KNOWING AGRICULTURAL BIODIVERSITY

"Managing Agricultural Resources for Biodiversity Conservation"
National Biodiversity Planning Tools

KNOWLEDGE FOR SUSTAINING AGRICULTURAL BIODIVERSITY

by

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Agricultural biodiversity encompasses the variety and variability of animals, plants and micro-organisms which are necessary to sustain key functions of the agro-ecosystem, its structure and processes for, and in support of, food production and food security. (FAO, 1999)

CONTENTS

1. Global Thinking about Agricultural Biodiversity

The term "agricultural biodiversity" is relatively recent, perhaps post-CBD. Although, the specific nature of the biodiversity used by people was recognised for a long time, the overwhelming emphasis in the CBD was on general biodiversity, mainly 'wild' flora and fauna that inhabit this fragile biosphere in which people also live.

The Nairobi Final Act took special cognizance of PGRFA in particular, but this opened the way for further developments in the whole area of GRFA.

But really only since the creative work of FAO and Swedish delegation members pre-COP 3 and the subsequent work done by FAO and CBD - and reflected in the Decisions (III/11, IV/9, V/5) as well in various workshop reports and proceedings - did this concept become solidly based. Agricultural biodiversity is now recognised by CBD as essential for global food production, livelihood security and sustainable agricultural development. The plant, animal and microbial organisms important to food and agriculture must be conserved and used sustainably if, as is required for universal food security, sustainable food production is to be achieved across the whole range of agro-ecosystems and production systems. This has been recognized not only by FAO but also by the Parties to the Convention on Biological Diversity (CBD) and many other organizations from global to local levels. It is now a major theme for implementation of the Convention on Biological Diversity (CBD) through the Agricultural Biodiversity work programme.

Evolution of Global Thinking about Agricultural Biodiversity

The understanding of agricultural biodiversity has developed during the last three decades from the recognition of the importance of genetic diversity, particularly for crops, and an emphasis on the ***ex situ*** approach in the 1970s to the adoption of the ***in situ*** approach in the 1990s and now to the development of the agro-ecosystem approach.

The Integrated Rural Development (IRD) concept of the 1970s, with its emphasis on providing complete input packages for seeds, agro-chemicals, irrigation, mechanization, credit, extension, etc., did not recognize that genetic resources and the wider agricultural biodiversity were also relevant at the production system and the agro-ecosystem levels. However, with the establishment of the FAO Commission on Plant Genetic Resources (CPGR) in 1983, an important milestone, it was recognized for the first time that genetic resources were a concern for humankind, requiring concerted intergovernmental action. This coincided with the introduction of the Sustainable Agriculture and Rural Development (SARD) concept, which recognized the need to integrate environmental and production goals. Several other organizations, such as the World Conservation Union (IUCN), had been developing policies and programmes for integrating nature conservation with agriculture, especially in Western Europe, since the early 1970s. This development of ideas culminated in the Conference on Environment and Development (UNCED) in 1992, in preparation for which the 1991 Den Bosch Conference, organized by FAO and the Government of the Netherlands, played a very significant role.

After UNCED, the CPGR was renamed the Commission for Genetic Resources for Food and Agriculture (CGRFA) in order to reflect its expanded mandate to include forest, animal, fish and other genetic resources, including bacteria and soil biota

essential for food and agriculture. Even though the scope was still on a genetic and species level, this was the first step towards developing the ecosystem approach.

Subsequently the Leipzig Conference in 1996 helped to translate some of these concepts, such as the ***in situ*** approach, into priority activities specifically for the conservation and sustainable use of plant genetic resources for food and agriculture.

Today, the focus is on developing the ecosystem approach. There is a need to understand the inter-relationships of agricultural biodiversity in agroecosystems (see box "Understanding Agrocecosystems"). There is need understand and recognise the knowledge components of an integrated and holistic approach, linking the genetic level, the species level and farm and agroecosystem level: to understand and recognise whose knowledge contributes most and how this can be protected and further developed.

UNDERSTANDING AGROECOSYSTEMS

Agro-ecosystems may be identified at different levels or scales, for instance, a field/crop/ herd/pond, a farming system, a land-use system or a watershed. These can be aggregated to form a hierarchy of agro-ecosystems. Ecological processes can also be identified at different levels and scales. Valuable ecological processes that result from the interactions between species and between species and the environment include, inter alia, biochemical recycling, the maintenance of soil fertility and water quality and climate regulation (e.g. micro-climates caused by different types and density of vegetation). Moreover, the interaction between the environment, genetic resources and knowledge and management practices determines the evolutionary process, which may involve, for instance, introgression from wild relatives, hybridization between cultivars, mutations, and natural and human selections. These result in genetic material (farmers' crop varieties or animal breeds) that is well adapted to local abiotic and biotic environmental variation.

