

# Improving seed systems for smallholder farmers' food security



## **Report of the mid-term workshop of the project**

*Pokhara, Nepal, 28 September-2 October 2015*

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We deliver scientific evidence, management practices and policy options to use and safeguard agricultural and tree biodiversity to attain sustainable global food and nutrition security. We work with partners in low-income countries in different regions where agricultural and tree biodiversity can contribute to improved nutrition, resilience, productivity and climate change adaptation.

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## Background

The project “Improving seed systems for smallholders’ food security” aims to contribute to a future in which smallholder farmers successfully use crop diversity to ensure their food security and that of their communities, to thrive in challenging conditions and to make their farms resilient. The project addresses two particular aspects vital to this goal: i) crop diversity available for farmers through seed systems; and ii) the policies that regulate such systems.

The project is funded by the Swiss Development and Cooperation Agency. It is coordinated by Bioversity International, and carried out in Bolivia, Burkina Faso, Nepal, Uganda and Uzbekistan. Box 1 presents the national organizations which are in charge of project implementation in each of the countries.

### Box 1: National project coordinators

**Bolivia:** Fundación para la Promoción e Investigación de Productos Andinos (PROINPA). Focal point for the project: Ximena Cadima, [x.cadima@proinpa.org](mailto:x.cadima@proinpa.org)

**Burkina Faso:** Institut de l’Environnement et Recherche Agricole (INERA); Focal point for the project: Didier Balma, [balma\\_didier@yahoo.fr](mailto:balma_didier@yahoo.fr)

**Nepal:** Nepal Agricultural Research Council (NARC). Focal point: Deepa Shresta; Local Initiatives for Biodiversity, Research and Development (LI-BIRD). Focal points: Sajal Sthapit and Deepak Upadhyaya, [Sthapit@libird.org](mailto:Sthapit@libird.org), [dupadhya@libird.org](mailto:dupadhya@libird.org).

**Uganda:** National Agricultural Research Organisation (NARO). Focal point: John Mulumba Wasswa, [jwmulumba@yahoo.com](mailto:jwmulumba@yahoo.com)

**Uzbekistan:** Research Institute of Horticulture, Viticulture and Wine-making named after acad. M. Mirzaev. Focal point at the Institute: Shuhrat Ahmedov, [axmedovshuhrat@gmail.com](mailto:axmedovshuhrat@gmail.com); general project coordination: Abdikhalil Kayimov, [a.kayimov@mail.ru](mailto:a.kayimov@mail.ru)

The project started in 2012. Its programme of work is articulated around the following five areas:

- Understanding the role of actors in seed systems and improving linkages among them
- Providing support to farmers and farmers’ groups for the production, storage and distribution of seed
- Developing catalogues of existing varieties and defining portfolios of varieties particularly adapted to the project sites
- Making good quality seed available through local seed systems
- Understanding how existing policies and legal frameworks influence the availability of diverse and quality seed

From 2012 to 2015, all country teams have made big efforts to advance the implementation of this programme of work. Based on the particular needs of seed producers and consumers in the project sites, country teams have put more emphasis on some areas of work than on others. While some teams have been very successful with some activities others have found a number of challenges to implement those same activities. The range of methodologies that have been applied is very diverse, as well as the lessons learnt during the process.

In October 2015, one year before the ending date of the project, Bioversity International and the Nepali organization Local Initiatives for Biodiversity, Research and Development (LIBIRD) organized a project-wide workshop in Pokhara, Nepal, with the following objectives:

- To exchange experiences and share approaches and methods that have been tested during the life of the project
- To review advances in project implementation in the five countries and prioritize remaining activities
- To discuss and agree on project-wide products that can be promoted at the international level to allow project results to scale up
- To identify areas of work for a possible second phase of the project

Thirty-five people participated in the workshop, including national partners involved in project implementation (2 in the case of Bolivia and Uzbekistan, 3 in the case of Uganda and 7 from Nepal), Bioversity experts directly involved in project implementation (7) and consultants and interns who are supporting project implementation. Unfortunately, the national project coordinators from Burkina Faso could not participate due to flight problems derived from political unrest in this country. A detailed list of participants is included as Annex 2.

The workshop started with a one day field trip to the Begnas and Rupa lakes' watersheds. The following four days, the sessions of the workshop observed a similar structure: The first five sessions started with a presentation by one of the country teams focusing on one of the areas of work of the project. This presentation helped frame the subsequent discussions, which took place in plenary or in small groups. In the last session, Bioversity experts presented a follow up plan based on previous day's discussions. This was discussed in small country groups. A detailed agenda is included as Annex 1. The list of workshop participants and a group photo can be found in Annex 2 and Annex 3.

This report presents the most salient issues discussed during the workshop and is expected to become a useful reference for the future work of country teams, as well for the design of a proposal for a second phase of the project.

## Field trip: visit to Begnas and Rupa lakes' watershed

The Begnas-Rupa lake watershed area in Kaski district is rich in flora and fauna, with 128 plant families and 150 species of butterflies, 104 of birds, 34 of mammals and 13 of fish. The watershed area ranges from an elevation of 600 to 1400 meters above the sea level, including a wide range of micro climatic variation and ecological niches. The farming system in the watershed harbors 63 varieties of rice, 17 of finger

millet and 12 of taro. Besides the two lakes, the landscape includes forests, rice terraces, maize and millet rain-fed fields and organic coffee farms.

Agriculture is the main source of income in the watershed area. The main cereals are rice, maize and finger millet. Cowpea, black gram and beans are the main legumes, and banana and papaya are the most produced fruits. Mandarin, orange and guava are also common but their production has declined due to disease outbreak. Sponge gourd, broadleaf mustard and taro are among the most common vegetables.

This area is the house of important historical and cultural places such as Begnas Kot, Rupa Kot and Chyawan rishi, Pachhabhhaiya (where five Pandavs of Hindu religion) and Hanaspaur Kot.



Picture 1: View of the Begnas Lake. Credit: Tamwer Morshed, on Wikimedia Commons

Several organizations have supported activities for the conservation and sustainable use of local biodiversity in the Begnas-Rupa watershed. Local Initiatives for Biodiversity, Research and Development (LI-BIRD) started to work with local communities in this area in 1995, focusing on the conservation and documentation of local crops and associated traditional knowledge. Currently LI-BIRD partners with local communities as well as local and district level stakeholders for the long-term management of the area.

The field visit introduced the workshop participants to the following initiatives and places:

1. Sundaridanda Information Centre

Although the Begnas-Rupa watershed is well known for its history, culture, biodiversity and traditional knowledge, it is hard to find a place where local people and visitors can find information about these

aspects. To fill in this gap, LI-BIRD and local communities have mobilized support to build an information centre. The main purpose of the centre is to promote domestic and international tourism as a sustainable source of income for local communities, closely linked to their agricultural related activities. The centre aims also at becoming an innovative learning and information sharing platform for farmers, local entrepreneurs and researchers. The information centre is located on Sundaridanda (which means beautiful hill) from where a beautiful view of both lakes can be enjoyed. The construction of the centre is coming to an end. While LI-BIRD has facilitated this project and will continue to provide technical support during the first few years of the centres' operation, local groups will take management responsibilities as soon as the centre opens.



Picture 2: Members of the Nepal team take a picture of themselves at Sundaridanda.

## 2. Sahar (*Tor putitora*) fingerling centre

Sahar (*Tor spp.*) is an indigenous fish of Nepal. Two different species of *Tor* are found in the rivers and lakes of Nepal hilly regions, including in the Pokhara valley. *Tor putitora* is known as Sunaulo Sahar and is very much appreciated. Breeding of Sahar has taken place in the Fisheries Research Station of NARC and at the facilities of the Rupa Lake Rehabilitation and Fisheries Cooperative. In addition, raising awareness and capacity building campaigns have taken place to prevent the erosion of the Sahar ecosystem and the over-exploitation of the species.

## 3. Sites of participatory crop improvement

Participatory crop improvement is at the core of LI-BIRD activities since the organization's establishment. In the last 18 years, LI-BIRD has worked on participatory crop improvement in numerous crops, including

rice, bean, finger millet, kidney bean, akabare chilli, potato and foxtail millet. The history of participatory crop improvement in Begnas area started with the project In situ/on farm conservation and use of agricultural biodiversity, in 1998. This project introduced tools for farmers and scientist to work closely together on varietal conservation and improvement. In addition to improved landraces and increased local biodiversity, these tools have empowered individual farmers and farming communities.



Pictures 3 and 4: Farmers in the hills of Begnas lake explain to workshop participants their involvement in participatory crop improvement project and the results of these projects.

#### 4. Ms. Lal Kumari's farm of medicinal plants.

Ms. Lal Kumari Thapa, lives in Chaur, together with her husband Mr. Jaya Bahadur Thapa, her son, and his family. They have a total land holding of six ropani (0.3 hectares) of upland, where they have a home garden. They keep a separate two ropani (0.1 hectares) for medicinal plants. In their medicinal plant garden, they keep a total of 121 species of plants, including the rare medicinal plant aloe (*Aloe vera*), serpentina (*Rauvolfia serpentina*), hibiscus (*Hibiscus sp.*), neem (*Azadirachta indica*), cinnamon (*Cinnamomum sp.*), bakaina (*Melia azedarach*), pakhanbet (likely *Bergenia ciliata*) and the rare species chautajhar. Lal Kumari is a member of the local Women's Group and the Pratigya Cooperative. She and her husband have displayed medicinal plants and medicines at various fairs and now many people come to their home to buy plants and products. Lal Kumari and her husband sell their medicinal remedies/powders and saplings of medicinal plants, as well seedlings to those who are interested in cultivating them. LI-BIRD has recognized and supported Ms. Lal Kumari's role as custodian farmer by giving her equipment for the management and processing of medicinal plants as well as several institutional prizes.



At the end of the day, participants were asked to share their reflections about what they had visited during the field trip. In particular, they were requested to indicate the aspects that have impressed them more and to provide one or two suggestions for LI-BIRD and its local partners to improve their interventions in the area. The following table summarizes the feedback received.

Table 1: Field trip's participants feedback

	On participatory crop improvement initiatives	On community participation in conservation and sustainable use
Participants were impressed by...	Farmers' clear understanding of participatory plant breeding (PPB)	Collective action for sustainable exploitation of common resources
	Results of PPB efforts on rice <i>Ekle</i> landrace	Strong social organization and social networks
	Farmers' strong commitment	
	LI-BIRD capacity to maintain long standing collaborations with local communities	
	Farmers leading the PPB process	
Ideas for further work	Improve PPB groups' capacities on marketing	Support value addition to, and commercialization of medicinal plants
	Increased women involvement	Increase incentives for custodian farmers like Ms. Lal Kumari
	More interaction between PPB groups and farmers not involved in PPB	Replicate medicinal plant garden in other project sites
	Extend PPB to other crops	Ensure transfer of knowledge and interest on PPB across generations
	Establish a community seedbank or genebank	Document the problems that LI-BIRD has found in more than 20 years of work in the area, and how it overcame them, or not.

## Opening of the workshop

Ram Bahadur Rana, Programme Operations Director of LI-BIRD welcomed all participants on behalf of Balaram Thapa, LI-BIRD Executive Director. Isabel López Noriega, policy specialist and global project coordinator at Bioversity International, presented the objectives and the structure of the workshop.

