout the plant and disrupt the nervous system of any insect on contact. The neurotoxins travel into the pollen and nectar and can poison beneficial insects such as bees. The LD₅₀ lies between 3-50 ng/bee. That means that 50 per cent of bees which consume 3-50 ng of the pesticide die. At lower, sub-lethal doses, these compounds can disorient bees; while not directly killing, those bees that cannot return to their hive will die.

Bee deaths in many parts of the world

Bees are important pollinators that play a vital role in many diverse ecosystems. Food security is highly dependent on the activity of bees and other pollinating insects.

The advent of neonicotinoids coincided with large bee-kills, first in France and later in Italy, Spain, Switzerland, Germany, Austria, Poland, England, Slovenia, Greece, Belgium, Canada, India, the USA and Brazil. Up to 70 per cent of all hives were affected. In France alone, around 90 billion bees (1.8 million colonies) died within ten years. Honey production fell by up to 60 per cent. Yields of apples, pears and rapeseed oil decreased. Populations of wild insects also fell dramatically.

The threat to bees posed by imidacloprid and clothianidin are indisputable. According to the US EPA, these active ingredients are 'highly toxic' to honeybees. The data sheet for imidacloprid published by

the German Office for Consumer Protection and Food Safety (BVL) says: *The substance is classified as dangerous for bees. It may not be applied on flowering plants; this applies also to weeds.*

Because of their high persistence, neonicotinoids can remain in the ground for several years. The half-life of clothianidin is up to five years. Thus, untreated plants, planted in fields where these pesticides were used in previous years, can absorb the substance via the roots and can be dangerous for bees. Imidacloprid is highly toxic to certain birds, bats, fish, amphibians and shrimps. It has been linked to bird eggshell-thinning, reduced egg production and reduced hatching success. The substance is acutely toxic to earthworms, highly important for soil, and can leach through soil to contaminate ground water.

Imidacloprid banned in France

In France, imidacloprid was banned as a seed dressing for sunflowers in 1999 after a third of honeybees died following its widespread use. Five years later it was banned as a treatment for sweetcorn. In 2003, the Comité Scientifique et Technique, convened by the French government, declared that the imidacloprid seed treatment is a significant risk for bees. The 108-page report ordered by the French agricultural ministry from the universities of Caen and Metz and the Institut Pasteur states: *The results of the examination on the risks of the seeds-treatment Gaucho (Imidacloprid) are alarming. The treatment of seeds by Gaucho is a significant risk to bees in several stages of life. (...) Concerning the treatment of maize-seeds by Gaucho, the results are as alarming as with sunflowers. The consumption of contaminated pollen can lead to an increased mortality of nurse-bees, which can explain the persisting bee-deaths even after the ban of the treatment on sunflowers.*

Studies showed that even doses of a few parts per billion impaired honeybee learning performance. Residues of imidacloprid in sunflower nectar and pollen were found at potentially hazardous levels that *can affect honeybees' learning abilities* and impair their memory. Individual bees exposed to sub-lethal doses decreased foraging activity and led to disorientation. Researchers concluded this *can temporarily damage the entire colony*. In 2002, a broad survey of pesticide residues in pollen conducted across France found imidacloprid in 49 per cent of samples, the most frequently found insecticide.

Approval of clothianidin

Clothianidin was launched in the US market in 2003 and the German in 2006. French authorities rejected Bayer's application to register clothianidin due to uncertainty over hazards to beneficial insects. The EPA fact sheet states: *Clothianidin is highly toxic to honeybees on an acute basis (LD50>0.0439 µg/bee). It has the potential for toxic chronic exposure to honeybees, as well as other non-target pollinators through the translocation of clothianidin residues in nectar and pollen. In honeybees, the effects of this toxic chronic exposure may include lethal and/or sub-lethal effects in the larvae and reproductive effects on the queen.* The Canadian Pest Management Regulatory Agency, PMRA, states that *Clothianidin was determined to be highly toxic to the honeybee, Apis mellifera, on an acute oral basis with a LD50 of 0.00368 µg/bee (i.e. one-tenth the level cited by the US EPA).*

German beekeepers had warned of clothianidin risks in 2006. In a letter to German authorities, Manfred Hederer, chairman of the German beekeepers' federation (DBIB), criticized Bayer's harmlessness claim indicating it was based on one-sided studies. The Canadian PMRA agreed, saying of Bayer's application: *All of the field/semi-field studies, however, were found to be deficient in design and conduct of the studies and were, therefore, considered as supplemental information only. Clothianidin may pose a risk to honeybees and other pollinators, if exposure occurs via pollen and nectar of crop plants grown from treated seeds. PMRA added: It should also be noted that Clothianidin is very persistent in soil, with high carry-over of residues to the next growing season. Clothianidin is also mobile in soil.*

Ban in Germany and Italy

In May 2008 in southern Germany, beekeepers reported that two thirds of their bees suddenly died; some beekeepers lost all hives. Wild living insects decreased likewise. The economic loss for the affected beekeepers averaged about €17,000. Tests on dead bees showed that 99 per cent were contaminated with clothianidin used as a seed-treatment on sweetcorn planted along the Rhine. The Julius Kuehn Institut, a federal agriculture research institute, stated that *Clothianidin is clearly responsible for the death of the bees*. According to the Institute, damage could not be explained by bee diseases.

The German Office for Consumer Protection and Food Safety immediately ordered suspension of approval for eight seed treatment products: Antarc (imidacloprid, produced by Bayer), Chinook (imidacloprid, Bayer), Cruiser (thiamethoxam, Syngenta), Elado (clothianidin, Bayer), Faibel (imidacloprid, Bayer), Mesurol (methiocarb, Bayer) and Poncho (clothianidin, Bayer). The ban on maize, the main application, remains in force. However, the ban for use on oilseed rape was lifted after a few months. The German environmental authority (Umweltbundesamt) complained to the Ministry of Agriculture when Poncho was re-approved on oilseed rape, calling Bayer's risk assessment '*insufficient*'.