Agro-ecosystems comprise polycultures, monocultures, and mixed systems, including crop-livestock systems (rice - fish), agroforestry, agro-silvo-pastoral systems, aquaculture as well as rangelands, pastures and fallow lands. Their interactions with human activities, including socio-economic activity and sociocultural socio-cultural diversity, are determinant. Some of the key functions for maintaining stable, robust, productive and sustainable agro-ecosystems may include the following:

- breakdown of organic matter and recycling of nutrients to maintain soil fertility and sustain plant and consequently animal growth;
- breakdown of pollutants and maintenance of a clean and healthy atmosphere;
- moderation of climatic effects such as maintaining rainfall patterns and modulation of the water cycle and the absorption of solar energy by the land and its subsequent release;
- maintenance and stability of productive vegetative, fish and animal populations and the limitation of invasion by harmful or less useful species;
- protection and conservation of soil and water resources, for example through a vegetative cover and appropriate management practices, and the consequent maintenance of the integrity of landscapes and habitats;
- sequestration of CO2 by plants.

(FAO, 1999)

Understanding the Scope of Agricultural Biodiversity

Agricultural biodiversity of all food species is a vital sub-set of general biodiversity, highly threatened by globalisation of food markets and tastes, intellectual property systems and the spread of unsustainable industrial food production, but it provides the basis of the food security and livelihood security of billions of people and the development of all food production, including for industrial agriculture and for the biotechnology (Life) industries. It is the first link in the food chain, developed and safeguarded by farmers, herders and fishers throughout the world.

Although the term "agricultural biodiversity" is relatively new - it has come into wide use in recent years as evidenced by bibliographic references - the concept itself is quite old. It is the result of the careful selection and inventive developments of farmers, herders and fishers over millennia. Agricultural biodiversity is a vital sub-set of biodiversity. It is a creation of humankind whose food and livelihood security depend on the sustained management of those diverse biological resources that are important for food and agriculture. Agricultural biodiversity includes:

- Harvested crop varieties, livestock breeds, fish species and non-domesticated ('wild') resources within field, forest, rangeland and in aquatic ecosystems;
- Non-harvested species within production ecosystems that support food provision, including soil micro-biota, pollinators and so on; and
- Non-harvested species in the wider environment that support food production ecosystems (agricultural, pastoral, forest and aquatic ecosystems).

Agricultural biodiversity results from the interaction between the environment, genetic resources and the management systems and practices used by culturally diverse peoples resulting in the different ways land and water resources are used for production. It thus encompasses the variety and variability of animals, plants and micro-organisms which are necessary to sustain key functions of the agro-ecosystem, its structure and processes for, and in support of, food production and food security.

Agricultural biodiversity has spatial, temporal and scale dimensions especially at agroecosystem levels. These agro-ecosystems - ecosystems that are used for agriculture - are determined by three sets of factors: the genetic resources, the physical environment and the human management practices. There are virtually no ecosystems in the world that are "natural" in the sense of having escaped human influence. Most ecosystems have been to some extent modified or cultivated by human activity for the production of food and income and for livelihood security.

Agricultural biodiversity thus comprises the variety and variability of animals, plants and micro-organisms used directly or indirectly for food and agriculture (including, in the FAO definition, crops, livestock, forestry and fisheries). It comprises the diversity of genetic resources (varieties, breeds, etc.) and species used for food, fodder, fibre, fuel and pharmaceuticals. It also includes the diversity of non-harvested species that support production (e.g. soil micro-organisms, predators, pollinators and so on) and those in the wider environment that support agro-ecosystems (agricultural, pastoral, forest and aquatic), as well as the diversity of the agro-ecosystems themselves.

So, agricultural biodiversity is not only the result of human activity but human life is dependent on it not just for the immediate provision of food and other goods, but for

the maintenance of areas of land that will sustain production and for the maintenance of the wider environment.

Expanding Knowledge of Agricultural Biodiversity's Functions

The multiple dimensions of agricultural biodiversity can be described as providing for:

- **Sustainable production of food** and other agricultural products emphasising both strengthening sustainability in production systems at all levels of intensity and improving the conservation, sustainable use and enhancement of the diversity of all genetic resources for food and agriculture, especially plant and animal genetic resources, in all types of production systems.
- **Biological support** to production emphasising conservation, sustainable use and enhancement of the biological resources that support sustainable production systems, particularly soil biota, pollinators and predators.
- **Ecological services** provided by agroecosystems such as landscape and wildlife protection, soil protection and health (fertility, structure and function), water cycle and water quality, air quality, CO2 sequestration, and so on.

In summary, agricultural biodiversity is essentially the interaction of knowledge and genetic resources used for food, biological support or ecological services. The accumulated knowledge is the product of countless generations of farmers, herders and fisherfolk. All policies for the conservation and sustainable use of agricultural biodiversity must therefore start from a recognition of this contribution, valuing this component and incorporating it into future plans.

2. Case Studies

There is now a whole literature on Agricultural Biodiversity, which includes case studies, policy analyses, as well as plans and programmes at international and national levels. All the Case Studies prepared for this study contain many references to the knowledge component of agricultural biodiversity, its protection and legal recognition.