## Session 1: Providing support to farmers and farmers' groups

### Framework presentation: Uzbekistan

Abdikhalil Kayimov, Chair of the Forestry Department of the Tashkent State Agrarian University of Uzbekistan, presented the work carried out by the project team in Uzbekistan in relation to providing support to farmers and farmers' groups for seed production, storage and distribution:

The project started in 2013 in 4 zones of the country: Northern, Fergana valley, Southern and Central zone). A first round table regrouping 255 stakeholders (including 120 farmers) was organized to discuss

current problems in the system of seed production and distribution for vegetable crops and fruit trees. Difficulties involved in ensuring the quality of seed and planting material produced by local and small seed producers were identified and support measures were defined. In 2015 other round tables and meetings were organized in each of the 4 zones. These trainings focused on the production of seed and planting material, as well as storage, promotion and commercialization of seeds. Information about 35 seed suppliers in the four project sites was put together and made available to local producers, including detailed information about crops and varieties available from each provider, and their contact details. The project also supported 15 farmers in creating demonstration plots where other farmers can appreciate the performance of different varieties, beyond the ones they usually grow and some of them more adapted to their environmental conditions and the local preferences. A training booklet on best practices in seed production and a total of 14 leaflets were published and distributed among seed producers, farmers and technicians. TV and radio programs, as well as articles in the press, were used to present and publicize good management practices taken by farmers, and inform farmers and seed suppliers about the availability of a wide diversity of the project's target crops. In order to respond to very practical needs of farmers and seed producers in the project sites, the project purchased and distributed equipment and tools, and elite seed of carrot and onion for multiplication. The project was also instrumental in obtaining agreements between vegetable production organizations and seeds producers for the continued supply of good quality seed.

### Quick round of updates from the other four countries

Ximena Cadima (Coordinator of Genetic Resources Research Area at the Fundación para la Promoción e Investigación de Productos Andinos-PROINPA, Bolivia), Deepak Upadhy (Socio-economist at LI-BIRD, Nepal), Rose Nankya (Associate Scientist at Bioversity and the National Agricultural Research Organization –NARO, Uganda) and Guy Bessette (consultant working for Bioversity International in Burkina Faso) summarized the efforts done so far in this area of work in their respective countries. The following paragraphs provide an overview of these summaries.

**Bolivia.** The project has focused on potatoes and arracacha (*Arracacia xanthorrhiza*). While for potato a seed system combining formal and informal elements is in place, the seed system for arracacha does not exist or is limited to sporadic exchange of seed among farmers. In the case of potato, since most seeds is provided by the informal system, the project has focused on reinforcing actors' capacities in that system, paying particular attention to native varieties of potato. At the beginning of the project, two groups of farmer-seed growers were selected and trained in good management practices for seed production and storage. This training led the seed suppliers to get their seed certified by official agencies and become part of the official list of seed suppliers. The project also provided basic equipment for potato seed production, storage and classification.

**Nepal.** The project started with a needs' assessment related to seed production, storage, and marketing among seed producer groups involved in the project. It organized various round tables to identify and discuss current challenges that these groups face, like farmers' lack of awareness about varieties with huge market potential, or seed suppliers' bad practice of mixing seed of different origins and quality. Based on the needs and issues identified, the project provided training and technical assistance for the production of quality seeds to selected farmers' groups. It also provided material and equipment and helped link seed producers with private entrepreneurs. As pointed out by the president of the national network of community seedbanks, there is a big need for linking seed producers with the private sector.

**Uganda.** Common bean and banana are the target crops of the project. One of the first activities of the project was the characterization of the informal seed system. Like in Bolivia, since this system predominates for both crops, the project has focused on reinforcing this system, particularly through creating and enhancing community seedbanks. In addition to providing financial and technical support to the opening or enlargement of seedbanks, the project provided training to custodian farmers and farmers groups on quality seed production, storage and commercialization and implemented mechanisms to reward farmers for producing quality seeds. The project has carried out studies on how national policies and laws influence farmers' choices and is currently engaged in advocacy to promote the recognition of quality seed coming from local and informal seed sources.

**Burkina Faso.** The project carried out surveys in each of the three sites to understand the seed value chain of millet, cowpea and sorgho, and to identify the needs that smallholders face in terms of seed. It provided support to farmers through basic infrastructure for community seedbanks and training on seed production and seed quality certification. The training strategy is actually in revision to follow-up on demands from farmers and efforts are currently being made in taking into account gender aspects in the the seed value chain.

### Issues for further consideration

A number of questions were put forward after the presentations and introduced different topics of discussion.

- How is quality control addressed and guaranteed in informal seed systems? In addition to training and technical back-up, which mechanisms have been put in place or could be put in place to systematically monitor seed quality? In particular, how can the project ensure the good quality of the source seed?
- Have country teams adopted tools to monitor the impacts of their activities oriented to providing support to farmers for seed production?
- Based on the project's experiences, which reward mechanisms provide incentives for farmers to invest in good quality seed production?
- In addition to supporting individual farmers who are also seed producers, how can the project support the functioning and the resilience of the informal system *per se*?
- Which criteria are used to select farmers and farmers' groups that will receive support from the project?
- To what extent has gender issues been taken into account?

### Small groups' work on supporting seed producers' and farmers' groups.

Participants broke in country groups. Groups were requested to discuss the following questions and present their ideas in plenary:

1. *Which activities are pending? What else needs to be done to advance the project's objectives in relation to providing support to farmers and farmers' groups?*

2. *How to ensure sustainability of the project's interventions? How can support to farmers and farmers' groups be mainstreamed?*

The following bullet points summarize the ideas proposed by the country groups during the presentations in plenary <sup>1 2</sup>. We have clustered them according to five major areas of work: generating and sharing knowledge; providing support to increase seed business and seed market; influencing policies and working with governmental agencies; creating markets for diverse agricultural products; and reaching more people and more territories.

- Generating and sharing knowledge
  - Creating a farmers' institute or training centre (UZ)
  - Producing and distributing crop based training material on seed production (NE)
  - Consolidating and implementing training plans (BF)
  - Documenting, updating, disseminating scientific and traditional knowledge on crops, varieties and agronomic practices (NE, UZ)
  - Using available knowledge to matching varieties with farmers' needs in different project sites (NE)
- Providing support to increase seed business and seed market
  - Building the entrepreneur capacities of farmers for them to approach seed production as a business and helping them create community based enterprises (BO, NE, UG)
  - Fostering the demand for diverse varieties (through niche markets, when appropriate) while working on the supply (BO, NE)
  - Exploring the possibility of establishing seed revolving funds for producer associations which don't have such funds yet (NE)
  - Providing support with the registration of associations as seed producers (BO, NE)
  - Discussing and exploring incentives for the private industry to diversify their portfolio of varieties (NE)
  - Facilitating registration of farmers' traditional and improved varieties in national catalogues of commercial varieties (BO, NE)
- Influencing policies and working with governmental agencies
  - Contributing to the development of policies (including on plant variety registration and seed quality certification) with lessons learnt and experiences from this and other projects (NE, UG, UZ)

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<sup>1</sup> BO: Bolivia; BF: Burkina Faso; NE: Nepal; UG: Uganda; UZ: Uzbekistan

<sup>2</sup> Guy Bessette proposed the ideas for Burkina Faso, in the absence of the national project coordinators

- Integrating project’s activities in governmental plans and engaging governmental agencies in project’s activities (BO, BF, UG)
- Negotiating investments in agriculture and seed production with local and district authorities (BO, NE)
- Creating markets for diverse agricultural products
  - Adding value to agricultural products derived from diverse varieties (BO, UZ)
  - Developing markets for processed material (BO, UZ)
- Reaching more people, more territories
  - Developing and disseminating communication materials (UG, UZ)
  - Creating or reinforcing linkages with other partners beyond farmers’ and seed producers’ associations, such as districts’ departments and councils on agricultural development, food producers’ associations, networks of community seedbanks (BO, BF, NE, UG, UZ)
  - Scaling up to generate a critical mass of people concerned about seed production and working towards diversified seed systems (UG)

### A closer look at capacity building activities within the project

As a summary of the country teams’ reports on capacity building activities that have taken place in the context of the project, the Bioversity team put together and presented the following tables. The first one presents the project activities oriented to assess the capacity needs in the five countries. As the table shows, according to the countries’ reports, only Nepal has conducted a systematic assessment of needs, and exclusively in relation to individual farmers and seed producer groups. The second table shows details of the capacity building activities carried out in each project country. Based on these two tables, the third table provides an overview of elements that could be integrated in the capacity building efforts of the project. In addition to providing a comprehensive picture of the capacity building activities carried out by the project so far, these tables can be used as a framework for country teams to design their capacity building plans in the area of seed production and commercialization.

Table 2: Capacity needs’ assessments carried out by the project

	Bolivia	Burkina Faso	Nepal	Uganda	Uzbekistan
<b>Focusing on whose needs?</b>					
<b>(Individual, farmers, Seed producer groups, Scientists and future scientists, Seed industry, Seed consumers, NGOs, Governmental agencies)</b>					

<b>Focusing on knowledge and capacity needs in relation to which topic?</b>	
<b>(Crop and varietal diversity, Breeding and PPB, Agronomic management practices, Community seedbank management, Seed selection, Seed storage, Seed commercialization, seed business management)</b>	
<b>Methods for carrying out the needs' assessment?</b>	Individual farmers, seed producer groups
<b>(Surveys, focus group discussions, consultations, interviews, literature reviews)</b>	
<b>Did it differentiate between women and men's capacity building needs?</b>	

Table 3: Capacity building activities carried out by the project

	<b>Bolivia</b>	<b>Burkina Faso</b>	<b>Nepal</b>	<b>Uganda</b>	<b>Uzbekistan</b>
<b>For whom</b> <b>(Individual, farmers, Farmer seed producer groups, Managers of community seedbanks, Scientists and future scientists, Seed industry, Seed consumers, NGOs, Governmental agencies)</b>	Seed producer groups	Individual farmers	Seed producer groups	Individual farmers	Individual farmers and individual seed producers
<b>How</b> <b>(Oral explanations in training course, Roundtables, Written material, Radio and TV programmes, Digital platforms)</b>	Oral explanations Radio programmes	Oral explanations	Oral explanations participatory exercises	Oral explanations	Roundtables Factsheets TV programmes
<b>Topic</b>	Agronomic practices	Agronomic practices	Agronomic practices	Agronomic practices	Agronomic practices

<b>(Crop diversity, Breeding and PPB, Agronomic management practices, Community seedbank management, Seed selection, Seed storage, Seed quality certification (including QDS, TLS), Seed commercialization, Seed business)</b>	Seed selection Seed storage Seed quality certification Seed commercialization	Seed selection Seed quality certification, Seedbank management	Seed selection Seed storage Seed quality certification	Seed selection Seed storage Seed quality certification	Seed selection Seed quality certification
<b>Resource material utilized (own material, material from other organizations)</b>	Proinpa material	Material of the Service Nationale de Semences and the Université de Ouaga			Project generated material (factsheets)
<b>Feedback collected from trainees/participants?</b>		Yes		Yes	
<b>Gender aspects integrated in the training?</b>					

Table 4: Areas for further exploration for capacity building within the project

<b>For whom</b>	<b>How</b>	<b>Topic</b>	<b>Resource material utilized</b>	<b>Feedback collected from trainees or participants</b>	<b>Gender aspects</b>
<b>Managers of community seedbanks, Scientists and future scientists, Seed industry, Seed consumers, NGOs, Governmental agencies</b>	Written material, Radio and TV programmes, Digital platforms	Crop diversity, Breeding and PPB, Community seedbank management, Seed storage, Seed quality certification (including quality declared seed, truthfully labeled seed),	Possibility to develop crop specific and project-wide training materials	Through focus group discussions, evaluation forms, informal consultations with participants, monitoring visits.	Strategy to ensure that capacity building activities reach farmers and address their needs. Particular attention to women's

Seed commercialization and seed business	role in seed value chains.
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## Session 2: Understanding impacts of policies on seed systems and influencing policy decision making

### Framework presentation: Understanding the impacts of policies on seed systems and influencing policy decision making in Uganda

Gloria Otieno, food security policy experts at Bioversity International, presented the work carried out by the project team in Uganda in relation to understanding the impacts of policies on seed systems and influencing policy decision making in this country. This work has been carried out by Gloria together with Julian Barungi (Advocate Coalition for Development and Environment-ACODE), Paul Aseete (National Agricultural Research Organization -NARO), Rose Nankya (NARO), Divine Nakedde (National Seed Certification Services of the Ministry of Agriculture, Animal Industry and Fisheries) & John Mulumba (NARO).

