Global Study on CBM and Empowerment

Nepal Exchange Report

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Global CBM Study Programme - Brazil, India, Ethiopia and Nepal

Wageningen University and Research Centre/Centre for Development Innovation
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In collaboration with:
Local Initiatives for Biodiversity, Research and Development (LI-BIRD), Pokhara, Nepal

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Contents

1. Introduction

The Global CBM study project began in 2009, with the objectives of analyzing the contribution of CBM as a methodology to empower communities and strengthen the scientific basis of CBM; and to analyze the experiences of the community management of agrobiodiversity in four countries that are known for playing a critical role in the global plant genetic resources (PGR) debate. The study sites of this project are located in Ethiopia (EOSA), India (MS Swaminathan Research Foundation and Bioversity International), Nepal (LI-BIRD) and Brazil (Embrapa and the Federal University of Santa Catarina).

LI-BIRD, with support from Wageningen University and Research Centre – Centre for Development Innovation, Wageningen, the Netherlands (Wageningen UR/CDI), organized the exchange visit to Nepal, from 23 August to 12 September 2010.

The participants of the exchange visit were referred to as 'hosts', representing the national organization LI-BIRD, and 'visitors', representing members of the three CBM partner countries - India (Kartik Charan Lenka from MSSRF and Manohar Sungar from the Department of Forest Biology, College of Forestry, Sirsi, on behalf of the Tropical Fruit Genetic Resources Project); Ethiopia (Habtamu Seboka Tura from Haramaya University, through EOSA) and Brazil (Alice Tempel Costa from Embrapa Clima Temperado). The objective of the programme was to build the capacity of CBM professionals to understand and demonstrate CBM in different social, political, ecological and economic contexts. It was also hoped that the shared knowledge-base, the exchange of experiences/ideas and exposure to grassroots level activities would contribute to developing a global understanding on 'what is the relation between CBM, *in situ* conservation and empowerment?

This report is the conclusion of the collective process where participating members expressed their observations and lessons learned. The report has been organized into nineteen different chapters and provides a general reflection on the components, processes and practices of CBM in Nepal. Different CBM sites were characterized and brief profiles of each of them have been provided. The report covers a wide range of key issues relevant to CBM, for instance, the historical, cultural, ecological, and economic drivers of each site were provided to understand what the major drivers for CBM are. At the end of report a general synthesis was provided to reflect on the participants' views and future priorities of the CBM study.

2. Methodology and process

Background Material on ToR:

Before the beginning of the exchange programme, a document with terms of reference was developed and circulated among all the members of the CBM community. This document has 5 steps and provides an outline for the exchange program process. It was divided in two sections, each sections is compounded by topics. The teams should address those topics in a comprehensive and empirical manner, during interactions with communities, farmers, community leaders and stakeholders.

Formation of working groups:

Two working groups were formed to carry out the tasks outlined in the ToR. The responsibilities were divided out between the groups but all the information was circulated between all the team members.

Visits to field sites:

One or two whole days were spent in each site in order to discuss and understand the CBM practices of the sites. The activities included some farm visits, discussions with community members and leaders and with LI-BIRD staff.

Sharing of information, brainstorming & data analysis:

After visiting each site, the group had one day to write the report. After the last site visit the group worked together to finish the data analysis and conclude the exchange.

Final reporting & submission:

The development of the final report was carried out in parts/pairs. Each section was reviewed once or twice by someone other than the author(s). The Brazilian report was also used as reference.

3. CBM site characterization

3.1 Bara site

3.1.1 Context:

The village of Kachorwa is made up of about 1200 households, out of which, 27% of the households are involved in CBM activities. The site is located 27 km South East of Kalaiya, district headquarters of the Bara district, in the Central Development Region (CDR) of Nepal. This eco-site is located in the Indo-Gangetic plains, which have fertile alluvial top soil and are characterized as being of high production potential. The farmers are exposed to technologies and have ample access to agricultural inputs due to its proximity to the Indian border. Agriculture is the main system of land use in Kachorwa and agricultural land is broadly classified as low land and high land. Because of the nature of the soil and the scarce availability of irrigation water, early maturing varieties of rice are planted in the high lands.

About 97% of the households in Kachorwa regard agriculture as their main occupation and they grow predominantly rice, wheat, potato, maize, lentil and pigeon pea. Other sources of income at Kachorwa are wage labouring and small businesses. The presence of active and functional community-based institutions is a prerequisite for the effective implementation of community based biodiversity management programmes. The establishment and work of the Agriculture Development and Conservation Society (ADCS) in this community, is an example of such local institutions. The ADCS mobilizes women's groups, manages the community seed bank, promotes participatory plant breeding (PPB) products, mobilizes the CBM fund and conducts community-based seed production and marketing activities. About 330 members, consisting of 308 women and 22 men (organized into 9 female farmers' groups, and one male farmers' group), are actively involved in CBM activities concerning the regeneration of landraces, which are collected in the community seed bank; the collection of monthly savings; and the mobilization of community biodiversity fund for income generation to meet their household requirements.

3.1.2 CBM process:

An *in situ* conservation project was initiated in 1997, and implemented with the support of LI-BIRD, the Nepal Agricultural Research Council (NARC) and Bioversity International (formerly the International Plant Genetic Resources Institute). The ACDS initiated different activities in order to enhance community awareness about biodiversity, especially agrobiodiversity. Initially, the programme was implemented in two thirds of the Village Development Committee (VDC) area but now the ADCS covers all areas of the VDC. The community (all members and groups) meets once a year at the general meeting (GM), and once a month at the regular meeting, to review the work of the previous month and to plan the activities for the following month. A number of subcommittees were set up to carry out different activities, like CBM fund management, PPB, community seed bank, and so.

In 1997, a range of methods and approaches for raising public awareness, such as rural theatre, rural poetry journey, song/poem/painting competitions, farmers' learning and sharing workshops, rural radio shows, travelling seminars, etc., were used to sensitize the community and policy-makers for enhancing on-farm conservation of agricultural biodiversity. The diversity fair was identified as a powerful practice not only for increasing public awareness but also for locating unique diversity and improving access to materials and traditional knowledge among communities. In the same year, after

the diversity fair, the community began documenting the plant genetic resources, and the associated indigenous knowledge, in the community biodiversity register (CBR). They analyzed the PGRs documented in the CBR using tools like four-cell analysis to identify the rare, endangered, and threatened species and varieties. The establishment of diversity blocks, seed multiplication, participatory plant breeding (PPB), participatory varietal selection (PVS) etc. were planned based on the results of the four-cell analysis.

3.1.3 CBM components:

The following CBM components were followed at the Kachorwa community:

Enhancing community awareness:

The genetic erosion of traditional varieties has been taking place in Kachorwa due to technological interventions, the provision of easy access to inputs and frequent natural disasters, like floods and drought. The farmers are faced with the erosion of rice landraces at an alarming rate; they have internalised the importance of conservation. A CBR and diversity fair were used to sensitize people to, and ascertain the scope of, this worrying situation in the Kachorwa village. Other awareness-raising CBM tools, like village workshops, field visits, social and resource mapping, folk song competitions, diversity blocks etc., were practiced in Kachorwa, to sensitize the farming communities, and now most of the farming communities are motivated towards biodiversity conservation and its sustainable use. In addition, a conservation programme has been integrated into the school programme, including the organization of competitive events among students.

Understanding local biodiversity, social networks and institutions:

The diversity fair and the community biodiversity register practices were used to assess the status of community plant genetic resources, with the involvement of community members. Analyzing this information with four-cell analysis, they were able to identify common, unique and rare plant genetic resources of their communities.

Capacity-building of community institutions:

In Kachorwa, 22 farmers' groups were formed in the initial stages of the *in situ* conservation project but these groups became less active because of their lack of interest in the conservation of agrobiodiversity. In 2003, those farmers who were more motivated and oriented towards conservation, formed the Agriculture Development and Conservation Society (ADCS), and established a community seed bank. The ADCS is actively involved in agricultural biodiversity conservation and management activities through PPB, PVS, the establishment of diversity blocks, the distribution of diversity kits, and the mobilization of the CBM fund. Different needs-based training, like CBM fund mobilization, value addition, and nursery management, etc., was organized. Similarly, farmer exchange visits also helped to increase their capacity.

Setting up of institutional working modalities:

CBM activities, like the community seed bank, the establishment of diversity blocks, CBM fund mobilization, PPB and PVS etc., have been implemented at field level. The ADCS and the CBM project are continuously facilitating the empowerment of these practices contributing to organizational development, the establishment of its own fund, and linkage and coordination with other stakeholders.

