The Mahesh Chandra Regmi Lecture 2013

Seed Freedom and Food Freedom in Times of Globalisation

Vandana Shiva

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SOCIAL SCIENCE BAHA

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Seed Freedom and Food Freedom in Times of Globalisation

(Reclaiming People's Freedom in Times of 'Free Trade')

Vandana Shiva

सीशल साइन्स बाहा
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Back cover shows Mahesh Chandra Regmi in the audience at the inaugural lecture on 24 April, 2003. Photograph by Bikas Rauniar.

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Freedom' has become such a contested term. We use freedom, corporations use freedom.

We refer to people's freedom to live and have livelihoods, to have access to vital resources—seed, food, water, land. And, we refer to the freedom of the Earth and all her beings, based on recognising the Rights of Mother Earth, Pachamama, Bhoomi, Gaia...

Corporations define freedom as 'free trade', which is corporate globalisation. 'Free trade' rules are written by corporations to enlarge their freedom to commodify and privatise the last inch of land, the last drop of water, the last seed, the last morsel of food. In the process, they must destroy the freedom of the Earth and the Earth Family, as well as the freedom of people to their lives and livelihoods, their cultures and democracies, by enclosing the commons, commodifying and privatising every aspect of life.

Creating markets by destroying people's seed and food freedom is at the heart of the rules of globalisation enshrined in the World Trade Organisation (WTO) rules, which are written *by* corporations *for* corporations. Thus, the Agriculture Agreement rules were written by Cargill, the world's biggest grain trader, to destroy the food sovereignty of countries. At the centre of the Bali negotiations was the pressure to force countries to dismantle food security programmes and transform food from being a right to a commodity.

Monsanto acknowledges having drafted the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) of the WTO. A Monsanto representative stated that they were the 'patient, diagnostician, physician' all in one, in drafting the TRIPS agreement.

And the 'disease' they diagnosed and sought to cure was that farmers saved seeds. The cure was that farmers should be prevented from saving and exchanging seeds by defining these fundamental freedoms as a crime.

TRIPS imposes patents on seeds, allowing corporations like Monsanto to prevent farmers from saving seeds. Worse, as in the case of Monsanto vs Bowman, farmers cannot buy grain in the market and grow a crop from it. And, worse still, as in the case of Percy Schmeiser, a Canadian farmer whose canola crop was genetically contaminated with Monsanto's Roundup Ready Canola, Monsanto can use patents to sue farmers whose crops it has contaminated with its genetically modified organisms (GMOs).

For me, saving and protecting life, especially biodiversity and seeds, on Earth is the highest duty, the highest Dharma. That is why I started Navdanya in 1987, when I heard the corporations spell out their vision of total control on life through genetic engineering and patents on life and seeds and a 'free trade' agreement.

Navdanya is dedicated to creating Earth Democracy based on Bija Swaraj (Seed Freedom/Sovereignty), Anna Swaraj (Food Freedom/ Sovereignty), Bhu Swaraj (Land and Forest Freedom/Sovereignty), Jal Swaraj (Water Democracy), and Gyan Swaraj (Knowledge Sovereignty). 'Swaraj' was used by Gandhi to describe self-rule and self-organisation by people and communities to govern themselves. It is the highest expression of people's sovereignty. Since 1987, we have used swaraj, freedom and sovereignty as interchangeable terms.

Bija Swaraj=Seed Freedom=Seed Sovereignty

Commons are spheres of life self-governed by local communities, and are not governed by the market or the state. The state, at best, can recognise the rights of local communities, but it cannot prohibit the freedom of communities to self-govern the commons. There is a difference in laws of recognition and laws of prohibition: While laws of recognition of people's sovereignty at higher levels strengthen people's sovereignty, laws of prohibition extinguish it. For example, India has enacted a Tribal Self-Rule Law to recognise the rights of

self-rule of local tribal communities (the Panchayati Raj extension to the Scheduled Areas) as well as the Forest Rights Act, of which I was a member of the drafting group. And the draft on the collective rights to biodiversity and knowledge of local communities is what enabled us to enshrine farmers' rights in our laws on plant varieties as a sui generis system instead of the International Union for the Protection of New Varieties of Plants (UPOV). The law entitled Plant Variety Protection and Farmers' Rights Act 2001 has a clause on Farmers' Rights:

> a farmer shall be deemed to be entitled to save, use, sow, resow, exchange, share or sell his farm produce including seed of a variety protected under this Act in the same manner as he was entitled before the coming into force of this Act.

For us, seed freedom includes farmers' rights to save, exchange, breed and sell farmers' varieties—varieties that have evolved over millennia without interference of the state or corporations. We use 'seed freedom' as the right of the seed as a living, self-organised system to evolve freely into the future, without the threat of extinction, genetic contamination from GMOs, and the threat of termination through technologies such as the 'terminator technology' designed to make seed sterile. In 'seed freedom' is the freedom of bees to pollinate freely, without threat of extinction due to poisons. In 'seed freedom' is the freedom of the web of life to weave itself, with integrity and resilience, through inter-connectedness and well-being for all.

We refer to 'seed freedom' as the freedom of farmers to save and exchange farmers' varieties freely among themselves. Seed and biodiversity are the ultimate commons, and commons are governed by local communities through local self-rule and self-governance, not by markets through privatisation, nor through centralised authority and its bureaucratic apparatus. We refer to 'seed freedom' as the freedom of eaters to have access to food grown from seeds bred for diversity, taste, flavour, quality and nutrition. In 'seed freedom' is

the duty to save and exchange native seeds bred by farmers. This is seed sovereignty. For farmers, varieties conserved, used and bred as a commons means self-organisation and self-rule at the level of local communities. At national and international levels, it includes the obligation of governments to protect people and their freedom of biodiversity by regulating corporations to prevent them from undermining people's sovereignty through biopiracy on the one hand, and threats to biosafety from genetically engineered seeds and crops on the other. Freedom and sovereignty is to have the freedom to self-govern at the level of the community, to take care of the commons, and to share sustainably and equitably in their fruits. It also involves prevention of biopiracy and freedom from harm through national and international regulation on biosafety.

Regulation by the state of those who can cause harm to others creates the context for the practice of freedom in people's space. That is why rapists do not have the freedom to rape, murderers do not have the freedom to murder, and polluters do not have the freedom to pollute. Corporations have unprecedented capacity to harm the Earth. So do people with new technologies like genetic engineering, and new monopoly power through intellectual property rights on seeds in so called 'free trade' treaties, based on the premises of the freedom of corporations, and the creation of unfreedom for people.

Defending people's freedoms in times of 'free trade' means challenging the laws that create and expand corporate rule to every dimension of our lives. That is why we created the International Forum on Globalisation, stopped the WTO Ministerial Conference in Seattle, and declared 'Our World is not for Sale'. That is why we started The Indian People's campaign against WTO under the inspiring chairmanship of the former Prime Minister of India, the late V.P. Singh.

However, even though WTO went into intensive care after the Seattle Ministerial, the ideology of free trade as corporate rule continues to be imposed undemocratically on people across the world through bilateral agreements. The US-India agriculture agreement with Monsanto, Con Agra and Walmart; and the Monsanto MOU

with Nepal are examples of continued contest between seed and food freedom of the people, and corporate monopolies in seed and food.

