



The International Treaty

ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE



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COMPILATION OF VIEWS AND EXPERIENCES ON THE IMPLEMENTATION OF FARMERS' RIGHTS SUBMITTED BY CONTRACTING PARTIES AND RELEVANT ORGANIZATIONS

Note by the Secretary

EXECUTIVE SUMMARY

1. This document compiles the views and experiences on the implementation of Farmers' Rights, as set up in Article 9 of the International Treaty, submitted by Contracting Parties and other relevant organizations, according to the request made by the Governing Body to the Secretary of the Treaty at its Third Session. All submissions contained in this document were received by the Secretary before 1 December 2010.
2. The submissions of six Contracting Parties and four international organizations have been inserted in this compilation, in the form and language in which they were received. Minor editorial changes include the full rendering of acronyms and the correction of spelling.

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I. CONTRACTING PARTIES

1.1 CZECH REPUBLIC

The Czech Republic in general accepts the Farmers' Rights concept. Nevertheless, these rights are not to relevant for Czech farmers and actually they are not applied.

1.2 DEMOCRATIC REPUBLIC OF KOREA

For the implementation of the Farmers' Rights requires there should be public awareness of the value of the genetic resources as well as relevant knowledge of it and also related laws and regulations in force.

Farmers' Rights is conducive to the collection, conservation and utilization of genetic resources since it gives incentives to the farmers/ cooperative farms who have the know-how, knowledge and seeds of genetic resources. Implementation of the clause concerning Farmers' Rights encourages farmers to readily provide the genetic resources and related knowledge for conservation and utilization of plant genetic resources for food and agriculture.

In the Democratic Republic of Korea (DPR Korea), in accordance with the Treaty, the Government is nurturing through media and publications the social environment in which plant genetic resources are regarded as valuable to sustainable agricultural development and farmers actively participate in the plant genetic resources management by providing their knowledge and germplasm for breeding and production.

Protection of traditional knowledge relevant to plant genetic resources for food and agriculture

Farmers/cooperative farms willing to provide their knowledge apply for registration of their knowledge as a new one to the National Agricultural Science and Technology Review Committee. The committee then organizes relevant tests and evaluates the knowledge, and, if suitable, issue a certificate of a new scientific and technological achievement, which is used as a legal instrument of ownership of the knowledge.

If a germplasm is submitted to the national genebank, the germplasm is also tested for its distinctness and value before issuing a national genetic resources registration certificate which is also used as a legal instrument. And the germplasms are to be distributed according to the principles stipulated in the Standard Material Transfer Agreement.

If a new cultivar has been developed and released by a germplasm registered, the germplasm provider reserves a right to be awarded a national certificate of cultivar development, together with the breeder.

Rights for equitable benefit sharing.

If any benefit were made thanks to the knowledge or genetic resources, the provider of the knowledge and seeds would be given a bonus.

If a promising genetic resources and knowledge were proposed to introduce in the farm by a farm member, the farm management board would assess value of the proposal and decide to. When other farm come up to request the use of the germplasm and knowledge, a relevant contract is made between the donor farm and the other. Benefits arising out of the use are shared among the two farms in accordance with provisions of the contract. The donor farm management board would give incentives in deferent forms to the provider of germplasm and knowledge. Any problem arising in the course of implementing the contract is dealt with by the Central or Local legal authorities.

Rights to participate in making decisions at the national level on matters to the conservation and sustainable use of plant genetic resources for food and agriculture

In the DPR Korea, the Supreme People's Assembly (Parliament) consists of people from all walks of life including farmers. Even any ordinary farmers can be elected as member of the Assembly. They can represent and submit the farmers' opinions and suggestions to the Assembly and participate in the course of decision-making.

And any farmer is entitled to submit its opinion and suggestions to the Assembly and the Government.

For releasing a new variety, a national cultivar registration conference is organized with participation of officials of the Ministry of Agriculture, agricultural scientists, farmer representatives and other related people. The farmer representatives, in the conference, present their opinion on new varieties, and prime consideration is given to it since they are the users of seeds.

In the conference, the farmer representatives explain their situation and their demand and those are considered in the planning of agricultural research and development including genetic resources management for the coming year.

Before introducing a new cultivar to real crop production, the cultivar is trailed on a large scale in a targeted region. The guarantee and opinion given by the farmer representatives who conduct the trial carries heavy weight in the planning of the total planting acreage of the cultivar.

1.3 GERMANY

With Decision No. 6/2009 of the Steering Committee for the International Treaty on Plant Genetic Resources for Food and Agriculture the Contracting Parties are asked to report on their experiences and views with regard to the implementation of the Farmers' Rights referred to in Art. 9 of the International Treaty. The position of agricultural associations as well as other relevant organisations – if appropriate - are to be considered as well.

This report has been drawn up in consultation with the major agricultural associations in Germany.

The German Government emphasises the sovereign rights of all countries with regard to their local genetic resources, their commitment to the protection of traditional knowledge relevant to these resources and the balanced and equitable sharing of benefits arising from the utilisation of these resources. The International Treaty states that the national governments are responsible for the realisation of Farmers' Rights with regard to plant genetic resources for food and agriculture, and it describes measures that the national governments should take in accordance with their needs and priorities and subject to their national legislation to protect and promote the Farmers' Rights.

In accordance with Art. 9 of the International Treaty the Contracting Parties are urged, as appropriate, in accordance with their needs and priorities and subject to their national legislation to undertake measures to protect and promote Farmers' Rights. Art. 9 explicitly states the following areas:

- 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 utilisation 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.

In the following we report on the different areas with regard to the situation in Germany.

Protection of traditional knowledge relevant to plant genetic resources for food and agriculture

Germany has a long tradition of putting traditional knowledge into writing and making it available to the public. Retrospectively such knowledge cannot be attributed to individuals but is rather collective knowledge which has developed over long periods of time in certain regions. If this knowledge is not protected by other legal standards (e.g. intellectual property or patent law) then the original carrier of knowledge, under German law, has no right to share in the benefits that other users might possibly reap from the utilisation of this knowledge.

Traditional knowledge as it relates to plant genetic resources for food and agriculture and which fulfils the requirements for granting intellectual property rights is protected by the general legislation regulating this area. These protection rights result from Art. 14 of German Basic Law and are also recognised in the 1. Additional Protocol of the European Human Rights Convention and the EU Charter of Fundamental Rights. The creation of a special system for the protection of traditional knowledge relevant to plant genetic resources for food and agriculture is thus deemed unnecessary in Germany.

Besides passing on knowledge in written form the practical passing on also plays a decisive role in the protection of traditional knowledge. Knowledge of taxonomy, cultivation, breeding, further development and utilisation of plant genetic resources also has to be passed on in a practical way to make sure it is not being lost. However the passing on of traditional knowledge to following generations has been clearly limited in the past years. It is not just the tradition of horticulture or the household and small scale utilisation of many cultivated plants that has been in sharp decline. The cancellation of relevant subjects from the curriculum of gardening and other related publicly regulated and financed training schemes has further accelerated this process. For this reason the traditional knowledge in Germany is largely restricted to being passed on in writing and exists as practical knowledge only in few individuals. The decline in the number of carriers of knowledge is an alarming fact. Therefore, the German National Work Programme on Plant Genetic Resources of Agricultural and Horticultural Crops underlines the necessity to find appropriate measures to protect this kind of knowledge as well.

The right to equitably participate in sharing benefits arising from the utilisation of plant genetic resources for food and agriculture

Germany supports the development of an international regime for access and sharing of benefits as agreed on at the World Summit on Sustainable Development in Johannesburg in 2002 and by the 8th Conference of the Parties of the Convention on Biological Diversity. In doing so the International Treaty has to be considered, among others.

Utilisation of plant genetic resources

Under the applicable national law the regulation of access to plant genetic resources for food and agriculture and an equitable sharing of benefits depends on the owners of the plant genetic resources. In situ property rights to biological resources are not directly regulated by German law. There is neither a constitutional norm nor a principle that assigns property rights to natural or biological resources to the state. Thus biological and genetic resources may be owned privately as well as by the state. As a rule the owner of the land or water area on which the biological or genetic resource is found is deemed the owner of the resource. However some sectoral legislation, such as the forestry law of the *Länder*, for example, specify the possible forms of ownership.

If plant genetic resources (in situ or ex situ) are privately owned then the access to these is in general at the discretion of the owner. Otherwise everybody is allowed to collect in situ growing plants with due regard to nature and species protection, other specific protection rights and phytosanitary regulation.

