

A stylized, black and white graphic of a leafy branch, possibly representing a seedling or a plant, is positioned on the left side of the cover. The leaves are elongated and pointed, with a central vein. The branch curves downwards and then back up towards the right.

The International Commission
on the Future of Food and Agriculture

MANIFESTO

ON THE FUTURE
OF SEEDS

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The International Commission on the Future of Food and Agriculture

Introduction:

MANIFESTO ON THE FUTURE OF SEEDS

Produced by The International Commission on the Future of Food and Agriculture
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In 2003, the International Commission On The Future of Food published and disseminated The Manifesto of the Future of Food:

(www.ARSIA.TOSCANA.IT/CIBO/INDEX.HTM and

www.FUTUREFOOD.ORG). It laid out practical steps and far-reaching concepts

toward ensuring that food and agriculture become more socially and ecologically

sustainable and strengthen the movement toward a more equitable and caring

world. Translated into different languages, it has been widely disseminated to

individuals and organizations, as well as at various conferences and gatherings

including the WTO ministerial in Cancun, Mexico in 2003 and adopted by

different communities throughout the world. The principals contained in the

Manifesto on the Future of Food led to the imperative of addressing seeds and

related issues as a matter of emergency. Thus the International Commission on the

Future of Food has prepared the present Manifesto on the Future of Seed, with the

support and active participation of the government of the region of Tuscany and

through the Global Stakeholder Consultation at Terra Madre in Turin. We hope

this manifesto serves to strengthen and accelerate the movement toward

sustainable agriculture, food sovereignty, biodiversity, and agriculture diversity,

help defend the rights of farmers to save, share, use and improve seeds, and

enhance our collective capacity to adapt to the hazards and uncertainties of

environmental and economic change. We urge people and communities to use it

as appropriate to their needs and as a tool to unify and strengthen the call to

counter the threat to seed and biodiversity imposed by industrial agriculture and

multi-national corporate interests.

PART ONE DIVERSITY OF LIFE AND CULTURES UNDER THREAT

Seeds are a gift of nature, of past generations and diverse cultures. As such it is our inherent duty and responsibility to protect them and to pass them on to future generations. Seeds are the first link in the food chain, and the embodiment of biological and cultural diversity, and the repository of life's future evolution. Since the onset of the Neolithic Revolution some 10,000 years ago, farmers and communities have worked to improve yield, taste, nutritional and other qualities of seeds. They have expanded and passed on knowledge about health impacts and healing properties of plants as well as about the peculiar growing habits of plants and interaction with other plants and animals, soil and water. Rare initial events of hybridization have boosted larger scale cultivation of certain crops in their Centers of Origin (such as wheat in Mesopotamia, rice in Indochina and India, maize and potato in Central America), which have since spread around the globe. The free exchange of seed among farmers has been the basis to maintaining biodiversity as well as food security. This exchange is based on cooperation and reciprocity, where farmers generally exchange equal quantities of seed. This freedom goes beyond the mere exchange of seed: it also involves the sharing and exchange of ideas and knowledge, of culture and heritage. This tradition and accumulation of knowledge and know-how on working the seed is gained by farmers actually watching the seed grow in each other's fields. The cultural and religious significance of the plant, its gastronomic values, drought, disease and pest resistance properties, and other values shape the knowledge that the community accords to the seed and the plant it produces. Today the diversity and future of seed is under threat. Of 80,000 edible plants used for food, only about 150 are being cultivated, and just eight are traded globally. This implies the irreversible disappearance of seed and crop diversity. The erosion of diversity has been propelled by the drive for homogenization in industrial agriculture. The freedom of seed and freedom of farmers are threatened by new property rights and new technologies which are transforming seed from a commons shared by farmers to a commodity under the central monopoly of corporations. Similarly, the rapid extinction of diverse crops and crop varieties and the development of non-renewable seeds such as property hybrids and sterile seeds based on the terminator technology, threaten the very future of seed, and with it the future of farmers and food security.