The policy related work in Uganda has been articulated around research activities at three levels: At the micro-level, the project has studied the social dynamics of the banana and common bean's seed systems in selected communities, through household surveys (268 households in 3 sites), focus group discussions with farmers and an analysis of bean and banana seed systems in the villages. At the meso-level, the project has studied the value chain of seed from genetic resource conservation and breeding activities to the dissemination of seed among farmers. This has been done through literature reviews and key informant interviews. At the macro level the project has analyzed existing agricultural policies and evaluated their actual or potential effects on farmers' access to quality and diverse seed. At the micro and meso-levels of analysis, the key issues emerging from the research conducted are: 1) The dominance of largely informal systems, where the diversity of planting material available is usually high; 2) farmers' preference for landraces, especially in the case of bananas, because of their taste; in the case of common beans, marketability and high yield are the most important traits ; 3) proximity, price and trust are key driving factors for farmers choices of where to source seed; 4) there are important constraints to production of good foundation seed, which is important to ensure seed quality along the value chain, and imperative in case of certified quality seed; 5) high transaction costs for seed producers and insufficient human and technical capacities to monitor seed quality during the certification process present important challenges to the production of certified quality seed and do not help control the recurrent problem of fake seed in Uganda; and 6) seed market dynamics are not well understood or documented; seed producers and distributors along the value chain lack enough information to predict the demand and adjust the supply accordingly. The analysis of existing policies at the macro-level demonstrate that broad framework policies (like the National Constitution and the Agricultural and Rural Development Policy) include language promoting crop genetic diversity in both formal and informal seed systems. Also, some draft policies like the one on plant genetic resources for food and agriculture rank high in terms of providing for availability and access to food crop genetic diversity within the informal seed system.



However, specific national policies dealing with agricultural development emphasize increasing availability and access to genetic diversity through formal seed systems exclusively, and with a strong focus on modern and specialized high yielding varieties. The expected result is that informal seed systems and local diversity will be left outside governmental efforts. Based on these results, some areas where the project can try to have some policy influence relate to the introduction of quality declared seed systems in the national seed legislation, the reinforcement of local institutions that may enhance the connections and synergies between formal and informal seed sectors (like community seedbanks), reviewing and simplifying procedures for variety release and seed quality certification and connecting policies on the conservation and sustainable use of plant genetic resources with seed policies. Project partners are working on several policy reports and policy briefs and are involved in the consultations for the development of the national policies on plant genetic resources and on seed production and commercialization.

### Small groups' work on advancing the policy work within the project and defining a strategy for policy influence at national and international level

Participants broke in groups involving participants from two project countries. They discussed priority policy areas where the project could make contributions, taking into consideration ongoing policy processes in each country.

The following paragraphs present the actions agreed by the country teams during the small groups.

#### Nepal

- Explore measures for local and national governments to provide incentives for the farmers to register and maintain local varieties and landraces. Current seed law provides for a simplified system for the registration and official release of landraces, but despite this simplified system local crop diversity is not being registered.
- Strengthen the linkages between community seedbanks, the national genebank and the district agricultural development offices (DADOs). For most of the community seedbanks, this link does not exist, and it can help mainstream local level efforts in national initiatives on the conservation and sustainable use of plant genetic diversity.
- Propose to the variety registration and seed quality control office protocols for registering non uniform varieties, including mixtures. For some crops, like common beans, mixing varieties is a common practice among small farmers. Varieties in the mixture protect and help each other, and therefore makes sense to register and commercialized them together.
- Explore ways through which national policies on agricultural innovation can strengthen the participation of farmers and private companies in crop research and breeding.
- Support the establishment of seed buffer stocks as envisioned in the National Seed Vision 2025 for emergency situations.

Two ongoing processes that are relevant and provide opportunities for the project's actions are the continuous monitoring of the National Seed Vision, which is in the hands of governmental bodies at local,

district, ministerial and national levels, and the finalization and approval of the national law on plant variety protection and farmers' rights, to which project partners have already contributed

### **Uganda**

- Promote and participate in the discussions for the protection of traditional varieties, which were not considered in the Plant Variety Protection Act recently approved
- Propose the adoption of alternative registration standards that allow registration of non-uniform landraces (including populations and mixtures) in the official catalogue of commercial varieties.
- Advocate for the adoption of quality declared seed as a category recognized in Uganda, and contribute to the development of quality declared seed guidelines. Advocate for the allocation of enough budget for the implementation of the quality declared seed system in the country, including support for technical officers who will facilitate and monitor implementation of the system.
- Support the Ministry of Agriculture to decentralize seed quality assurance
- Raise awareness on current seed policies through media and policy dialogues. Even if the current policies have gaps, they include important information and provisions for stakeholders.

The two key processes where project contributions can be relevant are the development and approval of the new national seed policy and the national policy on plant genetic resources for food and agriculture.

### **Uzbekistan**

In Uzbekistan, registration of varieties has traditionally been in the hands of breeders and research organizations. In order for small seed producers and farmers to get their contributions recognized, they must be able to register their local varieties. This allows them to multiply planting material in bigger quantities and commercialize them in Uzbekistan and also abroad. With this idea in mind, the project will propose the following two amendments in the national seed law:

- To shorten the tests for variety registration from three to two planting cycles.
- To recognize the capacity of farmers to carry out some of the tests involved in the registration process.

In addition, the project team in Uzbekistan will continue working on a bill for the conservation and sustainable use of the diversity of vegetable and fruit tree species. This bill will be submitted to a Parliament Committee.

### **Bolivia**

The current political framework in Bolivia is favourable to the recognition of indigenous peoples and native crop diversity. The National Constitution approved several years ago as well as the recently adopted framework law on Mother Earth recognizes indigenous and local peoples' roles and rights in

relation to the conservation of crop diversity, and they provide a good entry point for the following actions:

- Explore with national authorities mechanisms for integrating traditional seed systems and traditional seed producers' practices in the officially recognized seed sector in Bolivia
- Collaborate with national authorities in the development of quality certification schemes that certify good practices of seed production and the geographical area of seed provenance.
- Work with local authorities for maintaining healthy traditional seed systems, particularly in the municipalities where local governments have already taken measures to protect local agricultural diversity, like Colomi.

## Session 3: Understanding and enhancing seed value chains

### Round of short presentations by country teams

Ximena Cadima, Guy Bessette, Raymond Vodouhe, Deepak Upadhya, Rose Nankya and Abdikhalil Kayimov made presentations on the work done by each country team for understanding and documenting seed value chains of the target crops in the project sites. The following paragraphs summarize their presentations.

**Bolivia.** The characteristics of the ecoregions determine certain aspects of the production of potato seeds such as the varieties available, the types of sources of seed, the rate of seed renewal by farmers and the type of production that will eventually use the seed. The areas selected for the implementation of the project are located in two different ecoregions in the municipality of Colomi: The High Puna (above 3800 m) and Low Puna (3200-3800 m). Compared to the Low Puna, the High Puna is characterized for having more potato diversity, richer soils, and less or no presence of pest and diseases such as nematodes or aphids in the soils (which required for the production of certified seed). Under the scope of this project, Bolivia conducted an analysis of the potato seed value chain to obtain baseline information about the potato seed system in Colomi. To this end, farmers and other key informants including professionals from the Instituto Nacional de Innovación Agropecuaria y Forestal (INIAP), Unidad De Producción De Semilla De Papa (SEPA), and the PROINPA Foundation were interviewed. In addition, local seed fairs displayed in Colomi and other places were monitored. The seed value chain analysis evidenced that in the study area, the informal seed system represents the main source of seeds for farmers (98%). The informal seed sector in the study area has two branches: a short one, consisting of the farmers' own supply of seed, which is particularly common in the High Puna; and a longer one, present in both the High and Low Puna, characterized for having more actors involved, and through which seeds are supplied in rural markets or fairs. The seed value chain analysis revealed as well that the Colomi fair, an informal local market, is the most important hub for potato seed in the region. Years ago potato farmers decided from whom to buy potato seed based on seed suppliers' reputation, which was well known in municipalities and often associated to the geographical area where the seed was produced. Nowadays, the Colomi fair and other local markets have distorted the rules and social networks that are at the basis of informal seed supply. Sellers at the fair claim that their seed come from certain areas or that have been produced by certain communities, while this is not always true. Good and bad quality seed are mixed in the bags and seed buyers cannot make use of any traceability mechanism to identify the source of both types of seed. Reputation of certain communities as seed suppliers is being affected by these behaviors and the lack of

monitoring mechanisms in the local fairs. Small holder farmers cannot afford certified seed unless they acquire them as farmers' groups and with the support of development organizations or local governments. Informal seed producers and suppliers have a great knowledge and understanding of the dynamics of the potato market, having even the capacity for inferring which varieties will have the highest demand in during the following season.

**Burkina Faso.** The project studies around seed value chains in Burkina Faso are still ongoing. Household surveys and interviews with selected seed suppliers have taken place, but the data analysis has not been completed yet. Preliminary results show that for most crops seed acquisition by smallholder farmers relies on social networks. For cotton, maize and some introduced vegetables, formal producers and suppliers of seed operate in some parts of the country, while for all other crops the informal system prevails. Farmers often prefer traditional varieties. This is sometimes explained based on the fact that modern varieties are usually not adapted to Sahel's extreme climatic conditions, which in the last years have been exacerbated by climate change. Strong social networks and rules at the basis of informal seed systems allow and govern the flow of seed in most areas of the country, however there is an important gap in terms of quality and quantity that the formal system, or a mixed system combining formal and informal elements, could fill in.