The ratification of the International Treaty created an efficient and transparent process for a facilitation of access to important food crops in Germany. Material within the direct control of the Federal Government is registered in the Multilateral System. The most important genebanks have introduced the standardised Standard Material Transfer Agreement (SMTA) for the transfer of plant genetic resources of those crops listed in Annex I of the International Treaty. Thus farmers as well as plant breeders, scientists and other persons have access to seed and planting stock in the genebanks according to their needs.

Sharing of benefits arising from the utilisation

If plant genetic resources are privately owned then the access and any potential sharing of benefits is in general at the discretion of the owner.

If plant genetic resources are under public control then the utilisation is open to everybody with due regard to nature and species protection and other specific protection rights, property rights and phytosanitary regulation and such regulation resulting from the International Treaty on Plant Genetic Resources for Food and Agriculture. A participation of the public sector in the sharing of benefits from the utilisation of plant genetic resources is not provided for.

In order to realise possible benefits arising from the utilisation of plant genetic resources those involved can make use of the whole set of tools of the relevant intellectual property rights available in Germany.

In the area of plant breeding the protection of varieties has to be mentioned in particular. This can be applied for by individuals, e.g. plant breeders or farmers. The protection of varieties is designed as legal system in its own right (*sui generis*) for intellectual property in harmony with the International Convention for the Protection of New Varieties of Plants (International Union for the Protection of New Varieties and Plants (UPOV)). It enables everybody to use the material of protected varieties for research purposes and for the breeding of new varieties without consent of the owner of the variety protection. It also enables a farmer – whilst safeguarding the legitimate interests of the owner of variety protection and without his previous consent - to use farm-saved seeds harvested from a protected variety for further reproduction. Farmers who make use of the farm-saved possibility have to pay an adequate remuneration (farm-saved remuneration) to the owner of the plant variety right. The farmsaved remuneration has to be considerably lower than the usually collected licensing fee for the utilisation of the material of a protected variety. The exact amount of the farm-saved remuneration is subject to private law agreements.

There are no legal restrictions in place in Germany that govern the start of work as a plant breeder. A large part of the plant breeding companies that are active today are originally from the agricultural sector. Many companies still have an agricultural branch of business today. The professional representation of plant breeders' interests, the Federal Association of German Plant Breeders, is a member of the professional representation of farmers' interests, the German Farmers' Union. Consequently there is close cooperation and interdependence between seed industry and agriculture.

As a matter of principle the general public benefits from the entering of plant genetic resources into the Multilateral System of the International Treaty through facilitated access to a larger pool of genetic material, improved information exchange and improved access to new technologies.

The particular involvement of farmers in the sharing of benefits arising from the utilisation

In addition to plant breeders, breeding scientists and breeding companies farmers benefit in particular from the utilisation of plant genetic resources by means of seeds from efficient, site

adapted varieties with a high yield potential and improved quality and resistance properties which offer good income opportunities.

Possible consequences of biopatents

The widespread use of patents on plants and animals is considered a threat to the safeguarding of equitable sharing of benefits arising from the utilisation of plant genetic resources for food and agriculture. These so-called biopatents with unlimited scope may, among others, further reduce the range on offer at the relevant agricultural markets through their promotion of monopolisation tendencies. Experience has shown that this comes at the expense of smallholders or smaller breeding companies. The large holdings prevailing on the market usually concentrate on a few profitable breeds or varieties. This, in turn, would reduce the diversity of breeds and varieties. A controversial discussion is currently under way in Germany on whether patents on farm animals and plants should be granted at all.

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

The participation of farmers in the decision-making process concerning conservation and sustainable use of plant genetic resources for food and agriculture is as well ensured in line with generally established participation principles. According to the joint rules of procedure of the Federal Government the federations and general associations and experts groups at federal level have to be involved timely in the drawing up of bills. This also includes the relevant agricultural associations.

The principles for German activities on the conservation and sustainable use of plant genetic resources for food and agriculture are generally put down in the “BMELV Strategy on the Conservation and Sustainable Use of biodiversity in the food, agricultural, forestry and fishery sector“. They are detailed in the “National Programme on Plant Genetic Resources of Agricultural and Horticultural Crops“. The development and implementation of the national programme is by the Consultation and Coordination Committee for Genetic Resources Agricultural and Horticultural Crops. The committee consists of 17 members which are named by the federal and *Länder* authorities and organisations from science and industry. These also include representatives of agriculture.

Further need for fundamental action in Germany to safeguard 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 is thus not deemed necessary.

1.4 MADAGASCAR

La représentante du Conservation International a mentionné que les droits des agriculteurs n’ont jamais existé à Madagascar et n’ont jamais été élaborés par le ministère en charge de l’agriculture. Ce point, selon elle, mériterait d’être étudié à fond pour la mise en œuvre de la disposition relative aux droits des agriculteurs du TIRPAA.

1.4 URUGUAY

Respecto al Punto VI, “Artículo 9: Derechos del agricultor (Res 6/2009)”, se ha avanzado en la legislación sobre este aspecto. En efecto, cabe mencionar la Ley de Semillas, No. 16.811 de 21 de febrero de 1997, en la redacción dada por la Ley 18.467 de 27 de febrero de 2009, cuyo Artículo 72 numeral B - Capítulo V, Excepciones a los derechos protegidos

- establece que “El cultivar objeto del título de propiedad podrá ser usado sin que otorgue derechos a su tenedor a compensación alguna cuando B - Se reserve y siembre semilla para uso propio pero no para comercializar. Cuando quien reserve y siembre semilla para uso propio sea un pequeño agricultor, la presente norma es de orden público. El Poder Ejecutivo, a iniciativa del Ministerio de Ganadería, Agricultura y Pesca, definirá pequeño agricultor”.

También se está avanzando a nivel nacional en la discusión de cómo realizar el registro de variedades criollas, el cual será enmarcado en la Ley de Recursos Genéticos que próximamente será puesta a consideración del Poder Legislativo.

1.5 ZAMBIA

A policy review study of existing national policies and laws is underway to examine their adequacy in accommodating the provisions of the Treaty including the Farmers' Rights in accordance with Article 9 of the Treaty, identification of policy opportunities and gaps.

II. RELEVANT ORGANIZATIONS

2.1 Centre for Sustainable Development (CENESTA)

Farmers make up an important portion of the Iranian population (25%) and economy (20%). The vast majority of Iranian farmers are small holders (75% of farmers have less than 5 hectares of land) and rely mainly on farm-saved seed.

Iran ratified the International Treaty on Plant Genetic Resources for Food and Agriculture in 2006. While the Treaty does not give a detailed description of Farmers' Rights (see text of Article 9 in Annex 1), many attempts during and since the adoption of the Treaty have been made to define it. This document refers to outcome of these efforts in its definition of Farmers' Rights:

1. Legal protection for informal and peasant seed systems, including recognition of collective rights; a separate system of protection for farmer varieties
2. Right to conserve, use, exchange and market originating from past, present and future peasant farmer breeding
3. Right to protect traditional knowledge related to agricultural biodiversity
4. Right to participate in national decisions on management of agricultural biodiversity
5. Right to access to gene banks
6. Right to safeguard gene banks and farmers' fields from genetic contamination by GMOs
7. Support from Participatory Plant Breeding

Current status of farm-saved seeds in Iran

Farmers in Iran rely on farm-saved seeds for the vast majority of cereals, legumes, paddy and forage crops. These crops make up the major part of the crops grown in the country, 86% of the total area under cultivation (see Table 1, below).

Table 1: Hectares of main crops cultivated with farm-saved seeds

Category	Crop	Hectares
Cereals	Wheat	5250205
	Barley	1070416
	Rice	526921
	Corn	242740
Legumes	Chickpea	426248
	Beans	99427
	Lentil	152980
	Other legumes	18623
Forage crops	Alfalfa	617512
	Clover	52628
	Other forage crops	280381
TOTAL		8738081
TOTAL AREA UNDER CULTIVATION		10150924

The main crops that are not covered by farm-saved seeds are the majority of vegetable varieties in the country which originate mainly from imported hybrid seeds. In 1384 (March 2005 to March 2006) \$77,562,513 worth of vegetable seeds were imported (including corn) of which about \$30,000,000 was dedicated only to cucumber seeds¹. Besides vegetables, a significant amount of colza, sugar beet, corn and sunflower seeds are imported. A certain amount of hybrid seeds for some crops such as maize and canola are produced locally.

Aspects of Farmers' Rights

1. A specific legal and policy framework for farm-saved and peasant seed systems, including recognition of collective rights

There is no specific legal framework for farmer varieties or farm-saved seeds in Iran. The main legal reference point for seeds is the seed law, the “Act of Plant Varieties Registration, Control and Certification of Seeds and Seedlings”. The seed law covers issues related to varieties and seeds including variety release and registration, plant variety protection and seed quality control and certification. One of the aims of this law is to bring Iran in line with UPOV rules.