I. Erosion and extinction of diversity

The acceleration of technological revolutions in all fields and the growing concentration of economic power in the hands of a small number of people and organizations have produced an increasing homogenization of production strategies and of human cultures in our world. As a result the genetic variability of domesticated and wild plants and animals, along with the diversity of languages and cultures, are being destroyed at an unprecedented level. At the same time, industrial production strategies have unleashed unexpected long-term effects on climate and on the whole network of life systems. This process of ecological destruction and genetic erosion has been accelerating over the past decades. As

a consequence, abrupt and profound eco-systematic planetary changes can be foreseen within the present century as a consequence of human activity. Today's industrial productivity strategies have not only given rise to most of the challenges we face today, but they are destroying the very diversity that is the only proven strategy of living beings to cope with abrupt and uncertain change. While plants, animals and micro-organisms make use of their genetic variability, humans depend on their cultural variability and their inventive capacity to adapt to changes in the environment around them in order to obtain food from plants and animals adapted to diverse local ecosystems. These destructive industrial agricultural practices, together with wars and expulsion, are reducing seed diversity more dramatically than ever before¹. The disappearance of local seeds has gone hand in hand with the disappearance of small farmers and local food cultures. So has the local knowledge about the use of cultivated and wild plant varieties in their different ecological and cultural habitats.

With the extinction and reduction of languages and cultures the indigenous names and distinctions of thousands of plants have been lost, including the experiences and traditions of their cultivation. This not least also has been the result of the biased usage of the unexpected advances and successes in all fields of biology, particularly genetics and molecular biology. Technologies derived from now obsolete interpretations of biological concepts have been developed and advertised as the only way to overcome worldwide problems like famine and illness and are used as tools for economic and political control. Civilizations rose and fell with new agricultural technologies.

The ability to produce more food than needed by those working in the fields has been key to the development of progressively sophisticated division of labour practices. Traditionally the selection, preservation and maintenance, as well as the wise development and passing on of seed stock has been, and is still today, the domain of women in most rural communities.

Preserving seed for the next season has been a fundamental rule of survival in human history. Systems of rights and responsibilities must be put in place which recognize both the collective rights of local communities as well as the right of seed sovereignty of farmers, and the mutual interdependence between diverse cultures and countries.

I a. The bias of industrial agriculture and seed breeding

Industrial agriculture has led to severe erosion of the biological diversity of seeds and crops and of breeds of livestock. The spread of modern, commercial agriculture has been identified as the chief contemporary cause of the loss of genetic diversity², and the replacement of local varieties as the most important cause of genetic erosion³. Industrial agriculture, for which the lion's share of commercially traded seeds is produced today, pursues a dogma to change the production process in a way that conflicts with basic rules of seed production and

reproduction. The goal of ever-increasing yields of individual commodities is at the cost of reduction of overall output and erosion of biodiversity. Industrial agriculture is driven by short-term managerial concerns and profit margins to the detriment of consideration of public good such as long-term sustainability of soil, ecosystems, and farming communities. This market driven approach is often reflected at the government level.

In many cases governments, rather than acting in the interest of public good, further distort market prices by granting subsidies aimed at giving a competitive advantage to their domestic companies, thereby artificially reducing prices. Artificially low prices are pushing both biodiversity and small farmers to extinction.

It is obvious and generally accepted that such industrial agriculture and commodity market policies lead to the further depletion of our already limited natural resources, increase energy and toxic inputs at the expense of labor and lead to rural despair and hunger in the world. This despite the fact that more agricultural products are produced than needed to feed all 6,5 billion citizens of this planet – and, if wisely spread, enough to feed the additional 2.5 billion people expected to swell the global population within the next 40-50 years. The ineffectiveness of the current model of food production is evident from the fact that while more than one billion people are hungry and suffer from malnutrition due to being underfed, another two billion suffer malnutrition due to being overfed with unhealthy food. For the first time the number of children suffering from obesity is about to outnumber those children suffering from hunger. This “mechanistic utopia” reduces living systems to machines, maximizes output and thrives for “the best” of all crops and varieties. The ill-judged force behind this so-called utopia is the attempt to adapt environmental conditions to the production system – rather than adapting production to different eco- systems and cultural traditions. Such attempts have a devastating effect on the environment and natural resources as well as on the rural communities that are subjected to them. The “Green Revolution”, which was probably the single most forceful boost of caloric yields per hectare in recent history, is a prime example of what can go wrong with the apparent success of such linear and productionistic improvements. Today it shows that the nutritional impact, especially on rural populations and the poor in those regions which were to benefit most from the “Green Revolution”, has in fact been largely negative.

