PROCEEDINGS OF THE FSN FORUM DISCUSSION No. 50
**STRENGTHENING FOOD SECURITY BY EMPOWERING FARMERS TO CONTRIBUTE TO SEED BIODIVERSITY**
FROM 12 JANUARY TO 8 FEBRUARY 2010

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## I. GENERAL INFORMATION

Duration: from 12.01.2010 to 8.02.2010

Number of participants: 15

Number of Contributions: 16

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## II. INTRODUCTION OF THE TOPIC

Dear Forum Members,

My name is Maria van Heemstra. Biologist and agronomist by training, I have worked in genetics research and in NGOs focussing on agricultural and indigenous issues. Currently I am working within the Health and Healing project of the World Council of Churches (WCC)

The issue I would like to raise concerns the in situ conservation of plant genetic resources in a globalized world in which agriculture is increasingly industrial and based on monocultures of a limited number of plant species. **The trend for agriculture to be increasingly mechanized in the hands of fewer and fewer farmers cultivating larger and larger expanses of land is leading to a simplification of our landscapes and a reduction of our plant varieties**, whether directly related to food crops, or indirectly affecting agriculture by affecting climate, pollinators etc. For example in the United States and in Canada, for distances of some 1,800 km one can fly over fields planted to only two or three crop species. This simplification, homogeneous genotypes across large expanses of land, constitutes a threat to food security. An illustration of one of the consequences of this is that ironically bees have it better and produce more honey in the middle of Paris than in the countryside as they have access to a greater variety of flowers and are not exposed to pesticides

One aspect related to the simplification in agriculture is the **increasing concentration of seed production in the hands of a few large corporations**. In traditional subsistence agriculture production and reproduction (i.e. seed production) is not separated: farmers save seed from their own crops, thus developing many different local varieties which they continuously adapt to the changing conditions and their changing needs. However, these farmers, who have conserved a great genetic heritage and are holders of valuable knowledge about crops and are de facto plant breeders, are very vulnerable.

As one of the goals of the program I work in advocates for justice and the right to food, I am interested in hearing ideas, examples and experiences of people working in this area on the following questions:

- **How can we encourage subsistence farmers and indigenous peoples to continue to conserve this agrobiodiversity for the benefit of all humanity, while at the same time improve their living conditions and provide them with proper recognition and compensation?**
- **How can we raise the profile of these farmers so that the rest of the world is aware of and appreciative of their work and knowledge?**
- **Do intellectual property regimes applied to plant varieties protect subsistence farmers or rather do they reduce their access to genetic materials and contribute to genetic erosion?**
- **How can we ensure that the seeds being produced by large corporations are the ones needed by mankind and not only designed to make profits for the corporations?**
- **How can we bring biodiversity back into our landscapes and discourage the practice of widespread monocultures of single genotypes?**

Any responses or advice would help us in our advocacy work with the UN and other international agencies.

I thank all forum members in advance for their time and effort in contributing to this query for which I have a personal interest and passion.

Maria van Heemstra
World Council of Churches
Geneva, Switzerland

## III. LIST OF CONTRIBUTIONS

**Contribution by Romina Cavatassi from FAO, Italy**

Well,
this is a life- long type of debate!

Conserving agrobiodiversity is indeed of crucial importance both to achieve food security and to achieve sustainable development.

Unfortunately there is not a simple recipe for how to ensure the conservation of agrobiodiversity while at the same time ensuring that small farmers improve their living conditions or get compensation for that, even though a number of initiatives are taken in that sense (see the International Treaty on Plant Genetic Resources for Food and Agriculture, http://www.planttreaty.org/ particularly on access and benefit sharing).

However a set of different mechanisms and measures could and should work hand in hand in order to ensure a "sustainable use of Plant Genetic Resources" whilst at the same time help achieving "food security".

First and foremost, indeed, let us not forget that the most urgent challenge we are called to face is feeding a growing world population for which it is estimated the need of a 70% increase in world agricultural production by 2050 (Bruinsma, 2009). Reaching this goal will certainly require major improvements in crop production systems.
The production of staple food crops will remain the largest agricultural sub-sector in most countries and will keep playing an important role in meeting food security and agricultural development objectives in the future. However a sound management of Plant Genetic Resources will be a critical element in this challenge particularly in light of climate change. Maintaining and expanding agrobiodiversity in situ but also ex-situ through gene banks will thus be a crucial aspect to face this challenge (Lipper, Cavatassi and Keleman, 2009).