There is some reference to farm-saved seeds in the National Seed Policy Document, however this only addresses the specific issue of farm-saved seeds while other issues that should be addressed in a legal framework for the protection of peasant varieties, such support for research systems that produce and conserve peasant varieties.

Article 3, Note 1 of the Act stipulates that:

Non-improved and wild genetic resources shall be considered as national genetic

¹ Barressi vaziyat-e vaaredaat-e bazr-e mahsoolaat-e keshavarzi dar keshvar (Study on the status of import of seeds of agricultural products in Iran), 1385, Majlis Research Centre.

resources and by any means, the non governmental sector is not allowed to patent them. Pursuant to the request of the public sector, such resources can be patented in the name of the Government of the Islamic Republic of Iran.

The term “non-improved” genetic resources has to be clarified, but if it could be taken to mean landraces which have in fact been improved by thousands of years of peasant breeding, this would mean that there is some sort of implicit recognition of collective rights since landraces would not be open for being registered under the name of a company or breeder and could only be registered or patented under the name of the government. The issue of whether the central government is the best defender of collective and community rights needs further discussion.

2. a) and b) Right to conserve and use seeds originating from past, present and future peasant farmer breeding

While the Act of Plant Varieties Registration, Control and Certification of Seeds and Seedlings attempts to bring Iran in line with UPOV standards which would severely limit the conservation and use of farm-saved seeds, several articles of the National Seed Policy Document clarify that farmers do have the right to conserve and use their seeds, even those that are “protected varieties”, meaning varieties that are covered by plant variety protection or PVP:

Article 9

Paragraph 7: “Farmers who produce farm-saved seed and plants have the right to store, use, exchange, and distribute their planting materials.”

Paragraph 8: Farmers using farm-saved seed and plants are permitted to use protected varieties.

According to the National Seed Policy Document, not only are farmers allowed to save their seeds, but the government is even responsible for helping them to improve the quality of farm-saved seeds:

Article 17

Paragraph 3: Increase in the quality of farm-saved seed and planting material will be addressed.

Article 8

Paragraph 1: Rules related to seed and plant certification in Iran do not include farm saved seed and planting material, however, necessary support will be given in order to increase the quality of farm saved seed and planting material.

2. c) Right to exchange and market seed originating from past, present and future peasant farmer breeding

The Act of Plant Varieties Registration, Control and Certification of Seeds and Seedlings, limits the marketing of seeds to certified seeds only:

Article 7

The following cases will be considered as violations and infringements of the Act and the violators will be treated in accordance with the prevailing laws and regulations (paragraph V): Production and propagation of seeds and seedlings to be supplied to the market without obtaining of the certificate from the Institute (i.e. SPCRI).

The general criteria for certified seeds are specified in Article 4 and basically refer to seed quality (genetic authenticity, health and sanitation and national and international standards for certified seed).

However, the National Seed Policy Document again clarifies that this does not apply to farm-saved seeds:

Article 9

Paragraph 7: Farmers who produce farm-saved seed and planting material have the right to store, use, exchange, and distribute their own materials.

Paragraph 8: Farmers who are using farm-saved seed and planting materials are permitted to use protected varieties.

3. Right to protect traditional knowledge related to agricultural biodiversity

Iran has ratified the Convention on Biological Diversity, however as yet there is national policy or law for the protection and promotion of traditional knowledge.

4. Right to participate in national decisions on management of agricultural biodiversity

Farmers are not consulted in a systematic way or included automatically in national decision-making on the management of agricultural biodiversity. Currently a draft law on the management of genetic resources is being presented to parliament, but farmers' organisations have not been able to see the draft so far.

5. Right to access to gene banks

The National Gene Bank of Iran is the largest gene bank in West and Central Asia and North Africa and has an impressive collection of field crops. However, there is no law or policy which specifies whether and on what conditions farmers can have access to genetic resources in national gene banks. Access is left to the discretion of the Director of the Gene Bank of Iran and/or the Director of the Seed and Plant Improvement Institute (the Gene Bank is under the umbrella of the Institute) and there have been cases of both allowing farmers access to genetic material as well as cases where access has been denied.

6. Right to safeguard gene banks and farmers' fields from genetic contamination by GMOs

Information about whether gene banks screen material for genetic contamination is unavailable. There are no mechanisms by which farmers can ensure that their fields are free from genetic contamination by GMOs.

7. Support for Participatory Plant Breeding

A number of PPB pilot projects were launched in Iran since 2006, however there is no national law or policy which supports PPB. The existing projects have been carried out with the support of the country's Dryland Agricultural Research Institute, the Office of Jihad for Agriculture of Kermanshah province and ICARDA and were initiated by an NGO (CENESTA) and a farmers' organisation (Group for the Sustainable Development of Garmsar Plain).

2.2 INTERNATIONAL INSTITUTE FOR ENVIRONMENT AND DEVELOPMENT (IIED)

In response to Resolution 6/2009 of the International Treaty's Governing Body, this paper provides the findings of research on the protection of traditional knowledge and farmers' rights in Peru, China, India, Kenya and Panama. The research was conducted over 5 years (2004-2009), as part of the project "Protecting community rights over traditional knowledge: Implications of customary laws and practices". It entailed 7 studies with over 60 indigenous and local communities in areas of important but threatened bio-cultural diversity:

- Peru: The Andean Potato Park, near Cusco – a centre of potato diversity
- China: Southwest Karst mountains – a centre of maize and rice diversity
- India: Eastern Himalayas – centre of diversity for rice and traditional crops
- India: Chattisgarh – a centre of traditional rice diversity
- Kenya: Southern coast – kaya forest areas with rich traditional crop diversity
- India: Andhra Pradesh – Yanadi traditional knowledge and food systems
- Panama: Kuna and Embera-Wounaan traditional knowledge systems

This paper has 5 sections:

1. Farmers' rights under the Treaty
2. Review of implementation of Farmers' Rights in these countries
3. Research findings on how to effectively implement Farmers Rights
4. Research findings on PGR conservation and sustainable use
5. Conclusions and recommendations

1. Farmers' Rights under the Treaty

Article 9.1 of the Treaty recognises the enormous contribution that indigenous and local communities (ILCs) and farmers have made to the conservation and development of Plant Genetic Resources (PGRs). Article 9.2 identifies 3 measures to protect and promote farmers' rights:

- a) Protection of traditional knowledge relevant to Plant Genetic Resources for Food and Agriculture (PGRFA)
- b) The right to equitably participate in sharing benefits from the use of PGRFA
- c) The right to participate in national decision-making on conservation and sustainable use of PGRFA

Article 9.3 states that "nothing in this Article shall be interpreted to limit any rights that farmers have to save, use, exchange and sell farm-saved seed".

The implementation of Farmers' Rights should be guided by the overall objectives of the Treaty on the conservation and sustainable use of PGRFA, and related provisions on in situ conservation and sustainable use, in particular:

- Article 5.1 on supporting farmer and community efforts to manage and conserve PGR on farm; and in situ conservation of wild crop relatives and wild plants for food production, including the efforts of indigenous and local communities (ILCs); and
- Article 6 on promoting sustainable use of PGRFA through appropriate policy and legal measures, which may include fair agricultural policies that promote the maintenance of diverse farming systems.

Taken together, these provisions call for a broad interpretation of farmers' rights which goes beyond the right to benefit-sharing, to include the right of farmers to continue the practices which contribute to the conservation and sustainable use of PGRFA and to sustain the traditional knowledge and livelihood systems needed for this. The protection of Farmers' Rights is essential to enable in situ conservation of PGRFA and sustainable use.

The recently adopted Nagoya Protocol on Access to Genetic Resources and Benefit-Sharing under the Biodiversity Convention also requires countries to take measures to ensure equitable benefit-sharing from the use of traditional knowledge associated with genetic resources (TK), and genetic resources held by communities. It emphasises the need for prior and informed consent of communities for access to TK, and genetic resources where communities have the right to grant access, based on mutually agreed terms. It also emphasises the need for customary laws, community protocols and procedures to be taken into account when implementing its provisions on traditional knowledge; and encourages support for the development of community protocols for access and benefit-sharing relating to TK.