Due to numerous reports of bee decline, Italy's Agriculture Ministry suspended use of neonicotinoids on maize in 2008. In 2009, Italy's neonicotinoid-free corn resulted in far fewer cases of bee mortality in nearby apiaries for the first time since 1999. Slovenian authorities banned clothianidin in 2008.

Bee decline in the United States

Between 2006-2009, one-third of American beekeepers reported massive declines of bee populations. The EPA had planned to withhold registration of clothianidin because of bee toxicity concerns. It suggested a warning label: *This compound is toxic to honeybees. The persistence of residues and the expression of clothianidin in nectar and pollen suggest the possibility of chronic toxic risk to honeybee larvae and the eventual stability of the hive*. But in April 2003, the EPA gave Bayer conditional registration to sell the product, with the proviso that the company complete a life cycle study of clothianidin on corn by December 2004. Bayer was granted an extension until May 2005 (and permission to use canola instead of corn in tests), but did not complete the study until August 2007. Despite this, the EPA continued to allow the sale of the pesticide. Since then, a national census of bees, bumblebees, moths, hoverflies and other wild insects shows that populations have fallen dramatically.

In November 2010, an internal evaluation by the US EPA was leaked to the public. It described the studies submitted by Bayer, intended to confirm the harmlessness of clothianidin, as '*inadequate*' with particularly great risks for honeybees. Beekeeper Jeff Anderson testified before EPA on the topic: *The Bayer study is fatally flawed. It was an open field study with control and test plots of about two acres each. Bees typically forage at least two miles out from the hive, so it is likely they didn't ingest much of the treated crops. And corn, not canola, is the major pollen-producing crop that bees rely on for winter nutrition. It's as if they designed the study to avoid seeing clothianidin's effects on hive health*.

As the preliminary marketing authorization valid to date in the United States is based on precisely this study, US environmental and beekeeping associations have demanded that the marketing authorization be withdrawn. In a letter to the EPA, the groups state: *Food production, public health and the environment are all seriously threatened, and the collapse of the commercial honeybee-keeping industry would result in economic harm of the highest magnitude for U.S. agriculture*.

1.2 million signatures have been collected to underscore this demand; the signatures were handed over to the Bayer board at Cologne in the 2011 shareholder meeting.

Bird declines

In 2010, Dutch toxicologist Dr. Henk Tennekes published two studies that demonstrated that the long-term risks for bees associated with neonicotinoids are even greater than hitherto thought. Tennekes showed that there is no safe dose: Neonicotinoids bind irreversibly to critical receptors in the central nervous system of insects so the damage is cumulative. This explains why minute quantities of imidacloprid may induce bee decline in the long run. And bees are not the only victims: moths, bugs, butterflies, midges and flies have all succumbed too.

Dr Tennekes: Imidacloprid has been shown to seep out of storage or is washed out of the soil into waterways and groundwater. It is quite obvious that ground and surface water contamination with a persistent insecticide that causes irreversible and cumulative damage to aquatic and terrestrial insects must lead to an environmental catastrophe.

As the insects have disappeared, so have the birds. All over Europe, many species of birds have suffered a population crash. House sparrows, common swifts, starlings and farmland or woodland birds such as the spotted flycatcher, snipe, curlew and redshank all declined. Tennekes continues: *The evidence shows that the bird species suffering massive decline since the 1990s rely on insects for their diet.*

No investigation against Bayer Management

After the massive bee deaths in Germany in 2008, Bayer management was sued for downplaying risks of neonicotinoids, submitting deficient studies to authorities and thereby accepting the huge losses of honeybees. However, the state attorney refused to investigate the case. The charge was closed with the justification that the substances were approved, so the sales could not be illegal. Furthermore, German authorities refused to publish the documents that supported authorisation of neonicotinoids. The company's right of secrecy was valued above the public interest.

There are similar developments on the European level: Industry 'experts' are undermining an EU review of the regulations of pesticides. Because the EU institutions do not have their own expertise on bees, the EU Commission outsourced advice on new guidelines to the International Committee of Plant-Bee Relationship (ICPBR), which has set up a working group to look at the impacts of pesticides on bees. Representatives from pesticide manufacturers including Bayer CropScience, Syngenta and BASF all sit on this group and it is responsible for designing and recommending the methodologies for the risk assessments of bees' exposure to pesticides which are then approved by the EU institutions.

UNEP Report

In March 2011, the *United Nations Environment Programme* (UNEP) published a report on bee deaths and described the Bayer pesticides Poncho (Clothianidin) and Gaucho (Imidacloprid) as a risk to numerous animals. The study says: *Systemic insecticides such as those used as seed coatings, which migrate from the roots through the entire plant, all the way to the flowers, can potentially cause toxic chronic exposure to non-target pollinators. Various studies revealed the high toxicity of chemicals such as Imidacloprid, Clothianidin, Thiamethoxam and associated ingredients for animals such as cats, fish, rats, rabbits, birds and earthworms. Laboratory studies have shown that such chemicals can cause losses of sense of direction, impair memory and brain metabolism, and cause mortality.*

Conclusion

The fact that Bayer continually disregards all studies and reports that show the danger and harmful effects of neonicotinoids proves deliberate and cynical blindness. Neonicotinoids have been banned in several countries and yet, Bayer continues to market these products globally. The company should have given urgent consideration to these matters that were brought to their attention again and again.

Although Bayer has been informed about the causes of bee deaths for many years and protests have increased from year to year, the company refuses to take action for purely profit-related reasons, and attempts time and time again to distract attention from its responsibility.

