



Bangladesh: the importance of farmers' seed systems and the roles of Community Seed Wealth Centers

Top photo: Rajendrapur Nayakrishi Seed Hut, Natore. Credit: Bioversity International/R.Vernooy

UBINIG

About UBINIG [www.ubinig.org]

UBINIG, abbreviated from the Bangla name *Unnayan Bikalper Nitinirdharoni Gobeshona* (Policy Research for Development Alternative), is a community-based action research organization formed in 1984. UBINIG's role evolved from piloting community led action research to implementing innovative ideas based on a holistic view of the complex interactions between the biological and economic foundations of a community. Recent activities include action research on agro-ecological aspects of agrarian change with regard to sustainable development goals, climate change adaptation and the prevention of non-communicable diseases.

UBINIG's motivation and orientation to social change and development is to defend agriculture as a way of life instead of reducing farming to a sector of food production. One of the organization's major achievements has been to establish a biodiversity-based ecological agriculture movement blending innovative science and indigenous knowledge. It is known as Nayakrishi Andolon or New Agricultural Movement, now active in three major agro-ecological zones of the country and bringing together 300,000 Bangladeshi farmers. Because of the nature of its activities UBINIG has close grassroots connections with farmers, weavers, fishers, artisans and craft persons, community health providers, rural entrepreneurs and other rural actors involved in livelihood struggles.

Introduction: the context

Farmers in Bangladesh use an interesting mix of modern and traditional farming practices that include modern varieties, hybrids and local seed varieties. Since the introduction of Green Revolution technologies, the country's main cropping systems are based on irrigation, the use of chemical fertilizers and pesticides, and monocultures. This modernization process has led to a

significant loss of agro-biodiversity. It has also caused ground water depletion, soil fertility loss and environmental and human health problems due to the overuse of harmful chemical inputs.

Farmers increasingly have to deal with climatic unpredictability: excessive rains, flooding, severe droughts and cold spells. 2017 was disastrous for tens of thousands of farmers due to excessive rains and recurring

floods that severely affected harvests and seeds. Flooding submerged more than a third of the low-lying country from July to September, killed more than 130 people and affected more than 7.5 million people. Crops on more than 10,000 hectares of land washed away while another 600,000 hectares of farmland were damaged. In this context, farmers' seeds became critical to survive the disaster. The government provided some seeds for the next cropping cycle, but mostly farmers used their own seed sources. Healthy seeds are the key to ensure the natural and bio-productive foundation of farming communities.

Aman rice is broadcasted and transplanted. In the central Tangail flood plain region, the broadcasting of Aman seeds is known as Chhit Dhan. Local varieties used are Hijol digha, Dhepa, Patjag, Moynagiri, Chamara, Patishail, Bhaola digha and Patjak, Kajakshail. The *Chhit Dhan* of local varieties survived the first round of flooding, but got

damaged in the second round. Of the local varieties only Chamara did well due to its water-resistance. It grew and survived better in the unusual deep water levels than all the other varieties. After losing most of the *Chhit Dhan*, farmers tried transplanting Aman rice locally known as *Ropa Aman* (photo 1). For the third time fields were inundated by flood; the seedlings washed away. Comparing the successive flooding experiences, local farmers observed that overall *Chhit Dhan* varieties did somewhat better than *Ropa Dhan* ones for which they use different and fewer varieties. Unfortunately, farmers could not obtain any harvest from the *Ropa Aman*.

Nayakrishi Seed Network

The Nayakrishi Seed Network (NSN), known as the *Nayakrishi Beez Shongho* in Bangla, is the active farmers' network of Nayakrishi Andolon with specific responsibility to ensure the collection, conservation, distribution and enhancement of

seeds among the members of Nayakrishi Andolon. Farmers ensure *in situ* conservation of biodiverse life forms and genetic resources in farm fields and practice *ex situ* conservation of germplasm at the household and community levels. The Nayakrishi Seed Network builds on the farming household as the focal point for *in situ* and *ex situ* conservation. Women farmers are the key actors and leaders in the network. In addition, the Specialized Women Seed Network (SWSN) is entirely comprised of women farmers. The leadership of women farmers in seed conservation and community seed wealth centers is common, but it is important to have their own sphere of knowledge and practice to keep feminine wisdom free from patriarchal domination. Community Seed Wealth Centers are run by farmers as the apex body of the Nayakrishi Seed Network linked with the Seed Huts (known as *Beez Akhra*) at the village level. They are truly grassroots organizations.