Consolidating community roles in planning and implementation:

A number of good practices like biodiversity fairs, community biodiversity registers, diversity blocks, diversity kits, the community seed bank, PPB, PVS, and grassroots breeding, are increasingly being internalized in the community action plan in the study site. In Kachorwa, the ADCS is mainly

responsible for conservation-related activities, especially concerning the maintenance of the community seed bank (CSB), the promotion of PPB products, the mobilization of the CBM fund and the maintenance of diversity blocks, etc. So far, farmers, together with breeders, have developed 13 improved rice varieties, which have the farmer-favoured traits of those landraces. Among them, Kachorwa 4, Kachorwa 5, and Kachorwa 125 are very popular and widely spreading around Kachorwa village. In 2009, members from the Variety Release and Registration Committee (VRRC), the National Seed Board (NSB), the Department of Agriculture (DOA), NARC, and LI-BIRD, made a site visit and suggested the development of a variety release proposal for Kachorwa 4.

Establishing a CBM trust fund:

The Agriculture Development and Conservation Society (ADCS) has established a community biodiversity management fund. From the interest collected, 70% goes to the CBM fund, 20% is for administrative purposes and 10% goes to the group's saving fund. Credits are provided to those farmers who are willing to conserve landraces. The fund is used to mobilize conservation and income-generating activities as seed money, and as a revolving fund scheme under which community members receive credit for conservation-oriented activities. The interest generated by these investments contributes to the fund and is also utilized to manage the CSB. The ADCS prepared a guide to ensure people will pay back and will cultivate at least one landrace.

Community monitoring and evaluation:

With the objectives of monitoring and evaluation, the community holds a monthly meeting to plan and review progress, and discuss problems and constraints. It was also mentioned that an annual general assembly is held where progress made during the year, and plans for the following year, are presented and agreed on. Strategic decisions and changes to existing rules and regulations are also presented and agreed on during the annual general assembly. Decisions regarding day-to-day activities are taken by the ACDS during their monthly meetings.

Social learning and scaling-up of collective community action:

Several institutions from Nepal and abroad visited the site in Kachorwa, interacted with the farming communities and observed the CBM activities. During the general meeting everyone participated and they realized that it is easier to work as a group. The CBM fund brought the community together. When the community works in a collective way, community members have more opportunities and better access to resources.

3.1.4 Reflection:

It seems that CBM is well understood in this site. The farmers have a good understanding of their work and the impact that CBM activities have. The seed bank is one of the most important activities that they are involved in for ensuring their food security and the conservation of local landraces. The farmers also proved their capacity-building skills as managers working with funds (like the CBM fund and others), and they are well able to organize themselves and take on tasks and responsibilities.

3.2. Bardiya Site

3.2.1 Context:

The "Belwa Village Development Committee (VDC)" of the Bardiya district is located in the mid-western development regions of Nepal, 40 km from district headquarters. Although approximately 60% of the area is covered with tropical and sub-tropical forests, there is also a large area that is used for the agricultural production of a large number of crops, vegetables and fruit species. Agricultural land in this area is classified as low land and high land. Low land occupies a larger proportion of the

agricultural area (92%), with rice constituting the major crop cultivated. After rice, wheat-based cropping is predominant in low land areas; while maize-based cropping patterns dominate high land areas. Some vegetables and maize are cultivated in backyards, in the form of home gardens.

Landholdings indicate the level of wealth or poverty of agriculture-dependent households. Accordingly, 55% of households have less than 0.66 hectares (ha) and are as such considered poor; 25% have between 0.66 ha and 2 ha, and are of average wealth; 4% have more than 2 ha of land and are considered rich, while about 16% of the total households were landless and are considered to be very poor.

This community consists of about 2015 households. Tharu is the major ethnic group and the original inhabitants of the western Terai, whereas the other communities, like Chhetri, migrated from nearby hill and mountain regions. The majority of community members are Hindu and a small portion are Muslim or Christian. The major sources of livelihoods in the community are agriculture, small businesses and animal husbandry. The predominant plant genetic resources of the region include cereals, pulses, some forest fruits, plants etc.

3.2.2 CBM process:

During 2007, LI-BIRD established an association of farmers' groups called the Biodiversity Conservation and Development Committee (BCDC) to initiate different CBM activities and create community awareness in the community on plant genetic resource conservation. The committee was organized into 12 groups, consisting of a total of 317 members. Two individuals were selected from each group, and one individual was taken from the Village Development Committee (VDC) to establish an executive committee of 25 members to run all CBM activities in the community. One individual was selected by the 25 executive members to chair the committee. This committee meets at least once in a month to decide on all the routine CBM activities, and a general assembly meets every 2 years to elect a new committee.

Following the establishment of the BCDC, the community began CBM activities by registering and documenting the plant genetic resources available, in the community biodiversity register (CBR). The community then organized a biodiversity fair to display the registered plant genetic resources to increase the awareness within the community. Though they are in the initial stages, the Belwa community have planned and implemented different CBM activities, such as participatory varietal selection (PVS), participatory plant breeding (PPB), a community seed bank (CSB), a cyber plant conservation programme (CPCP), rainwater harvesting, diversity blocks, home garden management, nurseries of fruits and medicinal plants, and the establishment of a CBM fund.

3.2.3. CBM components:

The Belwa community are involved with the following CBM components:

Enhancing community awareness:

Village workshops, CBR and a diversity fair were used to create awareness on genetic resource conservation in the Belwa community and currently most of the farming communities understand the importance of local landraces, especially as sources of variability in crop improvement programmes and for biodiversity conservation and sustainable use. The community used landraces in PPB and PVS and enhanced their capacity of awareness. They also integrated a topic on biodiversity into the school curriculum by initiating the cyber plant conservation programme (CPCP), in which about 33 voluntary students organized and established nurseries of some indigenous fruit trees, planting them in their school garden. This programme is initiated with the objective of creating awareness among

the young generation on the conservation of biodiversity, and maintaining information related to these trees in electronic files, setting up a student website to enable the sharing of the information gathered with others.

Capacity-building of community institutions:

In Belwa, 12 farmers groups were organized under the BCDC, a community-based institution which established a community seed bank and which is actively involved in agricultural biodiversity conservation and management activities through PPB, diversity block, local fruit nurseries, CPCP, rainwater harvesting, the establishment of home gardens and CBM fund mobilization. Different needs-based training, like group mobilization, account keeping, the establishment of home gardens and nursery management, PVS, PPB, CBSP, development and management of web-based data for CPCP, etc., were organized by LI-BIRD.

Setting-up of institutional working modalities:

LI-BIRD has been implementing CBM activities like the community seed bank, the establishment of diversity blocks, the mobilization of the CBM fund, PPB, CPCP, rainwater harvesting etc., through the BCDC, and the CBM project is continuously facilitating the empowerment of these institutions in organizational development, the establishment of its own fund, and linkage and coordination with other stakeholders.

Consolidating community roles in planning and implementation:

Even though most of the CBM activities in this site are in the initial phases, a number of practices, like the biodiversity fair, the community biodiversity register, the community seed bank, PPB, PVS and diversity blocks, are increasingly being internalized in the community action plan in this site. In this community, the BCDC has the overall responsibility of implementing CBM activities. For example, one group out of the 12 BCDC groups is conducting PVS trials to select superior landraces with drought tolerance and of high productivity in conditions of variable moisture. They are also crossing local rice landraces with improved varieties to transfer some valuable traits in order to develop their own variety with the support of LI-BIRD.

Establishing a CBM trust fund:

The BCDC with support from LI-BIRD (donation of 100,000 NPR), and the group's own contribution of about 50,000 NPR, established a community biodiversity management fund and is mobilizing the fund in the community for different income-generating activities. According to the guidelines, credit and loans are provided with the annual interest rate of 12%; and from the collected interest, 25% is used for administration purpose, 25% is shared between the 12 BCDC groups, and 50% is deposited into the CBM fund. Loans are provided to the BCDC members only and the first priority is given to poor individuals for running income-generating small business activities.

Community monitoring and evaluation:

The executive committee of the BCDC meets at least once a month to plan and decide on all routine CBM activities and a general assembly is held every 2 years in order to change the committee. However, since they are still in the initial stages, a strong monitoring and evaluation system has not yet been fully established in this site.

Social learning and scaling-up for collective community action:

After the establishment of the BCDC, the community in Belwa realized that organizing in a group is easier for working on community development and conservation activities, as well as sharing ideas.