COMMENTARY

The studies (see summary document) show that there is still a preponderance of effort, however, on understanding the management and knowledge components of "general biodiversity", rather than agricultural biodiversity. The existence of major primary and secondary centres of crop diversity and animal breed diversity is noted in some cases, but not all. (Fish/aquatic diversity is missing?) It is heartening to see quite a number of programmes looking at pollinators, predators and soil biodiversity. Agroecosystem functions are mentioned by some, but not all. And recognition of the multi-variate complexities of agroecosystems at all levels is given less attention than perhaps it should.
The understanding of the complexities of agricultural biodiversity, its purposes in sustaining the functions of agroecosystems and providing for food and livelihood security, needs increased emphasis.

There is a danger in 'Biodiversity Planning' to focus on the measures needed to 'protect' biodiversity and ensure sustainable use and benefit sharing. In work on agricultural biodiversity, it is not so much its 'protection' as its 'development' through diverse management practices incorporating local knowledge, that becomes key.

It can be said that agricultural biodiversity is the PRODUCT of a healthy sustainable agroecological production system, as well as being its base component. So we are dealing with a highly dynamic system in which PEOPLE are at the centre.

There is a need to emphasise the importance of agricultural biodiversity and people first and then show how it fits into the overall picture of biodiversity planning and therefore how policy, plans and programmes can be modified to enhance agroecosystem functions.

3. Human values:

agricultural biodiversity and traditional knowledge

The special thing about agricultural biodiversity is that it is the product of human ingenuity: it embodies the knowledge of generations from since some 10,000 years BC. That knowledge is bound into the genetic, species and agroecosystem diversity through countless managed adaptations of interactions between species (and sub spp / vars/ breeds/ &c) that have been the result of human initiatives.

Thus, in the nature of this issue, all agricultural biodiversity activities are based on knowledge systems that stretch from the birth of agriculture to the present day.

CBD Article 8j

Traditional knowledge is perhaps a quaint term for a knowledge system that is undervalued by modern globalised food systems. Indigenous knowledge has a bit more weight, connecting the knowledge systems directly to a social group (as enshrined in Article 8j for example)

> ***Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilisation of such knowledge, innovations and practices***.

FAO Farmers' Rights

"Farmers' Rights" values the knowledge system of local farming communities and recognises the value of the genetic enhancements they have developed within seeds, in particular (e.g. FAO 5/89).

> ***Farmers' Rights mean rights arising from the past, present and future contributions of farmers in conserving, improving, and making available plant genetic resources, particularly those in the centres of origin/diversity.***

The FAO definition embodied in the International Undertaking now explicitly includes:

> ***(a) protection of traditional knowledge relevant to plant genetic resources for food and agriculture;***
> ***b) the right to equitably participate in sharing benefits arising from the utilization of plant genetic resources for food and agriculture;***
> ***(c) the right to participate in making decisions, at the national level, on matters related to the conservation and sustainable use of plant genetic resources for food and agriculture.***

FAO affirms the importance of Farmers' Rights

> ***that the past, present and future contributions of farmers in all regions of the world, particularly those in centres of origin and diversity, in conserving, improving and making available these resources, is the basis of Farmers' Rights. Also that the rights recognized in the International Undertaking to***

save, use, exchange and sell farm saved seed and other propagating material, and to participate in decision-making regarding, and in the fair and equitable sharing of the benefits arising from, the use of plant genetic resources for food and agriculture, are fundamental to the realization of Farmers' Rights, as well as the promotion of Farmers' Rights at national and international levels.

"Traditional Knowledge" is embodied in all aspects covered by the studies, not just the specifics highlighted under that term. It is the basis of Agricultural Biodiversity.

Knowledge Content of Agricultural Biodiversity

All the Case Studies have important aspects of the ***'knowledge content'*** embodied in agricultural biodiversity, and can be analysed using the following framework to see how this is changing and why:

a) Is the knowledge base associated with specific socio-cultural conditions and is it non-transferable?
b) Is there evidence of how this knowledge base is changing in modern times - is it generational, gender-biased, &c
c) Are there intellectual property issues about the use of such knowledge within, between and outside of communities (and countries)?
d) Are community rights laws (common law or e.g. the African Union Model Legislation) an appropriate way of 'protecting' such knowledge and will this lead to continued use of the knowledge within the specific agroecosystems in which it developed?
e) Is there evidence of ways of linking these knowledge systems with modern planning systems - in ways that allow for the continued development of agricultural biodiversity?

Knowledge Systems

Globally, there are two distinct and potentially conflictive knowledge systems. The knowledge systems of the formal sector, of both private and public institutions, and the knowledge systems of the informal sector of communities and individuals. The formal sector knowledge systems are codified, are recorded in writing and are defended through national and international law; the knowledge systems of the informal sector are often oral, are built on trust and are defended through the norms and practices of traditional institutions. The intellectual property (IP) of the former is recognised in law in industrialised countries and in the industrial sectors of developing countries. The latter has weak jurisprudence in its defence: there are no mechanisms to implement legislation and, in most cases, no legislation has yet been enacted, despite ratification of a number of international agreements, such as the Convention on Biological Diversity (CBD). It is left to individual governments to develop legislation that will ensure the protection of informal knowledge and the equitable sharing of benefits from its use.

