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The Mamudpur Nayakrishi Seed Hut

*M. A. Sobhan, Jahangir Alam Jony,
Rabiul Islam Chunnu and Fahima Khatun Liza*

Purpose and evolution of the seed hut

The Mamudpur Nayakrishi Seed Hut (NSH) was established in 2001, when Rina Begum, along with other farmers, became interested in collecting local seeds to improve their livelihoods (Plate 1). The farmers had participated in a training session in biodiversity-based farming held by Unnayan Bikalper Nitinirdharoni Gobeshona (UBINIG), a policy research organization working with the farming community. After joining the Nayakrishi Seed Network, whose aim is to collect and maintain seeds of local crop varieties, they decided to establish a 'seed hut' in the village of Mamudpur on land donated by Rina Begum. In a seed hut, a group of farming households takes joint responsibility for looking after seeds and genetic resources that they collect and propagate on behalf of the community.

The Mamudpur NSH is associated with the Community Seed Wealth Centre and is supported by the UBINIG Tangail Centre. UBINIG has been warning of the harmful effects of conventional agriculture and promoting and conducting training sessions on biodiversity-based farming at the community level. Rina and her husband, Mainuddin, were among 25,600 poorer farmers in Tangail district who were concerned over modern chemical-based agriculture as well as the loss of crop diversity and aquatic and animal genetic resources. Nayakrishi Andolon, a farmers' initiative to undertake biodiversity-based farming, soon became popular in more than 300,000 farming households in over 19 districts of the country.

More than 20 farmers practising nayakrishi (community-based farming) in Mamudpur joined the seed hut cooperative led by Rina Begum, Tara Banu and Tafizuddin. Currently, a committee of seven women and four men is responsible for its operation. Since 2009, UBINIG, in collaboration with the Community-based Biodiversity Management South Asia Programme, has been providing support for construction, repair and maintenance of the seed hut, training of farmers, seed production and the distribution of seeds to farmers (Plate 2). The farmers provide physical labour for construction, management and maintenance and take care of running the day-to-day activities, such as production, regeneration and enhancement of plant genetic resources at the community level. The cost of establishing the seed hut amounted to 60,000

Bangladeshi taka (BDT) or US\$800. Annual maintenance, management and improvement costs come to about BDT 40,000. UBINIG provided 50 per cent of the total original cost and 50 per cent was contributed by farmers.

For the farmers in Mamudpur, the focus was not only on stopping the use of chemicals, but also on conserving their own seed. They were already familiar with the Community Seed Wealth Centre, where they had been exchanging seeds. Although the NSH is not a formal organization, it is well known in the community and has informal links with various government departments, such as the Department of Agricultural Extension, the Bangladesh Rural Development Board, academic institutions, nongovernmental organizations (NGOs) and local government. The seed hut acts as a meeting place for the nayakrishi farmers to discuss their crops, seeds and other related issues. It provides training sessions, workshops and seminars and the participants take part in fairs and exhibitions.

Currently, 1,350 farmers from four villages (Mamudpur, Ghunikishore, Baraiatia and Kuchiamari) are directly involved in NSH activities. In Mamudpur, 75 per cent of farming households practise nayakrishi farming. Women there are experienced in seed conservation techniques and maintain a variety of crops grown in the homestead area. Mamudpur NSH has a Specialized Women's Seed Network formed by UBINIG in consultation with the community, and its members are key actors in conservation and maintenance of plant genetic resources. UBINIG has been organizing training, information-sharing sessions and exchange visits for its members, which have helped them gain more experience. The network also documents pertinent information on seed collection, conservation and distribution.

Functions and activities

The NSH preserves seeds of local varieties suited to the community. Currently, it holds 1,507kg of seed; the main species are rice (17 species), wheat (one), barley (one), pulses (five), oilseeds (six), vegetables (40), spices (11) and fibre crops (two). Small and marginalized farmers are particularly interested in the cultivation of indigenous varieties of crops following nayakrishi principles. They prefer local seeds, because of their resistance to common pests and pathogens, over commercial varieties and hybrid seeds, which are costly and require the application of chemical fertilizers, pesticides and irrigation. Between 2010 and 2012, 974 farmers (349 in 2010, 217 in 2011 and 308 in 2012) used seeds from Mamudpur NSH. Women farmers have been especially interested in cultivating vegetables and fruits. Local seeds of these crops are adapted to the mixed culture practised on homesteads and in the adjoining highlands.