I b. Genetic engineering

Starting in the mid 1990s, the first genetically engineered seeds were commercialized. Genetic engineering is a technology to transfer the DNA sequences for individual traits by means that cannot occur naturally. The risks involved in this technology for human health and the environment are unpredictable, especially as regards the long term effects they have on biodiversity. As they reproduce and outcross to wild relatives, it is impossible to

recall them once released into the environment. Scandals on the illegal release of some Gm crops have shown that it is hard to control such traits even within the commercial product chain. Ordinary seeds are frequently contaminated with Gm traits in areas where GMOs are planted. This poses a massive immediate threat to farmers wishing to continue producing Gmo free products, also in response to the growing world wide consumer rejection of Gm foods. So far two traits only have significant market shares, one conferring resistance to a broad spectra-herbicide “Roundup” (Rr) and another making plants poisonous to insects by means of a soil-microbe *Bacillus Thuringiensis* (Bt). Within a few years these GM-plants – soybeans, maize, oilseed rape and cotton – cover an area of about 90 million hectares annually, concentrated in 5 “GM- countries” (Usa, Canada, Argentina, Brazil and China plant over 90% of the total Gm plants). Their impact on seed diversity as well as on the overall biodiversity in these areas is devastating. A single multinational company, Monsanto, holds the patents for 90% of all GM-plant traits commercialized.

II. Corporate take-over of seed: a threat to seed freedom and the rights of farmers

Until recently seed has resisted basic principles of capitalist market laws, the most important barrier being the nature of the seed, which reproduces itself and multiplies. Thus seed has been both a means of production as well as the product itself. Research and development for seed improvement has long been a public domain and a government activity for common good. But private capital started to flow into seed production and take it over as a sector of the economy, determining an artificial split between the two aspects of the double nature of the seed: means of production and product. This process gained pace after the invention of hybrid breeding of maize in the late 1920s. Today most maize seed cultivated are hybrids, which allow withholding the distinct parent lines from farmers and result in grain not suited for seed saving and replanting. The extension of patent laws as an Intellectual Property Rights tool into the area of seed varieties soon started to create a growing market for private seed companies. Intellectual property rights previously had a much milder effect on the seed market to the extent that they were based on the initial concept of plant-variety rights, that did not prevent the use of seed for further sowing and breeding, upholding the farmer’s right to use freely the yield of seed once purchased, except for commercial re-sale as seeds.

II a. Intellectual Property Rights and Seed Monopolies

The advent of genetic engineering in the 1980s led to the generalization, in practically the whole world, of the introduction of industrial patents upon life-forms granting exclusive and total private control over discoveries, now redefined as inventions. Under these patent laws seeds are entirely subdued to a system of “intellectual property rights” (IPRs), which by law – though not necessarily in reality – convert such seeds into non-renewable production inputs that require them to be re-purchased by farmers every year. In addition, the past two decades have seen a boost in hybrid seed production of plants previously

inaccessible to this technology. The latest development is the advent of Terminator seeds, the production of seed that is sterile or suicidal by nature – or only reproduces upon the addition of certain external inputs (also called Gurts). Meanwhile, seeds as well as individually isolated DNA-sequences have become subject to industrial patenting. Plant variety protection under the global UPOV system (International Union for the Protection of New Varieties of Plants) has extended to include fees for re-planting of seeds and to incorporate industrial patent rights on GMOS. The World Trade Organization, under its Trade Related Intellectual Property Rights agreement (Trips) obliges member states to introduce general IPR system on plants. In addition, following the breakdown of the WTO talks in July 2006, industrialized countries are intensifying. The imposition of IPR laws on developing countries through an acceleration of bilateral trade agreements. These are further undermining the potential of the Convention on Biological Diversity (CBD) and the International Treaty on Plant Genetic Resources for Food and Agriculture (CGRFA), an agreement that includes securing the exchange of seed under the emerging new global IPR. The WTO Trips agreement, and its Article 27.3(b) on plants, seed and biodiversity, was up for review in 1999. Formal submissions have been made by many countries of the South to exclude life forms, including seeds, from patenting. This review of Trips has not been undertaken and must be carried out as a matter of priority.