Photo 1: Transplanted rice in the Tangail region. Credit: Bioversity International/R.Vernooy



Nayakrishi Community Seed Wealth Centers

The effective operation and management of Nayakrishi's Community Seed Wealth Centers (CSWCs) and Seed Huts have always been a challenge for farmers who practice biodiversity-based community farming. However, through learning by doing and innovation, farmers have achieved significant progress in collecting, conserving and reproducing local planting materials. This has strengthened farmer's seed systems and contributed to seed and food sovereignty at the household and community levels. Operationally, the key to success has been to enhance the roles of CSWCs and Seed Huts as nodal points of the Nayakrishi Seed Network (photo 2). This is one of UBINIG's major activities.

CSWCs and Seed Huts are not merely physical places where seeds are stored and regenerated. Farmers of the Nayakrishi Seed Network embed them in their day-to-day relationships with their particular environment and agro-ecological setting. This is essential to ensure their biological existence. The striking character of CSWCs and Seed Huts is their capacity to augment the dynamic and cyclical relation between *in situ* and *ex situ* conservation of planting materials



Photo 2: Tangail CSWC. Credit: Bioversity International/R.Vernooy

that make farming possible, sustainable and gainful. It is gainful not only in economic terms enabling farmers to engage in the market, but also biologically to enhance farmers' capacity to regenerate the biological foundation of farming and generate almost all the required inputs from farming. Nevertheless, genetic resource conservation as an integral component of agrobiodiversity-based farming has its challenges, different from conventional farming.

Community Seed Wealth Centers are the institutional set up located in one of the *Biddaghors* (learning centers) of UBINIG for seed collection, storage, preservation,

distribution, exchange and regeneration. The tasks of the CSWCs also include documentation and maintenance of general information of the area. The construction of CSWCs is based on two principles: (a) they must be built from locally available construction materials and (b) the maintenance should mirror the household seed conservation practices. Any difficulty encountered in the CSWCs usually reflects the problems that farmers are facing in their household conservation efforts (photo 3).

The staff members of UBINIG are responsible for the operation of the CSWCs. However, CSWCs are part of the Nayakrishi Seed Network; therefore, farmer representatives participate in the decisions of the CSWCs. Any member of the Nayakrishi Andolon can collect seed from a CSWC with the promise that they will return after the harvest at least double the quantity received. Farmers can ask for seeds of the variety or varieties they have returned at any time. A farming household can decide not to replant a species or a variety in a given season, but do so after two to three years.

Photo 3: Tangail CSWC seed production garden. Credit: Bioversity International/R.Vernooy



Ridoypur Community Seed Wealth Center (Tangail)

Ridoypur *Beez Shampad Kendra* has 1,754 accessions of paddy collected from different parts of Bangladesh. They store 161 varieties of vegetables, oil and pulses. Recent CSWC research focused on a few crops resulting in the collection of 47 varieties of beans, 16 varieties of brinjal (eggplant) and eight varieties of chili. Nine varieties of bean were selected as tolerant to water logging. Narshingdi is a very tasty one. Kartik collected from Noakhali matures early and is tasty. Brinjal varieties Bhita Begun, Mukta Begun and Kaika Begun were collected from Jamalpur. Seven varieties of chili are tested for their suitability in the flood plain ecosystem. Tangail CSWC also initiated cultivation of selected sweet pepper since they can add economic value to farming. So far, two varieties have been successfully cultivated in the Tangail center. Other vegetable crops, such as sweet gourd (Boidyabati) were cultivated with good results. Four varieties of sponge gourd were collected. A ridged gourd variety, Choishira jhinga, was selected

for its good taste. Ash gourd, sponge gourd and bean seeds were distributed from the Beez Shompad Kendro among local farmers.

