Forum
Environment & Development

# Experiences in Farmer's Biodiversity Management

Landesanstalt für Großschutzgebiete

Managing Agrobiodiversity in Rural Areas gtz

# Experiences in Farmer's Biodiversity Management

**Report on the International Workshop**
**on Animal and Plant Genetic Resources in Agriculture at the**
**Biosphere Reserve Schorfheide-Chorin, Germany**
**16-18 May 2000**

**Published by:**
German NGO Forum on Environment & Development
Am Michaelshof 8-10
D-53177 Bonn
Phone: +49-(0)228-359704
Fax: +49-(0)228-359096
E-Mail: info@forumue.de
Internet: www.forumue.de

**Chief Editor:** Jürgen Maier

**Editors:** Ricardo Armonia, Susanne Gura

**Layout:** Monika Brinkmöller

**Funding of the Workshop including this report is gratefully acknowledged:**
Misereor
Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH
Brot für die Welt
Rockefeller Foundation
Ausschuss für entwicklungspolitische Bildung und Publizistik
Stiftung Umverteilen
Stiftung Weiterdenken
Heinrich Böll Stiftung
European Community

"This document has been produced with the financial assistance of the European Community. The views expressed herein are those of the German NGO Forum Environment and Development/Deutscher Naturschutzring and can therefore in no way be taken to reflect the official opinion of the European Community."

Bonn, Germany, May 2001

# Contents

# Summary

The *Workshop on Experiences in Farmers' Biodiversity Management* held 16-18 May 2000 in Schorfheide-Chorin, Germany was one of the NGO activities accompanying the Global Forum on Agricultural Research (GFAR 2000). Around forty international and German NGO representatives, farmers and journalists from 15 countries in Africa, Asia, Latin America and the Northern countries participated. The German NGO Forum Environment and Development, the administration of the Biosphere Reserve Schorfheide-Chorin, and the sector project "Managing Agrobiodiversity in Rural Areas" of the German Technical Cooperation (GTZ), jointly organized it. Funding was kindly provided by Misereor, Brot fuer die Welt, Rockefeller Foundation, German Technical Cooperation (GTZ), as well as the European Commission.

The Workshop comprised

1. Field visits to biosphere reserve areas in Germany – nature parks, organic farms and research sites;
2. Presentation of experiences of NGOs/farmers based on cases from Asia, Africa and Latin America; and
3. Working group and plenary discussions, which produced recommendations.

During the field visits, main similarities and differences between North and South in ecological farming were identified. While consumer demand is an important motivating factor besides ecological awareness in the North, ecological farming in the South is often motivated by subsistence needs and a lack of resources to buy inputs like chemical fertilizer or pesticides. A notion of backward farming techniques is often connected with ecological farming in the South. Rarely, organic products fetch a premium price in the South; and there is a lack of certification arrangements, with a few exceptions. In the North, subsidies are available to organic farmers, while in parts of the South, the World Bank's structural adjustment programmes ban such subsidies.

In both South and North awareness is raising that ecological farming provides ecological services to society. Economic viability is an important criterion in both North and South. Ecological farmers tend to actively develop their farming systems; working in partnership with scientists occurs more frequently among ecological than conventional farmers.

The plenary presentations covered experiences of farmers and NGOs – rice breeding by Thai farmers, the relationship of genetic resources conservation to subsistence conditions in Ethiopia, partnerships and capacity building in genetic resources conservation and development in Southeast Asia, animal genetic resources conservation and management in India, vitamin A enriched genetically modified rice in the Philippines, and inclusion of farmers/communities' rights in the intellectual property rights discussions.

The working group discussions focused on the following topics:

- Incentives for farmers to enhance agro-biodiversity and protect their property rights;
- Formal, informal and private co-operation to foster agro-biodiversity;
- Animal genetic resource biodiversity;
- Bio-technology;
- Intellectual property rights; and
- Bio-piracy.

They examined incentives, relationships and cooperation with regard to enhancing agro-biodiversity conservation and development, and their implication for agricultural research.

The workshop recommended the following:

## Incentives for farmers to enhance agro-biodiversity

- Farmers' access to land should be secure. Lack of access to land or insecurity in land tenure discourages farmers to further invest in land development and therefore they neglect biodiversity.
- Genetic resources policies should encourage farmers to save, exchange and develop seeds and local animal breeds. Seed policies based on UPOV'91 limit the use and exchange of traditional varieties.
- Policies should not be biased against traditional varieties. Export orientation usually leads to agricultural policies favouring High-yielding varieties (HYVs) such that extension, research and credit facilities revolve around the high-input HYVs.
- A market for traditional varieties should be developed; and consumers should not follow governments in their preference for introduced or "improved" varieties or products.
- Success stories on agro-biodiversity initiatives should be shared.
- Strong partnerships between and among the farmers, scientists and NGOs should be established. Research that is mostly geared to HYV's and high yields discourages such partnerships and agro-biodiversity.
- Financial resources for participatory agro-biodiversity activities should be available.

## Formal, informal, and private sector cooperation to foster agro-biodiversity

The recommendations formulated are based on the goals of poverty alleviation, food security and environmental sustainability of the Consultative Group on International Agricultural Research (CGIAR). Specifically, the recommendations focused on the research agenda, access to CGIAR resources, and institutional transformation and governance.

With regard to its **research agenda**, the CGIAR should:

- Focus on "traditional" crops.
- Focus on crops needed rather by small farmers than by commercial agriculture.
- Consult with farming communities to identify their needs.
- Further develop participatory methods and disseminate them through national and international research systems.
- Integrate the research agenda with respect to biodiversity and into the wider development agenda.
- Delete the Genetically Modified Organisms (GMOs) from the CGIAR's approach to environmental sustainability.

### On Resource Access and Partnerships

- NGOs should not enter research partnership with the CGIAR as long as it pursues the patenting policy.
- There should be no research collaboration with the public sector without proper evaluation and disclosure of the impact of the research.
- Cooperation agreements should be made transparent and monitored. Specific policies should be in place for contractual relationships.

### Institutional Transformation and Governance, incl. Access to Germplasm

- CGIAR governance should be made more representative – with more participation from the South and with greater gender representation.
- The CGIAR should, in its policy on access to germplasm collection, safeguard the rights and interests of the South and the small farmers.

## Incentives for and Institutional Cooperation on Farmers'/Stock Keepers' Animal Genetic Resource Management

- More awareness is needed on the contribution of pastoralists to Animal Genetic Resources Management. An information system is needed that links pastoralists and organizations. Pastoralists should be involved in policy decisions, so that agricultural policies are made in favour of pastoralists. For example, subsidies for "improved" breeds should be withdrawn, and pastoralists involved in land use planning.
- Markets for rare breed products (e.g. camel milk) should be developed; Industry sponsoring could be looked for.
- Selection criteria should include Animal Genetic Resources conservation aspects.
- The productivity paradigm should be revised. More research on rare breed qualities is needed.
- National laws should be screened whether they support or suppress animal biodiversity. Informal law should be documented and respected. Also, awareness of bio-piracy should be increased and bio-piracy of Animal Genetic Resources monitored.
- Not more organizations are needed, but more cooperation between them is needed. Common objectives are an essential precondition for their cooperation. Especially, multilateral and international organizations should cooperate on Animal Genetic Resources Management.
- A lot can be learned from the development of Plant Genetic Resources (PGR) management over the last decade. Therefore, more interaction between Animal Genetic Resources (AnGR) and PGR organizations is needed.

## Intellectual Property Rights

- Agricultural research should take positions in favour of the farmers and stock keepers in order to protect their rights e.g. to save and exchange seeds and animal genetic resources.
- Patents should not apply to life forms. The CGIAR should not engage in patenting, not even in defensive patenting. Other mechanisms should be sought to show evidence of prior art.
- The agreement on Trade-Related Intellectual Property (TRIPS) should be reconciled with the Convention on Biodiversity (CBD) – including the expansion of

"geographical indication" (i.e. the community from which a genetic resource originates has a right to that genetic resource) to cover agricultural products in general.
- Agricultural research organizations should monitor and take action against bio-piracy, in order to avoid bio-piracy through scientific cooperation.

## Biotechnology

Laboratory research on gene technology may be acceptable provided that the following demands are met:

- That the CGIAR biotechnology research budget will be re-oriented to biosafety and significantly increase research on safety issues.
- That a comprehensive safety framework is developed and the socio-economic impact is assessed.
- That the CGIAR plays an important role in establishing appropriate scientific protocols for the assessment of biotechnology standards, and in strengthening the inadequate and incomplete Montreal protocol.
- That there is significant public participation in the discussion of risks and in the monitoring of gene technology activities.

## Bio-piracy

**At international level**: Acceptance of and compliance with the CBD particularly regarding the prior informed consent (PIC) and material transfer agreements (MTA) in order to ensure that communities share the benefits of the germplasm transfer.

**At national level**: There is a need to establish and enforce legislation that looks into the problems of bio-piracy and solves them. This could be a legislation that treats "oral knowledge" at par with published documentation as evidence to show "prior art" in challenging patents made, for example, on Indigenous Knowledge.

- Patents are covered by national laws (not international laws), which make it difficult to challenge patents granted in another country. There is need to integrate into the TRIPS agreement an international context of bio-piracy.
- Bio-piracy should be treated as a criminal offence and with stiff penalties.
- One problem is that many of the bio-piracy activities are carried out through the scientific research networks – there is a need for guidelines to avoid bio-piracy through scientific cooperation.
- Forgeries of written documentation have to be watched out for in establishing prior art.

**At local level**: Awareness-building activities and sustained vigilance at the level of communities, local officials and local NGOs are simple but effective local actions for stopping bio-piracy. For example, simply making people understand that the taking out of materials by tourists may constitute bio-piracy is already one important step toward minimizing bio-piracy.

The recommendations are carried to the following Workshop of Non-Government and Small Farmer Organisations in Dresden[1], where these groups formulate their positions for the Global Forum on Agricultural Research (GFAR), 21-23 May 2000, Dresden. The challenge there is to transform the GFAR

[1] German NGO Forum on Environment & Development: FOOD FOR ALL – Farmers First in Research. International Workshop of Non-Government and Small Farmer Organisations on Research for Poverty Alleviation. Dresden, Germany, 19-20 May 2000, report available at: http://www.GFAR2000-NGOactivities.de

into a genuine forum on issues confronting agricultural research. A critical discussion point for civil society therefore is to determine if GFAR is something that it wants to pursue. If so, and to the extent that the private sector, at which the priorities for agricultural research are largely oriented, takes the GFAR seriously – the next question to ask is: Would civil society be prepared to collaborate with private corporations?

# Introduction

The *Workshop on Experiences in Farmers' Biodiversity Manage ment* is part of the NGO activities accompanying the Global Forum on Agricultural Research (GFAR 2000). The Workshop was held 16-18 May 2000 in Schorfheide-Chorin, Germany – just before the GFAR meeting in Dresden, Germany held 21-23 May 2000. The Workshop happened at a time when national policies on Intellectual Property Rights (IPR) on genetic resources were being formulated to conform to World Trade Organization (WTO) requirements but with little regard to the requirements set by the Convention on Biological Diversity (CBD). The Workshop objectives were to:

- Exchange of experiences of practitioners from the North and the South on on-farm management of genetic resources;
- Contribute to progress in international NGO cooperation on on-farm management of genetic resources;
- Prepare a position on agro-biodiversity for the International Workshop NGO and Small Farmer Organizations on Agricultural Research and Poverty Alleviation in Dresden on 19-20 May 2000; and
- Provide information material to the press.

To facilitate the exchange of experiences and information, the Workshop included (i) field visits to biosphere reserve areas in Germany – nature parks, organic farms and research sites; (ii) presentation of experiences of NGOs/farmers based on representative cases from Asia, Africa and Latin America; and (iii) working group and plenary discussions. The working group discussions focused on the following topics:

- Incentives for farmers to enhance agro-biodiversity and protect their property rights,
- Formal, informal and private cooperation to foster agro-biodiversity,
- How to maintain animal genetic biodiversity and assist farmers/stock keepers in the management of animal biodiversity,
- Intellectual property rights,
- Bio-technology and
- Bio-piracy.

Around forty participants (international and German NGO representatives, farmers and journalists) from 15 countries in Africa, Asia, Latin America, Eastern Europe and Northern countries participated at the Workshop. Most of them joined the next GFAR 2000 accompanying activity – *the International Workshop of NGOs and Small Farmer Organizations on Research on Poverty Alleviation* – where further discussions on the issues were pursued. It was in the second workshop where the Dresden Declaration of NGOs and Small Farmers' Organizations was drafted and then presented to the GFAR 2000 meeting.

The German NGO Forum Environment and Development (Susanne Gura), the administration of the Biosphere Reserve Schorfheide-Chorin (Annette Meyer), and the sector project "Managing Agrobiodiversity in Rural Areas" of the German Technical Cooperation

(Annette von Lossau and Beate Weiskopf), jointly organized the workshop. Funding was kindly provided by Misereor, Brot fuer die Welt, Rockefeller Foundation, German Technical Cooperation (GTZ), as well as the European Commission.

## Workshop Programme

### 16 May 2000

- Field Visits:
  - *Hoellberghof:* animal genetic resources and nature conservation, historical land use and community development
  - *Brodowin farm:* on-farm research, marketing and ecological agriculture
- Evaluation of the field visits

### 17 May 2000

- Presentation of experiences and discussions on farmers' biodiversity management
  - *The Alternative Agriculture Network in Thailand* by Suksan Kantree
  - *Experiences of SOS-Sahel in On-Farm Management of Genetic Resources in Ethiopia* by Eyasu Elias
  - *Community Based Plant Genetic Resources Conservation and Development* by Wilhelmina Pelegrina, Biodiversity Use and Conservation Program, SEARICE, Philippines
  - *Indigenous Institutions for Managing Livestock Genetic Diversity in Rajasthan (India)* by Hanwat Singh Rathore, Society for Indigenous Livestock Research and Development, India
  - *Implementing the Convention on Biodiversity with Respect to Domestic Animal Diversity* by Ilse Koehler-Rollefson, League for pastoral people, Germany
- Working Groups discussions and plenary presentation of results on:
  - *Incentives for farmers to enhance agro-biodiversity and to protect property rights of farmers*
  - *Co-operation between the formal, informal and private sectors to foster agro-biodiversity*
  - *Incentives for maintaining animal genetic diversity and assisting farmers/stock keepers in the management of animal bio-diversity*
- Optional field visit to Greiffenberg: food plant genetic resources conservation, eco-tourism, environmental education

### 18 May 2000

- Presentation of experiences and discussions on the implications of biotechnology and patenting for agro-biodiversity
  - *Issues and Implications of the Vitamin A Enriched Genetically Modified Rice* by Charito Medina, MASIPAG, Philippines
  - *Intellectual Property Rights* by Suman Sahai, Gene Campaign, India
  - *Community Rights and Farmers' Rights in Thailand* by Witoon Lianchamroon, BIOTHAI, Thailand
- Working Groups discussions and plenary presentation of results on:
  - *Intellectual property Rights*
  - *Biotechnology*
  - *Bio-piracy*

# The Field Visits

The participants visited the Hoellberghof, a farm in the Na ture Reserve Niederlausitzer Landruecken situated half way between Berlin and Dresden, and the Ecological Village Brodowin within the biosphere reserve Schorfheide-Chorin, situated around 50 km Northeast of Berlin.

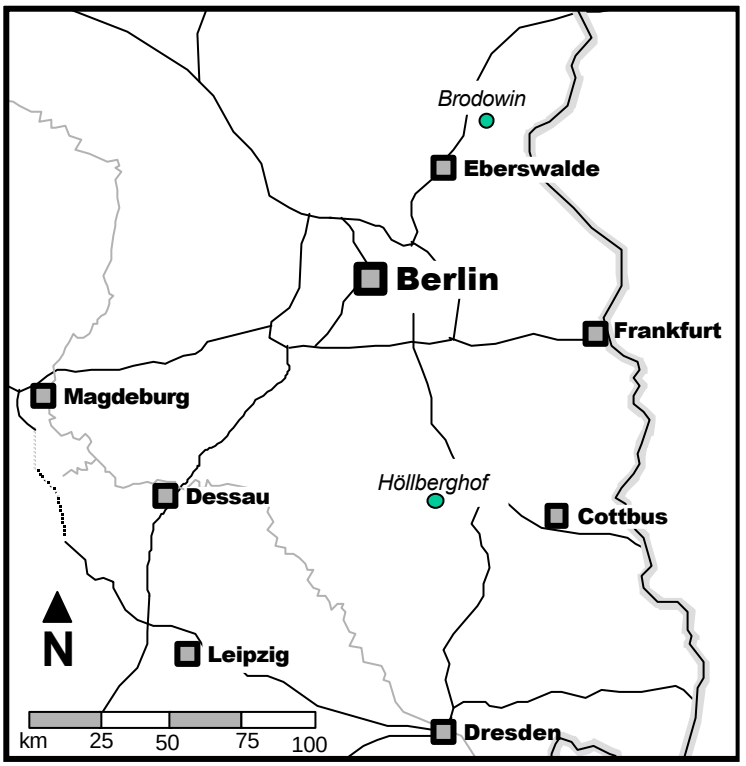
## Hoellberghof

The Hoellberg Farm demonstrates nature conservation through historical land use and the fostering of culture and tradition based on the practices of farmers who lived 200 years ago – when biological diversity was at its peak. The Hoellberg Farm is also a site for environmental education and research. It coordinates eco-tourism development within the nature reserve and the management of nature conservation by farmers compensated for their work. Presently, kids and adults enter the nature reserve for free. However, with the withdrawal of support from the ministries of agriculture and environment, the charging of entrance fees is now being contemplated to cover the cost of maintaining and further developing the park.

The nature reserve specializes in three areas – forestry, agriculture and landscaping. In forestry, the emphasis is shifting from a pine monoculture into a mixed deciduous forest. For agriculture, the focus is on improving problematic soils such that one can still do agriculture while trying to establish a habitat for rare species. As such, the nature reserve (i) has a "farmer garden" which is a collection of 200 organically-grown plant species that are at least 200 years old and (ii) is into the preservation of several endangered animal species including the Polish Koniks (horses), the German Grazing Pigs, the German Black Pied (cows), the Skudde sheep, and the Thuringian forest goats. These animals are being raised mostly for their value in landscape conservation particularly of the small plant species that cannot usually compete for survival with the tall species of shrubs and trees. Efforts are also taken to "re-nature" areas previously devoted to brown coal mining into protection areas

## Oekodorf Brodowin

The Ecological Village Brodowin is a 1,202 hectare agricultural area situated in the Biosphere Reserve Schorfheide-Chorin that showcases organic agriculture where on-farm research, marketing and ecological agriculture are key



components. The farm is devoted to (i) the cultivation of cereals, fodder, vegetables and meadow orchards; and (ii) livestock breeding and production mainly involving dairy cows and fattening pigs. The dairy production takes up the largest part of the farm.

The on-farm research activities in Brodowin are done in cooperation with various scientific organisations based in Germany and Switzerland. In general, these research activities aim to ensure that the farm meets the requirements of nature conservation while at the same time maintaining an acceptable level of economic effects on the farm business. Two such research projects were on (i) the effects of agricultural modes of production on birds, especially the skylarks, and on arthropods; and (ii) improving the udder health of dairy cows using homeopathic complex-agents in the treatment of udder diseases that are acceptable to organic farming principles.

*Eco-Basket Brodowin* is the marketing organization of the village and takes care of the door-to-door delivery to about 1000 customers in the Greater Berlin area of the farm's ecological products – vegetables, dairy and cheese products, eggs, meat, sausage and bread. Orders can also be placed on-line (via e-mail). Brodowin has a homepage (www.brodowin.de) that provides information not only on the assortment of the eco-basket products but also information on organic/ecological farming and the ecological village farms.

## Assessment of the Field Visits

The participants' impressions, and the similarities and the differences in agro-biodiversity management between the *Southern and Northern* countries were the focus of the assessment of the field visits.

