International Commission on the Future
of Food and Agriculture

MANIFESTO
ON THE FUTURE OF KNOWLEDGE SYSTEMS
KNOWLEDGE SOVEREIGNTY FOR A HEALTHY PLANET

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Knowledge sovereignty for a healthy planet

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MANIFESTO ON THE FUTURE OF KNOWLEDGE SYSTEMS
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Contents

B. Principles for a New Knowledge Paradigm for Ensuring a Healthy Planet

PRINCIPLES FOR A NEW KNOWLEDGE PARADIGM

Preamble

Solutions to the problems of society depend on the way knowledge is produced, used and diffused. Reductionism, fragmentation and mechanical thinking are at the root of the multiple catastrophes that grip humanity today: the financial implosion and economic collapse, climate chaos and the energy and food crises. Solutions to these crises require a new way of thinking – a new knowledge paradigm is necessary.

In the past we have seen cultures and ethnic groups disappear as a result of wrong choices. Today we are living at a time when decisions in one place affect the world at large and wrong choices can lead to irreversible destruction. A holistic approach is necessary to ensure our future on a healthy planet.

This manifesto offers a framework for a new knowledge paradigm based on the six principles outlined below, the first three delineate the failings of the present dominant knowledge system, the last three define the way forward.

A. FAILINGS OF THE PRESENT DOMINANT KNOWLEDGE SYSTEMS

1. Lack of holistic knowledge and a mechanistic worldview are at the root of the multiple crises humanity faces

As Einstein put it, we cannot solve problems with the same mindset that created them. Consciously or unconsciously the world has been equated in our minds to a huge machine, free to be improved and modified by humans. Just as machines are assembled through the manipulation of their components, the same, we thought, can be done with the whole world, both living and non-living. This has led to the disruption of fragile ecological processes vital for human survival.

It was assumed that complete knowledge of the whole could be attained simply by the knowledge of its individual parts. This method, reducing the whole to a composite of its parts was elevated from a methodology with a

practical scope, to a theory and even an ideology, and the metaphor "natural systems are like machines", progressively became the much more radical "natural systems are machines".
But we do not know all the components of the biosphere, let alone the function of each. This lack of knowledge applies to both living and non-living components. Even if the biosphere behaved like a machine, our limited knowledge of all its parts makes it impossible for us to know the outcome of changing, let alone eliminating, any one of those parts. Given our ignorance, we should minimize affecting the biosphere.
Pollution, degradation and depletion of our natural resources, together with global climate change are clear danger signals. The survival of the human species depends on its capacity of maintaining the resilience of the biosphere and evolving new knowledge systems to enhance our ability to adapt to change.
Reductionism elevated from a method to a worldview has caused the economic collapse and climate catastrophes we face. This still dominant worldview is inadequate in providing solutions to the problems it has created, or even in fully understanding the scale and scope of these problems. Often the application of this worldview shifts the weight of adaptation onto the poor and most vulnerable. Reductionism promotes gigantism, the protection of the powerful and the large, while rendering the small and diverse invisible and vulnerable. Both sustainability and justice demand a new worldview.

2. Exclusion of traditional knowledge and indigenous cultures has narrowed the knowledge base that humanity needs to face a crisis of multiple dimensions

The growing tendency to exclude the knowledge of indigenous communities, of women, farmers, and of older generations and young people's perspectives, is making humanity intellectually poor and more vulnerable to multiple threats. The dominance of a mechanistic worldview has subjugated the ecological worldviews and knowledge systems of diverse communities and groups. Traditional knowledge has been falsely identified with lack of systematic analysis, verification and dynamic evolution and innovation, which led to its identification with stagnation and backwardness. Based on this prejudice, reductionist scientific knowledge has progressively displaced traditional knowledge which has survived for centuries as part of evolving

knowledge systems intimately interacting with ecosystems and characterised by a high adaptive capacity.
Reductionism has led to super-specialization of disciplines and organizations which then transfer the fragmented knowledge to the world of production. This model creates hierarchies and divides between ordinary people and experts, between different parts of knowledge and production systems and between disciplines.
The imposition of the mechanistic worldview and reductionist method has disrupted the capacity of indigenous populations to continuously evolve their traditional knowledge within context of a changing world. Indeed, traditional knowledge systems have constantly enriched themselves through dynamic interaction between communities and a changing environment and has long been the basis of a virtuous co-evolution of humans and nature. Even today in many parts of the world, traditional knowledge is the only means by which indigenous populations meet the challenges of survival.
Already in some cases we have lost forever a treasure of knowledge materially enclosed in biodiversity and in diverse cultural traditions.
Diversity of languages is important in the context of diversity of human cultures. Eliminating linguistic diversity has prevented the maintenance and transmission of traditional knowledge from one generation to another. Languages are the vehicles of knowledge. Their disappearance is the disappearance of imagination.

3. The corporate control of science and the commercialisation of knowledge through patents and other Intellectual Property Rights (IPR's) are undermining the creation of knowledge itself

The industrial revolution and the mechanistic utopia have imposed their own vision of a world in which the planet is a deposit of limitless resources to be exploited through science and technology for the creation of wealth. Fully compatible with the directions taken by corporate capitalism, the mechanistic 'utopia' has served large corporations well. On the one hand it has given them access to the world's resources; on the other, it has created a fictitious world of finance, increasingly separate from the needs of society. Large capitalist enterprises have progressively taken control of the planet's resources, justifying their operations with ability for creating wealth. Through the introduction of Intellectual Property Rights, though initially introduced to

reward innovation, the development of scientific knowledge has increasingly become privatized and commercialised. With the alliance between large private corporations and public agencies of scientific research, knowledge has been co-opted to serve private interests.
Intellectual property rights have also legitimized the process by private enterprises of appropriating traditional knowledge. By denying the scientific value of traditional knowledge, they allow its appropriation simply by codifying it into modern scientific discourse, then patenting it as an invention, and finally preventing its use by its own creators and custodians. This is how, for example, farmers have been progressively expropriated of their knowledge of seeds and of their right to save, improve and exchange seeds.

B. PRINCIPLES FOR A NEW KNOWLEDGE PARADIGM FOR ENSURING A HEALTHY PLANET

4. New paradigms of food and agriculture should learn from holistic science of life

The survival of humans depends on the capacity of our species to maintain and preserve the plasticity of the Biosphere with all its interacting components, the human species included. Since agriculture is a production system based directly on the resources of the biosphere – soil, water and biodiversity – it provides a good example of non-sustainability brought about by the transition from traditional knowledge to fragmented traditional science. The reductionist method, born with modern science with the aim of simplifying the study of natural systems, led to impressive progress in technology, but also to a deep fragmentation in knowledge and a lack of capacity for synthesis.
The construction of a simplified world based on single versions of few, optimal products, both living and non living leads to the creation of a single, homogeneous society with only one culture, one ideology, one science, one technology, one model of economy and production. In other words it means destroying the tools and the processes that have allowed the adaptation and the proliferation of humans in all areas of the planet. It also implies the destruction of cultural and biological diversity.