APPENDIX 5.8

WITNESS STATEMENT

THE DEATH OF BEES – UK EXPERIENCE

Graham White
Beekeeper, UK

I hold a First Class Honours Degree in History of Ideas, Literature and Politics, and a post graduate teaching diploma. I worked as a teacher of Environmental Education and Outdoor Education in Edinburgh from 1980 -2000, and was the founding Director of the Edinburgh Environment Centre.

A problem-free beginning 1994 - 2000

I began beekeeping as a hobby in 1994 when I moved to Dunbar (Scotland), and was able to rent a four acre walled garden at the centre of an ancient estate, which had extensive parkland, a river, woodlands, meadows and a beach. I bought four hives of bees in 1994, which produced lots of honey in the first year; I expanded to six hives, then 10. I have managed 10 hives since about 1996 and averaged 30-40lbs of honey per hive from 1994 until about 2004, when the harvest began to decline and problems began to appear among my own bees and among thousands of other beekeepers throughout the UK.

The Varroa parasite came to my area around 1998 but we learned to treat it by applying IPM – a combination of chemical treatments and management techniques, which held it in check. It was a manageable problem. As long as bees were healthy and vigorous, they were able to cope with Varroa.

2000 – The start of problems

In 2000, I bought a house on a farm near Coldstream on the River Tweed. This entire area of the Scottish Border country is farmed intensively for wheat, barley, potatoes and beans; oilseed rape is a dominant crop and vast areas of the landscape are bright yellow with its flowers in spring. The farm is part of an estate of six separate arable farms of about 3,000 in total, under one management. The area is farmed intensively by huge tractors, spraying machines and combine harvesters – costing millions in capital. The farmer uses very high inputs of nitrate fertilisers, pesticides, herbicides and diesel fuel. It is a classic landscape of industrial farming monoculture; as soon as one crop is harvested another is planted in the same field, often within a few days. Oilseed rape was very dominant from the start.

Absence of frogs

The first thing I noticed on moving here was the absence of frogs and toads. This farm has miles of drainage ditches bordering fields to drain the land. These are permanently wet and filled with weeds. There should have been many thousands of frogs, toads and newts in such a habitat but I saw none in spring. In 10 years I have not seen a frog or toad here, while five miles away the countryside changes to sheep and cattle grazing and there is an abundance of frogs and toads in the ditches that border those fields. Why do sheep fields have thousands of frogs when my area has none? The convincing answer is that pesticides and herbicide run-off from the arable fields kill amphibians, their spawn and tadpoles.

Absence of moles

In Spring 2000, I observed that my garden was suddenly invaded by moles. Dozens of molehills appeared on my lawn and verges overnight but there were none in the surrounding arable fields. I discussed this with the ploughman who said: *whatever it is they put on the oilseed rape seed and the wheat seed and the beans and potatoes it kills all the earthworms. There is no food for moles in those fields so they migrate to the gardens and the grass verges, where earthworms still survive.* This and the absence of frogs alerted me that 'something' was killing the earthworms; a neonicotinoid, called imidacloprid.

News from France

Around 2000, British beekeepers became aware of some problems. In France vast numbers of bee colonies (over 500,000) had died in 1998. Studies at Montpellier University led the French government to ban Bayer's imidacloprid for use on sunflowers and oilseed rape. But we knew very little – and the British Beekeeping Association (BBKA) repeatedly said there was *no issue of pesticides in the UK.*

Co-option of BBKA by the pesticide companies

In 2003 members of the BBKA were made aware that the Executive of the organization had created a secret company, BBKA Enterprises, without consulting the membership in 2000. The sole purpose of this company was to receive large sums (£17,500 annually) in return for endorsing four crop pesticides as '*bee-friendly*'. The Durham Beekeepers Association 'discovered' this secret contract and identified the products and companies who were paying the BBKA in return for their endorsement. The contract lasted until 2011 and paid £175,000 in total.

A later report confirmed that these four insecticides were not '*bee-friendly*' – but were in fact all in the top ten most deadly insecticides which affect bees in the UK. Despite all objections, for the next seven years the Executive continued to receive £17,500 annually for endorsing these pesticides. Hundreds of BBKA members resigned in disgust. Many other members resigned when banned from the BBKA online Forum for raising the issue.

In 2011, after a massive campaign in the press and media, the BBKA Executive finally agreed to cancel the pesticide endorsement but allegedly only because the contract had expired. They insisted that they fully intended to 'continue to seek partnership with leading agro-chemical companies' – in the hopes of improving bee health.

It is alleged that Tim Lovett was the driving force on the BBKA Executive behind this secret deal with the pesticide manufacturers. Being a pharmaceutical consultant, he has extensive contacts in this and the chemical industries. Representing the BBKA, he has appeared on television at a Bayer press conference launching the company as the champion of '*bee health*' in Europe.

Many beekeepers believe that Bayer and Syngenta have co-opted national beekeeping associations by funding conferences, research and partnership-projects. The result has been that the BBKA – our national UK association – has completely ignored all bee-research from Europe, as well as the bans imposed on neonicotinoids by the French, German and Italian governments. The '*official position*' of the BBKA is that: '*there is no evidence of poisoning of bees by neonicotinoids in the UK*'.