### Impressions

Participants in general appreciated the educational aspects of the field visits and the exceptional reception provided to them by their hosts particularly the generous sharing of their ideas in clear

Source: GEH - A. Feldmann

Thuringian Forest Goat

Source: GEH - A. Feldmann

Bentheim Black Pied Pig

and concise terms. Participants also found the visits interesting for various reasons:

- Many ideas may be adapted in their respective countries e.g. the combination of eco-tourism and agro-ecological management;
- The educational function of such agro-ecological projects;
- The building of processes to combine ecological farming and natural conservation has gone a long way –nature conservation is even more difficult than organic farming.
- Farmers' motivation and commitment to conservation is crucial. In contrast to Brandenburg farmers, African farmers are not ready to sacrifice 10% of their yield for bird conservation
- The recognition of the multiple functions of genetic resources – particularly the importance of indigenous breeds in the light of development of modern biotechnology.
- Some were surprised to know that Europe has semi-arid regions.

## Similarities in Biodiversity Management in the South and the North

With the negative impact of conventional agriculture on the natural habitat, organic farming has become a global trend. It has reached a stage where in both the North and the South organic farming observes the same principles as nature conservation – including the conservation of endangered crops and animal species (e.g. through in situ conservation). Organic farmers in both the North and the South are often understood as providing "ecological services" to society.

Organic farmers, in whichever part of the globe, recognize that economic viability is a very critical element in the conservation of agro-biodiversity; this is a tall order considering that the shift from conventional to organic agriculture often means higher labour intensity and an initial decline in production. Not all farmers are willing to face such consequences, as their needs are immediate. Getting credits for organic farming is difficult in present society where

Source: GEH - A. Feldmann

German Black Pied Cattle

farming is often reduced to economics. However, society has to adjust to the fact that the benefits of organic farming are not always economic and not always immediate.

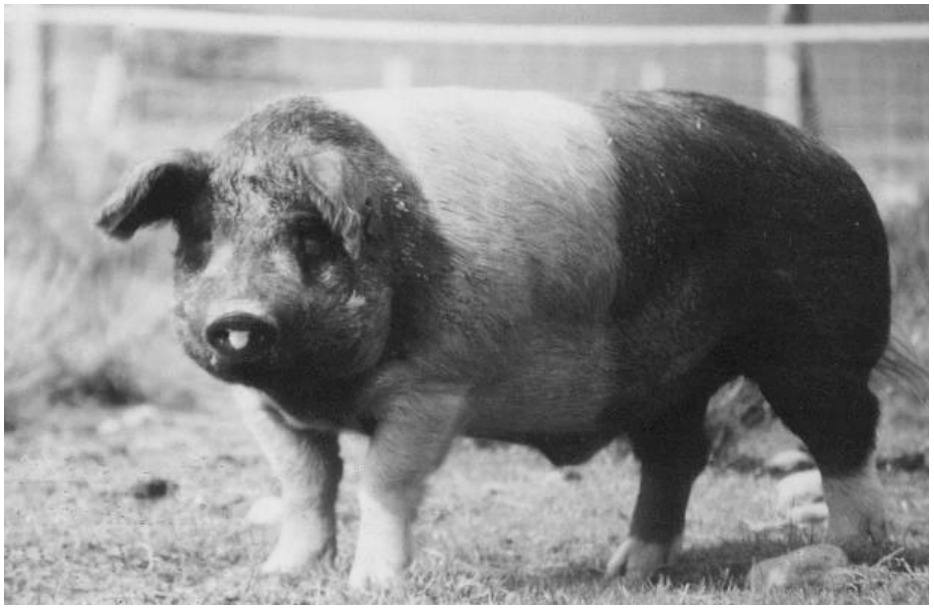
Fortunately, the global trend for organic farming and nature conservation is happening and this is because in both the North and the South, there are enthusiastic people who are into such activities. These are farmers who develop new farming systems, especially with the increasing trend for farmer-scientists partnerships where farmers themselves become researchers. The creation of such new types of farmers is a need in both North and South.

## North-South Differences in Agro-Biodiversity Management

One immediate and noticeable difference pointed out was that farmers in Europe could afford nature conservation for the sake of nature conservation – e.g. an emphasis on animal breeding for landscape conservation. Farmers in the South, however, cannot do the same unless food security and income issues are directly addressed in nature conservation activities – therefore, there is an emphasis on crops in biodiversity programmes in the South. This "affordability issue", of doing nature conservation for nature conservation's sake, can be traced to the higher income level of farmers in the North, and to more and better quality of government support. To cite a few cases:

- There are government subsidies in Europe while in some parts of Africa The World Bank's structural adjustment programmes ban such subsidies.
- In the South, there is no premium price for organically grown products (with a few exceptions in e.g. Zimbabwe, Brazil, Chile, Argentina, R.S.A.).
- Certification of organically grown products is hardly present in the South except for those certified by foreigners, like the German Naturland certifies organically grown sugar in the Philippines.

- Governments in developing countries tend to come out with blanket recommendations that run into conflict with biodiversity conservation programmes while there is a more diverse approach in Europe. With the lack of support of governments in the South to support their farmers, the discussion on agro-biodiversity in the South focused on farmers' organizations and NGOs. Some saw it as a political struggle – e.g. with respect to landholdings and agrarian reform. In the South, without land ownership, farmers would not invest to develop the land, a lost case for agro-biodiversity. In contrast, most farmers in the North would still invest in the land even if they do not own it.
- Organic farms in Germany are more mechanized than their counterparts in the South and farm sizes in the North are bigger and have more uniform designs. Their products are less diverse than products of Southern organic farms. In this sense, farmers in the North tend to view organic farming as equally progressive as conventional agriculture while their Southern counterparts look at it as backwards, as they can't afford "modern" inputs like chemicals and pesticides.
- In the North, the demand of consumers for organic products is an important motivating factor. In the South, organic farming is practiced in most cases out of the subsistence needs and the lack of resources.



Source: GEH - G. Schulze

Husum Pig

# Plenary Presentations

## Farmers' Experiences on Biodiversity Management

### Rice Breeding by Thai Farmers, presented by Suksan Kantree

The Alternative Agriculture Network (AAN) in Thailand was established in 1990 following the realization of the negative effects brought about by the Green Revolution. It is composed of about 100 peoples' organizations (POs) and non-government organizations (NGOs) comprising a total of 20,000 families. One of AAN's core members is the Khao Kwan Foundation that develops alternative technologies, in particular, rice breeding by farmers.

To stop the further loss of rice varieties in Thailand, Khao Kwan/AAN first engaged in rice varieties collection. In 1990, they came up with 3,000 varieties in their broad collection, which they placed in government gene banks and covered by a memorandum of agreement so that they can have access to the collection when needed. The criteria used for collecting these varieties were based on farmers' demands for seeds requiring low inputs, no chemical pesticides and have good cooking quality (and not necessarily high yields as striven at by government research stations).

By 1994, Khao Kwan participated in the breeding programs of rice research stations. They realized that conventional research stations couldn't produce the good quality seeds that would fulfil the requirements of the farmers and concluded that farmers themselves should do the breeding. At the same time, Khao Kwan/AAN learned about MASIPAG's work (a farmer organisation carrying out research) in the Philippines, training farmers in rice breeding techniques using inexpensive and readily available tools. Khao Kwan sent farmers and staff to MASIPAG for training and then started its own breeding programme with Thai farmers.

On the basis of that experience, Khao Kwan/AAN compared conventional with farmers' breeding programmes (see table) and concluded that the cost/benefit relation of farmers' breeding programmes is much better from the farmers' perspective.

#### Rice Biodiversity in Thailand

- There were at least 50,000 varieties of rice in Thailand in 1950.
- In 1990, there were only 5,000 – 6,000 varieties accounted for in the Thai national gene bank. Of these, only 15 varieties are cultivated by 90% of Thai farmers.
- The 1993-94 brown plant hopper outbreak in Thailand destroyed 50 % of the country's rice yields.
- 35-40% of rice produced by Thai farmers

### Genetic Resources and Subsistence in Ethiopia, by Eyasu Elias

SOS-Sahel is a British NGO with development projects in the dryland areas of sub-Saharan Africa. In Ethiopia, it works with subsistence farmers facing problems of land degradation and food security since the late 1980s. For these subsistence farmers, crop genetic diversity is critical to attaining house-

**TABLE 1: Comparison of the Conventional and the Farmer's Breeding Programmes**

| Activity/Issue | Conventional | Farmer's |
|---|---|---|
| Problem analysis | Scientists | NGOs and Farmers |
| Development of objectives | Funding agency/scientists | Farmers |
| Breeding process | | |
| ▪ Cross | Scientists | Farmers |
| ▪ Selection | Scientists | NGOs and Farmers |
| Place | Research Station | Farmer's field |
| Evaluation | Scientists | Farmers |
| Field Testing | Scientists and Farmers | - |
| Extension | Government Extensionists | Farmers |
| Cost | High | Very low |
| Who benefits? | Trans-national corporations/scientists | Farmers |
| Farmers' social development | Poor | Good |

hold level food security. Unfortunately, genetic erosion is now a serious threat to the existing genetic diversity in Ethiopia and therefore, to the country's food security as well. There are two major factors for the onset of this threat – modernization and drought.

To meet the needs of a growing population, governments have intervened to transform traditional agricultural systems. In the process, modern varieties of crops have been widely introduced along with the associated packages of fertilizers, pesticides and credit. In Wollaita, Southern Ethiopia, farmers refer to a 1970-1980 World Bank funded project as having brought fertilizer and hybrid seeds and famine to them. Before the project, these farmers used to plant drought resistant local varieties of maize and root crops such as *enset*, sweet potato, taro and yam.

The recurrent drought in the country further contributed to the genetic erosion. Crop failures made disappear local varieties that farmers have maintained through generations. Farmers were simply unable to retain seeds for future cropping. Relief operations in response to the famine further contributed to the displacement of these traditional varieties, as the food grain provisions (usually from the HYVs) became the only source of seeds for the farmers. These HYV grains used as seeds did not survive the harsh drought conditions.

The SOS-Sahel initiative was not primarily for agro-biodiversity conservation but rather, to address the farmers' needs for planting materials and seeds. Agro-biodiversity became part of the project because the suitable crop varieties retrieved, screened and multiplied by farmers themselves for distribution to other farmers mostly were traditional varieties. The project did not provide any reward to farmers for producing the traditional varieties as they themselves felt the need for those local varieties for

their subsistence. As an incentive, however, the project provided farm tools on credit and at subsidized prices, and engaged in integrated watershed management as an indirect support to the continued cultivation of local crops. To date, the project has brought back into production two local varieties of rice, five varieties of maize and four sweet potato varieties.

## Regional Partnerships and Capacity Building in Genetic Resources Conservation and Development, by Ditdit Pelegrina

The Southeast Asia Regional Institute for Community Education (SEARICE) has been into plant genetic resources conservation and development since 1989 – particularly in Thailand, Malaysia, Philippines and Vietnam. SEARICE is also covering the Lao People's Democratic Republic and Bhutan under its new project – the Biodiversity Use and Conservation Asia Program (BUCAP).

BUCAP has the following objectives:

- Strengthen the farmers' role and participation in plant genetic resources (PGR) research.
- Improve and increase agrobiodiversity.
- Strengthen/build capacity of local organizations in PGR
- Experiment on and develop a new form of partnership between the grantee and the aid agency where the latter also takes an active role in policy advocacy.

BUCAP will be operating in three countries – Vietnam, Lao PDR and Bhutan. Part of the criteria used for selecting these countries were (i) the ecosystem type and state of the agricultural economy in relation to the challenge they pose to PGR conservation vis-à-vis the farmers' needs and (ii) the existence of suitable partner organisations. Vietnam was selected for its intensive irrigated rice system where (i) genetic erosion is pronounced and (ii) formal science dominates the development of genetic resources; therefore, the need to strengthen farmers' role in plant breeding is very high. BUCAP will work with the Plant Protection Department. The National Integrated Pest Management Programme, the FAO-IPM Programme and International Cooperation for Development and Solidarity (CIDSE)-Vietnam are providing the technical support and financial oversight.

The choice of Lao PDR is because it is a country in transition – from subsistence economy to intensive agriculture. The challenge here is to stop genetic erosion and to maintain farmer science as the country goes into intensive agriculture. BUCAP will be implemented with the participation of the National IPM Programme of the Agriculture and Extension Agency, the National Agricultural Research Centre and selected secondary agricultural schools. The country partner is Oxfam-Solidarity (Belgium).

**Some Comments from the Plenary**

- Though difficult, there is a need to convince government officials in this effort (in response to the bias of BUCAP/SEARICE in working with NGOs/People's Organisations).
- Where is the CGIAR in this effort of BUCAP?

Bhutan is still into subsistence agriculture but its high altitude have played defining roles in the conservation and development of the country's genetic resources. The challenge here is to make the system productive while maintaining the role of farmers in crop development and conservation. The lo-

cal partner is the National Agro-biodiversity Programme and the Renewable Natural Resources Research Centre.

Since BUCAP is just starting, it is at the stage of developing specific programmes of action through a multi-stakeholder approach with the local partners and the other local players. There is admittedly a bias in working with NGOs and People's Organisations on the part of SEARICE, which makes the case of Bhutan more interesting because it is the first time SEARICE will implement a project with the government as main partner.

## Making the Case for Increased Attention to Animal Genetic Resources, by Hantwant Singh and Ilse Koehler-Rollefson

Most of the discussions on genetic resources conservation and development are often taken in the context of plant genetic resources (PGR) with only minor references to animal genetic resources (AnGR). In this Workshop, two presentations ensured that discussions on genetic resources conservation and development distinguish between plant and animal genetic resources and looked at specific features of animal genetic resources. The first presentation by Hantwant Singh Rathore of Lokhit Pashu-Palak Sansthan focused on the experiences in India on indigenous systems for managing livestock genetic diversity emanating from religious/cultural and socio-economic practices and beliefs. The second presentation by Ilse Koehler-Rollefson, League for Pastoral People proposed strategies for conserving domestic animal diversity in the South that are consistent with the UN Convention on Biological Diversity (CBD).

Suggestions made in line with the conservation of domestic animal diversity were to:

### Examples of Indigenous AnGR Management Practices in Rajasthan, India

- The *Raikas* (considered the most "socially backward" caste in India) keep oral records of genealogies, tracing the ancestry of their camel herds in female lines.
- If a person owns a good-quality male camel, that person is obliged to make it accessible to anyone who needs it for mating with female camels.
- There are "cow sanctuaries" called *gaushalas*. These are usually initiated by wealthy or religious people but co-funded by donations from the common people. In the *gaushalas*, people feed and take care of cattle that are no longer wanted by its owners because of old age, sickness, lack of productivity or because the owners cannot afford to maintain their animals esp. during drought. In these sanctuaries, there are also attempts to conserve and improve local breeds.
- The *amr-bakra* is a religious act where some goat raisers devote male goats to God by attaching a small ring in one of the goat's ears. This goat is then set free in the village and can be used by others for breeding. Everybody will feed this animal and nobody will dare to harm it.
- The *oran* is a piece of land belonging to a temple and protected by a local deity. In *orans* the cutting of trees and grass is prohibited but they are opened up for livestock

- Collect information on the local/indigenous institutions, breeding practices and cultures of peoples who nurtured and shaped so many hardy livestock breeds.
- Decentralize activities to involve stock raisers as lead actors in on-the-

ground conservation efforts (i.e. pastoralists as guardians of AnGR).

- Ensure that the specific ethnic groups and societies receive benefit from sharing the unique genetic resources they have conserved and developed.
- Take a more comprehensive livelihood approach towards conservation by instituting policies and programmes that secure access to pasture and animal health care and create a level playing field for the marketing of products of local breeds.
- Inform pastoralists and breeders organizations about the rights they have in countries that are signatories to the CBD; build capacities of NGOs and intermediary organizations for this purpose.

Both presentations also focused on the status of the endangered livestock/ local breeds, the plight of pastoralists, indigenous knowledge systems and practices and their critical roles in conserving domestic livestock diversity – therefore the need to recognize stock raisers' rights in the same degree that farmers' rights are being given attention. The issue of bio-piracy in AnGR and a further emphasis on habitat development/pastoral survival that would ensure the survival of the breeds need more attention, it was pointed out.

### Factors Responsible for AnGR Erosion

- Replacement/cross-breeding with exotic breeds
- Alienation of common property resources (breakdown of traditional management institutions, irrigation projects, wildlife protection, tourism, etc.)
- Political conflicts, land disputes and wars
- Natural disasters (droughts, floods, cyclones)
- Technological advances and neglect of traditional technologies (replacement of draft animals by machines)
- Integration into the global economy; unfavorable marketing environments for local livestock breeds

## Implications of Biotechnology and Patenting to Agro-Biodiversity Management

### Vitamin A Enriched Genetically Modified Rice, by Charito Medina

Vitamin A deficiency is a serious problem affecting around three million people, mostly the poor in the developing countries. As such, this should not be treated as a simple vitamin A deficiency problem but rather, as part of a more complex nutrition problem that is linked to poverty. While it may be true that the genetically modified (GM) rice would respond to the vitamin A needs of the growing urban poor populations, there is a need to critically examine other issues and concerns not only related to GM rice but to genetically modified organisms (GMOs) in general. Some of these include the following:

- GM rice is only a stopgap measure. It not only undermines biodiversity but could also lead to a trend for "isolated solutions to other nutrition problems" e.g. that there will soon be an iron-enriched GM rice to address iron deficiency.
- Health safety issues. Through the GM rice, vitamin A could be made "too abundant" in relation to the other

micronutrients in the body. The interaction of an increased proportion of vitamin A with the other micronutrients is not yet established – the interaction could have negative or positive health effects. More research is needed on the health issues.

- Intellectual property rights (IPR). The contention here is that living organisms must not be patented because this will result in the poorer sectors of society not having access to them. Many patents are involved in vitamin A rice development and it is expected that the cost will be much higher than for varieties, which do not include patented material. Information on the patents involved is being gathered. Proponents of the GM rice say that the owners of the patents will not collect royalties from developing countries but only from developed countries. Whether this is a "public relations gimmick " or not remains to be seen.
- The main motivating factor for "Golden Rice" is the health food market in industrialized countries, but the proponents always argue with possible benefits for developing countries. Vitamin A rice adds to the industrial public relation efforts of GMOs image to be life saving in developing countries while the Northern consumers can afford to reject them. In contrary, developing countries cannot afford the high risk GMOs pose to their food security.
- Ecological effects. Not only will GM rice further contribute to the genetic erosion of rice, varieties as experienced with the HYVs in the past, but also to "genetic pollution" i.e. the genetic integrity of the species involved is destroyed in the process.

**TABLE 2: Some of the Patents involved in Vitamin A Rice**

| Process | Patent Number | Patent Owner |
|---|---|---|
| Agrobacterium transformation | WO8603776 | Plant Genetic Systems (Aventis) |
| *Erwinia uredovora* phytoene desturase gene | EPO393690 | Kirin Brewery |
| Use of constructs comprising a carotenoid biosynthesis gene | WO9806862 | Calgene (Monsanto) |
| Endosperm-specific glutelin (Gt1) promoter of the daffodil gene | J6391085 | Norinsho |
| CaMV promoter of the *E. uredovora* gene | US5106739 | Calgene (Monsanto) |
| AphIV marker gene | US5668298 | Eli Lily |
| Daffodil PSY and LYC genes | Patent pending | University of Freiburg (Peter Burkhardt) |

Food security of future generations is at stake.

Instead of GM rice, the proposed solutions to vitamin A deficiency were as follow:

- Nutrition education, should continue to emphasise dietary quality and diversity, nutrition and health, including micro-nutrient malnutrition
- Awareness and utilization of inexpensive natural resources of vitamin A particularly green leafy vegetables, which are diverse, abundant, easy to grow, and low cost, thereby promoting biodiversity as well.
- Directly addressing poverty alleviation so that people can improve their access to natural sources of vitamin A among many other benefits which Vitamin A rice would not be able to provide.

The same sets of solutions apply to the urban poor population. Urban consumers who ridicule the eating of "greens " (leaves) because fast foods are in fashion in this age of modernization and globalisation need to be re-educated. With respect to providing the urban poor better access to the vitamin A-rich vegetables, the concept of urban gardening needs to be promoted more intensely. Cultural identity is linked to such local foods, as well as urban community development, income generation, and empowerment of women.

UN agencies like FAO, WHO and UNICEF have ample experience. They promote such approaches because they cover all nutrition deficiencies; they are sustainable, and therefore cost-effective.