2. Review of Implementation of Farmers' Rights

Protection of traditional knowledge relevant for PGRFA and the right to participate equitably in benefits from PGR use

Summary of key findings: While some progress has been made in protecting farmers' rights at national level, much remains to be done. Peru and Panama have developed laws to protect the collective traditional knowledge of indigenous peoples. However, these do not protect the rights of farmers and communities over the associated genetic resources and hence their right to equitably participate in the benefits from their use. In India, the Plant Variety Protection and Farmers' Rights Act (2001) aims to protect farmers' rights through registration of farmer varieties and benefit-sharing, but this has not been implemented given the unclear system for farmers to apply for registration.

At the same time, other policies and laws have negative impacts on Farmers Rights. In particular:

- The existence of IPR protection for plant breeders' rights, without equivalent protection for Farmers' Rights in many countries (eg. Peru, India, China) has the effect of undermining the rights of farmers. A number of countries are facing pressure to adopt UPOV '91 which is a particular concern since plant breeders' rights can extend to on-farm saved seeds, thereby threatening farmer seed systems.
- Agricultural subsidies flooding markets with subsidised farm goods which reduces market access for smallholder farmers. This was also a common constraint across the studies, reducing the ability of farmers to equitably benefit from the use of their genetic resources.

Peru and Panama were amongst the first countries to introduce national laws for protecting traditional knowledge. Peru introduced a National Regime to protect the Collective Traditional Knowledge of Indigenous People associated with biodiversity, in 2002. Panama introduced a Special Regime governing the collective rights of Indigenous Peoples for Protection and Defence of cultural identity and Traditional Knowledge in 2000, but this does not explicitly cover TK related to bio-genetic resources. Both laws explicitly recognise traditional knowledge as the collective heritage of indigenous communities. This is important given that traditional knowledge and genetic resources are developed, held and conserved cumulatively and collectively within and between communities. Protecting individual rights as in most western IPRs would undermine the customary practices through which TK and genetic resources are improved and conserved in traditional subsistence economies.

However, these laws still mirror existing Intellectual Property Rights (IPR) standards in other respects. For example, they only protect rights over the intellectual component of knowledge systems, and not over the associated genetic resources. Most policies to protect TK at international and national level emphasise 'state sovereignty' over natural and genetic resources. While this is not incompatible with community ownership, since it applies to all state actors, governments often interpret it as government ownership. Thus, genetic resources, including traditional crop varieties developed by generations of farmers, tend to be seen as state owned. This undermines the rights of farmers to equitable benefit-sharing from the use of PGR, and to customary use of genetic resources which underpins conservation and sustainable use of PGRs,

and is important for subsistence. Farmers and communities sustain, use and develop TK and bio-genetic resources together – the two are closely inter-related and inter-dependent.

At the same time, other policies and laws in **Peru** are impacting adversely on farmers' rights and the protection of TK. The IPR commitments in the US-Peru Free Trade Agreement (2006) allow for the patenting of genetic resources and traditional knowledge that have been developed and conserved by indigenous and local communities for thousands of years. With the ratification of the Free Trade Agreement (FTA), Peru accepted the US demand to make 'all reasonable efforts' to begin patenting plants and plant material. This goes against Decision 486 of the Andean Community which prohibits the patenting of plants. Furthermore, the FTA does not require patent applicants to disclose the origin of plants or obtain authorisation before using TK. This again contradicts Andean Community patent regulations, which require the biological and genetic heritage and TK of ILCs to be safeguarded, and patent applicants to provide a license to use the TK of indigenous and local communities. In addition, the FTA led to the approval of a new 'Law to Promote the use of Modern Biotechnology in Peru' which allows Genetic Modified Organisms (GMOs) to enter Peruvian territory, in place of existing legislation which stressed the risks of GMOs and how to prevent them. Furthermore, markets have been flooded with subsidised farm goods based on modern varieties, which has significantly impeded market access and returns for the agricultural products of smallholder and indigenous communities and their diverse traditional varieties.

In light of these national policy changes, the Cusco government introduced two regional laws. The first, passed in 2007, aims to protect native potatoes from transgenic contamination, in order to safeguard the rich PGRs and related TK in this centre of potato diversity. The second (2008) aims to combat bio-piracy. These were developed with support from the Non-Governmental Organisation (NGO) Asociacion ANDES and input from indigenous farming communities in the area.

Asociacion ANDES has been working for the last 15 years to protect native potato varieties and farmers' rights in situ in the Cusco region of the Peruvian Andes. It has helped six Quechua farming communities to establish a Potato Park. The Park is an Indigenous Bio-Cultural Territory managed collectively by the six communities, with about 1300 potato varieties and the greatest wild potato diversity in the world. It uses a number of tools to protect farmers' rights, agrobiodiversity and livelihoods:

- The Park itself enables farmers to assert their rights over the varieties and knowledge in the collective land title area, and provides the basis for a landscape based *sui generis* system for protecting TK and PGRs *in situ*.
- The Park signed a collaborative agreement with the International Potato Centre in Lima in 2004, for a reciprocal exchange of potato varieties and benefit-sharing, and in situ conservation and monitoring of potato GRs. This resulted in the return of 400 varieties to the park. The CIP also agreed not to allow any patents on varieties from the Park, thereby recognising and protecting the rights of the communities over them.
- An inter-community agreement for equitable benefit-sharing amongst the six communities provides the basis for protecting farmers' rights at community level, and for promoting collective TK and PGR management and conservation in situ.
- The Park's register database of potato varieties serves as a tool for the protection of farmers' rights over these varieties and for strengthening related access protocols based on customary laws, as well as for monitoring and in situ conservation of PGRs.

India's experience in the protection of TK and farmers' rights is spread over a number of national laws: the Protection of Plant Varieties and Farmers' Rights Act, 2001, the Biological Diversity Act, 2002, the Patent (Amendment) Act, 2005 and a proposed Seed Bill of 2004.

In the past, India had kept agriculture and plants out of the patent regime to ensure that the first link in the food chain, the seed, is held as a common property resource in the public domain. The recent amendment to the Patents Act has increased the possibility for international and national agri-businesses to patent plants and seeds, which could lead to monopolies and increase farmers' vulnerability and dependence on monopolies of modern varieties (Shiva, 2005). However, the Patent (Amendment) Act provides defensive protection to the farmers in the form of a disclosure provision. According to the amendment, a patent application not disclosing the source of geographical origin of the biological material used in the invention or incomplete specification of claims in the application thought to be from the knowledge of indigenous and local communities, forms a ground for raising objections to the patent applications filed.

It was only in 2005 that the PPVFR Act, 2001, became operational. The Act simultaneously grants IP rights to both plant breeders and farmers. The Indian government considers it to be the national response to the sui generis provision of the WTO/TRIPs to protect plant varieties. However, the PVP Act is not acceptable to many farmers associations and civil society organisations working towards protection of TK and farmers' rights. The Act recognizes the farmer as a cultivator, a conservator of the agricultural gene pool and a breeder who has bred successful varieties. Although it provides protection to farmers' seeds, this will only be possible when farmers' varieties are registered with the help of NGOs. The Act does not specify the system and criteria to be adopted for registering farmers' varieties and thus does not adequately protect farmers' rights (Sahai, 2003). The yardstick of DUS (Distinctness, Uniformity and Stability) used for other varieties does not suit farmers' varieties and even the government has recognised the need to find a more pragmatic procedure to register Farmers' Varieties (Nagarjuna et al, 2008).

The PVPFR Act has adopted the provisions of the CBD relating to benefit sharing but these provisions are vague and are left to be determined by the PVP authority in India (Sahai, 2001). There is no representation of farmers in the authority.

The Act provides IPRs over plant varieties through a system of registration. But given the vague system for registration and benefit sharing in the law and the inability of farmers to apply for registration, it seems extremely far-fetched that farmers' rights are going to be protected through the law. Farmers' varieties are developed as a collective and spread over large geographical regions and often the same variety is found in several villages and sometimes, even across national borders in villages of neighbouring countries especially if the same ethnic communities reside in the same agro-ecological region. In such a situation, the process of registration would also need to address these issues. (Pant 2008)

In India, the farming community is the largest seed producer, fulfilling about 87% of the country's annual requirement of over 6 million tons. Although this is largely done through a process of seed-exchange, sometimes money also changes hands when farmers do not have anything to barter. Control over seed production is vital to food security. However, weak Farmers' Rights in the legislation will allow seed corporations and modern varieties to dominate the seed market.

The PVP law is based on the view that plant variety protection accorded to commercial plant breeders leads to increased food production, greater food security and the development of new varieties by spurring investments in this sector. But the reality is that the commercial seed sector is essentially engaged in research on hybrid technology in a few commercial crops such as the maize, canola, sunflower, etc. Food production in India is still largely in the hands of the small farmers who use farm saved seeds (Shiva and Jafri, 2003).