The trend of commodification and privatisation of knowledge is prevalent. This is especially through moving knowledge and plant genetic resources from the informal sector into the formal sector, and from public domain to private ownership. It may result in the loss of knowledge and materials by, and benefits for, the originators of that knowledge and the associated biological resources, especially people and communities in the informal sector.

National level institutions clearly need to understand better the range of knowledge systems in their country, who benefits from them, how they are being exploited and how they are being protected. The livelihoods of the majority of people, especially in developing countries, may depend on their informal knowledge systems, which are often subject to predatory acquisition by the formal sector. There are many activities underway to assess these systems but more work is needed in most countries in order that there is a better understanding of the likely impacts of technological, institutional, legal and regulatory changes.

The potential conflict between the two knowledge systems does need to be recognised and social, technical and legal systems of protection for biological resources in the public domain and those used by, and for the benefit of, the majority need to be developed accordingly.

Intellectual Property Rights

Intellectual property rights (IPRs) are the rights given to persons over the creations of their minds – their intellectual property (IP). They are granted by a state authority for certain products of intellectual effort and ingenuity. They usually give the creator an exclusive right over the use of his/her creation for a certain period of time. Intellectual property rights are customarily divided into two main areas: copyright and industrial property rights. The latter covers the protection of trademarks and other distinctive signs and the protection of industrial property primarily to stimulate innovation, design and the creation of technology: inventions (protected by patents), industrial designs and trade secrets. The social purpose is to provide protection for the results of investment in the development of new technology, thus giving the incentive and means to finance research and development activities. Patents can be conferred on inventions, subject to the normal tests of novelty, inventiveness and industrial applicability. The protection is usually given for a finite term, typically 20 years in the case of patents (OECD, 1996; WTO, 1998).

As Steven Brush has said in his book on local knowledge systems "***Valuing Local Knowledge"***:

> ***Granting intellectual property is a familiar method for converting public goods into private ones (Demsetz, 1967). Intellectual property does not directly convey market value to an idea or plant that is protected. Rather, it allows the market to work where it otherwise would not, by permitting a person to exclude others from using his or her ideas or plants, except under license or royalties. The right to exclude effectively becomes the right to profit from selling the idea or plant. Without intellectual property, all ideas are public goods or common property, and no one can be excluded from using another's idea. The right to exercise temporary monopoly power, however, requires that the claimants of the right prove their eligibility. Defining and defending this eligibility pose very high costs. (Emphasis added) (Brush, 1996).***

There has been much debate over the suitability of patents and other forms of intellectual property rights (IPRs) for the protection of plant genetic resources for food and agriculture. For example. the Crucible Group in their first report ***"People, Plants and Patents"***, included reflections on the inappropriateness of IP systems that risk the well-being of their peoples or that jeopardise the biological diversity within their

borders. They also noted that there were likely to be conflict between IP proposals and other initiatives for plant genetic resources conservation and exchange:

Whatever the arguments may have been, there is now an overwhelming pressure on all WTO Members, through TRIPs Article 27.3(b) to consider applying IPRs to living material, and an obligation to apply them to plant varieties. In responding to this, countries have to weigh the balance of rights between industrial innovators, often not from the country concerned, and the rights of local communities, farmers, indigenous peoples and consumers within the country.

Community Rights

As Darrell Posey points out in ***"Beyond Intellectual Property",*** IPR laws are generally inappropriate and inadequate for defending the rights and resources of local communities and indigenous peoples. Traditional community knowledge is usually shared and the holders of restricted knowledge in communities probably do not have the right to commercialise it for personal gain. There are thus a number of models that are emerging to help people develop the basis of future legal systems to protect their knowledge and resources. These rights embody both biological and cultural rights and thus may go beyond other ***sui generis*** models (i.e. rights or legally recognised systems that are adapted to the particular needs of a country or community), which concentrate only on the biological resource (Posey and Dutfield, 1996).

Community rights may incorporate rights to manage some aspects of self-governance, natural resource management and economic livelihoods, including control over biodiversity, local knowledge, innovations and practices as required by the CBD.

The movement to set up community registers of biodiversity to thwart misappropriation and initiatives to implement a moratorium on bioprospecting are evidence of concern at community level, in the absence of adequate protection. Farmers' Rights should also be considered within this bundle of rights and, importantly, need to be seen as complementary to, rather than in conflict with, other forms of community or indigenous peoples' rights.

Some of these rights are embodied in the CBD, especially Article 8(j), as well as in the FAO Farmers' Rights resolution 5/89, but these have yet to be enacted in national laws in most countries though there are a number of models under consideration (see Posey and Dutfield, 1996). The African Union (AU) has developed draft community rights legislation and some countries, including India and Malaysia as well as Andean Pact countries, have developed legislation that protects certain aspects of community rights.