**Nepal.** In Nepal, formal seed production and distribution started during the late 1950s and early 1960s. Until the 1990s, seed business related activities were solely a public sector's responsibility. It was in 1991, with the creation of the Seed Entrepreneurs' Association of Nepal (SEAN), when the private sector started to progressively get involved in the seed sector. Since then, the seed system has progressively expanded and the number of actors involved in the seed value chain and seed business increased. Currently, the seed value chain in Nepal involves several steps and actors. For domestic seeds (i.e. the seeds produced within the country), the value chain includes variety development and maintenance, seed multiplication and seed processing, seed marketing and, finally, seed use. Actors in each of these steps can be of formal or informal nature, or both. The chain is much shorter for imported seeds, where only the last two steps apply. Currently, seed quality is a major source of concern. Fake seed is a common problem in both formal and informal seed value chains. The project in Nepal has focused on these three objectives: to obtain a better understanding of the role played by the different actors involved along the seed value chain (i.e. ranging from plant variety development to seed consumption); to identify gaps and weak points in the communication and information flow between these actors; and to identify the main constraints faced by the seed suppliers in predicting and responding to demand (both in terms of quantity and diversity). Discussions between LI-BIRD, NARC and Anamolbiu at early stages of the project led to several instruments for achieving these objectives. These included in-house meetings, focus group discussions, surveys, and workshops. Broadly speaking, the actors involved in the seed value chain of Nepal can be categorized as being involved in three different areas: research, extension and conservation. For the purpose of this study, 32 key informants belonging to agrovets, the Nepal Agricultural Research Council (NARC), community seed banks (CSBs), Community-Based Seed Production (CBSP) and district agricultural development offices (DADOs) from Kathmandu, Pokhara, Jumla and Bara were interviewed. In Nepal, variety seed development and research takes place in the variety development stations of the NARC. The resulting varieties, once released or sometimes even before releasing, are further multiplied by on-farm variety development groups, community based organizations or farmer organizations, and then assessed by the Seed Quality Control Center (SQCC), which belongs to the Ministry of Agriculture. The SQCC is also responsible of the registration and release of existing or new

varieties. Once multiplied, seeds are sent to the different DADOs, civil society organizations, agrovets, community-based seed production groups, and other centers in charge of the seed distribution; and finally to the farmers (including both CSBs and participatory plant breeding groups). However, the seed flow is not always linear: all these actors acquire seed from each other. In addition, there is a vibrant network of seed exchange within certain communities, while in others the flow of seed among community members is very limited. The following two diagrams represent the rice seed value chains in Bara and Kaski districts. Actors in grey usually operate within informal or traditional seed systems. Actors in green are usually part of the formal seed system. Seed exchange among farmers at the village level is represented in the dark grey circle. A detailed representation of how these exchanges take place (red square) were extracted from previous LIBIRD studies.

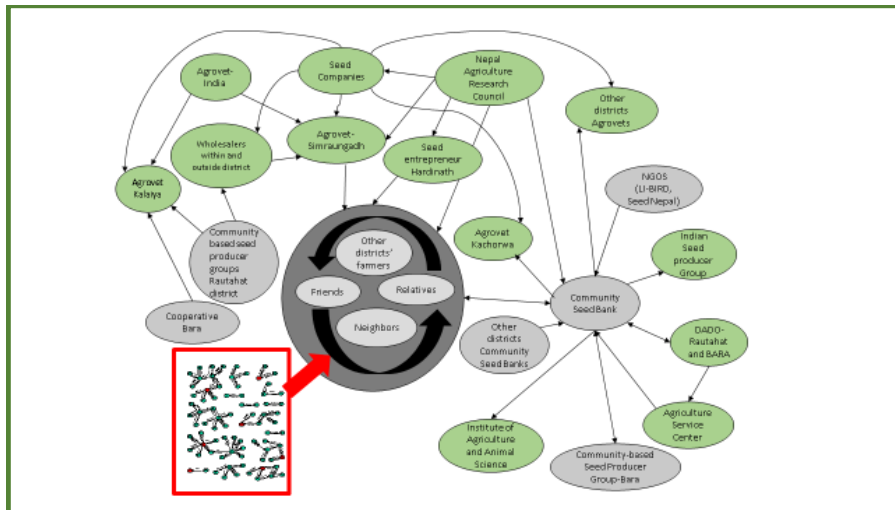


Figure 1: Rice seed value chain in Bara district

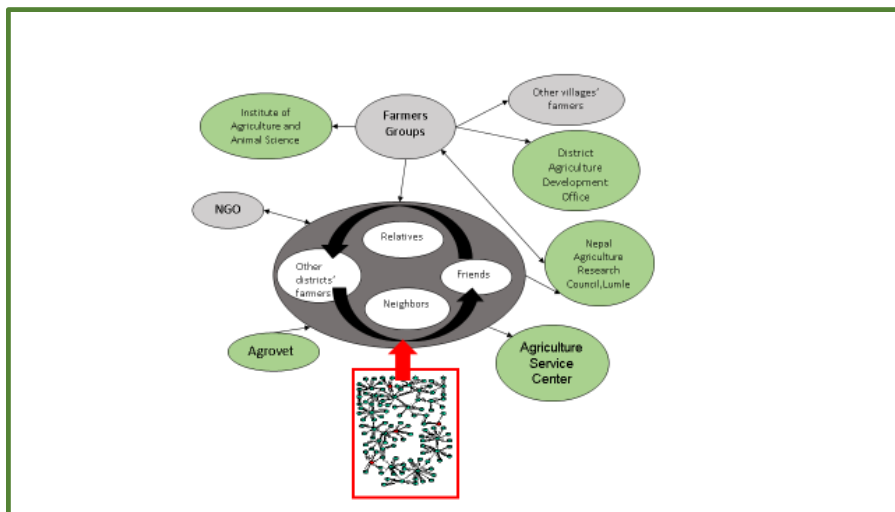


Figure 2: Seed value chain in Kaski district

Two main challenges were raised by the key informants concerning the seed sector in Nepal: The fact that 90% of the seeds that farmers have access to come from the informal seed system (i.e. is not subject to seed quality certification), and the lack of coordination and communication between the different

actors involved in the seed value chain in the country, which makes it difficult to understand the demand and respond to it. Consequently, future efforts under this project include improving the capacities of different actors working along the seed value chain of Nepal and to organize and conduct workshops or exchange visits seeking to increment the flows of information and communication between these different actors.

**Uganda.** The project team in Uganda surveyed a total of 180 farmers and 50 key informants including project field staff and representatives and coordinators of the District Farmer Associations, the National Agricultural Advisory Services (NAADS), the Ministry of Agriculture, Animal Industries and Fisheries (MAAIF), the District Agricultural Offices (DAO), seed dealers, NGOs and Community Based seed companies, and the National Agricultural Research Organization were interviewed. The following diagram represents the different steps and actors involved in the seed value chain of common bean.

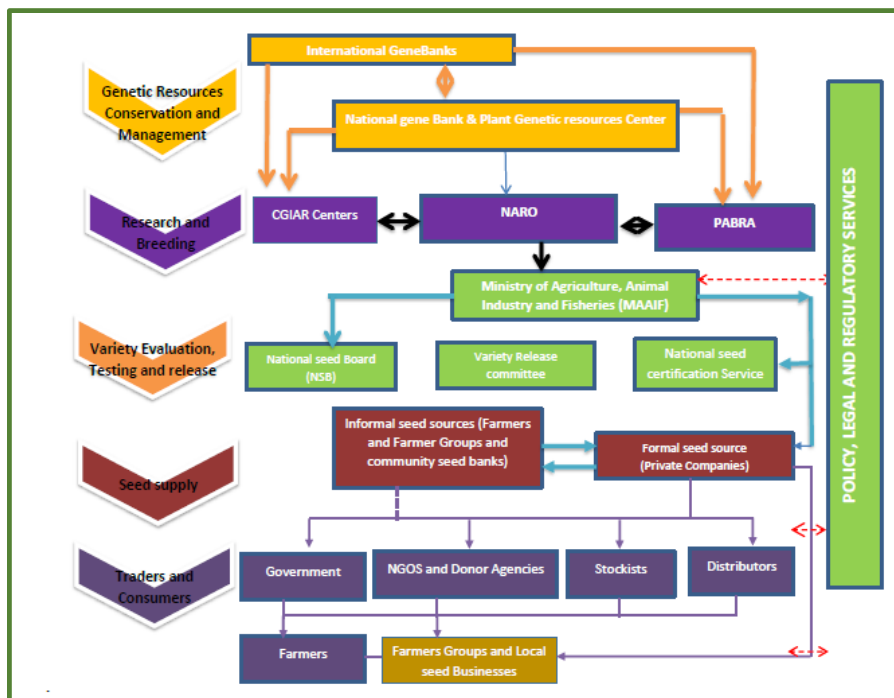


Figure 3: Common bean seed value chain in Uganda

From the interactions with farmers it was learned that 83% of the seeds that they use come from the informal sector. Main reasons behind the relative higher importance of the informal seed system compared to the formal were attributed to the high prices of the improved seeds, the poor quality of the certified seed and the lack of information about the varieties provided by the formal system. Main concerns raised by the interviewed seed suppliers included the unpredictability of the demand, price fluctuation; limited access to foundation seed; high transaction costs associated to the seed certification process; and limited capacity to supply the seed amounts and types requested on time. Breeders pointed out the following challenges: limited financial resources to maintain breeders' seed and produce pre-basic seed; limited information on the demand for foundation seed; and the high transaction costs associated to the variety release process.

**Uzbekistan.** Cotton and wheat, with 1.4 million hectares each, dominate agricultural production in Uzbekistan. The national government maintains a strong support and monitoring system for these two crops, including a well-functioning seed supply system where the formal sector supplies all the seed necessary for cotton production and around 90% of seed for wheat production. However, the informal seed system supplies more than 90% of the seeds of vegetable and legume crops. It comprises mainly on-farm production, selection, and saving of seed as well as farmer exchanges in the local markets (cash, barter, in-kind loans). There are however connections between formal and informal actors: Research institutes like the Uzbek Research Institute of Horticulture, Viticulture and Wine-making produces basic seed that are then supply to farmers for multiplication. Farmers can access the services provided by decentralized laboratories which control the quality of the seed. Based on this control, the government eventually provides a certificate, which allows farmers to sell the seed in larger quantities in the market. Supply of fruit trees takes place through nurseries. The largest ones belong to research institutes, and are open to everyone. Throughout the country there are local nurseries, some of them managed by very skilled farmers who maintain and provide traditional varieties. In the last decade, seed imports have increased considerably in Uzbekistan. Hybrid vegetables come from Holland, Belgium and Poland, not always subject to internal control mechanisms. Recently, the government has supported imports of fruit trees' planting material from Eastern Europe, as part of the national strategy to promote orchards and increase fruit production. However, imported varieties do not always adapt to Uzbek harsh conditions and their tasting qualities are much poorer than the local ones. There is also a concern that government's policies to support import may limit national seed suppliers' ability to find or maintain their place in national and international markets. In order to address these problems, through roundtables, capacity building workshops and individual support to selected suppliers, the project has focused on promoting local vegetable and fruit tree diversity among farmers and seed suppliers, enhancing suppliers' capacities by providing technologies and techniques that can complement their traditional ones and improving the connections between research organizations, local suppliers, quality control laboratories and farmers. From the point of view of climate and environment, Uzbekistan is very diverse. A key measure is therefore to identify and test the crop diversity that performs better or could adapt to the changing climatic conditions in each part of the country.

### Issues for further consideration

Workshop participants raised issues that require closer attention by national project teams. These are:

- How do informal systems work? How are they organized, particularly in Burkina Faso, Uganda and Uzbekistan?
- The demand for seed is not always clear. Governments come up with figures, but they sometimes do not show the reality. How is seed demand calculated and what are the implications of governments' proposed figures for seed national production and seed import?
- How is the seed price established? How do government subsidies distort the real price and what are the consequences of this for seed dealers and consumers?
- What is the volume of imports, particularly of hybrid varieties? Are they subject to state control? How do they affect production and supply of seed at local level?