One way of increasing agricultural productivity is by improving farmers' access to, and use of, crop genetic resources. In this respect, agricultural markets represent a key vehicle for improving the farm-level supply of seeds and the crop genetic resources they embody. In addition, participating in agricultural markets can increase the returns to agricultural production, and thereby offer a pathway out of poverty (Lipper, Anderson and Dalton, 2009).
Even though trade-offs between market development and agrobiodiversity are often address, recent evidence based on case studies conducted in 5 countries show that local markets can be an important means of sustaining and even increasing some forms and measures of crop genetic diversity. Case studies' findings support the importance of programs and activities aimed at strengthening the informal seed sector and improving links to the formal sector of seed production.
For further information see:
http://www.fao.org/economic/esa/seed2d/projects2/marketsseedsdiversity/en/
and http://www.earthscan.co.uk/?tabid=92750.

Last but not least, a useful way to think about which and what kind of mechanisms could help in facing this challenge is to think of seeds and of the genetic resources they embody through the type of benefits they entail. Lipper and Cooper quite nicely group them into the following:

- Private benefits to farmers via the consumption and production values they derive from seeds.These are shaped by their own preferences and constraints, but also policies affecting the demand and supply of crop genetic resources;

- Local or regional benefits to farmers, and ultimately, consumers, when the choices of varieties (and their genetic content) make farming more resilient to biotic and abiotic stress;

- Global benefits to future farmers, plant breeders and consumers, when the choices they make protect against genetic erosion.

Benefits in the first category are private goods that accrue to farmers. The second category of benefits is a local public good, benefiting all farmers in a given area, whether or not they actually contribute to generating the good itself. The third benefit is also a quasi public good at the global scale.

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Romina Cavatassi,
Environmental Economist,
ESA,
FAO, Italy

**Contribution by David Olubiyi Ojo from National Horticultural research institute, Nigeria**

Well, what else shall I say than that. Romina shares my views in addition to what I contributed earlier in this forum.

Regards
Courtesy

**Contribution by Bhubaneswor Dhakal form Nepal**

Hi Maria

Your queries motivated me to write something in this discussion forum. It requires place and time specific strategies to encourage subsistence farmers and indigenous peoples to continue to conserve agrobiodiversity for the benefit of all humanity. I like to share my experience on degrading the agrobiodiversity of hill communities in Nepal which cannot be conserved by monetary compensation measures alone.

1. Nepali hill farmers including indigenous people are living at limited resources and often in harsh conditions. These people developed and followed agrobiodiversity to hedge against risk/ vulnerability from environmental variability and adapt to the stress conditions. Combination of many factors contributed to be developed and sustained the resources. Many traditional varieties response poorly with chemical fertilizer and require organic manure to grow successfully. Livestock was main source to produce the organic manure. The traditional varieties of some important species (e.g. cucurbite and legume

families) cannot withstand in chemical fertilizer regime. The varieties can grow as an intercrop in maize and tolerant better to drought and hail stresses. Now these varieties are lost in fertilizer intensive use areas. Traditional varieties of wheat and maize were considerably better in terms of diseases and pest resistance and suitable in poor soil of high altitude region. Farmers have drastically reduced the varieties due to reduction of farm manure production. Similarly traditional varieties grown in poor soil of dry region could withstand drought stress better in organic manure than in chemical fertilizer. People are abandoning the varieties which are largely contributed by reduction of farm manure production. Organic manure production from other methods is incompatible in these agroclimatic conditions. I have not seen organic manure in market for selling. Therefore money is not panacea of all problems in developing countries.

2. Women could play more vital role in the agrobiodiversity conservation in subsistence communities. Currently access resources are not enough to sustain traditional practices due to increasing cost of managing basic need goods and services. These people could make greater contribution on agrobiodiversity conservation if public forest resources are managed in favour of poor people including women.

**How can we raise the profile of these farmers so that the rest of the world is aware of and appreciative of their work and knowledge?**

Communication media and labelling of their products can be some means to raise their profile. Some business agencies and media have used these farmers' profiles to make their profit but its benefit is little transferred to them.

**Do intellectual property regimes applied to plant varieties protect subsistence farmers or rather do they reduce their access to genetic materials and contribute to genetic erosion?**

Animal and plant varieties are important means for human wellbeing and sustaining other live supporting systems. These important things should be managed as common properties and made access to everyone. The property right policy makes little difference in income for the people. It can be too costly to control the property rights. The intellectual property rights regime can limit access to these resources. Most powerful people and companies enjoy its benefit and poor farmers marginalise further.

No any plant variety is created artificially with technological power of seed production companies. All varieties are sourced from local varieties which were maintained by many people. Therefore it is not a genuine policy to give patent rights on varieties for private companies.

**How can we ensure that the seeds being produced by large corporations are the ones needed by mankind and not only designed to make profits for the corporations?**

It requires a good policy at national and international level to monitor the quality of seeds. Large corporations are very influential at policy levels. They use various strategies to influence policy decision makers. Bad governance is everywhere. Public pressures can reduce the bad governance and influences of large corporation on policy decisions.