The development of such codes of ***sui generis*** rights, recognised by trading partners, are seen by some countries as being a preferable alternative to the TRIPs Agreement with respect to biological resources, indigenous, local and community knowledge and locally controllable productive resources. A decisive impact on the ownership of biological resources for food and agriculture and their associated knowledge, will be the review of TRIPs Article 27.3(b) and this will continue to be on the agenda of the WTO.

4. Policy and Planning

The decisions of the COP, FAO, CSD and other international and national bodies, through programmes of work at global, regional and local levels, provide many avenues for, and have committed governments to, the development of relevant policies and the need to ensure coherence between these.

Countries are already developing national biodiversity strategies and action plans, in accordance with relevant COP decisions. The opportunity exists to include agricultural biodiversity as an integral part of these through appropriate guidelines. Equally important, the conservation and sustainable use of agricultural biological diversity could be included in agriculture, rural development, trade, and other sectoral and cross-sectoral plans, and research and extension strategies at national, regional and international levels.

In regard to the reform of policies, particular opportunities to deal with these issues exist in Europe (EU) with the revision of the Common Agriculture Policy (CAP) and the development of Agenda 2000. Eastern European countries are seeking access to the EU and will need to harmonize their trade and environmental legislation, without further eroding their agricultural biodiversity resources.

In regard to the WTO, agricultural biodiversity policies may be impacted by trade measures, including TRIPs, if these policies do not permit local determination of production methods and priorities nor recognize the importance of protecting agricultural biodiversity for sustainable food production, biological or life support systems and ecological and social services.

Appropriate actions need to be taken by competent bodies and authorities to account for biosafety considerations, with a view to avoiding and/or mitigating negative impacts on agricultural ecosystems resulting from pollution by chemicals, invasion by alien species and trends towards genetically uniform crops and breeds which threaten plant and animal diversity.

Coordination

The need for coherence at national level between relevant ministries and other sectoral bodies was thus raised as a key issue and as an opportunity to achieve integration of agricultural biodiversity concerns in overall biodiversity, environmental and agricultural policies, strategies and action plans. For example, it could be possible to ensure that Ministries of Agriculture are aware of and implementing relevant policy with respect to agricultural biodiversity that may hitherto have been the responsibility only of environment ministries.

Cross-sectoral coordination, joint planning initiatives and integrated approaches to the development of policy were seen as essential for progress in this area:

- national environmental action plans and conservation policies and plans;
- agricultural policies strategies and action plans including those pertaining to in situ and on-farm conservation;
- land-use policies;
- trade and marketing policies and regulations;
- wildlife and forest policies;
- plant variety protection laws;

- legal framework for pollution control, quarantine laws and safe minimum standards.

Mechanisms and linkages

There are many ecoregional and national differences in the impacts and importance of such measures. Thus, national and regional meetings could be organized to facilitate discussion and debate on these issues and to assist in the development of appropriate and coherent national legislation, policies and strategies.

Relevant governmental bodies and organizations should be encouraged to mainstream agricultural biodiversity issues into their national planning processes including the development, implementation and evaluation of agricultural and environmental policies, programmes and actions.

Negative market influences

The market is largely unregulated in terms of environmental and social impacts but highly influenced by international and national policies and trade rules. Market forces were seen to favour “new” varieties and use of agrochemicals, as well as larger economies of scale, the foci of agro-industry in lower-labour, industrial and monocultural production systems, leading to reductions in agricultural biodiversity. Other negative indirect effects were also identified, such as reduced recognition of local knowledge systems or of local diversity (e.g. local varieties and foods). This leads, in turn, to lower investments in local technological development by scientists and other innovators (including farmers). It also leads to lower income opportunities in agriculture in particular and in rural areas in general, and to the consequent loss of skilled people and new entrants into agriculture owing to outmigration from the area or the sector. The workshop contemplated whether there were any opportunities to bring about a change in paradigm to encourage agro-industries to strive for combined production and biodiversity goals and create alternative market structures to enable resource-poor producers to participate in these initiatives.

Incentive measures

The need for incentives for the conservation and sustainable use of agricultural biodiversity is based on the premise that those resources are a valuable asset for present and future generations and that their preservation is essential for human economic development and is also important for social and cultural benefits. However, as many of the benefits of agricultural biodiversity conservation accrue to the public as a whole, and because of information, market and government failures, they are often utilized at levels that are not sustainable. Thus, incentive measures are required to internalize the costs of maintaining agricultural biodiversity in the activities that lead to this loss, and to provide the necessary information, support and encouragement for its sustainable use and/or conservation. In this context it is recognized that: incentive measures should be designed in the context of sustaining ecosystems and with targeted resource management stakeholders in mind; and economic valuation of agricultural biodiversity and its products is an important tool for well-targeted and calibrated economic incentive measures

In order to identify appropriate incentive measures it is necessary to understand the relationship between market forces and agricultural biodiversity. This requires targeted research in different regions where different trade frameworks apply within different production economies.