The non-sustainability of food and agriculture systems based on reductionist science has created the need for new paradigms based on holistic science, both traditional and modern. Farmers across the world are re-evaluating traditional knowledge as a source of innovation, and are following their own independent paths of development as opposed to those suggested by official systems of knowledge, and are building parallel systems of knowledge, aligning themselves with non reductionist segments of scientific research. At the same time, at the heart of these same scientific institutions, currents of thought are emerging that support the need to incorporate traditional knowledge into modern systems of knowledge. Successes of ecological organic agriculture and production based on local food systems, born outside of, and often despite conventional forms of production and distribution, are speeding up the re-evaluation of the role of traditional knowledge in new paradigms of food and agriculture.

5. Diversity and pluralism of knowledge systems are vital for evolution and adaptation, especially in times of intensifying instability and great unpredictability

All living systems evolve and die when they stop evolving. This is true for natural systems as well as for cultural systems. Real knowledge is a living system which changes and adapts to a changing reality. Uniformity deprives systems of evolutionary mechanisms and potential. The simplistic assumption that nature is 'simply mechanical' no longer has currency. Knowledge diversity is needed today to strengthen the systems of knowledge so that we can ask the right questions and provide the answers to the enormous challenges of our times.

Traditional and indigenous knowledge, also through integration with a scientific knowledge that is able to recognize its own partiality when faced with complex phenomena can help humanity adapt and evolve in our unpredictable and volatile times, given their intimate link to biological and cultural diversity. Farmers' daily observation and study make them scientists in the field, ensuring conservation of the habitat, the soil and water systems. Across the world farmers' knowledge has protected and enhanced biodiversity at the same time guaranteeing food security for their own communities. In most cultures women's activities have been directly connected with life and

therefore with adaptation and survival in changing environmental and human contexts. Older generations are the ones who keep memory of knowledge and experience alive, giving the community the humus on which can be based evolution, innovation and identity. Young people are creatively challenging today's outmoded paradigms, they are quick to identify the critical points of the system. Their contribution to multidirectional processes of learning and teaching can help enrich human knowledge and facilitate the processes of adaptation and transformation.
Many scientists today, especially when not compromised by the lure of large private enterprises, know well that the reductionist solution is not necessarily the best. Now that the dominant model is showing its inadequacies and failures, we must recognize the plurality of knowledge systems and the potential of their integration essential to increase our capacity to survive as a species.

6. The knowledge sovereignty of communities has to be recognized and knowledge must be freely used, enhanced and shared

All human beings are knowing subjects, irrespective of class, race, gender, religion, ethnicity or age. All communities and cultures are knowledge creators. Cultures that have survived over time have constantly evolved their knowledge systems which are categorized as 'traditional knowledge'. Dominant structures and institutions of knowledge generation in contemporary society have led to the domination of 'experts' while excluding the knowledge of people. The right of communities and cultures to jointly develop and enhance their knowledge, asking the questions of their choice and sharing this knowledge freely with other groups and networks, constitutes their knowledge sovereignty.
Knowledge should flow freely. Knowledge sovereignty does not imply the right to refuse its free flow. It includes the full democratic participation by citizens for the new knowledge synthesis based on inclusion of excluded knowledge systems.
A new awareness of the importance of cultural and scientific diversity and the availability of new information technologies make necessary a profound transformation of official knowledge systems which are presently undemocratic, technocratic and separated one from the other. The new knowledge systems must be able to promote sustainability, equity and resilience, through:

- knowledge systems that allow a plurality of approaches and forms of knowledge to live side by side and integrate;
- guaranteed openness, equal dignity of all knowledge, and the capacity of farmers and local rural communities' to be heard;
- the distribution of public resources and the regulation of intellectual property, clearly identifying public interests and private interests, with priority being given to the first.

Just as Food Sovereignty has emerged as the organizing principle for our food security based on full participation, where all people have the right to decide what they eat and the way they produce, so too Knowledge Sovereignty must be fully integrated into structures and institutions of knowledge generation, technology choices and production and consumption choices. Knowledge sovereignty rests on the duty to share knowledge freely with other sovereign communities and to continue the free flow of knowledge.

INTRODUCTION

Thinking in a new way

Humanity is engulfed by multiple catastrophes – the financial implosion and economic collapse, climate chaos and the energy and food crises. At the root of these multiple crises is a paradigm of knowledge based on fragmented world views, as well as a separation between people and experts, between nature and narrow scientific knowledge, and between a real economy and a financial economy. Knowledge needs to reconnect to reality. The world views for the future need to be more holistic ("everything is connected to everything") and less anthropocentric ("man is a part of, not the master of the biosphere"). Complicated, obtuse and opaque expertise, whether in the economic sphere or scientific disciplines, is not the knowledge we need. This separation of expertise from reality and of experts from people has resulted in instability and insecurity as reflected in the current financial collapse and food crisis. The democratization of knowledge in every sphere has become vital. This democratization requires both full democratic participation by citizens in generation of knowledge and a resurrection of subjugated knowledges, such as traditional and indigenous knowledge, and women's knowledge. Changes in the knowledge paradigms have become an imperative. The new paradigms have to be based on the realizations that :

- all human being are knowing subjects and all cultures have knowledge systems;
- everything is connected and hence knowledge must be holistic;
- human being are part of nature and not its masters;
- human activities have to contribute to the conservation of the biosphere and living nature.
- the Precautionary Principle must be implemented to avoid technologically based irreversible changes to the ecosystem and the biosphere.

Based on these realizations, the following principles provide the framework for a knowledge transition and paradigm shift to find real and lasting solutions to the multiple crises we face.

A. FAILINGS OF THE PRESENT DOMINANT KNOWLEDGE SYSTEMS

Section one
LACK OF HOLISTIC KNOWLEDGE AND A MECHANISTIC WORLDVIEW ARE AT THE ROOT OF THE MULTIPLE CRISES HUMANITY FACES

As Einstein put it, we cannot solve problems with the same mindset that created them. Consciously or unconsciously the world has been equated in our minds to a huge machine, free to be improved and modified by humans. Just as machines are assembled through the manipulation of their components, the same, we thought, can be done with the whole world, both living and non-living. This has led to the disruption of fragile ecological processes vital for human survival.

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these problems. Often the application of this worldview shifts the weight of adaptation onto the poor and most vulnerable.
Reductionism promotes gigantism, the protection of the powerful and the large, while rendering the small and diverse invisible and vulnerable. Both sustainability and justice demand a new worldview.