**How can we bring biodiversity back into our landscapes and discourage the practice of widespread monocultures of single genotypes?**

Many factors have contributed adoption of monocultures of single genotypes. It requires many strategies and large efforts to increase biodiversity in production landscape and discourage the practices of monocultures. It needs change from government policy to social values on the products of monocultures to create incentives and disincentives for producers.

**Any responses or advice would help us in our advocacy work with the UN and other international agencies.**

The above discussion showed that promotion of livestock farming would contribute the agrobiodiversity conservation from various aspects in the regions. However, policies and practices of both national and international environmental are dictating local resource management in other direction (Dhakal 2009). The livestock farming of the poor farmers has been purposively reduced and controlled (Master Plan 1988) due to interventions of government agencies and international aid agencies and environmental INGOs (Edmonds 2003; Hausler 1993; Ives and Messerli 1989). Farmers cannot feed their livestock from their own production due to small land holding (national average landholding size = 0.8 ha). Supplies of fodder and pasture from community lands are declining due to interventions of bad policies and practices. These agencies have increased further worse interventions on resource management. For example, the government has declared to implement climate change mitigation policies (e.g. REDD programme and expanding national parks from 20 percent to 25 percent of national area) which are focused in those agrobiodiversity sensitive region. International agencies have played key roles to introduce the harsh policies and practices in the country with weak local institutions and bad governance. The policies and practices not only reduce livestock farming and other food production but also affect local economic activities which pressurise the farmers for abandoning the resources and migrating in other areas. If you work on bad governance of UN and other international aid agencies you can make some difference on problems of agrobiodiversity conservation, food security, and livelihood of poor farmers.

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**Contribution by Luigi Guarino from the Global Crop Diversity Trust, Italy**

Dear FSN Members

I would like to share with you the **Training Guide for In Situ Conservation On-farm**, I authored with my coleagues Jarvis, Myer, Klemick, Smale, Brown, Sadiki, Sthapit and Hodgkin and which I belive is of relevance to this discussion.
*In situ* conservation techniques are an effective way to improve, maintain and use traditional or native varieties of agricultural crops. In order to empower farmers to take on this important, yet challenging task, national programmes could be of great importance in providing assistance and guidance.
This manual is intended to provide a broad range of actors, including Ministries of Agriculture and the Environment, universities, research and extension institutions, non-government organizations (NGOs), and community based groups, with a comprehensive view of factors involved in designing and implementing a programme to support the *in situ* conservation of crop genetic diversity on-farm.

You can find the full publication here:

http://www.fao.org/SD/ERP/toolkit/BOOKS/A_training_guide_for_in_situ_conservation_on_farm.pdf

Best regards

Luigi

**Contribution by Edward Mutandwa from Rwanda Development Agency**

Dear FSN members,

This is certainly an important topic. Nowadays, food security is largely determined by the crops which have been ushered in by the Green Revolution including maize, wheat among others. Seed supply systems for these crops are driven by public research institutes, for example in Rwanda, by the Rwanda Agricultural Development Authority and the Institute of Agronomic Research (ISAR). However, for "orphan crops" that include traditional vegetables, seed supply is a constraint for rural farmers. From a recent study, that I am conducting, I found out that the majority of farmers do not have specific mechanisms of preserving seed biodiversity. Instead they rely on informal methods for example they dry seeds after harvest for re-use. Otherwise they rely on social capital to get access to seeds from these crops. The reason is that they are grown by so few people. To strengthen seed security and biodiversity, agricultural research institutes should have deliberate programs of mobilizing the existing genomes in the wild or within the community. They must also engage the communities to identify some of the lost species-which are being used today by few people. Within local communities, they are key informants who include traditional chiefs, local agricultural extension workers, and other influential people in the society (opinion leaders). Multi-stakeholder approach need to be adopted for enhanced food security.

Edward Mutandwa
RDA, Rwanda

**Contribution by Nidhi Tandon from Networked Intelligence for Development, Canada**

This is a useful manual (*Training Guide for In Situ Conservation On-farm, mentioned by Luigi Guarino, previous contributor to the discussion, Ed.*). Does anyone know if there are funds/grants we can access to translate some of these field manuals into Spanish and French? I have been training women in organic farming methods in the Caribbean using the Jamaica Organic Agriculture Movement's handbook but we are unable to train in Haiti, Cuba, Dominican Republic and others because the handbooks and manuals are in English.
Any advice is very welcome!

Nidhi

**Contribution by Joseph Opio-Odongo from Sustainable Development Services, Uganda**

Dear Edward,

I share your sentiments and endorse the need for some wise collaboration between farmers and the research scientists. However, that collaboration should be done in a manner that empowers farmers rather than merely *using them as a conduit for collecting seeds.*

Regarding the traditional methods of seed selection and preservation, we had a very interesting research experience with farmers in the early 1980s when I was teaching at Makerere University in Uganda.
Their criteria for selecting maize and bean seeds were impressive. So was the viability of their seed samples. We were able to obtain impressive germination rates on planting the seed samples.