## Planning knowledge products coming out from the project

Participants broke in groups that combined country representatives plus members of Bioversity team and discussed knowledge products to be generated as well as project' interventions in the area of seed value chains. The following paragraphs present the actions proposed by each country team:

### **Uzbekistan**

- Document knowledge sharing among farmers and putting in place mechanisms to support knowledge flows
- Produce mass communications tools
- Define a strategy for farmers' capacity building, looking at needs and actions in the short, medium and long term
- Organize roundtables and workshops involving scientists and farmers, together with other stakeholders
- Explore policy and technical mechanisms to monitor seed quality in informal systems

### **Nepal**

- Produce and distribute flyers presenting crop specific seed value chains
- Produce a scientific article presenting research on value chains of target crops in Nepal and paying particular attention to the role of custodian farmers
- Disseminate information about available varieties and seed suppliers through radio programmes and other means
- Continue organizing capacity building events, combining different actors (scientists, seed dealers, farmers) in the same event
- Organize travelling seminars for different actors in the seed value chain, for them to see practical actions at different stages of the seed production chain and issues involved

### **Uganda**

- Produce training manuals for trainers working with farmers on seed production
- Produce postcards presenting varieties and related agronomic practices, and distribute them among farmers
- Produce policy briefs and brochures and make them available to policy makers, governmental agencies, NGOs and international donors, highlighting measures through which formal and informal systems could complement and reinforce each other in Uganda
- Produce one scientific journal for researchers in Uganda and abroad

### **Bolivia**

- All partners within the project join forces and produce a global publication: "Bases to reinforce the informal seed system". Based on research carried out so far, each country team would contribute information on the following topics: actors involved in the seed value chain, in both formal and informal systems, and the role they play; weaknesses and strengths in the chain; volume of seed and varieties that are managed in formal, informal and mixed seed systems. With all this, project partners could do a comparative, global analysis of informal seed systems in



developing countries and provide recommendations on how to improve seed systems overall.

- Consolidate seed produce groups involved in the project, by reinforcing their business capacities and helping them become a real seed business
- Reinforce the connections between formal and informal actors in the potato seed value chain
- Explore mechanisms to calculate the real demand for certified and not certified seed

Workshop participants agreed that the proposal put forward by Bolivia to produce a project-wide publication building on the seed value chain analyses done by the project was a good idea. The Bioversity team agreed to coordinate this effort.

## Session 4: Developing catalogues of varieties and assembling and testing varietal portfolios


### Framework presentation: Variety Catalogues, Functional Traits and Varietal Portfolios in Nepal

Sajal Sthapit, Deputy Director of LIBIRD Programme Operations, and Deepak Upadhy, LIBIRD officer, made a presentation on the work done in Nepal in relation to documenting, characterizing and promoting existing crop diversity and assembling and testing varietal portfolios.

Project research activities on local crop diversity have showed that in various project sites rice production is dominated by a very low number of rice varieties. Many traditional and some modern varieties are also cultivated, but only by a few farmers. Continuation of this trend can lead to rapid genetic erosion and make seed system vulnerable. In addition, limited varietal availability leads to limited market options.

Considering together primary and secondary data, there is plenty of information about the agrobiodiversity and associated traditional knowledge in Nepal. However, since this information has not been collected in systematic way, it is currently difficult to find documented information about the crop varieties existing in the country. As a result, although crop diversity exists in the country, farmers are usually unaware of the better alternatives to grow in their fields. A different but related issue is that the number of local varieties are rapidly declining and thus there is a need to prioritize, given the limited resources, the varieties that should be conserved *in situ*. Under this context, one of the main priorities of the project in Nepal has been the production of a catalogue of varieties which consists of a compilation of the existing information about existing crop diversity and its associated traditional knowledge. The development of the varietal catalogue comes from the assumption that increasing awareness of existing rare varieties among farmers and consumers will lead to increased production and use of those varieties. To reach a wider public, two different types of variety catalogues are being produced: a catalogue of nationally released and registered varieties through formal systems; and a catalogue on varieties cultivated by farmers, as characterized by them. Figures 4 and 5 present examples of variety factsheets extracted from the two draft catalogues.


## Format for varietal catalogue



- **Crop Name:** Rice
- **Scientific Name:** *Oryza sativa*
- **Variety Name:** Pokhreli Jethobudho
- **Area of origin, cultivation and adaptation**
  - Kaski, suitable in 600-900 masl, Cold irrigated wet land, can perform even in water logged condition
- **Crop duration:** Mid May- end of October
- **Morphological trait**
  - plant height 140 to 191 cm, panicle length 20 to 30 cm, panicle initiation occurs at (x) days, flowering occurs (x) days after the start of panicle initiation, elongated grain, blackish color at the tip of grain, yellow white color of grain
- **Functional trait**
  - Aroma, soft and good in taste, high straw yield, good for *gundri* making, religious importance, staple food.
- **Current status:** Grown by large number of farmers at larger area.
- **Include photos of plant, flower, leaf, inflorescence/flower, panicles, seed etc that helps to distinguish the variety**

Figure 4: Example of catalogue factsheet

## Format for varietal catalogue






माली	चुर्चानी (Chili)	  
वैज्ञानिक नाम	Capsicum annum	
जात	सामो खुर्सानी	
सैलीको लागि उपयुक्त क्षेत्र	७०० देखि ९००० मिटर उचाई, बरेला बारीमा	
जात पाईने स्थान	डिडा गाउँ, हंशपुर	
संसादकत्व	१ के.जी प्रति मोटमा फल्ने	
माली जग्गी	वैशाख देखि भाद्र सम्म	
हुनीया	फलको रंग हलिया र रातो पाउटि रातो हुन, फलको जाकार मोलाकार, रात बुझ्दा परेको चुन्ने सेतो, फलको जाकार लामो हुने ।	
निरुपेण गुणहरू	धेरै फल्ने, लामो समय रहने, सितो रातो हुने	
प्रयोग	अचार बनाएर राख्न सकिने, तरकारीमा प्रयोग गरिने र बजारिकरण गर्न ।	
हालको अवस्था	धेरै कृषकले धेरै बोट लगाउने	

Figure 5: Example of catalogue factsheet

Ultimately, the production of these catalogues is expected to contribute to the attainment of two main objectives: to provide alternatives and increase varietal choice; and to make farming system resilience with various stress conditions. Further plans to continue with the efforts initiated during the implementation of the project include the publication of the catalogue book; making it widely available on line; identifying and registering promising varieties in the national catalogue; mainstreaming and testing varietal registration mechanisms for mixtures and providing support and incentives to seed producers for them to multiply seed of alternative varieties and mixtures.

LIBIRD team has also been working on assembling portfolios of varieties that can increase agricultural production resilience in a context of changing climatic and socio-economic conditions. First of all, the team has focused on defining the conceptual framework for the portfolio approach: A portfolio of varieties is simply a set of varieties maintained at a defined unit of interest. This unit can be a plot (for example multiple varieties of beans grown in a single plot), a household (for example a single household can have many varieties of rice, but on different plots), a community (for example, the varieties whose seeds are available at the local CSB and from local agrovets), or the market (local, national or international). The key question for the project is whether applying the portfolio approach based on functional traits is an effective way to meet farmers' needs. When thinking about constructing portfolios of varieties around selected functional traits, one must take into consideration existing practices and management issues that may arise in relation to each particular crop: for example, at the plot level, beans are already cultivated in mixtures by small farmers; to a great extent, this practice responds to the fact that people like eating mixtures of beans. Similarly, farmers plant different types of amaranths together. The different inflorescence colors of amaranths make differentiated management possible, and green parts from all varietal types can be eaten together. At the household level the portfolio approach is not entirely new for rice farmers: they often try to match different varieties to land types, therefore distributing portfolios of varieties across available plots, depending on soil and environmental conditions in each plot. However, other crops may be more difficult to cultivate in mixtures, because of possible hybridization and management challenges at the plot level, or because their post-harvest management requires different techniques for different varieties. Figure 6 shows the methodology applied by the project team in Nepal to approach the development of the catalogues and to use the information collected in further project's actions.

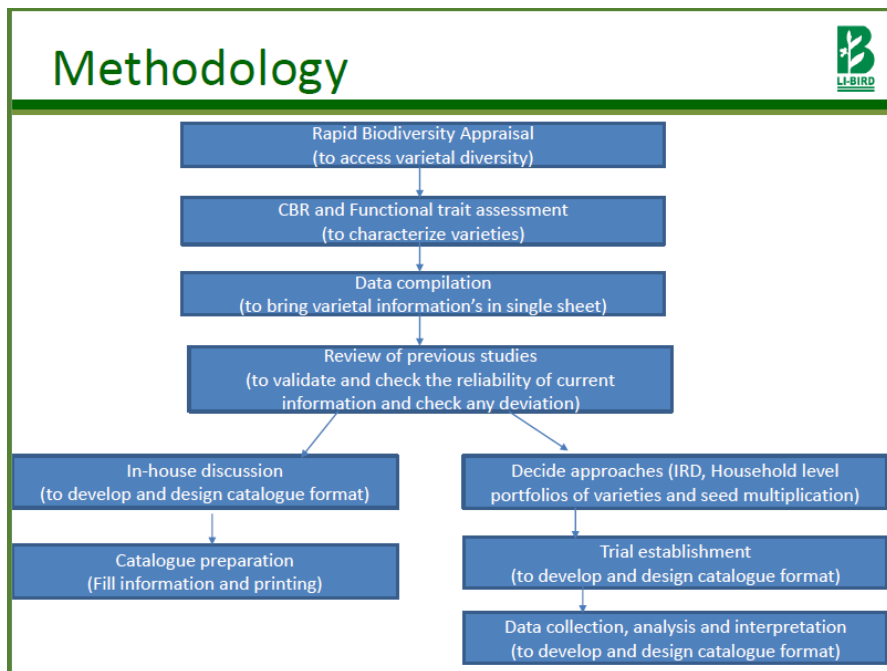


Figure 6: Varietal catalogue meethod

## Working groups: Defining a methodology for the application of the portfolio approach

Workshop participants broke in four groups with the mandate to delineate a methodology for the application of the portfolio approach, based on: 1) the main steps defined at the workshop “Assembling portfolios of varieties”, which was organized by the project in 2014; 2) project teams’ own practical experiences and knowledge about varietal portfolios; and 3) the conceptual framework provided by Sajal and Deepak in their presentation. The following paragraphs present the results of the small groups’ work.

### Group 1: Characterizing functional diversity (Uzbekistan team)

The first step in the portfolio approach is to understand the varietal diversity that exists for a given crop and the functional traits that each variety has. For the characterization of varieties, this step must involve observation of the varieties in farmers’ fields as well as experiments and tests in controlled environments and on farm (particularly for characteristics related to water needs, resistance to pest and diseases, etc.). Variety characterization needs to cover traits that are important for scientists, farmers and food processors, and must combine observations from these three actors. Table 4 presents some of the characteristics that have to be taken into consideration and the actors that are better positioned to assess each characteristic.

Table 5: Traits to be characterized and actors to be involved in the characterization

	Scientists	Farmers	Food processors
Main descriptors of the plant (color, high, etc)			
Vegetative period			
Resistance to pests and diseases			
Drought tolerance			
Salinity tolerance			
Lodging tolerance			
Main descriptors of the fruit (color, size, taste)			
Productiveness			
Post-harvest characteristics (storage, transport)			
Processing and cooking characteristics			

### Group 2: Assembling functional portfolios (Uganda team)

The second step in the portfolio approach is to identify and rank farmers and consumers’ constraints and preferences, and how the constraints affect optimal productivity and marketing. Literature reviews and participatory methods can be adopted to carry out this task. Focus group discussions involving different actors, household surveys and interviews with key informants can provide a comprehensive picture of existing constraints and preferences. It is necessary to adopt methodologies that are gender inclusive and to well capture differential needs of women and men, young and elder people. In view of climate change, climate modelling tools can be used to predict future climatic characteristics and resulting constraints for the production of particular crops in a given geographic area.