There are four Seed Huts linked to the Ridoypur Community Seed Wealth Center:

- Mamudpur Seed *Akhra* maintains 30 varieties of 19 species of vegetables; 5 varieties of 4 species of pulses; 5 varieties of 4 species of oil seeds; 7 varieties of 5 spice species; 7 varieties of rice and 5 varieties of other cereals.
- Lauhati Seed *Akhra* maintains 21 varieties of 13 species of vegetables; 5 varieties of species of pulses; 5 varieties of 5 spice species; 5 varieties of rice.
- Babupur Seed *Akhra* maintains 22 varieties of 18 species of vegetables; 3 varieties of 3 species of pulses; 3 varieties of 3 oil seeds species; 6 varieties of 6 spice species; 8 varieties of rice and 5 varieties of other cereals.
- Fazilhati Seed *Akhra* maintains 27 varieties of 19 species of vegetables; 3 varieties of species of pulses; 3 varieties of 3 oil seed

species; 6 varieties of 6 spice species; 4 varieties of rice and 4 varieties of other cereals.

Arshinagar Community Seed Wealth Center in Ishwardi (Pabna)

Rice research is a primary activity of this CSWC (photo 4). In addition, the CSWC is maintaining seeds of threatened varieties of other crops. Bean (*shim*) is an important crop mostly cultivated in the Ishwardi on commercial basis. Because of aggressive marketing of commercial varieties, farmers not belonging to Nayakrishi are dependent on commercial hybrid varieties. However, the Ishwardi region has maintained many local varieties. This CSWC has a collection of 33 bean varieties. A few varieties were brought from the coastal region of Cox'sbazar. These are Noldong, loita shim, vutta shim and Tiktiki shim.

18 varieties of brinjal collected are cultivated and maintained in the CSWC. Among these, Akbori and Ghritokanchan are of very good quality and suitable for the Ishwardi area. Nine tomato varieties were collected, cultivated and maintained. Chili and capsicum varieties (long, round) are also maintained. Water gourd, sweet gourd and bottle gourd are being cultivated in container bags. Tepaboro Dhan is expected to yield 5 to 8 tons per hectare. About 24,000 farmers are attached to the Arshinagar Community Seed Wealth Center.

Three Seed Huts that benefited from UBINIG support are (photo 5):

- Parashidai Seed *Akhra* maintains 150 varieties including Dhal digha rice. About 300 farming households benefit from this Seed Hut.
- Rajendrapur Seed *Akhra* maintains 218 varieties including rice, medicinal plants, flowers, oil seeds. Kartikshail, Kalpat,

Photo 4: Ishwardi region. Credit: Bioversity International/R.Vernooy





Photo 5: Mariam Begum in the Parasidhai Nayakrishi Seed Hut. Credit: Bioversity International/R.Vernooy

Hijaldigha, Hasha boron rice have been maintained for the last 12 years. The Seed Hut has saved many threatened rice varieties. Kalpat and Kolamocha have been regenerated. About 800 farming households benefit.

- Krishnopur maintains 90 varieties including Hidi, a rice variety considered essential for the farming families. A common rhyme goes like this: *Jodi na thake Hidi, Gushti rakhba ki di* (How you are going to maintain continuity of your family if you do not have the Hidi variety?) About 260 farming households benefit.

Seed Hut operations

The Seed Women Specialized Committee is responsible for the management of the Seed Huts and to connect them to the Community Seed Wealth Centers. The women running the committee do not call themselves “experts” as in the formal system, but they specialize in different seeds according to their interest, background and technical capacities. Each woman

of a Specialized Seed Women Committee has her own collection of seeds and has knowledge about it. The Committee is comprised of ten members in a 6:4 women-men ratio. They meet once in a fortnight or a fixed day of the month. For example, in the Rajendrapur Seed Hut, they meet on the first third day of the Bengali Calendar month. They discuss and share information about the crops and emerging issues, such as losses due to floods, drought, water-logging, early or delayed rain, etc.