Joseph Opio-Odongo
Director, Sustainable Development Services (SDS)
Kampala, Uganda

**Contribution by Marion Dublaska from Austria**

Dear FSN Members,

Let me join this discussion:
Farmers are the main stakeholders of rural development and do certainly play a pivotal role in the conservation and active promotion of biodiversity in situ. Monocultures are especially susceptible to large scale diseases as their limited genetic variety lowers the plantations resistance. Wheat Leaf Rust is just one of many diseases threatening entire regions.

Nevertheless I see the problem as more an economic than a moral one. Farmes should choose the method which gives them most benefit. Growing of genetically diverse species and the employment of crop rotation in order to preserve soil fertility versus growing monocrops or employing GM seeds are economic decisions. Farmers do have to be able to choose which method best suits their needs.
To be able to choose they need to be educated and informed proper extension services. I disagree that farmers should be given incentives to preserve seed variety other than their greater success, food security and wealth when farming biodiverse crops. It is therefore vital to strengthen public information and education of these farmers and to provide for independent extension services. Studies and farmers experience show that in certain conditions, especially concerning small-scale farming, maintaining crop diversity is by far the more efficient farming method. This should be the main reason for farmers to choose this road, as I believe that only the prospects of greater food security and wealth would prove to be a strong enough, enduring incentive. All other incentives, be they monetary, social or symbolic would prove sooner or later to be distortive, unjust and detrimental for social stability of any community.

Marion Dublaska
Graz
Austria

**Contribution by KV Peter from India**

Many reasons emerge for the food insecurity widely felt in developing and least developed countries. Rice, wheat and maize are the main crops cultivated for mass consumption so far. Potato is encouraged in Europe and North America. Soybean captured attention in North and South America. The emphases on tubers like cassava, sweet potato, yams, and millets in general, leaf vegetables, cucurbits, tropical carrots, tropical radishes etc. are quite minimal. Purchasing power of consumers in majority of developing and least developed countries is on decline. Investments in agriculture are also on decline. The above reasons coupled with natural calamities as happened in Haiti further lead to food insecurity.
I have serialised a 5 volume Underutilized and Underexploited Horticultural Crops (www.bookfactoryindia.com) and a 2 volume Biodiversity of Horticultural Crops (www.dayabooks.com) for understanding future crops and also the biodiversity existing.

Prof KV Peter Ph D
Director, World Noni Research Foundations,

India

**Contribution by Riccardo Rifici from the Ministry of Environment, Italy**

The expansion of monocultures and transgenic cultivation is increasingly taking advantage on local and traditional cultivations, with many specific social, environmental and economic consequences especially at the expenses of local communities. This model someone called "agriculture without agricultures" is expanding everywhere from Africa to Argentina as well as Europe and Italy in particular.
Rather than contributing to the production of better food for all and ensuring food security in the countries involved, this trend is driven by other types of interests and demands, among which is the rising demand for industrial livestock's feeding: a relevant percentage of crops from monocultures is estimated to be directed to the animal industry globally.
A specific industrial model of food production based on meat proteins intake is playing an important role in the expansion of monocultures and in threatening biodiversity.
Meat production is projected to double by 2020 due to increased incomes, population growth and rising per capita demand.
Unsustainability of industrial livestock has been widely analysed also by FAO and it is clear that the patterns of meat consumption actually present in rich countries, USA and Europe in particular, cannot be achieved by the world population. With the same energy input it is possible to growth around 7 kg of vegetables against 1 kg of meat.
This issue is quite well known but there is a great inertia in addressing it by intergovernmental agencies.
Limiting meat consumption per capita and building knowledge and awareness in citizens should be a priority, starting from the richer countries.
How can we contribute in limiting this?
- Strengthening consumer movements
- Enforcing local markets
- Promoting protein intake alternatives and educating on diet patterns with lower meat intake
- Directing public procurement / government expenditure

Many initiatives in this direction are already going on but are often still at a niche level.
Meat might not be the only driver of monoculture expansions but it is certainly an important one!

Riccardo Rifici
Sustainable consumption and production expert
Ministry of Environment
Italy

**Contribution by Claudio Buscaroli from Centro Ricerche Produzioni Vegetali, Italy**

Monoculture and biodiversity conservation is one of the most important problems in agriculture both in developed and developing countries. Monoculture has caused a significant increase in pests and plant diseases aggressiveness consequently stimulating the massive use of pesticides.
Actually the barrier that diseases find when they infect plants is very low and it is very easy for them to create systems to overcome plants defences. The availability of sprays in the last century has made the situation worse because it has caused the wide spreading of plant varieties with very good commercial and aesthetic value but without natural defences.
In our researches we have found that many old varieties no more cultivated since 30 years when cultivated again are often not infected from common diseases because pests, fungi and bacteria have lost the devices they specifically had to attack those plants. Therefore conservation of biodiversity is essential for sustainable, low impact agriculture.
OGMs such as rice enriched with Vitamine A are not the right way to solve food security problems: it would be much better to spread carrot or other Vitamine A cultivations different from rice to reduce monoculture.
What can we do to reduce the trend in monocultures increase?

