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Banking for the future:

Savings, security and seeds

A short study of community seed banks in Bangladesh, Costa Rica, Ethiopia, Honduras, India, Nepal, Thailand, Zambia and Zimbabwe.



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Back cover photo: Woman dries melon seeds in Kigbara-Dere, Nigeria. Photo: George Osodi

CONTENTS

CHAPTER I: WHY COMMUNITY SEED BANKS?	4
SEED DIVERSITY AND CONSERVATION STRATEGIES	4
CHAPTER II: LINKING COMMUNITY SEED BANKS AND FARMERS' RIGHTS	5
COMPONENTS OF FARMERS' RIGHTS	5
HOW COMMUNITY SEED BANKS MAY PROMOTE FARMERS' RIGHTS	6
CHAPTER III: MAKING A CASE OF LOCAL EXPERIENCES	7
SUSTAINABLE AGRICULTURE SECURES BANGLADESH'S SEED FUTURE	7
FARMERS AS SEED PRODUCERS IN COSTA RICA	7
BRINGING TRADITIONAL VARIETIES BACK TO FARMERS IN ETHIOPIA	9
SAVING SEEDS IN HONDURAS: RELIEF WHEN THE WEATHER HITS	9
MEETING POOR FARMERS' NEEDS IN INDIA	10
INCREASING FARMERS' INCOME IN NEPAL	10
INVOLVING HIGH SCHOOL STUDENTS IN THAILAND	11
DISTRIBUTING MODERN VARIETIES IN ZAMBIA	11
SEED FAIRS PROMOTE SEED DIVERSITY IN ZIMBABWE	13
CHAPTER IV: ARGUING THE CASE FOR COMMUNITY SEED BANKS	13
WHY ARE COMMUNITY SEED BANKS ESTABLISHED?	13
WHO ARE INVOLVED?	15
HOW DO COMMUNITY SEED BANKS WORK?	15
DOCUMENTED RESULTS	15
CHALLENGES	16
CHAPTER V: UP-SCALING COMMUNITY SEED BANKS TO IMPLEMENT FARMERS' RIGHTS AND TOWARDS A SUSTAINABLE FUTURE FOR AGRICULTURE	18



CHAPTER I: WHY COMMUNITY SEED BANKS?

The global seed market has grown considerably the last decades into a multibillion dollar industry, largely due to more farmers purchasing seeds.¹ Despite the growth in the commercial seed sector, the majority of the farmers in the developing world still depend on the harvest season to collect seeds. They are therefore very vulnerable to the risk of crop failure, and even more so as weather patterns change drastically every year. Availability and reliability of seeds at the right time, as well as easy access, is crucial for poor farmers.

Seeds are related to food, culture, religion and local traditions. Taking care of quality seeds has always been a core task for farmers and farmers are constantly on the outlook for seeds that will give them the best harvest. Many farmers particularly in developing countries still maintain seed diversity on their farms, where seeds have been selected and conserved through generations.

Why is conserving seeds so important? Seeds are carriers of genetic diversity that contains the building blocks required for plant breeding and thus constitutes the basis of *all* food and agricultural production in the world. Plant genetic diversity is probably more important for farming than any other environmental factor, simply because it is what enables farmers to adapt to changing environmental conditions, such as climate change. There are many ways of storing seeds, one of which is through community seed banks.

Community seed banks are collections of seeds that are maintained and administered by the communities themselves. Seeds can be stored by a community either in large quantity to ensure that planting material is available, or in small samples to ensure that genetic material is available should varieties become endangered. As one researcher has put it: The aim [of seed banks] is to increase local seed security and contributing to the possibilities to continued utilisation of locally important genetic diversity.²

The work of small scale farmers with community seed banks is often integrated in broader programmes on agricultural biodiversity, that also have aspects of rural community development, including strengthening farmers' organisation and development of sustainable agricultural production systems³. When the community decides to establish and manage a seed bank, the community members will start a process of being organised. A robust local community, both in terms of locally adapted seeds, diversity of crops and strengthened local institutions, has better chance of adapting to changing conditions such as climate change.

However, in different communities farmers face challenges as how to best organise around community seed banks in order to maintain their livelihoods. This report links community seed banks to the implementation of Farmers' Rights to crop genetic diversity, before looking into different experiences with community seed banks in 9 countries in Africa, Asia and Central America, and makes some policy recommendations to circumvent common challenges of community seed banks.

SEED DIVERSITY AND CONSERVATION STRATEGIES

Community seed banks provide an important supplement to formal or official crop conservation strategies. During the peak of the Green Revolution in the 1960s and 1970s, the formal plant breeding research communities underestimated or even overlooked the benefits of traditional farming practises. Much emphasis on crop conservation and variety development was given to the institutional technologies of formal breeding and gene banks, known as *ex situ* (off-farm) conservation.

Ex situ conservation of genetic diversity, meaning the storage of seeds in freezers in gene banks is a well-established and recognised method for maintaining these important resources. The Global Seed Vault at Svalbard, which opened in 2008, is providing backup storages to the gene banks from around the world. But this kind of *ex situ* conservation has its limitations. Access for farmers is limited, the frozen seeds do not evolve, and the knowledge and culture of seed management may be lost.

Community seed banks are also *ex situ* systems, but they have the advantage of giving easy access to farmers, and is easy to link to constant on-farm conservation. *In situ* or on-farm conservation where farmers actively maintain diversity in their fields is crucial in order to continue the dynamic evolutionary process of local genetic diversity and its associated knowledge and culture. Furthermore, farmers maintain the control over their seeds.