II b. Privatisation of Seed

The artificial split of the nature of seed as production tool and product and its transformation into a sheer commodity extends into most areas of industrial agriculture today, despite the fact that it is subject to controversy and fights, especially in rural areas of developing countries.

At the same time an unprecedented global concentration of private seed companies is taking place. Small seed companies as well as entire national seed collections and institutions are being bought up at comparatively moderate prices by agro-chemical multinational companies. For these companies seeds are but one component of their sales packages of agricultural and chemical input, and just another strategy to vertically integrate the global market of agricultural commodities for food and non-food purposes. The transformation of a common resource into a commodity, of a self-regenerative resource into mere 'input' under the control of the corporate sector, changes the nature of the seed and of agriculture itself. It robs peasants of their means of livelihood and the new technology becomes an instrument of poverty and underdevelopment, one that has displaced huge numbers of farmers. Public funding for seed development and conservation has been steadily dwindling and has reached today such low levels that even major seed collections are under threat and increasingly depend upon so called public-private partnerships. Such partnerships open the way for private seed companies to further expand their IPR-based control over the global seed stock. While public seed collections are obliged to provide samples of their

stocks free of charge, private companies are free to choose not to participate in this system of free exchange and take advantage of it for their own interests. In addition, every new step of corporate concentration of seed stocks comes with a reduction of seed varieties as well as a reduction of the number of breeders and scientists maintaining these seed stocks.

There is a clear relation between increases in investments in the digitalization of seed information at the DNA and genomic level, and a parallel decrease in investments in on-field research and the development and maintenance of holistic research and knowledge of seed and seed varieties in different ecosystems.

¹

Crop genetic resources are disappearing at the rate of 1-2 percent per annum (UN Food and Agriculture Organization, FAO, Development Education Exchange Papers, September 1993). About 75 percent of the diversity of agricultural crops is estimated to have been lost since the beginning of the last century. ²

Stated in the Leipzig Global plan of Action on Plant Genetic Resources for Food and Agriculture, 1995, based on 158 country reports and 12 regional and sub-regional papers.

³

FAO Leipzig conference on Plant Genetic Resources, 1996.

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Part Two A NEW PARADIGM FOR SEED

The failures, limitations and vulnerability of industrial agriculture and corporate monopolies must be taken into account in a post-industrial concept of seed and food production, a concept that should be based upon holistic, long- term considerations – considerations that present-day industrial agricultural systems, that produce for a global market, by their very nature are unable to take into account.

Seed diversity can be saved only if the livelihoods of small farmers who save and use bio-diversity are protected. Biodiversity based farming systems generate more employment, produce more nutrition and better quality food and provide higher incomes to farming families and communities. The challenge of agriculture must no longer be to produce huge quantities of nutritionally unbalanced food, but rather to produce nutritionally balanced food in a sustainable way. A sustainable agriculture maintains the natural resources needed, preserves the communities and social and cultural systems that allow for the appropriate distribution of food, and provides the possibility of decent livelihoods in rural areas.

The one dimensional focus on 'yield' has led to a serious decline in systems productivity, food quality and nutrition. Quantity must give way to quality. Seed production by Food Communities is based on a holistic concept of food quality that considers taste, compatibilities with human physiological and cultural conditions, all aspects of nutritional properties, the degree of biodiversity present, the environmental impact of production, as well as the working conditions, processes of participation and value of retribution to producers.

This holistic concept should be the first step towards reinforcing or creating and

dispersing seeds for quality food systems. The monoculture paradigm must give way to a flourishing biodiversity paradigm. Any future concept of agricultural production must anticipate and take into account the change in climatic conditions and urgently introduce stringent measures to further reduce CO2 and greenhouse gas emissions – with the hope of preventing unsustainable consequences.