Different CBM activities, such as the CBM fund, PPB, PVS, rainwater harvesting, CPCP, etc., brought the community together. When community members work in a collective way, they have more opportunities and better access to use and conserve the resources.

3.2.4 Major CBM practices

The following are the main CBM practices implemented in Belwa:

Screening of drought tolerant rice landraces:

One of the 12 BCDC groups consists of 35 members, of which, 25 women and 10 men are responsible for PPB. This group carries out selection for drought tolerance in rice landraces on their secretary's land, who provides the private land voluntarily for this activity. The main objective of this trial is to select superior landraces with drought tolerance and of high productivity in different moisture conditions. The group also used this trial as a diversity block to maintain the landraces, as they used 36 varieties of landraces for the trial. Trial responsibilities are distributed evenly between the group members, but the women are mainly involved in manual labour, such as transplanting the seedlings, weeding, and watering, harvesting and threshing activities. The secretary is responsible for planning and coaching all the other activities. Technical support is provided by LI-BIRD staff for recording important agronomic data.

Community seed bank (CSB):

The community established a seed bank in 2007, with the help of LI-BIRD, and created certain norms for running the seed bank. Community members who take out loans from the CBM fund are obliged to grow at least two local crop landraces of their choice. Additionally, the BCDC has announced a prize, worth one thousand NPRs, for the farmers' group that cultivates the highest number of indigenous landraces in a year. The BCDC groups have already started collecting seeds of the various crop landraces in their seed banks.

A specific BCDC group is responsible for managing the seed bank, as well as the multiplication of seeds of improved varieties of rice and their sale to the CSB. The seeds are then sold on to other members of the BCDC so that the community can avail of the improved seeds at fair prices. In addition to this, the group conserves seeds of rice landraces in the seed bank.

Rainwater harvesting programme:

The community participated in the construction of ponds to harvest rainwater for use in nursery beds and for transplanting in the dry season. They also planted and maintained a number of medicinal plants in the borders of the pond. 120 households and 15 members of the executive committee (8 men and 7 women) participated in the activity. Some members of the community other than BCDC members also participated in this activity, which started last year.

Establishment of a local fruit nursery:

In this activity, the conservation of a number of vegetables and fruits was started on an individual plot of land owned by one farmer, through the initiative of LI-BIRD representatives, who provided training on how to manage and plant fruits and vegetables, using techniques such as the grafting of mango fruit trees. This farmer started conserving and distributing mango seedlings to different farmers, for use as sources of income, as well as a way to ensure food security of the individual families. Although this activity is carried out by an individual, it indirectly helps CBM activities, being a source of local fruit saplings for *in situ* conservation.

Cyber plant conservation programme (CPCP):

In this activity, about 33 voluntary students organized and established a nursery of some indigenous trees, planting them in their school garden. This programme was initiated by LI-BIRD last year, with the objectives of creating awareness among the younger generation on the conservation of biodiversity; recording the relative information of the trees on computer; and creating a students' website as a way of sharing the information gathered.

CBM Fund:

In order to sustain CBM activities in the community, LI-BIRD donated 100,000 NPRs and the community contributed 50,000 NPRs for the establishment of a CBM fund. The CBM fund has rules and regulations, which were developed by LI-BIRD, regarding loans, savings and credit. Accordingly, loans are provided with an annual interest rate of 12%, and from the return interest, 25% is used for administrative purposes, 25% is shared between the 12 groups, and 50% is deposited in the CBM fund. Loans are provided to BCDC members only and the first priority is given to poorer individuals.

3.2.5 Reflection:

Although the CBM activities in this site are in their initial phases and so it is too early to assess their impact on the community and agrobiodiversity conservation, there are promising initiatives, which will be strengthened by the active participation of the community for their sustainability and for the conservation of genetic resource. The CPCP activity, which was initiated in schools to create awareness among the younger generation and to establish web-based data conservation of indigenous trees and fruits, can be considered as the best example. CBM activities such as PPB, biodiversity blocks, diversity fairs and the CSB are also good initiatives for the improvement, maintenance and use of landraces with the active participation of the farming community. Collective activities, such as rainwater harvesting, are also very important practices that should be enhanced and promoted to combat drought stress and to adapt to climate change at community level. Some activities, such as the conservation of home gardens are practiced on individual farmers' fields and as such it is difficult to consider them as collective activities. The sustainability of such activities with regards to conserving genetic resources is consequently limited, and as such they should be organized and publicized in the community. Therefore, it is very important to strengthen those CBM activities initiated, in such a way that they can include most of the members of the community, become more collective activities and more sustainable, and have a greater impact on the community and biodiversity conservation. It is also equally important to enhance the capacity of the community in planning, implementing and monitoring these activities so that they are more empowered and can sustain the CBM activities.

3.3. Begnas site

3.3.1 Context:

The village of Begnas is a mixture of different ethnic communities. The population is about 5500, consisting of approximately 900 households. The site is located around 16 kilometres East of Pokhara, and comprises ward numbers 9, 10, 11 and 14 of the Lekhanath Municipality; and ward numbers 1, 7 and 8 of the Rupakot Village Development Committee (VDC). In terms of climate, the average temperature is 20.9ºC, with January being the coldest month (mean temp. 7.0ºC) and May the hottest month (mean temp. 30.5ºC). The site has an annual precipitation of 3979 mm, with over 75% of occurring between the months of June and September. Winter is generally dry and cold with intermittent rain. The temperature of this eco-site allows for growing three crops per year.

In Begnas, based on the availability of irrigation, agricultural land is categorized as khet-land (where irrigation is available seasonally or year round) and bari-land (high land areas with no facility for irrigation). Rice is the predominant crop of khet-land areas and is cultivated in the summer season. Maize, finger millet, taro, vegetables and fruits are planted in bari-land areas. The majority of households in Begnas are involved in farm-based activities, such as cereal crops, horticultural production and livestock rearing, as their main occupations and sources of income. The provision of services within and outside Nepal, small businesses and wage labour are the off-farm based sources of income.

Initially, 22 farmers' groups were set up in Begnas, facilitated by CARE Nepal. Several years later, LI-BIRD began working with the community. The Pratigya cooperative has been involved in the collection and selling of local agrobiodiversity-based products, from 1998 to date. This cooperative mobilizes other farmers' groups to produce local food items, such as Masaura, Tandra, Gabha, Anadi rice, and Dunatapari. Cooperative members also work as mediators in the collection and selling of those products. Another cooperative is the Rupa Lake Rehabilitation and Fishery Cooperative, which manages wetlands biodiversity around Rupa lake and its watershed area. The Jaivik Shrot Sanrachan Abhiyan (Biodiversity Conservation Movement) is another community-based organization, which mobilizes a community biodiversity management fund for income-generation and conservation activities. The PPB farmers' group in Begnas is responsible for the establishment and management of mother trials, PVS and the segregation of materials of *in situ* PPB products. Biodiversity Conservation and Development Committees (BCDCs) were formed in wards at VDC level at Rupakot VDC, which is also responsible for the conservation and management of genetic resources and the mobilization of a community biodiversity management fund.

Rice is the main food crop grown across the study site and it is cultivated in all categories of land: swampy, irrigated or partially irrigated, rainfed and high land. Finger millet is the second most important hill crop, after maize, and it is grown under marginal conditions. The local genetic resources base in the site includes 68 rice, 24 finger millet, 13 sponge gourd, 24 taro and 15 cucumber local varieties. The site is rich in fruits, vegetables, grain legumes, forests (including non-timber forest products), fodder species and wetland species diversity.

3.3.2 CBM process:

CARE Nepal formed the initial 22 farmers' groups and the *in situ* conservation project activities were implemented through these groups. 17 of the 22 farmers' groups formed the BCM (Biodiversity Conservation Movement), which acts as a leading community-based organization for the collective activities of the community. The 17 groups include 14 farmers' groups, the two cooperatives, Pratigya and fishery, and the farmer to farmer association, Kideki. The BCM has 9 executive members. One member is from the Pratigya cooperative, another is from the fishery cooperative and a third is from Kideki. The other 6 members are selected from the 14 groups at the General Assembly meeting, which is held once a year and where any major decisions are made. Monthly review meetings are also held, where the activities of the previous month are reviewed and activities for the month ahead are planned.

The initial farmers' organizations were formed with the objective of documenting the available genetic resources in the community biodiversity register (CBR) project. With the data from the CBR, the farmers were able to identify through four-cell analysis rare, endangered and valuable varieties. Subsequently, they initiated the awareness-raising process amongst the farmers to conserve the vanishing local genetic resources. Activities were organized to increase awareness in the community,

these included the following practices: rural drama; rural poetry trips; singing, poetry, and painting competitions; farmers' learning and sharing workshops; rural radio shows; and travelling seminars. The farmers also set up diversity blocks and formed a PPB (Participatory Plant Breeding) group to conserve landraces. One of the objectives of the PPB group is to improve local landraces, by selecting and transferring the desired traits into the landraces.