The Seed Bill proposed in 2004 is likely to further curtail the rights granted to farmers in the PVPFR Act. This is due to a provision requiring compulsory registration of all farmers' varieties. This bill proposes prohibition of exchange of unregistered seeds, a traditional practice still being followed in large parts of the country.

Agrarian communities are not able to come to grips with the new policy situation. They find it difficult to believe that laws could be enacted which will take away their right to save, sow,

exchange and sell their seed. The introduction of IPRs prevents farmers from exchanging unregistered seeds and engaging in their own seed production which eventually leads to extinction of the farmers' varieties thus leading to a loss of agro-biodiversity. It also hampers their right to determine what they would like to grow, what inputs they would like to use, and their right to follow their own practices which are closely linked to their socio-cultural ethos.

The government also promotes seed distribution through the extension services of the departments of agriculture and horticulture and other development programmes. These seeds are mostly modern varieties, and this undermines markets for local varieties.

The National Biodiversity Act recognises the rights of communities over traditional knowledge, but its implementing Rules only provide communities with the authority to develop community registers, and there is hardly any community participation in the biodiversity institutions established to implement it at national, state and sub-state levels. There are also concerns about the TK Digital Library and pressure to add community TK registers to this, in the absence of effective policies and institutions for ensuring farmers' and community rights are protected.

A number of NGOs in India have been working with communities for the last decade or more, to protect local varieties and farmers' rights, through community TK registers, seed banks etc. Ecoserve along with a local NGO, Centre for Mountain Dynamics, initiated a capacity development programme for small farmers in district Darjeeling in the Eastern Himalayan region. This programme entailed a legal literacy component, where farmers, especially women, were appraised about the provisions of the new laws and the implications such laws have had in other countries where they have been in force for a while now. Modules were developed and farmers were taken on exposure and learning visits to interact with farmers in other parts of the country. Farmers decided to document their knowledge pertaining to traditional rice varieties in the form of a computerised database to be available with the local NGO. And from time to time, these farmers with the help of the local NGO, update this database when they are able to find seeds of a traditional variety with some farmer in a remote village. These farmers have also created a small seed bank with the local NGO. The NGO has created a small rice park in their premises as an in situ conservation initiative, to grow these seeds on a periodic basis by rotation to keep the seeds alive. Farmers are welcome to take these seeds from the NGO when these varieties are not available any more.

In **China**, the protection of traditional knowledge and farmers' rights is included in China's NBSAP and these issues are increasingly being discussed. The Chinese government has set up 62 protected areas for in situ conservation of wild PGRs and invested in integrating in situ and ex situ conservation. There is no specific legislation to protect TK or farmers' rights in China. However, the rights of farmers to their TK and plant genetic resources and benefit-sharing are under discussion for the development and implementation of concrete elements.

In general, farmer TK and seed systems are still not fully recognised by the formal agricultural system, and the public sector is mainly engaged in hybrid breeding. In the absence of legislation to protect the rights of farmers, current legislation on Plant Variety Protection (1997) and the Seed Law (2000) tend to favour the rights of plant breeders.

Scientists in China largely assume that gene banks are enough to conserve PGRFA. A recent scientific study found that landraces in the field are far more genetically diverse than the same varieties collected from the same area 20-30 years ago (CCAP forthcoming paper on the results of laboratory analysis of 170 landraces in SW China). This shows that farmers and ecological factors play a critical role in conserving and enhancing PGRFA.

Some explorations and practices have been conducted to address these issues and protect PGRFA and TK in field over the last decade. The Chinese Centre for Agricultural Policy, under Chinese Academy of Science, has been working with poor farmers in the genetically and culturally rich provinces of South West China since 2000 to protect farmer knowledge and local genetic resources and promote benefit-sharing. The main focus has been on Participatory Plant Breeding

with maize, the staple food crop for the poor, in SW China. Since 2008, PPB has spread to Yunan and Guizhou, and to rice, casava and beans.

PPB contributes to in situ conservation because local landraces and knowledge are used and valued rather than replaced with modern varieties. It has enhanced both the farmer seed system and the formal seed system. For the farmer seed system it has broadened seed access and exchange networks. For the formal seed system, it has provided genetically diverse landraces which can promote future breeding. The collaboration established through PPB provides the basis for negotiating equitable benefit-sharing. Two types of benefit-sharing agreement have been established between farmers and communities and formal breeding institutions. The first is for conservation and management of local landraces for future breeding, recognising that landraces are the product of farmer knowledge; and the second for farmer collaboration in the PPB process, recognising their contribution of GRs and knowledge. PPB, where farmers needs and interests are addressed, is now being supported by provincial governments in some areas.

The basic tools used in conducting participatory plant breeding (PPB) and related protection, value addition and capacity building for TK and PGRFA are as follows:

Around PPB –

- Community-based seed registration and conservation – through which farmers get to know more information about varieties, including landraces, farmers’ traditional varieties and modern hybrids. Based on such information and its annual change, farmers can plan for both landrace conservation and quality hybrid adoption.
- On-farm experiments and varietal selection – through which farmers and local communities recognize the values of their genetic resources and their TK and share them, in an appropriate way, with other communities and scientists through PPB and PVS. This helps farmers find/breed better adapted varieties.
- Community-based seed production – through which farmers can get monetary benefit from their seeds; and the farmer seed system can be enhanced, since it has been challenged by the industrialized and profit-driven hybrid seed systems for a long time.
- ABS discussion and contracting with public breeding institutes – which can be seen as the implementation of PIC and MAT at the project level. Both farmers and institutes have reached an ABS agreement at the project level, which regulate benefit sharing principles and working mechanisms in written form. These should be signed before accessing the crop germplasm.

Around traditional organic products –

- Niche market development together with local NGO and/or public institute – through which value can be added to PGR & TK with specific recognition of their biological and cultural values.
- Interaction with urban consumers – through which the value of PGR & TK can be introduced to consumers and integrated into diverse food systems. The linkages between traditional farming and organic farming have been defined by consumers and intermediaries, which will provide more opportunities for PGR & TK products in light of concerns on national food safety.
- Farmers’ organization and network building – can support mutual learning among farmers and communities. Farmers can thus get back their varieties and knowledge as well as their confidence through learning from each other.

The right to participate in national decision-making on conservation and sustainable use of PGRFA

National efforts on the conservation and sustainable use of PGRFA still focus largely on supporting the role of plant breeders, scientist and gene banks, rather than the role of farmers, in situ conservation and farmers' rights. Despite progress in introducing new laws to protect TK, PBR and seed laws increasingly threaten the rights of farmers and in situ conservation. This suggests that there is limited participation of farmers and communities in national decisions relating to PGR conservation/sustainable use.

In India for example, farmer participation in agriculture policy and decision-making is limited. Rich industrial farmers have an influence (eg. on the Public Distribution System for seeds) but not poor traditional farmers. In the environment and biodiversity sector, government institutions have tended to be more open to farmer and community involvement. However, the government has become quite closed to NGOs in recent years (Swiderska et al 2008). Community participation in biodiversity institutions dealing with TK protection is still very limited, and there is no farmer participation in the authority that decides over implementation of the PVPFR Act.

In Peru, there has been some farmer and community involvement in national environment policy-making, but this has generally been consultation rather than active participation in decision-making, and there has been far less involvement in the agriculture sector. The process to develop Peru's Free Trade Agreement with the US in 2006 was largely conducted behind closed doors, without involvement of civil society or the Environment Ministry - but with some industry involvement (Siegele, Swiderska and Argumedo, 2006).

Industry and scientists tend to be by far the most influential in national decision-making, and increasingly foreign industry through Free Trade Agreements and other trade deals. The seed industry is pushing for the adoption of UPOV 91 in all countries, as evident from the World Seed Conference in September 2009, organised with the FAO, where there was very limited participation of farmer organisations. Most FTAs include an obligation to accede to the 1991 UPOV regime, which supports the rights of industrial breeders over those of farmers and communities and threatens farmer seed systems (ie. seed saving and seed exchange). Many FTAs require protection of IPRs beyond existing international agreements (eg. WTO/TRIPS), including on the patenting of plants. Where developers of GMOs are able to patent GM seed, they generally charge a royalty to cover research and development costs and require farmers to agree not to save, replant or sell the seeds from crops grown with the patented seed. Generally, regional and bilateral trade agreements have been negotiated behind closed doors without taking account of civil society concerns, and have excluded the local stakeholders – ie. small farmers and local communities – who are most likely to be affected by their outcome (Siegele, Swiderska and Argumedo 2006).