To push free trade as corporate freedom, three processes must be imposed simultaneously. The first is the privatisation of commons such as seeds, through IPR and seed laws imposed by state or inter-state bodies on behalf of corporations. Thus, patents on seeds were imposed through genetic engineering. In addition to being the privatisation of commons such as seeds and life, it is also the enclosure of the biological and intellectual commons. Genetic Engineering (GE) has failed to increase yields, or control pests and weeds.[1] And growth in Monsanto's super profits through the collection of royalties goes hand in hand with farmers entering into debt to pay royalties and consequently committing suicide. When the failure of GMOs and the high economic and social costs borne by farmers is taken into account, there is no justification for privatising seeds through patents. Intellectual property rights on seeds lead to policing and regulating of citizens by the state to increase corporate control. Instead of being a defender of people's sovereignty by regulating corporations, the state then becomes an instrument of corporate sovereignty and people's slavery.

Seed laws for compulsory registration, which are being pushed everywhere, are based on the illegitimate restriction of people's freedom in order to enhance corporate freedom to establish seed monopolies. An example of the expansion of corporate freedom by extinguishing people's freedom to save and exchange farmers' seed varieties is the proposed EU seed law, and the push for harmonisation of seed-related laws in Africa. Other examples are the 2004 Seed Law of India which could never be enacted because of our resistance through a seed satyagraha, and the Colombian laws passed to implement the US-Colombia Free Trade agreement and consisting of, among others,

- Controls on the production, use and marketing of all seeds in the country (Resolution 970 of 2010);

1 See Navdanya report 'The GMO Emperor Has No Clothes'.

- Expansion of intellectual property rights to include seeds (Law 1518 of 2012); and
- Prohibition of the production and marketing of heritage-breed chickens (Resolution 000957 of 2008).

All of these laws favour large-scale industrial production over small-scale producers that do not have the resources to comply with such regulations. The Colombian campesinos[2] are incredulous. 'When we produce things like milk or chickens for our communities, of course, we ensure that those products are safe because our families are the ones consuming them. It is an economy based on trust. But these new laws destroy that,' expressed one community member in Cauca.[3] The laws have been put on hold because of an uprising.

The second process for establishing corporate rule and increasing corporate freedom is deregulation of areas that need to be regulated by the state. For example, GMOs can cause ecological harm through genetic pollution, harm to public health, and socio-economic harm through seed monopolies, leading to distress among farmers. That is why we have biosafety laws at national levels and the Cartagena Protocol for Biosafety at the international level. Attempts to change India's Biosafey laws and introduce the BRAI (the Biotechnology Regulatory Authority of India) stand as examples of such deregulation. Another example was the Monsanto Protection Act of the US, which died during the budget debate.

The third process to enhance corporate freedom at the cost of people's freedom is to direct public wealth to corporate welfare, away from public welfare. The US shutdown over Obamacare in the US illustrates this well. The corporate rule ideology of the Tea Party would like health care for people and public expenditure on food for people to end, but not subsidies for agribusiness and benefits to the pharmaceutical industry.

During the shutdown, a spokesman for ending Obamacare said:

2 Peasants (in Spanish).

3 http://citizen.typepad.com/eyesontrade/2013/08/colombia-uprising-is-this-what-free-trade-looks-like.html.

'More Government, less freedom; less Government, more freedom.' However, as Free Trade shows, corporations want more, not less government to police and regulate citizens, to enclose the free spaces of the commons and threaten other countries to grab their resources and markets, through trade and military. They want more, not less government for corporate welfare. The inefficient model of industrial agriculture pushed by global agribusiness would collapse tomorrow without the USD 400 billion of public money agribusiness appropriates as agriculture subsidies.

But they want less government for public welfare. They want less government for protecting citizens from corporate harm. This is what deregulation is about. Corporate rule through free trade first created corporate states—states that work for corporations, not for people. This has created an inverted state, which protects corporations from democratic control, instead of protecting people from predatory corporations. 'Free Market Democracy' is essentially a rule of the corporations, for the corporations, by the corporations. People will not give up their freedoms without resistance, so we see the next step of the creation of the corporate military state. Why else would US intelligence spy on anti-GMO activists? Why else would the FBI go after activists of the occupy movement? Why else would NSA have surveillance over citizens and governments of the world as revealed by Snowden? Why else would governments and corporations impose seed laws to prohibit the use of local seeds and breeds which have been evolved by farmers and have been proven safe over millennia?

And the next generation of 'free trade agreements' give corporations the power to sue governments that protect their people. This is at the heart of the Trans-Pacific Partnership and the US-Europe Free Trade Agreement. Investment chapters in free trade agreements contain highly controversial provisions (dubbed 'investor-state dispute settlement', or ISDS) empowering an investor, i.e., a corporation, to sue the host state. This is not about trade any more. It is about totalitarian corporate rule which cannot co-exist with people's freedom.

We want freedoms for people, not corporations. We want

governments to regulate corporations that cause harm, and not police citizens through undemocratic seed and food laws whose only objective is to criminalise citizen freedoms in order to establish corporate totalitarianism over our seed and food.

To ensure that unjust laws do not destroy our last freedoms, we must remember Gandhi's call: 'As long as the superstition exists that unjust laws must be obeyed, so long will slavery exist.' And, there is only one way to defend freedom in the face of unjust laws – satyagraha – the Fight for Truth. We are being called on to practise seed satyagraha and food satyagraha to defend our everyday seed freedom and seed sovereignty, and food freedom and food democracy.

Patents on Seeds and Seed Monopolies

GMOs are intimately linked to seed patents. In fact, patenting of seeds is the real reason why industries are promoting GMOs. Monopolies over seeds are being established through patents, mergers and cross-licensing arrangements. Monsanto now controls the world's biggest seed company, Seminis, which has bought up Peto Seed, Bruinismo,

Table 1: World's Top Ten Seed Companies

SN	Company	2007 seed sales (USD million)	% of global proprietary seed market
1	Monsanto (USA)	4694	23
2	Dupont (USA)	3300	15
3	Sygenta (Switzerland)	2018	9
4	Groupe Linagrain (France)	1226	6
5	Land O'Lakes (USA)	917	4
6	KWS AG (Germany)	702	3
7	Bayer Crop (Germany)	524	2
8	Sahata (Japan)	396	< 2
9	DLF Trifolum (Denmark)	391	< 2
10	Takii (Japan)	347	< 2
	Top 10 Total	**14,785**	**67**

Source: http://www.etcgroup.org/sites/www.etcgroup.org/files/publication/707/01/etc_won_report_final_color.pdf.

Genecorp, Barhan, Horticere, Agroceres, Royal Suis, Choon Ang and Hungnong. (Other acquisitions and joint ventures of Monsanto are provided in the centrespread on pages 14 and 15). In addition, Monsanto has cross-licensing arrangements with BASF, Bayer, Dupont, Sygenta and Dow. They have agreements to share patented genetically engineered seed traits with each other. The giant seed corporations are not competing with each other; they are competing with peasants and farmers over the control of the seed supply.

The combination of patents, genetic contamination, and spread of monocultures means that society is rapidly losing its seed freedom and food freedom. Farmers are losing their freedom to have seed and grow organic food, free of the threat of contamination by GE crops. Citizens are losing their freedom to know what they are eating, and to have the choice to eat GE-free food.