## IPR, Farmers' Rights and Agro-biodiversity

Gene Campaign and BIOTHAI provided the initial workshop inputs on this controversy-filled topic of intellectual property rights (IPR) based on the experiences of their own countries, India and Thailand, respectively. They described the implications for agro-biodiversity conservation of existing international agreements that largely define in trade and economic terms the current manner and systems by which the rights of breeders, farmers and communities have to be dealt with. These agreements include:

- The Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) that allows the patenting of microbiological processes and products, and plant varieties. It also foresees the adoption of a *sui generis* system where each signatory country is given the flexibility to generate a system of protection (legislation) on its own, albeit limited by the UPOV that regulates the patenting of plants. TRIPS was introduced into the GATT/WTO in 1986, reflecting the growing importance of gene technology and the fact that industrialized nations have the technology but not necessarily the bio-resources. The Cairns Group of some industrialized countries is pressuring against the sui generis clause.
- The 1978 (amended in 1991) Convention of the International Union for the Protection of New Varieties of Plants (UPOV). The UPOV is seen as an inappropriate platform for developing countries for the protection of plant varieties because countries with largely industrial, not agricultural economies formulated it. Its primary goal is protecting the interests of seed companies who dominate the world markets. Further, the UPOV does not recognize the rights and contribution of farmers and local communities in the protection and development of plant varieties. This puts farmers and communities at risk

of losing control over the genetic resources around which their farming/ agricultural, socio-cultural and knowledge systems revolve – e.g. the right to save, exchange and develop seeds.

- The Convention on Biological Diversity (CBD) which was initially signed by 150 countries in 1992 during the United Nations Conference on Environment and Development and then came into effect in December 1993. The CBD, unlike the other treaties, takes a comprehensive (not sectoral) approach to the conservation and sustainable use of biological resources – including the equitable sharing of the burden and the benefits between (a) developed and developing countries and (b) indigenous/local communities and the users in the modern sector. As the TRIPS agreement is now under review developing countries should, especially after the failure of the WTO negotiations in Seattle, Washington in 1999, lobby for the return of the flexibility of the *sui generis* system and insist on linking the TRIPS to the CBD.

The two presenters also shared how their respective organizations and governments are dealing with these agreements. This included, more importantly, how they have made deviations and are now lobbying for changes in the agreements for the protection of their own genetic resources and the rights of their constituents and communities. In both India and Thailand, legislation drafts are currently under review for the protection of plant varieties that take into consideration the rights of farmers and communities. These are the Plant Variety and Farmers' Protection Act in India and the Plant Variety Protection Bill in Thailand. Both drafts are against patenting. They support farmer practices to save, exchange and develop seeds, farmers being the major seed producers, both in terms of quantity and quality. Their right to sell seeds must be maintained. This is also a reason why the Terminator technology is banned in India.

In Africa, Zimbabwe was the first country to develop a sui generis system, which then was adopted as a model by the Organisation of African Unity (OAU).

The Gene Campaign of India in 1998 convened a forum for implementing farmers and breeders' rights in developing countries – the Convention of Farmers and Breeders (CoFaB), as an alternative to UPOV. Gene Campaign invites all developing countries into this forum.

In Thailand, efforts were made to overcome a lack of participation prevalent in other countries: the TRIPS agreement, the Biosafety issues and the national policy on GMOs were negotiated in commissions of several ministries and representatives of many relevant stakeholders. BIOTHAI's instruments are to provide wide access to information, farmer demonstrations, NGO campaigns, and participation in the negotiation of national policies.

The participants were reminded that all discussions and achievements on IPRs are in vein if trade control techniques like the Terminator, or certain satellite technologies, are applied.

> The 1999 UNDP Human Development Report has commended the Gene Campaign's Convention of Farmers and Breeders (CoFaB) as an alternative to UPOV. It describes CoFaB as a "strong and coordinated international proposal [which] offers developing countries an alternative to following European legislation by focusing on needs to protect farmers' rights to save and reuse seed and to fulfill the food and nutritional security goals of their people."

# Working Group Results and Recommendations

The Workshop had two sets of working group discussions each with three discussion topics – for a total of six working group outputs. The first set focused on the examination of incentives, relationships and cooperation with regards to enhancing agro-biodiversity conservation and development. The second set puts emphasis on the implications for agricultural research.

The key topics for the first set of working group discussions were the following:

- Incentives for farmers to enhance agro-biodiversity – to protect and valorise varieties/breeds developed by farmers and farmers' knowledge;
- Formal, informal, private cooperation to foster agro-biodiversity; and
- Incentives and reasons and institutional cooperation for farmers'/ stock keepers' animal genetic resource management.

Workshop participants selected the topic/group they would like to join. In discussing above topics, each member of the working groups first rated their individual experiences (as very good, good or bad) with respect to the topic assigned to them and then shared the reasons why it was so. The groups then analysed the experiences. The second round of group discussions focused on intellectual property rights, biotechnology and bio-piracy. Again, participants chose their own topic and discussed their implications for biodiversity management as well as for agricultural research. Each group then formulated recommendations.

The meta-card (one-idea-per-card) technique was used in most of the group discussions. The highlights of these discussions and the recommendations that came out of the working groups are presented in the following subsections of this report. Annex 2 provides details of the outputs of each group based on the ideas presented in the cards.

## Working Group 1:

***Incentives for Farmers to enhance agro-biodiversity – to protect and valorise varieties developed by farmers and farmers' knowledge***

### Rating of the Experiences

The experiences of the members of this working group on engaging farmers on biodiversity and related activities have ranged from a rating of "good" to "very good" with no reported bad experiences. The high ratings can be attributed to the following:

- The activities addressed farmers' needs– i.e. access to/control over seeds; improvement of traditional varieties; good yields without use of chemicals; improved food security; incomes, marketing possibilities and lower production costs providing some autonomy.
- Seeing a significant number of farmer adapters is a great source

of encouragement.
- Farmers developed the capacities and interests for engaging in actual breeding and extension activities
- Good partnership relationships between farmers, scientists and NGOs
- High awareness and concern of farmers with regard to GMOs.

The group also identified the following "clusters" of **favourable conditions** towards greater farmer interest in biodiversity conservation and management:

- Security of land tenure encourages the farmer to further invest in it leading to biodiversity conservation and management.
- Strong partnerships between and among the farmers, scientists and NGOs characterized by good access to genetic resources, technical support and use of participatory processes and methodologies.
- Availability of financial resources for participatory process-oriented biodiversity projects/activities.
- Market development and market access that comprise market niches for traditional varieties, infrastructure development and equipment complementing biodiversity activities.
- Sharing of success stories on biodiversity initiatives to encourage others to go into similar activities.

On the conditions that would have negative effects (**constraining factors**) on biodiversity conservation and management by farmers, the following were noted:

- The market factor, particularly consumer attitudes – i.e. preference for introduced or "improved" varieties or products.
- Policies that are biased against traditional varieties. In particular, government's export-orientation that leads to agricultural policies favouring production of HYVs such that extension, research and credit facilities revolve around the high-input HYVs. Also, seed policies based on UPOV'91 limits the use and exchange of traditional varieties.
- Lobbying by seed companies that put further pressure on government to enforce policies favouring HYVs/improved varieties. This contributes to the loss of genetic materials or the farmers' lack of access to these genetic materials in the quantity and quality desired.
- Research is mostly geared to HYV's and high yields.
- Lack of access to land or insecurity in land tenure discourages farmers to further invest in land development and therefore they neglect biodiversity.

## Working Group 2:

### *Formal, informal, and private sector cooperation to foster agro-biodiversity*

The formal sector in this group discussion referred to the public sector; the informal sector to the NGOs, Small Farmer Organisations, etc; and the private sector as the for-profit organizations/companies.

There were very little experiences with the private sector in the group; its discussions focused on the formal and informal sectors.

### Experiences with the Formal Sector

Experiences with the formal sector mostly got "bad" ratings although there

were some that were rated as "good" experiences.

The bad experiences were because of indifference and unresponsiveness of the formal sector, ignorance of the formal sector about the informal sector, visible mistrust between formal and informal sectors, and no proper mechanisms for partnership.

The positive experience relates to the public sector being able to develop national and regional programs.

## Experiences with the Informal Sector

Experiences with the informal sector generally got "good" ratings although there were a few "bad" ratings.

The good experiences related to: flexibility and use of participatory methods in genetic resources and breeding work; visible impact of work as seen in the establishment of community gene banks; open sharing of information and exchange of experiences; dynamic approach to education and training with farmers; revitalization of local/indigenous knowledge; intensive cooperation between NGOs, SFOs, etc. due to common interest in agro-biodiversity; and access to local/foreign expertise and funds from international NGOs from the West.

The bad ratings were with respect to individualistic attitudes e.g. among plant breeders resulting in a lack of cooperation, as well as "Bureaucrazy" in some NGOs.

## Recommendations

The recommendations formulated are based on the CGIAR system's goals of poverty alleviation, food security and environmental sustainability. Specifically, the recommendations focused on the research agenda, access to CGIAR resources, and institutional transformation and governance.

The Research Agenda should:

- Focus on "traditional" crops.
- Focus on crops needed rather by small farmers than by commercial agriculture.
- Consult with farming communities to identify their needs.
- Further develop participatory methods and disseminate them through national and international research systems.
- Integrate the research agenda with respect to biodiversity and into the wider development agenda.
- Delete the GMOs from its approach to environmental sustainability.

Resource Access and Partnerships

- There should be no research partnership with the CGIAR if it pursues the patenting policy.
- There should be no research collaboration with the public sector without proper evaluation and disclosure of the impact of the research. The cooperation agreement should be made transparent and monitored.
- Specific policies should be in place for contractual relationships and these should be monitored.

Institutional Transformation and Governance, incl. Access to Germplasm

- CGIAR governance should be made more representative – with more participation from the South and with greater gender representation.
- The CGIAR should, in its policy on access to germplasm collection, safeguard the rights and interests of the South and the small farmers.

## Working Group 3:

***Incentives for and Institutional Cooperation on Farmers'/Stock Keepers' Animal Genetic Resource Management***

### Incentives for engaging in Animal Genetic Resources conservation and management:

The group has identified four categories of incentives for stock keepers to be engaged in animal genetic resource management. These are (i) ecological, (ii) animal qualities, (iii) socio-cultural, and (iv) economic.

Regarding ecological aspects, stock keepers engage in animal genetic resources management activities because they contribute to the sustainability of pasturelands. Grazing is in some places the only possible land use strategy. Small species may be favoured in hilly areas since they cause less erosion. Specific browsing habits are associated with certain animal species. Some are better adapted to the conditions in wildlife conservation areas.

On animal qualities, stock keepers are encouraged to engage in AnGR management of local/indigenous species because of their adaptability to the local environment, their robustness, resistance to disease, as well as their low feed and water requirements.

With respect to the socio-cultural aspects, the incentives for keeping local AnGR (other than for the important but often neglected aesthetical and sentimental reasons) include the social and cultural importance attached to these animals being part of the communities indigenous knowledge systems and the added social status that comes with preserving these stocks.

Regarding economic incentives, a major reason for farmers/stock keepers to go into AnGR conservation and management is because the animals serve multiple purposes –power for ploughing and pulling carts), milk and meat production and the use of their dung for manure. Moreover, animals often serve as a form of a "bank" or investment and in some cases rare breeds are used for tourism purposes. Prices are often good for traditional breeds.

### Challenges in AnGR management

The problems and challenges that have to be faced in AnGR management include:

- The low status accorded to pastoralism especially because agricultural policies favour "improved" breeds and cash crops; pastoralists often suffer from a bad environmental reputation.
- The productivity paradigm: Traditional breeds are often low milk producers; however, this view of productivity is narrow, as rare breeds have many other economically relevant qualities (see under "incentives")
- Very little information about the stock keepers and their activities is available; they live in complex systems, which are not readily quantifiable.
- The absence of institutional cooperation and markets for traditional breeds;
- Lack of awareness of bio-piracy of AnGR; and
- Environmental degradation resulting to a lack of pastureland.

### Recommendations

More awareness is needed on the contribution of pastoralists to Animal Genetic Resources Management. An information system is needed that links pastoralists and organizations.

Pastoralists should be involved in policy decisions, so that agricultural policies are made in favour of pastoralists. For example, subsidies for "improved" breeds should be withdrawn, and pastoralists involved in land use planning.

Markets for traditional breed products (e.g. camel milk) should be developed; Industry sponsoring could be looked for.

Selection criteria should include Animal Genetic Resources conservation aspects.

The productivity paradigm should be revised. More research on rare breed qualities is needed.

National laws should be screened whether they support or suppress animal biodiversity. Informal law should be documented and respected. Also, awareness of bio-piracy should be increased and bio-piracy of Animal Genetic Resources monitored.

Not more organizations are needed, but more cooperation between them is needed. Common objectives are an essential precondition for their cooperation. Especially, multilateral and international organizations should cooperate on Animal Genetic Resources Management.

A lot can be learned from the development of Plant Genetic Resources (PGR) management over the last decade. Therefore, more interaction between Animal Genetic Resources (AnGR) and Plant GR organizations is needed.

## Working Group 4:

***IPR and Agricultural Research***

### A Case Against Patenting

The discussions of the Working Group on IPR showed the inter-relatedness of IPR, GMOs and bio-piracy in agricultural research in that these favour the transnational companies rather than the farmers/stock keepers and the agenda of poverty alleviation and food security. The group sees IPR as a threat to biodiversity because it would curtail the exchange and saving of germplasm that is a common practice among farmers/stock keepers. There is recognition of the need to stop bio-piracy and ensure that germplasm exchanges and "bio-prospecting" work in the interest of the public good. However, the proposed solution that is the patenting of genetic resources/life forms as a safeguard from bio-piracy is contrary to the rights of farmers/stock keepers. By patenting genetic resources like seeds, farmers are more likely to lose their freedom to save, exchange and develop seeds, which is essential to food security of farming communities. This becomes more worrisome because the position of the CGIAR and its member international research centres on patents is not clear – that is, there is little accountability and transparency in the CGIAR on its IPR policy. The IPR Working Group reached the following conclusions:

- That patents are threats to biodiversity and are disincentives to agricultural research.
- That GMOs are not the answer to food security problems of the poor, as these do not necessarily increase productivity and poor people's access to food.
- That even the *sui generis* rights as applied to plant variety protection (PVP) will hardly foster seed ex-

change because of attempts to delete such clauses from the TRIPS agreement.

### Recommendations

The group recommends to agricultural research the following:

- That agricultural research should take positions in favour of the farmers and stock keepers in order to protect their rights e.g. to save and exchange seeds and animal genetic resources.
- Patents should not apply to life forms.
- The CGIAR should not engage in patenting, not even in defensive patenting. Other steps should be sought to show evidence of prior art.
- The TRIPS agreement should be reconciled with the CBD (Convention on Biodiversity) – including the expansion of "geographical indication" (i.e. the community from which a genetic resource originates has a right to that genetic resource) to cover agricultural products.
- That agricultural research organizations take action against bio-piracy.

## Working Group 5:

***Biotechnology***

The Working Group focused its discussions on the implications of GMOs for the rural areas and farming communities. Likewise, the group looked at agricultural research as supposedly contributing to poverty alleviation. That is, agricultural research must work for the good of poor rural communities and not to unnecessarily put them at risk. GMOs, however, are high-risk technologies, and therefore:

- Should CGIAR research on GMOs adhere to the highest possible standard of safety; and
- Should the CGIAR focus its gene technology research on assessment of both risk and need – socio-economic impact should be assessed prior to going into research on the technology itself.

### Recommendations

The working group takes the position that laboratory research on biotechnology may be acceptable **provided** that the following demands are met:

- That the biotechnology research budget will be re-oriented to biosafety and significantly increase research on safety issues.
- That a comprehensive safety framework is developed and comprehensive socio-economic impact assessments made.
- That the CGIAR plays an important role in establishing appropriate scientific protocols for the assessment of biotechnology standards, and in strengthening the inadequate and incomplete Montreal protocol.
- That there is significant public participation in the discussion of risks and in the monitoring of biotechnology activities.

## Working Group 6:

***Bio-piracy***

### Understanding Bio-piracy and its Impact

The group noted that traditionally the free exchange of genetic resources is allowed as long as they are used for the "public good". This is usually the type of exchange that happens at the community level when farmers trade or

share seeds with each other. In its earlier definition therefore*, when the exchange of germplasm ceases to be for the public good bio-piracy is committed*. However, now that genetic resources have become an important "economic" resource that is patented and privatised, bio-piracy has come to mean the unauthorized use of genetic resources without prior informed consent (PIC) and material transfer agreement (MTA).

Bio-piracy is more clearly indicated in plant genetic resources (PGR) than in animal genetic resources (AnGR). Nevertheless, there are reported cases of bio-piracy in AnGR e.g. of the Ongole cattle being taken from India for breeding programs without proper compensation. Another case involves the crossing of cattle from Asia with German breeds. Although this experimentation has failed, it could have genetically polluted the native breed. It was noted, that there are cases where traditional "bio-piracy" helped to enrich bio-diversity – for example the "cattle raids" in Kenya. However, such traditional bio-piracy does not involve patenting.

The greatest impact of bio-piracy is its effects on the rights of farmers and communities – on the economy and on the further utilization of indigenous knowledge (IK). Classic examples of the negative economic effects of bio-piracy are the patenting in the US of the Pakistani *Basmati* that resulted to export market losses and consequently, the loss of income for the farmers. Royalties to the US patent holder are due if Indian or Pakistani Basmati rice is imported in the US.

In terms of the effect of bio-piracy on Indigenous Knowledge, an example is the US patent on turmeric as a wound-healing agent. India successfully challenged this patent by showing "evidence of prior art" that the product was not a novelty. Bio-piracy implies piracy of knowledge and its two potential negative impacts on IK are as follow:

- The possible economic benefits of sales in those countries were patents are granted shift from the community who conserves and owns the knowledge to the patent holders, mostly companies. Bio-piracy denies the credit that should go to Indigenous Knowledge.

## Recommendations

To control bio-piracy, the working group suggested the following strategies at the international, national and local levels.

### At the international level:

The acceptance of and compliance with the Convention on Biodiversity (CBD) particularly regarding the prior informed consent (PIC) and material transfer agreements (MTA) in order to ensure that communities share the benefits of the germplasm transfer.

### At the national level:

There is a need to establish and enforce legislation that looks into the problems of bio-piracy and solves them. This could be a legislation that treats "oral knowledge" at par with published documentation as evidence to show "prior art" in challenging patents made, for example, on IK.

Related issues/recommendations:

- How does one prove "oral knowledge to be documented knowledge"?
  An example to look into is Canada where oral evidence ingrained in tradition (e.g. through songs and dances) is taken seriously in courts. Although a long and painful process of proving prior art, it means that there is room for "customary

laws" being acceptable evidence of prior art without necessarily coming up with written documentation.

- National laws cover patents (not international laws), which makes it difficult to challenge patents granted in another country. There is need to integrate into the TRIPS agreement an international context of bio-piracy.
- Bio-piracy should be treated as a criminal offence and with stiff penalties. The problem is that many of the bio-piracy activities are carried out through the scientific research networks – there is a need for guidelines to avoid bio-piracy through scientific cooperation.
- Forgeries of written documentation have to be watched out for in establishing prior art.

**At the local level:**

Awareness-building activities and sustained vigilance at the level of communities, local officials and local NGOs are simple but effective local actions for stopping bio-piracy. For example, simply making people understand that the taking out of materials by tourists may constitute bio-piracy is already one important step toward minimizing bio-piracy.

# Closing Remarks

This section provides the highlights of the closing remarks delivered by Pat Mooney of the Rural Advancement Foundation International (RAFI). In his remarks, Pat prepared participants for the following workshop[2] where NGOs and small farmers' organizations elaborate positions for the Global Forum on Agricultural Research in Dresden. Pat described that forthcoming GFAR meeting as the coming together of four different actors with no clear purpose or agenda. These different actors, however, recognize the need to come together to sort things out – to show some signs of collective purpose or dialogue to put direction to global agricultural research Pat then went further to describe in his own terms the state of mind of these different actors.