- Empower subsistence farmers and indigenous people by supporting the creation of small seed reproduction and multiplication centres of their local varieties, that are run by the same farmers outside the common channel of seed companies;
- Raise the farmers' profile and expertise by promoting the exchange of information and experience with other farmers from Europe and USA and stimulate self-organization;
- Promote patenting local plant varieties: this would make people more aware of the richness of plant heritage they have and build stronger independence from multinational seed companies, thus avoiding the risk that somebody else takes advantage of plant heritage before locals. It is crucial that germoplasm remains free. It has already happened that a multinational company tried to patent ancient African and Indian plant varieties.

The creation of small seed reproduction company organized by indigenous farmers can stimulate big companies to produce local seeds, working together with local people, rather than producing only international varieties for monoculture

The above listed actions could be one way, although not the only one, to discourage monocultures!

Claudio Buscaroli
Centro Ricerche Produzioni Vegetali
Agronomist, Plant Breeder
Ravenna,
Italy

**Contribution by Sylvia Kanyiri Mbaabu from Kenya**

Dear FSN members,

In contributing to the current topic I would like to bring a few things to your attention.

Regarding knowledge on seed bio-diversity, you would be surprised about how informed the local farmers are on the seeds they use and on seed selection based on season, region and water availability. Hence development agencies organizations and donors should be more cautious when promoting that they are bringing knowledge to the local farmers though agricultural experts. But then again, having said that, it is important to keep in mind that farmers' knowledge (mostly inherited) is very much limited to the local seeds they have been using from generation to generation. The seed distribution system mostly based on social capital in terms of exchange and buying from the local markets as well had for years ensured the survival of local crops. However, these seeds are with time being replaced by the so-called enhanced hybrid seeds which usually need fertilizers and pesticides for realization of a good yield. Someone mentioned the continued disappearance of local fruits, vegetables or grain. Unfortunately with the continuing campaign for commercialisation of small holder agriculture, this will deteriorate further, mainly because most of these local foods are viewed as non-economical and are mostly for subsistence farming. The well-meant organizations whose missions are "to alleviate hunger and reduce poverty for small farmers", who have preferred crop choice to realize this mission, are endangering the local seed biodiversity further. It is understandable that helping of farmers to produce certain crops and getting them international market access mostly to big supermarket stores like Wal-mart would do wonders for their economic status, but then it is at the expense of local crops that will be sacrificed to create cultivation space for the marketable production. In most cases (from impact analysis on the field), the food security realised is in terms of economic access and not availability as the case should be. The increased income from sale of produce translates to higher purchasing power for food.

Consequently, the limited available local foods have become relatively expensive due to restricted availability with fewer farmers still engaged in their cultivation. These corporations and organisations despite having to make profits and for the non-profit ones realizing their objectives should look at impact on this other side of the coin.

Encouragement of the farmers to still keep portions of land for local crop production while committing the rest to the project production would go a long way in reducing or even terminating the extinction of local seeds. Again, the use of the farmer's knowledge in a participatory approach setting other than branding them as knowledge recipients would provide farmers the platform to contribute to seed biodiversity.

That's my two cents.

Thanks.
Sylvia Kanyiri Mbaabu
Kenya

**Contribution by B.P.Gangadhara Swamy from India.**

Dear All,

I take this great opportunity to share my views on the issue, as I had worked as a farm manager in a bio-diversity conservation centre for 2 years, which was working on farm conservation of landraces.

Landraces are nature gift for the people, which were developed over thousand of years, which sustained over natural calamities like drought, flood etc. Plants also respond to nature as we human beings do.

1) I have seen rice varieties with life cycle of 2-6 months, if the weather is very hot and with less rain, there exists a 60 days paddy, if weather is too cool with heavy rains, there exists a 180 days paddy, if soil condition is saline, there exists salt tolerating paddy varieties. Nature has provided food for all, but we have to explore it and should try to conserve it.

2) Yield should not be the single criteria to select and popularize a variety. Taste, pest and disease resistance, fodder quality and duration, tolerance to stress conditions are also the important parameters for a variety.

3) For every crop, there is a particular growing season; growing a crop all over the year will increase the pest and disease load and also yield will come down.

4) Indigenous Technical Knowledge (ITK) and Participatory Technology Development (PTD) should be part of all the agriculture research and there should be proper documentation of the traditional systems

Finally one question for all of us, is bio-diversity conservation the sole responsibility of farmers? What about others?