Monsanto does not just control the seed through patents. It also spreads its control through contamination. After spreading genetic contamination, Monsanto sues farmers as 'intellectual property thieves' as it did in the case of Percy Schmeiser.[4] That is why a case has been brought against Monsanto by a coalition of more than 80 groups to stop it from suing farmers after polluting their crops.[5]

GMOs and Seeds of Suicide

The announcement on Monsanto India's website declares: 'Monsanto is an agricultural company. We apply innovation and technology to help farmers around the world produce more while conserving more… producing more, conserving more, improving lives.' All the pictures are of smiling prosperous farmers from the state of Maharashtra. However, the reality on the ground is completely different. Farmers who have become dependent on Monsanto's seed monopoly are in debt, and in deep distress. Most of the farmers who have committed suicide in India due to being trapped in debt are from the cotton belt,

4 Schmeiser became famous for his long legal battle with Monsanto, and was the subject of the 2009 film *David Versus Monsanto*.

5 http://www.pubpat.org/assets/files/seed/OSGATA-v-Monsanto-Complaint.pdf.

which has become a suicide belt. It is also notable that, contrary to what the pictures on their websites depict, the highest number of suicides is also in Maharashtra. Monsanto's talk of 'technology' tries to hide its real objectives of ownership and control over seed where genetic engineering is just a means to control seed and the food system through patents and intellectual property rights.

The objective of the patents on life sections in the TRIPS agreement of the WTO was to stop farmers from saving seeds and exercising their seed sovereignty. Monsanto has gone very far down the road in destroying biodiversity and farmers' seed sovereignty. It is now extending its patents to conventionally bred seed, as in the case of broccoli and capsicum, or the low gluten wheat it had pirated from India and which we challenged as a case of biopiracy in the European Patent Office.[6]

Over the last decade, an epidemic of farmers' suicides has spread across four states of India—Maharashtra, Andhra Pradesh, Karnataka and Punjab. According to official data, more than 280,000 farmers have committed suicide in India since 1995. The suicides are most frequent where farmers grow cotton and have been a direct result of the creation of seed monopolies. Increasingly, the supply of cotton seeds has slipped out of the hands of the farmers and the public system and into the hands of global seed corporations like Monsanto.

The entry of seed MNCs was part of the globalisation process. Corporate seed supply implies a number of shifts simultaneously. Firstly, giant corporations start to control local seed companies through buyouts, joint ventures and licensing arrangements, leading to a seed monopoly. The entry of Monsanto in the Indian seed sector was made possible by the 1988 Seed Policy imposed by the World Bank, requiring the Government of India to deregulate the seed sector. Indian companies were locked into joint ventures and licensing arrangements, and concentration over the seed sector increased. In the case of cotton, Monsanto now controls 95 per cent of the cotton seed market through its GMOs and seed prices have

6 http://www.no-patents-on-seeds.org/en/information/background/green-light-for-patents-on-plants-and-animals.

jumped 8000 per cent in the past decade. In 2006, India's anti-trust court, the Monopoly and Restrictive Trade Practices Commission, was forced to rule against Monsanto.

Secondly, seed is transformed from being a common good to being the 'intellectual property' of Monsanto, for which the corporation can claim limitless profits through royalty payments. For the farmer, this means deeper debt.

Thirdly, seed is transformed from a renewable, regenerative and multiplicative resource into a non-renewable resource and commodity. Seed scarcity and seed farmers are a consequence of seed monopolies, which are based on renewability of seed, beginning with hybrids, moving to genetically engineered seed like Bt cotton[7], with the ultimate aim of the 'terminator' seed which is engineered for sterility. Each of these technologies of non-renewability is guided by one factor alone – forcing farmers to buy seeds every planting season. For farmers, this means higher costs. For seed corporations, it translates into higher profits.

Fourthly, cotton, which had earlier been grown as a mixture with food crops, now has to be grown as a monoculture, with higher vulnerability to pests, disease, drought and crop failure.

Fifthly, Monsanto started to subvert India's regulatory processes, and, in fact, started to use public resources to push its non-renewable hybrids and GMOs through so-called public-private partnerships (PPP). The field data of Bt cotton is also manipulated to show that cotton yields are low in the pre-Bt cotton years while not mentioning that cotton has traditionally been grown as a mixed crop and not as a monoculture. Converting biodiversity to monocultures of course leads to increase in 'yield' of the monoculture, but this is accompanied by a decline in production at the biodiversity level.

Sixthly, the creation of seed monopolies is based on the simultaneous deregulation of seed corporations, including biosafety and seed deregulation, and super-regulation of farmers' seeds and

7 Bt cotton is a GM variety of cotton containing the genetically engineered bacterium gene, *Bacillus thuringiensis*, that produces natural toxins against some insects.

varieties. Globalisation allowed seed companies to sell self-certified seeds, and in the case of genetically engineered seed, they are seeking self-regulation for biosafety. This is the main aim of the recently proposed Biotechnology Regulatory Authority of India Bill, which I have named the Monsanto Protection Act, and is, in effect, a Biosafety Deregulation Authority. The proposed Seed Bill 2004, which has been blocked by a massive nationwide Gandhian Seed Satyagraha by farmers, aimed at forcing every farmer to register the varieties they have evolved over millennia. Although this compulsory registration and licensing system robs farmers of their fundamental freedoms, such laws are being introduced in every country.

The creation of seed monopolies and, with it, the creation of unpayable debt to a new species of money lender – the agents of the seed and chemical companies – has led to hundreds of thousands of Indian farmers killing themselves since 1997. The creation of seed monopolies, the destruction of alternatives, the collection of super-profits in the form of royalties, and the increasing vulnerability of monocultures has created a context for debt, suicides and agrarian distress.

I have always been critical of reductionism. I look at systems, and at contextual causation. It is this system that Monsanto has created, of seed monopoly, crop monocultures and a context of debt, dependency and distress, which is driving the farmers' suicide epidemic in India. This systemic control has been intensified with Bt cotton. That is why most suicides are in the cotton belt.

The suicides first started in the district of Warangal in Andhra Pradesh. Peasants in Warangal used to grow millets, pulses and oilseeds. Overnight, Warangal was converted into a cotton-growing district based on non-renewable hybrids, which need irrigation and are prone to pest attacks. The technology of engineering Bt genes into cotton was aimed primarily at controlling pests. However, new pests have emerged in Bt cotton, leading to higher use of pesticides. In the Vidharbha region of Maharashtra, which has the highest number of suicides, the area under Bt cotton increased from 0.200 million ha in 2004 to 2.880 million ha in 2007. The cost of pesticides