Trouble begins in the UK

Around 2004 – many beekeepers in the UK began experiencing problems, including:

- Queen bees fail to mate
- Queen bees are superseded by the bees in the first season
- Queen bees die while still young
- Colonies never seemed to thrive and gradually faded
- Colonies went into the winter looking OK, but were dead in Spring
- Increasing infections by Nosema and other bacterial and fungal diseases
- Falling honey crops

APPENDIX 5.9

WITNESS STATEMENT

HARASSMENT AND ATRAZINE

Dr. Tyrone B. Hayes

Biologist and Professor at the University of California, Berkeley, USA

In addition to my main appointment in the Dept. of Integrative Biology at UC, Berkeley, I also hold joint appointments in the Museum of Vertebrate Zoology, the Group in Endocrinology, the Molecular Toxicology Group, and the Energy and Resources Group. Among other awards, I have received both the Distinguished Teaching Award and the Distinguished Mentor Award from UC, Berkeley, the Jennifer Altman Award for Integrity in Science from the Jennifer Altman Foundation, the National Geographic Emerging Explorer Award, and the President's Citation Award from the American Institute of Biological Sciences. January 24th has officially been proclaimed Dr. Tyrone Hayes Day in Minneapolis, Minnesota and I was recently inducted into the Hall of Fame in my school district in South Carolina.

For more than 20 years, I have been studying the role of environmental factors on growth and development in amphibians. My undergraduate thesis, doctoral dissertation, and post-doctoral fellowship have all focused on this subject. Since then, I have published more than 40 papers and over 200 abstracts, as well as given over 400 talks, on this same topic. In the course of my research, it has become clear to me that the most important factors affecting amphibian development are synthetic chemicals – such as pesticides – that interact with hormones in a variety of ways. Thus, my current research focuses on the effects of endocrine disrupting pesticides on amphibian growth, development, reproduction and immune function and how these studies predict effects in other wildlife and humans.

In 1997, in addition to my work at the University, I began consulting with and conducting research for the chemical company, Novartis (which eventually became the agrichemical giant, Syngenta). My laboratory showed that the herbicide atrazine (the number one selling product for Syngenta) is a potent endocrine disruptor that chemically castrates and feminizes exposed male amphibians at low ecologically relevant concentrations. Atrazine inhibits production of testosterone (the male sex hormone) and induces estrogen production (the female sex hormone), upsetting the balance between these two hormones. This effect of atrazine has been observed in fish, amphibians, reptiles, and mammals, and I have been joined by 41 scientists from 12 countries to publish the ubiquity of atrazine's effects. The result is chemical castration (demasculinization) and feminization. 'Feminized' male fish and amphibians produce eggs and egg yolk and some males even grow ovaries (become hermaphrodites). In fish, amphibians and laboratory rodents, the decrease in testosterone results in decreased sperm counts, impaired fertility, and a reduction in masculine features. Similarly, atrazine exposure is associated with decreased sperm and reduced fertility in humans.

Cognizant of the implications for human health, I immediately brought my findings to the attention of my employers but contrary to my expectations, the company and their contracted consultants at Ecorisk Inc. were not enthusiastic about my findings. They began to restrict and delay funding for continued research. I repeatedly asked for funds to extend and strengthen my research but they were not forthcoming so I began to invest my own resources into developing and analyzing data. Syngenta

then prevented me from presenting these data at scientific meetings, or from publishing the data. They also delayed and hindered my progress in replicating and validating the data. When I finally resigned my consulting position with the company, they offered me \$2 million in lab support if I continued my research 'in a private setting', that is, if I didn't publish my results and make them public. I declined the offer and chose to publish my work.

Thereupon, they initiated a two-pronged campaign to avoid responsibility for their toxic product: on the one hand, they took a defensive stance, pretending they had no knowledge of my findings; on the other hand, they took the offensive and commenced efforts to discredit my work by sponsoring studies that seemed to question or contradict my conclusions using faulty 'science'. As part of the first tactic, Ann Lindsay of the US EPA testified in a court of law that she never saw the results of my studies. This statement was completely and utterly false, which I proved by showing emails from the EPA that specifically thanked me for sharing the results of my studies with them. The EPA has stated, in writing, that I not only shared my raw data and results with them, but that I also *spent a considerable amount of time helping the Office of Pesticide Programs to understand the significance of [my] data and... provided insightful reviews of similar research efforts.*

They have also engaged in character assassination, have pressured interest groups to deny me speaking engagements, and have commissioned new studies to cast doubt on my work: three Syngenta-sponsored studies have been published which seem to undermine my findings (in one of these poorly constructed studies, up to 86 per cent of the frogs died, in another frogs jumped from tank to tank and in all 'controls' were contaminated with atrazine!). Unfortunately for them, studies which support my own conclusions far outnumber these few sloppy examples, and virtually all scientists who study atrazine, not funded by Syngenta, have joined me in co-authoring key papers showing adverse effects of atrazine across vertebrates.

Moreover, laboratory research conducted by a number of independent scientists has shown that atrazine causes significant reproductive and neural damage in mammals and fish, including the development of cancers. These same effects are associated with atrazine exposure in humans. In one of Syngenta's own factories, a site where atrazine is manufactured, the rate of prostate cancer increased 8.4 fold.

This is why, despite all their denials, excuses, misrepresentations, and threats to me, my family, and my laboratory I continue to speak out about Syngenta today. My decision to stand up and face the industry giant was not a heroic, but a necessary one. We cannot continue to allow giant chemical companies to control our health and that of our children when the scientific evidence is clearly against them. Something must be done and I pin my hopes to innovative new entities like the Permanent People's Tribunal to bring these offenders to justice when our existing judicial and political systems fail us.

APPENDIX 5.10

WITNESS STATEMENT

THE PROBLEMS POSED BY OBSOLETE PESTICIDES IN AFRICA

Abou Thiam

Director, Pesticide Action Network Africa, Senegal

Already wrought by periodic drought, soil erosion and desertification, agricultural production in the Sahel must periodically contend with invasions of locusts. Locusts and grasshoppers are ancient scourges. During invasions, these insects destroy crops, pastures, trees, etc. in their path. Chemical-based approaches are used the most to control the insects, and large quantities of pesticides are dumped during invasions. Spreading millions of litres over large areas cannot continue without affecting Sahelian ecosystems. Assessment of these impacts and mitigation of the most negative aspects are poorly known or difficult to implement in the context of widespread conflict. In 1986, three million hectares were treated with chemical pesticides in West Africa. During the last invasion, in 2003-2005, 13 million hectares were treated; four times more than the amount used in the eighties.