A priority must be sustainable fresh-water management that addresses the present scarcity of drinking water in many regions of the world and the rapid expansion of this emerging water crisis. This water crisis is likely to be dramatically exacerbated by the impacts of climate change. The continuing erosion of soil must also stop to preserve the basis of agricultural production. A priority must be the phasing out of the alarming input of toxic substances into vital eco-systems as well as the human food chain. Reducing the waste of energy and natural resources due to irrational, counterproductive, unhealthy systems of processing, storage, transport, and consumption must become integral to future sustainable food production and consumption policies. Finally, future agricultural production must aim at reducing and ideally stopping present trends of unsustainable urbanization and development of mega- cities, which not only dramatically increase negative ecological impacts and destructive trends, but are also glaring high-risk hotspots of potential climate impacts on humanity. International agreements such as the FAO Plant Genetic Resources for Food and Agriculture, and the Convention on Biological Diversity which recognize the need to conserve biodiversity and defend farmers' rights, as well as national and sub-national laws that have upheld the rights of farmers to save, use, exchange, improve and develop seeds, need to be upheld and strengthened and made effective instruments to counter the growing corporate monopoly over seeds. It is at the local level that the new paradigm of seed is being formed. Communities are creating movements to save and share seeds and create alternatives to non-sustainable agriculture based on monocultures and monopolistic "intellectual property rights" over seed.

Part Three THE LAW OF SEED

Diversity, freedom and the enfolding potential and evolution of agriculture and humanity are core principles of the law of seed.

I. DIVERSITY

Diversity is our highest security. Diversification has been the most successful and widespread strategy of agricultural innovation and survival over the past 10.000 years. It increases the choice of options and the chances of adapting successfully to changing environmental conditions and human needs.

For these reasons and others, in contrast to the present trends towards monocultures and genetic erosion, diversity must once again become the overarching strategy of future seed development in the following ways.

.1. **Diversity of Seed** There is immediate and urgent need to conserve seed

diversity to expand the number of plants used for human nutrition as well as the number of varieties used in any single plant species. Reversing the dangerous trend of narrowing the diversity of plants used and the genetic diversity within plants is one of the most urgent calls to preserve humankind's options for the future and protect diversity.

.2. Diversity of agricultural systems Agricultural policies aimed to promote and implement global diversity of seed cultivars must support the development and the spreading of agricultural systems based on an holistic approach, where human, crop, animal, microbial biodiversity is an indispensable tool to reduce external inputs, to increase productivity efficiency and reach sustainability.

Two main categories have to be considered and focused on: • traditional low external input agricultural systems where crop biodiversity (poly-cultures) and seed mixtures (consociations) help to fulfill farmer's needs at different levels; ecological agricultural systems, where seed diversity is required to maintain planted biodiversity (crop rotation) and associated biodiversity (soil, plants and fauna).

.3. Diversity of producer-consumer relationships Agricultural biodiversity is best conserved when the produce from seeds enters directly into production-consumption circuits that enable farmers to earn a decent income. The merging of the production and distribution systems of food impoverishes biodiversity, whereas food systems that enable food growers and producers to have direct contact with consumers enrich biodiversity. Diversity of producer-consumer relationship is key to food democracy and protection of biodiversity.

.4. Diversity of cultures Biodiversity and cultural diversity go hand in hand. Preserving, maintaining, and re-expanding the remaining agricultural traditions and cultures of production is an immediate and most urgent challenge to prevent the further erosion of biodiversity and the depletion of global, as well as regional options for the future. This also entails respect and appreciation of the different traditions and ways of human perception of nature and food cultures.

.5. Diversity of innovation Communities and farmer co-operatives by the hundreds of thousands, and millions of family and subsistence farms and gardeners around the world, not only form the basis of the conservation and propagation of farmers' seed and plant varieties, but also the basis of further seed development. The addition of scientists and professional plant breeders practicing the art of participatory plant breeding would make an even more formidable force of innovation and further adaptation of seed. Finding fair and equitable ways of co-operation among these different groups and integrating their diverse levels of knowledge and experience would give enormous impetus and strength to meeting future challenges.

II. FREEDOM OF SEED

Seeds are a gift of nature and of diverse cultures. They are not a corporate invention. Passing on this ancient heritage from generation to generation is a human duty and responsibility. Seeds are a common property resource, to be

shared for the well being of all and saved for the well being of future generations. Hence they cannot be owned and patented.