3.3.3 CBM components:

Enhancing community awareness

The community developed a wide range of methods and tools to increase awareness on the value of biodiversity conservation and its use. A number of village workshops were organized as one of the first activities for establishing a working relationship with farming communities. Following the workshops, sub-committees were established that act as working platforms for the community members to plan and implement awareness-raising activities, such as biodiversity fairs, food fairs, rural theatre, rural poetry, etc.

Understanding local biodiversity, social networks and institutions

A participatory assessment of agricultural biodiversity was carried out, using four-cell analysis, and with the involvement of community members. This helped community members and stakeholders to identify common, unique and rare plant genetic resources, to understand farmers' rationale behind the extent and distribution of local crop diversity, to identify important biological assets that play vital roles in the livelihoods of local people, and ultimately to enable them to develop diversified options and conservation strategies.

Capacity-building of community institutions

In Begnas, 17 of the 22 farmers' groups constituted the Biodiversity Conservation Movement (BCM). To increase the efficiency, self-confidence and social mobilization capacity of local institutions, needs-based training and orientation programmes were organized concerning CBM approaches, CBM fund mobilization, value addition, and nursery management, etc. For example, following various training and orientation programmes, Pratigya cooperative began to mobilize other farmers' groups to produce local food items, such as Masaura, Tandra, Gabha, Anadi rice and Dunatapari. The farmers worked as mediators in the collection and sale of those products. The PPB farmers' group in Begnas is responsible for the establishment and management of mother trials, PVS and the segregation of materials of *in situ* PPB products.

Setting-up institutional working modalities

Key institutions, like Jaivik Shrot Sanrachan Abhiyan (BCM), the Pratigya cooperative, Kideki (the farmer to farmer group), and the Rupa Lake Rehabilitation and Fishery Cooperative, were identified for the coordination of a number of activities; with their roles and responsibilities, and institutional norms defined. For example, Kideki is responsible for the conservation and promotion of non-timber forest products (NTFPs), beekeeping and hill goat farming. The BCM mobilizes the community biodiversity management fund for income generation and conservation activities. Biodiversity Conservation and Development Committees have been formed at ward and VDC level and are also responsible for the conservation and management of genetic resources and the mobilization of the community biodiversity management fund.

Consolidating community roles in planning and implementation

In Begnas, 22 farmers' groups initiated the documentation of traditional knowledge and plant genetic resources in a community biodiversity register, in 1998. A number of good practices like biodiversity

fairs, community biodiversity registers, diversity blocks, diversity kits, the community seed bank, PPB, PVS and grassroots breeding, are increasingly being internalized in the community action plan in the site. In Begnas, PPB on rice was initiated in 1998 and rice landraces Biramphool, Mansara, Naulo Madhise, Thulo Gurdi, Sano Gurdi, Anga, Jethobudho and Ekle, were jointly identified by the local farmers and breeders. To date, farmers have developed Biramphool 3 and Biramphool 6 from Biramphool crosses; and Mansara 4, Mansara 5 and Mansara 6 from Mansara crosses.

Establishing a CBM trust fund

The establishment and mobilization of a CBM fund has significantly contributed to conservation and the income-generation of farmers, especially those from poor and marginal categories. The CBM fund was jointly created with the financial contributions of LI-BIRD and the community, and it provides easy access to financial resources for farmers' groups and group members. The BCM, a network of 14 farmers' groups and 3 nodal CBOs (Pratigya cooperative, Kideki farmers' group, and the fishery cooperative), has brought the fund to about one million NPRs. Loans are provided at an interest rate of 12%. The community maintains two types of fund, a revolving fund and a seed money fund, the source of which is the UNDP who provides the funding for the implementation of CBR through LI-BIRD. From the seed money fund, 250,000 NPRs are given to each of the cooperatives (Pratigya and the fishery cooperatives) and Kideki, and 50,000 NPRS are provided by the revolving fund for each of the 14 groups.

Community monitoring and evaluation

In Begnas, BCM is the main group responsible for the activities of the all the other organizations of the community, and it is made up of members chosen from each of the 17 farmers' groups. The general assembly addresses all priority action plans, including those of participating institutions, and defines community members' roles and responsibilities. The organization of monthly meetings, review of progress made, discussion of problems and constraints faced by members, and planning for the following month, have been institutionalized. Similarly, annual review and planning meetings and travelling seminars are regularly organized to monitor and evaluate community actions.

Social learning and scaling-up for collective community action

This site is recognized as a resource centre for on-farm conservation of biodiversity. Several institutions from Nepal and abroad have visited this site, interacted with the farming communities and observed the grassroots-level activities. Training programmes have been organized by different government, and non-government, institutions. The community mobilizes the CBM fund from the external sources (financial institutions, partners), decides on the collective activities in the general assemblies and monthly meetings, and is aware of the importance and benefits of the fund.

4. Diversity of sites: impact on empowerment

Based upon our field visits we found that CBM is regarded as both a methodology and a practice. In some of the sites, CBM is considered a methodology, as we could see in the Bara site. The community seed bank is a process that community members can work on collectively and can share their experiences both within and outside the community, which has been shown in Kachorwa. Based on these findings we consider that LI-BIRD has succeeded in empowering the community.

In Begnas, CBM, as both a practice and a methodology, has contributed towards the empowerment of the community. The community itself formed the fishery cooperative to conserve fish species. All community members joined; it has resulted in have food security and economic empowerment. In Begnas, the community has not only been economically empowered but has also established strong social and institutional modalities for sustainable conservation. It addresses several components and levels of biodiversity; e.g. forest resources, rice landraces and some aquatic plants. In this regard, we found some variations between this site and the other two.

However, we have also observed some similarities, such as cultural and religious beliefs, and the nature of collaboration. With regards to the drivers behind empowerment and CBM, we asked community members how stakeholders became involved. The community members explained that the stakeholders became involved because of the local biodiversity, and the erosion of genetic resources. Most of the institutions, like CARE Nepal, Bioversity International, World Vision, NARC, and UNDP, etc., have been working either directly or indirectly, through LI-BIRD, in a number of the sites. In a collaborative effort, these stakeholders have facilitated the organization of farmers in the conservation of genetic resources, and as such, contributed to their empowerment.

Concerning gender issues, we observed that men dominate in all the sites. In some sites, like Begnas, the number of women participating is higher than the number of men. This will be further discussed in the chapter on gender inclusiveness and participation.

LI-BIRD started working in Bara site with the aim of conserving landraces and some genetic resources in the community following the erosion of local varieties. LI-BIRD organized diversity blocks, seed fairs, awareness-raising meetings, and formed a number of groups for biodiversity conservation. In the Belwa site, owing to the level of poverty; the small size of land holdings; and the introduction of improved varieties, which led to the loss of some genetic resource in the area, LI-BIRD began a resource in-use programme, implementing CBM activities, such as the establishment of home gardens and nurseries, CPCP, PPB, etc. The Begnas site is totally different from the other two sites. In 1996, LI-BIRD began conserving agricultural diversity, through biodiversity fairs, diversity blocks, value addition of local varieties, and it organized farmers into cooperatives to conserve and market their genetic resources in sustainable ways. Herewith it contributed to community empowerment. Based on the information we collected from different community members in Begnas, the community can be considered empowered by participating in collective activities.

5. Historic drivers for empowerment

Nepal is a country rich in plant biodiversity. The country has diversified crop species such as cereals, pulses, vegetables, fruits and forest trees. The majority of the population depends on subsistence agriculture, based mainly on the cultivation of rice, vegetables and some pulses and fruits. In each of the sites, communities with small landholdings began to shift away from landraces to the production of improved varieties, in order to increase productivity and obtain food security, a number of years before the initiation of CBM activities. This resulted in the loss of many local genetic resources. The concerned communities now realize that the loss of genetic resources can mean the loss of landraces with specific characteristics of use to the community, resulting in a potential loss of food security. They understand the importance of maintaining and using diversity for different purposes.