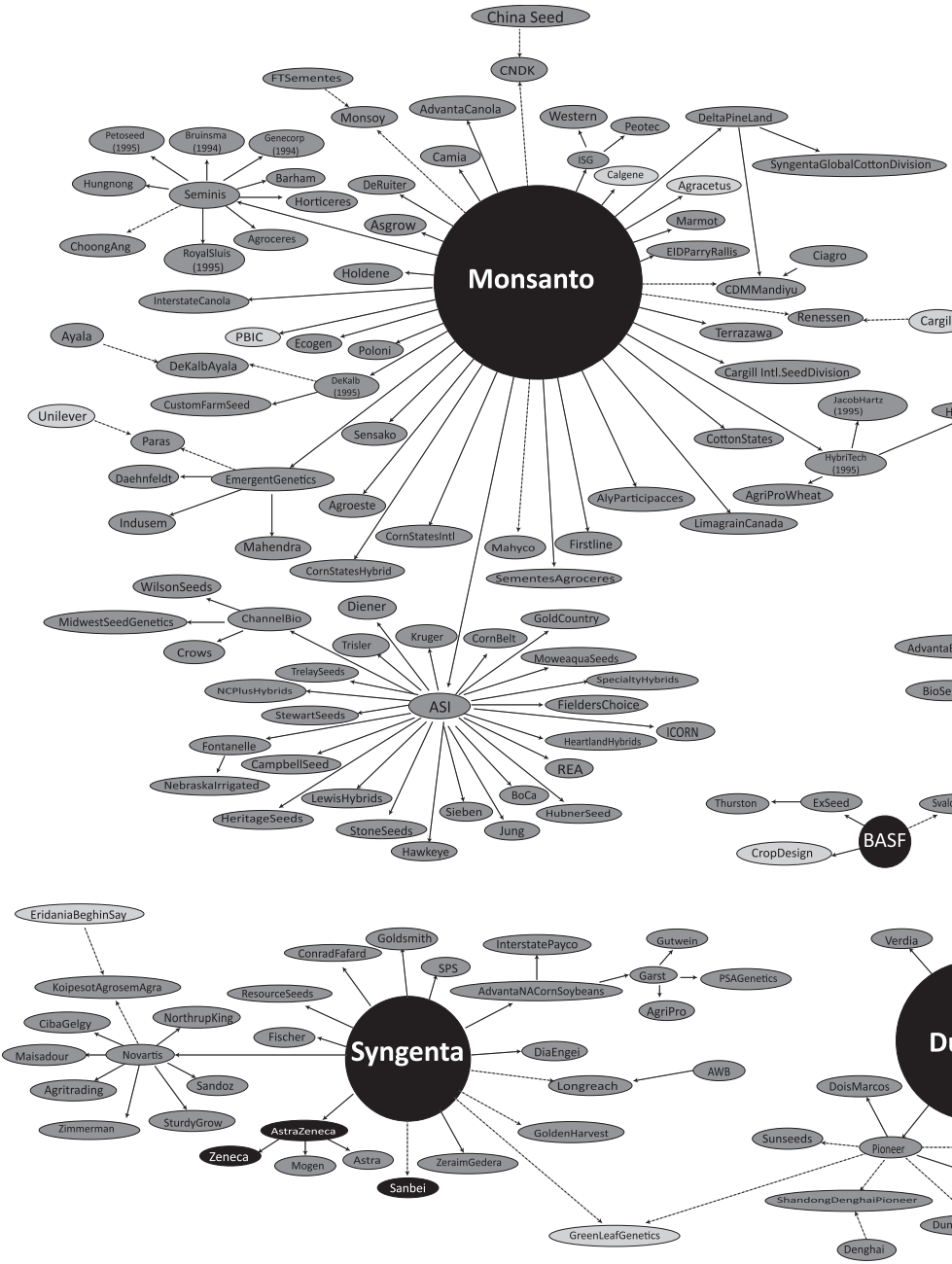
for farmers increased from INR 921 million to INR 13,264 billion in the same period, a 13-fold increase. A pest-control technology that fails to control pests might be good for seed corporations which are also agrichemical corporations. But for farmers, it translates into suicide.

Monsanto was forced to reduce the price of its Bt cotton seeds after the Government of Andhra Pradesh filed a case with the Monopoly and Restrictive Trade Practices Commission, arguing that Monsanto's seed monopolies were the primary cause of farmers' suicides in the state. It is not only the high cost of seeds and other inputs for there is also the falling prices of cotton, resulting from the USD 4 billion subsidy by the US government to its cotton farmers, and the dumping of this subsidised cotton on India by using the WTO to force India to remove quantitative restrictions on agricultural imports. Rising costs of production and falling prices of the product is a recipe for indebtedness, the main cause of farmer suicides. Since farmers' suicides are most prevalent in the cotton belt, Bt cotton is heavily implicated in these deaths.

Monsanto and its PR men are trying desperately to delink the epidemic of farmers' suicides in India from its growing control over the cotton seed supply. For us, it is the control over seed, the first link in the food chain, the source of life, which is our biggest concern. When a corporation controls seed, it controls life, including the life of our farmers.

The trend of Monsanto's concentrated control of the seed sector in India and across the world is the central issue. This is what connects the farmers' suicides in India to Monsanto vs Percy Schmeiser in Canada, to Monsanto vs Bowman in the US, and to farmers in Brazil suing Monsanto for USD 2.2 billion for unfair collection of royalty. Through patents on seed, Monsanto has become the 'Life Lord' on the planet, collecting rents for life's renewal from farmers, the original breeders. Patents on seed are illegitimate because putting a toxic gene into a plant cell is not the 'creation' or invention of the plant. They are seeds of deception—the deception of Monsanto being the creator of seeds and life, the deception that while it sues farmers and