The Management Committee members decide about seed distribution among the farmers and about the rules of exchange. They discuss situations that the Committee needs to consider:

- Seed entering the seed hut. They must be free of disease and insect infestation; matching the crop calendar of the locality; weighed; and labeled with information of the seed donor.
- Seeds going out of the seed hut: the Committee decides who is

entitled to obtain seed. Usually, Nayakrishi farmers ask for and are given seeds. Non-Nayakrishi farmers often come for particular seeds. They are questioned about the purpose of the visit and if they use pesticides in their fields. They are invited to follow Nayakrishi rules and if they agree, they will receive seeds. Farmers receiving seeds from the Seed Huts are expected to return seeds. However, sometimes they fail to do so. Seed Hut leaders sanction farmers who do not return seeds by not allowing them to receive seeds again. Seeds received from Seed Huts are mostly vegetable seeds, such as string bean, Shim (hyacinth bean), Indian spinach, water gourd, ash gourd and ridged gourd. However, in 2017, Seed Huts were of great help and gave rice seeds to many farmers affected by the floods.

Farmers knowledge

Rina Begum, Mamudpur, Tangail, is a champion custodian farmer with a wealth of seed knowledge. She shared the following (photo 6):

“Chamara rice is common among farmers. Most conserve the seeds and cultivate it on their land. Jhingasail rice is used for puffed rice, Vasha manik for making popped rice (khoi). Chiniguri is cultivated to make polao (a specially cooked aromatic rice with butter oil) and payesh (a sweet desert preparation of rice with milk and molasses), a delicacy for family occasions. Hijal dhiga is good as boiled rice.

Farmers cultivate safflower for medicinal use, Sonali maize for khoi (popped rice) and as poultry feed. Some spices like Radhuni soj are cultivated in the mixed crop field. Other crops are ash gourd, pea, two varieties of Hyacinth bean (Shim), shat potol (Sponge gourd), mustard, radish, and ginger.”

When asked which crops are the favorite, she replied: “Chamara rice, ash gourd, Chichinga (snake gourd), Tarmuz Lau (water gourd), Bira lau (a variety of pumpkin). Sweet gourd is grown as a mixed crop with other crops like sweet potato.”

Nihar Banu: Rajendrapur Seed Akhra, Natore, is another champion seed custodian sharing the following:

“Sada kalika rice is cultivated by farmers for making khoi (popped rice) and muri (puffed rice). Vorilota is deep water aman rice. Kalojira rice is needed for making pithas (cake) and polao. Hidi rice is a high



Photo 6: Rina Begum in the Mamudpur Nayakrishni Seed Hut. Credit: Bioversity International/R.Vernooy

yielding local variety rice, very favored by farmers. Kalabokri is an aus rice variety which can be cultivated as a mixed crop with other rice. Kalamocha is an endangered rice variety; it is available in the Seed Hut, but not available from other local farmers.

Among vegetables, sweet gourd is cultivated: the variety is golap, a round variety and very sweet. Atghoria brinjal is a high yielding variety. Among the Hyacinth beans Kaikla shim is very tasty. Baromashi shosha (ever bearing cucumber)

and Italy garlic are strong like bricks.”

The favorite crops are the following:

“Chalklet bean and Taherpuri onion are very popular. Kalabokri aus rice variety is relay intercropped in the jute field just after or at harvesting of jute in July/August. Kalojira (black cumin) grows as a border crop. Khesari is a very good yielding easy crop that gives very good return in terms of leafy greens used as spinach and feed for cows.”

Conclusion: maintaining and improving farmers' varieties

Nayakrishi farmers collect, conserve and reproduce seeds in their own fields; they call it *jat* in Bangla. Diverse and good quality farmers' varieties are key to maintain an agro-ecological production system that ensures returns of maximum productivity in specific agro-ecological conditions. Although farmers are aware of the broader roles they play in the conservation of biological diversity in the country, they are relatively less aware of how particular management practices influence what is conserved, where and in which quantity. The various community seed banking efforts aim to strengthen farmers' knowledge about the evolution, maintenance and improvement of discrete farmers' varieties. In the context of climate change, management of diverse seeds to meet the challenge of climatic variability and disaster is becoming more and more important.