Seed saving and sharing is an ethical duty that cannot be interfered with by any national or international law which makes seed saving and seed sharing a crime. The law of the seed must protect the freedom of seed and the freedom of farmers based on the following principles

.1. Freedom of Farmers To Save Seeds The first duty and right of farmers is to protect and rejuvenate biodiversity. The conservation of biodiversity requires by necessity the saving of seed. Laws of compulsory registration and policies for “seed replacement” undermine the freedom of farmers to save farmers varieties. “Intellectual Property” laws, patent laws and breeders rights laws violate the “law of the seed” by making it illegal to save seeds.

.2. Freedom of Farmers to Breed New Varieties Farmers’ rights are rights derived from their intellectual contributions to the breeding of seeds and plant genetic resources. Farmers are inherently breeders, though their breeding objectives and methods might differ from the objectives and methods of the seed industry. Farmers breed for diversity while the seed industry breeds for uniformity. Farmers’ breeding strategies and intellectual contribution must be recognized in order to stop the practice of using farmers’ seeds as “raw material” with no intellectual contribution of farming communities. Farmers have the right to freely develop new varieties of seeds.

.3. Freedom from Privatization and Biopiracy Farmers’ rights arise from their past, present and future contribution to the conservation, modification and exchange of plant genetic resources. Farmers’ innovation in plant breeding takes place collectively and cumulatively. Therefore farmers’ rights arising from their role as conservers and breeders have to be vested in farming communities not in individual farmers.

The recognition of farmers’ collective rights is necessary for protecting seeds and biodiversity as a commons. The practice of using farmers varieties as “raw material” to then claim patents and intellectual property rights on the basis of invention of the traits derived from farmers’ varieties, must be stopped.

This phenomena can be referred to as biopiracy. The global seed industry misuses the concept of “common heritage of mankind” to freely appropriate farmers varieties, convert them into proprietary commodities and then sell them back to the same farming communities at high costs and heavy royalties. Such privatization through patents and intellectual property violates the rights of farming communities and leads to debt, impoverishment and dispossession of small farmers.

Farmers and food-communities’ access to seeds and plant genetic resources must not be restricted by private property claims and patent laws, nor by

withholding germ plasm stored outside the region of origin. This freedom is the basis of farmers' seed sovereignty.

.4. Freedom of Farmers to Exchange and Trade Seeds Since seeds are a "commons", freedom to exchange seeds among farming communities must be an inalienable part of the law of the seed. This also includes the right to sell and to share seeds on a non-exclusive basis. Any rewards paid for seeds should be calculated as a fraction of the value of the products they yield.

.5. Freedom to have access to "open Source" seed "Open Source" seeds are open pollinated varieties, which can be reproduced from year to year, generation to generation and can be saved and replanted. The knowledge about the information embedded in seeds and germ-plasm is by definition not an invention but the result of cumulative collective discovery upon which additional discoveries may be based in the future. This knowledge must be freely available and should be made accessible to all farmers. The development of seed systems that cannot be reproduced by farmers should not be pursued. Optimum benefits for all are achieved if research and development concentrate on seeds that can be freely reproduced. Public investment should go exclusively into seed systems which entail the full genetic information necessary for their reproduction. Farmers should have access to parent lines used for crossing and creation of hybrids. Hybrids in which parental lines are controlled by corporations lead to homogenization and monopoly ownership.

.6. Freedom from Genetic Contamination and Gmo's Farmers freedom includes freedom from genetic contamination and biopollution. The introduction of new varieties and plants must take into account the potential environmental risks as well as other potential detrimental agricultural effects.

.7. Freedom of Seed to Reproduce "Terminator" technology to produce sterile suicide seed that cannot reproduce is an assault to the fundamental nature of seed as the source of reproduction of life and to the fundamental freedom of farmers. The introduction of such traits is designed to create a monopoly on the seed and food of the world and must be banned on a global level.

III. SEEDS FOR THE FUTURE: BREEDING TOMORROW'S SEEDS

Seeds embody the past and the future. Seeds for the future have to evolve on the basis of the conservation of the widest seed diversity and crop varieties to manage the multiple challenges of food and nutritional security, food quality, climate change and sustainability. The following are ways in which the conservation, use and further development of seeds can be tailored to meet the challenges ahead.