Despite efforts of conserving plant genetic diversity, the Food and Agricultural Organisation of the United Nations (FAO) estimates that 75 % of crop diversity was lost between 1900 and 2000. One of the most important⁴ reason for the loss of seeds, and thereby the loss of genetic diversity, is the replacement of genetically diverse *farmers' varieties* (*traditional varieties*) with *modern varieties* (*improved varieties*). Modern varieties are products of formal plant breeding systems and give higher yields when cultivated under favourable conditions with the necessary inputs like chemical fertilisers and pesticides. Farmers' varieties, on the other hand, are products of careful and extensive selection by farmers: They are part of *informal* seed systems where farmers acquire seeds by saving them on his or her own farm or from other farmers who have done so. This strategy relies on the skills of farmers in maintaining, enriching and utilising crop diversity. The main selection criteria used are yield and yield stability, risk avoidance, low dependency on external inputs when selecting crops under low-input conditions, and a range of quality factors associated with storage, cooking characteristics and taste. In contrast, the formal breeding system has a more narrow focus on

1 Niels Louwaars (et al) (2009): "The future of plant breeding in the light of developments in patent rights and plant breeders' rights", CGN Report 2009-14 (EN).

2 Conny Almekinders (2001): "Management of Crop Genetic Diversity at Community Level", Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ)

3 See e.g. Lossau, Annette von, and Qingsong Li (Eds., 2011): "Sourcebook on Sustainable Agrobiodiversity Management", Social Sciences Academic Press (P.R. China)

4 FAO (2010): "The Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture", Rome



Community seed bank in India. Photo: Green Foundation

yield increase. Besides, modern varieties are genetically distinct from each other, uniform and stable (i.e. they fulfil the so called DUS criteria of formal breeding: distinct, uniform and stable).

CHAPTER II: LINKING COMMUNITY SEED BANKS AND FARMERS' RIGHTS

Regine Andersen⁵ and Tone Winge⁶

Basically, realising Farmers' Rights means enabling farmers to maintain and develop their crop genetic resources as they have done since the dawn of agriculture and recognising and rewarding them for this indispensable contribution to the global pool of genetic resources. The realisation of Farmers' Rights is a precondition for the maintenance of crop genetic diversity, which is the basis of all food and agricultural production in the world. Since farmers are the custodians and developers of crop genetic resources in the field, their rights in this regard are crucial for enabling them to continue this role. For this reason, Farmers' Rights constitute a cornerstone in the International Treaty on Plant Genetic Resources for Food and Agriculture, or the Plant Treaty. This treaty aims at the conservation and sustainable use of crop genetic resources,

their accessibility, and the sharing of benefits arising from their use.

Parties to the Plant Treaty recognise the enormous contributions that farmers have made, and will continue to make, in conserving and developing plant genetic diversity, and in making this diversity available. According to the Plant Treaty, the responsibility for realising Farmers' Rights rests with the national governments. The governments are free to choose measures according to their own needs and priorities. Measures suggested in the Plant Treaty include protecting and promoting traditional knowledge relevant to crop genetic resources, enabling farmers to participate equitably in the sharing of benefits arising from the utilisation of such resources, as well as in national decision making on related matters. Furthermore, the treaty addresses the rights that farmers have to save, use, exchange and sell farm-saved seed and propagating material. We will have a closer look at these components of Farmers' Rights.

COMPONENTS OF FARMERS' RIGHTS

Protecting traditional knowledge first and foremost means taking measures to halt this knowledge from disappearing. This can be done by collecting and documenting the remaining knowledge, sharing it to ensure continued use, teaching it to the younger generations, and encouraging its use. In some countries, stakeholders are concerned about protecting traditional knowledge from misappropriation. There are several examples of how this can be done while at the same time ensuring that the knowledge can be shared, for example in the form of catalogues.

5 Dr. Regine Andersen is senior research fellow at the Fridtjof Nansen Institute and director of the Farmers' Rights Project (www.farmersrights.org).

6 Tone Winge is research fellow at the Fridtjof Nansen Institute, working for the Farmers' Rights Project.

Benefit sharing is aimed at rewarding farmers who conserve and sustainably use crop genetic resources for their contribution to the global genetic pool. In other words: It is not limited to farmers who provide plant genetic resources to commercial breeding. The main instrument of the Plant Treaty to ensure benefit sharing is the Multilateral System of Access and Benefit Sharing. This system ensures facilitated access to crop genetic resources of specified species that are under the parties' control and within the public domain. A Benefit Sharing Fund is part of the Multilateral System and is distributing funds to projects in developing countries that support farmers in the conservation and sustainable use of crop genetic resources.

Participation in decision-making related to plant genetic resources is about farmers' participation in the development and the implementation of legislation, agricultural policies and programmes, as well as capacity building in this regard.

Ensuring the rights to save, use, exchange and sell seed is the basis for enabling farmers to further conserve and develop crop genetic diversity. These rights represent the very practices required for farmers' contribution to the global genetic pool. Among the laws and legislation that relate to this right are variety release and seed marketing legislation, as well as intellectual property laws (on plant variety protection and patents).

HOW COMMUNITY SEED BANKS MAY PROMOTE FARMERS' RIGHTS

Community seed banks contribute towards the realisation of Farmers' Rights in several ways⁷. First of all, they ensure diversified seed supply that is adapted to the growing conditions in the communities and the preferences of their inhabitants. Through their focus on maintaining and using local varieties, community seed banks help to protect *traditional knowledge*. Such knowledge survives when it is kept alive and practiced, and when farmers have easy access to seed from local varieties. Access is particularly crucial when traditional knowledge is in danger of disappearing, as is the case in many farming communities around the world. In some cases, community seed banks may even choose to focus on documentation of traditional knowledge along with seed storage. Such documentation is a good basis for awareness raising regarding the value of genetic diversity, as well as for wider sharing and participatory breeding of new varieties. Documentation is also a means to avoid misappropriation by preventing others from getting intellectual property rights to the plant genetic resources.