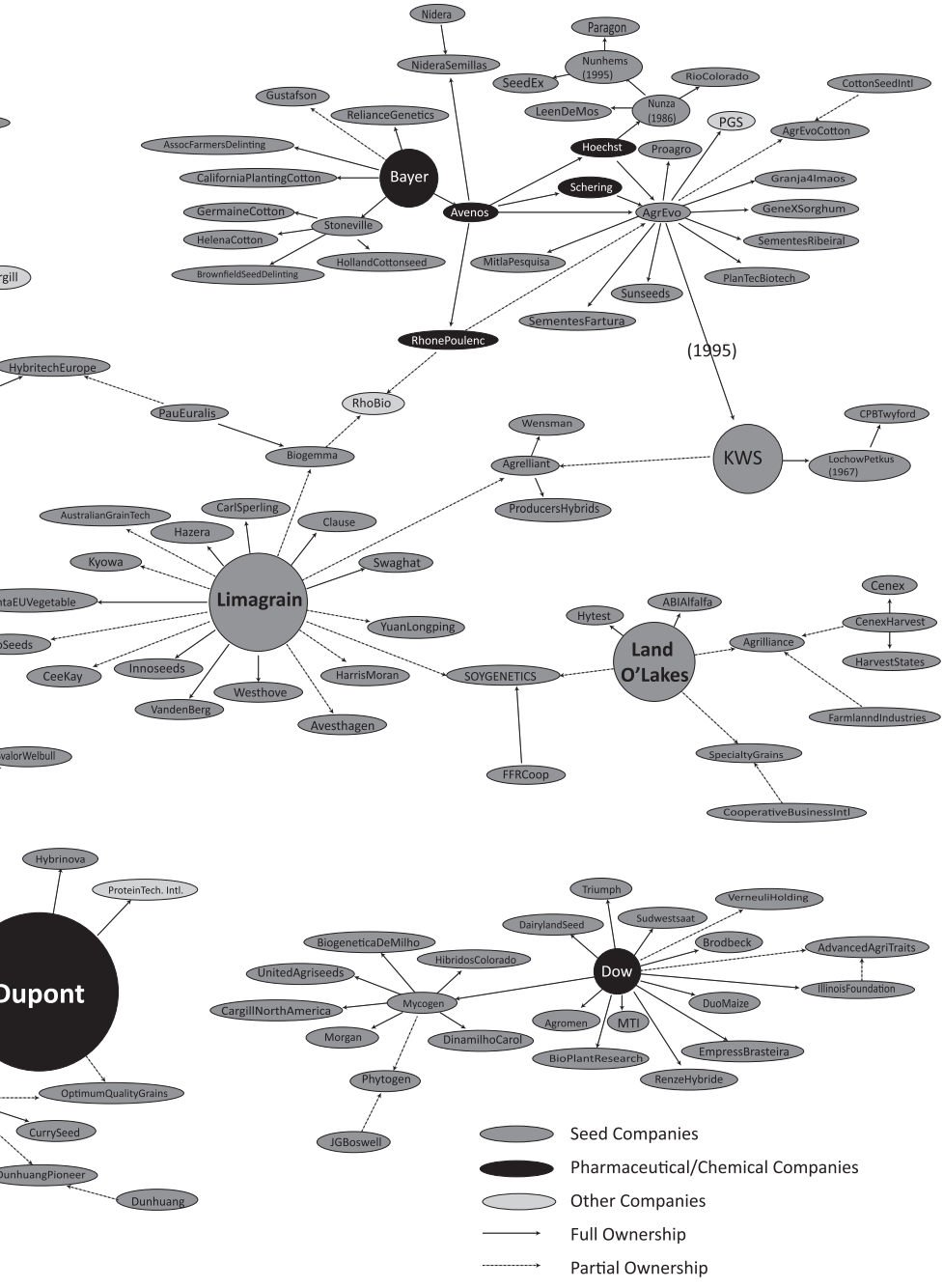
Fig 1: Seed industry st



◯ Size proportional to global seed market share

Source: Philip H. Howard, 'Visualizing Consolidation in the Global Seed Industry: 1996–2008', *Sustainabilit*

structure, 1996-2008



lity, 1, pp. 1266-1287, 2009, www.mdpi.com/journal/sustainability.

traps them in debt, it is working for farmers' welfare and 'improving lives', the deception that GMOs feed the world.

In 1995, Monsanto introduced its Bt technology in India through a joint venture with the Indian company Mahyco. In 1997-98, Monsanto started open field trials of its propriety GMO Bt cotton and announced it would be selling the seeds commercially the following year. All imports and field trials of GE organisms in India are governed by a law under the Environment Protection Act called the 'Rules for the Manufacture Use, Import, Export and Storage of Hazardous Microorganisms, Genetically Engineered Organisms or Cells 1989', making it mandatory to get approval from the Genetic Engineering Approval Committee under the Ministry of Environment for GMO trials. We – at the Research Foundation for Science, Technology and Ecology – used these laws to stop Monsanto's commercialisation of Bt cotton in 1999, which is why approval was not granted for commercial sales until 2002. But, it had started to change Indian agriculture before that.

Recently, Monsanto has indulged in publishing news articles that propagate lies and false claims about the yield and prosperity achieved by Bt cotton. One such article, 'Farmers Reaped Gold Through Bt Cotton' was published in the *Times of India* on 31 October, 2008, and repeated on 28 August, 2011. The article says, 'The switch over from conventional cotton to Bt cotton in the villages (Bhamraja and Antargaon) has led to social and economic transformation. There are no suicides and people are prospering in agriculture.'

But, a visit by Navdanya to Bhamraja and Antargaon had shown that no farmer had reaped gold through Bt cotton. Whatever little success some farmers had achieved, it was through some other sources. Although the news reports claimed that since the adoption of Bt cotton, there had been no suicide in Bhamraja, the villagers reported 14 farmers' suicides since the introduction of Bt cotton.

In another advertisement, Monsanto claimed that its Bt cotton seeds had helped create additional income of over INR 315 billion for six million cotton farmers by reducing pesticide use and increasing yield. The Advertising Standards Council of India (ASCI)

found the claims not substantiated by facts and figures, and asked Monsanto to drop the advertisement, which it agreed to. Faced with severe criticism of Bt cotton all over the world, Monsanto and other multinational seed companies are making desperate and futile attempts by funding articles, reports and reviews which promote Bt cotton and conceal the grim scenario of farmers' suicides and their indebtedness due to the failure of Bt cotton.

Earlier, too, the International Food Policy Research Institute (IFPRI), the International Service for the Acquisition of Agribiotech Applications (ISAAA), the Associated Chambers of Commerce and Industry (ASSOCHAM), and the Indian Market Research Bureau (IMRB) had published reports which were far from any truth. A report by IFPRI states: 'In specific regions and years, where Bt-cotton may have indirectly contributed to farmer indebtedness (via crop failure) leading to suicides, its failure was mainly the result of the context or environment in which it was introduced or planted; Bt-cotton as a technology is not to blame.'

This is an interesting argument. A technology is always developed in the context of local socio-economic and ecological conditions. A technology that is a misfit in a context is a failed technology for that context. You cannot blame the context to save a failed technology

More recently, an article entitled 'Case Studies: A Hard Look at GM Crops' by Natasha Gilbert published in *Nature*, dated 1 May, 2013 tried to deny links between farmers' suicides, GMOs and seed monopolies. Monsanto and other seed companies have also been making false propaganda that Bt cotton is not responsible for farmers' suicides in Vidarbha. To unravel the truth, Navdanya conducted a study in Vidarbha in February 2009, covering four districts—Yavatmal, Wardha, Amrawati and Washim. The study found that 84 per cent of farmer suicides were attributed to Bt cotton failure.

The highest acreage of Bt cotton in India is in the state of Maharashtra and that is also where the highest number of farm suicides occur. There were only 1083 farmer suicides in 1995 in the state but the number jumped more than three times to reach 3695 in 2002, coinciding with the year Monsanto introduced Bt cotton.

Table 2: Farmer suicides over the years in Vidarbha

Year	Number of suicides
2001	52
2002	104
2003	148
2004	447
2005	445
2006	1148
2007	1246
2008	1248
2009	916
2010	748
2011	916
2012	927

The scenario of Vidarbha is more grim, as shown in the Table above. There were only 52 farmer suicides in 2001 but the deaths have increased alarmingly since 2002.

The figures hide lives ruined as collateral damage. Every suicide destroys the lives of 8-9 people in a family. A simple calculation shows that during 2002-2011, the lives of 55,000-65,000 people were affected due to farmers' suicides in Vidarbha. The stories of surviving members are tragic. With the husband's death, a new vicious cycle of debt is set in motion, the widows inherit their husbands' debts and work round the clock to pay back as well as to make the ends meet.

The recent situation is worse in Maharashtra and Andhra Pradesh, both major cotton-producing states with more than 95 per cent of the acreage covered by Bt cotton. In Maharashtra, farmers' suicides jumped sharply to 3786 in 2012 from 3337 in 2011, an increase of 449, the worst annual increase in comparison to the previous seven years. Andhra Pradesh also witnessed an upward trend, from 2206 in 2011 to 2572 in 2012, 366 more than the last year.