In the Kachorwa community of the Bara site, in the past, a large variety of rice landraces were used for several socio-cultural purposes. The community has small landholdings; therefore a high demand exists for increasing productivity for obtaining food security. This has resulted in the introduction of improved modern varieties and technologies. As the site is located on the border between Nepal and India, the farmers have easy access to high yielding, seed of improved varieties and agricultural technologies. As a result of this, local landraces of many crops, particularly rice, have been disappearing. When the National Agriculture Research Council (NARC), Bioversity International (then the International Plant Genetic Resource Institute) and LI-BIRD began the *in situ* conservation project in 1996, 33 landraces were found in the community. The now existing community seed bank is playing a vital role in the conservation of endangered rice landraces, providing easy access to seed for community members. Thus, the replacement of local landraces with improved modern varieties led the community towards the *in situ* conservation of rice landraces and therefore can be considered a historic driver for empowerment of the Kachorwa community.

In the Belwa community, owing to the small size of landholdings and the high demand for food, community members began to shift towards improved varieties, which is one of the main causes of genetic resource erosion. LI-BIRD started to introduce some agricultural changes in the community, establishing a BCDC. Currently, 317 households are involved and are working together through the BCDC. LI-BIRD also supported the set up of a CSB. From our point of view, local biodiversity, genetic erosion and culture were the main historic drivers for empowerment of the community.

In Begnas, and similar to the other communities, the livelihoods of community members depend on agriculture, mainly rice cultivation and livestock production, as well as the harvesting of natural forests since the majority of inhabitants live in hilly areas that are rich in natural forest resources. However, due to the less cultivable nature of the land in the area, community members shifted towards the use of improved varieties of rice. The presence of these improved varieties, the erosion of local resources like forests, crops and fish, and the local breeding programme, can be considered the main historic drivers behind genetic resource conservation in this community, and thereby contributed to the empowerment of the community.

Therefore, we can conclude that the introduction of improved technologies at the expense of local landraces, within a given community, resulting in genetic erosion, can be considered a major historic driver for CBM in Nepal. This driver can be internal, when farmers understand the negative change in their farming system and try to re-introduce and conserve their genetic resources in a collective way; or external, when a government or non-government organization takes the initiative to organize the farmers for the conservation and use of the genetic resources, thus empowering the community.

6. Cultural drivers for empowerment

Nepal is made up of multi-ethnic communities with different lifestyles, beliefs and religions. Most of the communities in the different sites belong to the Brahmin and Chhetri ethnic groups and Hinduism is the main religion followed by Buddhism, Islam and Christianity. These ethnic groups have dissimilar cultures and beliefs, which are strongly related to the cultivation and use of local landraces. The communities have many cultural and religious festivals for which they prefer foods prepared using local landraces to cerebrate the festivals as well as for worshiping purposes. Sharing such traditions, cultures and beliefs, within or between ethnic groups, further unites the communities and forces them to conserve and use their genetic resources, and this can be considered as a driver for empowerment in Nepalese communities.

For example, in the Kachorwa community, the majority of people are from the Madhesi ethnic group, are followers of Hinduism and Islam, and have many festivals that are associated with food prepared using rice landraces. The community also has the culture of working together for village development, such as road construction, irrigation canal construction, the building of temples, etc. This typical culture of uniting and working together to celebrate cultural and religious festivals that are strongly associated with the cultivation and maintenance of landraces can be considered a driver for empowerment for the conservation of genetic resources at community level.

In the Belwa community, there are some ethnic groups whose traditions and cultures are associated with the harvesting of the first local product to celebrate their festivals and thus conserve their genetic resources. For example, the *Anandi* rice landraces are associated with the deity, *Devi Puja*, and the fruit of *Aegle marmalous* L. is required when a new baby is born, etc. We consider that such cultural and religious importance of landraces to be the drivers for empowerment.

In Begnas, following discussions, we understood that the community does not have such strong traditional and cultural values and practices linked to the conservation and use of landraces, except in relation to specific plants like *Occimum*, which is used for ceremonies by priests. Local products that are associated with festivals of different ethnic groups, like *Anandi*, varieties of rice landraces, and some other plants, are used during worship or festivals. However this association is less strong compared with the communities in the other CBM sites.

In general, we conclude that communal traditions and cultural practices, which are highly dependent on food prepared from landraces, can automatically force the community to collectively conserve and use such landraces, and can be considered cultural drivers for empowerment in the Nepalese context.

7. Drivers for CBM

As discussed, in the previous chapters on historic and cultural drivers for empowerment, the shift from local landraces to improved varieties, in order to increase productivity, brought radical changes in agricultural production systems. This is because the communities in each of the sites have small areas of cultivable land and need to increase productivity by using improved varieties and agronomic packages that have been gradually replacing landraces. Only a small number of farmers cultivated landraces and their area of cultivable land was also very small. In some communities, these changes in farming systems (erosion of local genetic resources) were recognized by the farmers themselves when they lost a number of important traits of landraces such as food quality, aroma, drought resistance, pest resistance and other important qualitative values, which were strongly associated with the cultures and beliefs of the society. This loss came to the attention of several development institutions and farmers in the communities, leading to the initiation of a number of CBM activities, such as the biodiversity register, diversity fairs, PPB, CSB, etc., and can be considered as a major driver for CBM activities in the country.

For example, the community in Kachorwa village (Bara), owing to their proximity to the Indian border, has easy access to improved high yielding and early maturing rice varieties, as well as improved agronomic practices. To increase productivity and feed their family, the majority of farmers started to cultivate modern varieties, reducing the number of local landrace varieties cultivated. In order to bring about some changes in agriculture practices, LI-BIRD implemented the *in situ* conservation project, diversity blocks, and seed fairs, to conserve the local genetic resources. This response to genetic erosion is the most important driver for CBM in this site. In addition to this, the community has strong cultural festivals and social beliefs which are directly associated to the cultivation and use of local landraces. Thus, the community themselves understood the importance of these landraces, not only to celebrate their cultural and religious festivals, but also because when the improved varieties failed, under environmental stress conditions, the farmers realized they needed to cultivate and conserve local landraces.

The community in Belwa also started to introduce and cultivate improved varieties of different crops, which resulted in the rapid erosion of variable genetic resources. Based on this, LI-BIRD implemented the resource in-use programme and diversity blocks, to conserve local genetic resources. These factors are considered the most important driver for CBM activities. In addition, the community has cultural festivals and social beliefs which are directly associated to the use of landraces. Community members recognize the value of landraces and have organized themselves to implement and continue CBM practices introduced by LI-BIRD.

For the community at Begnas, the immense biodiversity of natural resources in this site attracted the attention of NARC, LI-BIRD, and Bioversity International. These organizations facilitated the establishment of a number of farmers' groups in the community and implemented various *in situ* conservation programmes for sustainable genetic resource conservation and use. These groups were established and supported using various CBM practices, such as CBR, diversity fairs, awareness-raising programmes. The availability of biodiversity and its risk of loss are considered the most important drivers for CBM in this site.

8. Definitions of empowerment

In each site, we asked the farmers to define what they understand by 'empowerment' and we collected their answers. In this chapter, we also provide the group's own definition of what we consider 'empowerment' to be.

Empowerment in the Bara site is understood in several ways. Firstly, with respect to social and cultural aspects, in the past, the women were not at all involved in any community activities; they were confined to the kitchen. They were also very shy to speak face-to-face with outsiders. Now they are coming forward to participate in collective activities and are also taking out loans from the community organization. The height of empowerment can be seen in the creation of a community identity, and the work of community members is recognized at national and international level as it is their seed bank that acts as the national model. The community members are also aware of their rights and the various ways to provide access to information to outsiders. In addition, community members now also operate computers. To sum up, empowerment can be seen as enhancing the capacity of the community to organize, monitor, evaluate and sustain the efficient utilization of the resources available.

In Belwa, empowerment is seen as being active and ready to accept any kind of change. It can also be linked to an economic improvement. Now the community does not depend on the market, they are selling seeds to the market. They do not use chemicals anymore and have shifted to organic cultivation, which is also a way of making a conscious choice, empowering community members.

In Begnas, the community members believe they are already empowered. This belief is due to the autonomy that they have reached for implementing the activities that they are carrying out. In the beginning, they needed external organizations to help them. Now, they are teaching other communities and providing training in subjects like value addition and other CBM practices. At the same time, to improve their capacity they are also undergoing training themselves. The CBM fund helped to increase the economic standards of the community. Community members feel that they have a voice, both inside and outside the community, to fight for their rights and get things that the community needs. "In the beginning no one knew who we were, now we are here talking to you and teaching you about the community and biodiversity".

The group's definition of empowerment is:

"Empowerment within a community is a process that starts with the awareness of the community about their rights and obligations, where they are able to organize, plan and implement decisions, taking into consideration ethnic groups and gender, with the objective of conserving biodiversity to ensure food security and autonomy."