Moreover, community seed banks make farmers less dependent on seed supply from sources outside the communities. They therefore give farmers greater choice among the varieties and seed they deem most appropriate. Self-sufficiency in seed often boosts the self-confidence

of farmers and fuels empowerment, which in its turn is important for participation in *decision making*.

In addition, community seed banks may contribute greatly to the sharing of seeds among farmers, and thus to boosting their rights to *save, use and exchange* farm-saved seed. The degree to which they do so depends on how they are organised. Is the community seed bank a membership-based entity or in the public domain of the community? Can other farmers than those involved in the community seed bank receive seed samples from it? And at what conditions? This differs among different community seed banks.

Some banks cooperate with agricultural colleges and universities to document the collections, control the quality of seeds and multiply the most interesting varieties so that greater quanta can be distributed to each interested farmer. This also contributes to realising Farmers' Rights.

Often community seed banks have been initiated by non-governmental organisations (NGOs) or intergovernmental organisations (IGO). Such projects can be regarded as a type of *benefit sharing*, which targets farmers who contribute to the conservation and further development of plant genetic diversity. Functioning as a seed reserve for farmers when crop failure has destroyed their ability to use farm-saved seed, community seed banks improve the food security of farmers. They also provide an important basis for farmers to develop new varieties of crops, thereby improving their prospects for better livelihoods. As such, community seed banks serve as very concrete measures to ensure that farmers participate in benefit sharing.

However, so far such projects have only reached a limited number of farmers. To have a real impact for the farmers who serve as custodians of crop genetic resources, scaling up is required. No country has so far managed to scale up such activities to a national level. In most countries, agricultural extension services would probably provide the best institutional infrastructure to get started. Through capacity building in matters of crop genetic diversity, the establishment and use of community seed banks and nation-wide sharing of experiences, extension service officers could learn how to support communities. NGOs and IGOs with experience from community seed banks elsewhere could provide the capacity building, help setting up strategies and support with advice. Evaluating on-going community seed bank projects could provide important input to strategies and plans. And farmers from communities with seed banks could help conveying the knowledge and serve as examples to farming communities considering to set up such banks.

With regard to funding for such scaling up, the Benefit Sharing Fund of the Plant Treaty would be one relevant source for developing countries. Development cooperation agencies involved in the conservation and sustainable use of crop genetic diversity are another potential source.

⁷ See also research of the Farmers' Rights Project at the Fridtjof Nansen Institute (www.farmersrights.org).

CHAPTER III: MAKING A CASE OF LOCAL EXPERIENCES

Community seed banks have been set up in many countries. Here is a short visit to some in Bangladesh, Costa Rica, Ethiopia, Honduras, India, Nepal, Thailand, Zambia and Zimbabwe.

SUSTAINABLE AGRICULTURE SECURES BANGLADESH'S SEED FUTURE

The formal seed system only covers about 20% of the seed requirements in Bangladesh.⁸ The rest has to be covered by the informal seed system, which is challenged by floods and cyclones that destroy crops. The private research organisation UBINIG established a community seed wealth centre to address the problem of loss of crop genetic diversity and secure farmers' access to locally adapted seeds. Locally, UBINIG works with the movement *Nayakrishi Andolon* (New Agricultural Movement of Bangladesh). Their philosophy calls for changes in life style by practicing biodiversity-based ecological agriculture with no use of pesticides, minimal use of chemical fertilisers and careful use of ground water. UBINIG has set up several *seed huts*, which in principle functions as community seed banks.

According to Nayakrishi Andolon, seed conservation is an art belonging to women. *Women's Seed Networks* are bodies of autodidact and experienced women who provide technical capacity building to the community, give information to the seed wealth centre and take part in meetings. Both the centre itself and the management committee in each seed hut are run by women.

The seed network of 3000 farmers in the districts where Nayakrishi Andolon operates emphasises indigenous practices of seed maintenance. UBINIG has no mid or long term seed conservation system. The seeds are stored for limited periods in the houses of farmers, in their seed huts or at the seed wealth centre. Thus, UBINIG has to regenerate its seeds every year.

Any member of the movement can collect seeds from the seed huts if they promise to deposit double the quantity they received when the harvest is finished. The seeds are sold to other farmers of the village, and the cost of the seed huts is maintained from the income. All varieties are registered and a database of varieties is being maintained at each seed wealth centre and also centrally at UBINIG.

Management among farmers is based on collective decisions and information sharing. This is to ensure that, in every planting season, all available varieties at farmer's households are planted and seeds collected and conserved for the next season. Diversity is always encouraged as long as it does not become an economic stress on the farmer. Seed exchange is encouraged and this is mainly done through the women's seeds. The relation between Bangladesh's National Gene Bank and the community seed wealth centre is just starting to be examined. UBINIG has received 1500 rice varieties from the Bangladesh Research Institute which are now maintained in the community seed wealth centres. In addition, Nayakrishi Andolon sometimes receives technical support from, and collaborates with public research institutions.

FARMERS AS SEED PRODUCERS IN COSTA RICA

Many farmers in Costa Rica are organised in associations of producers. These units provide their members with an integral agricultural package and help them improve their income through multiplication of seeds. Both the collection of local seeds and the multiplication process in farmer's fields are done by researchers in close collaboration with seed committees consisting of farmers. In addition, the *National Institute of Innovation and Agrarian Technology Transfer* transfers materials and in some cases the National Producers Commission (CNP) reproduces seed.

The local materials collected are stored, developed and validated in research stations by scientists and farmers, based on seed committees' records of what materials are used and where they come from. Committees are also responsible for choosing breeding strategies. At present, striving for higher yields to satisfy the demands of the market has a higher priority than keeping diversity in farmers' field.

The national Costa Rican partner in the regional *Participatory Plant Breeding Programme in Mesoamerica* (PPB-MA) purchased a cold chamber at the end of 2008 that will function as a community seed bank for all the neighbouring producers' associations. But as of February 2011, the community seed bank is still not fully operational, due to lack of funds. Furthermore, opinion varies among farmers as to which seeds should go into the community seed bank, how this bank should be organised and what role should be assigned to the seed committees. Overall, conservation of seeds is at an early stage, since the main focus of the associations is to reproduce seeds for marketing.