With regards
B.P.Gangadhara Swamy

**Contribution by Manoj Singh from Chandel Agritech Solutions, India**

Dear Members,

With a recent concern of food security issues at global level, there is urgent need to protect seed biodiversity especially in developing countries like India which has got rich biodiversity and this could be achieved by empowerment of farmers/ communities.
I would like to mention some of the initiatives led by various stakeholders such as farmers, communities, NGOs, Research Institutions, Government etc for protection of seed biodiversity in India.

**Save the Seed Movement in Uttrakhand**
High input-intensive techniques of farming lead to loss of several indigenous practices and seeds and one of the key needs was to revive these. This was the basis of the Save the Seeds Movement in Uttrakhand. A group of villagers, led by farmer and social activist started visiting remote villages in search of varieties of traditional seeds. After intensive travelling, the group collected as many as 250 varieties of rice, 170 of kidney beans and many others, which had been presumed 'lost' in the region. In the course of this search, a wealth of traditional knowledge was documented for the first time about different crop varieties that can survive well in the harsh conditions, requires less input and high yielding.

**Award Institution for Seed Sovereignty System**
An award was given by the NGO and civil society networks (called Coalition Against Biopiracy) to women and men farmers of the Deccan Development Society, Andhra Pradesh. Called the 'Best People's Defence'. An award was granted for organising successful seed sovereignty systems amongst dalit women communities in Medak district of Andhra Pradesh. Others who got the 'Best People's Defence' award were the Maize Network and Wixarika (Huichol) People of Mexico for their fight against GM contamination, and La Via Campesina for its global seeds campaign to assert the right of small farmers to their seeds.

**NGO partnership with communities for biodiversity resources**
One of the NGO in India has stated Integrated Management of Biodiversity Resources in Partnership with Communities. The major objective of this initiative is to concurrently conserve and utilize the rich agro-biodiversity held by poor tribal communities in three agro-biodiversity hotspots: the Jeypore tract in Orissa, known to be a secondary centre of origin of rice; Wayanad in the Western Ghats of Kerala, a Global Biodiversity Hotspot and Kolli Hills in Tamil Nadu, a site known for cultivation of a range of millets.

**The NGO established four different types of banks for communities:**

1. For ensuring food and seed security and conservation of biodiversity a linked series of **community banks** have been established.
2. **Field Gene Bank** (Land races with distinct characteristics are stored for long term) by NGO has been established, these landraces are accessed for their genetic material and the economic benefit arising from such use will go to the individual or the community who conserved the landrace.
3. **Seed Bank** - A facility for storage of excess seeds of farmers, which can be accessed during times of shortage or can be lent to other needy farmers who return seeds with a small interest.
4. **Grain Bank** - A facility for storage of excess grain, which can be lent and returned with interest to families in need. Grain banks ensure food security and also reduce the danger of seeds being consumed in times of stress.

**Organizing Seed Fairs**

Seed fairs generally take the form of temporary markets organized by NGOs to promote the trade of seed between farm households. Originally, seed fairs were viewed as a means to promote

sharing of a wide range of traditional crop varieties in order to promote agro-biodiversity. Farmers who had lost access to traditional varieties or crops could regain seed from their neighbours.

**Zero Energy Gene Seed Banks**

The international network of Gene Banks consists of cold Gene Banks which are very different from farmer level field gene banks. The former is an energy intensive bank maintained at low temperature, for long-term storage of genetic material. The latter, a model promoted by one of the NGO, is a labor-intensive bank with no energy costs. Both are for *ex situ* conservation of agro biodiversity.

Conservation is to set up community managed, field level Gene-Seed Banks. These Banks are simple rooms, which are moisture and light proof and well aired. The seeds of traditional varieties of rice, and other crops like legumes, oilseeds and vegetables are collected from the fields of farmers who are still cultivating them, usually in remote areas. At the time of collection information is recorded about the properties of each variety. This knowledge held by the farming community is extensive and detailed and documenting it faithfully provides a wealth of information about the genetic properties of crop varieties. It is farmers who reveal whether the variety performs well under drought conditions, is resistant to disease or has a short or long duration to maturity. This valuable information tells the scientists which traits to look for in which varieties. The seed samples collected from the field are scientifically processed to reduce moisture level and stored in glass jars for medium term storage and in baskets for short-term storage. The properties of the traditional varieties are characterized, and their genetic features are documented for use by scientists in research institutions.

Multiplication and renewal of the seed samples is done by a cycle of growing out each sample every alternate year so that the seed retains its viability. The routine growing out of the seed samples exposes the crop varieties to the prevailing weather and climate conditions, helping them to adjust and adapt. The seed material that is returned to the bank after every grow-out season is adapted to the environment, which includes the climate as well as pests and disease. The material frozen in the cold Gene Bank does not get a chance to adapt to the local climate and when it is taken out at a time of crisis, it may or may not have the adaptive capacity to provide an efficient crop under the prevailing conditions.