Expression of a trait of a variety is directly dependent on local conditions. It is important that farmers understand that a variety they collect from a different agro-ecological zone may not perform the way they expect, based on the experiences of the farmers that are growing the variety under different conditions. A second learning topic is that the potential of a variety is never exhausted, but to explore its possibilities requires careful observation and monitoring. CSWCs therefore encourage farmers to select species and varieties purposefully and document their performance during the cropping cycle. This has become more important than ever due to increased climate change vulnerabilities. CSWCs support farmers to select appropriate

varieties that can cope with cyclones, floods, droughts, cold/fog and heat waves. It is imperative that CSWCs continue to collect seeds from all over Bangladesh and test them under different agro-ecological conditions to identify what diversity works best where.

Breeders, scientists and farmers all have important roles to play to strengthen farmers' seed systems (photo 7). What requires more attention is to emphasize the distinctively different and crucial role of farmers in this process, which cannot be assumed by breeders or scientists. By collecting, conserving and selecting their local varieties, farmers document very specific ecological and local knowledge conditions. Although the literature acknowledges that facilitating effective links between farmers' knowledge and formal seed systems' knowledge is central to the conservation and sustainable use of crop diversity, there is hardly any meaningful gesture in this regard from the formal scientific community. Despite the fact that knowledge erosion is a serious international concern with regard

to conserving crop diversity, mainstream research priorities and activities are geared toward breeding for commercial farming and release of varieties from private commercial companies or public research institutions. Resources are not available to support farmers and their seed systems.

Nayakrishi farmers are preserving a wealth of diversity in the Community Seed Wealth Centers and Seed Huts. These have become a source for enhancing seed diversity and the knowledge associated with the seeds. The sharing of knowledge and exchange of seeds are the most important actions for biodiversity-based farming practices of Nayakrishi farmers. Increasing farmers' access to a larger variety of seeds and planting materials can help make them more resilient to shocks and hazards. Facilitating natural adaptations of the local traditional varieties to the prevailing local conditions is crucial to develop locally relevant, improved varieties. When a CSWC or Seed Hut deals with farmers' varieties it is at the same time dealing with local agro-ecological conditions.

Photo 7: UBINIG staff meets with Seed Hut members, Pabna. Credit: Bioversity International/R.Vernooy



Recommendations

- Development of an economically viable and replicable practice of community seed management is urgently needed to maintain viability of farmers' seed systems and to deal with the challenge of the commercial seed system. Farmers need financial resources and technical support and resources to accomplish this task.
- Effective working relationships between the national genebanks and the Community Seed Wealth Centers at all institutional and organizational levels should be developed immediately. National institutions should take leadership. International institutions could provide valuable support.
- Organization of exchange visits of seed conserving farmers within and outside the country is a very effective education and training

mechanism. Such visits should be encouraged and organized.

- Strengthening the seed conservation networking of women contributes to their empowerment and to achieving food sovereignty.

Acknowledgements

We thank RSF Social Finance and the New Field Foundation for the financial support, Bioversity International for the technical support and Ronnie Vernooy (Bioversity International) for the editing of the brief. Opinions expressed are those of UBINIG only. The research was carried out under the umbrella of the CGIAR Program Policies, Institutions, and Markets led by IFPRI.

Citation: UBINIG (2018) Bangladesh: the importance of farmers' seed systems and the roles of Community Seed Wealth Centers. UBINIG, Dhaka, Bangladesh and Bioversity International, Rome, Italy



Bioversity International is a CGIAR Research Centre. CGIAR is a global research partnership for a food-secure future. www.cgiar.org

Bioversity International is registered as a 501(c)(3) non-profit organization in the US. Bioversity International (UK) is a Registered UK Charity No. 1131854.

Contacts:

Bioversity International
Via dei Tre Denari, 472/a
00054 Maccarese (Fiumicino), Italy
Tel. (+39) 06 61181
Fax. (+39) 06 6118402
bioversity@cgiar.org

www.bioversityinternational.org

Photo 8: Cleaning seeds for the CSWC. Credit: Bioversity International/R.Vernooy