Once constraints and preferences are ranked, the functional diversity that can address these constraints and preferences can be identified, using the information generated in the previous step (“characterizing

functional diversity”). Socio-economic conditions and current farming practices need to be taken into consideration when prioritizing the traits that are to be included in the portfolio.

The target scale of the portfolio needs to be very clear from the beginning: what is the geographical scope of the varietal portfolio? Is it to be cultivated in a plot, in different plots of a household, in different households of a community or in different communities of a district? The scope will determine the constraints and preferences that need to be addressed, and consequently the size of the portfolio, the traits include and the amount of variability within the traits. When unpredictable environmental changes is one of the constraints (for example, erratic rains), a high degree of variability of a given trait across the portfolio may be valuable. The people involved in this exercise will also very much depend on the scale or unit where the portfolio approach is to be applied.

When assembling portfolios at the plot and household levels, farmers might not be able to articulate in portfolio terminology what traits they prefer. Organizing sessions in demonstration plots and gardens may help scientists and farmers to understand each other and to effectively carry out a participatory selection of varieties following a portfolio approach.

The portfolios should be dynamic. They should evolve across time and across space, to accommodate changes in constraints and preferences from now to the future and throughout a given geographical space.

### **Group 3: Testing portfolios (Nepal team)**

The Nepal team presented an experiment that they put in place to test a varietal portfolio of rice taking pest and insect resistance and drought tolerance as the main traits to assemble the portfolios. These traits were decided based on farmers’ communities preferences as expressed in previous activities of the project. Using the catalogue of rice varieties developed by the project, LIBIRD team assembled two portfolios: one to be tested at the community level (i.e. the different varieties within the portfolio were to be planted in different plots of the household) and at the plot level (i.e. the different varieties were to be planted together, but not mixed, in the same plot). The hypothesis that the experiment aimed to test were the following:

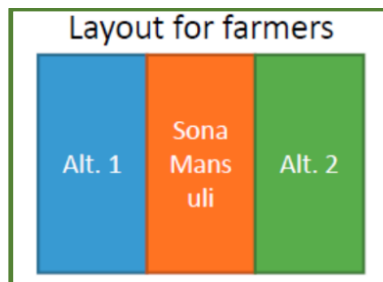
- H1a: There is no difference between average yield of set of varieties and the average yield of varieties grown individually.
- H1b: Average yield performance of set of varieties is greater than average yield performance of each individual variety.
- H2a: There is no difference between the disease resistance of set of varieties grown together and the disease resistance of varieties grown individually.
- H2b: Average disease resistance of set of varieties grown together is greater than the disease resistance of varieties grown individually.
- H3a: There is no difference between the insect resistance of set of varieties grown together and the insect resistance of varieties grown individually.
- H3b: Average insect resistance of set of varieties grown together is greater than the insect resistance of varieties grown individually

The experiment took place in the village of Kachorwa. Previous project research activities have showed that farmers' fields in this village are dominated by very few varieties despite having 84 local and 16 modern paddy rice varieties. This means that there is high varietal richness, but evenness is very low. All farmers cultivate the variety Sona Mansuli.

The project team multiplied and distributed six drought tolerant varieties to each household, to be planted in different plots. Households were also given a portfolio of three different varieties to be planted together in the same plot. All these last portfolios included Sona Mansuli and two other varieties with more resistance to pests and insects than Sona Mansuli.

- Set 1: Swarna Sub-01, **Sona Mansuli** and Sambha Mansuli Sub
- Set 2: Swarna Sub-01, **Sona Mansuli** and Kachorwa-04
- Set 3: Sambha Mansuli Sub 1, **Sona Mansuli** and Kachorwa-04

One hundred thirty four community members were trained in the portfolio approach. They were requested to cultivate the plot portfolio following this scheme:



The results of the experiment were not useful to test the hypotheses presented above. At the plot level, a very long drought destroyed many of the seedlings of Sona Mansuli, and did not allow the project to test Sona Mansuli's performance when planted together with other more resistant varieties.

However, some practical implications of the portfolio approach were evidenced through the experiment:

- Applying the portfolio approach to the plot level is quite difficult due to small landholdings which cannot hold three varieties in a single plot.
- Farmers were exposed to alternative varieties and expressed their interest in continuing cultivating some of them.
- There is a very extended trend to cultivate popular but susceptible varieties. According to farmers, this is because they are unaware of better alternatives. The portfolio approach can address this limitation.

#### **Group 4: Multiplying and making portfolios available. (Bolivia team and part of the Nepal team)**

Making the portfolios available requires having in place seed multiplication and distribution mechanisms. All or some of the following measures may be necessary to actually make the portfolios available and accessible for farmers:

- If seed multiplication of the portfolio varieties at large scale is necessary, the registration or release of those varieties that are not already registered may be compulsory.
- Production of high quality basic, foundation or source seed
- Multiplication of seed production sites and core seed multipliers
- Define the necessary seed quality and take measures to ensure the decided quality standards. These measures may include capacity building and quality monitoring on farm and in research stations.
- Link seed multiplication with seed distribution channels, both formal and informal.
- Put in place mechanisms for promoting the portfolios.

In some cases, existing seed value chains may be capable to make the portfolios available and accessible by farmers. In other cases, initiatives like this project may have to support production, distribution and promotion of the portfolios. The target scale and the actual content of the portfolio will very much influence the kinds of interventions that are necessary to make portfolios available, as well as the actors that need to be involved along the seed value chain.

### Next steps in defining and testing the portfolio approach

Workshop participants agree that the project has defined the pillars of a methodology that would allow to put in practice the portfolio approach. However, more thinking and practical experiences are necessary to understand the conceptual and practical issues involved at each step. Some of the steps' measures have been already tested and documented by previous initiatives. In particular, a lot of resources are available for the step "Characterizing functional diversity". Previous works on mixtures offer principles and tools for assembling and testing portfolios of varieties. However, more work needs to be done under these two steps, to first make them really participatory and second test and show the benefits of portfolios at different scales. The step that requires more efforts and innovation is the last one: multiplying and making portfolios available. The seed sector is articulated around the development, multiplication and commercialization of single varieties. Diversity kits are sometimes distributed in the context of research and development projects, but commercial seed producers and dealers are not used to selling varieties as part of a functional package. Workshops participants agreed that the project will continue to define the conceptual framework of, and the methodological approaches to the portfolio system. A possible product of this effort could be a scientific article. Further experiments and case studies at different geographical scales may need to take place in a possible second phase of the project.

## Session 5: Making diverse good quality seed available to farmers

### Framework presentation: Making good quality and diverse seed available for farmers in Bolivia

Ximena Cadima, on behalf of the Bolivian team, made a presentation on the project activities focusing on making good quality diverse seed available to farmers in the Colomi municipality of Bolivia.

As mentioned before, the project is being implemented in two different areas, both of them located in the municipality of Colomi, part of the Cochabamba region. The zones are the Puna zone and the Tropical area. The Puna zone is characterized for having a relative humidity of 55% and an altitude of between

3.000 and 4.800 meters above the sea level. It has a cold wet winter, an average temperature of 15°C; and precipitations of around 800 mm/year. The Tropical area, on the other hand, is located at an altitude of between 100 and 3.000 masl, has a relative humidity of around 75%; an average temperature of 20°C; and precipitations ranging from 2000-3500 mm/year.

The target crops of the project are potato in the Puna zone and arracacha in the tropical zone. Potato is the most important crop, both as a dietary staple and as a source of income, for the farmers of the highlands of Bolivia. A further reason for the selection of this crop is the outstanding biodiversity of potato varieties found in this area. Estimations indicate that in the Colomi municipality there are around 50-60 landraces of potato. Moreover, about 80% of the area cropped with potatoes is actually sown to landraces. Arracacha is a key product for the economy of at least 168 families of this area. However, and despite its high potential due to its rich nutritional values, the arracacha is currently underutilized.

In the study areas, more than 95% of the seed used for agricultural production comes from the informal sector. In addition, whereas there is an established seed system for potato, there is none for arracacha. A common feature of the informal seeds systems is that they lack standards guaranteeing the quality of the seeds that they offer. As a result, the smallholder farmers whose seeds usually come from these informal systems are more vulnerable to suffer from the spread of pests and diseases on their fields, particularly in the case of tubers like potato and arracacha. Under this context, the implementation of the project in Bolivia has focused on the following objectives: to improve the availability of quality seed of a wider range of varieties; to make good quality seed of these varieties accessible for farmers-seed producers; and to promote the varieties among potential users (i.e. farmers).

To begin with, the project worked on the identification of different portfolios of potato and arracacha varieties and of potential seed producers. Functionality of the portfolios in view of environmental constraints was not the primary criteria for assembling the portfolios. The main criteria was the actual or potential market demand for the varieties, based on their taste, shape and colors, as well as their performance in storage and transportation. The varieties of arracacha were selected based on their agro morphological variability, taste, their resistance to transport and their levels of productivity. Seed suppliers who would be assisted by the project were selected according to technical criteria. Particular aspects taken into consideration were soil health and potential surface free of nematodes; availability of rested land; crop isolation and minimum altitude requirements (between 3900 - 4200 meters high); individual and group capabilities; experience in seed production; and farmers' willingness to work collectively. Making seeds of selected portfolios available and promoting their adoption by farmers were the following steps of the project. With that purpose, the project provided high quality foundation or basic seed to the seed producer groups, who multiplied it and sold the seed in the local market. In addition to the basic seed, the project provided technical support in the form of training workshops, infrastructures and equipment and accompanied the seed producer groups during the whole process for seed certification. As a result, the seed producer groups involved in the project were eventually included into the official list of seed suppliers of the INIAF. In order to promote the adoption of seed diversity, the project organized farmers' visits and field days to demonstration plots at various stages of the potato cultivation cycle and produced promotional banners and brochures that increased the groups' visibility in the Colomi local market and in general among potato producers in Cochabamba department.

As a result of the activities undertaken by the project, the availability of quality seed of 14 different native potato varieties (3 portfolios) has increased in the formal and informal systems of seed production



and distribution of Colomi municipality. Text box 1 below summarizes the basic seed and the certified and non-certified seed that were produced and sold with the project support in Colomi.

- ▶ Seed of high quality - Potato
  - ▶ 1<sup>st</sup> group: direct purchase of seed "Basic" category
  - ▶ 2<sup>nd</sup> group: seed virus-free (laboratory and greenhouse) and seed "Pre-basic" category
  - ▶ 3<sup>rd</sup> group: seed virus-free (laboratory and greenhouse). Pre-basic seed production still in process
- ▶ Distribution of seed - Potato
  - ▶ 1<sup>st</sup> group (5 varieties):
    - ▶ 5.000 kg seed delivered to seed growers for multiplication during 1<sup>st</sup> year
    - ▶ Around 13.400 kg certified seed
    - ▶ It is estimated other 35.000 kg sold as informal seed and potato for consumption
  - ▶ 2<sup>nd</sup> group (5 of 7 varieties, 2 seed lots):
    - ▶ 60 kg (lot #1) delivered to seed growers for multiplication during the 2<sup>nd</sup> year
    - ▶ Estimated 5000 Kg produced
    - ▶ 180 kg (lot #2) delivered to seed growers for multiplication during 3<sup>rd</sup> year

Text box 1: Basic, certified and non-certified seed generated with the support of the project in Bolivia.

After conducting an analysis of the performance and potential of marketing of these portfolios, four of these 14 varieties have been found to have relatively higher potential in the short term. The project has contributed to establish connections with some potato producer groups in Cochabamba, who have requested the project seed groups to continuously provide them with seed. In the case of the arracacha, the project identified four varieties with potential to be brought to the market while at the moment only one of these varieties is present in the market.