The obsolete pesticide stocks mostly came from these campaigns to control locusts. Large stocks of products remain unused possibly because of the purchase of huge quantities by affected countries, generous or poorly coordinated donations, or post-invasion delivery. For example, in 1992, pesticides worth 44 million dollars were purchased by sub-Saharan countries through the Japanese program KR-II. This amount far exceeded the needs of concerned countries.

Countries often lack the necessary and adequate infrastructure to store pesticides properly. They are sometimes stored in precarious conditions. After a few years, products become obsolete and unusable. They then become toxic waste that must be eliminated with sophisticated technologies not available in Africa. The disposal cost is very high and sometimes exceeds their purchase price.

Dieldrin was widely used in the past. Banned in the 80's, it can still be found in significant quantities in the obsolete pesticide stockpiles. This insecticide was manufactured and marketed for a long time by the multinational company Shell. It is a highly persistent organochlorine pesticide, classified as extremely hazardous by WHO (Class 1a). It has been used for over 30 years against the desert locust. In the early 90's, there were still nearly 200,000 litres of dieldrin scattered throughout the Sahel. At that time, Sahelian countries decided to stop use due to its high toxicity and bans in many other countries.

Recent assessments estimate about 100,000 tonnes of obsolete pesticides in Africa and the Middle East, with almost 50,000 tonnes in Africa. By the late 1990s, during an international symposium held in Rabat, Morocco, we made a call to urgently find better means to eliminate this hazardous waste, to avoid situations where pollution adversely affects health and the environment (see our paper on locust control at the conference in Rabat). It was only 10 years later, in early 2000, that the problem was addressed through the Africa Stockpile Programme. Meanwhile, there were a few countries who took actions to eliminate obsolete pesticide through bilateral cooperation, but these projects were very localized and specific to have a significant impact across the continent.

Many pesticide stocks are stored outdoors, exposed to weather and sun. They are often near houses, wells supplying drinking water, or food storehouse in both poor rural areas and urban centers. This often entails human exposure and environmental contamination. In Tanzania, more than 300 sites containing obsolete pesticides have been identified. Ethiopia seems to have the largest amounts of obsolete products across the continent – nearly 3,000 tonnes over 1,000 sites have been identified.

Factual data on the impacts of pesticides in general and obsolete stocks in particular are not available. The limited data that exist are scattered and specific and do not give a good picture of the magnitude of the problem. Serious accidents due to pesticides, at times fatal, are reported everywhere. Reliable statistics are not available. Health facilities are generally not equipped to care for pesticide poisoning, the health staff is often not trained to diagnose poisoning and suggest appropriate treatments. In addition, antidotes and first aid are not accessible to the people especially those from rural areas and few data on the chronic toxicity of pesticides are available.

African countries lack equipment, and human and financial resources to investigate and ascertain the impacts of pesticides on human and animal health, and the environment. Pesticide storage containers are sometimes damaged or do not meet standards required for such storage. The floors on the storehouses are not made from concrete and poorly-stored pesticides easily seep through. Storage facilities are not secure. Thus, people living near sites used to store toxic waste often complain of headaches, nausea, dizziness, and other diseases, etc. In addition, chemical pesticides may have adverse effects on natural enemies of pests, on birds and on beneficial insects in agricultural systems

Pesticides have high market value. The overpowering commercial interests of multinational companies pressure States to provide farmers with way more pesticides than needed.

In December 2000, the African Stockpiles Programme (ASP) was set up with the ultimate goal of eliminating existing stockpiles as well as other obsolete POPs pesticides and to implement preventive measures to avoid similar situations in the future. The program would have been conducted in phases and would have involved all African countries for 12-15 years. The estimated cost was US \$250 million and would have to be achieved through a partnership with several organizations and institutions. CropLife committed to provide US \$30 million for the program. This indicates an implicit acceptance of certain responsibilities by industry in the building up of obsolete pesticides stocks.

The ASP finally started in 2005 in seven countries. Unfortunately, the program encountered many difficulties in its implementation at the institutional level in both governance and finance. It could not continue as a global program; many differences emerged. The main partners FAO, World Bank, CropLife eventually continued their separate ways. It is very difficult to assess the results. It appears that over the 10 years, less than 5 per cent of estimated stocks have been eliminated. A lot remains to be done in the field.

Finally, significant amounts of obsolete stocks remain in many parts of Africa and constitute an 'ecological time bomb'. The problem is serious in several sites as indicated by the assessments [at this point the witness showed photographs of obsolete pesticide stocks].

It is essential and urgent to bring together the different parties responsible for the build-up of these obsolete pesticide stocks to implement effective measures to solve problems. In this regard, political will and well-targeted campaigns by civil society are necessary to bring TNCs to fulfil their role to finally solve the problem and put in place preventive measures to avoid the build-up of future obsolete stocks. It is high time to learn from the lessons of pesticide management in the past and adopt strategies, means and methods which reduce drastically the use of chemical pesticides in the fight against crop pests and control of disease vectors.

APPENDIX 5.11

WITNESS STATEMENT

CHILD LABOUR – PERSONAL EXPERIENCE

D. Ashwini, aged 15

Child labourer

What do you do? Do you go to school?

Yes, I go to school. I am in Class 10 right now studying in the Kasturba Gandhi Balika Vidyalaya (KGBV), Dharur Mandal, Mahabubnagar District.