8 C. K. Saha (2009): "Case Study Report on Community Based Management of Community Seed Wealth Center", Development Fund



1



2



3

BRINGING TRADITIONAL VARIETIES BACK TO FARMERS IN ETHIOPIA

Ethiopia is regarded as a secondary centre for durum wheat diversity. This diversity has been endangered due to the introduction of modern varieties of wheat, as well as by repeated droughts and unprecedented food crises in the 1970s and 1980s. To counter this development, researchers from the national gene bank at the Institute of Biodiversity Conservation (IBC) collected traditional varieties of durum wheat from different agro-ecological zones. In addition to this *ex situ* conservation, twelve community seed banks were constructed in six different districts from 1994 to 2002⁹.

The community seed banks aims at contributing to a sustainable conservation strategy and supporting seed exchange of traditional varieties among farmers. Banks are managed by the local farmers, who use them to exchange seeds of traditional varieties from diverse crops, such as wheat, teff, barely, lentil, beans and chickpeas. Having registered in crop conservation associations, farmers borrow and return seeds from the community seed banks. As interest on their seed loan, they are obliged to return more seeds than they initially received, thereby helping to increase the banks' seed stock.

One of the twelve seed banks is the Ejere Community Seed Bank, situated in the central highlands of Ethiopia. Since 2001 it has been managed by an NGO called Ethio-Organic Seed Association (EOSA) in collaboration with the IBC.

Through community seed banks, farmers' varieties that had been lost on farms were brought back from the national gene bank at IBC. At the same time, samples of the remaining diversity in farmers' field were collected. Now, the community seed bank in Ejere maintains about 90 accessions of durum wheat out of which 50 are under screening. Each year, the IBC undertakes renewal of this collection. EOSA, on its part, works to increase the interest of the private sector in agricultural products of traditional varieties for processing and trade. EOSA also provides training and direct technical support for farmers.

"People considered it a miracle when traditional varieties were brought back to their door steps after having been considered lost completely."

Tadesse Reta (45), farmer and member
of Ejere Community Seed Bank

SAVING SEEDS IN HONDURAS: RELIEF WHEN THE WEATHER HITS

In Honduras, as in most of the world, the commercial seed system is generally not designed with the interests of small-scale farmers in mind. The Honduran NGO Foundation for Participatory Research with Honduran Farmers (FIPAH) helps farmers organise community-wide research teams known as *Comités de Investigación Local* (CIALs). These farmer research teams identify the most pressing local agricultural problems and find solutions, one of which is the establishment of community seed banks. Here both traditional varieties and varieties improved through participatory plant breeding are stored.

Several CIALs have set up community seed banks to ensure that the poorest farmers always have access to quality plant materials. This helps to ensure that communities have a stable supply of food. In 2000, FIPAH assisted the establishment of one seed bank in the community of Santa Cruz in Yorito in Northern Honduras. Initially, the community seed bank focused on rescuing traditional varieties in the area. After receiving training, the community also started to provide seeds to its members.

During the flooding caused by a tropical storm in 2008, farmers in Yorito lost approximately 90 percent of their maize and bean harvest. The stocked seeds in the bank were immediately distributed to farmers and all farmers attached to the community seed bank managed to plant again when the storm stopped. The response was effective and no other relief service came so quickly and directly to the farmers rescue.

According to former, local CIAL leader, the late Don Luis Alonso, the inhabitants of Yorito were saved by its community seed bank. "After the flood, we distributed seeds to our members and other farmers in the community. Thus, we are less dependent on support from outside," said Alonso. This contrasts with the situation in 1997, when hurricane Mitch hit the country. Then farmers had to receive seeds from outside without being familiar with their quality or characteristics.

"Local varieties of wheat have low productivity, but give us considerable security since they withstand extreme and unfavourable climatic conditions and are less demanding in terms of management and input requirement. Their food preparation qualities are superior and highly demanded for specialty products such as local beer production. Productivity of local varieties, particularly in durum wheat, needs to be improved."

Getachew Admassu (52), farmer and member
of Ejere Community Seed Bank

⁹ Severin Polreich (et al.) (2005): "Assessing the Effectiveness of the Community-based Seed Supply System for in Situ Conservation of Local Wheat Varieties", paper presented at the Conference on International Agricultural Research for Development, Stuttgart-Hohenheim, October 11-13, 2005

Images opposite side:

1. Community seed bank in Rampur Dang, Nepal. Traditional seed storage structure made of bamboo for storing tubers. Photo: LI-BIRD.
2. Rice management in Northern Thailand. Photo: CBDC-Nan.
3. Visitors learning from diversity block established by the community seed bank of Kachorwa in Nepal. Photo: LI-BIRD

MEETING POOR FARMERS' NEEDS IN INDIA

In India, resource poor farmers face the dilemma of procuring expensive modern seeds with potentially higher yields or keeping traditional varieties that are less vulnerable to pest and disease and better adapted to varying climatic conditions. If the crop is lost, it is difficult for them to pay back the loans often obtained when buying modern varieties. Trying to improve this situation, the NGO Green Foundation focuses on strengthening community based biodiversity conservation. Their aim is to protect the ecology and encourage the small and marginal farmers to adopt sustainable agricultural practices. Among other things, Green Foundation motivated members of local Krushi self-help groups to establish community seed banks in a selected cluster of villages.

Each community seed bank has members from four to seven neighbouring villages. Self-help group members who are interested in conservation take active part in managing the seed banks. Green Foundation, on its part, trains farmers in seed selection, storage by traditional methods and record keeping and manages disbursements of seeds. Farmers receive seeds from the bank in return for double the quantity after the harvest. In times of crop failure, farmers compensate with other varieties which they hold and return the seed the next season.