3. Research Findings on how to effectively implement Farmers' Rights

The protection of Traditional Knowledge and Equitable Benefit-sharing from PGR use

Recognising collective rights: Our research into community perceptions and patterns of knowledge 'ownership'² stressed the importance of recognising collective rights. Knowledge is believed to come from God and so is always considered to be collectively held, even if it can be attributed to a particular inventor or provider in the community, in which case both collective and individual rights should be recognised. Knowledge and related bio-genetic resources are widely shared within and between communities and this sharing is important to sustain traditional subsistence economies in often difficult environments– no individual can survive based on their knowledge and resources alone. Sharing allows farmers to innovate further and add to the stock of knowledge and genetic resources. In this context, recognising individual or exclusive rights would

² Knowledge is not owned outright as in the western concept of property – it is held by custodians as heritage to be passed on to future generations.

not only threaten livelihoods but also the innovation systems which sustain and enrich genetic resources and traditional knowledge.

This means that measures to protect TK, such as the Prior Informed Consent of communities and equitable benefit-sharing, must also be collective. Obtaining PIC and sharing benefits with a single individual or family would promote individual rights and undermine sharing values. As our research found, indigenous communities make decisions collectively. Even where traditional authorities have been weakened, many decisions are still made collectively, particularly in relation to farming and natural resources. Collective PIC and benefit-sharing reinforces collective resource rights and responsibilities, which underpins community-based action to conserve PGRFA. Furthermore, when access is negotiated by an individual, there is a risk that the full value of TK will not be taken into account.

The Kuna of Panama have developed a protocol for research on biodiversity on their territories, which sets out the process and requirements for PIC. Consent is required from the Kuna Congress level (representing 49 communities), the source community authority and the individual knowledge provider, and can be granted or denied at any stage.

Communities can also use ‘soft’ IPRs, such as collective trademarks or Geographical Indications, to protect their rights over particular products based on TK and genetic resources (defensive protection). These are termed ‘soft’ because they protect collective rights, rather than exclusive rights, and can link a product to a particular territory and culture. For example, the six Potato Park communities have registered a collective trademark, and a percentage of the sale of trademarked products goes into a communal trust fund to support the park’s activities for PGR conservation.

Ensuring equitable benefit-sharing amongst communities. Equitable benefit-sharing at community level is very important to ensure that conflicts over benefits are minimised amongst communities, and that benefits and conservation incentives are widely distributed, rather than captured by local elites. However, this requires strong, locally accountable institutions. The six Quechua communities of the Potato Park, Peru have developed an Inter-community agreement for equitable sharing of the benefits that they are deriving from a collaborative research agreement with the International Potato Centre in Lima. The agreement is based on a long process of participation and deliberation within and amongst the six communities. It is a community protocol which establishes the rules for how the monetary benefits and potato varieties acquired are shared amongst them. The rules are based on customary laws which promote conservation and equity. Those most involved in the park activities – ie. in sustaining PGRFA – get the most benefits.

Understanding the drivers of traditional innovation. Measures to protect traditional knowledge rights should also provide incentives for innovation. This is the original purpose of IPRs, and is particularly important for protection of TK given its rapid loss. It is estimated that 50-90% of all TK will be extinct or threatened by 2100 (UNESCO, 2003). TK relating to PGRFA is a subset of TK and needs to be sustained as part of wider traditional knowledge and livelihood systems.

Western IPRs protect and incentivise innovations through financial benefits - but financial benefits and incentives alone are unlikely to be sufficient to promote traditional innovation – and could undermine the traditional cultural values, collective/sharing practices and dependence on natural resources that sustains TK.

Our research identified the following key drivers of traditional innovation: collective activities, use of diverse GRs, landscapes, cultural and spiritual values and customary laws:

- Collective agriculture and NR use activities at family and community level.
- Use of diverse genetic resources – both wild and domesticated.
- Access to wild gene pools and wide sharing/exchange of genetic resources and TK (within and between communities).
- Cultural values and preferences eg. for traditional varieties/foods.

- Spiritual values and beliefs and customary laws that promote conservation of PGR, sharing and reciprocity.
- Land and landscapes which support all the above.

Land is an essential resource for traditional subsistence economies that depend directly and substantially on natural resources for meeting basic needs (food, agriculture, healthcare, income and cultural/religious needs). Landscapes provide access to wild gene pools and wild plants for food production and healthcare, and to sacred wilderness areas for sustaining spiritual beliefs. Landscapes not only have economic value but are tied to cultural identity and spiritual beliefs (eg. gods associated with mountains and forests). They also provide the physical space for sharing and conservation practices based on customary laws – the wider the area for sharing and exchange between farmers and communities, the richer the genetic and intellectual basis for further innovation.

Protecting ‘bundles of rights’. Therefore, policies and laws to protect TK should not only protect TK, but also rights to the associated genetic resources, landscapes, cultural and spiritual values and customary laws that sustain it, in order to protect TK from loss as well as misappropriation. Most policies only protect the intellectual component of knowledge systems, but not the biological, cultural and landscape components that sustain TK and innovation systems. They separate rights over TK which are vested in communities, and rights over genetic resources, which vested in governments (‘state sovereignty’). Yet knowledge forms part of genetic resources which have been domesticated, improved and conserved by farmers, and the two are used and transmitted together. In the holistic indigenous worldview, knowledge and bio-genetic resources are inextricably linked and cannot be separated.

Cultural and spiritual values and customary laws also play an important role in sustaining TK and PGRFA, but are being eroded by various processes and policies. Land tenure and access are at threat from development pressures (eg. biofuels, commercial agriculture) as well as conservation schemes in some cases (eg. strict protected areas). While farmers need *access* to land and natural resources to sustain TK and in situ conservation, research has also shown that secure tenure rights over land and Natural resources (NRs) is also important for communities to invest in conservation (eg. research on common property resources by Ostrom in the 1990s). Our comparative research also suggests that rights to land are important to revitalise TK systems and reduce the loss of TK and PGRs. In the Potato Park, Peru, collective land rights have helped to re-establish a sense of collective responsibility for managing traditional potato varieties.

Thus, in order to protect TK and PGRs in situ and prevent their loss, we need to focus on farmers’ rights as bundles of rights - rights to traditional knowledge, genetic resources and related landscapes, cultural and spiritual values and customary laws – or to ‘collective bio-cultural heritage’ as a whole. Such an approach is consistent with the overall objectives of the Treaty of conservation and sustainable use, and implements articles 5 and 6 on in situ conservation and sustainable use. It also implements the UN Declaration on the Rights of Indigenous Peoples, which requires countries to protect the rights of indigenous peoples to their traditional territories, resources, seeds, cultures and customary laws, as well as their knowledge.

Recognising customary laws. Measures to protect TK should be based on the customary laws and practices of indigenous and local communities for protecting and sustaining TK, rather than existing IPR standards. Communal knowledge relating to seeds, farming and everyday healthcare is openly shared, while specialised or sacred knowledge is restricted to elders, family or clan members. The obligation to share is particularly strong in relation to seeds, and the principle of reciprocity means that the more seeds are shared the more seeds are received. Hence reciprocity promotes diversity, and the wider the space for sharing and exchange the greater the diversity. In the Potato Park for example, an additional 100 varieties have been gained from reciprocal exchange of potatoes with communities outside the park.

The Peruvian study identified three key Andean customary principles which guide all aspects of life:

- Reciprocity, meaning equal exchange in society and with nature
- Equilibrium, meaning balance in society and in nature
- Duality, meaning that everything has a complementary opposite

These principles were found to be essentially the same for all the other indigenous and local communities involved in the project. The principle of solidarity was also common, meaning helping those in need (eg. widows, orphans, women headed households etc).

Despite a weakening of customary laws in some cases (eg. SW China), similar values are still evident in more remote areas; and even in less remote areas where it was assumed that no customary laws would be found (eg. 7 hrs drive from Delhi, India). In India, the traditional practice of seed barter in many parts of the country has for various reasons, been partly replaced by sale and purchase either within the community or in *haats* (local village market). However, the traditional practice of seed exchange is still very common among the mountain communities where the community bonding is strong.

In the Potato Park, these customary principles – along with the holistic concept of bio-cultural heritage- have guided the development of all the different tools to protect traditional knowledge and farmers rights, in order to strengthen the customary laws that sustain TK, bio-genetic resources and traditional agricultural landscapes.

Supporting local as well as national measures. National measures alone are unlikely to be enough to effectively protect TK or farmers rights, and need to be complemented by measures at local and community level, particularly if farmers' rights are to be a tool for in situ conservation. The threats to TK and PGRs and drivers of change affect communities at local level, and hence require local as well as national responses to effectively address them.