The multiple crises humanity is facing both in the ecological and economic spheres, are rooted in the false mechanistic perception that equates life and other dynamic systems to machines manipulated at will. This concept greatly influenced science as exemplified in the "Manifesto of medical materialists" published in 1847 which posited the equivalence between living systems and machines. Similarly, living beings were considered to be a mere assemblage of independent components. This led to the reductionist method based on the dissection of systems into separate parts, assuming that the knowledge of the parts was the knowledge of the whole.
While reductionism was successful at the methodological level in promoting scientific research, it has proven to be inadequate in understanding systems as a whole, with all their complexity and interconnections. Transforming an effective methodology into an ideology has led to human knowledge evolving in directions which are inadequate to address the problems we face. Acting as if the world were a machine leads to a world in which living processes and systems are undermined and destroyed. Living systems evolve and adapt to their environment. Machines neither evolve nor adapt. They either run or they break down. Thus the reason that the mechanistic approach is inadequate in dealing with the living world.
At the macroscopic level, the effect of this approach is evident in climate change, the result of external and 'unintended' effects of the 'mechanisation' of production without respecting the limits of our planet. The same failure of the mechanistic utopia is evident in the increase in hunger and poverty through the promotion of industrial agriculture and the green revolution, with the associated destruction of sustainable, small scale, local agriculture. The introduction of genetic engineering is intensifying the failure of this mechanistic approach to living systems.
Unfortunately many of these failures are still advertised and seen as successes and the perception and conception of the real world around us and in our lives is becoming more and more faint. We act as if we did not fail. Thus we continue

to walk blindly on the path that has no future.
Even material progress has been emptied of its reality. It is no longer connected with the production of matter and of material goods but is connected, rather, with the exchange of money. The only parameter used to measure human progress is the GNP, that is the circulation of money. In fact, before the financial collapse, the financial economy was 70 times bigger than the real economy. Thus a tiny proportion of the monetary flux is today covered by the exchange of matter.
All this is weakening our capacity to recover from the present economic and ecological catastrophes which should be based on the continuous mutually compatible innovation of patterns of production and consumption ways that meet human needs without destroying the planet. While 'new' technologies like genetic engineering still adhere to the outmoded mechanistic thinking, basic life sciences are challenging it, based on the third millennium's 'biological revolution'. In the last two decades new research in biology directly contradicts the mechanistic world view.
In particular, the following principles are now generally accepted by the scientific community:

- living and non living systems are all dynamically interconnected, the consequence being that any change in one element will necessarily lead to not fully predictable changes in other parts of the network;
- variability is the basis of change and adaptation while its absence leads inevitably to death;
- living systems actively change the environment and are changed by it in a reciprocal way;
- while bacterial evolution is based on genetic variability, higher organisms rely on plasticity - our species "invented" a new adaptation strategy, namely the active changing of environments but with a virtuous interaction. This has led to very low genetic variability in our species as compared with others.

However our strategy for adaptation is to evolve cultural diversity, including diverse knowledge systems and diverse languages, each adapted to specific environments. It is alarming that today we are simultaneously destroying our biodiversity and the genetic variability of our crops as well as the cultural diversity of our languages and knowledge systems. We are thus losing precious sources needed for adaptation and recovery from the present day catastrophes.

Section two
EXCLUSION OF TRADITIONAL KNOWLEDGE AND INDIGENOUS CULTURES HAS NARROWED THE KNOWLEDGE BASE THAT HUMANITY NEEDS TO FACE A CRISIS OF MULTIPLE DIMENSIONS

The growing tendency to exclude the knowledge of indigenous communities, of women, farmers, and of older generations and young people's perspectives, is making humanity intellectually poor and more vulnerable to multiple threats. The dominance of a mechanistic worldview has subjugated the ecological worldviews and knowledge systems of diverse communities and groups. Traditional knowledge has been falsely identified with lack of systematic analysis, verification and dynamic evolution and innovation, which led to its identification with stagnation and backwardness. Based on this prejudice, reductionist scientific knowledge has progressively displaced traditional knowledge which has survived for centuries as part of evolving knowledge systems, intimately interacting with ecosystems and characterised by a high adaptive capacity. Reductionism has led to super-specialization of disciplines and organizations which then transfer the fragmented knowledge to the world of production. This model creates hierarchies and divides between ordinary people and experts, between different parts of the knowledge and production systems and between disciplines. The imposition of the mechanistic worldview and reductionist method has disrupted the capacity of indigenous populations to continuously evolve their traditional knowledge within the contest of a changing world. Indeed, traditional knowledge systems have constantly enriched themselves through dynamic interaction between communities and a changing environment and has long been the basis of a virtuous co-evolution of humans and nature. Even today in many parts of the world, traditional knowledge is the only means of indigenous populations to meet the challenges of survival.

Already in some cases we have lost forever a treasure of knowledge materially enclosed in biodiversity and in diverse cultural traditions. Diversity of languages is important in the context of diversity of human cultures. Eliminating linguistic diversity has prevented the maintenance and transmission of traditional knowledge from one generation to another. Languages are the vehicles of knowledge. Their disappearance is the disappearance of imagination.

Reductionism does not merely mechanically reduce systems to their parts, it also reduces the landscape of knowledge. Reductionist criteria exclude non-reductionist holistic systems and ways of knowing from being counted as knowledge systems. This is how time-tested traditional knowledge, which provided us reliable ways of living sustainably on the planet, has been discounted as knowledge. The time has come to resurrect these subjugated knowledge systems in order to build a holistic science of living.

The rise of a mechanical philosophy was based on the destruction of concepts of a self-regenerative, self-organizing planet which sustained all life. This transformation of nature from a living, nurturing mother to inert, dead, and manipulable matter, was eminently suited to the exploitation of nature.

Reductionism is an instrument of centralization and concentration of economic and political systems which has led to the emergence of a few big players - few big banks, few big corporations, few big political powers, and few big research centres. This is how oligarchies have been created in every sector, leading to instability as witnessed in the bursting of the financial bubble.

Furthermore,

the same reductionist tendencies and mechanical paradigms which have promoted the concentration of economic and political systems and that are at the root of the planet's catastrophes, are now being offered as solutions to the very problems they have created. When applied to agriculture and nutrition – activities that millions of people have carried out since well before the creation of modern scientific institutions – this model has progressively marginalized traditional knowledge and all those holding such knowledge, that is to say women, farmers and the old, and prevented them from the capacity of producing new knowledge to respond to changes in their own needs and environment.

We must urgently turn to other paradigms and ways of knowing. We must enlarge our knowledge base, bringing in the full diversity of perspectives and plurality in approaches to respond to the overwhelming challenges we face as humanity.