1

Community sharing of information on seed varieties, storing capacity, germination, crop yields and disease resistance are crucial to enhance local knowledge of seed production. Female members are showing particular deep interest in saving and exchanging seeds, as well as in practicing traditional pest control measures. At present, Green Foundation facilitates nine functioning community seed banks in the district of Ramanagaram in South India, each providing 70-80 farmers with seeds every season. Farmers contribute to conservation of the traditional varieties by increasing the area under which the traditional varieties are grown.

Green Foundation also has a back-up gene bank in case a particular variety of seed is lost. The seeds are grown out seasonally and field days are organised to show the diversity within the gene bank. Researchers from the agriculture university and extension department are invited to the field days, where they share their expertise.

INCREASING FARMERS' INCOME IN NEPAL

As part of a global on-farm crop conservation project in Nepal, community seed banks have been established by the Nepal Agriculture Research Council and the NGO Local Initiatives for Biodiversity, Research and Development (LI-BIRD). The community seed bank in itself is managed by Agriculture Development Community Society (ADCS), a farmers' organisation.

The seed bank deals with a variety of local seeds as well as improved varieties. In addition, some rice varieties bred from traditional varieties with the technical assistance of LI-BIRD are included.

In collaboration with partner organisations ADCS collects, regenerates, multiplies and promotes diversity on-farm. The diversity and knowledge gathered through different techniques, such as diversity fairs, biodiversity registration and diversity blocks, have improved farmers' access to seeds of preferred varieties. To refresh seeds maintained in the seed bank and meet local demands, seeds of the crop varieties are regenerated each year.



2

The seed bank offers local people seeds of local origin as well as preferred improved varieties, and it empowers the community with respect to conservation, use and marketing. Farmers and farmers groups frequently visit the seed bank for technical input, facilitation of saving and credit schemes, business advice and funding for small scale businesses. This strongly suggests that ADCS is becoming a key institution in the area. However, maintaining seed quality has been a challenge for ADCS, as it lacks quality control mechanisms and trained man power.

The most important lesson learned from the project is that most crop varieties of local origin are maintained by wealthier households. Poorer farmers use those varieties, but are unable to invest resources for the sake of conservation for future use. In this situation, the community seed bank can maintain varieties preferred by small scale farmers, who often operate in marginal environments where local varieties are preferred. The seed access provided by community seed banks therefore directly improves the food security of small scale farmers.

ADCS has also established a diversity fund, which has been effective in raising the incomes of small scale farmers, including landless households. By accepting fund rules, those who borrow from the diversity fund agree to be responsible for the regeneration of one traditional variety. The fund thus strengthens small scale businesses *and* contributes to conservation of traditional varieties. Most of the diversity fund loan takers have been resource poor farmers or people from socially excluded and ethnic minorities.

INVOLVING HIGH SCHOOL STUDENTS IN THAILAND

In 2000, a seed bank was established in the mountainous Nan Province in North Western Thailand to solve common problems of insufficient seeds, poor seed quality and high production costs. The Thung Kong Community Seed Bank was initiated by Pin Kamsaen and her relatives. In her late 40s, Pin was illiterate but enthusiastic about sharing her traditional knowledge about seed saving and plant breeding. Staff from the NGO Joko Learning Centre recognised her qualities and gave Pin multiple training opportunities both locally and abroad.

Thung Kong Community Seed Bank has successfully integrated its activities into the local high school curriculum. With active support from the school's biology teacher, the community seed bank benefits from the weekly contribution in documentation and labour from Grade 11 students, as part of their science curriculum. Students help with planting and harvesting, as well as with recording properties of traditional varieties and new seeds. Some attend the Farmers' Field School on Saturdays during the growing season to learn additional techniques.

The establishment of Thung Kong community seed bank went hand in hand with the establishment of Thung Kong Farmers' Field School, initiated by Joko Learning Centre. The school curriculum is matched to each rice growing season and taught in an actual field. The on-farm research itself is taken up by individual farmers, notably Pin. With her rice field located next to the forest, Pin often discovers new genetic materials. She cultivates these varieties into seeds for propagation. Somkuan, treasurer at the community seed bank, breeds selected varieties that are put up for sale as foundation seeds to local buyers and other farmer networks.

Thung Kong Community Seed Bank receives some seed supplies from rice research scientists, from the government office in north-eastern Thailand and from universities in the northern region. Joko Learning Centre's technicians and rural development workers provide support on pest management and organic production techniques as well as advice on management of community seed banks. The Thung Kong Community Seed Bank also has a one-way relationship with farmer-breeders in the region. Members collect new varieties during study trips. In return, the seed bank serves as an educational model and initial seed supply for other farmer groups from across Thailand.

DISTRIBUTING MODERN VARIETIES IN ZAMBIA

Poor farmers in rural Zambia face problems in accessing good quality seed when they need it. This has frequently led to farmers doing their sowing late and consequently results in poor harvests. To meet these challenges, the British/Irish NGO Self Help Africa is working with seed grower associations in Northern, Western and Eastern provinces of Zambia, where community seed banks have been established. However, like some seed companies, these community seed banks rely on seed bred by the Zambian Agriculture Research Institute rather than promoting local crops and varieties. Thus, the community seed banks work as outlets of improved varieties.

The trained members of the seed growers associations participate in seed multiplication. Members have to pay a fee and are then allowed to buy shares in the association on which interest is paid whenever it makes money from bulk selling of modern varieties. However, seed companies and traders take advantage of informal sector seed producers' lack of a readily available market for the seeds they produce, and the insufficient training in marketing skills. Companies and traders buy seeds from them at very low prices, repack the same seeds with their logo on it and sell it at up to three or four times the price.