At the same time, protecting TK in situ may also be the best way to protect the rights of communities over their TK, because it enables communities to strengthen control and management of TK and customary laws. The participatory action- research process facilitated by ANDES has strengthened the capacity and motivation of farmers, empowering them to protect their rights, TK and PGRs. A number of different tools are likely to be needed to effectively protect and strengthen TK at community level – including community protocols, registers, territories and collaborative agreements (see the Potato Park example p. 3).

Promoting reciprocal exchange of PGRs As explained above, financial benefits are not the only or even the best type of benefits to contribute to the conservation and sustainable use of PGRFA by subsistence farmers. Communities have shared many genetic resources with outsiders over the years, but received little in return. According to the customary law of reciprocity, they expect genetic resources in return for those shared. Genetic resources have been eroded and are increasingly critical to enable farmers to adapt to climate change. This is why the Potato Park communities insisted on gaining access to potato varieties collected from the Park in the 1960s by the CIP, which have since been lost due to genetic erosion, as well as financial benefits from the past use of their potato varieties.

4. Research Findings on PGR conservation and sustainable use

Rapid genetic erosion over the last 1-2 decades:

Southwest China is a centre of maize diversity, the origin of maize cultivation in China and of waxy maize worldwide. In Guangxi, Yunnan and Guizhou provinces, 90% of survey households were cultivating maize landraces in 1998, but only 56% in 2008, as more and more farmers are turning to hybrids accessed from markets (according to a survey in 2009). In Guangxi, all maize varieties were local before the mid 1980s, from the mid 1980s to the 1990s more and more

hybrids were imported, but local varieties were still the majority; and since 2000 the planting area for hybrid maize has enlarged at great speed, with the consequence that the local varieties have decreased rapidly. Maize is the main staple food crop. A key reason for the adoption of hybrids is limited arable, which means that increasing productivity is a priority. Local GRs are lost in the process, and this weakens resilience to climate change. However, older people and women are still growing some traditional varieties such as waxy maize (eg. in their kitchen gardens) due to cultural preference and for use in festivals (eg. to make maize wine for weddings).

There has also been a major loss of genetic varieties across the **Himalayan region** and this is happening very fast. In the Eastern Himalaya study area near Kalimpong, only a few traditional rice varieties are still planted, not because modern varieties are being planted but because they are cheap to buy, since they are often subsidised. Nevertheless, traditional varieties are still grown for use on special occasions, festivals, weddings etc. Different varieties are grown in different seasons, and rice is still widely exchanged between farmers, even between communities and across country borders (this has been witnessed especially where there are marriages across borders).

Similarly, the **Andean region** has experienced significant genetic erosion over the last few decades, due to modern agriculture and development processes, and the disintegration of collective resource management systems under colonial feudal farming systems where farmers became farm labourers. But collective management has been re-established amongst the six communities of the Potato Park thanks to the potato being a symbol of common cultural identity, legal reforms allowing the recognition of collective land rights, and the revival of customary laws in the park.

Key common factors eroding genetic resources and traditional knowledge

Across the different studies, the following common drivers of loss of genetic resources and related traditional knowledge were identified:

- Promotion of modern varieties and technologies by agricultural policies, subsidies and R &D
- Promotion of modern varieties/food products in the media, influencing consumer demand and decreasing markets for traditional foods
- The reduction in size of landholdings and/or take over of community land for other uses
- The existence of plant breeders' rights to protect new varieties without commensurate protection of farmers rights over traditional varieties, which means that farmers have no economic incentive to sustain them
- Erosion of cultural values and customary laws undermining cultural incentives and local rules for PGR conservation and sustainable use. This is due to a number of drivers of change, including the spread of modern/urban values and lifestyles, western education and religion, extension of government authorities and national laws for natural resources, and migration to cities and changes in occupation due to economic pressures.

These factors apply to both genetic resources and traditional knowledge because the two are closely linked – traditional varieties embody the knowledge of farmers that have developed and conserved them. The studies show that erosion of genetic diversity leads to the loss of associated TK, and this can lead to further erosion of genetic resources.

Key common factors sustaining genetic resources and traditional knowledge

Across the different studies, the following factors were identified as playing a key role in sustaining genetic resources and traditional knowledge:

- The use of diverse bio-genetic resources is critical for sustaining traditional knowledge. The return of traditional varieties to ILCs has also revived related traditional knowledge and cultural values and practices (eg. in Peru and China).

- Cultural values and preferences associated with traditional varieties – eg. for use in festivals, ceremonies and because of preferred qualities such as taste.
- Spiritual beliefs and customary laws associated with nature which promote conservation and sustainable use
- Customary laws which promote sharing and reciprocal exchange (eg. evidence in Peru and India studies that reciprocity contributes to conservation).
- Land and landscapes which sustain traditional knowledge and belief systems by providing access to sacred sites and wild gene pools for breeding. Communities need sufficient land to sustain traditional subsistence economies and to exchange and conserve genetic resources over wide areas, based on customary laws.

5. Conclusions and Recommendations on Measures to Implement Farmers' Rights

In order to implement the Treaty's provisions on Farmers' Rights, governments need to take measures at four levels:

1. Developing effective national legislation for protection of Farmers' Rights National legislation to protect TK should recognise TK as the collective heritage of indigenous and local communities, be developed with their active participation and leadership, and be fully designed on the basis of customary laws rather than western IPR standards. They should ensure that farmers and communities have the authority to decide over access and use of their knowledge. In order to implement the right of farmers to equitably participate in sharing benefits, laws on TK protection and ABS should recognise the rights of farmers and communities over their varieties in the exercise of national sovereignty. This should include farmers' rights over traditional varieties held in situ, including crop wild relatives, and over traditional varieties which have been collected from their land/communities and are held ex situ. To facilitate this, a list of traditional varieties of communities and farmers could be developed with their participation, including in the development of criteria to be used for identifying these varieties. The PIC of farmers and communities should be required for access to these varieties, along with equitable benefit-sharing from their use based on mutually agreed terms. In order to protect traditional knowledge from loss as well as misappropriation, and to support in situ conservation, legislation is also needed to protect farmers' and ILC rights to traditional landscapes, cultural values and customary laws associated with TK and genetic resources.

2. Addressing the impacts of other policies and laws on Farmers' Rights. Existing policies and laws tend to favour the interests and rights of plant breeders and agri-business over those of poor farmers. To effective, protection of farmers' rights needs to be commensurate with that provided to plant breeders, and other policy constraints also need to be identified and addressed. For example, Plant Breeders' Rights under UPOV 91 which extends breeders' rights to on farm saved seeds; seed laws which require registration based on uniformity and distinctiveness and prevent exchange of unregistered seeds; and agricultural subsidies which flood the market with cheap modern foods, making it very difficult for small farmers to sell their products/varieties.

3. Supporting farmer and community level initiatives. Protecting farmers' rights requires new practical tools for Prior Informed Consent (PIC) and equitable benefit-sharing. Supporting policy pilot experiments at farmer and community level provides a way to test out and develop these new approaches, and inform the design of policy and law. At the same time, this will build the capacity of farmers and others to implement farmers' rights, and ensure that new laws are informed by farmers' needs and based on practical experience. Such experiments might include the development of agreements between farmers and plant breeders for access to genetic resources and equitable benefit-sharing. Supporting community initiatives and capacity is also important to enable poor farmers to protect their rights - national laws on farmers' rights alone may not be enough given the many threats that communities face at sub-national and local level.

4. Supporting and institutionalising farmer participation in national decision-making on PGR conservation and sustainable use: Farmer participation in national decision-making is far from

being standard practice. Laws to ensure public participation tend to be non-existent or poorly implemented in developing countries. Legal reforms are often needed to ensure that traditional farmers can participate in decisions relating to PGRs. New institutional structures are also needed to enable farmer representatives to participate in national policy and legal processes on genetic resources and agriculture, and ensure that farmers can actually influence the outcome of decisions, and have the same voice and influence as trade and economic actors. This is also likely to require funding for farmer information, capacity building and consultations at local level, to enable farmers to participate effectively.

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2.3 INTERNATIONAL SEED FEDERATION (ISF)

Plant breeders serve an important function in achieving increased yields of food and feed crops, which are essential to preserving the economics of farming and the livelihoods of farmers. Plant breeders not only develop new varieties but also explore the value of unused germplasm to enhance genetic resources already in use on-farm. By this means they play an important role in conserving plant genetic resources.

In today's industrialized and urbanized societies almost all agricultural production is undertaken by farmers who specialize in production using seeds that have been developed by plant breeders. At the same time many farmers, particularly in developing countries, continue their traditional practices of seed saving and exchange for their seed supply; and in so doing also play a role in distributing germplasm and exploiting genetic resources.