Reductionist science applied to agriculture has reversed the process of seed improvement. While in traditional knowledge seeds adapt to a changing environment, in reductionist science seeds are created in laboratories and then the environment is changed to adapt to the seed. Now that climate change

is creating unpredictable environmental conditions, the same experts falsely claim an exclusive role for adaptation and keep negating the contribution and potential of farmers' breeding and traditional knowledge to innovate and to adapt to a changing environment. What has happened in plant breeding is just one example of a progressive decline in many other sectors of agricultural research and, as a consequence, in the diversity of food. The decrease in biodiversity has been dramatic in the agricultures of the North and South and represents a severe threat to food security.

Reductionism has changed the nature of knowledge and the nature of food. Food is related closely to the metabolic processes, which are the very essence of biological life. Understanding the fundamentals of food means understanding the fundamentals of life. While the scientific understanding of life in terms of its inherent metabolism and its ecological dimensions is less than a hundred years old, the science and art of producing and preparing food is part of the cultural wisdom of humanity that has matured over millennia. In the human realm, food has not only a biological and an ecological dimension, it has also a cultural dimension. In fact, in its original meaning, the word "culture" referred to the cultivation of crops and the breeding of animals. From there, it was extended metaphorically to the cultivation of the human mind before it acquired the meaning of a distinctive way of life for any given population. And the original biological meaning of 'culture' as cultivation is still present in our term 'agriculture'.

The privileging of reductionism is neither natural nor inevitable. It is based on the subjugation of nature. According to Bacon "the nature of things betrays itself more readily under the vexations of art than its natural freedom. The discipline of scientific knowledge and the mechanical inventions it leads to do not merely exert a gentle guidance over nature's course; they have the power to conquer and subdue her, to shake her to her foundations".

Not only did the rise of the mechanical philosophy subjugate nature it has also subjugated women, indigenous cultures and their knowledge systems. Robert Boyle, the famous scientist who was also the governor of the New England Company, saw the rise of mechanical philosophy as an instrument of power not just over nature but also over the original inhabitants of America. He explicitly declared his intention of ridding the New England Indians of their ridiculous notions about the workings of nature. He attacked their perception of nature as

sacred and argued that "the veneration, wherewith men are imbued for what they call nature, has been a discouraging impediment to the empire of man over the inferior creatures of God". Market mechanisms have progressively replaced activities carried out on the farm or within the rural community with externally produced goods, services and 'technologies'.
Farmers' techniques and the knowledge embodied into them have been progressively delegitimized, and large "knowledge transfer" projects have been replacing traditional techniques with so called "sound science" and industry-based techniques. Public policies have continued to support this process of destruction and exclusion of diverse knowledge systems. In the allocation of public research budgets, most areas of knowledge vital for our future survival receive little or no support, and untested and unwanted options such biotechnologies or military applications are allocated the biggest share of the research budgets. Such exclusion of knowledge systems as well as of human priorities is making us more vulnerable to crises.

Integrating traditional knowledge

The traditional knowledge of indigenous cultures is increasingly being recognized as vital to the ecological renewal of the planet. Especially in the case of agriculture, traditional knowledge systems are making rich contributions in the transition to sustainability. The use of biodiversity in mixtures and rotations is an example of learning from tradition.
The resurgence of the Chinese, Indian and other holistic systems of medicine is another example of how the mechanical reductionist paradigm is giving way to holistic knowledge systems.
The emergence of agroecology as the new science for sustainable agriculture is the result of combining traditional knowledge of farming with knowledge of interconnections at the system's level.
At the 1992 United Nations Conference on Environment and Development, clear reference was made to traditional knowledge in the Rio Declaration and Agenda 21. Article 8 (j) of the Convention on Biological Diversity addresses the "knowledge, innovations and practices of indigenous and local communities" while one of the intergovernmental committees of the World Intellectual Property Organization is concerned with "Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore".

The 2005 Convention on the Protection and Promotion of the Diversity of Cultural Expressions of UNESCO article 2.3 affirms: “The protection and promotion of the diversity of cultural expressions presuppose the recognition of equal dignity of and respect for all cultures, including the cultures of persons belonging to minorities and indigenous peoples”.
The FAO´s International Treaty on Plant Genetic Resources for Food and Agriculture (Article 9 on Farmers´ Rights) states that “The Contracting Parties recognize the enormous contribution that the local and indigenous communities and farmers of all regions of the world, particularly those in the centres of origin and crop diversity, have made and will continue to make for the conservation and development of plant genetic resources which constitute the basis of food and agriculture production throughout the world” and then goes on to agree that national governments should develop measures to protect and promote Farmers’ Rights, including: “the protection of traditional knowledge”,“the right to equitably participate in sharing benefits arising from the utilization of PGRFA” and “the right to participate in making decisions, at the national level.
Community Biodiversity Registers (CBRs) are documenting the traditional knowledge held by elders and helping the transmission of this knowledge to future generations. CBRs are also acting as tools for legal declaration of community rights to biodiversity and as a counter to biopiracy.
The movements for community seed banks and saving heritage seeds are not just protecting biodiversity, they are also protecting the knowledge and cultural diversity that the seeds embody.
Participatory plant breeding initiatives around the world are combining farmers’ knowledge with scientists’ science, enlarging the base of seed supply and seed security. Seeds improved at community level through participatory methods, in partnership with researchers have proven to be better adapted to local conditions and climate change.
Biodiversity and seed fairs are being organized that gather farmers from different communities and countries for exchanging their knowledge, seeds, experiences, and expectations.

Section three
THE CORPORATE CONTROL OF SCIENCE AND THE COMMERCIALISATION OF KNOWLEDGE THROUGH PATENTS AND OTHER INTELLECTUAL PROPERTY RIGHTS (IPR'S) ARE UNDERMINING THE CREATION OF KNOWLEDGE ITSELF

The industrial revolution and the mechanistic utopia have imposed their own vision of a world in which the planet is a deposit of limitless resources to be exploited through science and technology for the creation of wealth. Fully compatible with the directions taken by corporate capitalism, the mechanistic "utopia" has served large corporations well. On the one hand it has given them access to the world's resources; on the other, it has created a fictitious world of finance, increasingly separate from the needs of society. Large capitalist enterprises have progressively taken control of the planet's resources, justifying their operations with ability for creating wealth.
Through the introduction of Intellectual Property Rights, though initially introduced to reward innovation, the development of scientific knowledge has increasingly become privatized and commercialised. With the alliance between large private corporations and public agencies of scientific research, knowledge has been co-opted to serve private interests. Intellectual property rights have also legitimized the process by private enterprises of appropriating traditional knowledge. By denying the scientific value of traditional knowledge, they allow its appropriation simply by codifying it into modern scientific discourse, then patenting it as an invention, and finally preventing its use by its own creators and custodians. This is how, for example, farmers have been progressively expropriated of their knowledge of seeds and of their right to save, improve and exchange seeds.