Images opposite side:

1. Seeds bags in Ethiopia. Photo: Ashnan Films, Canada
2. Farmers from Western part of Nepal visiting community seed bank at Kachorwa Bara, Nepal. Photo: LI-BIRD



There has been a general shift from using traditional varieties because they are late maturing and low yielding compared to improved varieties. This shift has been compounded by the many programmes that promote modern varieties such as the Farmer Input Support programme, which provides subsidised hybrid seed and fertilisers. Even the community seed banks of the seed growers associations tend to promote only the use of improved varieties.

SEED FAIRS PROMOTE SEED DIVERSITY IN ZIMBABWE

In 1991/1992 a severe drought contributed to genetic erosion in Zimbabwe's agriculture. As a response, the NGO Community Technology Development Trust (CTDT) set up community seed banks in close consultation with communities. These were to provide back-up facilities for farmers' varieties, capture traditional knowledge and enable farmers' access to local seeds of reasonable quality.

One such bank is The Uzumba Maramba Pfungwe Community Seed Bank, established in 1998. It is located in a semi-arid area and serves four different administrative areas. There are two rooms in the building constructed to be relatively cool, maintaining a temperature ideal for seed storage. Seeds brought to the bank undergo a thorough cleaning process, to rid the seeds of pests and diseases. Germination tests are conducted every two years to assess seed viability. Seeds with low germination percentages are regenerated.

The Uzumba Maramba Pfungwe Community Seed Bank is managed by farmers. The community elects a management committee responsible for the coordination and management of all activities. Both CTDT and the government's agricultural extension services provide technical assistance and capacity building to farmers. The National Gene Bank also collaborates by providing materials and seeds to the bank as well as technical management.

Collection and cleaning of seeds are done by individual households and farmers who have been capacitated in seed handling. Because of socio-economic and cultural norms and values, women play an important role in communal farming and are therefore largely contributing through seed selection in the fields, cleaning and bringing seeds to the community seed bank as well as participating at seed fairs. Youth participation is minimal; only a few are engaged in conservation bring their seeds to the bank. Many young people are not interested in farming and many have moved to cities looking for employment.

The community seed bank functions as a meeting place for farmers to exchange information and local knowledge on crop genetic diversity. In order to increase awareness, seed fairs are conducted at the community seed bank every year and at national level biannually. These fairs provide an additional meeting forum for farmers. They also enable communities to evaluate the level of diversity and to assess and monitor genetic erosion.

CHAPTER IV: ARGUING THE CASE FOR COMMUNITY SEED BANKS

As can be seen from the previous chapter, different forms of community seed banking practices are being promoted in different countries. Some are highly specialised in collection, regeneration, distribution and maintenance of local crop diversity and documentation of associated information and traditional knowledge. Others are engaged in production and marketing of seeds of improved farmers' varieties. The present chapter sums up the lessons learned from the cases examined and presents some current and future challenges.

WHY ARE COMMUNITY SEED BANKS ESTABLISHED?

Most community seed banks in the presented case countries have been established to combat seed insecurity. Such insecurity is mainly due to drought causing crop failure (e.g. in Ethiopia and Zambia), flood and cyclones (e.g. in Bangladesh) and introduction of modern varieties and policies promoting it through subsidies or by other means (e.g. in India, Nepal, Thailand, and Zimbabwe). Modern varieties are increasingly replacing traditional ones. They are expensive for small scale farmers and hence inaccessible. In addition, in the cases examined, introduced modern varieties have not met local needs and thus have failed to adapt. This failure is particularly evident in the case of irrigated and paddy rice growing areas in India, Nepal and Thailand, as well as in growing areas for maize in Zimbabwe and maize and beans in Honduras. In the case of Zambia, focus on traditional varieties is almost non-existent. Here, community seed banks mainly provide improved varieties; the issue of conservation is not taken into consideration in bank practice and management.

In some countries (e.g. Costa Rica) the motivation behind the seed bank is for marketing high quality seeds of improved farmers' varieties and modern varieties at community level. This differs from the "traditional" goals of community seed banks: addressing the challenges of seed insecurity in times of shortage and human and nature induced calamities, in addition to on-farm conservation of crop genetic diversity.

WHO ARE INVOLVED?

Farmers are the primary stakeholders in the community seed banks approach for primary management of agricultural biodiversity. Their knowledge of agro ecosystems, crops and varieties, have been central in the management of community seed banks. Farmers have elected committees to manage the seed banks (e.g. in Ethiopia), while in Costa Rica and Zambia farmers were organised in seed producing associations.

Images opposite side:

1. Seeds at display in India. Photo: Green Foundation.
2. Seed storage in India. Photo: Green Foundation.
3. Traditional storing of rice seeds, taro cormel and potato tubers in community seed bank in Gadariya, Nepal. Photo: LI-BIRD



All community seed banks in the case studies were initiated or supported by NGOs. The NGOs played a useful role in organising and training farmers in collaboration with different national institutions. However, high reliance on NGOs is a challenge for the sustainability of community seed banks. This challenge seems to have been overcome in Nepal, where farmers managing community seed banks have established a community biodiversity management fund, which is being used for conservation and development of plant genetic resources and improving livelihoods of the target group. Generally, community seed banks in many cases have remained innovative demonstration examples. They have not received the institutional support required for a scaling-up that would make them part of larger strategies for conserving crop genetic diversity.

In some cases, national gene banks have served as a source of diversity in varieties for farmers managing community seed banks. In some of the examined cases, gene banks restored lost varieties to certain areas through farmers (Ethiopia). In Zimbabwe, the national gene bank works in close collaboration with the community seed bank by providing materials for restoration of local varieties. Here, the national gene bank also acts as a backup for varieties. However, in most of the case countries there is a loose connection between gene banks and community seed banks, that is, between *ex situ* and on-farm conservation.