The definition of empowerment in the context of CBM is:

"Empowerment in the context of CBM in Nepal is a process that brings dependence to independence (autonomy). It is the capacity of the community to organize, administer and evaluate their resources. It is where the community and external stakeholders are aware of the biodiversity. Decision-making is made in a collective and inclusive way, where the goal is to have better skills and obtain better products from landraces in order to ensure food security and maintain their cultural demands."

9. Community within the term CBM: Is this collective management?

The information that we obtained led us to believe that all CBM processes are carried out using participatory approaches. However, there is always an element of 'influence' from an individual (chairman, leaders) or organizations, such as LI-BIRD, in all of the activities described by them. The following is the description of how we perceived decisions that are collective in each site:

In the case of Bara, when the farmers were asked about the terms "collective" and "building collectiveness", we got the following response: When there is an equal sharing of roles and responsibilities between all the members of the community, of different genders, castes, ages etc., and when there are no restrictions on any religious or ethnic groups, or gender, in the collective activities. These collective activities include, involvement in the planning and monitoring process; abiding by the rules and regulations of the community organization; making efforts to raise the awareness of other members of the community who are less aware of the importance of the community organization and the benefits available from it; and motivating them to participate in the collective activities. Community members from marginal groups are encouraged to join. To become integrated, community members must know the rules, for example, that they must cultivate at least one landrace to have access to loans. Groups should be aware that they organize themselves to form stable groups in order to obtain the benefits from the different government development programmes. There is also the collective guardianship of diversity, by the whole community, as can be seen with farmers' organizations arranging different training programmes to train community members for understanding the importance of local landraces and the ways to conserve them.

In the Belwa community, collectiveness is when everyone is responsible for all the activities. The community realized that working together is safer and people feel more responsible. They also realized that working as a group can enable them to access external help easier. For example: training courses to improve their capacity. LI-BIRD helped the community to work in a collective way and now they are working together on the construction of a pond and diversity blocks. They are also linked to groups in other communities, with whom they exchange seeds. We observed that the project is still in its initial stages and for that reason the activities are not yet wholly collective.

In the Begnas community, collectiveness was achieved with the help of CARE Nepal. With this organization, the community learned how to work in a collective way to conserve the forest, and other activities, although not related to CBM. Then, in 1996, LI-BIRD, NARC and Bioversity International, initiated a project for improving their collective work with CBM activities, such as setting up a cooperative, PPB and community biodiversity groups, and so on. These groups generate income and the money can be used for individual or collective purposes (e.g. establishment of nurseries, training, diversity blocks, etc.).

One activity that we can describe as collective is the mobilization of funds. In this activity, the community holds a monthly meeting where community members decide on how to mobilize the fund. They divide responsibilities and form subcommittees to manage the fund.

In general, we can conclude that for the three sites the level of collectiveness is more internalized inside the community in Bara and Begnas. This is partly due to the number of years that they have had CBM projects. However, the practices are similar in all the sites. In Begnas, the community members are more mature and are able to continue the activities, even autonomously. This can be because of the economic incentives that the various cooperatives have received. Members engaged in value addition thereby sustain their livelihood, which adds to conservation activities.

10. Inclusion/equity and gender

In the CBM sites, men play the dominant role. However, women are included in most of the activities and in some cases more women are involved then men in CBM practices. Some women also hold leading positions, such as vice-chairperson, but this does not mean that women are as empowered as men inside the community.

In Bara, in the past, men dominated outside activities, like working in the agricultural fields, as well as in business, they held key positions and influenced the whole process of decision-making. Women were occupied with household activities and taking care of the children. They were also less educated. Nowadays owing to their participation in CBM activities, women take part in decision-making as well as in education, and are involved with small businesses and fieldwork. For example, more women are actively benefitting from the CBM fund, while men make up 93% of the fund members. Moreover, after LI-BIRD intervention and some government initiatives, women started to participate in several activities, which resulted in improving the levels of education of the women, albeit slightly. The participation of women in collective work is also high. In Bara, we found, in general, that women still do not participate equally and are not independent from men.

In Belwa, women and men are equally represented. There are 12 farmers' groups. The chairman of the groups is always a man and the vice-chairperson is always a woman. We observed that men are more dominant in this community despite the balanced representation of gender. Nevertheless, women are allowed to have an opinion and voice disagreements when they feel it is necessary. The 12 groups are made up of 370 members, of which 200 are women, and 170 are men. The men are mainly involved in construction work while the women are involved in the home gardens and in mobilizing the community for vegetable production. Seed production is carried out by both men and women.

With regards to ethnicity, the different ethnic groups are all involved but they are not all equally involved. The reason for this is based on where the different ethnic groups live. For instance, the Tharu in Belwa are more involved in the activities because they make up the majority of the population. In the future, the community is planning to increase the ethnic groups represented by including more members.

In Begnas, we did not observe specific gender issues. Women and men participate equally in all activities. However, women are more involved in some activities, such as PPB, PVS, transplanting, and home gardens; while the men are more involved in the fishery cooperative and in construction work (eg. building the community seed bank).

We observed that, in general, men and women are equally represented in all the farmers' groups.

11. Competing claims: land ownership, CBM and empowerment

In Nepal, land ownership does not seem to be an issue. However, in all of the sites visited, landless people were mentioned.

The Kachorwa community consists of people who have no land and people who have up to 7 ha of land. The average landholding is 0.8 ha. In the community, a person who has 5 to 7 ha is considered rich, while those with 2 to 3 ha are considered of average wealth, and the poor have less than 1 ha. Landless people work as wage labourers within or outside the community. Some of those who work outside the community do so as seasonal labourers in other parts of Nepal and India. Some of those who work inside the community work on the land of rich people, who give them a part of their land to cultivate in return for half of the harvest.

Some of the landless community members received benefits from the CBM fund to run small businesses for improving their livelihoods. At the same time the CBM fund is helping other families with loan with a low interest rate (12% annually). In the past, many people lost their land as they could not repay their loans from local money lenders, which calculated high interest rates (48% annually). To sum up, we can say that the CBM fund is helping these people to avoid being marginalized, and to maintain their own land.

The Belwa community consists of those who have no land and those who have up to 2.5 ha. The average landholding is 0.7 ha. Within the community, for a person to be considered rich, in addition to the size of the landholding, the landowner's involvement with economic activities is also taken into account. There is no discrimination based on land ownership in the CBM activities. Everyone is allowed to participate. The community mentioned some land conflicts involving common land (government land) owing to the fact that such areas are public areas and people can become involved in situations of encroachment, especially with regards to forest land. The contribution made by landholders towards the conservation of local rice landraces depends mainly on the location of the land, whether it is in the lowland or in the highland areas. Farmers with large landholdings in the lowlands are more actively involved in *in situ* conservation of rice landraces. Those who do not have any land are involved in activities like poultry, fish farming, pig farming, etc.

In Begnas, a person's wealth does not depend of the size of land but on the surplus of food for the year. If the produce from the land is sufficient to feed the family the whole year round a person is considered to be of medium wealth. Community members who do not produce enough to feed the family year round are considered poor. As with the other sites, land ownership is not an issue here; however, landless people were mentioned. Landholdings in the community vary in size, from 0 ha (i.e. those with no land) to 1 ha. The average landholding is 0.5 ha. No land conflicts were mentioned and the community also has permission from the government to cultivate the communal land.

The link between land ownership and CBM is the same in all the sites: those who have less land are able to conserve landraces in just a few places. Those who have more land can maintain more landraces.

12. Governance and CBM

LI-BIRD, NARC and UNDP are the most important organizations responsible for initiating CBM processes at the Nepalese CBM sites that we visited. Those organizations, together with the farmers' associations (CBOs), formed the base for CBM activities. Since those organizations are currently working with the communities we visited, we were able to see the types of work being carried out. The rules established for the CBM fund, and the ways decisions are made regarding activities, are more or less the same in the three sites.

The division of roles amongst the organizations follows the same rules and sometimes depends on their physical distance from the sites. Even when communities said that decision-making is collective and democratic, we noticed that in many cases decision-making is carried out only by the leaders. What led us to think in this way was a limited number of persons is involved in the discussion. It should however be realized that the team was unable to verify or triangulate this information with distinct groups of community members.