Can you tell us about the work that you do/did? (Work conditions - hours of work, how many days a week, nature of work, wages, contract/arrangement, food, breaks, water)

I started working at a very young age. I worked at a cotton field for five years from the age of 6, with my mother, Yashoda and father, Anjaneyulu. My parents earned Rs.50 a day and I earned Rs.25. I would start my day by waking up at 4 a.m., do the household chores, such as cooking and getting my younger brother Chandu to school, and then I would leave for work.

I would go to the cotton fields at 6:30 am. It was 2 km away and I would walk there by foot and then start work right away. I would pluck out the weeds, grass and other wild plants and then throw them away, outside the village. I was tasked with spraying fertilizer and picking the seeds for fertilizing, which I was very good at. I was given a break of 15 minutes when the sun was at its hottest. I would carry food from home; not even water was provided to me.

After working for a minimum of 12 hours, I would come home, cook and go to bed. Every day was long and tiresome, and the next day I would have to wake up for the same routine. My friends Aruna and Eshwari had the same long days as me. The wages that I would earn would be spent quickly to buy groceries and food so that the family could fill their stomachs. My whole family's wages would be spent for this reason, resulting in no savings.

I would work for 365 days and would not be given rest even on major festivals.

Have you experienced any health problems from your work on the cotton field? Can you describe these?

I have had lots of health problems due to my work. I started having severe back problems and was not allowed to take rests, even for 5 minutes. I developed kidney stones and my hair and nails fell off due to picking of the seeds. I also developed breathing problems and used to cough the whole day. I was ignored when I complained about the back pain or any illness. Like me, other children in the village would start working right from the age of 5-6 and were treated inhumanely.

Were you harassed or abused in your job?

Yes, I would face torture and physical abuse by my employer. I would also be mentally tormented along with the rest of the people working on the farm. They would beat us if we did not come to work and would make us work continuously for hours without any food and water.

How long have you been working in the cotton field?

I worked in the cotton fields from the ages of 6 to 11.

What led you to this job?

The reason for me not studying and going to work instead might sound different, but it is normal in my village for girls to do only one thing, and that is work, work and more work. The people from my village also believed that poor people were born only to work for the people of a higher caste. The thoughts of the villagers are very much primitive, but this is not surprising as these villages are very disconnected from the rest of the world.

My father, a drunkard, could not bear the expenses of the family, which consisted of 6 people. My brother, Karthik, aged 7 and in Class 4 was sent to live with my grandmother and went to school at Z.P.H.S., in Chintarevula. My sister Fiba, who is 6 years old, studies at Z.P.H.S. in Gudemdoddi. I had high hopes of studying when my siblings were sent to school. I was a daily wage labourer rather than a contract labourer but I would be beaten if I spoke about school, and was denied when I tried to leave work. My father would get drunk and beat me, and the rest of the family, out of frustration.

Many children in this village are sent to work because their parents owe major debts to landlords. Out of desperation, parents would send their children to work to help pay the debt. If the children stopped working, interest would be charged and parents would owe even more.

Are you exposed to pesticides in the cotton fields?

Yes, we are given the task of spraying and using fertilizers.

How are you exposed to the pesticides?

In the case of the other crops, on the day when pesticides are sprayed, generally no manual work is attended to in the fields in order for people to avoid exposure to pesticides. Unfortunately, in cottonseed production, cross-pollination work has to be attended to every day. While the pesticides are sprayed, the cross-pollination work is also done simultaneously; hence the exposure to pesticides is more and direct in cottonseed fields.

The employer of the fields I worked in would not give me or anybody else, any protection against the pesticides. One day, due to all the exposure, I vomited and fainted. I also developed rashes and asthma because of the exposure to pesticides. The rashes were caused by endosulfan and because of the contact with the oil from the seeds. This happened to all the people who worked in the fields. The employer (Owner of the field and husband of the Sarpanch, Rangamma) Munappa, ignored my desperate pleas when he found out that I fainted. My friends reported my bad condition to my parents, who immediately took me to Mohan Rao hospital at Gadwal.

After being discharged from the hospital, I went back to work the very next day. I believed that if I didn't work for even just one day, my family would starve.

Are there any other children working with you in the cotton fields? Do they also suffer from health or other problems related to working on the field?

Yes, lots of children work in the fields with me. Almost all children in the villages want to go to school to study and play but are not allowed to. Mahabubnagar has the lowest literacy rate in Andhra Pradesh.

My friend Aruna, who worked in the same field as me, also fell sick. She had illnesses like high fever, nausea, swollen legs, constant headaches, skin allergies and back pain (due to constant bending).

APPENDIX 6

FORTY WRITTEN SUBMISSIONS FOR THE CASE AGAINST AGROCHEMICAL TNCs

Defendant/s	Country of Origin	Country/Places Impacted	Case	Who/What Was Impacted
1. All	USA, Germany, Switzerland	Global	Gross Human Rights Violations by the Defendants (General/Main Allegations)	Rural communities, peasants, agricultural workers, indigenous people, fisherfolk, migrant workers, small scale farmers, women, children and youth, activists, scientists and consumers and the future generations
2. All	USA, Germany, Switzerland	Global	Globalization and corporate aggression over people, land, food and resources	as above
3. All	USA, Germany, Switzerland	Global	Poisoning of people and the environment by pesticides	as above
4. All	USA, Germany, Switzerland	Global	The risk of genetically engineered crops to human health, the environment, food safety, and food security	as above
5. All	USA, Germany, Switzerland	Global	How intellectual property rights violate farmers' rights	as above
6. Monsanto	USA	Paraguay	Glyphosate (poisoning of people and the environment)	Rural communities including an 11-year old child
7. Monsanto	USA	Latin America, particularly	GE soybean expansion and destruction of rural	Farmers, rural communities