Conclusion

Agricultural, **environment** and **trade** planners need to work together on a basis of better mutual understanding and a recognition of how to nurture the **knowledge component** of agricultural biodiversity, in order to achieve improved food and livelihood security for their people, to protect biological and agroecosystem functions and conserve landscapes.

PRINCIPLES

- Recognise the distinctive nature of Agricultural Biodiversity (and all genetic resources for food and agriculture) and that this contains a predominant KNOWLDEGE COMPONENT
- Value farmers' knowledge in genetic resource development and conservation
- Recognise farmers' contribution to biological support and ecological services
- Value farmers' contributions to landscape protection and the management of terrestrial ecosystems
- Implement Farmers' Rights and Community Rights regimes
- Defend local and indigenous knowledge systems from predatory approaches by the Private Sector and the State
- Implement Biosafety legislation
- Widen scope of Agricultural Biodiversity regulation through the CBD explicitly to include all agricultural biological resources, their conservation and sustainable use and that there is fair and equitable sharing of benefits from their use.
- Integrate planning and policy development across all relevant sectors: agriculture, environment, trade (including Intellectual Property)
- Strengthen understanding of the knowledge components of agricultural biodiversity
- Remove perverse subsidies
- Mitigate threats to agricultural biodiversity from:
  - Genetic modification
  - Globalisation of cultures, tastes and markets
  - Erosion of diversity of agricultural systems
- Improve policy environment

Perverse government policy

Over the past 5 years governments have themselves been promoting or facilitating, or tolerating corporate sector involvement in, a wide range of actions that are undermining diversity, threatening access to genetic resources, destroying rights, spreading genetic pollution and compromising food sovereignty for example by:.

- Allowing spread of GMOs and genetic pollution, despite agreeing the Biosafety Protocol
- Allowing ongoing research into, patents on and licensing of Genetic Use Restriction Technologies (GURTs), especially Terminator technologies
- Promoting globalisation of markets through WTO rules that reduce local options for socially and environmentally sustainable production that sustains local diversity
- Failing to implement a substantive review of WTO/TRIPs Article 27.3(b) on life patents

- Tolerating widespread patent abuse and biopiracy
- Allowing unparalleled increase in Corporate power in the Life Sciences industry

Farmers' Voices

As the World Forum on Food Sovereignty attended by farmers' organisations concluded in August 2001:

"***Genetic resources are the result of millennia of evolution and belong to all of humanity. Therefore, there should be a prohibition on biopiracy and patents on living organisms, including the development of sterile varieties through genetic engineering processes. Seeds are the patrimony of all of humanity. The monopolisation by a number of transnational corporations of the technologies to create genetically modified organisms (GMOs) represents a grave threat to the peoples' food sovereignty. At the same time, in light of the fact that the effects of GMOs on health and the environment are unknown, we demand a ban on open experimentation, production and marketing until there is conclusive knowledge of their nature and impact, strictly applying the principle of precaution."***

SBSTTA should heed these sentiments, recognising that farmers, herders and fisherfolk the world over are the source, guardians and managers of agricultural biodiversity. Policy that impedes this work threatens food security and environmental integrity.

Additional Case Studies of NGO work on Agricultural Biodiversity

MAINTAINING CROP DIVERSITY

Celebrating Seed Diversity

Seed Fairs in Kenya[1]

Seed fairs are increasingly popular modes of promoting diversity. In Tharaka, Kenya, they have been held annually since 1996, having been initiated in an NGO project development area. In 1998, displays were mounted by 29 women and 47 men as well as some community groups. The displays are evaluated by a panel of judges and the most diverse are awarded prizes. The total number of crop varieties displayed increased in 1998 to 149 from 134 in 1997. In 2001, 46 farmers displayed 206 varieties. Participants gave the following reasons why they liked the seed show: farmers obtain rare crop varieties from the seed show; they identify seed sources through the show; it is a good forum for exchange of ideas on farming and exchange of seeds; farmers are exposed to national agricultural research work; the spirit of competition boosts farmer's morale and motivates farmers to diversify their crops indirectly enhancing food security; and it is a platform for interaction between farmers, students, researchers, extension staff and other development agents.
ITDG East Africa

Emergency Seeds for Agricultural Recovery in Tanzania[2]

The Lake Zone and Arusha Region are among the areas that were hard affected by the 1999 – 2000 drought. From mid-2000, CRS Tanzania started receiving requests for food assistance from the above-mentioned dioceses. However, it was already evident that free relief distribution is no longer the best option to help people recover from disasters. Therefore, CRS agreed with the affected households in communities to help them recover by providing them with seeds as a more sustainable way to produce not only their own food but also their own seeds for the coming seasons. The most vulnerable households were provided with vouchers to buy seeds at special seeds fairs that were organised within their respective villages. On one hand, local farmers and seed vendors were encouraged to bring whatever good seed they had for sale at the fair sites. On the other hand, beneficiaries of the vouchers were left free to buy seed of their choice, suitable for their farms and for the nutritional or economic needs of their families. Although the project areas had had severe droughts and crops failures, it was surprising to discover that certain community members had quantities of good seeds to sell at the fairs. The main lesson learnt is that the traditional seed system is very resilient and able to withstand even four years of drought. The seed fairs showed that even though the seed coping mechanisms had collapsed for the more vulnerable in the community, there were still seeds available in the community to meet their needs.
CRS Tanzania