The four actors referred to are the public institutions, the private sector, the donor governments and civil society organizations. The public institutions come as a highly confused, emotionally distraught, economically damaged groups of people with no clear sense of where they want to go. The private sector is coming to the GFAR meeting because they were told to do so. They have very little interest in public research i.e. they do not really care about public research. The donor governments come to the meeting to assess if international public research continues to be viable - otherwise, to just put their money elsewhere. Since the 1980ies, there has been a notable drop in public research funding and this trend will not be reversed unless the Dresden meeting convinces governments why they need to continue to support public agricultural research. Civil society, unlike the three other actors, is the only group coming to the GFAR meeting with a clear sense of identity and of what they want to achieve i.e. to put the small farmers in the centre of agricultural research.

For now, the name of the game in international agricultural research is biotechnology. There is great fascination among the CGIAR researchers with genetic engineering and it would be difficult for them, being scientists, to move away from it unless they are continually challenged – as is now being done by civil society organizations. This is a tall order for civil society because the CGIAR puts insignificant attention to bio-piracy and violations on the rights of farming communities in the pursuit of biotechnology – arguing that such incidents are only isolated and negligible cases in comparison to the benefits that would be derived. For example, the CGIAR does not talk much about bio-piracy; from its publications one could conclude that it is happening only in Australia and not in the entire world. Further, with respect to IPR violations committed against developing nations, not once in the history of the CGIAR has it fought in the courts for the "good of public interest" and will not be about to do it now.

Civil society would have to transform GFAR into a genuine negotiating venue; a genuine dialogue on political and agricultural issues confronting agricul-

[2] German NGO Forum on Environment & Development: FOOD FOR ALL – Farmers First in Research. International Workshop of Non-Government and Small Farmer Organisations on Research for Poverty Alleviation. Dresden, Germany, 19-20 May 2000, report available at: http://www.GFAR2000-NGOactivities.de

tural research. It is not just a matter of screaming out the issues but of tactfully but sharply conveying the messages. A critical discussion point for civil society therefore is to determine if the GFAR is something for it to pursue or to just let it die by itself. This may also depend on how seriously the private sector takes the GFAR. Many governments seem to believe that the real world is identical with the corporations, so that they sometimes set priorities for agricultural research as if the private sector has dictated them. Few corporations participate in such discussions. But to the extent that the private sector takes the GFAR seriously, the question to ask is: Would civil society be prepared to collaborate work with private corporations?

The IPR issue makes the situation painfully sharp. Public research organisations should not engage in patenting, and there are many reasons for it. One is the "Don Quichote reason": There is no way to fight for the public interest by winning patents. Pat concluded with a story about Daniel Webster and the devil:

A farmer who is about to lose his land gives up his soul to the devil in return for his land. He then goes to the lawyer Daniel Webster to fight to get back his soul. The lawyer wins back the farmer's soul, but the legal fees are such that the farmer loses his land.

# Annex 1
# Selected Presentations

# Experiences of SOS-Sahel in On-Farm Management of Genetic Resources in Ethiopia

*By Eyasu Elias*

## Introduction and Background

### SOS-Sahel and its Programme of Work

SOS-Sahel is a British NGO carrying out a programme of site-specific projects in dryland areas of sub-Saharan Africa. It supports community actions and initiatives that focus on the management and conservation of natural resources and increasing food production by subsistence farmers. SOS-Sahel has been working in Africa since 1985 and currently operates in Sudan, Mali, Kenya Eritrea and Ethiopia.

In Ethiopia, SOS-Sahel works with subsistence farmers in areas that face problems of land degradation and declining food security since 1989. Currently there are two integrated rural development projects that are implemented by the organization in areas that face severe environmental degradation and food insecurity. These are the Koisha Rural Development Project in the enset/root crop-based system of Wollaita (southern Ethiopia) and the Meket Development Project in low potential cereal system of northern Ethiopia. The primary focus of SOS-Sahel's development programmes is to assist rural communities in finding sustainable ways to improve their livelihoods. The major sectoral focus of intervention for SOS-Sahel is the development of natural resource management (soils, forestry and rangelands) as a primary means to tackle food insecurity. Recently, SOS-Sahel also begun to launch a collaborative action programme of forest management and conservation in the semi-arid rangelands of Borena plateau in southern Ethiopia (see below).

### Ethiopia in Brief

Agriculture has always remained to be the corner stone of the Ethiopian economy. Numerous studies indicate that Ethiopia is endowed with various natural resources among which 60% of the total landmass is potentially arable. However, despite the nation's rich resources agricultural production has not kept pace with the food needs of its fast growing human population. Rural poverty, famine and food insecurity are therefore, major policy concerns at national level. The underlying causes for the disappointing performance of the agricultural sector include highly variable climatic condition, low level of agricultural technology, land degradation due to deforestation and erosion among other factors.

Owing to the diverse agro-climatic and terrain conditions Ethiopia possesses one of the largest and most diverse genetic resources in the world (Abebe, 2000; Regassa, 1996). The unique topographical features and climatic variations have made the country home to numerous wild life and plant species. According to available data 247 mammal, 845 bird, 178 reptile and 54 animal species are identified within the country some of which are endemic to Ethiopia. Crop plants such as coffee, teff, and many root crops are known to have originated in Ethiopia. Even crops that were originally domesticated elsewhere exhibit immense variation in a number of adaptive traits (Abebe 1999).

## Agro-biodiversity as a Means for Food Security for Subsistence Farmers

In agriculture, genetic diversity in crops is critical for promoting stabilized production and for minimizing risks arising due to unpredictable environmental changes. Traditional farmers of low input agriculture have long favoured diversity on their farms because it balances yield variations through the maintenance of wide range of diversity within and among crops. That is to say, failure of a particular crop or variety is always compensated for by yield of other crops or varieties as a source of food or income. For this reason, subsistence farmers follow complex and diverse cropping patterns, which involve a huge mixture of cereals, root crops, vegetables, and legumes (pulses). In many parts of Ethiopia, farmers plant mixtures of cereals and root crops, fruits and vegetables, wheat and barley, etc. This type of multiple cropping on the small farms accounts for the bulk of food production in Ethiopia. The genetic potential of crop varieties in resisting stress, pests and diseases as well as qualities such as palatability and storability are well defined by farming communities.

Traditional varieties are locally adapted and therefore, of greater value to farmers than modern varieties. Mixtures of locally adapted traditional crops and varieties give farmers some insurance against pest and disease attack in a very variable environmental condition. They provide farmers with a range of outputs, and combined yields are often greater than mono-crops and erosion is reduced by a greater ground cover given by the mixture (Pretty, 1996). Especially in stress prone or marginal areas the landraces show greater potential, are more stable and provide more reliable source planting material (Tesfaye, 1996).

However, the broad range of genetic diversity existing in Ethiopia in general is presently subject to serious genetic erosion and irreversible losses. This threat of depletion of potentially useful genetic diversity is particularly serious in the SOS-Sahel project areas. The contributing factors for erosion of bio-diversity are many and diverse but the two major causes in crop diversity are discussed below.

## The Decline of Diversity under Modernisation of Agriculture

Modernization brought with it the steady decline of biological diversity (Pretty, 1996) as it causes replacement of indigenous landraces[1] or local varieties by new improved crop varieties. In many countries, the spread of monoculture has drastically squeezed out many native landraces (Regassa, 1996). In pursuit of increased agricultural production in order to meet the needs of growing population, governments have intervened to transform traditional agricultural systems. In this process modern varieties of crops have been spread together with the associated packages of fertilizer (at subsidized prices), pesticide and credit.

In some cases, there have been mechanisms to prevent the growing of traditional crop varieties. For example, in Wollaita, southern Ethiopia, farmers lost source of subsistence due to introduction of modern varieties and fertilizer by a World Bank funded development project (1970-1980). Farmers said *'the project brought fertilizer*

[1] *These are crops and crop varieties that are adapted to the local conditions and resistant to drought, pests and diseases.*

*and hybrid seed and famine with them'*. Before the project, farmers used to take precautions against famine by planting sufficient drought resistant local varieties of maize and food security crops such as enset (Enset ventricosum or otherwise called Musa ensete), sweet potato, taro and yam.

The World Bank funded development project (called Wollaita Agricultural Development Unit, WADU) discouraged production of subsistence traditional crops as they were thought to be poor in nutrition, and less productive and less responsive to fertilizer application. The project thus, distributed improved varieties of maize and other cereals allied with fertilizer with aim of achieving a rapid increase in food production. In this process traditional crop varieties of maize were replaced by improved varieties since improved seed was not sold for cash, but a unit of improved seed was distributed in exchange for the same unit of a local seed. Also, the rapid expansion of cereal cultivation has endangered subsistence root crops such as sweet potato, taro, yam, etc. that have actual significance for food security. Farmers prefer to add new varieties into their existing mix of landraces, but the agricultural modernization favoured/encouraged uniformity and substitution of land races by modern varieties. This agricultural uniformity left fields vulnerable to pest and disease attacks and drought. Consequently, there has been a chronic food crisis and series of famines occurred in 1984, 1988, 1991 and 1994, which brought massive relief operation by the governmental and the non-governmental organizations.

## Drought and Famine

In north-central highlands including Wollo where SOS Sahel operates, the famine that occurred during the 1980s was the major event that seriously threatened Ethiopia's crop genetic resources. Many farmers in the project areas suffered from food shortage and farm production were barely adequate to satisfy food needs. Thus, farmers were often unable to retain seeds for the next planting season. Recurrent drought over the past years also led to complete crop failure and subsequent disappearance of local varieties that the farmers maintained through generations. In many instances food grain coming through relief agencies became the only source of seed for planting as farmers ate up their own seeds. This often resulted in massive displacement of native varieties of maize, sorghum and by exotic seeds provided by relief agencies in the form of food grains. The poorly adapted exotic varieties required fertilizer, water, herbicides and pesticides and therefore, failed to grow under adverse climatic conditions.

## SOS-Sahel's Experience In On-Farm Bio-Diversity Conservation

Though the conservation of bio-diversity is not the main aim of SOS-Sahel's programme of work, a variety of land races have benefited from its rural development projects in different parts of the country. Farmer-based multiplication and distribution of seeds and planting materials is an integral part of SOS-Sahel's rural development programmes. The agency encourages continued cultivation of root crops that are threatened with extinction. One way to do this is to encourage local farmers to exchange seeds between themselves and grow them for their potential economic, medicinal, social and cultural values.

Under conditions of intermittent drought stress, combined with pest infestation and declining soil fertility, access to locally adapted seed provides reliable plating material, but many poor households do not have locally appropriate varieties in sufficient quantities. Similarly there are few crops that could help bridge seasonal food deficits for poorer households. Following the identification of lack of planting materials, as an important constraint on production, seed/planting material, multiplication and distribution has become an important component of field intervention for SOS-Sahel. This is to encourage continued cultivation of varieties of existing crops in the system where the crops have evolved and thereby promote crop diversification. It is believed that this will allow increased resilience of households to production crisis and improve their ability to meet immediate food needs.

## Method of Seed Selection, Multiplication and Distribution

Collection of local planting materials begins with socio-logical survey of the community land area in consultation and collaboration with farmers. Extension workers of the woreda office of agriculture and researchers from the regional research centres of EARO are involved in the survey and monitoring exercises. A number of crops are considered for multiplication and distribution of planting materials. These include maize and sorghum, sweet potato, field pea and cotton. Crop varieties that were found to be suitable in terms of growth performance and yield are selected/screened by farmers. Some of the criteria used in selecting crop varieties included early maturity, seed size, seed colour, and resistance to disease, taste and yield.

The selected/screened planting materials are purchased from local markets. These are planted and multiplied on selected farmers' plots established for adaptive on-farm trials under a scheme called participatory on-farm trials (POFTs). There is also a central nursery of the project established for seed multiplication and on station agronomic trials. The planting materials produced on farmers' plots are bought by the project at market price for later redistribution to other farmers on credit basis. Redistributed is done to other farmers in the same locality to avoid transportation and other logistical problems. Besides financial profit obtained from selling seed/planting materials, farmers who participate in seed multiplication benefit through keeping enough seed stock for planting on their own fields.

## Selection of Beneficiaries

Community development committee (composed of farmers, project staff and woreda office of agriculture staff) conducts the need assessment and beneficiary identification. In many cases households most needed seed and therefore, those who could make the most productive use of it were selected. These are farmers who had their land ploughed and ready for sowing, but who had neither seed, nor money available to buy it. A collective beneficiary ranking procedure (sort of wealth ranking exercise) was followed to identify needy farmers; poor and very poor groups are targeted. Ranking was discussed in open community meetings regarding eligibility of households for seed credit. Depending on the farm size, each household selected receives 5-25 kg of seed, which enables farmers to plant about a quarter of a hectare (average land holding varies between 0.5-1 hectare). In the case of sweet potato bundles of planting materials enough to plant a plot are provided. The committee

also manages the credit repayment and selects new families who they think need to receive seed/planting material.

The committee is also responsible for distribution, collection, storing and redistribution of seed. The beneficiaries of seed credit or planting material sign an agreement with SOS-Sahel for repayment in kind for onward distribution to other farmers in the following season. The farmers themselves rejected repayment in cash. The same amount (about 25 kg seed) is repaid after harvest, which is then stored by the project for distribution to other farmers in the locality. The community development committee ensures repayment of the seed so that other farmers can also benefit from the seed credit. Farmers who are known to have suffered crop failure are exempted from seed repayment.

## Incentives to Farmers and Institutional Linkage

There is no reward strategy for farmers growing and utilizing local varieties based on yield differentials. Farmers themselves feel that there are advantages in producing traditional crops for their own subsistence. However, farmers are provided with small farm tools and equipment to encourage management and conservation of soil, which indirectly support continued cultivation of indigenous crops. In most cases, farmers in the project areas lack farm tools to carry out various agricultural activities. Therefore, the project provides a loan-based material support to encourage improved management of natural resources including traditional crops. Farm tools (pick axes, flat hoes, shovels and three-finger hoes) are given on subsidized prices since nearly all households could not afford the full price of the required farm tools. SOS-Sahel has also initiated a blacksmith support programme to address the tool-related constraints. This is aimed at enhancing local production and supply of improved farm tools at affordable prices. Targeted blacksmiths received tool kits at subsidized prices to be repaid over five years. They also received training for the production of improved farm tools.

SOS-Sahel works in close collaboration with the community and relevant governmental departments enhancing their capacities to ensure the technical and management support after termination of the project. The project particularly works closely with the Bio-diversity Institute (BDI), the Ethiopian Agricultural Research Organization (EARO) and the ministry of agriculture at various levels (regional, zonal and woreda office). EARO and BDI co-operate in provision of technical expertise, assistance in formulating environmental guidelines for appropriate conservation measures.

## The Need for Establishment of Community Seed Bank

The number of farmers that have been included in this programmed in two project sites reached 12,000. The major lesson learned is that seed multiplication and distribution is a complex process that requires a long-term presence to ensure sustainability of community-based genetic resource conservation. In particular, organizational problems such as structure, sources of seed and credit terms need to be clarified (Pratten, 1997). In view of this, the establishment of community seed banks is an important strategy to facilitate seed supply among households including exchange of seeds through local markets to achieve the objective of *in-situ* conservation. The major objective here is to increase the number of options in using wide crop diversity

and minimize vulnerability to seed shortage, famine and crop genetic erosion. There have been discussions with farmers and local offices of agriculture to establish community seed banks, which would manage seed credit on a sustainable basis.

## References

Abebe Demisse, 2000. *Current status of biodiversity conservation in Ethiopia*, Paper presented on International conference on a biodiversity challenge for Ethiopia (February 2-4, 2000, Addis Ababa.

Abebe Demisse, 1999. In situ conservation: the Ethiopian experience. ILEIA newsletter for low external input and sustainable agriculture, Vol. 15, No. 3.

David Pratten, 1997. Local institutional development and relief in Ethiopia: A kire-based seed distribution programme in North Wollo.

Pretty N. Jules, 1995. Regenerating Agriculture. Policies practice for sustainability and self-reliance. Earthscan Publications Ltd, London.

Regassa Feyissa, 1996. Agro-biodiversity: A base for food security and sustainable agriculture.

Tesfaye Tessema, 1996. Low agricultural inputs: Opportunities for farmer-based approach to land race conservation, enhancement and utilization. Paper presented on a CRDA workshop on agricultural extension, Addis Ababa.

# Community Based Plant Genetic Resources Conservation and Development — The SEARICE Experience for BUCAP

*by Wilhelmina R. Pelegrina*

## Introduction

SEARICE (Southeast Asia Regional Institute for Community Education) has been involved with on-farm plant genetic resources conservation and development work 1989. These ten years of work is replete with lessons and new challenges, which this paper and this presentation will fail to capture. The best way we can look at some of the experiences of SEARICE is by looking at one of its program on community based PGR conservation and development. The program is called BUCAP.

The Biodiversity Use and Conservation Asia Program (BUCAP) has twin objectives of strengthening farmers' systems in PGR conservation and development while improving and increasing agro-biodiversity. The third objective is an institutional experiment, which was made possible because of the long-standing relationship between SEARICE and the Development Fund of Norway (Utvikslingfondet). The two organisations agreed to venture into a new form of partnership veering away from the traditional donor-recipient relationship. This time, the Development Fund of Norway will take a more active role in policy advocacy. The objective is to bring the experiences of BUCAP in community based plant genetic resources conservation and development to the wider Norwegian public and to address key policy issues relating to BUCAP.

## Country Selection

Seven countries were visited, key contacts were tapped and the potentials, strengths, weaknesses and opportunities present in each country were assessed. Finally three countries were selected: Lao PDR, Bhutan and Vietnam.

The decision for the selection was partly based on ecosystems. Vietnam was selected because it exemplifies the intensive irrigated rice system where genetic erosion is well pronounced and where institutional science strongly dominates the development of plant genetic resources. However, the farmers? High demand for more and newer varieties to respond to many and fast changing biotic and abiotic stresses is not being met by institutional sources. It is also not likely that this demand will be met in the future. The need to strengthen the role of farmers as active partners in plant breeding is very high.

Lao PDR was selected because it exemplifies a country undergoing agricultural transition from subsistence economy to intensive agriculture. The challenges of arresting genetic erosion and maintaining farmer science while undergoing transition were some of the prime reasons for selection. Bhutan was selected because of its unique ecosystem. The country is still in subsistence agriculture where altitude and season plays defining roles in plant genetic resources conservation and development. The

challenge is how to make the system productive while maintaining the prime role of farmers in crop development and conservation.

However, the identification of institutional partners rather than on which country needed BUCAP was the most decisive factor of all, which led to the selection of these three countries. In terms of crops, eco-systems and socio-cultural realities, all the surveyed countries were equally interesting. It was therefore difficult for these factors to be the sole basis for selection. The decision cannot be based on need alone. BUCAP is not a charity project but a research and development project, which in a broader sense is about developing a research and development model on PGR management that is aimed at influencing development policies at all levels; and aimed at being duplicated in other communities and/or countries. The need for partners with the highest potential to successfully implement a participatory, empowering and technically sound project, and a country that provides the space to implement such a project are therefore imperative.

## Selection of Country Partners

This was the most decisive and the most difficult part of the preparatory phase. The country partners can make or break a project. First, we looked for partners that have the commitment and capacity (at least a high potential) for implementing technically solid projects. At the same time, we also looked for partners that are committed and have the capacity (and potential) to implement projects that empowers the poor and the powerless. These kinds of partners are difficult to find.

We also took a difficult path of selection that did not presume that NGOs (although we were biased for NGOs) are the best partners for BUCAP. Objectively, we assessed NGOs and governmental/formal institutions based on their technical capacities and commitments. Most of all, we also assessed both sectors on their capacity to implement participatory and empowering research and development project.

Not satisfied with this, we tried to develop institutional arrangements for all cooperating local partners that will minimize problems and strengthen their positive aspects. For Vietnam and Laos, we were able to combine and join the best possible combination of NGO-GO and International Organizations.

In Laos, Oxfam Solidarity (Belgium) in Laos is the country partner. The National IPM Program of the Agriculture and Extension Agency of the Department of Agriculture and Extension is the main counterpart along with the National Agricultural Research Centre and the secondary agricultural schools in Luang Prabang and Champassak with assistance from CIDSE-Lao. BUCAP will be implemented in the provinces of Savanakhet, Champassak, Vientiane, Luang Prabang and Vientiane municipality.