8. Monsanto	USA	USA	Patents on seeds and destruction of family farms	US farmers
9. Monsanto	USA	Mexico	Bt corn, contamination of center of origin's maize land races, and devastation of indigenous farms	Native crop diversity, indigenous farmers, consumers, local food production
10. Monsanto	USA	India	Bt brinjal: endangering the center of origin of brinjal and collusion to get Bt brinjal approved	Native crop diversity, farmers, consumers
11. Monsanto	USA	India	Bt cotton false promises: erosion of farmers' rights and destruction of livelihoods, massive farmers suicides, increased pesticide use	Cotton farmers, rural communities
12. Monsanto	USA	Indonesia	Bt cotton bribery, undermining Indonesia's self-determination	Indonesian people, country's sovereignty
13. Syngenta	Switzerland	Brazil (Paraná)	GE testing and violence against social movements, endangering natural ecosystems, undermining self-determination	Landless rural workers, pristine ecosystems, country's sovereignty
14. Syngenta, US Government	Switzerland	USA	Atrazine poisoning of the environment, threats to human health, manipulation of science and harassment of scientists	US Midwest rural areas, farmers, human rights defenders
15. Syngenta	Switzerland	Malaysia	Paraquat poisoning of people and the environment	Women sprayers, plantation workers

16. Bayer	Germany	India (Kasargod)	Endosulfan aerial poisoning of people and the environment	Rural communities, particularly women
17. Bayer	Germany	Africa	Endosulfan aerial poisoning of people and the environment	Farmers, rural communities, environment
18. Bayer	Germany	Philippines	Endosulfan aerial poisoning of people and the environment; harassment of scientists	Environment, peasants, fisherfolk, human rights defenders
19. Bayer	Germany	Uruguay	Endosulfan contamination of the environment and threat to livelihoods	Environment, cattle, fish
20. Bayer	Germany	Europe	Neonicotinoid poisoning of the environment, massive death of bees, undermining livelihoods and food security	Bees, environment, beekeepers, humanity, fruit and vegetable production
21. Bayer	Germany	USA and 32 countries	LibertyLink Rice 601 contamination of rice & rice products, risks to health, undermining livelihoods, the right to know, and collusion with governments	Rice farmers, consumers, countries' sovereignty, US regulatory system
22. Bayer	Germany	Peru (Taucamarca), Cambodia	Methyl parathion exposure, contamination of food, and death of innocent children	Peasants, children
23. Bayer, BASF	Germany	USA, France, Germany, Madagascar, China	Fipronil widespread poisoning of the environment, risks to human health, destruction of livelihoods, marketing double standards to developing countries	Environment, bees, wildlife, aquatic organisms, rural communities, workers, consumers, shrimp farmers, beekeepers

24. BASF	Germany	USA	Clearfield Production System (CPS) crops, stewardship agreements and the destruction of agro-ecosystems and livelihoods, risks to health	Farmers, environment
25. BASF	Germany	Malaysia	CPS rice field testing, threat to rice ecosystems and livelihoods	Farmers, environment
26. BASF	Germany	Europe	GE potatoes for industrial use: contamination risks to conventional potatoes, farmers' livelihoods and people' health	Farmers, environment, consumers
27. Dow	USA	India	Bribery of government officials to secure pesticide registration and undermining self-determination	Taxpayers, society at large
28. Dow	USA	USA (California)	Chlorpyrifos contamination of the environment and acute poisoning of people	Agricultural workers, rural communities
29. DuPont	USA	Costa Rica (Siquirres)	Bromacil, diuron contamination of the environment and sources of drinking water	Rural communities
30. Syngenta, Bayer, Monsanto, Dow, DuPont, BASF	USA, Germany, Switzerland	Arctic (Alaska, USA)	Pollution and endangerment of Arctic tribal nations and the environment	Arctic indigenous people, environment, wildlife source of food
31. Syngenta, Bayer, Monsanto, Dow, DuPont, BASF	USA, Germany, Switzerland	USA (Lake Apopka, Florida)	Environmental contamination, destruction of health and livelihoods of rural communities	Largely African-American former farmworker community

32. Syngenta, Dow, BASF	USA, Germany, Switzerland	India	Monocrotophos poisoning of the environment, destruction of livelihoods, farmers suicides	Cotton farmers, rural communities
33. Bayer, Syngenta	Germany, Switzerland	United Kingdom	Organophosphate pesticide exposure, risks to health	Health workers, farmers
34. Syngenta, Bayer, Dow, Monsanto, DuPont, BASF	USA, Germany, Switzerland	Philippines (Kamukhaan)	Aerial pesticide application and poisoning of rural communities; harassment of human rights defenders	Peasants, banana plantations workers, human right defenders
35. Bayer, Dow Monsanto, DuPont, BASF, Syngenta	USA, Germany, Switzerland	New Zealand	Aerial pesticide application & poisoning of indigenous people	Maori people, environment
36. Agrochemical companies	Donor countries	Africa	Toxic dumps of obsolete pesticides: environmental contamination and threats to human health	African rural communities, environment
37. Bayer, Dow, Monsanto, DuPont, BASF	USA, Germany, Switzerland	India (Punjab, seat of India's Green Revolution)	Cancer in the Punjab: the long-term impact of the Green Revolution	Peasants, rural communities, environment
38. Monsanto, USA, IMF, World Bank	USA	Africa	GMOs Pushed Through Food Aid to Africa	Farmers, consumers, environment
39. Monsanto Syngenta, Bayer	USA, Germany, Switzerland	USA, Philippines	Suppression, corruption and manipulation of science/harassment of scientists	Human rights defenders
40. Monsanto Syngenta, Bayer	USA, Germany, Switzerland	India	Agricultural child labor and violation of children's rights	Children from rural communities