Seeds are distributed among the nayakrishi farmers on demand and with their commitment to deposit seed in the NSH after the harvest. For example, Aynal Houque, a farmer from Adazan village, Basail, received 50g of safflower seed, which he cultivated as a mixed crop. Now he has 300g of seed that he will share with five other farmers after returning 50g to the NSH. In 2012,

11 varieties of rice seeds (Lalchamara, Hizaldigha, Sadadepa, Laldepa, Patjag, Latashail, Notashail, Kalijira, Salla, Bawailadihga and Lakhidigha) were distributed among 56 farmers for planting during the May–August season; these varieties are popular because of their suitability in the flood-plain ecosystem. For the same season, 41 farmers received vegetable seed, and for the January–April crop period (a drier season), 192 farmers received vegetable and spice seeds. All recipient farmers were able to return seeds to the NSH after harvest. The status of stored seeds is checked regularly for viability and arrangements are made for seed multiplication.

Neglected and underused seeds are collected, regenerated and maintained with special care because they are grown by only a few farmers. During 2010–2012, lesser-used crops identified and regenerated by the NSH included safflower, satpotal (a rare variety of ridged gourd), elephant foot yam, bean, local red radish, aniseed, tosa jute, finger millet and a number of local rice varieties including Begun Bichi, Chitkashaita, Hiali Baron, Sadabaronlakhidigha, Shamubanga, Karchamuri and Ashaira. Eight farmers are involved in identifying endangered and threatened species and varieties for collection, multiplication and maintenance. The NSH has been playing a vital role in taking stock of these resources and developing an appropriate strategy for their multiplication and maintenance. Farmers are actively conserving barley, fox-tail millet, sesame and chili – examples of species that were neglected or underused in the past but are now important in terms of adaptability to changing environmental conditions and yield potential. The Mamudpur NSH has paid special attention to conservation of such varieties through collection and exchange with other NSHs in the area. Five farmers are experienced in handling rice seeds, and nine specialize in vegetables, pulses and spices. The assigned seed-producing farmers are given 16 varieties, including rice (eight), vegetables (four), pulses (two) and oil seed (two). Surplus seeds are available at the nayakrishi sales outlet.

The NSH is participating in a programme to improve aus varieties by combining drought tolerance with high yield. (Aus is a pre-monsoon, rain-dependent, fast-growing rice grown during the January–April season.) There are 277 aus varieties now under cultivation in Bangladesh. Six selected varieties are in the third year of participatory varietal selection trials. Two varieties of aman rice, Kalakut and Lalcheyshail, have also been selected by nayakrishi farmers using a participatory approach. The seeds are maintained at the seed hut and distributed to farmers for crop production.

The Mamudpur NSH also supports local research. For example, the Department of Agricultural Extension (DAE) at Upazila and at the district level has regular communication with the seed hut and uses seeds from it. Government policies have been based on conventional agriculture, and its promotion of mainly introduced crops has eroded local varieties. However, recently the government has become interested in incorporating local varieties of aus rice into its cropping system, and the DAE and UBINIG have an agreement to promote these varieties at the community level. In 2012, DAE collected 17 accessions of local rice seed from Mamudpur NSH.

Nayakrishi farmer researchers also regularly use seed from Mamudpur NSH. Among them, five farmers from Mamudpur are conducting research on productivity, land pattern suitability and selection of new varieties. Their findings help other farmers increase their yields and grain quality.

Two DAE staff stationed at Mamudpur carried out research on the productivity of five varieties of local rice seed from the NSH. Their yields were high, and they are now practising nayakrishi on their own farms. Local varieties of rice, vegetables, pulses, oil seeds and jute seeds are also frequently used in research.

Traditional knowledge plays a key role in the practice of nayakrishi. For example, only unblemished fruits free from infection and pest infestation are selected for seed harvesting. Rice panicles of a certain length with a large number of grains are harvested separately for seed collection, threshed and dried separately in the sun. Quality control consists of a bite check. When the grain is completely dry, it is cooled and stored in containers, often earthen pots, sealed with a mixture of fresh cow dung and mud. Seeds with a thick coat are stored in transparent bottles; those with a thin coat are stored in coloured bottles. Pulse and wheat seeds are stored in tin containers. Neem leaves are placed around seed containers to prevent disease and insect infestations.

Governance, management and networking

Two committees are responsible for the management and coordination of the NSH: the Natural Resource Auditing Committee, with seven members, and the Specialized Women's Seed Network, with 11 members. The Specialized Women's Seed Network is engaged in cleaning the NSH, collecting seeds from harvested plants, drying seeds and containers and ensuring that stored seeds are kept dry. It meets weekly to approve the cropping plan for the season, seed distribution and seed exchanges.