In Vietnam, the country partner is the Plant Protection Department (PPD) and the Plant Protection Sub department (PPSD). The National IPM Program and the FAO-IPM Program in Vietnam and CIDSE-Vietnam shall provide technical advice and financial oversight. BUCAP will be implemented in five provinces (Quang Nam, Hue, Hoa Binh, Bac Kanh, Ha Noi) in central and North Vietnam. In each of the provinces, at least two villages with existing IPM clubs (farmer clubs) were selected for initial project implementation.

In Bhutan the project is under the National Agro-biodiversity Program in coordina-

tion with the RRNRC (Renewable Natural Resources Research Centre) of Bajo and Tashigang are the partners of BUCAP. The best institutional arrangement for Bhutan will still have to be discovered and developed during the course of the project implementation. The project will be implemented in a watershed in Wonghdiprodang and Tashigang.

The other projects of SEARICE and those it helped set-up for the purpose of on-farm PGR conservation and development are directly implemented by NGOs, except for the South Vietnam project, which is with the Farming Systems Research and Development Institute of Cantho University. BUCAP will provide a new experience for SEARICE in terms of looking at possible institutional set-up, which brings in the different stakeholders. We have yet to see if the current set-up of BUCAP will work. At present, we already have interesting insights into the dynamics and politics of bringing in the different stakeholders in one program.

The country partners and counterparts for BUCAP also differ from previous SEARICE projects in terms of the coverage of their work. With CBDC and CONSERVE, SEARICE concentrated its efforts on one contiguous area of a province or in one province. The work and contact is thus limited at the provincial level. The success of this set-up gave us the possibility and the drive to take it one step higher - at the national level. Thus, for BUCAP we have national government agencies as partners and its implementation will be in two to five provinces. We have up-scaled the level of implementation.

As mentioned earlier, it was not easy to achieve this level of scale. There were a lot of difficulties and errors, which we made. There were cases of bad contacts and the difficulty for our part to drop the contact without incurring the ire of the organization and the people whom we have established good working and personal relationships with. There were also cases of misunderstanding and a lot of doubts on whether we can take this at the national level. We brought in personalities who have doubts about BUCAP and who are only interested in project funds, which almost split our efforts. We had to bring in these people because they are stakeholders and there is simply no way to avoid them. These experiences gave us an important lesson, that there can only be one centre. Only one institution that we can call a national partner will see the project through including the necessary negotiations.

## Participatory Process of Programme Development

The BUCAP initiative was built from the errors/lessons and successes of other SEARICE programmes/projects, especially CBDC (Community Biodiversity Development and Conservation), CONSERVE/Seeds of Survival. From these, we tried to develop a participatory programme development even as at the same time it tried to identify its partners.

The best example was in Vietnam were even the farmers (through the IPM clubs) were involved in designing and defining the program proposal. From the start, we visited some farming communities and asked what they thought is the possibility of having a project on on-farm plant genetics resources conservation and development. We were grilled endless on what our objective is and how do we plan to achieve this. It was fortunate that most of the rice farmers we visited who are involved in the IPM programme are now looking at other possible areas of study. They said that developing PGR with good resistance to pest and diseases and with good production poten-

tial is the next step for plant protection. There were series of consultations and workshops with the farming communities, which were identified by the people from the Plant Protection Sub department at the province using a set of criteria which they defined based on our discussions, to brainstorm the process, initial content of the project and their planned activities at the community. These planned activities were pooled into a provincial plan by the PPSD. The provincial plans were then combined by the PPD, FAO-IPM and CIDSE-Hanoi to form the national plan for Vietnam.

This courage to open up the process was possible because of our previous experiences with the other programs of SEARICE. In our earlier attempts we were not bale to bring in as much participation of communities as early as the project development stage or the proposal writing stage. The level of participation, which we achieved in our earlier program, was consultative. This time, there were cases of consultative and collegial level of participation in proposal writing. This process is one of the strengths of BUCAP.

## Identification of the crop/s

Rice is the main crop of the project although we are aware that sustainable development in agriculture should not be dependent on a single crop (mono-crop systems). There are four reasons why we chose rice.

First, rice is the central crop of these farming systems. To have an impact for sustainable agriculture at the farmer level requires intervention on this major crop. The best example is the expansion to other crops of the IPM technology and the participatory research discipline propagated by IPM. The IPM's success on the rice crop built the foundation from which the farmers expanded their research and experimentation to other crops.

Second, rice has suffered the greatest reduction of its genetic base. It is in the rice crop where diverse local varieties had been largely replaced by much fewer cultivars, where genetic erosion has occurred. Most of the other species cultivated in rice-based farming systems are mainly farmer varieties. No significant genetic erosion has occurred with most of the other crops cultivated under rice-based farming systems.

Third, it is also in the rice crop where the farmers? Knowledge system of PGR management had been replaced by institutional and/or commercial based knowledge system. Farmers? Knowledge systems continue to dominate in the research and development of the other species cultivated in the rice-based farming systems.

Fourth, there is a need to focus the project's limited resources, in terms of funds, personnel and expertise. The project needs to gain experiences, lessons and successes on one crop (it is also the most important crop). The resource needed every time a new crop is added, in terms of expertise, different research requirements, different resources, etc., is very high.

Again, our choice for rice and the lowland irrigated areas were made on the basis of our experiences with CBDC and CONSERVE. With CONSERVE, we work with lowland irrigated rice, upland rice and corn. With CBDC we work with lowland irrigated rice and root crops. We saw that the impact of on-farm PGR conservation and development is fastest in the lowlands.

## Challenges

BUCAP will be faced and is faced with many challenges. It is an ambitious program that looks at the possibility of increasing agro-biodiversity and production by strengthening farmers' role in PGR research and development. Among the challenges it has to face are:

a) Can we achieve this objective on community based PGR conservation and development by targeting the most challenging area - the prime irrigated rice lands, where the impacts of green revolution are so pronounced and where national and IRRI researches have focused for decades?

b) By having BUCAP as a national project there is even a greater pressure to succeed. Can the current multi-stakeholder composition and involvement bring about success and strengthen farmers' participation? At this stage, at least there is a common understanding and pursuit to bring farmers knowledge and science into PGR research, but in the actual implementation, how will this work out?

c) As a project with the national government, what form will policy advocacy take? If we are able to succeed on the ground, can we use our current national partners to advocate and push for policy changes within? SEARICE has no experience yet on this field and we liken the new form of policy advocacy work for BUCAP as asking the government to stab itself. But can it be done with a strong support from grassroots effort?

d) This is a new form of partnership for SEARICE and its long-time funding partner, the Development Fund of Norway. Will BUCAP be able to provide a good working model for this new form of partnership? What is the possibility that we can have the same partnership with other funding agencies? What lessons can we draw from the experiences of BUCAP?

e) BUCAP is a very small part of the effort to address the issue of weak nation states against corporate monopoly. We've looked at one small area, what can we draw from the experience of BUCAP in this arena? SEARICE, by working with national research centres and extension agencies also aims to strengthen these institutions and by strongly bringing in farmers' participation strengthen public research. Will this be one way to move forward with public research?

f) For purposes of GFAR, BUCAP represents one effort on agro-biodiversity research, one example of what is happening on the ground, of what to do next. Where are the CGIAR Centres in this effort?

# Indigenous Institutions For Managing Livestock Genetic Diversity in Rajasthan (India)

*by Hanwant Singh Rathore (Lokhit Pashu-Palak Sansthan) & Ilse Köhler-Rollefson (League for Pastoral Peoples)*

## Introduction

Rajasthan, a state in the Northwest of India, is known for its desert conditions and harsh climate with maximum temperatures up to 50° C. Mean annual rainfall ranges from less than 100 mm in the extreme west and over 1000 mm in the east. The yearly amount of precipitation is also extremely variable and, on average, every third year witnesses a shortage of rain while every eight years there is a major drought or famine.

Rajasthan has long been famous for the excellent quality of its livestock, which contribute a significant share to the national milk and wool output. Although it hosts only 7% of India's cattle population and 21% of its total sheep, Rajasthan provides more than 10% of the national milk yield and more than 40% of the wool.

Representing a hub of domestic animal diversity, Rajasthan is home to a larger number of officially recognized livestock breeds (see box). It is significant that the majority of these descript, phenotypically well-defined breeds hail from the western, i.e. arid part of the state. The Imperial Gazetteer for Rajputana from 1908 noted that "the main wealth of the desert lands of the west and north consists in the vast herds of camels, horned cattle, and sheep which roam over the sandy wastes and thrive admirably in the dry climate". According to the same source "in the east there is nothing remarkable about the livestock".

**Officially Recognized Livestock Breeds of Rajasthan**

7 breeds of cattle: Tharparkar, Kankrej, Nagauri, Gir, Rathi, Malvi and Haryana
8 breeds of sheep: Marwari, Jaisalmeri, Nali, Magra, Pugal, Chokla, Malpura and Sonadi
3-4 breeds of goat: Marwari, Sirohi, Jakkharana
several camel breeds: Bikaneri, Jaisalmeri , Mewari, Marwari etc.
1 horse breed: Marwari

## Examples of Threatened Breeds/Species

### Nagauri Cattle

The *Nagauri* cattle from the "*Swalak*" area in Nagaur district (250 mm mean annual rainfall) is very famous as a draught breed and used to be exported to Multan, Sind and other regions. It was developed by Jat farmers to resemble a horse rather

than a cow with a very light body and has no superfluous fleshy hangings at dewlap, prepuce, or testicles (Akhil Bharat Krishi Goseva Sangh 1981). This particular phenotype was achieved by both selective breeding and specific management practices. The young calf is starved from milk so that it will never develop fat cells and always remain lean. Later its access to roughage is also restricted to prevent the rumen from expanding. A normal diet is started only after the rumen has been stunted. (Akhil Bharat Krishi Goseva Sangh 1981). In the 1980s pairs (*jori*) of Nagauri bullocks for draught were still very popular and purchased by customers from Punjab and Uttar Pradesh for top prices (more than 20.000 Rs.). Currently this breed is very much in decline because the demand for fast bullocks has decreased.

## Tharparkar cattle

This is a dual-purpose breed from the India-Pakistan border area, which is highly disease resistant, and heat tolerant (due to black skin and white coat). Even under the extremely harsh climatic conditions of the Thar Desert, cows give 9-11 or sometimes even 16 kg of milk per day with a very high fat content. Earlier bullocks were also popular as draught animals. This breed is regarded as "threatened", but estimates of the current population size vary dramatically. Some experts assume that the entire cattle population of the two districts where it occurs represents "Tharparkar", which would amount to a population of several tens of thousands. Others say that only the 200 or so cattle kept on the state breeding farms can be considered as "Tharparkar". For local people, on the other hand, the term "Tharparkar" is meaningless - they refer to it as "Sindhan".

A rapid rural appraisal session with farmers revealed a complex set of reasons for the disappearance of the Tharparkar breed (Köhler-Rollefson, 2000):

> Political: After partition, most purebred animals had ended up on the Pakistani side of the border. Formerly, cattle breeders had undertaken seasonal migrations, but this has become impossible.
>
> Gene drain: Some time later milk sellers from Jodhpur had purchased a large number of the remaining high-quality animals.
>
> Crossbreeding: The Tharparkar breeding area has become infiltrated with cattle belonging to other breeds (Kankrej in the south and Rathi in the north), on the search for pasture. This has lead to unintentional crossbreeding and dilution.
>
> Ecological: The pasture base - Sewan grass that used to be abundant - has become degraded, partly due to the influx of animals from other areas.
>
> Economic: Since there is no longer a demand for the male animals as neither draught bullocks, nor can they legally be sold for meat, people also have lost interest in breeding these animals

## The one-humped camel (dromedary)

India has the third largest camel population in the world and the camel has long represented an important component of Rajasthan's agro-biodiversity and cultural heritage. Even today, there is much demand for male camels as a source of draught

power by the poorer sections of the rural community. Nevertheless, according to the latest available census data, the camel population is dwindling rapidly, with especially the proportion of young animals being in severe decline. This is due to the fact that camel breeders opt out of the business despite prices for camels being high and increasing further every time the diesel prices are raised. At the root of the problem is the alienation of the traditional grazing areas, which makes it impossible to raise camels, despite strong demand. Impaired nutritional status has increased disease incidence and the rate of abortion, which further decreases the already low reproductive rate of camels. Although experience has shown that the provision of health care and access to good quality male breeding camels can contribute to stabilizing camel numbers, policy changes, such as reservation of grazing areas, are required if the camel population is to be maintained at a reasonable level (LPPS, 1999a).

## Indigenous Animal Genetic Resource Management

In view of western Rajasthan's extreme environmental constraints with shortages of feed and water being regular features of daily life, it is surprising that the livestock of this area is not only hardy but also much more productive than in the eastern part of the state or other parts of India. We believe that the superior quality of the breeds in this part of the state is a reflection of highly developed local institutions for managing animal genetic resources and of mechanisms that ensure genetic improvement in the context of the given environmental limitations. Representing highly evolved and successful human adaptations to a high risk environment, these practices and institutions are manifestations of a long pastoral tradition and way of life (Köhler-Rollefson 1993, 1997).

While in western Rajasthan practically everybody owns a few heads of livestock for subsistence purposes, there are also communities, which are specialized pastoralists and supply livestock and its products for sale or barter. These include the Rebari/ Raika, Gujjar, Sindhi Muslims, Gairi and Bhats. The most famous among these are the Raika who earlier took care of the camel breeding herds kept by the Maharajahs. Today only a minority of the Raika still breed camel while many have become large scale sheep breeders or left the pastoral occupation altogether. It is mainly these pastoral communities whom the knowledge about breeding is vested with. This will be illustrated with a few examples.

### Camel Genetic Resource Management

For camels, the Raika, a hereditary camel breeding caste, keep oral records of genealogies, tracing the ancestry of their herds in female lines. (Every animal in a herd has a name and a female animal is usually named after its mother.) They seem to conceive breeding stock more as communal heritage rather than private property. If a person owns a good-quality male, he is obliged to make it accessible to anybody else who needs his females to be mated. Some breeding bulls can attract hundreds of females, clearly going beyond their service capacity. On the other hand, the sale of female camels to anybody outside the community is traditionally not condoned by the community (although this is now changing). Female animals usually change ownership only at the occasion of marriages, being sent as *dhamini* when the bride joins her in-laws.

While, due to limited economic returns, not all camel breeders can afford to be finicky, the majority select male camels used for breeding with great care, taking into account a wide variety of criteria, such as looks, size, colour, temperament and milk yield of the mother and other female relatives. In the first year, a male camel is allowed to service only a limited number of females - but if the offspring turns out well, is he used more widely. They see it as a good sign if the calves "look more like the father than the mother". The Raika also profess to prefer bulls that sire a high proportion of males (although according to scientific genetics this is not possible). In order to prevent inbreeding they routinely change the stud after four years (Köhler-Rollefson, 1993, 1997).

The Raika are a good source of information in regards to the traits and advantages of local breeds and strains. For instance, they had been aware of the Malvi camel, a breed with high milk potential, for decades before it came to the attention of outsiders and was reported scientifically (Köhler-Rollefson and Rathore, 1996).

## Cattle Breeding Institutions

Castration

Cattle are kept by people from all castes. The superior quality of the cattle breeds in western Rajasthan by comparison with the rest of the state has been linked to the fact that in "Marwar" (western Rajasthan) village communities meted out strict punishment to people who did not castrate male cattle that had not been sanctioned by the community as fit for breeding (Kothari, pers. comm.). There was a special caste in charge of castration, the Satyas (Alstrom, 1999). In "Mewar" (southern Rajasthan) where farmers depended mostly on crops and kept only a small number of animals for work or dung production, such regulations did not exist. In some parts of Marwar, the old practice of community-enforced castration now also seems to have fallen into oblivion. To some extent this is because the community is no longer prepared to carry out this socially debasing task (Alstrom, 1999). In addition with few or no economic benefits emanating from cattle breeding there is no point in upholding the tradition.

Village Bulls

A survey conducted by Lokhit Pashu-Palak Sansthan in 50 villages of the Godwar area (a part of former Marwar) revealed that the institution of the village bull is alive and well. This is a truly community embedded institution with villagers jointly selecting the animal and each household contributing to its purchase cost, sharing the expense of its upkeep (in green fodder and grain) and the salary (in cash and in kind) of a keeper. Most of the villages also maintain a communally owned buffalo (*pardah*) along the same lines, but for this animal it is also necessary to provide a stable. Some villages go to great expense to obtain good quality bulls and buffaloes from long distances and superior genotype (LPPS, field notes).

Indigenous Breed Classification

The Godwar Raika also are associated with and have created a cattle breed that is locally known as "*Nari*", but has not yet been documented scientifically. It core breeding zone is in the area between Nana Bera in Pali district and Sirohi. This breed is said to come from the Aravalli forest (*nar* means hilly area) and kept in migratory husbandry systems. Distinguished by its concave ("dished" face, white markings on the face, grey body colour and long lyre-shaped horns, it is a dual purpose breed for

both milk and draught that is also extremely drought resistant. Villagers come from near and far to purchase male animals from the Nari breeding area in order to upgrade their own herds (LPPS, 1999b and field notes).

Gaushala

Another type of traditional institution that makes a contribution to maintaining livestock genetic diversity is the gaushala. Gaushalas are religiously motivated cow sanctuaries. Usually initiated by wealthy or religious people but co-funded by donations from the general public, they feed and take care of cattle that are no longer wanted by its owners, because of old age, sickness, or lack of productivity. During droughts these gaushalas have a valuable buffer function. Against a donation, they accept cows that their owners can no longer support because of the unavailability or high price of feed. Once the drought is over, the gaushalas dispense these animals back to the community, again against a fee. Some of these gaushalas also make attempts to conserve and improve local breeds.

Sheep and Goat

Sheep raisers usually recruit breeding rams from own herds. Based on the quality of their dam, promising lambs are singled out at birth and provided with special care and feed. Use for breeding starts at the age of two years and lasts for three years. Female sheep all have individual names. If a Raika wants to start a herd, then all his livestock-owning relatives will contribute animals, up to 20 head each (LPPS field notes).

In regards to goat there is the practice of "*amr-bakra*". As a religious act, some goat keepers devote male goats to God by attaching a small ring in one of his ears. This goat is then set free in the village and can be used by others for breeding. Everybody will feed this animal and nobody will dare to do it any harm.

Donkey

Rajasthan has a donkey population of almost 200 000 head, according to official sources. Exclusively members of lower casts, such as Kalbelia Yogis, Kumhars and Bhat, keep this species. For them it is indispensable as a beast of burden carrying loads practically without supervision. Some of its products, including milk and dung, are valued in traditional medicine. Donkeys also ease the workload of women. But from the official side, this animal remains ignored and stigmatised. The donkey mela held in Bavgarh Banda near Jaipur has been an annual event for a couple of hundred years and is attended by breeders and traders from several states, but its organizers complain that they have never been able to attract a bureaucrat or politician to preside over its inauguration function!

According to the scientific view, the donkeys of India are not differentiated in the breeds. However, a quick survey among the buyers and sellers at the mela revealed that local knowledge distinguishes between at least three types of donkeys, Kathiawari, Ner and Jhadi. Moreover, the Kathiawari donkey, imported from Gujarat fetches quite considerable prices - raging from Rs. 5,000 - 10,000, ergo represents a considerable economic asset - of higher value than most cows or even camels! Even more astonishing is the fact that male donkeys that can be used for mule production, i.e. are willing and able of mating with horse mares, are valued at more than 150,000 Rs. (LPPS field notes).

Conservation of grazing areas

Going beyond the scope of this paper, but deserving to be mentioned are various traditional institutions that protect grazing areas with the aim of reserving forage for times of drought. One example is the "oran", a piece of land belonging to a temple and protected by a local deity. In orans the cutting of trees and grass is prohibited but they are opened up for livestock grazing in severe crises (Robbins, 1998).

## Government Interventions in Animal Breeding

Unfortunately, the intricate community-embedded mechanisms for managing animal genetic resources have a very low visibility to the outsider - they are not evident unless one looks for them and takes the time to investigate. Accordingly, the rhetoric emanating from the formal institutions dealing with the livestock sector decries livestock breeders as backward, and asserts that the local breeds have deteriorated due to inbreeding, indiscriminate cross-breeding, scrub bulls, etc. With respect to cattle it is stated that its keepers are not aware of the need to rotate bulls to prevent inbreeding, nor know about the oestrus cycle and the proper timing of breeding. For sheep, it is said that farmers have not yet begun to appreciate scientific facts of breeding, that their methods of breeding and management are antiquated and uneconomic and that they have no breeding policy (Kavoori, citing Narayan 1948).