Overall, there has been good progress in improving the availability of quality seed in the study areas. Yet, the seed grower groups still need technical support to consolidate their knowledge in the management of quality seed, in developing business plans for marketing the diverse seed they produce, and for finding the appropriate markets to sell them. One of the lessons learned is that improving seed systems for smallholder farmers requires long term field actions. Therefore, further steps to continue with the efforts made throughout the implementation of this project should focus on continuing accompanying the seed production and distribution of good and diverse quality seeds to make sure that these are available to small holder farmers who are still highly dependent on the informal seed system for their subsistence.

## Session 6: Thinking of the future: Ideas for a second phase of the project

The last session of the workshop was dedicated to exchange ideas about a possible second phase of the project. Isabel López Noriega, global coordinator of the project at Bioversity International, presented the areas where future work could focus and the main activities under each area of work. These areas of work had been identified as priority ones in the discussions that had taken place during the workshop and also in the course of project activities so far.

### 1. Improving supply of foundation/ basic/ elite seed

- Influencing annual planning for production of foundation seed (of which crops, which varieties, how much, for which parts, etc.) in order to:
  - Increase varieties for which foundation seed is produced
  - Inform decision making so that varieties match local demand (in qualitative and quantitative terms)
- Increasing number of organizations with capacity to produce foundation seed, if possible
- Understanding demand for foundation seed
- Increasing diversity and amount of foundation seed produced

## **2. Improving seed business in informal seed systems**

- Supporting farmer seed producers to approach seed production as a business. This could include:
  - Training on commercialization
  - Developing market plans
- Promoting local/national/international market demand for diverse varieties.
- Developing/providing affordable harvesting and processing technology adapted to production of diverse seed

## **3. Enhancing seed value chains**

- Gender analysis: Understanding women's role along the seed value chain
- Supporting and creating opportunities for women at higher levels of the chain
- Continue to create and reinforce connections among actors (research institutes, seed producers, governments at various levels, etc.).
- Continue to improve information and information flows for the supply to match the demand

## **4. Increasing accessibility of seed by farmers**

- Understanding factors that determine farmers' access to appropriate seed (Proximity, price, information, etc.)
- Defining (gender sensitive) interventions

## **5. Continuing capacity building for different actors involved (or to be involved) in local seed systems**

## **6. Advancing the portfolio approach**

- Refining and testing the portfolio methodology at the most appropriate level/s in each country.
- Documenting results

## **7. Providing incentives for seed industry to diversify their variety portfolio**

- Compile possible incentive mechanisms
- Discuss incentives with industry

## **8. Continuing policy analysis and influence to get local seed systems recognized and supported**

Isabel clarified that not all the project countries would give the same importance to all areas of work. In order to start developing a proposal for a second phased of the project, country teams should discuss and identify those areas that were particularly important in their countries and/or for which the current or other ongoing projects offered good opportunities of success. With this idea in mind, the plenary broke in groups and country teams discussed their priority areas of work as well as the general activities that would allow them to efficiently approach each area of work.

Table 6 summarizes both the areas of work proposed in Isabel's presentation and countries' priority actions under each area of work. This table will constitute the basis for the development of a second phase project proposal.

Table 6: Ideas for a possible second phase of the project: Areas of work and priority actions in each country

Priority Areas of Work	Priority actions in each country				
	Bolivia	Burkina Faso	Uganda	Nepal	Uzbekistan
<b>Improving supply of source, foundation or basic seed</b>	<ul style="list-style-type: none"> <li>-Understanding demand for foundation seed according to seed market demand</li> <li>-Increasing amount of foundation seed produced by actual or potential seed producers</li> </ul>		<ul style="list-style-type: none"> <li>-Training and facilitation to increase number of foundation seed producers</li> <li>-Increase diversity of foundation seed produced</li> <li>-Provide information on sources of foundation seed</li> </ul>	<ul style="list-style-type: none"> <li>-Assess national and local demand and supply situation</li> <li>-Prepare varietal catalogue and disseminate the information among actors involved in decision making on the production of basic seed</li> <li>For Community Seed Banks: Seed multiplication of identified suitable varieties; support the seed collection process, packaging and distribution of the identified varieties; provide necessary equipment,</li> </ul>	<ul style="list-style-type: none"> <li>-Land certification (land health) for production of foundation seeds by private seed companies</li> <li>-Facilitate establishment of private seed sector for production of foundation seeds (shifting from research institutes to private seed production sector).</li> </ul>

infrastructures and technical supports.

**Improving business capacities in informal seed systems**

- Training on business and commercialization
- Developing market plans by, among other things, facilitating round tables among seed producers, traders, carriers, users, etc.
- Providing technology to facilitate seed selection, packing, labeling.

- Training all seed actors along the value-chain
- Making the informal seed sector more attractive by creating a reliable market

- Training in making business out of seed production
- Linking seed producers to markets

- Include local varieties in national register
- Providing support to informal seed producers in order to maintain genetic purity and physical quality of seed

**Enhancing seed value chains**

- Reinforcing women's role in the process of seed selection and commercialization
- Reinforcing connections among seed producers, local government and civil

- Support information sharing and communication on seed needs and seed availability (Government to provide on regular basis information on reliable demand per

- Creating and reinforcing connections and collaboration among actors
- Establishing mechanisms for improving information flows among actors


- Put in place gender and youth inclusion strategies along the value chain, particularly to prevent youth migration

	<p>society organizations (“sindicatos”)</p> <ul style="list-style-type: none"> <li>-Assess demand (who demands, which varieties and quantities)</li> <li>-Induce demand for rare and unique varieties</li> <li>-Use of ICT technology to improve information and information flows;</li> <li>-Enhance connection between seed producers, farmers and final consumers</li> </ul>	<p>district and for specific varieties)</p> <ul style="list-style-type: none"> <li>-Develop a national database on seed needs at the district and village level</li> <li>-Mapping variety distribution and monitoring seed diversity at national level</li> <li>-Explore government support to Informal seed systems</li> </ul>	
<p><b>Increase accessibility of seed by farmers</b></p>	<ul style="list-style-type: none"> <li>-Enhancing information about diverse seeds on local markets (make them more visible)</li> </ul>		<ul style="list-style-type: none"> <li>-Establish and support local seed businesses and community seed banks</li> <li>-Disseminate information about seed suppliers so that the consumers of seed get</li> </ul>

				to know where and how to access the seed
<b>Continue capacity building for different actors involved (or to be involved) in local seed systems</b>	<ul style="list-style-type: none"> <li>-Capacity building to current seed producer groups in order to consolidate them as a enterprises community-based</li> <li>-Promoting a network of seed growers (from different sites)</li> <li>-Capacity building on harvest, post-harvest and commercialization</li> </ul>	<ul style="list-style-type: none"> <li>- Continue capacity building for different actors involved (or to be involved) in local seed systems</li> </ul>	<ul style="list-style-type: none"> <li>-Build capacity in professional seed production including foundation seed production</li> </ul>	<ul style="list-style-type: none"> <li>-Involve young scientists in seed production research</li> <li>-Establish school for young farmers to ensure pass of knowledge on quality seed production from older to younger generation of farmers</li> </ul>
<b>Advancing the portfolio approach</b>		<ul style="list-style-type: none"> <li>-Revise and update portfolios on regular basis</li> <li>-Work on community and national genebanks capacities as providers of portfolios</li> </ul>	<ul style="list-style-type: none"> <li>-Establish and support stakeholder platforms at different local government levels for reviewing and promoting the selected portfolios</li> </ul>	<ul style="list-style-type: none"> <li>-Prepare and test portfolios according to agroecological and market assessments</li> <li>-Study ways to deliver portfolios</li> </ul>
<b>Providing incentives for seed industry</b>			<ul style="list-style-type: none"> <li>-Conduct demonstrations where</li> </ul>	

<p>to diversify their variety portfolio</p>	<p>all key players in the seed sector participate in selecting portfolios</p> <ul style="list-style-type: none"> <li>-Conduct workshops for key players to develop incentive mechanisms</li> <li>-Implement incentive mechanisms</li> </ul>			
<p>Continue policy analysis and influence to get local seed systems recognized and supported</p>	<ul style="list-style-type: none"> <li>-Promoting the implementation of an alternative policy for the certification of informal seed production</li> </ul>	<ul style="list-style-type: none"> <li>-Organize national seed actors to reflect on complementarity between formal and informal seed systems</li> <li>-Organize high policy level meeting to brief policy makers on need to revise national seed regulation and law</li> <li>-Initiate new seed law/policies</li> </ul>	<ul style="list-style-type: none"> <li>-To get local seed systems recognized and supported</li> <li>-To promote recognition of farmers rights</li> <li>-To provide alternative variety registration to cater for landraces and mixtures</li> </ul>	<ul style="list-style-type: none"> <li>-Include local varieties in national register for legally permission to multiply and sell seeds of local crop varieties</li> </ul>
<p>Other?</p>	<ul style="list-style-type: none"> <li>-Area: Enhancing the resilience of informal seed systems to face climate change effects</li> </ul>	<ul style="list-style-type: none"> <li>-Better characterization of existing informal seed system (SWOT analysis)</li> </ul>	<ul style="list-style-type: none"> <li>-Ensure quality assurance in informal and formals seed systems (e.g. Training</li> </ul>	<ul style="list-style-type: none"> <li>-Establish information exchange web platform for easier access to quality seeds</li> </ul>





-Activity: Promote the design of action plans with local governments to assist eventual disasters (in order to assist farmers with seed in case of disasters)

-Develop an improved informal seed system using FAO "Quality Declared Seed " approach as a basis

-Developing informal seed platform approaches that brings together all seed actors (i.e. develop new dialogue among actors of formal and informal seed systems)

-Influencing national seed regulations and policies to get local varieties with desired traits registered and multiplied as commercial seeds

seed producers in quality control; incorporate seed inspection in seed production)

(information with quality seed suppliers' contacts, name of crops and varieties which seeds are supplied, process, seed amount, technical guidelines and manuals on quality seed production, seed planting dates, harvest, etc.) hosted by Farmer's Union of Uzbekistan

## Annex 1 –Workshop agenda

### **Improving seed systems for smallholder farmers' food security**

#### **Second project-wide workshop**

#### **Pokhara, Nepal**

28 September – 2 October 2015

#### **Background, objectives and structure of the sessions**

The project “Improving seed systems for smallholder farmers' food security” started in 2012. In the last three years, all country teams have made big efforts to advance the programme of work for the implementation of the project. Based on the particular needs of seed producers and consumers in the project sites, country teams have put more emphasis on some areas of work than on others. While some teams have been very successful with some activities others have found a number of challenges to implement those same activities. The range of methodologies that have been applied is very diverse, as well as the lessons learnt during the process. All this offers the opportunity to all country teams and Bioversity experts to exchange experiences and learn from each other.

The project will come to an end in 2016. Since we have only one more year in front of us and the programme of work is very ambitious, some country teams will have to prioritize activities and products. This is also the time to identify possible collective products that the joint work of country teams and Bioversity experts can produce for the benefit of the countries involved and also other countries around the world.

The Swiss Development and Cooperation Agency has expressed its interest in receiving a proposal for a second phased of this project. If we obtained funds for a second phase, some of the areas of work of the project could be expanded. Some activities could be consolidated to obtain a greater impact on the ground. Some innovative approaches tested by the project could be scaled up. Before the project ends, the main components of a possible second phase should be identified and presented to the donor.