Recent data for the year 2012, released by National Crime Records Bureau (NCRB), presents a more worrying scenario of farmers'

suicide in the country. The figures for the 17 years from 1995 to 2012 show that at least 284,694 farmers have committed suicide in India.

Monsanto's royalty extraction and the high cost of purchased seed and chemicals have created a debt trap. According to Government of India data, nearly 75 per cent of rural debt is due to purchased inputs. Farmers' debt grows as Monsanto's profits grow. It is in this systemic sense that Monsanto's seeds are seeds of suicide. An internal advisory by the Agriculture Ministry of India in January of 2012 had this to say to the cotton-growing states in India: 'Cotton farmers are in a deep crisis since shifting to Bt cotton. The spate of farmer suicides in 2011-12 has been particularly severe among Bt cotton farmers.'[8]

GMOs and Gyan Swaraj: Knowledge Sovereignty in Times of Globalisation

'Golden rice to remove vitamin A deficiency and end blindness', and 'iron-enriched GMO bananas to prevent Indian women from dying during childbirth from iron-deficiency anemia' are two of the nutritional promises of genetic engineering. Biofortification through genetic engineering is the big push. They undermine Gyan Swaraj, Bija Swaraj and Anna Swaraj by creating seed monopolies and food monopolies through knowledge monopolies, and eclipse the traditional knowledge which is far more effective in addressing vitamin A and iron deficiency.

Nature has given us a cornucopia of biodiversity, rich in nutrients. Malnutrition and nutrient deficiency results from destroying biodiversity, and, with it, rich sources of nutrition. The Green Revolution has spread monocultures of chemical rice and wheat, driving out biodiversity from our farms and diets. And what survived as spontaneous crops like the amaranth greens and chenopodium, which are rich in iron, were sprayed with poisons and herbicides. Instead of being seen as iron-rich and vitamin-rich gifts, they were treated as 'weeds'. A Monsanto representative once said that genetically engineered crops resistant to their proprietary herbicide Roundup

8 http://www.hindustantimes.com/business-news/ministry-blames-bt-cotton-for-farmer-suicides/article1-830798.aspx.

killed the weeds that 'steal the sunshine'. And their Roundup ads in India tell women to 'Liberate Yourself, Use Roundup'. This is not a recipe for liberation, but for being trapped in malnutrition.

A blind approach to blindness prevention

Genetically engineered vitamin A rice has been proclaimed as a miracle cure for blindness—'a break-through in efforts to improve the health of billions of poor people, most of them in Asia'. The rice is being promoted as a cure for blindness since vitamin A deficiency causes vision impairment and can lead to blindness. According to the UN, more than 2 million children are at risk due to vitamin A deficiency.

More than USD 100 million has been spent over 10 years to produce transgenic rice at the Institute of Plant Sciences at the Swiss Federal Institute of Technology in Zurich. The Zurich research team introduced three genes taken from a daffodil and a bacterium into a rice strain to produce yellow rice with high levels of beta-carotene, which is converted to vitamin A within the body. Their work was funded by grants from the Rockfeller Foundation, the agency which had launched chemical agriculture in Asia through the Green Revolution, which in turn led to erosion of biodiversity and erosion of diverse sources of nutrition for the poor. The Swiss Government and the European Community have also supported the research.

It will, however, take millions more in dollars and another decade of development work at the International Rice Research Institute (IRRI) to produce vitamin A rice varieties that can be grown in farmers' fields. Is the 'golden' rice a miracle that is the only means to prevent blindness in Asia or will it introduce new ecological problems like the Green Revolution did and create new health hazards like other genetically engineered foods?

The genetic engineering of vitamin A rice deepens the genetic reductionism of the Green Revolution. Instead of millions of farmers breeding and growing thousands of crop varieties to adapt to diverse ecosystems and diverse food systems, the Green Revolution reduced

agriculture to a few varieties of a few crops (mainly rice, wheat and maize) bred in one centralised research centre (IRRI for rice and the International Maize and Wheat Improvement Center [CIMMYT] for wheat and maize).

The Green Revolution led to massive genetic erosion in farmers' fields and knowledge, erosion among farming communities, besides leading to large-scale environmental pollution due to the use of toxic agri-chemicals and wasteful use of water. Genetically engineered rice as part of the second Green Revolution is repeating the mistakes of the Green Revolution while adding new hazards in terms of ecological and health risks. The 'selling' of vitamin A rice as a miracle cure for blindness is based on blindness to alternatives for removing vitamin A deficiency and blindness to the unknown risks of producing vitamin A through genetic engineering.[9]

Eclipsing alternatives

The first deficiency of the genetic engineering of rice to produce vitamin A is the eclipsing of alternative sources of vitamin A. According to Pinstrup Anderson, Head of the IRRI, vitamin A rice is necessary for the poor in Asia because 'we cannot reach very many of the malnourished in the world with pills'. However, there are many alternatives to pills for vitamin A supply. Vitamin A can be found in liver, egg yolk, chicken, meat, milk and butter. Beta-carotene, the vitamin A precursor, is provided by dark green leafy vegetables, spinach, carrot, pumpkin, mango and drumstick. Women farmers in Bengal use more than 100 plants for green leafy vegetables.

A far more efficient route to removing vitamin A deficiency is biodiversity conservation and propagation of naturally vitamin A rich plants in agriculture and diets. The table below gives sources rich in vitamin A used commonly in Indian foods.

The lower cost, accessible, and safer alternative to genetically engineered rice is to increase biodiversity in agriculture. Since those who suffer from vitamin A deficiency suffer from malnutrition,

9 See more at http://www.indiatogether.org/reports/goldenrice/science3.htm#sthash.ZVoLVpwd.dpuf.

increasing food security and nutritional security of the poor through increasing the diversity of crops and diversity of diets of poor people (who suffer the highest rates of deficiency) is a more reliable means of overcoming nutritional deficiencies.

Table 3: Sources rich in vitamin A used commonly in Indian foods

Source	Content (microgram/100g)
Amaranth leaves	266-1166
Coriander leaves	1166-1333
Cabbage	217
Curry leaves	1333
Drumstick leaves	1283
Fenugreek leaves	450
Radish leaves	750
Mint	300
Spinach	600
Carrot	217-434
Pumpkin (yellow)	100-120
Mango (ripe)	500
Jackfruit	54
Orange	35
Tomato (ripe)	32
Milk (cow, buffalo)	50-60
Butter	720-1200
Egg (hen)	300-400
Liver (goat, sheep)	6600-10,000
Cod liver oil	10,000-100,000

Environmental costs of vitamin A rice

Vitamin A from native greens and fruits is produced without irrigation and wastage of scarce water resources. Introducing vitamin A in rice implies a shift from water-conserving alternatives to a water-intensive system of production, since the so-called high-

yielding rice varieties are highly water-demanding. Vitamin A rice will, therefore, lead to mining of ground water or intensive irrigation from large dams with all the associated environmental problems of water-logging and salinisation.

Further, as in the case of other genetically engineered crops, rice with vitamin A will have an impact on the food web. The ecological impact on soil organisms and other organisms dependent on rice in the food chain should be part of the biosafety analysis of genetically engineered rice before it is released for production. Research has already shown that indigenous rice varieties support far more species than Green Revolution varieties. How will genetically engineered rice impact biodiversity and the potential for disease and pest vulnerability?