.1. Community based seed conservation and development The preservation and maintenance of seed and the knowledge about them should be based and rooted with those who make use of them. Ex-situ and in-situ conservation of germ plasm should be conducted to support essential on-farm maintenance of the seed. Strategies and technologies for the further development of seeds should be based on the wealth of experience and ingenuity of farmers and food-communities in general, and include their participation and active input into the

scientific aspects of plant breeding. This includes making available to farming communities modern technologies of selection, identification and breeding.

.2. Embedding in agricultural eco-system As a principle, seed varieties should allow farmers to conserve soil, water and biodiversity and smartly adapt to local and regional environmental conditions rather than require the adaptation of the environment to the needs of the seed. The goal of future use and development of seeds should be the embedding of agricultural production into agro-eco-systems to protect soil, water and biodiversity and increase resilience to environmental change.

.3. Reduce greenhouse gas emissions In order to minimize the emission of greenhouse gases that are leading to climatic chaos, seeds should not require more external input of energy (through synthetic chemical fertilizers, pesticides and fuel) than absolutely necessary. The goal should be greenhouse emission neutral agricultural practices, that rely on renewable energy and on soil-biological resources.

.4. Eliminate and phase out toxic inputs In order to reduce the toxic contamination of our food chain and environment, seed breeding needs to shift from a chemical input response to seeds that are better adapted to the requirements of agro ecological practices.

.5. Diversity within varieties Further development of seed should be based on the broadest possible genetic diversity as a means to reducing the risk of susceptibility to pests and adverse environmental conditions, and to enhance the natural diversity. To this end an urgent review of present commercial requirements for the homogeneity of seed varieties is called for.

.6. Breeding for food quality The holistic quality of food, including its taste and nutritional value, should be the dominant concern for further enhancing, preserving and developing seeds of the future.

.7. Women are the protagonists of biodiversity Globally, women represent the majority of the agricultural work force and are the present and traditional custodians of seed security, diversity and quality. Women are also the prime depositaries and disseminators of knowledge about the quality and methods of processing food.

As such their central role in safeguarding biodiversity and in conserving, exchanging and reproducing seeds in post-industrial agriculture must be supported and enhanced.

Part Four LIVING ALTERNATIVES – SEEDS OF HOPE

It is in the nature of seeds to carry the expression of hope. They bring to mind a cornucopia of harvest. Large numbers of individuals, initiatives and traditional food communities all over the world have long been engaged in safeguarding seed. Despite the present alarming scenario of monocultures and corporate monopolies on seed, many encouraging initiatives have sprung up to counter the threat to seed imposed by industrial agriculture. The principles on which this manifesto is based have evolved from the initiatives and actions of diverse groups and movements across the world. The following are some such

examples.

- A mushrooming of Seed banks to preserve ex-situ and cultivate in-situ seed and plant diversity is taking place within seed communities. Women have played a pivotal role in safe-guarding the heritage of seed and are set to continue to do so in increasing numbers.

Movements such as Seeds of Survival in Ethiopia and Navdanya in India have evolved new models of saving seeds and enhancing food security and ecological security of farmers' communities.

- Seed saving initiatives and seed exchange platforms are taking on an increasingly important role. Large numbers of individuals are creating gardens with the express aim of growing their own food and have the potential to play an important role in seed saving and exchange.

- Individual communities committed to the protection of and reversing the huge losses in seeds and breeds varieties are rallying their forces. One such example are the 'presidia' projects (biodiversity protection) of the Slow Food Foundation for Biodiversity that have sprung up in all regions of the world.

- Targeted plant breeding projects adopting seeds to the needs of organic and ecological agriculture are fast increasing.

- Alliances and networks of civil society around seed are forming at regional, national and international levels. This includes networks like Etc and Grain, and political pressure initiatives like Save our Seeds as well as farmer rights groups. Movements such as the "No Patents on Life" in Europe and movements to create patent free zones (Living Democracy / Jaiv Panchayat) and non-cooperation with patents on seeds (Bija Satyagraha) in India, the seed sovereignty movement of native American Tribes in North America and international food sovereignty movement in Africa are evolving from the group up to defend the Freedom of Seed.