Nayakrishi farmers and members of the Specialized Women's Seed Network participate in regular meetings of the NSH. Every nayakrishi farmer can exchange seed and genetic resources with this NSH. The Mamudpur NSH communicates regularly with the Atia Union Parishod (local government institution), the DAE in the Delduar subdistrict and the Bangladesh Rural Development Board at Delduar. People from educational institutions in Delduar have visited the Mamudpur NSH, and it is well recognized by local government, the DAE, the Bangladesh Rural Development Board and academic institutions. During the untimely flood and drought in 2011, when farmers in Mamudpur and neighbouring villages lost their field crops, Mamudpur NSH distributed vegetable and oil seeds to 73 farmers as back-up support.

In collaboration with the Community Seed Wealth Centre, the NSH has been regularly participating in agricultural and plant fairs organized by the Upazila DAE and has won five first-place prizes. The NSH has also been participating in various events organized by NGOs and other civil organizations. The NSH is a component of the Nayakrishi Seed Network, which in turn

maintains a link with the National Agricultural Research System's gene bank. Through the Nayakrishi Seed Network, the NSH has collected 900 accessions of rice seed from the Bangladesh Rice Research Institute and has regenerated these varieties through the Community Seed Wealth Centre. Seven of these varieties are maintained by Mamudpur NSH through regular cultivation by the farmers. During 2012, 117 women farmers linked with Mamudpur NSH exchanged seeds with three other NSHs and Community Seed Wealth Centres.

Technical issues

Eight specialized farmers are involved in high-quality seed production and practise integrated crop management. The members of the Specialized Women's Seed Network select mature, robust, disease-free fruit for collection of seeds. The network members are knowledgeable and experienced in seed maintenance and management, and their expertise is useful to all farmers as they ensure the availability of high-quality seeds.

All crops maintained at the seed hut are regenerated every year in the appropriate season under the close observation and monitoring of the seven members of the Natural Resource Auditing Committee. Pertinent data are recorded over the season from sowing to postharvest handling. Morpho-agronomic data are also recorded, mainly by the Natural Resource Auditing Committee with the collaboration of NSH members. Weekly meetings are held at the NSH, and information is exchanged among seed users in group discussions, group meetings and exchange visits. Farmers' knowledge and skills are strengthened at monthly meetings of the Specialized Women's Seed Network, exchange visits and various training sessions.

Achievements and prospects

The use of local varieties of crops has increased in Mamudpur, as has the use of on-farm resources such as crop diversification, mixed cropping and cow dung and compost. The application of chemical fertilizers has decreased and no pesticides are now used. More and more farmers are growing local varieties. Women farmers, especially, are playing an important role in the efficient management of the NSH. Seventeen local varieties of aman rice have been reintroduced. In 2001, 11 major crop varieties were grown in the Mamudpur area; now, 89 local crop varieties are available from the NSH and these are well suited to local flood-plain agro-ecological conditions.

The farmers feel confident and believe that the work of the NSH is their strength. Recently, rainfall patterns and soil moisture conditions have become variable, with drought sometimes followed by heavy rain and flooding. Based on their observations and practical experience, the farmers are now selecting crop varieties that can withstand changing climate conditions. The aus paddy varieties Kala manik, Karchamuri, Vaturi and Lohachure; aman paddy varieties Maynagiri, Kaika, Patishaile, Jhuldhan, Sada depa and Lal depa; sesame; jute;

and foxtail millet are suitable in dry and drought conditions. The aman paddy varieties Hizaldigha, Chamaradigha and Bawailadigha are suitable in flood conditions. Radishes, sweet potatoes and grass peas are suitable in heavy fog conditions.

Most households have become self-sufficient, earning about BDT 8,000–12,000 (about US\$100–155) a month and are now able to buy cows or repair their house. Total productivity has increased through the use of mixed cropping and crop rotation. For example, one popular practice is to broadcast a mix of aman and aus rice in April–May. In 70–90 days, the farmers harvest the aus rice and leave aman rice as a standing crop. Then in October–November, 15–20 days before the aman rice is ready to harvest, the farmers sow black grams and grass pea. After harvesting aman rice, the pulse crops remain until January–February when the mature crop is harvested. This system has not only increased productivity but has also increased soil fertility.

By growing varieties of vegetables and pulses in their fields and homesteads, farmers have ensured a supply of balanced and nutritious food free from contamination by chemical fertilizers and pesticides. Their cash income comes mainly from aus and aman rice; mustard, sesame and lin seeds; lentils and black gram; barley; millet; and many varieties of vegetables.

The NSH has been able to cooperate with the community to improve livelihoods and food security with very little outside support. The community holds meetings on its own initiative and finances the NSH with its own contributions. The NSH stores and multiplies seeds; the seeds are used by its members and the surplus harvest is sold; and the money earned is used for running the NSH. The farmers are happy and content.