Thus, plant genetic resources can be explored, characterized and developed by plant breeders and exploited by breeders and farmers at the same time that they are being conserved, both *in situ* and *ex situ*. Therefore, as a means of supporting sustainable use ISF fully supports an access and benefit sharing system that respects intellectual property, whether the intellectual property is created by farmers or by plant breeders in the public or private sectors.

In order to create an environment that encourages the continuous and substantial investments required to support breeding and the large scale characterization and conservation of germplasm undertaken by the commercial sector, breeders - companies or individuals – must have the

opportunity to protect their new varieties through intellectual property rights in order to obtain a fair remuneration. ISF strongly supports Plant Breeder's Rights based on the UPOV 1991 Convention as it provides an adequate protection of plant varieties against inappropriate exploitation by others. This protection is combined with free access and use for further breeding purposes (breeder's exemption) and the compulsory exception of acts done privately for non-commercial purposes³ allowing subsistence farmers in developing countries to save and use seed from their own harvests.

Article 9 of the International Treaty on Plant Genetic Resources for Food and Agriculture (the "Treaty") refers to the contribution farmers have made towards the conservation and development of plant genetic resources, but it also expressly acknowledges that implementation of a system that allows farmers to "save, use, exchange and sell farm saved seed" rests with national governments "subject to national law and as appropriate". The Treaty recognizes that each Contracting Party has its own domestic needs and priorities, and recognizes that a Contracting Party may also have obligations under other international agreements and conventions it adheres to.

Most national laws recognize and protect intellectual property. They allow protection of new plant varieties created by breeders through years of breeding effort and significant economic investment to the exploration, characterization and development of germplasm as intellectual property. The Treaty does so too. Even as Article 9 calls for Farmers' Rights it does not exclude the intellectual property of commercial plant breeders.

Farmers are the primary market for new varieties developed and protected by commercial plant breeders. Free and unlimited use of farm saved seed that is harvested from protected varieties developed by plant breeders destroys the economic incentive to those breeders to continue to conserve, characterize and develop the available genetic resources in important food and feed crops. If farm saved seed of protected varieties is permitted and used², breeders should receive a fair remuneration for that use. Failure to respect and protect the property newly created by breeders will eventually restrict the release of genetically diverse and improved varieties to the detriment of farmers and to society as a whole. However, farmers still have the opportunity to freely use seeds of landraces and seeds of varieties that are not or no longer protected, independently of the consent of the breeder.

2.4 LA VIA CAMPESINA

Non reproducible seeds "improved" by the industry are the problem

"The improvement of plants" by the seed industry paints a flattering media image: a tenfold increase of the average yield by hectare of industrial monoculture. No green revolution however has ever resulted in such a multiplication of available food and the proportion of people experiencing hunger is perpetually on the rise.

The plants weren't "improved", but adapted everywhere with a same technological package that requires a very large consumption of fossil fuel energy, including chemical fertilizers and pesticides and motorization. However, today this agricultural model is reaching its various following limits:

- energetic. The replacement of farmers' work by fossil fuels has driven hundreds of millions of farmers from their lands, which today constitute the vast majority of people suffering from hunger. The fossil fuels that have replaced them are coming to an end after having released in the air immense amounts of carbon previously trapped in the soil in the form of petrol and humus.

³ Article 15 (1) of the UPOV 1991 Convention

Monocultures of agrofuels, that are supposedly to replace fossil fuels, are in fact aggravating the problem. Indeed, they highlight the low productivity of industrial monocultures by adding to the amount of hectares necessary for food production, those that are devoted to energy generation for the production of fertilizers and motorization.

- environmental and sanitary. The forcing of crops with chemical fertilizers destroys the life of the soil and directly feeds the pathogens that then require usage of chemical fungicides and insecticides. The replacement of associated crops with monocultures calls for the use of herbicides. The result is a never-ending race to acquire new pesticides to fight against the resistances generated by the use of the precedent ones. The new GMO pesticide plants accelerate this headlong rush towards dire sanitary and environmental consequences.

- climatic. Standardized industrial varieties are designed to express their potential only in conditions that are stabilized by their associated technological packages and are incapable of adapting to the current acceleration of climatic variations.

Reproducible peasant seeds are the solution

At the same time, the most highly efficient agroecological systems, based on local reproduction and the "informal" exchange of seeds amongst farmers see an acceleration of the exchange of knowledge between farmers around the world and provide as much or more food by hectare as industrial monocultures, while employing more farmers, less chemical inputs and less fossil fuels.

Each time a farmer resows a part of her or his harvest, new characteristics appear in the field. By choosing to multiply the best plants at each generation, by regularly exchanging small amounts of seeds and by favoring specific breeding or selection pressures, farmers renew the diversity and the variability that is indispensable to the adaptation of their varieties to diverse terrains, climate change and evolving human needs. Generations of farmers have thus created, preserved and renewed hundreds of thousands of different varieties that guarantee the food supply of themselves and future generations, and further the progress of agroecology. Participatory selection processes that are under the control of farming communities reinforce the efficiency of this type of dynamic management of biodiversity.

Lift the obstacles to farmers' Rights

The contribution of farmers to the conservation of biodiversity is hindered by numerous obstacles to their collective rights to conserve, use, exchange and sell the seeds of their farms, to protect them from biopiracy and from genetic contamination, to fairly share the benefits and to participate in local decisions regarding the management of seeds.

These obstacles are primarily the result of the absence of judicial and institutional recognition of peasant seed systems, which are called "informal", i.e. the conservation and dynamic management of local varieties in the farms, participatory peasant selections, local seed banks managed by the communities... even though these seed systems form the basis of the food of the majority of the world's population. To various degrees depending on the country, these obstacles are then reinforced with "agricultural development aid" and with legislation that benefits seed and agrofood transnational companies.

1) The aggressive promotion of "improved" non-reproducible seeds destroys local peasant varieties. Hybrid and "terminator" seeds, or those protected by intellectual property rights, were selected to grow only when accompanied by large doses of chemical fertilizers and pesticides. Buying these ruins farmers whose priority is to feed their community, not the global market. When the farmers then want to sow again, then can't reuse part of their harvest. They are instead forced to purchase commercial seed again along with the technological packages that are needed for their cultivation, and they don't have enough money to do so.

The distribution of non-reproducible seeds by the industry must immediately be replaced by support to the production of reproducible seeds that are adapted to local conditions, by farmers and in their fields.

2) The promotion of industrial cash crop monocultures destroys local agriculture which is destined to feed the population, results in the expulsion of hundreds of millions of farmers to slums, in the disappearance of their local varieties and in their replacement by corporations controlled by speculative financial capital. It must be replaced by the promotion of agroecological models that focus on local food production.

4) The standards imposed by the industry for the commercialization of seeds (homogeneity, stability and valorization of chemical fertilizers) and the costs of certification or of mandatory catalogues exclude local peasant seeds that are diverse and very adaptable. Peasant seeds must be exempted from these standards and from certification.

5) Patents on varieties outlaw farm seeds. Patent protection for genes or genetic technologies covers all of any plant that contains the genes in question or the marker genes of the protected technology, which results in an enormous concentration of the seed industry in the hands of the biggest patent holders. By extending coverage to any plant or variety contaminated by a patented gene, patents outlaw farm seeds of non-protected peasant varieties as well as those of protected varieties. When patents protect a gene that comes from genetic technologies other than transgenesis, information on its existence is not available to farmers and is difficultly available to the industry. Patents forbid any protection against the contamination of local varieties and sterilize any possible variety innovation. All forms of patent on seeds, their genes, or on life in general should be banned.

6) All "improved" seeds that are sold by the industry come from seeds that were selected and preserved by hundreds of generations of farmers, then picked from their fields without any remuneration. Plant breeders' rights and gene patenting legalize this biopiracy by authorizing the protection of varieties that are "discovered" in farmers' fields and then simply homogenized, or of genes that are "discovered" in these varieties. This doesn't stop the industry from doing everything to forbid farmers to use or exchange the seeds of their farms, or from forcing them to pay royalties when they don't buy certified seeds. The 1991 act of the UPOV convention, that makes farm seed into counterfeit, should be done away with along with patents on life.

7) The contamination of crops and seeds by GMOs destroys locally adapted peasant seeds. The commercialization of all GMO seeds, or seeds that are contaminated by GMOs, should be banned.

The local adaptation of the cultivated biodiversity to local constraints is dealt with locally and collectively. The collective usage rights of this biodiversity can only be defined locally, their global management can only be the result of multilateral negotiations between local communities and not of "universal" standards that barely conceal the dictatorship of the global market and of intellectual property rights.