CBM practices were initiated in Bara by encouraging the farmers' groups that had been previously organized by LI-BIRD, Bioversity International and NARC, to form the ADCS, in which the decision-making process is participatory and members are elected by the whole community by way of voting. The executive meeting of ADCS is held each month. Decisions relating to all the day-to-day concerns of the community are made during these monthly meetings. Major decisions, like planning for the year ahead; evaluating those CBM activities implemented during the previous year; and delegating responsibilities for activities like managing the accounts and loans system, looking after the community seed bank, monitoring diversity blocks and seed production, organizing meetings, guiding women and other CBM activities, are made during the annual general meeting. Small and urgent matters are decided on as required. One of the rules of the organization is that NGOs intending to work with the local farmers' organization should sign an agreement with the ADCS. There is a very good community organization structure, headed by a chairman and 9 members (one from each of the 9 wards of the Village Development Committee [VDC]) and regular elections are held for electing the members and chairman, at intervals of 3 years to make it sustainable.

In Belwa, there are 12 farmers' organizations, which were initiated by LI-BIRD. NARC provided technical and financial support for forming a stable community organization and for the *in situ* conservation of local landraces, particularly of rice. The number of community members in each of the 12 organizations ranges between 25 and 40; on average there are 35 members, often the majority of which are women. Every two years, two members of those 12 groups are chosen at the general assembly to represent their organization in the BCDC. The BCDC is made up of 25 members, one member from the VDC and the other 24 are chosen during the general assembly. The most important activities related to CBM are discussed during the annual general meetings. Usually, members review the progress of the previous year and plan the activities for the coming year. It is also during this meeting that elections take place. Some other meetings, like monthly meetings, are important for reviewing the activities that have been carried out, and for and planning the activities for the coming month. Community members also take advantage of these monthly meetings to form the groups that will monitor the rules and delegate responsibilities. To sum up, the idea of the committee, to divide the responsibilities between members in such a way as to ensure the spread of CBM activities and related knowledge, is good but this has not yet been fulfilled because it is still in the initial stages. Since the plan is to change the members representing the farmers' group every two years, the committee will be continuously integrating new members.

In Begnas, the division of work is well structured. Out of the 17 farmers' groups, 14 do not have specific conservation activities. The three groups that have specific conservation activities involve PPB activities; marketing products and value addition; and fisheries and Rupa lake conservation of local fish. The meetings take place once a month and one general assembly is held annually. The 17 farmers groups are made up of 635 members (85 are men and 550 are women). Nine members (5 men and 4 women) are selected from each of the 9 wards in the community to represent the 635 members at the general assembly. Every 4 months these 9 members, with help from LI-BIRD, look over the accounts and prepare the financial report of the groups. The chairman is changed every two years, during the general assembly. LI-BIRD, and other organizations, provides technical support to the community.

13. Sustainability of CBM

The community organization of the Bara site is well recognized by the local government and is assisted by a number of NGOs. The VDC is a functional unit of development in Nepal, which contains a number of clusters, each cluster is called a ward, and in the VDC there are 9 wards which provide financial support to farmers' organizations. CBM was initiated in Bara jointly by the ADCS, LI-BIRD, and NARC, who provided financial and technical support. The organization is sustainable in terms of members; access to funding from external sources; income-generation through activities like seed production, other various projects, and CBM fund management. With all this support and good management, CBM is sustainable and is reaching autonomy. For sustainability the community integrates new members in order to exchange knowledge, like PPB, and improve skills. It is trying to reduce the dependency on NGOs and rely more on the government. The community mentioned that in the past they needed NGOs for all activities and nowadays they can carry out their activities by themselves since they have improved their skills. CBM activities helped the community to be more integrated, including members from different ethnic groups, economic status and gender.

In Belwa, community members got involved in establishing a community biodiversity register and a community seed bank, working with diversity blocks, and enhancing the production and marketing of seeds of improved varieties. Participatory landrace selection and participatory plant breeding methods are used for improving the competitiveness of landraces. Farmers' organizations were established by LI-BIRD, and now the farmers are better organized and have formed their own community organization, which is being run according to guidelines for empowering the community and for obtaining autonomy. The seed bank is very important because it is one of the activities that helps local development. Farmers who were not able to access landraces in the past can now do so through the bank and can ensure their food security. The seed bank also acts in a way to conserve endangered and rare landraces. Another activity that contributes to the sustainability of the community is the CBM fund. Those who take out loans must cultivate at least one landrace and this is one way to ensure the sustainability of landraces inside the community. At the same time, the low interest rate charged by the CBM fund enables farmers to develop their own activities for generating or increasing their income. Other organizations, such as the poverty alleviation fund (PAF); smallholder irrigation market initiative (SIMI); and rural reconstruction Nepal (RRN), are not directly involved with CBM activities, but the results of their work can influence some CBM activities. The construction of an irrigation canal, for example, enables farmers to produce more vegetables and other crops. The construction of roads and schools is going to improve the lives of community members and their capacity to access markets and work both inside and outside the community. So far, we cannot say whether the activities implemented by this community will be sustainable or not. The activities are in the third year of their implementation and the community still depends completely on the support of LI-BIRD as well as other organizations (to a lesser extent).

In Begnas, we observed that some activities such as the fishery cooperative are sustainable. This activity is a good example because it involves all ethnic groups, using knowledge from different cultures. Also, women and men both take part in this work, even though the men have greater representation. The aim of this cooperative, apart from marketing, is to conserve local fish and local vegetation around the lake. For this reason the cooperative respects certain periods when they do not allow people to fish in some areas. In the early stages of this activity, some conflicts arose but they were resolved through discussions and now most of those involved in the conflicts have become part of the cooperative. Members of the cooperative also carry out some awareness-raising activities, like singing competitions (about the lake); offer a scholarship to young people for increasing awareness; and help people affect by floods. This cooperative is sustainable because members make a good profit

from marketing the fish. A part of the profits is distributed amongst members and in this way the members are happy to contribute towards conservation. Some of the profits go to the community for maintaining the forest (4000 to 5000 NPRs per family, annually), some of the profits are also spent on maintaining the lake (25%); and the cooperative also uses some of the profits to cover government taxes. So far, the government has not provided them with any support, despite numerous requests.

In conclusion, the CBM activities, at least in Bara and Begnas, seem to be reaching sustainability. They are autonomous in most of the CBM practices. This is because the activities emerged within the communities in some cases (e.g. fishery cooperative, farmers' organization), while in other cases, the activities were proposed by other organizations. Further economic empowerment through collective activities will ensure the sustainability of CBM (e.g. the fishery cooperative). External funding for CBM activities is still required for some activities, especially in Belwa. Some activities still depend on a few individuals or organizations to make decisions. We think that for an activity to be sustainable it must not depend on external funding. Their own activities must generate income and the support, when necessary, must be technical only. Otherwise, the community will not be motivated to continue.

14. CBM and GR policies

Nepal adopted many international policy regimes and developed national mechanisms for the conservation and sustainable use of its biodiversity and genetic resources. In 1992, Nepal signed the Convention on Biological Diversity (CBD) in order to promote conservation and sustainable use, access and benefit-sharing (ABS), and the protection of traditional knowledge and customary rights. Nepal acceded to the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), in 2009. To enter into the World Trade Organization's Agreement it needed to develop an intellectual property regime in accordance with the Trade-Related Aspects of Intellectual Property Rights (TRIPs).

Regarding national legislation, a number of policies and laws have been established in Nepal regarding CBM, for example, a draft ABS law, 2003; the Seed Act, 1998; an amendment to the Seed Regulation, 1997; Biodiversity strategies, 2002; Agrobiodiversity policies, 2007; Plant variety protection and farmers' rights (draft); national Plant Genetic Resources and Animal Genetic Resources reports. Details are provided in Table 1 below.

Table 1. The scope and limitation of international and national policy issues in relation to farmers

	Policy regime	**Opportunities for CBM**	**Threats to CBM**
International	CBD, 1992	• Promote conservation, sustainable use, access and benefit-sharing mechanisms. • Protect traditional knowledge and customary rights.	• Emphasis on wild and forest biodiversity only. • Much emphasis on facilitating access rather than protecting traditional knowledge (TK).
	ITPGRFA	• Promote *in situ* conservation of PGR, • *CBM practices support the protection of genetic resources and TK with their custodian rights.* • CBM empowers people to make decisions on conservation, use and exchange, facilitate ABS. • PPB makes it possible to obtain farmers' rights. • CBM encourages the saving, exchange, use, reproduction and sale of seed. • Recognize farmers' rights, provision of financing mechanisms.	• Much emphasis on promoting the *ex situ* approach (e.g. genebanks). • Multilateral system may weaken the rights of communities regarding important PGR.
	WTO (TRIPS)	• Provide *sui generis* mechanisms to protect the breeders' rights • Enhance local seed systems so that farmers will be less dependent.	• TRIPS contradicts the CBD on ABS and prior informed consent (PIC). • PIC is not included as part of the discloser requirements for patents. • It promotes a corporate-led seed system.