Against this background, official policies have long been oriented towards improving cattle, sheep and goat breeds by crossbreeding with exotic breeds.

Cattle

Crossing of local cattle with Jersey, Red Dane and Holstein was started in the early 1970s and initially restricted to peri-urban areas. After 1974 when the World Bank provided a loan for expansion of dairy cooperatives, it was extended to the rural areas. Currently, the government of Rajasthan is operating 2700 points for artificial insemination with exotic breeds. But this intervention is not popular with the rural population, especially women who regard it as unnatural. Furthermore it entails loss of control over the whole process of breeding since there is no chance to actually see the provider of the semen. For the rural people, "Holstein" or "Jersey" are meaningless and interchangeable terms and agreeing to A.I. equates an act of blind faith. Until recently, veterinary doctors had to perform a certain number of inseminations per month, in order not to face salary deductions.

In 1998, the breeding policy was revised and now gives emphasis on the conservation and improvement of indigenous breeds, which are to be promoted if local breeders are interested. A.I. with exotic breeds is to be performed only when demanded (Government of Rajasthan 1998)

Goats

Because the indigenous goats were conceived as inferior, the Indo-Swiss Goat Development and Fodder Production Project set out in 1981 to promote crosses of the local Sirohi breed with Alpine and Toggenburg goats from Switzerland. The project later came to the conclusion that the crosses did not perform as well as expected and that the productivity of the local Sirohi breed was higher than had been assumed (Kropf et al., 1992). Henceforth it switched to the propagation and genetic improvement of the Sirohi breed.

Sheep

The history of interventions by the especially instituted Sheep and Wool Department that was intended to upgrade the local sheep breeds by cross-breeding with exotic rams from Europe has recently been chronicled (Kavoori, 1999; Ray, 1999). These efforts to upgrade the local breeds by crossbreeding with more prolific and better wool yielding exotic sheep have not gained acceptance by sheep raisers (due to high mortality, problems with feed supply and other factors) and failed to achieve any measurable impact.

## Conclusions

The migratory pastoralists of Rajasthan are conceived as marginal people that are bound by traditions and unwilling to change by the government, and this perception is shared by much of the rural population. The Raika, in particular, have the reputation of being the most "socially-backward" caste. But it is precisely their reluctance to give up the old ways, their tenacity in sticking to time honoured customs (such as not selling female animals), their refusal (or inability) to abandon old patterns of animal production which also has up to now conserved what is left of Rajasthan's indigenous animal genetic resources.

In view of Rajasthan's frequent droughts and rapidly depleting groundwater supplies, pastoralism probably represents by far the most sustainable land-use option. Because the Raika generally do not own land, intensive animal production relying on especially grown green fodder is unlikely to represent an option for them. Basically the Raika have only the choice of continuing their pastoral existence or of merging into the urban labour force. If that happens, then this will probably be the end of the camel, the sheep genetic diversity and of the Nari cattle.

By signing the Convention on Biodiversity (CBD), India has committed itself to "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 to promote their wider application". Furthermore, the CBD explicitly states that biodiversity should be conserved in the surroundings it was developed, and in the case of livestock this refers to pastoral and farming communities.

In essence, the CBD provides a legal tool for the Raika to get credit for their achievements as animal breeders and creators of local breeds and to press for benefits, such as free animal health care and medicines, in return for the role they play as guardians of livestock genetic diversity (Köhler-Rollefson, 2000). Explaining this concept to them is difficult, since their universe often only encompasses a few villages and many of them are hardly aware of the existence of the state and center government, but it is a challenge that needs to be tackled by NGOs and other actors in rural development.

## References

Alstrom, S. 1999. The social dimensions of cattle castration in Northern Rajasthan, in Hooja, R. & Joshi, R., Eds.) *Desert, drought and development: Studies in resource management and stability*. Rawat Publications, Jaipur and New Delhi, p. 316-324.

Akhil Bharat Krishi Goseva Sangh 1981. *Exotic Cross Breeding of Cattle in India*. Report for the Expert Committee. Bharatiya Vidya Bhawan, Bombay.

Government of Rajasthan, Department of Animal Husbandry. 1998. *Breeding policy in Rajasthan for Cattle & Buffaloes*. Jaipur.

Imperial Gazetteer of India. 1908. *Provincial series. Rajputana*. Superintendent of Government Printing, Calcutta.

Kavoori, P. 1999. *Pastoralism in Expansion: The Transhuming Herders of Rajasthan*. Oxford University Press, New Delhi.

Köhler-Rollefson, I. 1993. Pastoralists as guardians of biological diversity, in *Indigenous Knowledge and Development Monitor 1*(3):14-16.

Köhler-Rollefson, I. 2000. *Management of Animal Genetic Diversity at Community Level,* Report Prepared for GTZ

Köhler-Rollefson, I. 1997. Indigenous practices of animal genetic resource management and their relevance for the conservation of domestic animal diversity in developing countries, *Journal of Animal Breeding and Genetics 114*(3):231-238.

Köhler-Rollefson I. and Rathore, H.S. 1996. The Malvi camel: a newly discovered breed from India. *Animal Genetic Resources Information 18*:31-42.

Kropf, W., N. Prasad, O.P. Sharma, B. de Groot and G. Nieuwshof, 1992. A comparison of reproductive performance and milk production of Sirohi goats with Alpine and Toggenburg Crosses. Paper presented at the Vth International Goat Conference 2-8 March, New Delhi.

LPPS. 1999a. *The Camel in India: A Threatened Livestock Species*?

LPPS. 1999b. *The First Three Years*.

Ray, S. 1999. Declining production conditions of raw wool. Analysis of emerging conflicts in sheep husbandry in Rajasthan. *Economic and Political Weekly 34(20): 1209-1214*.

Robbins, P. 1998. Nomadization in Rajasthan, India: Migration, institution and economy. *Human Ecology 26*(1): 87-112.

# Implementing the Convention on Biodiversity With Respect to Domestic Animal Diversity

*By Ilse Köhler-Rollefson, League for Pastoral Peoples*

## Background

The FAO (FAO, 1999; FAO/UNEP, 1995) is alerting the global community to the alarming figures in respect to domestic animal diversity. It estimates that about one third of the world's recognized 5000 livestock and poultry breeds are endangered and that breeds become extinct at the rate of one per week. Nevertheless, the subject has received much less attention than plant genetic diversity and hardly any awareness appears to exist about the problem of animal genetic resource erosion among either donor agencies or among NGOs and groups at the grassroots level. Contrary to the situation with plant genetic resources, approaches for participatory conservation are lacking, although the majority of the threatened AnGR are vested with traditional pastoralist and farmer communities. Domestic animal diversity is an outcome of these very diverse ethnic and social groups managing domesticated animal populations in a wide variety of habitats and manipulating their genetic composition according to their own needs, cultural preferences, indigenous knowledge and ecological conditions.

The reasons why indigenous breeds become extinct are manifold. Factors include replacement or cross-breeding with exotic breeds, alienation of common property resources (due to break-down of traditional management institutions, crop cultivation, irrigation projects, wildlife protection, tourism, etc.), political conflicts (land disputes and wars), natural disasters (droughts, floods, cyclones), technological advances (replacement of work animals by machines), integration into the global economy, unfavourable marketing and policy environments for local livestock products, and others.

Article 8 of the UN Convention on Biological Diversity states that genetic resources should be conserved in the "surroundings where they have developed their distinct properties" - which with respect to livestock is a reference to the farming and pastoral communities that have nurtured local breeds. Furthermore, the CBD spells out that "the knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity are respected, preserved and maintained". Clearly, the spirit of the CBD calls for a participatory approach to animal genetic resource conservation.

## Formal Research on Animal Genetic Resources and the CBD

Let us now look at the activities and approaches of the two international institutions that have shouldered responsibility for finding solutions to the problem of animal genetic resource erosion, in the light of the provisions made in the CBD.

### FAO

The Food and Agriculture Organization has been given a world mandate to study, advise, and set guidelines on conserving livestock genetic resources for present and future food security. A core activity of FAO's Initiative for Domestic Animal Diversity (DAD) is the establishment of a database to inventory and monitor AnGR resources worldwide — the DAD Information System or DAD-IS (http://www.fao.org/dad-is). Designated national coordinators in FAO member countries provide the information that is entered into DAD-IS. They characterize breeds according to their production characteristics and population size. The former include milk yield, lactation length, milk fat, litter size, birth weight, adult weight, and adult wither height. Population data recorded in DAD-IS include total population size, total number of females bred, total number of males used for breeding, etc. Up to date more than 5000 livestock and poultry breeds have been registered in DAD-IS. Currently, documentation is further being refined with individual countries compiling national status reports.

Going beyond documentation, the FAO Initiative is also involved in capacity building for achieving conservation of those breeds classified in the database as endangered and critical. Another task is to promote sharing of precious genetic resources as well as free access to this global "public good". To achieve this, the Initiative has set up an intergovernmental mechanism, a technical programme of management support for countries, a cadre of experts, and a country-based global infrastructure of national coordinators. Accepting that it will neither be possible nor even desirable to save the large number of recognized breeds, the FAO has invested heavily into a project of establishing genetic distances between the breeds of various species. The aim is to identify those breeds that are taxonomically most distinct and should therefore be prioritised for conservation (Barker, 1999).

The FAO has commissioned an expertise on the implications of the CBD for the management of animal genetic resources and the conservation of domestic animal diversity (Strauss, 1994). It makes the point that "the indigenous knowledge that has helped to produce and maintain domestic animal diversity is largely unexplored and yet this knowledge is essential in order to understand and continue developing these animal genetic resources." (FAO n.d.).

### ILRI

Activities at the International Livestock Research Institute in Addis Ababa also focus on genetics at the molecular level such as establishment of a phylogenetic tree for cattle breeds of Africa and Asia and mapping of genetic traits. Again, these efforts are undertaken with an eye on identifying those genetic resources that are most worthy of being saved. ILRI makes no reference to the CBD (mention of which is also notably absent in the New Vision and Strategy of the CGIAR 2000). In its breed survey questionnaire it however asks for certain information on "adaptive and unique attributes" to be supplied from the Indigenous Knowledge of Farmers.

## Omission of indigenous knowledge

The data collection strategies and databases of both institutions are geared towards the needs of scientists and representatives of government institutions. Rooted in formal scientific concepts and values, they are not designed to integrate and make use of indigenous knowledge. This results in an incomplete picture of the actual situa-

tion on the ground that could interfere with conservation efforts.

- Stock raisers and scientists use different terminologies and categories when referring to local livestock breeds. Farmers' breed classification systems may be more refined than the latter, indicating the existence of breeds that have escaped scientific attention. For instance, scientists opine that India's donkey population has not diversified into breeds, but local donkey experts distinguish at least three, phenotypically quite distinct types of donkey that hail from three different areas — making them, in all probability, three breeds or at least strains. Similarly, pastoralists had long known a camel breed from India with high milk-production potential before it was reported scientifically for the first time (Köhler-Rollefson and Rathore 1995).

- Stock raisers evaluate breeds differently than scientists. Whereas the latter are chiefly interested in documenting the output per single production cycle (under optimal husbandry conditions), feed and system efficiency is of greater relevance to farmers who raise animals under severe environmental constraints and have to cope with seasonal shortcomings in fodder supply. In addition, many breeds are appreciated for characteristics that have little to do with productivity, such as ritual significance, social role and aesthetic aspects.

- Population data that are based on scientific breed concepts and do not draw on local breed definitions and terminologies can be misleading. This is illustrated by the case of the Tharparkar cattle in India where no agreement obtains among scientists about which animals are to be subsumed under this category. Some scientists count the entire cattle population (several tens of thousands of head) in the two districts of India where it occurs (or once occurred), while others consider only the couple of hundred animals kept on state breeding farms as "true Tharparkar". Local people on the other hand do not know what 'Tharparkar' means and instead refer to it as 'Sindhan' (Köhler-Rollefson 2000).

As the FAO acknowledges, the sustainable management of AnGR is only feasible with the active participation of farmers and pastoralists. "The most rational and sustainable way to conserve animal genetic resources is to ensure that locally adapted breeds remain a functional part of production systems" (FAO, 1999). Adoption of local categories and understanding of local institutions for managing AnGR resources would be a prerequisite for the development of such participatory approaches.

ILRI has made the following public goods available according to information presented at its website (http://www.cgiar.org/ilri/products)

- A database on the distribution and physical performance characteristics of African cattle, sheep and goats
- A phylogenetic tree for cattle breeds of Africa and Asia
- Methods for determining ruminant breeds at risk of extinction
- A reference herd of N'Dama-Boran crossbred cattle serving as an international resource for a global project to develop a primary genetic map of cattle
- The first mapping of quantitative trait loci controlling resistance to haemoparasitic disease of major economic importance (animal trypanosomiasis)
- A set of genetic markers disclosing superior disease (trypanosomiasis)-resistant animals for use in livestock breeding programmes.

Furthermore, omission of indigenous knowledge and perspectives results in an evaluation of animal breeds on the basis of their outputs of cash products only. It is exactly the conception of animals as commodity producing machines while ignoring other vital traits that has been a prime mover in genetic resource erosion. On the other hand, domestic animal diversity in the South has evolved precisely because its people and cultures relate to animals in a different manner and accord them variable social status and ceremonial roles.

Hence reducing animals to gene sequences is neither legitimate nor will it serve the purpose of conserving domestic animal diversity. We must bear in mind that it was farmers and pastoralists who have created domestic animal diversity by subjecting animal populations to diverse cultural and ecological regimes. Scientifically designed manipulations of gene pools such as artificial insemination, embryo-transplantation, and now cloning on the other hand have invariably resulted in genetic homogenisation. (That this can have positive effects is not disputed here, but represents an entirely different matter).

Setting priorities for breed conservation via molecular genetic techniques is a scientific shortcut that ignores the human dimensions of domestic animal resources. It would seem much more urgent and appropriate to establish a dialogue with the ethnic groups and communities that are associated or have co-evolved with the respective breeds[1]. Understanding of their needs, priorities and attitudes should form the basis for developing conservation strategies. Science alone cannot be expected to conserve DAD, nor will in-situ conservation on government farms and standardized husbandry conditions suffice. Instead, we need to foster as large a diversity of approaches to conservation as possible by getting rural development NGOs, pastoralist associations and others into the picture!

## Value of Local Breeds

One important factor driving the process of animal genetic resource erosion is lack of confidence in the value of local breeds. For decades, southern livestock breeds were a priori regarded as less productive than their northern counterparts. Furthermore, it was believed that genetic improvement by selection within the breed was too time-consuming to be worthwhile; hence all energies were spent on attempting a quick fix by crossbreeding. There is now increasing evidence that local breeds may not only be superior, but also that their productivity can be further improved within reasonable timeframes. One example concerns the various zebu cattle breeds (including Ongole, Gir, Kankrej) that were exported from India to Brazil, Australia and other countries earlier this century. In their new homes they have been improved on genetically and come to represent prime beef or dual purpose producers, whereas the Indian populations have decreased in number, become diluted due to cross-breeding and in some cases are regarded as threatened. Some private initiatives in India, such as that by the Gir cattle-breeding farm of the Shri Bhuvaneshwari Pith in Gujarat, show that considerable improvements in milk production can also be achieved. Examples where efforts to replace local breeds with imported ones were reversed include

[1] *Not all breeds are associated with particular communities; many of them are composite breeds - the results of scientific efforts to create new breeds, but local farmers never adopted that. It is questionable to what extent they need to be conserved.*

- The Indo-Swiss goat project in Rajasthan initially tried to popularise crossbreeding of local goats with Swiss breeds but then came to the conclusion that the native Sirohi goat was superior in many ways (Kropf et al., 1992).
- In Mexico, the Criollo pig was almost replaced by imported white pigs despite its usefulness for smallholders, its ability to make use of local feed and its better taste (Anderson et al., 1999).
- From South Africa there is the case of the Nguni cattle, which is disease resistant and can thrive on poor pastures. The government upgraded this breed by cross-breeding with European breeds but the improved animals also required much higher inputs, which became unaffordable to small farmers. Now there are efforts to re-supply farmers with Nguni cattle whose population has decreased (Blench, 1999).

## Stock Raisers Rights

So far there have been no efforts to give credit to stock raisers for their role in nurturing domestic animal diversity, in tune with the concept of "Farmers Rights". This may in part be due to the fact that the significance of indigenous knowledge and institutions in breed formation processes has not yet filtered into general awareness. Animal scientists subscribe to the opinion that local livestock breeds have evolved only in response to ecological conditions without any intellectual inputs by pastoralists or farmers. Documentation of indigenous institutions and practices of animal genetic resource management is hence of crucial importance.

Unfortunately this has not yet happened, although the NGO initiative in India to establish People's Biodiversity Registers provides some valuable pointers. Its intention is to protect people's rights to their intellectual property and natural resources by building an open and transparent system on biodiversity resources from village level upwards (Utkarsh, 2000). It is urgent to extend a similar approach to pastoralists and farmers knowledge on domestic animal resources as well, since it is quite likely that the indigenous breeds from the South that currently receive little appreciation may at some stage in the not so distant future be in great demand in the North as well.

Northern high performance livestock is dangerously inbred and has lost many of its fitness traits. For instance, modern chicken strains are no longer able to hatch their young, because brooding behaviour is no longer present. Turkeys and certain pig breeds often can not mate naturally because of heavily developed chest and thigh muscles respectively and depend on artificial insemination for their reproduction. German cows only survive for an average of 2.7 lactation cycles. Farmers who want to raise poultry under natural conditions outside factory farming systems face problems of finding chicken that can survive outside cages.

To ensure at least a modicum of fitness and vitality in future populations of food-producing animals, and to keep genetic options open, access to fresh genetic material will therefore always be required. Since most of the wild relatives of today's domesticated animals are extinct, a major source of such material lies with the livestock raised by herders and farmers under extensive, subsistence-oriented production systems in the South. This is already being utilized for such purposes by northern livestock industries. In 1990 Australia imported embryos of 269 Tuli and 264 Boran cattle from

Zimbabwe and Zambia to improve its Friesian stock in regards to fertility, docility and environmental stress resistance. These imports were hailed as saviours of the northern Australian cattle industry (RAFI/UNDP, n.d.). The threatened N'dama cattle were used to create a new hardy, disease resistant breed called Senapol that is now raised in the southern US.

The danger of big corporations' free-for-all bio-prospecting among indigenous genetic resources is definitely real. As a recent paper on swine genetics recounts, "Some genotypes formerly not among the ones of economic interest for the industry became targets of the breeding companies' research programs which aimed at discovering and transferring specific genes from these genotypes to the industrial genetic lines. This is for example the case with the highly prolific Chinese breeds and the Iberian pig with excellent meat quality for production of extensively cured pork products" (Pereira et al. 1998).

Given that the stock breeding industry zealously guards and patents their own genetic materials, there is a moral imperative to extend similar protections to traditional stock raisers and breeders — although, granted, this will be no easy task.

## Conclusions

Currently few benefits seem to percolate down to pastoral and farming communities from AnGR related activities currently pursued by formal sector international and national institutions. Agendas are pursued predominantly from the so-called "genetic resource angle" that seeks to save or rescue breeds in their role as carriers of genetic material that might have some economic potential in the future and could be valuable for humanity at large. While the important role of many indigenous breeds in sustaining rural livelihoods is also highlighted by the FAO, the existing strategies are insufficient for supporting and facilitating sustainable management of AnGR by farmers and pastoralists. We must be aware that extinction of a breed is often the outward symptom of an existential crisis experienced by the people who previously depended on it. Many breeds can best be saved by supporting the associated communities in their livelihoods through appropriate policies, such as those that ensure access to pastures and markets.

In order to conserve domestic animal diversity in the South in line with the stipulations of the Convention on Biodiversity, activities must be expanded to include the following strategies:

- Documentation of the local/indigenous institutions, breeding practices, and cultures of the peoples who nurtured and shaped so many hardy livestock breeds.
- Decentralization of activities to involve stock raisers themselves in on-the-ground conservation. Pastoralists with their long history of co-evolution often have a culturally highly developed sense of guardianship, partnership, or even personhood vis-à-vis their animals. This heritage should make them the lead actors in conservation efforts
- Ensuring that the specific ethnic groups and societies receive benefit from sharing the unique genetic resources they have created.
- Adoption of a more comprehensive sustainable livelihood approach towards con-

servation by instituting policies and programmes that secure access to pasture and animal health care and create a level playing field for the marketing of the products of local breeds.

