

Role of Farmers in Selecting Crop Species

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Abstract

Farmers describe their activities investing in and developing their agricultural output, with details of their production and Suwarna paddy rice (an improved variety).

Introduction

We have been following the traditional method of cultivating crops according to the methods used by our ancestors. In those early days it was not possible to know the kinds of soil, the type of crop that was suitable to the kind of soil, the types of pests and diseases, the methods of controlling them and how much fertilizer is required for a particular type of crop, and hence, the harvest was not satisfactory. I feel the government is not much interested in the agricultural sector, but without improvement in the agricultural sector, there can't be improvement in industries and commerce. In every country the role of agriculture is prominent. Because of the three basic human needs—food, shelter, and clothing—food occupies the prominent place in man's life. The basic need of all sorts of living beings, from the wealthy to the poor beggars and birds and animals, is food. Without food, nobody can live; it is a universal fact. This point is most significant for us to understand.

Nepal is an agricultural country, so the people here would be most happy if they were given knowledge about the formation of land, the types of soil, means of irrigation, and given the priority to develop improved seeds for local use. In 1929 we migrated from Lamjung to Geetanagar VDC, Ward no.8. At that time there was no irrigation system in the village. The field had mixed cultivation of different species of paddy in the same plot, like *Dudharaj*, *Aap jhuthe*, *Battisara*, *Gola*, *Mansara*, *Thapachini*, *Jetho buro*, *Ghaiya*, etc.

Development

In terms of harvest, there used to be 25 to 35 *muri* of paddy per *bigha* of land. At Tandi, we grew maize and mustard. There was no system of cultivation by rotation. Later on there came new species of paddy called *Achhami masino*, *Mansuli radha-4*, and *Radha-17*. Among them, the *Mansuli* was the best, so there was extensive cultivation of this species of paddy everywhere. Vegetable cultivation was limited to small kitchen gardens for vegetables like green vegetables and radishes, but later, from the year 1937, with the assistance of the Agricultural Development Branch Office, we began to grow vegetables on a larger, commercial scale: improved species like cauliflower snowball, Kathmandu local, snowcorn cabbages, radishes, carrots, mustard, etc. Now, these improved varieties require good irrigation systems, so we took a loan from the Agriculture Development Bank, dug out deep wells, kept motor engines, drew out water, and kept sprinklers to irrigate the vegetable fields.

Now we have at our rescue the LI-BIRD Organization, who, by keeping in contact with the different research centers, have made available for us new and better improved seeds, like *Rajma*, *Panta-11*, *BC 1442*, *PNR 381*, and *Sarvati*. These crop species are suitable for the soil at Tandi, but in water-logged fields where the paddy plants tend to fall easily, the *Sawarna* species of paddy seems to be appropriate.

Experiences regarding the *sawarna* species

This variety of paddy is excellent in churned fields. The plant stalk is strong and does not fall easily. The rice is tasty, good in texture, has weight, has solid grains, is easy at milling and at threshing prior to milling. Seventy-six percent of the rice grains remain during the processing period and do not break easily into pieces in the de-husking process, and unlike the *Mansuli* species, even when the plants are shorn of green leaves, there is no difference in the usual production of rice kernels. Last year for the research study, the LI-BIRD Organization and the Agricultural Development Branch office at Bharatpur made improved seeds available, and so we were able to cultivate the *sawarna* variety of paddy in 10 *katha* of land.

In terms of production, it gives us four *muri* of harvest per each *katha* of land. This year we harvested 80 *muri* of paddy. In the village of Indrapuri, for Tandi there are varieties of paddy species that can be cultivated, like BG 1442 and Panta-10, IR13155.

We farmers are very happy now because a mini-kit has been prepared for the farmers with the different species of paddy, exhibition of research results, trial checks, specimens, etc. From such programs, we have highly benefitted and learned that now we can choose by ourselves which of the species would be most suitable for our land, soil, and climatic conditions so we can be selective in cultivating crops ourselves.

Role of Farmers in the Improvement of Crops: New Species of Paddy in Maramche

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Abstract

This paper describes the agricultural situation in Maramche. Village farmers have been participating with the Local Initiatives for Biodiversity Research and Development (LI-BIRD), testing improved varieties of paddy rice. Details of the qualities of the new varieties, qualities preferred by the farmers, and experiences with the participatory plant-breeding program are included.