ACRONYMS

ACAT	Alaska Community Action on Toxics
ADM	Archer Daniels Midland
AGRA	Alliance for a Green Revolution in Africa
ALS	Acetolactate synthase
AoA	Agreement on Agriculture
APHIS	Animal and Plant Health Inspection Service (of USDA)
ASP	Africa Stockpiles Programme
BBKA	British Beekeeping Association
BRAI	Biotechnology Regulatory Authority of India Bill
Bt	Bacillus thuringiensis
CBD	Convention on Biological Diversity
CBG	Coalition against Bayer Dangers
CECSR	Committee on Economic, Social and Cultural Rights
CEDAW	Convention on the Elimination of all Forms of Discrimination against Women
CFS	Center for Food Safety (US)
CGIAR	Consultative Group on International Agricultural Research
CIP	International Potato Center
CIB	Central Insecticides Board (India)
COP	Conference of the Parties
CPS	Clearfield Production System
CRC	Chemical Review Committee (of the Rotterdam Convention)
CSE	Centre for Science and Environment
CSO	Civil Society Organisation
EC	European Commission
EFSA	European Union Food Safety Authority
ETO	Extraterritorial Obligations
EC	European Commission
EIS	Environmental Impact Study
EU	European Union
FAO	Food and Agricultural Organization of the United Nations
FCPA	Foreign Corrupt Practices Act (US)
FDA	US Food and Drug Administration
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FIPPAT	Fredrick Institute of Plant Protection and Toxicology
FTA	Free Trade Agreement
GAPROFFA	Group of Action for the Promotion of Fauna and Flora
GATT	General Agreement on Tariffs and Trade
GE	Genetic engineering / genetically engineered
GEAC	Genetic Engineering Approval Committee (India)

GEF	Global Environment Facility
GM	Genetically modified
GMO	Genetically modified organisms
HCH	Hexachlorocyclohexane
HIPC	Highly Indebted Poor Country
HRDC	Hybrid Rice Research and Development Consortium
HT	Herbicide tolerant
HYV	High yielding varieties
IAASTD	International Assessment of Agricultural Knowledge, Science and Technology for Development
IARC	International Agency for Research on Cancer
IBAMA	Brazilian Institute of Environment and Renewable Natural Resources
ICC	International Criminal Court
ICCPR	International Covenant on Civil and Political Rights 1966
ICESR	International Covenant on Economic, Social and Cultural Rights 1966
ICJ	International Court of Justice
ICJ	International Commission of Jurists
IFI	International Financial Institution
ILO	International Labour Organisation
IMF	International Monetary Fund
International Code	International Code of Conduct on the Distribution and Use of Pesticides
IPM	Integrated Pest Management
IPRs	Intellectual Property Rights
IRRI	International Rice Research Institute
IRS	Indoor Residual Spraying
ISAAA	International Service for the Acquisition of Agri-biotech Applications
IMPOA	Malaysian Palm Oil Association
MIC	methyl isocyanate
MRL	Maximum Residue Limit
MRPTC	Monopolies and Restrictive Trade Practices Commission (India)
MST	Movement of Landless Rural Workers (Brazil)
NAFTA	North American Free Trade Agreement
NGO	Non-governmental organisation
NIOH	National Institute of Occupational Health (India)
NRDC	Natural Resources Defence Council
NRI	Natural Resources Institute
OECD	Organisation for Economic Co-operation and Development
OBEPAB	Organisation Béninoise pour la Promotion de l'Agriculture Biologique
OP	Organophosphate
OPEC	Organisation of Petroleum Exporting Countries
OPIN	Organophosphate Information Network (UK)
PAN	Pesticide Action Network

PAN AP	PAN Asia and the Pacific
PANNA	PAN North America
PCB	Polychlorinated biphenyls
PIC	Prior Informed Consent
PMFAI	Pesticide Manufacturers and Formulators Association of India
POPs	Persistent Organic Pollutants
Ppb	parts per billion
PPE	Personal Protective Equipment
PPT	Permanent People's Tribunal
PRSP	Poverty Reduction Strategy Paper
PVP	Plant Variety Protection
PVPA	Plant Variety Protection Act
RAAA	Red de Acci6nen Alternativas al uso de Agroqu6micos (PAN Peru)
RAPAL	PAN Latin America
RBM	Roll Back Malaria Partnership
RR	Roundup Ready
RSPO	Round Table on Sustainable Palm Oil
RTI	Right to Information
SAPs	Structural Adjustment Programmes
SCFA	Standing Committee on the Food Chain and Animal Health (of the EC)
SRO	Rural Society of the West (Brazil)
TNC	Transnational corporation [multinational corporation]
TRIPs	Trade-Related Intellectual Property Rights
UC	University of California
UCC	Union Carbide Corporation
UCIL	Union Carbide India Limited
UCS	Union of Concerned Scientists
UDHR	Universal Declaration of Human Rights
UNCED	UN Conference on Environment and Development
UNCTAD	UN Conference on Trade and Development
UNDRIP	UN Declaration on the Rights of Indigenous Peoples
UNEP	UN Environment Programme
UPOV	Union for the Protection of New Varieties of Plants
US EPA	US Environmental Protection Agency
USGS	US Geological Survey
US PTO	US Patent and Trademark Office
USAID	US Agency for International Development
USDA	US Department of Agriculture
USTR	US Trade Representative
WFP	World Food Programme
WHO	World Health Organisation

About PAN Pesticide Action Network (PAN) is a network of over 600 participating non-governmental organizations, institutions and individuals in over 90 countries working to replace the use of hazardous pesticides with ecologically sound and socially just alternatives. PAN was founded in 1982 and has five independent, collaborating Regional Centers that implement its projects and campaigns.

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