Agricultural research institutions are involved in training of farmers in breeding, plant variety selection, seed production and storage (e.g. in Nepal, Thailand and Costa Rica). They provide farmers with pre-breeding materials for further selection and seeds for multiplication. Furthermore, research institutions are interested in using organised farmers as outlets for distributing their varieties and even multiplying them (e.g. in Zambia).

Sometimes governmental agricultural extension offices collaborated with community seed banks to promote modern varieties (e.g. Zambia). On the other hand, in Thailand and Nepal, agricultural extension offices were used to promote farmers' varieties that were improved through Participatory Plant Breeding and Participatory Variety Selection in addition to modern varieties from the formal sector. Thus, the role of agricultural extension in management of crop genetic diversity varies, depending on the activities of the community seed banks.

HOW DO COMMUNITY SEED BANKS WORK?

The operational modalities of the community seed banks differ from country to country. In Ethiopia and Bangladesh, members of community seed banks access seeds on loan basis. The approach in this case is similar to micro credit where seeds replace money. In these cases, farmers are pleased with saving money on fertiliser that would be required if they were planting modern varieties. Moreover, they get access to the varieties they appreciate and have knowledge of. The community seed banks are mostly managed by elected committees.

Images opposite side:

1. Seed sacks and germplasm reserve in Ejere community seed bank in Ethiopia. Photo: EOSA
2. Traditional seed storage structure made of bamboo and mud, Nepal. Photo: LI-BIRD
3. Rice display in Northern Thailand. Photo: CBDC-Nan

Most community seed banks reach out also to non-member farmers. For instance, farmers managing community seed banks in Ethiopia, Nepal, India, Thailand and Zimbabwe are selling seeds to non-members. This implies that community seed banks, in addition to conserving and enhancing traditional varieties, can be transformed into viable and self-sustained seed business entities.

The case from Zambia shows that participating communities were also engaged in multiplying seeds based on parent lines of a very limited number of varieties given to them from the country's breeding stations. They have also assisted with selling the multiplied seeds. The same documentation shows that the Zambia Agricultural Research Institute has produced some of the crop varieties for seed production by use of the community seed banks. However, these variety development activities did not fully involve farmers. Efforts were made to collect local varieties for various crops under the community seed banks programme in Zambia, but it did not manage to distribute seeds to members for reproduction. Furthermore, a seed company took advantage to peddle its varieties. In this case, the idea of community seed banks seems to be misunderstood by implementers.

DOCUMENTED RESULTS

First and foremost, community seed banks improve farmers' access to seeds. In most countries, the formal seed system does not meet the needs of farmers either in terms of quantity (e.g. in Bangladesh, it constitutes only about 20 %) or quality with its narrow focus on modern varieties – or at a cost affordable to poor farmers. Most of community seed banks distribute to members and non-members alike. In India and Nepal, access to seeds for resource poor farmers has been given particular attention. In Honduras and Bangladesh, community seed banks improved access to seeds after harvest loss. Due to the prioritising of modern varieties by government programmes, farmers' varieties are not distributed in the formal seed system. Community seed banks can therefore be a tool for farmers to access traditional varieties (e.g. in Nepal, Zimbabwe, Bangladesh, India and Ethiopia), but also improved varieties. Thus, community seed banks function as locally accessible *ex situ* conservation of crop genetic diversity.

Traditional knowledge is documented and shared among members of community seed banks. This is especially valuable in situations where the farmers' varieties are disappearing but the traditional knowledge can be used to promote its rehabilitation. In Thailand, traditional knowledge is also reaching younger generations by being integrated in the high school curriculum.

Empowerment of farmers is an important outcome of the establishment of community seed banks. This indicates that farmers have got the necessary skill and knowledge in seed selection, breeding, seed production and role of diversity of crops and their varieties in farming. Community seed banks promoted bulk selling of produce and allowed for its members to be trained in local seed production and management. They also improved farming systems (e.g. in Thailand, Costa Rica and Nepal). Through methods like Participatory Plant

Breeding (PPB), Participatory Varietal Selection (PVS), crop rotation and crop diversification, community seed banking helped increase productivity and household food security, and improved nutrition. This kind of farming also demonstrates sustainable agricultural practises.

In economic terms, banking contributed to increased disposable income from the sale of surplus seed and produce for farmers' groups. In Ethiopia and India, for instance, such income has been used to meet various household needs, including acquisition of assets and agriculture inputs, and starting up small business enterprises. More generally, the affiliated farmers regard the seed multiplication through community seed banks as an opportunity to generate income (e.g. Zambia and Costa Rica). This is so because seed for the next planting season can be stored in proper conditions and still have good yields and germination. As an additional benefit, if a variety is not requested by the market its seed can be saved for more advantageous market conditions. In fact, community seed bank projects are more likely to succeed if seed marketing is included.

Overall, the commitment of women in farmer groups managing community seed banks outweighed that of men. Home garden fruits and vegetable varieties managed by women helped farmers understand the importance and value of diverse seeds of vegetables required for different growing seasons (e.g. in India and Bangladesh). Female members of community seed banks are showing deep interest in saving and exchanging seeds for purposes like household nutrition and cultural uses of certain crops. Their knowledge of seed storage, aptitude for nurturing with patience and ability to save seeds for future seasons often make women better than men at managing seed banks. Female farmers practice several pest control measures while saving seeds.

Many farmers cultivate both modern and traditional varieties. They try commercial varieties without necessarily discarding their own. That's when ideas of combining the better of the two worlds through participatory plant breeding came up. If farmers grow 'low-yielding' farmers' varieties, it is usually because those varieties are the best under local circumstances or because of specific merits that are missing in the commercial 'high-yielding' varieties. If the community seed bank networks involve themselves in participatory plant breeding they would usually try to combine the high yield potential of commercial varieties with the attractive traits in their own local varieties.