Reductionism as the dominant way to read reality has emerged as a perfect instrument for commercial interests to appropriate and commodify any dimension of nature and of human life. The marriage of knowledge and power that is now occurring through patents and other intellectual property claims on knowledge itself, is transforming knowledge from a commons into private

property. Wherever patents have been associated with scientific research, the result has been closure of communication within the scientific community. Reflecting on the closure of scientific openness Martin Kenney observes in his book *Biotechnology: the University Industrial Complex* (1993) that "the fear of being scooped or of seeing one's work transformed into a commodity can silence those who presumably are colleagues. To see a thing that one produced turned into a product for sale by someone over whom one has no control can leave a person feeling violated. The labour of love is converted into a plain commodity – the work now is an item to be exchanged on the basis of its market price. Money becomes the arbiter of a scientific development's value". With knowledge being reduced to 'knowledge for money', both basic science and traditional knowledge are considered less and less useful in and of themselves. The aims are no longer a better understanding of nature or human needs but the production of commodities and increase in corporate profits through trade and commerce and intellectual property rights. Today anything can be patented from real industrial products to processes applied to living and nonliving objects. These include mental products such as algorithms for informatics, and general software as well as financial methods and processes such as tax payer declaration techniques. This is necessarily hampering the progress of science, limiting the access to patented knowledge and preventing human adaptation through knowledge.

Genetically engineered products have opened the way to the application of all encompassing patents on living beings, conferring to corporations the ownership of such life form, material or process 'containing the invention'. GMOs, today cultivated on millions of hectares, are a prime example of the privatization and commercialization of scientific knowledge, with a handful of large corporations taking control of these crops and markets worldwide. Of particular concern are IPR instruments that inhibit seed saving, exchange, sale and access to proprietary materials necessary for the independent research community to conduct analyses and long-term risk and safety related research. Particularly in developing countries, GMOs and patents related to them have driven up costs. Agricultural patents restrict experimentation by the individual farmer or public researcher and potentially undermine local practices that contribute to food security and economic sustainability.

Patents also deny society access to essential products of knowledge such as seeds and medicine, both by creating monopolies and by encouraging biopiracy

through their appropriation and patenting by corporate and commercial interests. Thus the communities who evolve the knowledge are now prevented access to what they have collectively and comunatively created. This is particularly true in the fields of agriculture and pharmaceutical products. Both traditional agricultural practices and traditional medicine are being destroyed. As a consequence, knowledge is losing its value as a guide for adaptation in an everchanging world, particularly relevant in a period of world-wide instability. The time has come to arrest this ever increasing commercialization and commodification of knowledge and to defend knowledge as a pubic good to which all have access. The appropriation of traditional knowledge through patents clearly needs to stop. For this the incomplete review of the Trade Related Intellectual Property Rights (TRIPS) of the World Trade Organization (WTO) must be completed as mandated. Since the coming into force of WTO, these changes have been an ethical imperative. Today these changes in international rules, to allow once more the free flow of knowledge and the usage of its variability, have become an imperative for adapting to the accelerating planetary changes.

B. PRINCIPLES FOR A NEW KNOWLEDGE PARADIGM FOR ENSURING A HEALTHY PLANET

Section four
NEW PARADIGMS OF FOOD AND AGRICULTURE SHOULD LEARN FROM A HOLISTIC SCIENCE OF LIFE.

The survival of humans depends on the capacity of our species to maintain and preserve the plasticity of the Biosphere with all its interacting components, the human species included. Since agriculture is a production system based directly on the resources of the biosphere – soil, water and biodiversity – it provides a good example of non-sustainability brought about by the transition from traditional knowledge to fragmented traditional science.
The reductionist method, born with modern science with the aim of simplifying the study of natural systems, led to impressive progress in technology, but also to a deep fragmentation in knowledge and in a lack of capacity for synthesis. The construction of a simplified world based on single versions of few. optimal products, both living and non living, leads to the creation of a single, homogeneous society with only one culture, one ideology, one science, one technology, one model of economy and production. In other words it means destroying the tools and the processes that have allowed the adaptation and the proliferation of humans in all areas of the planet. It also implies the destruction of cultural and biological diversity.
The non-sustainability of food and agriculture systems based on reductionist science has created the need for new paradigms based on holistic science, both traditional and modern. Farmers across the world are re-evaluating traditional knowledge as a source of innovation, and are following their own independent paths of development as opposed to those suggested by official systems of knowledge, and are building parallel systems of knowledge, aligning themselves with non reductionist segments of scientific research. At the same time, at the heart of these same scientific institutions, currents of thought are emerging that support the need to incorporate traditional knowledge into modern systems of knowledge.

Successes of ecological organic agriculture and production based on local food systems, born outside of, and often despite conventional forms of production and distribution, are speeding up the re-evaluation of the role of traditional knowledge in new paradigms of food and agriculture.

Holistic knowledge is necessary to be able to take into account the consequences of every human action and manipulation. For the evolution of holistic knowledge we need to go beyond mechanistic reductionism and include both the knowledge of people and the emerging knowledge from science itself.

Scientist's science and traditional knowledge

There is a distinct difference between the word and metaphor 'Science' as compared to the german 'Wissenschaft' or the Italian 'Sapere'. 'Science' has often been used to exclude the 'wrong' people and the 'wrong' kinds of knowledge. 'Wissenschaft' means the creation of knowledge, whatever the means or the methods. This implies that a farmer or a fisherman, young and old, man and woman have the capacity to participate in the eternal knowledge creating processes. 'Sapere' means the legacy of learning, technical and empirical, manual and conceptual, accumulated by people over time and handed down from generation to generation.

The shared metaphors of a society are a basis for wrong or right conceptions, assumptions, actions, activities and knowledge creation and utilization. The metaphors are obviously steering the questions raised and the hypotheses created within a given society. The metaphors for the Science of the North and for agro-biotechnology are often derived from mechanistic engineering, a warfare or a profit-oriented economy.

The breakdown of normal scientific discourses within important, biotechnology-related research fields, has been a tragic side effect of the extreme polarizations within and between the society as a whole and the vast economic investments and revenues that are at stake. This is particularly true in the case of GMOs. Furthermore, despite a recognized need, a number of ethical, socioeconomic, cultural, gender and legal issues, including concern for food safety, ecosystem safety and sustainable development, have not been given appreciable attention within research and regulatory frameworks.