Health risks of vitamin A rice

Since rice is a staple eaten in large quantities in Asian societies, vitamin A rice could lead to excessive intake of vitamin A, especially among those who do not suffer from vitamin A deficiency. Excess vitamin A can lead to hypervitaminosis A, or vitamin A toxicity, which may cause abdominal pain, nausea, vomiting, dizziness, popillidena and bulging fontanelle.[10] Such toxicity is known to occur as a side effect of an inappropriate therapy, due to food faddism by over-solicitous parents or because of over-ingestion of vitamin A-rich food for protracted periods.

Natural sources of vitamin A are consumed seasonally and in small quantities as greens, relishes and fruits, and hence do not carry the risks of vitamin A toxicity. Rice-eating regions have been found to be associated with higher malnutrition than wheat-eating regions, especially after the Green Revolution, which destroyed fish and plant biodiversity necessary for a balanced diet. These regions also have higher prevalence of water-borne diarrhoea, amoebiasis hepatitis A and E, dysentery, and vector-borne diseases like malaria,

10 Chronic toxicity of vitamin A is characterised by bone and joint pain, hyperotosis, hair loss, dryness and fissures of lips, nausea intraeranial hypertension, low grade fever, pruritis, weight loss, and hepatosplenomegaly.

which is increasingly becoming falciparum malaria unlike in earlier years when it was a less hazardous form of plasmodium vivax. These health problems are known to involve damage to the liver. The additional risks of vitamin A under these vulnerable health conditions of the poor in Asia need to be assessed with care before a large-scale push is given to genetically engineered rice.

Further, the globalisation of agriculture is leading to an increase in malnutrition in the Third World as the most fertile ecosystems are diverted to luxury export crops, and as domestic markets are destroyed due to dumping of subsidised agricultural commodities. In India, the per capita consumption of cereals has declined by 12 per cent in rural areas over the past two decades. The shift from policies based on the 'right to food' to free trade policies will push millions into hunger and poverty.

Genetically engineered rice is part of a package of globalised agriculture which is creating malnutrition. It cannot solve the problems of nutritional deficiency but it can introduce new risks of food safety. Since the vitamin A in rice is not naturally occurring and is genetically engineered, novel health risks posed by vitamin A rice will need to be investigated before the rice is promoted or commercialised.

The risk assessment for living modified organisms intended for direct use as feed is given in Annexe II of the recently finalised Biosafety Protocol under the Convention on Biological Diversity. The risk assessment of vitamin A rice should therefore consist of:

- An identification of any novel genotypic and phenotypic characteristics associated with the vitamin A rice that may have an adverse effect on biological diversity in the likely potential receiving environment, taking also into account risks to human health.
- An evaluation of the likelihood of these adverse effects being realised taking into account the level and kind of exposure of the likely potential receiving environment.
- An evaluation of the consequences should these adverse effects be realised. The risk assessment also needs to take into account

the vectors used, the insects, the ecological differences between transgenic vitamin A rice, and conventional rice varieties. The diverse contexts in which the rice is to be potentially introduced also need to be taken into account. This includes information on the location, geographical, climatic and ecological characteristics, including relevant information on biological diversity and centres of origin of the likely potential receiving environment.

It is these potential risks which have put a question mark on genetic engineering in agriculture. The genetically engineered vitamin A rice is now being used as a Trojan horse to push genetically engineered crops and foods.

GMOs bananas for iron deficiency

As the 'monoculture of the mind' took over, biodiversity disappeared from our farms and our food. The destruction of biodiverse rich cultivation and diets has given us the malnutrition crisis, with 75 per cent of women now suffering from iron deficiency.

Our indigenous biodiversity offers rich sources of iron. Amaranth has 11.0 mg per 100 gm of food, buckwheat has 15.5, neem has 25.3, bajra has 8.0, rice bran 35.0, rice flakes 20.0, bengal gram (roasted) 9.5, Bengal gram leaves 23.8, cowpea 8.6, horse gram 6.77, amaranth greens 38.5, karonda 39.1, lotus stem 60.6, coconut meal 69.4, niger seeds 56.7, cloves 11.7, cumin seeds 11.7, mace 12.3, mango powder (amchur) 45.2, pippali 62.1, poppy seeds 15.9, tamarind pulp 17.0, turmeric 67.8, raisins 7.7...

Bananas only have 0.44 mg of iron per 100 grams of edible portion. All the effort to increase the iron content of bananas will fall short of the iron content of our indigenous biodiversity. GMO bananas will be 3000% less efficient than biodiversity alternatives in reducing iron deficiency anemia in Indian women.

The solution to malnutrition lies in growing nutrition, and growing nutrition means growing biodiversity. It means recognising the knowledge of biodiversity and nutrition among millions of Indian

women who have received it over generations as 'grandmothers knowledge'. In order to remove iron deficiency, iron-rich plants should be grown everywhere, on farms, in kitchen gardens, in community gardens, in school gardens, on rooftops, in balconies. Iron deficiency was not created by nature. And, we can get rid of it by becoming co-creators and co-producers with nature.

But there is a 'creation myth' that is blind to nature's creativity and biodiversity, and to the creativity, intelligence and knowledge of women. According to this 'creation myth' of capitalist patriarchy, rich and powerful men are the 'creators'. They can own life through patents and intellectual property. They can tinker with nature's complex evolution over millennia, and claim their trivial yet destructive acts of gene manipulation 'create' life, 'create' food, 'create' nutrition. In the case of GM bananas, it is one rich man, Bill Gates, financing one Australian scientist, James Dale, who knows one crop, the banana, to impose inefficient and hazardous GM bananas on millions of people in India and Uganda who have grown hundreds of banana varieties over thousands of years in addition to thousands of other crops.

The project is a waste of money, and a waste of time. It will take 10 years and millions of dollars to complete the research. But in the meantime, governments, research agencies and scientists will become blind to biodiversity-based, low-cost, safe, time-tested, democratic alternatives in the hands of people, especially women.

Junk Food Nation

On her recent visit to India, the CEO of Pepsico, Indira Nooyi, announced how Pepsico had created 200,000 jobs and was going to double investment in India. In a land rich with diversity of indigenous soft drinks like panna, nimbu pani, sattu, bel, jal jeera... and countless healthy snacks, Pepsi's entry has not created jobs, it has destroyed livelihoods in the cottage industry and the artisanal processing sector. For example, 50,000 women in Bikaner used to make hand-made Bikaneri bhujia. Today, Pepsico makes industrially processed Bikaneri bhujia, and 50,000 women's livelihoods have

been destroyed. If one adds all the livelihoods lost by the destruction of indigenous soft drinks and snacks, we are talking of millions displaced and thrown into the ocean of unemployment. This is why in Navdanya we have created a network for food sovereignty in women's hands – Mahila Anna Swaraj – to protect and rejuvenate livelihoods in artisanal processing of healthy and nutritious foods.

With annualised revenues of USD 60 billion, PepsiCo holds the world's largest portfolio of billion-dollar food and beverage brands, including 19 different product lines—Frito-Lay, Quaker, Pepsi Cola, Tropicana and Gatorade. Pepsico describes these as 'nourishing, tasty foods and drinks that bring joy to our consumers in more than 200 countries'. These snack foods and soft drinks are also called 'junk foods'. The impact of a junk food diet on public health is well known. Today 25 per cent of the school children in Delhi suffer from obesity. Many have adult onset diabetes. Globally, 2 billion people are victims of diseases linked to the junk food industry.