- Parallel to civil society activities are laws and legal protection initiatives that are establishing GMO free zones on a large scale and protecting diversity of seed. The Region of Tuscany's Law on Seed is a good example of how local and regional governments can take responsible and concerted action to protect seed diversity.

- The fast growing direct relationships between producers and consumers such as the Community Supported Agriculture (CSA) networks are another vibrant step in the movement towards conserving and maintaining seed and plant varieties.

- International agreements such as the Treaty on Plant Genetic Resources for Food and Agriculture and its Article 9 on Farmers' Rights, as well as the Convention on Biological Diversity are instruments which have the potential to be evoked in countering the aggressive control and suicide oriented policies of large multinational corporations. This potential needs to be strengthened.

Demands to review Act 27.3(b) of the Trade Related Intellectual Property Rights (Trips) agreement of WTO, and to stop the patents on life, patents on seeds and

biopiracy of farmers' varieties and traditional knowledge, continue to be made by Third World governments.

The future evolution of humanity goes hand in hand with the future and free evolution of our seeds. What is embedded in and has been practiced in peasant cultures from time immemorial needs the utmost support from the public and private sector if our right to choose and to live healthy, safe and culturally diverse lives is to prevail.

The future of the Seed carries within it the future of humanity.

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Appendix THE INTERNATIONAL COMMISSION ON THE FUTURE OF FOOD AND AGRICULTURE

A joint initiative of

Claudio Martini, President of the Region of Tuscany, Italy Vandana Shiva, Executive Director, Research Foundation for Technology,

Science and Ecology / Navdanya, India

Commission composition

Vandana Shiva, Chair Miguel Altieri, Professor, Department of Environmental Science Policy and Management,

University of California, Berkeley Aleksander Baranoff, President, All, National Association of Genetic Safety, Moscow

Deby Barker, Director and Chair of the Agricultural Committee of the International Forum on Globalization (Ifg)

Wendell Berry, Conservationist, farmer, author and poet

Marcello Buiatti, Consultant on G_{mo} issues to Tuscany, Professor, University of Florence

Peter Einarsson, Swedish Ecological Farmers Association, Ifoam EU Group

Elena Gagliasso, Scientific Coordinator for the 'Legambiente', Professor, University of Rome

Bernard Geier, Organic agriculture and food activist

Edward Goldsmith, Author, Founder and Editor of 'The Ecologist'

Benny Haerlin, Foundation of Future Farming, Former International Coordinator of G_{mo} campaign for Greenpeace

Colin Hines, Author of Localisation: A Global Manifesto Fellow, International Forum on Globalization (Ifg)

Vicki Hird, Senior Campaigner on Food and Farming, Friends of the Earth Andrew Kimbrell, President, International Center for Technology Assessment Tim Lang, Professor of Food Policy, Institute of Health Science, City University, London

Frances Moore Lappe, Author, Founder, Small Planet Institute Alberto Pipo Lernoud, Vice President Ifoam

Caroline Lucas, Member of the European Parliament, Green Party UK Jerry Mander, President of the Board

of the International Forum on Globalization Samuel K. Muhonyu, Coordinator Network for Ecofarming for

Africa (Necofa) Helena Norberg-Hodge, International Society for Ecology and Culture

Carlo Petrini, Founder and President Slow Food, Italy Assétou Founé Samake, Biologist, Geneticist,

Professor, Faculty of Sciences,

University of Mali

Sandra Sumane, Sociologist at the University of Latvia

Percy Schmeiser, Canadian farmer and G_{mo} activist

Aminata Dramane Traoré, Coordinator of the 'Forum pour un Autre Mali', former Minister of Culture and Tourism of Mali, Author

Alice Waters, Founder Chez Panisse Associates

Institute for Agriculture & Trade Policy Food First Arche-Noah, Austria

Coordinator

Caroline Lockhart, Commission Coordinator, arslia/Region of Tuscany

Arsia Secretariat, Regional Government of Tuscany, Italy via Pietrapiana, 30 - 50121 Firenze tel. 055 27551 - fax 055 2755216/231 www.arsia.toscana.it

email: futureoffood_tuscany@yahoo.com, carolinelockhart@yahoo.com www.future-food.org