In a number of countries the same government regulatory organizations are given the responsibility to perform conflicting tasks of biotechnology promotion and risk governance simultaneously. This is an impossible balancing act, particularly since the power and resources for efficient lobbying are so unequally distributed among interested parties. In such cases all too often biotechnology promotion overshadows safety, biodiversity and sustainability concerns.
The GE/GMO issues are characterized by "technology-push" rather than "demand-pull". Additionally, data based on some years and some GM crops indicate highly variable 10-33% yield gains in some places and yield declines in others. This points to a fundamental lack of knowledge and of scientific interest related to the influence of different ecosystem parameters on the functioning and regulation of plant genomes.
Although firmly rooted in most national laws and international agreements, the Precautionary Principle has not been the intended roadsign to good regulatory practices and to the science of risk assessment, and has largely not been accounted for in policy decisions on GMOs. In the near future, marketing applications for the next generations of GE plants (e.g. multitransgenic, nutritionally enhanced, plastic-producing, enhanced for farm fish favorable oils, pharmaceutics- and vaccine-producing, etc.) will overflow the regulatory organizations. Furthermore, we will have techniques from nanobiotechnology and synthetic biology converging with recombinant DNA methods into new technologies that, ironically spoken, promise to solve virtually all the environmental and health problems we can realize and dream of. But they may potentially also create food, feed and ecosystem safety problems we have never realized or dreamt of.
The global situation calls for new and improved ways to regulate modern biotechnologies. Society cannot afford to leave biosafety research to the biotechnoloy of industry. Democratic control over the food chain is crucial. Truly independent biosafety regulatory organizations and research institutions must be established and firmly supported. All regions and countries need biosafety research relevant for their own societies and ecosystems. It should be evaluated whether independent, society-funded biosafety research really is 'more costly' to society or not when the risks of 'unexpected' harm and missing benefits are taken into account.

Roads to a healthier planet

There is nothing in the present state of the Planet indicating that we need more of the coherently non-holistic science and technologies that are dominant today. On the contrary, our common blue-green little spaceship is in desperate need of new types of science and knowledge. The adverse consequences of global changes have the most significant effects on the poorest and most vulnerable who historically have had limited entitlements and opportunities for influence on global policies.

A problem-oriented approach to agricultural research and development would focus on local priorities identified through participatory and transparent processes, favoring holistic solutions to local problems. These processes require new kinds of support for the public to critically engage in assessments of the technical, social, political, cultural, gender, legal, environmental and economic impacts of modern biotechnology. New science should be used to support and maintain local expertise and crops so that the local community owns the capacity for further research. Such approaches would put much needed emphasis on participatory breeding projects and agroecology. Consumers also can contribute to participatory breeding especially in identifying objectives such as taste, quality and nutrition.

Successfully feeding the world in sustainable ways, while responding to new priorities and changing circumstances, would require a fundamental shift in agricultural strategies and world views, with ramifications for science, technology, policies, institutions, capacity development and investment. Such a shift would recognize and give increased importance to the holism of agriculture, accounting for the complexity of agricultural systems within diverse social and ecological contexts. It would require new institutional and organizational arrangements to promote holistic and integrated approaches to the development and deployment of knowledge, science and technologies. The farming communities, farm households, and farmers would have to be recognized as users, guardians and managers of ecosystems. The needed changes must be directed primarily at those who have been served least and hit worst by previous agricultural technology revolutions, i.e., resource-poor farmers, women and ethnic minorities. In order to succeed, traditional and local knowledge has to be integrated into an interdisciplinary, holistic and systems-based approach to knowledge production and sharing.

If such new holistic, agro-ecological technologies are to contribute to greater equity as well as sustainability and a healthier Planet, this must be accompanied by an expanded access of farmers and other rural populations to occupational, non-formal and formal education. In addition, there should be systems of incentives and rewards for holistic and sustainable practices, and organized relief in realization of the vulnerability of agricultural communities. Local and traditional knowledge as well as the concerns and priorities of farming communities should be included in research program goals and university teaching curricula. New modes of governance to develop innovative local networks based on participation must be stimulated and enforced.

Section five
DIVERSITY AND PLURALISM OF KNOWLEDGE SYSTEMS ARE VITAL FOR EVOLUTION AND ADAPTATION, ESPECIALLY IN TIMES OF INTENSIFYING INSTABILITY AND GREAT UNPREDICTABILITY

All living systems evolve and die when they stop evolving.This is true for natural systems as well as for cultural systems. Real knowledge is a living system which changes and adapts to a changing reality. Uniformity deprives systems of evolutionary mechanisms and potential. The simplistic assumption that nature is 'simply mechanical' no longer has currency. Knowledge diversity is needed today to strengthen the systems of knowledge so that we can ask the right questions and provide the answers to the enormous challenges of our times.

Traditional and indigenous knowledge, also through integration with a scientific knowledge that is able to recognize its own partiality when faced with complex phenomena can help humanity adapt and evolve in our unpredictable and volatile times, given their intimate link to biological and cultural diversity. Farmers' daily observation and study make them scientists in the field, ensuring conservation of the habitat, the soil and water systems. Across the world farmers' knowledge has protected and enhanced biodiversity at the same time guaranteeing food security for their own communities. In most cultures women's activities have been directly connected with life and therefore with adaptation and survival in changing environmental and human contexts. Older generations are the ones who keep memory of knowledge and experience alive, giving the community the humus on which can be based evolution, innovation and identity. Young people are creatively challenging today's outmoded paradigms, they are quick to identify the critical points of the system. Their contribution to multidirectional processes of learning and teaching can help enrich human knowledge and facilitate the processes of adaptation and transformation.

Many scientists today, especially when not compromised by the lure of large private enterprises, know well that the reductionist solution is not necessarily the best. Now that the dominant model is showing its inadequacies and

failures, we must recognize the plurality of knowledge systems and the potential of their integration essential to increase our capacity to survive as a species.

Complexity has emerged as the most important organising principle for living organisms, systems and processes. Complexity is related to diversity and both give rise to the emergence of a new capacity for adaptation and plasticity in the context of change.
The uniformity and centralization of reductionist systems actually makes them less resilient. The reductionist scientific modelling of 'complex' systems shows that when systems reach a state of critical instability they either break down to their components or break through to another order of integral functioning. As these are irreversible 'points of no return' the maintenance of a *status quo* or return to a previous mode of organization and functioning are impossible. Instability and breakdown is being witnessed from the cellular to the planetary level. Disease outbreaks such as mad-cow disease, avian flu and swine flu, are signals that our manipulation of organisms and species is crossing the limits of balance and stability.
The simplistic mechanistic utopia lacks the complexity and diversity for evolution of knowledge. Unidimensional mechanical systems break down under stress due to their lack of ability to adapt. Uniformity is rigid, diversity is flexible. Contemporary energy intensive industrialized monocultures are dependent on high level external inputs and are therefore vulnerable to breakdown when input supply is ruptured because of economic, political or ecological changes. On the other hand internal input, biodiverse, ecological and local food systems have resilience in the context of external turbulences, both climatic and economic. The rise of monoculture of knowledge has rendered invisible the multiple traditions of knowledge, diverse metaphors and communication modes so vital to our times. Different forms of knowledge have different ways of transmission and testing: oral, symbolic, observational. The monoculture of knowledge only recognizes the written and quantified, ignoring the oral traditions and the science of qualities. It has become important to recognize, to recode and to rejuvenate these marginalized and forgotten knowledge systems, taking advantage of possibilities offered by modern communication systems. People's knowledge (evolved by male and female farmers and indigenous

communities) and Scientist's science are not necessarily contradictory. The main difference between them is of a methodological nature: people's contributions to a new technology are based on observations repeated over time, while scientists' conclusions are often based on observations repeated over space (replications) and for a limited period of time. Traditional knowledge is enriched every day by the observations of an ever changing nature and is used with the aim of achieving sustainable interaction with the environment.