- Information for pastoralists and breeders organizations about the rights they have been accorded in countries that are signatories to the CBD
- Capacity building of NGOs to take up roles as intermediary actors between governments/ research institutions on one hand and farmers/pastoralists on the other.

In summary, it is both technically and ethically imperative to open channels of communication with stock raisers and to institute mechanisms for reaching the grassroots groups — those who have shaped and stewarded different breeds down through the centuries and who stand to lose the most if these unique resources disappear from the fact of the earth. In order to successfully implement the Convention on Biodiversity, a close integration of the activities of all stakeholders - researchers, governments, civil society, but especially livestock keepers and pastoralists - is absolutely essential and steps towards this goal should be taken without further delay.

## References

Anderson, S., Drucker, A. and Gündel, S. 1999. Conservation of Animal Genetic Resources. Long distance course, Wye College External Programme. University of London.

Barker, J.S.F. 1999. Conservation of livestock breed diversity. Animal Genetic Resource Information 25:33-43.

Blench, R. M. 1999. 'Til the cows come home'. Why conserve livestock biodiversity ? ODI, London.

FAO, n.d. The Global Programme for the Management of Farm Animal Genetic Resources. Rome.

FAO, 1999. The Global Strategy for the Management of Farm Animal Genetic Resources. Executive Brief. Rome.

FAO and UNEP, 1995. World Watch List for Domestic Animal Diversity. Second ed. (Ed. Beate D. Scherf). Rome.

Köhler-Rollefson, I. 2000. Management of animal genetic diversity at community level. Report prepared for GTZ.

Köhler-Rollefson, I., & C. McCorkle. 2000. Domestic animal diversity, local knowledge, and Stockraisers' Rights. Paper presented at the ASA Conference, 2-5 April, 2000 at SOAS, London.

Kropf, W., N. Prasad, O.P. Sharma, B. de Groot and G. Nieeuwshof, 1992. A comparison of reproductive performance and milk production of Sirohi goats with Alpine and Toggenburg Crosses. paper presented at the Vth International Goat Conference 2-8 March, New Delhi.

LPPS 1999. Lokhit Pashu-Palak Sansthan: The first three years. Project Report, Sadri, India.

Pereira, F.A. et al.1998. Use of worldwide genetics for local needs. Proceedings of the 6th World Congress on Genetics Applied to Livestock Production, pp. 155-160.

RAFI/UNDP.n.d. Conserving indigenous knowledge. Integrating two systems of innovation.

Strauss, M.S. 1994 (ed.). Implications of the Convention on Biological Diversity. Report of an Infomal Working Group, Animal Production and Health Division, FAO, Rome.

Utkarsh, G. 1999. People's Biodiversity Register. Compas 2: 16-17.

**Table 1: Numbers of breeds of the major livestock species recorded in the FAO Global databank for Animal Genetic Resources, and the numbers estimated to be at risk (source: R. M. Blench, 1999)**

| Species | Recorded | At risk | % at risk |
|---|---|---|---|
| Donkey | 77 | 9 | 37.5 |
| Buffalo | 72 | 2 | 3.6 |
| Cattle | 787 | 135 | 23.2 |
| Goat | 351 | 44 | 16.5 |
| Horse | 384 | 120 | 43.3 |
| Pig | 353 | 69 | 26.0 |
| Sheep | 920 | 119 | 18.1 |
| Yak | 6 | 0 | 0 |
| Dromedary | 50 | 2 | 4.0 |
| Bacteria camel | 7 | 1 | 14.3 |
| Alpaca | 4 | 0 | 0 |
| Llama | 4 | 0 | 0 |
| Guinea-pig | ? | ? | ? |
| Duck | 62 | 29 | 46.8 |
| Turkey | 31 | 11 | 35.5 |
| Chicken | 606 | 274 | 45.2 |
| Muscovite duck | 14 | 5 | 35.7 |
| Goose | 59 | 28 | 47.5 |
| Guinea-fowl | 22 | 4 | 18.2 |
| Quail | 24 | 16 | 66.7 |
| Pigeon | 19 | 4 | 21.1 |
| **Total** | **3851** | **872** | **22.6** |

**Table 2: Livestock breeds at risk by region (source: R.M. Blench 1999)**

| Region | Recorded | At risk | At risk % |
|---|---|---|---|
| Africa | 396 | 27 | 6.8 |
| Asia Pacific | 996 | 105 | 10.5 |
| Europe | 1688 | 638 | 37.8 |
| Near East | 220 | 29 | 13.2 |
| South-Central America | 378 | 15 | 4.0 |
| North America | 204 | 59 | 28.9 |
| World | 3882 | 873 | 22.5 |

# Community Rights and Farmers' Rights in Thailand

*by Wittoon Lianchamroon, Thai Network on Community Rights and Biodiversity (BIOTHAI)*

Recent developments in Thailand's legislation aim at the recognition of traditional knowledge and the rights of local communities. The Plant Variety Protection bill could combine rights of plant breeders to their newly developed varieties with the protection of native varieties that have been conserved and developed by farmers and local communities.

In Thailand communities have had their own rights in administrating and managing their local natural resources ever since Thailand was established as a nation more than 400 years ago. Although the Thai government made some efforts to centralize the authority in natural resource administration, in practice the government could manage only a few kinds of natural resources such as forests and minerals. The central authorities still allowed communities to have their own freedom in the management of water resources and farming. The government did not interfere with the communities' tradition, culture, and ways of living. The main reason may have been that existing natural resources and culture did not have economic value in the government's view. The real change of natural resource management (NRM) in Thailand began in 1961 when the first National Social and Economic Development Plan, supported by the World Bank and the USA, was launched. As a consequence, plans on the development of agriculture, health, education, and natural resources were initiated. Through these plans, the government's authority in the respective fields was becoming more effective and centralized. At the same time, free market and private sector activities have increased. The Thai government stopped its own state companies and promoted the role of private companies in many sectors such as banking, industry and agriculture. As a consequence the government allowed mining and logging companies to exploit forests and lands that had originally been managed by local communities.

## The Struggle for Community Rights

The centralization of NRM by the Thai government increasingly caused social and community dispute. Concerns have been raised especially in cases where the government cooperated with private companies and allowed them to monopolize the use of forests and lands, for instance for logging of tropical woods or eucalyptus tree plantations. This practice is opposed by a movement of farmers and people in local communities who used to have the authority in managing their own natural resources. Their principal objective at the policy level is to convince the government to enact a Community Forestry Bill. This law would give the rights in NRM back to communities. This includes the management of forests, wild products, minerals and genetic resources. Although it is not yet enacted, the debate during the process of drafting and legislation educated the Thai society on the role of local communities in NRM. The prominent progress in community rights in Thailand can also be noticed in the country's new 1997 constitution. In the constitution, there are three acts such as the Community forestry Bill, which state the principles of community rights. Particularly in

act 57, community rights for the management of biological resources are clearly manifested. The statement in the constitution is the principle foundation and offers crucial tools for the development of laws on the rights of biological resources and indigenous knowledge in the future.

## The Thai Plant Variety Protection Bill

To date Thailand does not have any legislation to protect breeders' rights on new varieties, or Farmers' Rights on traditional varieties. Only the export of some endangered species and some cultivated varieties is prohibited by law. In 1994 the Ministry of Commerce and the Ministry of Agriculture and Cooperation drafted a Plant Variety Protection Bill to protect new plant varieties and the rights of plant breeders. This draft was based on the 1978 Act of the Convention of the International Union for the Protection of New Varieties of Plants (UPOV) and was opposed by Thai non-governmental organizations (NGOs) and farmers' networks. Their resistance was grounded on the fact that the draft would now acknowledge the contribution of farmers and local communities to the development of commercial varieties. Eventually, in 1997 the government formed a national committee composed of representatives from all sectors including plant breeders and farmers to redraft the Plant Variety Protection Bill. The present version was drafted to comply with the sui generis principles as outlined in Art. 27.3. (b) of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) and was approved by the Thai cabinet. However, it still needs the two-round approvals form the parliament before it can be enforced. The Plant Variety Protection Bill is based on the fact that in developing useful plant varieties, local plant varieties are employed as their "first-hand varieties". Therefore, the Plant Variety Protection Bill protects the benefits for conservers of local plant varieties as well as owners of commercial plant varieties. Farmers and communities who conserve and improve their varieties will have the similar rights as plant breeders to their newly developed plant varieties. The main principles of the Plant Variety Protection Bill are as follows:

- A technical sub-committee will be set up by the Ministry of Agriculture to determine which varieties are specific for certain regions/communities and are therefore considered to be local varieties.

- Compensation has to be paid for the use of local plant varieties in the development of new commercialised varieties. The commercial plant breeder must sign a contract, which grants at least five per cent of the benefit to communities who conserve the original plant varieties. If new cultivars are bred for the benefit of small-scale farmers and local communities or the general public, no compensation has to be paid. Compensation also has to be granted when materials from local plant varieties are extracted to gain ingredients for medicinal or other products.

- Rights on plant varieties grown only in particular communities will be enforced only for those communities. The rights for commercial benefits of the varieties will belong to the particular communities for the duration of the protection, which ranges form 15 to 25 years. This rule does not apply if these plant varieties are employed for public or non-profit purposes.

- A new plant variety, especially when it is created by genetic modification, will only be granted variety protection if its biological safety is proven. If a new variety

causes damage to community environment or community health, its owner, by law, is liable for the compensation.

- The purpose of this law to protect local plant varieties, farmers' and community rights is reflected by the composition of the National Plant Variety Committee. Amongst the 23 members of the committee there are six farmers and two representatives of NGOs. The same kind of mechanism is also applied at the regional level.

- The law will establish a foundation for plant variety development and conservation. Income of the foundation arises from different kinds of fees and compensation. It is generated from benefits gained from local wild plant varieties, which do not grow in community forests, and from local plant varieties that are common assets of many communities. The role of the foundation is to channel the incomes to the farmers and the local communities. The income will be used for activities in conserving and developing plant varieties in various communities.

Although some commercial seed companies consider this bill as a hurdle for the development of new varieties, other breeders feel that it is more useful to have a plant variety protection in this fashion rather than having no legislation at all.

## Plant Variety Protection Bill in Relation to Other Legislation and Treaties

If the Plant Variety Protection Bill is approved as law, it will be related to two other bills. One is the Traditional Medicine Bill. This bill was already approved by the cabinet and is now being brought to the consideration of the parliament. The difference between the Plant variety Protection Bill and the Traditional Medicine Bill is that the latter protects not only plant varieties but also traditional knowledge such as on herbal medicine. However, once these two bills are made legally binding, there may be cases in which the same kinds of plant varieties are protected by both laws. Therefore it should be clearly classified which type of plant varieties will be protected by each law. Plant variety protection will also be related to the Thai Patent Act that was amended in 1992. This Act does not allow for patents on plants, animals and patents for microorganisms are only granted if these organisms are modified. It furthermore excludes patents on plant varieties, therefore the Plant Variety Protection bill will have to be enacted to bring Thai legislation in line with the legal requirements as outlined by the Agreement on TRIPS. The above-mentioned bills will be effective only within Thailand. It is therefore possible to use Thai plant varieties abroad without complying with Thai plant variety protection or patent law. In this case the Thai government cannot force a person or organization to pay for the compensation. In principle, the use of Thai genetic resources outside of the country could be regulated by the access regime and benefit sharing mechanisms that are stated by the Convention on Biological Diversity (CBD). At present, Thailand has not ratified the CBD because it was felt that mechanisms to acknowledge community rights inside the country had to be established before "access rights" at an international level could be granted. However, the Thai mechanism of compensating local communities will only be possible if Thailand has sufficient bargaining power at international level. At present, there are many countries and groups engaged in elaborating laws to protect Farmers' Rights, community rights and local genetic resources. The international cooperation amongst de-

veloping countries will stimulate each country to work on its own legislation. Furthermore, it will counterbalance industrialized countries' demands in international negotiations on, for instance, the CBD or the TRIPS Agreement. It will, as well, result in benefit sharing in the case that common genetic resources exist in many countries, or help to construct mechanisms and principles for the exchange and transfer of biological resources.

## Sources

S. Chamarik and Y. Santosombat (1993), Community Forest. Bangkok, Thailand: Research Books.

GRAIN (ed.) (1997), Signposts to *Sui Generis* Rights. Background discussion papers for the international seminar on sui generis rights. Bangkok, Thailand: BIOTHAI.

D.A. Posey (1996), Traditional Resources Right. Cambridge, UK: IUCN.

## About Bio Thai

Thai Network on Community Rights and Biodiversity
801/8 Ngamwongwan 27 Soi 5, Muang district, Nonthaburi 11000 Thailand
Tel 662-9527953, 662-9527371 email: biothai@wnet.net.th

Thai Network on Community Rights and Biodiversity or BioThai is a citizen network firstly originated from a small forum called "Thai working group on biodiversity and local wisdom". The group consisted of NGOs, academicians, government officials, lawyers, farmers and people organizations that concern about natural resources conservation and sustainable development on biodiversity and community rights.

BioThai started its activity by set out popular campaign on biodiversity and community rights since 1996, focusing on problematic aspects in CBD (Convention on Biological Diversity) and an interference on Thailand's legislative system, dominated by superpower in the North.

The ultimate objective of BioThai is to promote participation and role of people, particularly, farmers and local organizations, in the development on national policy and law. Concerning biodiversity and community rights, BioThai plays coordinating role in the networking among concerned citizen, people organization, state authority, academician, lawyer politician and mass media; to distribute information, raise awareness, create understanding, among public in the campaign. BioThai also is a follow-up and monitoring body on issues related to biodiversity and the campaign.

### Development of the national policy and advocacy:

1. BioThai is involved in the legislative drafting committee on Traditional Medicines Protection and Promotion Bill and Plant Varieties Protection (PVP) Bill as well as the Executive Order on Biodiversity Utilization.

2. Campaign on Bio-piracy/Bio-prospecting activity in Thailand: BioThai has continuously followed-up and monitored bio-piracy activities of Transnational Corpora-

tions in Thailand, for instance RiceTec's Jasmine-Jasmati case and Portsmouth University's marine fungus.

3. Publicize and create popular awareness on the impact of biotechnology: BioThai has distributed critical information on biotechnology such as the importation of GMOs (genetically modified organisms) in to Thailand. Concerning the negative impacts of GMOs crops and food products, BioThai has demanded the government to consider on GMOs national policy and also set out the campaign of NO-GMOs which finally led to the public debate. The most recent and controversy case is Bt cottonseeds which spread out to commercial fields before biosafety approval by responsible state authority. This shows the lack of responsibility, transparency and people's participation.

4. Networking on international policy on biodiversity and trade related issue: BioThai has actively coordinated with citizen groups at local, national and international levels, in order to create network with common perspectives and seeks for collaboration on international laws and policy concerning biodiversity. During 1997-1998, BioThai had co-organized the International Seminar and Workshop on Sui Generis in Bangkok and the Consultation on TRIPs Review in Geneva.

5. Promotion local organizations, farmers and people networks on community rights and biodiversity: BioThai, with the coordination of Local Development Institute, has conducted the study research on biodiversity management and community rights. The results of the study is disseminated to local communities and people network

# Annex 2

# Working Group Discussion Results as Presented in the Workshop Plenary

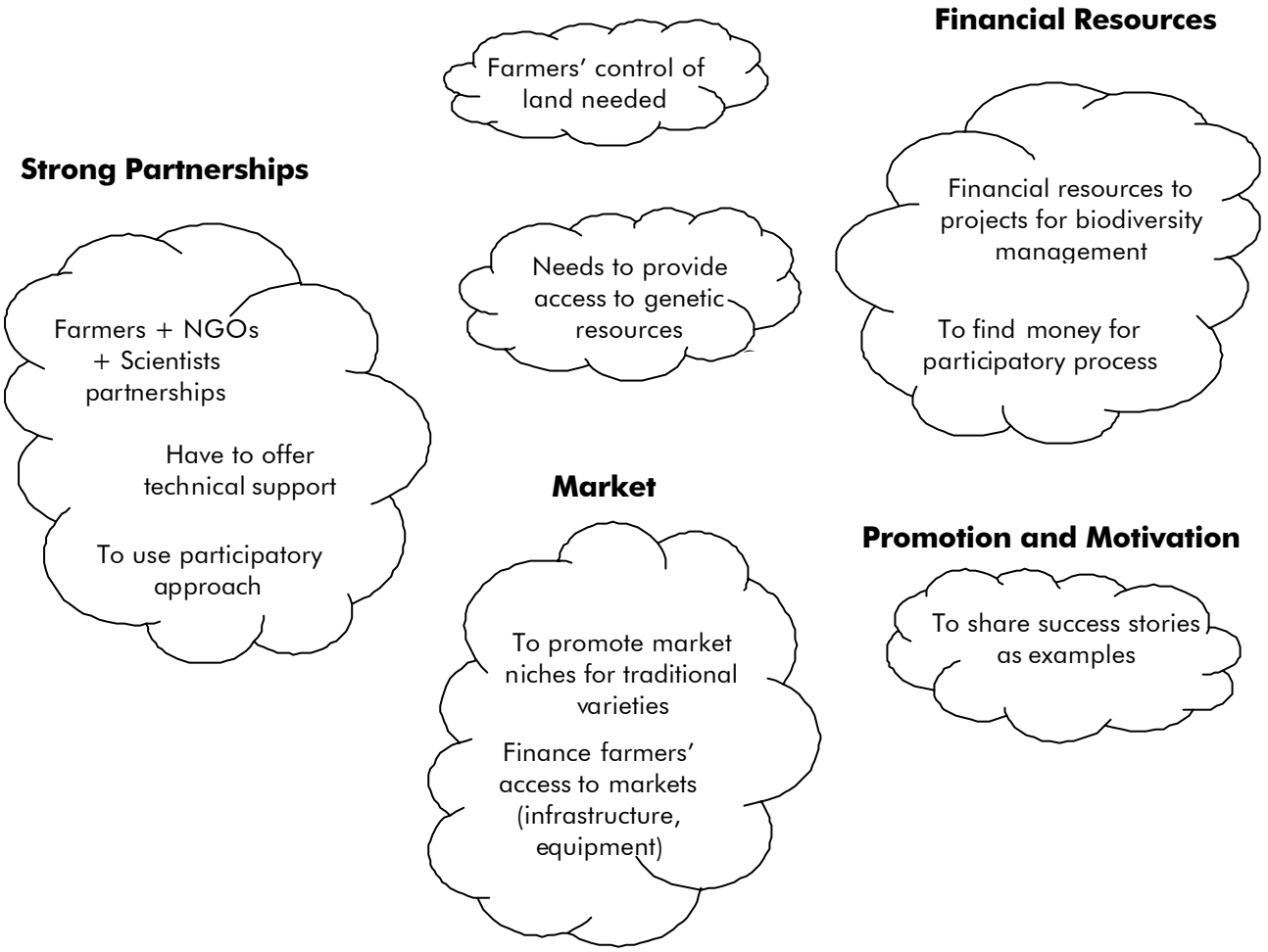
# Working Group 1:

**Incentives for Farmers to enhance agro-biodiversity – to protect and valorise varieties developed by farmers and farmers' knowledge**