CHALLENGES

Community seed banks still face many challenges. Among them are: lack of markets for farmers' varieties; inadequate capacity and knowledge in marketing seeds; inadequate storage facilities; lack of manpower during peak seasons; insufficient seed quality; late distribution of seeds and late payments for the seeds loaned, as well as high dependence on NGOs or a few dedicated farmers. The different farming committees running the seed banks meet these challenges in different ways.

Challenge number one, however, is at a higher level than what can be solved at community level alone: Governments' agricultural policies prioritise high yields through intensification (increased use of modern varieties and intensification of agricultural inputs). Both research and government extension services are focused on improved varieties in combination with chemical fertilisers and pesticides. Training and orientation of development/extension agents is also geared towards the implementation of accelerated productivity and growth strategies, with little or no relevance to the conservation and utilisation of local genetic diversity due to lack of understanding and appreciation. There is also the danger of creating the impression among farmers that their traditional varieties are inferior and this may contribute to erosion of genetic resources and loss of related traditional knowledge.

Farmers also want high yields, but high-yield technology packages may be difficult to adopt for economic reasons, for lack of agro-ecological adaptation (they do not fit farmers marginal land), or for having other negative impacts like harming the environment. Care should therefore be taken not to miss the target group (seed insecure poor farmers) and the banks' "traditional" objectives of conservation.

Today, countries lack legal frameworks and institutional support to community seed banking. They also uphold restrictive laws, such as seed certification based on the criteria in the formal seed system of distinct, uniform and stable. As a result, farmers cannot market branded seeds coming out of their efforts. This situation threatens the sustainability of the seed banking concept itself. Under current legal and policy regimes, it is hard for farmers through community seed banking to combine modern and traditional seeds as they prefer.

In cases where traditional varieties are not so attractive for local farming communities any longer, it is not the sole responsibility of farmers managing community seed banks to conserve them. The next chapter looks at steps needed to be taken in order to up-scale community seed banks.

Images opposite side:

1. Rice seeds, Nepal. Photo: LI-BIRD
2. Conservation of traditional varieties, Ethiopia. Photo: EOSA
3. Rice and finger millet seeds, Nepal. Photo: LI-BIRD
4. Inside the community seed bank in Kachorwa, Bara, Nepal. Photo: LI-BIRD





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CHAPTER V: UP-SCALING COMMUNITY SEED BANKS TO IMPLEMENT FARMERS' RIGHTS AND TOWARDS A SUSTAINABLE FUTURE FOR AGRICULTURE

To fully reap the benefits of community seed banks in enhancing farmers' access and control of seeds, as well as their contribution to the conservation and sustainable use of crop genetic diversity, we will end this report with a set of policy recommendations.

Governments should:

- * Establish and/or support community seed banks as part of their obligations to implement Farmers' Rights and other provisions of the Plant Treaty, such as sustainable use and conservation of crop genetic diversity. Parties should support the up-scaling of community seed banks in order to reach as many farmers as possible, especially in marginalised areas.
- * Integrate community seed banks in broader programmes on agricultural biodiversity, where the local seed banks should serve as a storing place for results of participatory plant breeding and participatory variety selection, and make such results accessible to farmers. Seed banks should also be venues for seed fairs for farmers to exchange and display their seed diversity.
- * Include community seed banks in governments' agricultural development strategies as a vehicle for adaptation to climate variability. Agricultural extension services would provide the best institutional infrastructure to embark on a scaling up of local seed bank experiences to a national level.
- * Revise seed regulations and provisions on intellectual property rights to seeds to ensure Farmers' Rights to save, use, exchange and sell farm-saved seeds.
- * Redirect public subsidies from promoting modern varieties to fund the above mentioned activities.

1. Maize and bean seeds in Honduras. Photo: Development Fund
2. Community seed bank in Rampur Dang, Nepal. Traditional seed storage structure made of mud. Photo: LI-BIRD.

***Agricultural Research Institutions should:***

- * Ensure that farmers are given an informed choice between traditional and modern varieties. Extension services and government agricultural policies should be reviewed as to ensure this balance. There is a need to democratise agricultural extension systems so that it provides all kinds of information (e.g. about the role of formal and informal seed systems) in a transparent way without putting farmers' varieties to a disadvantage.
- * Extend their expertise and services for free to assist and support communities and NGOs in setting up and maintaining community seed banks. Their assistance and support should be based on the actual needs and capacities of the communities and local organisations seeking their expertise.
- * Facilitate the access of communities and NGOs setting up community seed banks to other *in situ* as well as *ex situ* sources of seeds, if necessary and when required. They should help provide linkages among communities engaged in community seed banking and relevant institutions and organisations that may be able to support such efforts. Community seed banks are the bridge between *in situ* and *ex situ* conservation. Through them, national gene banks should make their acquisitions available to farmers.

Commercial seed sector should:

- * Contribute to the Benefit Sharing Fund of the Plant Treaty, which in its turn should make sure that sufficient funds for supporting community seed banks are in place. The cost of conserving crop genetic diversity should not be borne by resource poor farmers in the Global South, but be shared by all who benefit from the commercialisation of this diversity.
- * Multiply and produce farmers' varieties for increased availability of locally adapted seeds.

NGOs should:

- * Adopt a mechanism to share their skills and knowledge in establishing and maintaining community seed banks to interested communities, farmers' organisations and other NGOs in and around the countries where they are based. The main role of NGOs is to promote community seed banks until governments have incorporated such banks in their formal systems like agricultural extension services.
- * Strengthen community based management of agricultural biodiversity and avoid using community seed banks for promoting only modern varieties.

“All States should: Support and scale-up local seed exchange systems such as community seed banks and seed fairs, community registers of peasant varieties, and use them as a tool to improve the situation of the most vulnerable groups,..”

Mr Olivier De Schutter, UN Special Rapporteur on the Right to Food, speaking at the 64th session of the UN General Assembly (October 2009)



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