It must be recognized that men and women farmers domesticated the crops that are feeding humanity today. They have continued to modify, adapt, improve and spread crops, and they plant, harvest, exchange seeds and feed their neighbours, all this for several thousand years. In doing all this our ancestors accumulated an immense wealth of community shared knowledge that "science" has almost entirely ignored. Yet, as we have seen, companies today are increasingly hijacking that knowledge to exploit it for profit purposes via patenting and biopiracy without benefit sharing with the owners.

People's utilization of their knowledge in improving crops has resulted in the agricultural biodiversity which is still present in those few areas not touched by commercial breeding. This is because part of that knowledge is related to the diversity that reduces the risk of crop failures and therefore increases food security. In addition the diversity of climates, soils and uses, has progressively led to the selection of different crops and different varieties within crops, with a strong emphasis on adaptation over time and hence site specificity. In contrast to this, commercialization based on 'scientific breeding', emphasizes wide spatial, even global adaptation with an inevitably progressive decrease of biodiversity. Participatory plant breeding, a type of breeding that is carried out in collaboration with farmers and is based on selection for specific adaptation, though practiced for only about 20 years and by relatively few groups, has shown impressive benefits for both biodiversity and crop production. Participatory plant breeding can be developed into "evolutionary plant breeding" to cope in a dynamic way with climate changes.

Indigenous and traditional local systems which have coevolved together with changing environmental conditions, have high resilience and high adaptation capacity. Dominant science has not taken into consideration the possibility of benefiting from time tested traditional knowledge or contributing to its enrichment in favour of local communities. We do not need a transition from

one system to another based on mutual exclusion. What we need are new partnerships, new communication and new networking among diverse systems on the principle of equality and mutual respect. In order to respond to the serious challenges ahead, inclusion of excluded knowledge systems becomes a historical necessity.

Adaptation in turbulent times requires maintaining high levels of degrees of freedom and degrees of choice. This requires diversity in all its forms. At the intellectual level, this means pluralism of knowledge systems and scientific approaches. At the ecological level, it means diversity of species and ecosystems. At the cultural level, it means diverse languages, diverse communication systems, diverse forms of artistic expression. At the economic level, this means diverse forms of production and marketing.

All these diversities at all levels need to be recognised, protected, nurtured. Small niches and marginalized traditions could hold the highest potential for systems innovation and adaptation. Just as small seed banks and gene banks are vital for the continued evolution of agriculture, protection of diverse knowledge systems is vital for the continued evolution of knowledge. At the Indigenous Peoples conference on Climate Change in Anchorage in April 2009, an elder of the indigenous community stated "We have the knowledge of how to live through these climate changes. We need to use traditional knowledge to help all our cultures live through these changes".

A holistic synthesis between people's knowledge and the best of modern ecological science is vital for the return to a healthy planet, and healing human society. This synthesis has to be built on an understanding of interconnections and inter-relationships between parts and has to be based on mutual respect and recognition of equal relevance.

Diversity of knowledge systems and their continuous evolution are based on sharing knowledge. Knowledge can be shared only when it is a commons. Present intellectual property regimes inhibit knowledge diversity and stop learning and innovation processes by blocking sharing of knowledge. They also create the threat of appropriation and privatization of traditional knowledge through biopiracy. Precisely at the time when humanity needs the integrity and soundness of diverse cultures and knowledge systems, biopiracy threatens the future evolution of traditional knowledge.

Diversity is created and increased through exchange - between generations,

cultures, and knowledge systems and traditions. Indigenous and traditional knowledge need to be resurrected based on plurality and the necessary discussion between scientific paradigms, with equal recognition of all forms of knowledge. Such a dialogue needs to be based on the understanding that innovation is the result of learning through social interaction and the ability to integrate different knowledges and ways of knowing. In such pluralistic systems, scientific and traditional and local knowledge grow and are enriched through a complementary process of hybridization. Local knowledge that evolves over a long period of time can benefit through the speed of information flow through processes of sharing and exchange. Academic researchers can create new knowledge through interacting with all those who, outside of academia, develop specific capacities of observation, analyses and experimentation within their respective fields of activity. Terra Madre is an example of thousands of communities from different parts of the world bringing their local traditions in a global exchange facilitated by new communication technologies.

UNESCO has a major initiative on traditional knowledge which is documenting the cumulative body of knowledge, know-how, practices and representations of local communities. These sophisticated sets of understandings, interpretations and meanings are part and parcel of a cultural complex that encompasses language, naming and classification systems, resource use practices, ritual, spirituality and worldview. This local and indigenous knowledge is a key resource for empowering communities to combat marginalization, poverty and impoverishment.

Section six
THE KNOWLEDGE SOVEREIGNTY OF COMMUNITIES HAS TO BE RECOGNIZED AND KNOWLEDGE MUST BE FREELY USED, ENHANCED AND SHARED

All human beings are knowing subjects, irrespective of class, race, gender, religion, ethnicity or age. All communities and cultures are knowledge creators. Cultures that have survived over time have constantly evolved their knowledge systems which are categorized as 'traditional knowledge'. The dominant structures and institutions of knowledge generation in contemporary society have led to the domination of 'experts' while excluding the knowledge of people.

The right of communities and cultures to jointly develop and enhance their knowledge, asking the questions of their choice and sharing this knowledge freely with other groups and networks, constitutes their knowledge sovereignty. Knowledge should flow freely. Knowledge sovereignty does not imply the right to refuse its free flow. It includes the full democratic participation by citizens for the new knowledge synthesis based on inclusion of excluded knowledge systems.

A new awareness of the importance of cultural and scientific diversity and the availability of new information technologies make necessary a profound transformation of official knowledge systems, presently undemocratic, technocratic and separated one from the other.

The new knowledge systems must be able to promote sustainability, equity and resilience, through:

- knowledge systems that allow a plurality of approaches and forms of knowledge to live side by side and integrate;
- guaranteed openness, equal dignity of all knowledge, and the capacity of farmers and local rural communities' to be heard;
- the distribution of public resources and the regulation of intellectual property, clearly identifying public interests and private interests, with priority being given to the first.