Because Zero Energy Banks are located in the village, they are owned by the people. Village youth committees supervised by village elders run the Banks. The seed in the Bank is accessed every season by the farmers who return three times the seed they take when their harvest comes in. The core collection is multiplied in carefully designed plots in farmers' fields, monitored by trained village youth and Gene Campaign staff. The material that is returned to the Bank after renewal is taken from the centre of the plot to avoid mixing.

Issues of food security should be concern for all whether it is Communities, Producers, Corporate, Govts. Or any other formal/ informal institution as food is the fundamental right of every human being. Therefore, there is need to strengthen the conservation efforts of seed biodiversity and protection and documentation of traditional knowledge of different crop varieties so that it could take care of present and future generations food requirements.

Regards

Manoj Singh
Agribusiness Consultant
Chandel Agritech Solutions Pvt Ltd

**<u>Concluding remarks by Maria van Heemstra</u>**

Many thanks to the FSN moderator team and to those who contributed to this difficult discussion, which, as one participant said, is "a lifelong debate". The discussion attracted 13 contributions. I

have tried to synthesize the responses according to the different questions. In general in my synopsis I have not tried to mention all the names of the authors of the comments.

Several contributors pointed out that one should not forget the main purpose of agriculture, which is to ensure adequate food and nutrition for the world's growing population. Therefore measures and mechanisms to ensure the conservation and use of plant genetic resources should work hand in hand with those to ensure productivity and food security while ensuring that farmers can make a decent living.

**Question 1. * How can we encourage subsistence farmers and indigenous peoples to continue to conserve this agrobiodiversity for the benefit of all humanity, while at the same time improve their living conditions and provide them with proper recognition and compensation?**

A number of approaches were mentioned including:

- the International Treaty on Plant Genetic Resources for Food and Agriculture, http://www.planttreaty.org/

-strengthening the informal seed sector and supporting the creation of local seed reproduction and multiplication centers run by local farmers, while also improving links to the formal seed production sector so that seed companies develop seed based on local needs rather than only international varieties for monocultures; promoting seed fairs;

-recognizing the benefits seeds bring to farmers, plant breeders and finally consumers;

- strengthening local markets (links to case studies: http://www.fao.org/economic/esa/seed2d/projects2/marketsseedsdiversity/en/

and http://www.earthscan.co.uk/?tabid=92750

- giving women access to public resources;

-engaging agricultural research institutions to identify and mobilize genetic resources existing in the communities but in a way which involves farmers, who have valuable knowledge about their local crops, in the collaboration rather than simply collecting seed from them;

-providing farmers with education and independent extension services so that they are able to make their own decisions as to what varieties would most benefit them, i.e. the incentive to preserve seed biodiversity should be driven by the inherent benefit of doing so for the farmer rather than an outside incentive for an abstract good to humanity;

- linking up farmers all over the world for exchanges of information and experience,

- doing more research on "orphan crops" rather than concentrating all research efforts on the major staple crops; also incorporating indigenous technology and participatory technology in agricultural research; in this respect links were provided to publications entitled Underutilized and Underexploited Crops www.bookfactoryindia.com and Biodiversity of Horticultural Crops www.dayabooks.com .

- emphasizing important criteria other than yield, for example pest and disease resistance, quality, tolerance to stress, ability to yield without expensive agricultural inputs, ability to yield in marginal areas, taste;

- enabling local seed banks organized by communities for farmers to store excess seed for use in times of need, together with the recording of the farmers' knowledge about these local varieties;

accompanying this, the regular growing out of samples of each variety to expose them to the varying climatic and environmental conditions so the varieties continuously adapt.

- maintaining grain banks for times of need to ensure that valuable seed is not eaten up in emergencies.

- encouraging farmers to keep some of their land in food crops for local consumption: in this respect the emphasis on cash crops for the global market was mentioned as a threat to agrobiodiversity without necessarily increasing purchasing power for food. Indeed, if the availability of food is reduced locally as a result of cash cropping, this could lead to increased food prices.

- A link to a Training Guide for In Situ Conservation On-farm was provided: http://www.fao.org/SD/ERP/toolkit/BOOKS/A training guide for in situ conservation on farm. pdf as well as links to

The importance of having this guide available in various languages was pointed out.

- a number of examples of initiatives were described by Manoj Singh: the Save the Seed Movement in Uttrakhand (an effort to collect and record the wealth of famers' knowledge about local varieties), the awards given by the Coalition against Biopiracy to local seed sovereignty systems, the linking of a field gene bank, a seed bank, and a grain bank to simultaneously conserve and use the rich agro-biodiversity in three agrobiodiversity hotspots in India.