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[1] See <www.ukabc.htm/abc.htm>

[2] Interim Report on Emergency Seeds for Recovery Projects, CRS Tanzania, Edward W. Charles (Programme Representative) and Juvenal Kabiligi (Senior Project Manager) CRS Tanzania Edward@crstanzania.org; Juvenal@crstanzania.org

Community Seed Banks. in Paraíba, Brazil[3]

The north-eastern region of Brazil is known for its dramatic periods of drought. At the state of Paraíba, the lack of water available to small farms represents a major constraint on the food security of the local community. In these systems[4], diversity is synonymous of food security.

Farmer access to seeds has been very difficult. The region's precipitation regime allows only one crop cycle per season and the reduced areas of the farms (most are under 5ha) does not provide enough seed production for feeding the family and keeping seeds for the next crop. Because of this, some local varieties have been lost. Two other factors contribute negatively to genetic erosion:

- farmers need to adopt crop varieties to meet market demands;
- government seed programmes where only a few commercial varieties are distributed.

This collective seed supply and husbandry through Community Seed Banks (CSBs) is being built through participatory approaches and has furthered farmers' autonomy by timely provision of seeds and conservation of agricultural biodiversity. AS-PTA and other local organisations have trained farmers who by 2000 had organised 220 CSBs, benefiting 6,920 families, storing over 80 tons seeds of the main crop varieties, including 67 varieties of three different bean species.

AS-PTA

CONSERVING DOMESTIC ANIMAL DIVERSITY

Reintroduction of Polish Red Cattle[5]

Polish Red cattle is an old local race that is very useful in some specific conditions especially in hilly and mountainous regions where controlled grazing protects slopes against erosion. They are being replaced by supposedly higher potential animals, which are often not suitable for the local conditions. To protect this local breed, Heifer International's office in Poland worked with the community of _egocina to revitalise and increase the population of Polish Red Cattle in the region. 79 head were reintroduced to local farms. Farmers appreciate these cattle, because of their high productivity and resistance to disease. As a result _egocina has also retained its beautiful landscape that attracts many visitors, supporting agro-tourism development. Moreover, the cattle constitute a very valuable genetic resource. In the year 2000 National Livestock Show, a Polish Red cow from _egocina was awarded the National Vice–Championship.

Heifer International Poland

RESTORING MARINE DIVERSITY

Constructing Artificial Reefs[6]

In Kerala, SW India, local CSOs have worked with artisanal fishing communities to restore aquatic biodiversity in their fishing grounds. The solution was the construction of simple artificial reefs by village fishermen in response to loss of fishing grounds through destructive effects of trawling. India is the world's 7th largest producer of fish products and one quarter of India's catch is from the artisanal fishermen of Kerala who use very simple craft and gear. In the 1960's Norwegian fishery advisors

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[3] From AS-PTA Brazil <aspta@alternex.com.br>

[4] Family farms units are composed by home gardens, crop areas (corn, bean and cassava, mainly), pastures and orchards (esp. banana and citrus)

[5] Contact Katarzyna Malec HI Poland <malec@delta.sggw.waw.pl>

[6] Contact ICSF <mdsaad06@giasmd01.vsnl.net.in>

advocated the introduction of trawlers. The village fishermen survive at subsistence levels and did not have the capital to invest in this technology. They saw the market price of their catch collapse, fall in catches through overfishing and destruction of natural reefs. Militant actions were taken to keep trawlers away. Kerala fishing policy was changed, introducing a closed season for trawlers. But the fisherfolk took long-term actions themselves.

Artificial reefs were constructed using any available materials, rocks, coconut palm stumps, tyres, concrete well rings and later triangular ferro- concrete units cast on the beach. These have restored aquatic ecology and fish breeding sites, provided inshore fishing sites (especially valuable for training youngsters and providing continuing occupation for elderly fishermen), made the fishery more reliable (with attendant financial benefits for subsistence economy) and created a sense of ownership and stewardship for the resource. The unmarked reefs also protect the artisanal fishing grounds by erecting on the sea floor a significant disincentive to trawlers whose nets snag on the underwater obstructions.

International Collective in Support of Fishworkers (ICSF)

DEVELOPING AGRO-ECOTOURISM

Promoting on-farm conservation of Andean tubers through agro-ecotourism, Peru[7]

Cusco is important for tourism in Peru because it is the centre of pre-Hispanic Inca culture; however, the rural population benefits only marginally. One source of income is through the sale of their produce, mostly derived from the unique biological resources of the region. In recent years there has been a loss of traditional conservation practices and other customs (food, dress, etc.).This has been mainly because of the expansion of the use of high-yielding species and varieties in commercial agriculture, climatic factors, pests and diseases, inappropriate agrarian policies and development activities and poverty, which increase the migration of indigenous youth (with their knowledge, experience and customs of traditional Andean agriculture).