	Policy regime	Opportunities for CBM	Threats to CBM
National	ABS draft law, 2003	• Access will be regulated, PIC mechanisms will be specified, and mechanisms for benefit-sharing and easy distribution will be established.	• Access is regulated; hence exchange of genetic resources and traditional knowledge will be difficult. • Over-expectations of the community/ethnic groups regarding the benefits.
	Seeds act, 1998;	• Farmers can register the distinctness, uniformity and stability (DUS) of their varieties. • Local varieties can be registered for seed marketing purposes. • Small-scale farmers are allowed to produce their own seeds and exchange them between themselves.	• A variety to be register has to be register has to follow DUS and farmers varieties are highly variable • Excluded from public policies as financial support, seeds distribution or ex-change • The ways to register a Local variety are expensive (characterization, ex situ conservation and all)and not possible for small of farmers.
	Amendment of seed regulation, 1997	• Recognize ABS and community mobilization for the conservation and sustainable use of PGR.	• It has not yet been fully implemented.
	Biodiversity strategies, 2002 Agrobiodiversity policies	• Promotes *in situ* and *ex situ* conservation, identifies community rights and roles in ABS, and identifies farmers' rights.	• It has not yet been implemented by law.
	Plant variety protection and farmers' rights	• Ensures sui generis system of PVP. Protects both customary and custodian rights of farmers to seeds.	• PVP potentially discourages the informal seed sector
	National PGR and AnGR reports	• Benchmarking national status of genetic resources. • Growing concern of conservation strategies.	• Many important species are neglected (neglected underutilized species).
	Other agricultural plan and policies.		• Agricultural plan and policies promote monoculture, commercialization, etc (farmers receive of seed of improved varieties, fertilizers, pesticides, high yielding varieties, and so on).
	National Genebank	• It may be a good plan to link the NGB with the CSB.	• Is still under development.

15. CBM and farmers' rights

The implementation of farmers' rights is of fundamental importance because farmers are the main users of plant genetic resources, nationally and internationally, and as such they are responsible for their conservation and sustainable utilization. The corporate sector has been dominating the market and impeding farmers' rights for many years. International bodies now recognize the importance of farmers and regulations have been developed to protect and promote their rights. However, in the case of Nepal, farmers' rights are not yet recognized, despite the fact that the government signed the CBD and that national and international policies related to farmers' rights have been drafted.

16. Relation between customary rights and custodianship

Customary rights:
Customary rights are fundamental elements of the sustainable use and management of biological diversity and the promotion of conservation, sustainable use, and access and benefit-sharing mechanisms. We found that the farmers in Bara and Begnas had a better understanding of their customary rights than in Belwa.

Custodianships:
We observed that in Nepal there are a number of policies regarding custodianships and community members have some idea of custodianship. We did not find any farmer who individually conserves as custodian particular varieties of crops. In Bara, this activity is carried out by groups, and in Begnas, while there is conservation at the individual farmer level; this is applicable for any particular varieties.

Guardianships:
We did not find much about guardianship. Although many landraces are conserved in Bara, it is a collective process and so with regards to guardianship in this site, the community members are all become guardians of genetic resources. Some farmers in the committee have a vast knowledge regarding the resources in their seed bank, and even of national and international policies. In Belwa, activities were initiated by LI-BIRD, in 2007. In such situations the farmers have no such sense of empowerment over their resources. In Begnas, farmers have some knowledge regarding policies and guardianship but in such cases, the women have better knowledge and are more involved than the men. They also have knowledge of the formal and informal seed sectors.

17. CBM and Access and benefit-sharing over genetic resources

A national law on access and benefit-sharing (ABS) in Nepal was drafted in 2003. The CBD is being implemented nationally through ABS-CBD Article 15, which indicates that ABS between two parties in the country can be facilitated by the use of the ABS at the VDC level, which is a local grassroots' system of governance in Nepal. In Nepal, benefits can be divided, based on genetic resources obtained from the original owner, though prior informed consent (PIC), into 3 types of ownership: individual farmers, community ownership, and land forest genetic resources. In the third situation, the ownership goes to the government. In such cases, 51% of the benefits go to the community, 30% go to the National Genetic Resource Council (NGRC), and 19% go to government. In cases where there is no specific ownership, the government is deemed owner and the funds are distributed in the following way: 50% go to the government, 30% go to the NRGC, and 20% go to the local government.

In such cases, CBM emerges as a methodology that enhances the capacity of the community to manage their genetic resources. Many CBM practices have been contributing to increase the access to, and choice of, genetic resources within and between the communities. Farmers have been using informal systems based on their culture and society, regarding the exchange of seed, seed fairs, diversity blocks, etc., and also regarding relationships between two communities. In such cases, laws and policies limit the process of marketing their agricultural product. If the ABS law is passed it will help to provide the community with easier access and will empower them with regard to their resources. But the system has not yet been established in the country and farmers are not yet independent.

In Nepal, there are informal systems of seed flows. In particular in Bara, the seed flows not only within the country but also outside the country, due to its proximity to the Indian border. We did not find any cases of access and benefit-sharing within the community.

18. CBM, empowerment and *in situ* conservation

In our exchange programme, we noticed that many activities are carried out collectively by the communities, and that CBM can be linked to empowerment and *in situ* conservation. In practice, we saw the fishery cooperative, where the farmers work in a collective way to ensure the conservation of local fish and vegetation around the lake. As a methodology we can also mention the fish cooperative since it is taking initiative to increase the awareness of young people and include all ethnic groups (especially indigenous people). Finally, we can say that the fish cooperative is helping the community to be empowered because it generates a good income and members feel strong when they are part of such a good organization.

In Belwa, CBM is still in the initial stages and can be considered a methodology. However, we can already see a link between CBM, empowerment and *in situ* conservation. Some activities like the seed bank and the CBM fund are established. Those activities are helping to increase awareness and to conserve the landraces. Still, the community depends on external help and that is the main obstacle in the way of them being fully empowered in biodiversity management.

If we can generalize, we can say that in Nepal, the level of awareness (social empowerment) has been successfully enhanced in all of the three communities visited. The CBR work is really important, providing documentation for future generations, for understanding traditional knowledge and increasing community awareness.

We also noticed that collectiveness is still an issue to be improved in some farmers' groups. Many activities, such as seed production, are carried out by individuals (e.g. Belwa and Begnas).

Another issue is gender. We observed that despite the equal (or greater) number of women participating in the farmers' group, men still dominate most of the activities and this led us to conclude that women and men are not equally empowered.

19. General synthesis

General reflections of the group on CBM and its meaning in the Nepalese context:

a) CBM in Nepal is mature and has been internalized in most of the communities visited. However, our basis for this finding is limited to the people we met in the communities. The degree of internationalization at policy levels we could not assess, since we did not meet policy makers.
b) The conservation of landraces is successful in part because of the communities' awareness but mainly owing to the influence of the traditional festivals, cultural events and food habits that require the use of the traditional landraces.
c) The use of PPB for improving local varieties helped solve the farmers' problems (low productivity of landraces).
d) We observed that the CBR, seed bank and CBM fund are the most successful community activities for ensuring to the conservation of local knowledge and local varieties *in situ* (and *ex situ* in some cases).
e) Further work still needs to be carried out regarding issues like benefit-sharing, farmers' rights and the release of varieties, for empowering the farmers and recognizing their work in PPB groups.
f) Some communities in the sites need to improve their collective organization in order to ensure the benefits for all members.

Suggestions and future strategies for the CBM study:

a) More discussion between farmers and the government (release committee) could be facilitated in order to clarify some aspects about the release of varieties. LI-BIRD could help to pressure the government in order to speed up the process.
b) It is necessary to put farmers' rights in practice at community level and local governmental level.
c) It would be useful if farmers and those who benefit from CBM activities were included in discussions in order to bring more ideas and give some idea of the reality of their situation.
d) The focus on native forest species, both from the point of CBM processes and for their *in situ* conservation needs to be extended. How to link CBM with forest landscapes could be one of the research topics.
e) Since many communities are also involved with fisheries, focusing on native species of fish and how to conserve them is an idea that could be spread from the Begnas community to others.
f) The Cyber Plant Conservation Programme is a good idea and could be shared with other sites, especially with Begnas where natural forest resources have strong potential.
g) LI-BIRD should facilitate an exchange programme between communities, to share their best practices and knowledge.