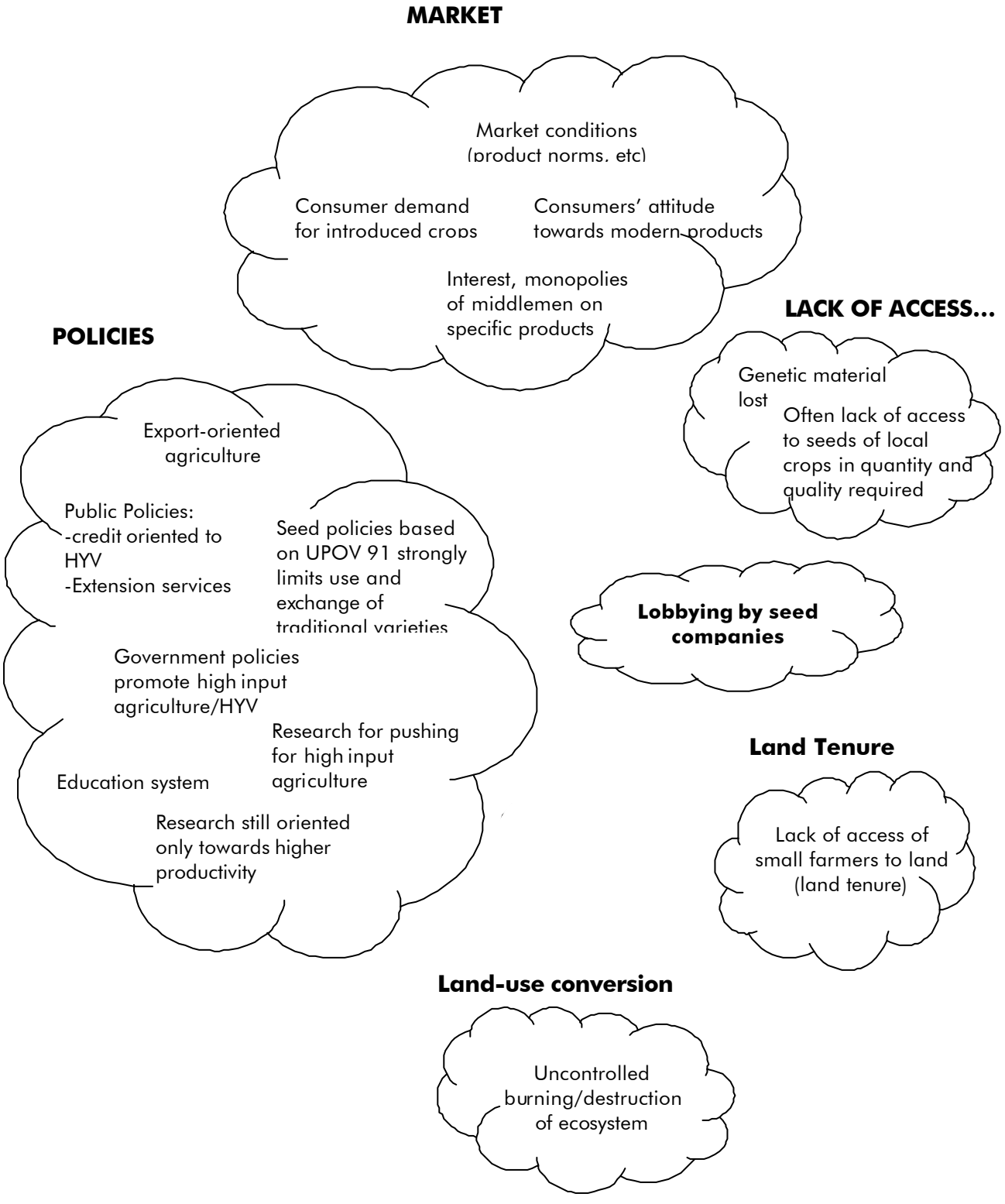
## I. My experiences with ...(title of working group topic)... so far has been...

| VERY GOOD | GOOD | | NONE | BAD | VERY BAD |
|---|---|---|---|---|---|
| ●● (2 votes) | ●●●●●●● (7 votes) | | ●● (2 votes) | | |
| **Reasons/examples for voting:** | | | | | |
| Address farmers' needs:<br>▪ access/control of seeds<br>▪ good yield without chemical inputs<br>Great number of adaptors: e.g.<br>▪ 387 Peoples' Organizations<br>▪ 97 church-based organizations<br>▪ 46 NGOs<br>Support partners<br>▪ technical scientists<br>▪ organizations/ NGOs<br>▪ moral persistence = members (sustainability of organization)<br>Farmers doing breeding and farm conservation e.g. farmer-breeders<br>Farmers doing the technology diffusion through organizations<br>Success experience: Seed Network (Brazil)<br>+/- 300 NGOs/POs<br>+/- 40,000 farmers<br>Traditional varieties recovered<br>+/- 400 for corn<br>+/- 180 for beans<br>+/- 40 for potatoes<br>Less costs, more autonomy (motivation)<br>Incentives: access to genetic material; possibility to compare performances<br>Information on how to improve traditional varieties<br>Marketing possibilities | Good foods & income (internal incentive)<br>Against GMO/ genetically engineered varieties<br>Highly concerned farmers about GMO<br>Seed security<br>For reproduction purposes/breeding/ seed material<br>Food security<br>Reduce cost<br>Medicinal purpose<br>For sale/market<br>Production cost of farmers reduced<br>Small scale farmers (mostly women) adapt sustainable agriculture<br>Soil structure and fertility improved<br>Empowering:<br>- breeding<br>- FDATs<br>- CSBs<br>Satisfaction from sharing seeds, know-how, IKS | Spiritually rewarding (working with people, nature)<br>Accountability to the grassroots (people before profit)<br>Tool for farmers' unity (expanding SFOs)<br>Organic production good for agro-biodiversity<br>Farmers are basically interested in both agro-biodiversity and GMO (conflicting?)<br>Incentives for organic farming:<br>▪ EU regulations<br>▪ Marketing channels<br>▪ Labeling | | | |

## II. FAVORABLE CONDITIONS identified as contributing to farmers' involvement in enhancing agro biodiversity.



## III. CONSTRAINTS/NEGATIVE CONDITIONS identified as disincentives for farmers' involvement in enhancing agro-biodiversity



# Working Group 2:
## Formal, informal, private cooperation to foster agro-biodiversity

## I. Experiences With Formal, Informal And Private Cooperation

### *a. Formal/Government Sector*

| VERY GOOD | GOOD | NONE | BAD | VERY BAD |
|---|---|---|---|---|
| | ●● (2votes) | ●●●●● (5 votes) | ●●●●● (5 votes) | |
| | **Formal sector stance:** Let's work together so you can help us. | | | |
| | Allow/made possible national programs on agro-biodiversity<br>Good but difficult<br>Developing regional programs (formal sector) | | Formal sector does not trust NGO engagement<br>NGO work is not appreciated enough by government<br>Formal system unresponsive<br>Formal sector: no partnerships to develop strategies<br>"credit grabbing" by Government of NGO accomplishment<br>Ignorance/arrogance of formal sector<br>Indifference of Ministry of Agriculture to biodiversity<br>Low awareness of decision makers | |

### *b. Informal Sector*

| VERY GOOD | GOOD | NONE | BAD | VERY BAD |
|---|---|---|---|---|
| ●●● (3 votes) | ●●●●●●● (7votes) | ● (1 vote) | ● (1 vote) | |

**Farmers often choose HYVs over biodiversity**

| | | |
|---|---|---|
| Impact (gets things done) | Seed selection built up by contributions from SFOs and NGOs | Potentials not utilized |
| Works for participatory processes | Rice/corn breeding and DIFDS being done by SFOs | NGO "**Bureaucrazy**" |
| Stimulated local/rural economy | Exchange of experiences and information | Plant breeders are too individualistic to cooperate (compared with animal breeders) |
| Revitalized local knowledge | Training/transforming research experience | |
| Availability of consultation from foreign and local expertise | Help from German NGOs | |
| Intensive cooperation to foster PGR due to common interest | Open sharing of information and materials | |
| Availability of funds from the West with some private sector participation | Substantial development is possible including indirect effects. | |
| | Farmers' demand for local crop diversity | |
| | Possibility to be flexible working the participatory way | |

### *c. Private Sector*

| VERY GOOD | GOOD | NONE | BAD | VERY BAD |
|---|---|---|---|---|
| ● (1 vote) | ● (1 vote) | ●●●●●●●●● (9 votes) | | |
| Finds the private sector very reliable, consistent and useful in what they say they will do | | | | |

# Working Group 3:
## Incentives and Reasons and Institutional Cooperation For Farmers'/Stock Keepers' Animal Genetic Resource Management

## I. Incentives and Reasons

| Ecological | Animal Qualities | Social and Cultural | Economic |
|---|---|---|---|
| The only possible land use strategy | Adaptability (e.g. catabol/anabol) | Indigenous knowledge | Multi-purpose use |
| "Bovine/arnica" pasture system | Robustness, good constitution | Social and cultural importance | Animal power |
| Dung | Disease resistance | Status | Dung |
| Availability of pasture that needs to be grazed | Selective browsing habits | Specialized communities | Serves like a "bank" |
| Selective browsing habits | Low feed and water requirements | They already exist within the community | Europe/India tourism |
| Large animals foster erosion in hilly areas | Low input requirements | Aesthetical and sentimental reasons | Milk and meat quality |
| Co-conservation with wildlife | Adapted to the climate | Educational value | Low labour intensity |
| | Availability of good male breeding animals | | Adequate price for rare breeds |
| | Character of animals | | India: subsidies for cart-pulling animals |

## II. Problem Analysis and Recommendations

| Problem Analysis | Recommendations | | | |
|---|---|---|---|---|
| Low information status about stock keepers<br>Bad environmental reputation<br>Low status of pastoralism<br>Rare breed = luxury | **More awareness needed among all institutions**<br>Set up information system that reaches pastoralists | | | |
| No markets | Create markets for rare breed products (e.g. camel milk) | Look for industry sponsoring | | |
| Not easily quantifiable<br>Complex systems | More research on rare breed qualities needed | Selection criteria should include conservation | | |
| Productivity paradigm<br>Narrow view of productivity | Revise productivity paradigm | | | |
| Lack of pasture land<br>Competition with nature conservation<br>Competition with cash/export crops | Respect pastoralists in land use planning | | | |
| Agricultural policies neglect pastoralists and favour "improved" breeds | | | | |
| | Involve pastoralists in policy decisions | | Agricultural policies in favour of pastoralists | Withdraw subsidies for "improved" breeds |

## II. Problem Analysis and Recommendations (continued)

| Problem Analysis | | Recommendations | |
|---|---|---|---|
| Institutional cooperation | | Not more institutions needed | Multilateral and international institutions should cooperate |
| Few isolated institutions, NGOs, government, universities, | Formal institutions do not accept informal priorities | More cooperation between them needed | |
| Individual farms | | Cooperation if have common objectives | |
| Foundations | | Define common objectives | |
| North/East: Breeding associations are leading | Objective: to support "improved" breed | Learn from Plant Genetic Resources (PGR) institutions | |
| In D.C. little cooperation | | Interaction between animal genetic resources (AGR) and Plant GR institutions needed | |
| South: village institutions are not known | | | |
| Better cooperation in East and North | | | |
| Government farms suffer from bureaucracy | | | |
| Does national law support or suppress animal biodiversity? | | | Document and respect informal law |
| No awareness of bio-piracy | | Increase awareness of bio-piracy | Monitor bio-piracy |

# Working Group 4:

## What can agricultural research do with regard to IPR?

Including IRRI

IPR will lose importance

Agricultural research should take position against terminator

Animal genetic resources are not discussed

Exempt patenting of life forms

**Recommendation**

Preblem:

Agricultural Research should...

CGIAR has no transparency/ accountability

IPR is a threat to biodiversity

IPRs are no incentive to agricultural research

GMOs are not needed for food security

GMOs do not increase productivity and access to food

Patenting creates a contradiction between bio-piracy and exchange of seeds

Even *sui generis* Plant Variety Protection (PVP) is not fostering exchange

Take positions in favor of farmers/stock keepers

Take position against IPRs in order to support farmers' rights

Foster farmers' rights to exchange and save seeds/ animal genetic resources

IPRs should not be applied to agriculture/life forms

Take action against bio-piracy (also IRRI) US tried to delete the *sui generis* clause

IPR discussions dominated by TNCs

US tried to delete the *sui generis* clause

TRIPS agreement to reconcile with the CBD

Expand geographical indication to cover agricultural products

Thai National Institute of Corn and Sorghum is against IPRs

# Working Group 5:

GMOs (crops, livestock) within and between species

Biotech Research at CGIAR should concentrate and stop at risk and need assessment

Agricultural science is to be seen in the context of all work done in rural areas

GMOs research should adhere to the highest possible safety standard

To orient research to contribute towards poverty alleviation (considering local potentials)

**POSITION:**

To do laboratory research may be acceptable **BUT...**

**DEMANDS:**

Re-orient biotech budget to biosafety research

We want a comprehensive safety framework

... and socio-economic impact assessment

Research on safety issues must significantly increase

Install participatory monitoring by all stakeholders (industry, consumers, farmers)

Public participation in risk discussions

The inadequate and incomplete protocol of Montreal must be strengthened/ corrected

CGIAR should play an important role to establish appropriate, scientific protocol for assessment of biotech standards

Biotechnology should only be used in appropriate places

# Working Group 6:
## Bio-piracy

### What is bio-piracy?

- **Earlier** the free exchange of genetic resources was used for the PUBLIC GOOD; bio-piracy then was the change that happens when exchange of germplasm ceases to be for the public good.
- **Now**, genetic resources are an "economic" resource that is patented and privatised. Bio-piracy now means the unauthorized use of genetic resources without prior informed consent (PIC) and material transfer agreement (MTA).

Bio-piracy is more clearly indicated in plant genetic resources (PGR) than in animal genetic resources (AnGR).

There have been some reported cases of bio-piracy in AnGR e.g. the Ongole cattle, which were taken from India for breeding programs but without proper compensation for use of such germplasm.

### Impact of bio-piracy

Bio-piracy impact on agro-biodiversity is difficult to monitor. But cattle germplasm from Asia has been crossed with German breeds but this has failed; otherwise, it could have had affected biodiversity (i.e. the native breed may have not remained intact).

It was noted that there could be cases where bio-piracy may help enrich bio-diversity – an example is the "cattle raids" in Kenya.

Greatest impact of bio-piracy is on the rights of communities e.g. when the Basmati rice of India and rubber from Brazil was taken out of these countries, these resulted to losses in the countries' export market and consequently, the loss of income for farmers. (Basmati rice could not be exported to the US if it has a patent there because doing so will be a violation of the US patent law.)

### Impact on Indigenous Knowledge (IK):

Bio-piracy implies piracy of knowledge.

Example: Patent was obtained for turmeric as a wound-healing ointment but this was challenged by India and was successful in showing "evidence of prior art" that the product given the patent was not a novelty.

Negative impact of bio-piracy in IK:

- The economic benefits shift from the community who conserves and owns the knowledge to companies who obtain patents for IK.
- Denies the credit that should go to IK.

## Recommendations: Strategies to control bio-piracy

1. At the international level:

   The acceptance of and compliance with the Convention on Biodiversity (CBD) particularly on the PIC and MTA (prior informed consent and material transfer agreements) that will ensure communities share the benefits of the germplasm transfer.

2. At the national/local level:

   i. To enact legislation that will look into the problems of bio-piracy and solve them. For example, a legislation that will treat "oral knowledge" at par with published documentation as evidence to show "prior art" in challenging patents made e.g. on IK.

      Related issues:

      - How does one prove "oral knowledge to be documented knowledge"?

        In Canada, oral evidence ingrained in tradition (e.g. through songs and dances) is taken seriously in courts, although it is a long and painful process. This means there is room for "customary laws" without necessarily coming up with written documentation.

      - Patents are covered by national laws (not by international laws) making it difficult for countries to challenge patents given in another country. There is need to put into the TRIPS framework an international context to bio-piracy.

      - Bio-piracy should be treated as a criminal offence and with stiff penalties. The problem is that many of the bio-piracy activities are carried out through the scientific research networks – need to have guidelines on this.

      - Forgeries of written materials/documentation are something to look into.

   ii. Awareness generation and vigilance at the level of communities, local officials and NGOs. For example, on understanding that taking out materials by tourists may constitute bio-piracy.

# List of Abbreviations

| | |
|---|---|
| AAN | The Alternative Agriculture Network, Thailand |
| AnGR | Animal Genetic Resources |
| CoFaB | Convention of Farmers and Breeders, India |
| DADIS | Domestic Animal Diversity Information System |
| GFAR | Global Forum on Agricultural Research |
| GTZ | German Technical Cooperation |
| HYVs | High-yielding varieties |
| NRM | Natural resources management |
| OAU | Organisation of African Unity |
| PGR | Plant Genetic Resources |
| PIC | Prior informed consent |
| WTO | World Trade Organization |
| BUCAP | Biodiversity Use and Conservation Asia Program |
| CBD | Convention on Biodiversity |
| CBDC | Community Biodiversity Development and Conservation |
| CGIAR | Consultative Group on International Agricultural Research |
| CIDSE | International Cooperation for Development and Solidarity |
| FAO | Food and Agriculture Organisation of the United Nations |
| GATT | General Agreement on Tariffs and Trade |
| GMOs | Genetically Modified Organisms |
| ILRI | International Livestock Research Institute, Ethiopia |
| IPRs | Intellectual Property Rights |
| RAFI | Rural Advancement Foundation International |
| MASIPAG | Farmer-Scientist Partnership for Development, The Philippines |
| MTA | Material transfer agreements |
| SEARICE | Southeast Asia Regional Institute for Community Education, The Philippines |
| SFOs | Small Farmer Organisations |
| TRIPS | Trade-Related Intellectual Property |
| UNICEF | United Nations Fund for Children |
| UPOV | Convention of the International Union for the Protection of New Varieties of Plants |
| WHO | World Health Organisation of the United Nations |

# List of Participants

## Experiences in Farmers' Biodiversity Management Schorfheide-Chorin, May 16-18, 2000

Ricardo C. Armonia,
CONSULTING TEAM, INC., PHILIPPINES

Rainer Barthel,
Landesanstalt fuer Großschutzgebiete, Germany

Wolfgang Bayer,
consultant, Germany

Patricia Bravo,
journalist, Chile

Angelina Briones,
Department of Soil Science, University of the Philippines Los Baños, Philippines

Rudi Buntzel-Cano,
Forum Environment & Development, Germany

Eyasu Elias Fantahun,
Soil Fertility Research Coordinator, SOS-Sahel Ethiopia

Ejigu Jonfa,
Farmer's Research Project of FARM Africa, Awassa, Ethiopia

Antje Feldmann,
GEH, Germany

Chiramwiwa Gawi,
journalist, Participatory Ecological Land Use Management, Zimbabwe

Hans-Peter Grunenfelder,
SAVE Foundation, Switzerland

Leopoldo Guilaran,
MASIPAG, PHILIPPINES

Susanne Gura,
International co-ordination of NGO activities accompanying GFAR2000, Germany

Hanwant Singh Rathore,
Lokhit Pashu-Palak Sansthan, India

Ulrike Herfort,
Landesanstalt fuer Großschutzgebiete, Germany

Carmen Hess,
facilitator, Germany

Anita Idel,
journalist, Germany

Mariam Jorjadse,
Biological Farming Association ELKANA, Georgia

Gesa Kluth,
Landesanstalt fuer Großschutzgebiete, Germany

Ilse Koehler-Rollefson,
League for Pastoral Peoples, Germany

Herbert Lohner

Annette von Lossau,
GTZ, Germany

Yvonne Mabille,
journalist, Germany

Charito Medina,
farmer, PHILIPPINES

Annette Meyer,
Landesanstalt fuer Großschutzgebiete, Germany

Pat Mooney,
Rural Advancement Foundation International (RAFI), Canada

Simone Neumaier,
translator, Germany

Eliud Kihoro Ngunjiri,
RODI, Kenya

Levan Paposhvili,
Agrobiodiversity Protection Society "Dika", Georgia

Wilhelmina Pelegrina,
Southeast Asia Regional Institute for Community Education (SEARICE), Philippines

Stanislau Ramanau,
Belorussian Association of Ecological Agriculture "ZemEKO", Belarus

Joel Rodriguez,
MODE, Philippines

Suman Sahai,
Gene Campaign, India

Gudrun Soergel,
administrator, Germany

Ute Sprenger,
journalist, Germany

Gabriele Stoll,
MISEREOR, Germany

Suksan Kantree,
Alternative Agriculture Network, Thailand

Govindan Venkataramani,
Agricultural Correspondent, THE HINDU, India

Rudolf Voegel,
Landesanstalt fuer Großschutzgebiete, Germany

Jean Marc von der Weid,
AS-PTA - Assessoria e Servicos a Projetos em Agricultura Alternativa

Beate Weiskopf,
GTZ, GERMANY

Witoon Lianchamroon,
BIOTHAI, THAILAND

Ralf Wysujack,
Landesanstalt fuer Großschutzgebiete, Germany

A group of workshop participants