In the communities included in the present initiative, it is the local farmers who have conserved the wide range of local varieties of Andean root crops on farm. Rather than maximisation of yield or income they recognise the need to spread risks by planting mixtures of species on their small parcels of land to guarantee a harvest every year. The incentive provided by the development of agro-ecotourism could facilitate new mechanisms for promoting traditional conservation and sustainable use practices.

During guided tours to the communities, tourists will see the remarkable morphological and agronomic variety of Andean plants and tubers in demonstration plots, a potato museum and restaurants with menus based on traditional Andean produce. This proposed initiative intends to support a school education programme about Andean crops and culture and the participation of the young people in agro-ecotourism in order to reduce migration.

ANDES/IPBN

[7] Summary available at< http://www.fao.org/WAICENT/FAOINFO/SUSTDEV/EPdirect/EPre0066.htm>

FACILITATING FARMERS' VOICES IN THE BIOTECH DEBATE

Citizens Juries on GMOs[8]

ActionAid recently began a series of Citizens' Juries that are bringing the perspectives of the developing world's farmers to national and global debates on GM crops. The Indian farmers turned the debate around: instead of experts from the developed world telling the people of the developing world what is good for them, a spectrum of those who could be affected by GM crops judged whether they could make their livelihoods better, or whether such crops would increase their poverty and insecurity. The jury demonstrated that the poorest farmers can have a sophisticated knowledge of the way new types of crop can impact on their lives. They saw interlinkages between different elements of new agricultural technologies that scientists and other specialists often miss.

Based on their mixed experience of the Green Revolution, the farmers were sceptical of GM crops, with a two to one majority saying they did not want to grow them. They also called for a 5–10 year moratorium on the commercial release of GM seeds and for a system of insurance to protect their livelihood from the increased risks they would face. They had some useful suggestions for how the potential of future crop technologies could be improved, especially by becoming more farmer-led. ActionAid is repeating this process in other parts of the world so that the views of those with a real, practical knowledge of 'feeding the world' are put in their proper place at the forefront of the biotechnology debate.

actionaid

CHALLENGING PERVERSE PATENTS

Patent challenge on Basmati rice[9]

In September 1997 a Texas-based company, RiceTec Inc., won a controversial US patent (No. 5,663,484) on basmati rice lines and grain. Basmati rice has been grown for centuries in what was the Greater Punjab region, now divided between India and Pakistan. Farmers in this region have selected and maintained Basmati rice varieties that are recognised worldwide for their fragrant aroma, long and slender grain and distinctive taste. RiceTec's basmati patent has become widely known as a classic case of 'biopiracy.' Not only does the patent usurp the basmati name, it also capitalises on the genius of South Asian farmers. The patent applies to breeding crosses involving 22 farmer-bred basmati varieties from Pakistan and India. The sweeping scope of the patent extends to such varieties grown anywhere in the Western Hemisphere (although the patent is valid only in the US).

There are numerous legal and technical concerns with respect to RiceTec's patent and its use of the name basmati. Ultimately, RAFI, the Berne Declaration and the Gene Campaign conclude that the core issue is morality. Farmers have selected and bred aromatic rice over generations. It is indecent and unacceptable for the genius of millennia to be usurped by a US-based company (controlled by European royalty). RiceTec's patent is predatory on the rights and resources of South Asian farmers, and it should be abandoned.

RAFI / ETC Group

[8] Full report on http://www.actionaid.org/pdf/jury.pdf

[9] See <http://64.4.69.14/web/docus/pdfs/basmatiupFD.pdf> accessible also through <www.rafi.org>

PROTECTING FARMERS' RIGHTS

Contamination of crops with GM genes becomes farmer's crime[10]

Percy Schmeiser, a Canadian farmer, is the victim of Monsanto's contamination of his fields and crops by roundup-ready ***canola*** (oil seed rape) plants. This ***canola*** has spread involuntarily into his fields but Monsanto claim that they own his crops because their intellectual property (round-up ready genes) is contained in them. As a consequence, they claim his crop and all profits from it. He is appealing a decision by the Canadian courts that he is guilty of patent infringement. If Monsanto wins, it could claim any crop that becomes contaminated.

Of even greater concern than the harm done to Percy and Louise Schmeiser, is how this decision will affect all western Canadian farmers - regardless of whether they even grow canola, let alone GM canola. Land can be contaminated with proprietary seed in other ways. Intentionally planted RR canola [or any other herbicide tolerant (HT) canola], will lead to soil contaminated with shattered RR seed which might germinate not only the next year but in subsequent years. Emergence of 'volunteer' canola in subsequent crops is nothing new in western Canada - but what is new is that the volunteer plants bear proprietary genes and are tolerant to one or more common herbicides. Cross contamination of seed crops with GM seed is now so pervasive that seed companies will no longer guarantee "100% GM-free" even in the seed they sell to farmers, for any field crop that has been subject to genetic modification.

IATP and others

[10] See <www.percyschmeiser.com>