Pepsico entered India in 1989 during the Punjab crisis. In the 1980s, Punjab was a land of violence and extremism, even though Norman Borlaug, founder of the Green Revolution there, had received the Nobel Peace Prize for introducing chemicals in agriculture, and seeds that could respond to chemicals. Pepsico announced its entry in Punjab as Pepsico for Peace. It was going to replace rice and wheat with tomatoes and potatoes. The tomatoes were processed into paste at the Zahura plant in Hoshiarpur district. The paste was exported to Japan, and to Pizza Hut in USA. In any case, since the tomatoes were bred for long-distance transport and industrial processing, the skin was too hard for domestic use in cooking.

Pepsi gave the seedlings to Punjab farmers as a loan, sold pesticides and fertilisers at a high price. It paid the farmers INR 0.80 per kg of tomatoes in 1993, while the market rate was INR 2. When the cost of seedlings and chemicals are subtracted from the price farmers sell the tomatoes at, the farmers were left with nothing. In 1994, the Hoshiarpur mandis were piled with tomatoes no one wanted, and the price dropped to INR 0.50 per kg. By 1996, the Pepsi experiment had totally failed in Punjab.

The potatoes were for Lay's chips

Pepsi tied up with the Tata subsidiary, Voltas, which would take up the responsibility for distributing potato chips and bottling the Pepsi range of soft drinks in Western India. Tata ran losses of up to INR 720 million and packed up the joint venture. Pepsi has since then spread to other parts of India, especially West Bengal, where some of the south Bengal districts, namely, Hooghly, Burdwan, Birbhum, West Midnapore, Howrah and Bankura, are becoming potato districts. PepsiCo India, which began contract farming in West Bengal with just 800 farmers in 2004, now has some 6500 farmers growing potatoes for it on 2250 acres.

Pepsico makes super-profits at three levels. First, it is creating a seed monopoly in potato. It sells high-cost, proprietary seeds and seedlings to farmers and collects royalties. By 2017, 80 per cent of PepsiCo crisps will be made from new, proprietary potato varieties. Pepsico is seeking control over potato biodiversity and has invested in the Agricultural Development Center of Peru (CEDAP). Peru is the centre of diversity of potatoes. Pepsi is already using native Andean potatoes for Lay's Andinas and the yellow potato for Lay's Peruanisimas.

Secondly, by creating a monopoly through monocultures, Pepsico pushes farmers into distress and can buy cheap potatoes.

Thirdly, it sells chips made from cheap potatoes at high cost. As in the case of Bt cotton, Pepsico's potatoes are pushing farmers into a debt trap and suicides. Between October 2011 and March 2012, 34 farmers committed suicide in the state of West Bengal. Many of the suicides are among potato farmers. As farmers are encouraged to grow potaoes, there is overproduction and a crash in prices. In 2012, the price had crashed to INR 0.20 per kg.[11]

While farmers' incomes fall, Pepsico's profits rise. When potatoes are selling at INR 0.20 per kg, the industry sells chips at INR 20 per packet of 90 gm, i.e., around INR 220 per kg. Farmers are receiving 0.1% of what you pay Pepsi for a packet of Lay's chips. This is a

11 www.pragoti.in/node/4628.

transfer of billions of rupees from farmers to corporations. Agrarian distress and corporate profits, therefore, have an intimate link.

'Our crop is perishing in the fields for the last 20 days as potatoes do not survive this scorching sun for even two weeks,' said Arati Chakraborty, who mortgaged her two *bighas* of land to money-lenders to borrow INR 30,000 at the beginning of the cropping season. Potato farming is now pushing farmers to suicide. A farmer in Gill Kalan village spent INR 240,000 on costs of cultivation, and had to sell one acre of land to make up for the losses of INR 100,000. Bhagwan Singh, a potato farmer from Nadao village in Agra district, committed suicide due to the rising costs of production and falling prices of potatoes.

The ecological impact of the junk food industry is also everywhere. The non-biodegradable plastic water bottles, soft drink bottles, and aluminium packets are littering our landscape. We are well on our way to becoming a junk food nation.

Before we totally trash our farmers, our health, and our environment, let us change course. Let us shift to our biodiversity and our diversity of foods that bring us health and enrich our culture, our diet, our land and society. Let us create Bija Swaraj, Anna Swaraj, Gyan Swaraj to defend our fundamental freedoms in times of Globalisation and Free Trade.

The **Mahesh Chandra Regmi Lectures** from the previous years can be downloaded from www.soscbaha.org.

2012 André Béteille – **Varieties of Democracy**

2011 James F. Fisher – **Globalisation in Nepal: Theory and Practice**

2010 Elinor Ostrom – **Institutions and Resources**

2009 Romila Thapar – **The Vaṃśāvalī from Chamba: Reflections of a Historical Tradition**

2008 David Ludden – **Where Is the Revolution? Towards a Post-National Politics of Social Justice**

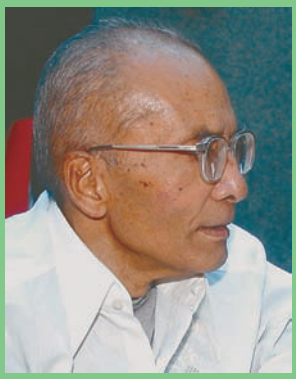
2007 Ashis Nandy – **The Return of the Sacred: The Language of Religion and the Fear of Democracy in a Post-Secular World**

2006 Michael Oppitz – **Close-up and Wide-Angle: On Comparative Ethnography in the Himalaya and Beyond**

2005 Gérard Toffin – **From Caste to Kin: The Role of Guthis in Newar Society and Culture**

2004 Kumar Pradhan – **दार्जीलिङमा नेपाली जाति र जनजातीय चिनारीका नयाँ अडानहरू**

2003 Harka Gurung – **Trident and Thunderbolt: Cultural Dynamics in Nepalese Politics**



Mahesh Chandra Regmi
(1929-2003)

The Mahesh Chandra Regmi Lecture was instituted by the Social Science Baha in 2003 to acknowledge and honour historian Mahesh Chandra Regmi's contribution to the social sciences in Nepal. The 2013 Mahesh Chandra Regmi Lecture was delivered by renowned environmentalist **Vandana Shiva**.

Dr Shiva was a recipient of the 1993 Right Livelihood Award (also referred to as the 'Alternative Nobel Peace Prize'). Her contribution to diverse fields such as intellectual property rights, biodiversity, biotechnology, bioethics and genetic engineering has been two-fold: intellectual and through activist campaigns. She has played a major role in the global ecofeminist movement. She was a founding board member of the Women's Environment & Development Organization (WEDO) and also of of the International Forum on Globalization (IFG). She founded Navdanya, an organisation she founded to work in rejuvenating indigenous knowledge and culture.

Dr Shiva has written extensively on a variety of environment issues. Her recent publications include books such as *Making Peace with the Earth: Beyond Resource, Land and Food Wars* (2012), *Staying Alive: Women, Ecology, and Development* (2010), and *Soil Not Oil: Environmental Justice in an Age of Climate Crisis* (2008).

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