**Question 2. * How can we raise the profile of these farmers so that the rest of the world is aware of and appreciative of their work and knowledge?**

Several participants emphasized the wealth of knowledge local farmers have about their crops, and also pointed out that this knowledge in general remains in the local sphere. Promoting exchanges between farmers all over the world was mentioned as a way of raising their profile and expertise. It was also suggested that the media as well as labeling of farmers' products could help to raise the profile of farmers.

**Question 3. * Do intellectual property regimes applied to plant varieties protect subsistence farmers or rather do they reduce their access to genetic materials and contribute to genetic erosion?**

There were few responses to this question. One opinion was that plant varieties should be managed as common properties accessible to all, and that formal intellectual property rights mainly benefitted the wealth companies to the detriment of the farmers. The importance of somehow preventing multinational companies from taking undue advantage of local plant varieties without local farmers benefitting was also mentioned.

**Question 4. * How can we ensure that the seeds being produced by large corporations are the ones needed by mankind and not only designed to make profits for the corporations?**

Policies to monitor the quality of seed, and good governance were considered essential to prevent large companies from influencing decision makers. Improving links of informal seed production to the formal seed production sector was also mentioned to try to get seed companies to develop seed based on local needs, rather than only international varieties for monocultures. Governments should promote research on orphan crops, and the use of a variety of foods to provide a good basis for nutrition as opposed to concentrating mainly on how to breed traits like vitamin A in rice as a sole strategy to fight malnutrition.

**Question 5. * How can we bring biodiversity back into our landscapes and discourage the practice of widespread monocultures of single genotypes?**

It was considered essential to raise awareness in rich countries about the effects that their model of food consumption, based on a very high level of meat consumption, was having on crop biodiversity abroad; it is driving the expansion of monocultures and transgenic crops for interests other than food security. Also mentioned as important: strengthening consumer movements, local markets, and nutrition education on how to reduce meat consumption with a view to changing consumption patterns and the agricultural model so they do not undermine crop biodiversity in other countries. This does not mean however that one should discourage livestock production in all countries: the policy of discouraging livestock raising in Nepal for example was reported to be reducing the availability of manure for fertilizing crops and subsequently leading to the abandonment of traditional varieties that did better with manure than with chemical fertilizers.

As a conclusion I concur with the final statement of B.P. Gangadhara Swamy, namely that the conservation of bio-diversity is the responsibility of all, not only that of the farmers.

**Contribution by Tirso Gonzales from University of British Columbia Okanagan, Canada**

Dear Dr. Maria van Heemstra:

Thank you very much for the Concluding Remarks.

The "lifelong debate" should not obviate the central relevance of the United Nations Declaration on the Rights of Indigenous Peoples, UNDRIP. This document is the template not only for indigenous agri-cultures, but for selfdetermined indigenous peoples' development. UNDRIP has been approved by the majority of Nation-States members after more than 12 years of discussion. I invite all the participants of the FSN Forum to take a good look at UNDRIP and its implications for the issues discussed in the Forum in question.
http://www.un.org/esa/socdev/unpfii/en/declaration.html

"The Declaration on the Rights of Indigenous Peoples was adopted by the General Assembly on Thursday September 13, by a majority of 144 states in favour, 4 votes against (Australia, Canada, New Zealand and the United States) and 11 abstentions (Azerbaijan, Bangladesh, Bhutan, Burundi, Colombia, Georgia, Kenya, Nigeria, Russian Federation, Samoa and Ukraine). Since its adoption, Australia has reversed its position and now endorses the Declaration. Colombia and Samoa have also reversed their positions and indicated their support for the Declaration

During the Durban Review Conference in April 2009, 182 States from all regions of the world reached consensus on an outcome document in which they " welcome[d] the adoption of the UN Declaration on the rights of indigenous peoples which has a positive impact on the protection of victims and, in this context, urge[d] States to take all necessary measures to implement the rights of indigenous peoples in accordance with international human rights instruments without discrimination…" (UN Office of the High Commissioner for Human Rights, Outcome document of the Durban Review Conference , 24 April 2009, para. 73)."

Below is the link to download the AWGIA Document # 127, which addresses issues surrounding the implementation of the recent UN Declaration on the Rights of Indigenous Peoples. The document also contains the full text of the Declaration.

http://www.iwgia.org/graphics/Synkron-Library/Documents/publications/Downloadpublications/Books/Making%20the%20Declaration%20Work.pdf <http://www.iwgia.org/graphics/Synkron-Library/Documents/publications/Downloadpublications/Books/Making%20the%20Declaration%20Work.pdf>

Kind regards,
Tirso Gonzales

The University of British Columbia Okanagan
Community, Culture and Global Studies
IKB School of Arts and Sciences
Kelowna, BC. Canada