Therefore, the objectives of the workshop are:

- To review advances in project implementation in the five countries and prioritize remaining activities
- To discuss and agree on project-wide products that can be promoted at the international level to allow project results to scale up
- To identify areas of work for a possible second phase of the project

All the six sessions of the workshop will be organized in a similar way: we will start with a presentation by one of the country teams, focusing on one of the areas of work of the project. This presentation will help frame the subsequent discussions, which will take place in plenary or in small groups.

#### **Agenda**

**DAY 1, 28 September 2015**

8.30	All participants meet at the hotel reception.
8.30-17.00	<b>FIELD TRIP</b> to project site in Begnas and Rupa Watershed followed by a short reflection in the Sundaridanda information centre.

**DAY 2, 29 September 2015**

9.00-9.25	Welcome	Balaram Thapa, LIBIRD Executive Director
9.25-9.35	Presentation of the workshop objectives and how the sessions will be organized	Isabel López Noriega
<p><b>SESSION 1: Understanding and documenting seed value chains</b></p> <p><b>Chair:</b> Bhuwon Sthapit</p> <p><b>Note taker:</b> Gloria Otieno</p> <p>Most country teams have completed the majority of the activities related to understanding and reinforcing seed value chains. The objective of the first part of the session is to exchange experiences in the application of different methodologies for gathering information, share the results of the studies on seed value chains and identify what needs to be done to reach the project objectives in relation to enhancing connections among actors in the seed value chain.</p> <p>The project has generated considerable amount of information around existing seed value chains for the target crops. During the second part of the session we will discuss and agree on joint products based on the results coming from different countries and on follow up activities that could be included in a second phase of the project.</p>		
9.35-10.00	<p><i>Presentation</i> on the work done to understand and document seed value chains in <b>Burkina Faso</b></p> <ul style="list-style-type: none"> <li>○ Context</li> <li>○ Objectives</li> <li>○ Methodologies</li> <li>○ Results</li> </ul>	<p>Didier Balma</p> <p>Mahamadi Ouedraogo</p>

	<ul style="list-style-type: none"> <li>○ Products (results, publications, meetings, etc.)</li> <li>○ Plans for the future</li> </ul>	
10.00-10.15	Additions from other country teams. Comments, questions and discussions.	All participants
10.15-10.45	COFFEE and TEA	
10.45-11.45	<p><i>Small group work:</i></p> <p>1. Possible products arising from the project in this area of work at national and international levels:</p> <ul style="list-style-type: none"> <li>- Which kind of products (publications, international workshops, participation in conferences, etc.)</li> <li>- Roles of country teams and Bioversity experts</li> </ul> <p>2. Possible activities under this area of work that could be included in a second phase of the project</p>	<p>Group 1: Teams from Bolivia and Uzbekistan, with Bioversity person/people</p> <p>Group 2: Teams from Burkina Faso and Uganda, with Bioversity person/people</p> <p>Group 4: Team from Nepal, with Bioversity person/people.</p>
11.45-12.30	<i>Feedback from small groups and plenary discussion</i>	All participants
12.30-14.00	LUNCH	
<p><b>Session 2: Understanding and influencing policies</b></p> <p><b>Chair:</b> Muhabbat Turdieva</p> <p><b>Note taker:</b> Jessica Brusgmans</p> <p>Except for some remarkable exceptions, the progress made by country teams in this area of work has been modest. In 2014, Bioversity International organized a training workshop on policy analysis where some national partners learnt about methodologies and tools that they can use in their policy related activities. During this session, small working groups will define a programme of work for advancing their knowledge of policy obstacles and opportunities that are relevant to achieve the project objectives and will identify opportunities to influence policy decision making at national and international levels.</p>		
14.00-14.30	<i>Presentation</i> on the work done by the project in <b>Uganda</b> for understanding the impacts of	John Wasswa Gloria Otieno

	<p>policies on seed systems and influencing policy decision making.</p> <ul style="list-style-type: none"> <li>○ Context</li> <li>○ Methodologies</li> <li>○ Results</li> <li>○ Products</li> <li>○ Plans for the future</li> </ul>	<p>Rose Nankya Julian Barungi</p>
14.30-15.10	<p>Comments from other country teams and Bioversity, questions, general discussion</p>	<p>All participants</p>
15.10-16.00	<p><i>Small group work: Advancing the policy work within the project and defining a strategy for policy influence at national and international levels</i></p> <ul style="list-style-type: none"> <li>- Policy analysis: scope, resources, expected results.</li> <li>- Policy influence: with whom, when, where.</li> </ul>	<p>Group 1: Teams from Bolivia and Burkina Faso, with Bioversity person/people</p> <p>Group 2: Teams from Nepal and Uganda, with Bioversity person/people</p> <p>Group 4: Team from Uzbekistan, with Bioversity person/people.</p>
16.00–16.30	<p>COFFEE and TEA</p>	
16.30-17.30	<p><i>Feedback from small groups and plenary discussion</i></p>	<p>All</p>

### DAY 3, 30 September 2015

9.00-9.15	<p>Summary of the previous day and arrangements for today</p>	<p>Isabel López Noriega</p>
<p><b>SESSION 3: Providing support to farmers and farmers' groups for seed production, storage and distribution</b></p> <p><b>Chair:</b> Raymond Vodouhe</p> <p><b>Note taker:</b> Guy Bessette</p> <p>Country teams have adopted a wide range of approaches to support farmers and small seed producers. Training workshops have taken place in all country teams, with success in most of the cases. The objective of this session is to exchange experiences, identify activities that need to be completed before the project ends and discuss about the possibility of preparing joint training</p>		

material on seed production, storage and commercialization for publication in the project countries and worldwide.		
9.15-9.45	<p><i>Presentation</i> on the work done by the project in <b>Uzbekistan</b> to support farmers and small seed produces in the production, storage and distribution of seed</p> <ul style="list-style-type: none"> <li>○ Context</li> <li>○ Methodologies</li> <li>○ Results</li> <li>○ Products</li> <li>○ Plans for the future</li> </ul>	Abdikhalil Kayimov Khasan Buriev
9.45-10.30	<i>Quick round of updates</i> from other countries (10 minutes each)	All country teams
10.30-11.00	COFFEE and TEA	
11.00–12.30	<p><i>Discussions in plenary:</i></p> <p>1. Which activities are pending? What else needs to be done to advance the project’s objectives?</p> <p>2. Developing training materials and other relevant products at national and international levels</p>	All participants
12.30–14.00	LUNCH	
<p><b>SESSION 4: Developing catalogues of existing varieties and defining portfolios of varieties</b></p> <p><b>Chair:</b> Devra Jarvis</p> <p><b>Note taker:</b> Richa Gurung</p> <p>One of the core components of the project is producing catalogues of existing varieties and assembling portfolios of varieties that can respond to existing environmental constraints, farmers’ self-consumption and marketing preferences and final consumers’ demands. Discussions during this session will build upon the work done at the Workshop on Assembling Portfolios of Varieties, which was held in Rome in April 2015. The objective is to refine the methodology delineated during such workshop and discuss possible on the ground activities to be covered during this project or in a possible second phase.</p>		
14.00-14.30	<i>Presentation</i> on the work done by the project in <b>Nepal</b> for developing catalogues of	Deepak Upadhya

	varieties and assembling and testing portfolios of varieties <ul style="list-style-type: none"> <li>○ Context</li> <li>○ Objectives</li> <li>○ Methodologies</li> <li>○ Results</li> <li>○ Products (catalogues, reports, etc.)</li> <li>○ Plans for the future</li> </ul>	Sajal Sthapit Krishna Ghimire Maheshwor Gurung
14.30-15.10	Additions from other country teams. Comments, questions and discussions.	All participants
15.10-16.00	<i>Small group work:</i> Writing a paper on a methodology for assembling portfolios of varieties, possible uses and policy issues (draft to be provided by Devra and Isabel)	Group 1: Teams from Bolivia and Nepal, with Bioversity person/people Group 2: Teams from Uzbekistan and Uganda, with Bioversity person/people Group 4: Team from Burkina Faso, with Bioversity person/people.
16.00-16.30	COFFEE and TEA	
16.30-17.15	<i>Feedback from small groups and plenary discussion</i>	All country teams
17.15-17.30	Any other business	All participants

#### DAY 4, 1 October 2015

9.00-9.15	Summary of the previous day	Isabel López Noriega
<p><b>Session 5: Making good quality and diverse seed available for farmers</b></p> <p><b>Chair:</b> Rose Nankya</p> <p><b>Note taker:</b> Paola De Santis</p> <p>The project is contributing to improve the availability of quality seed of a wider range of varieties of the target crops in the project sites. Country teams have achieved this result adopting different approaches and using different means. During this session, we will discuss the efficiency and sustainability of the different approaches. Country teams will provide feedback to other country teams on the activities that they have conducted. Through questions, comments and suggestions,</p>		

country teams will help other country teams identify ways to improve their interventions and make them sustainable and efficient.		
9.15-9.45	<p><i>Presentation</i> on the work done in <b>Bolivia</b> for producing and distributing quality seed of diverse portfolios of varieties Promoting portfolios of varieties</p> <ul style="list-style-type: none"> <li>○ Context</li> <li>○ Objectives</li> <li>○ Methodologies</li> <li>○ Results</li> <li>○ Products</li> <li>○ Plans for the future</li> </ul>	Ximena Cadima Franz Terrazas
9.45-10.30	<i>Quick round of updates from the other countries (10 minutes each)</i>	All country teams
10.30-11.00	COFFEE and TEA	
10.45–11.45	<p>Receiving feedback on this area of work from peers in other countries: Country teams ask questions and provide feedback to the other country teams.</p> <p>30 minutes country teams prepare questions and feedback</p> <p>20 minutes country teams provide and receive feedback</p>	<p>Group 1: Bolivia and Uganda teams will provide feedback to each other</p> <p>Group 2: Burkina Faso and half of Nepal team will provide feedback to each other</p> <p>Group 3: Uzbekistan and the other half of Nepal team will provide feedback to each other</p>
11.45-12.30	<i>Feedback from small groups</i>	All
12.30–14.00	LUNCH	
<b>AFTERNOON: Free for sightseeing</b>		

**DAY 5, 2 October 2015 (note that this day we will start earlier than previous days)**

8.30-8.45	Summary of the previous day and arrangements for today	Isabel López Noriega
<b>Session 6: Preparing for a possible second phase of the project</b>		



**Chair:** Devendra Gauchan

**Note taker:** Rose Nankya

Based on discussions during the previous days, Bioersity team will present the main components of a proposal for a second phase of the project. By the end of the workshop, these main components should be agreed by participants, together with a plan for the writing and presentation of the proposal.

8.45-9.30	<i>Presentation</i> of possible areas of work during the second phase of the project, based on discussions from previous days	Isabel López Noriega Paola De Santis Devra Jarvis
9.30-10.15	<i>Plenary discussion</i>	All participants
10.30-10.45	COFFEE and TEA	
10.45–11.00	Closure of the workshop	

## Annex 2 – List of participants

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LIBIRD staff involved in related projects and participating in this workshop:

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<b>Sandesh Neupane</b>	Project Officer
<b>Indra Poudel</b>	Technical Officer
<b>Anju Pandey</b>	Project Officer
<b>Aastha Khanal</b>	Project Officer
<b>Balaram Thapa</b>	Executive Director
<b>Shanti Ale</b>	Senior Program Officer

\* Flight problems did not allow this person to participate in the workshop

## Annex 3- Group photo