Just as Food Sovereignty has emerged as the organizing principle for our food security based on full participation where all people have the right to decide

what they eat and the way they produce, so too Knowledge Sovereignty must be fully integrated into structures and institutions of knowledge generation, technology choices and production and consumption choices. Knowledge sovereignty rests on the duty to share knowledge freely with other sovereign communities and to continue the free flow of knowledge.

Contemporary society is often referred to as the knowledge society. This categorisation is based on the deployment of information technologies. However information is not knowledge. It does not in and of itself provide the discrimination, the patterns to separate the useful from the not useful, the sustainable from the not sustainable, as knowledge does.
Where information does not provide a deeper understanding of life and of living, its use is limited. Without a holistic perspective, knowledge is reduced to its fragments. Knowledge replaced by mere information promotes a new kind of information consumerism. As with food, information can serve essential needs of people, but can also be consumed in excess. Severe shortage and lack of essential knowledge can exist next to information overflow and 'information obesity' and both can result in different forms of dependency which undermines sovereignty.
Along with the privatization and concentration of knowledge processes, we are witnessing other tendencies that are radically changing the way knowledge is being produced, reproduced and circulated. Facilitated by the flow of people and by information technology, today horizontal, not hierarchical systems of knowledge emerge and develop by means of 'hybrid' networks of independent individuals, that include researchers, technicians, consumers, producers, connected to one another on an equal basis, and permit learning processes through people and things.
New knowledge emerges within these networks each time that the learning processes lead to new ways of doing things. The separation between producers, intermediaries and holders of knowledge is increasingly blurred, being replaced by a *de facto* distinction between local experts, cultural mediators, communicators and theorists.
Knowledge evolves through interaction with our environment. It also grows in response to new challenges. It is additionally driven by demand and values, and its quality and relevance depends on the ability to meet challenges in the real

world. In other words, knowledge should enable activity, have an evolutionary history, a regional context. Knowledge communities share, maintain and further develop knowledge, not only among themselves but also in broader and more complex networks of exchange and collaboration.

Democratic ownership is essential for knowledge to be meaningful, life enhancing and fostering creativity and furthering development. Knowledge must serve peoples needs and must ensure community participation. Communities in this context are defined as diverse forms of active human conviviality, from traditional village communities and families, to scientific communities, to communities of working collaboration and cultural cooperation, to virtual communities or new urban lifestyle communities. Most humans belong to more than one community and may change the communities they belong to.

Different types of knowledge have been defined, such as scientific, traditional or indigenous knowledge. All these types of knowledge are based on paradigms and values and rules of application as well as how to distinguish true and false, right or wrong. Knowledge helps us in defining our place on the earth and our relationship with life on earth. Besides providing understanding, knowledge also brings us benefits through its practical applications. Most knowledge is treated and shared as public good, while many forms of its application are also exchanged on different markets serving demand and rewarding the labour and excellence of mastering specific aspects of knowledge.

As with other products in contemporary times, also in knowledge production speed replaces content and quality. Instant access to information replaces knowledge absorption just as instant access to fast food replaces quality eating. Change is being imposed at a faster and faster rate, not considering, and often against, the will of people. 'New improved' products fill the supermarket shelves while time tested foods disappear. Similarly time-tested seeds evolved by farmers' participatory breeding are replaced by non-renewable seeds that have to be bought every year.

Constant replacement of old by new products implies a loss of history and accumulation of waste. This is part of the central production and marketing strategies of a 'throw away' society (getting as much as you can to then throw away large parts of it), including the creation of a passive and wasteful consumerism. Parallel to a wasteful, material consumption, we are witnessing

a widespread, highly alienated knowledge consumption, much of it being for secondary purposes (status, distraction, substitution). The question "do I need to know this" is rarely asked and heavily sanctioned.
Where knowledge is no longer produced and used for practical and convivial purposes, qualities derived from these purposes are of decreasing importance, including their long term values of being part of a historical evolution of culture and values shared in communities. As a result, increasing amounts of bits and pieces of proprietary "junk knowledge" with short market-cycles and low density of use and quality are discharged upon the markets of the ´knowledge-society' in increasing quantities and reproduced, adulterated, as well as simply faked at high speed.
The present state of knowledge about food and its application is a perfect example of this type of industrialised knowledge. Consisting of constantly and fast changing disconnected pieces of information, it has actually led to an unprecedented high level of consumer confusion with major detrimental consequences for health, environment, culture and quality. The accelerated rhythm of these systems of knowledge related to the introduction of new techniques and input has impeded the ability of local systems to develop and introduce knowledge that, being outside of the dominant scheme, take longer to elaborate and consolidate. At the same time this has generated false needs and waste both as much with consumers as with producers. Following the principle of 'use it or lose it', traditional knowledge, which has evolved and was carefully maintained and enriched over generations, must be protected to provide us with wholesome knowledge for wholesome living.
Producing knowledge independent from its context of use, beyond the control of communities, undermines sovereignty. While it intends to also serve the public good and communities, and despite the fact that most of such undemocratic science has always been financed by and serving specific needs of corporate profits and warfare, this dominant paradigm pretends to create knowledge for knowledge sake, while being intimately linked to economic and political interests. This tradition based on the mechanical utopia substantially differs from other traditions of knowledge which are guided by the sovereignty of people and communities and work for their benefit.
We need a change from the undemocratic, insular, exclusivist, technocratic decision making, in all areas of human activity. Knowledge Sovereignty is

people's right to create knowledge and to participate in processes that affect their lives. Peoples knowledge must be fully integrated into structures and institutions of knowledge generation, technology choice and production and consumption choices. Such participation is not possible in the commercialized, centralised knowledge structures and research systems that dominate today. Independent and public science is at the core of knowledge sovereignty.

The merging of knowledge and power has become a threat to human freedom, to human security. The tyranny of commercial interests is stifling knowledge and preventing the full evolution of our human capacities and potentials.

Democratization of knowledge implies participation in the generation of knowledge. It also implies access to knowledge through removal of the walls of exclusion in the form of IPR's as well as biases against indigenous and traditional knowledge, the knowledge of women and the knowledge of citizens.

Knowledge sovereignty exists at multiple levels - the individual, the community and society level. Knowledge sovereignty goes hand in hand with a duty to share knowledge freely with other sovereign communities and does not imply the right to refuse free flow.

We need a new holistic science based on democratic participation which takes into account the wellbeing of nature, people and future generations. The care and concern for future generations can only be built on the democratic participation of present generations.

Knowledge is power. Knowledge sovereignty ensures that this power is shared by all.

INTERNATIONAL COMMISSION ON THE FUTURE OF FOOD AND AGRICULTURE

A joint initiative of

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