Introduction

Maramche is a small hilly village in the Dhikur VDC near the Lumle Agriculture Research Center. It is about 30 kilometers from Pokhara, the tourist area in the Kaski district, to the northern side of the western Baglung Highway. It has a cold climate and a diversity of ethnic tribes. It is 1600 meters above sea level. In this village there are about 36 households only. Although the village contains a diversity of ethnic tribes, the majority of the people belong to the Brahmin caste. Just as Cheerapunji is the world-renowned place for rain, likewise Maramche is also the village in Nepal that has the highest rainfall.

Due to poverty in the country, many of the people have left their homeland in search of work, while the rest are dependent on agriculture. Looking into the picture of farming in this village, we find much diversity. The following table helps to illustrate the important crops and vegetables grown in this area.

Farmers	Land Area		
		Much	Less
Much		Paddy, maize, wheat, millet	Potatoes, mustard, radishes, beans (bodi, simi, bakulla), gourds (ghiraula), pindalu, soybeans, iskush (squash), karela (bitter gourd), garlic, onions
Less			Cauliflower, carrots, salgam (turnips), kerai (chick peas), sugarcane, green vegetables (chamsur, palungo), jau (barley), uwa, gahat, lentils (arhar) tarul, turmeric, ginger

Among the crops mentioned in the table, paddy is most extensively cultivated. But unlike the other crops, paddy has the maximum number of local varieties. The following are the names of the local species:

1. *Kanthe*
2. *Kalo patle*
3. *Reksali*
4. *Mansara*
5. *Juwari*
6. *Silayam*
7. *Tarkange*
8. *Chhomrong local*

Introduction of M-3 and M-9

As the above-mentioned names of local paddy species show, they are many and they possess the qualities to withstand maximum rain and the cold climatic conditions of the place. Therefore, as the people had no other means to find out about species that have these qualities, the local people continued to cultivate the species available to them locally. In this context, in the year 1996 with the cooperation of LI-BIRD and the local farmers, the Participatory Plant-Breeding Program was initiated. Immediately after the program was started, LI-BIRD distributed improved seeds M-3 and M-9 to five farmers in the village. After the paddy was planted, it was found that these species of paddy were capable of withstanding the climatic conditions of this village. So the people of LI-BIRD and the Creative Mothers' Group went to the field area to inspect these species of paddy cultivated on an experimental basis. The inspection and study of the paddy was made on various factors, like production, the height of the paddy straws, and the shape and size of the rice grains. After thorough mutual discussions and giving priority to the farmers' interests, the species M-3 and M-9 were accepted as the right choice for cultivation.

The reasons for their acceptance

1. Maximum production
2. Tolerance of fertilizer
3. Tolerance of the cold climatic conditions
4. Ability to tolerate wet and moist conditions
5. Suitable in less water
6. Quick ripening period
7. Less wastage through falling (not that they will not fall with threshing)

Nature of the popularity of M-3 and M-9 species

1. After the inspection, the request for the improved seeds as per the needs of farmers
2. Based on the advice of the farmers who initially cultivated the improved varieties
3. Interest in cultivating new species of improved paddy, and by the distribution of seeds
4. Based on the request of local organizations to do the experiment again and mutually exchange and share ideas, and the system of taking away the improved seeds for cultivation

So the study of the popularity of M-3 and M-9 reveals that the local species of paddy do have some weaknesses, which are as follows:

1. Not able to tolerate fertilizer
2. Thin flowerings and smaller harvests
3. Less production and grains not full and solid
4. Not able to tolerate the cold
5. More time needed in cooking

The qualities that we farmers would want in our paddy

The paddy must have long straws, full and sold rice grains. It must be delicious to taste, fragrant, able to tolerate heavy rains, able to tolerate the cold, able to tolerate the fertilizer. It will not flower, not easily fall, give heavy paddy crops, take less time to ripen, and increase in volume in cooking.

As these qualities were not available in the paddy, we continued to cultivate the local variety. But in the year 1996, LI-BIRD not only brought the M-3 and M-9 varieties but also 144 other varieties of paddy. In the land that belonged to Indra Prasad Poudel, the nursery was made and all the different varieties of seed were planted in that plot of land. At that time, due to hailstones, the experiment suffered setbacks, but even then, among them, 30 species were saved and selected for our purposes. In this experiment, three groups were actively involved: LI-BIRD, the Mothers' Group, and the Progressive Youth Club.

In this way, in the year 1998, the 30 species—selected on the basis of discussions among the local organizations—were distributed among the 30 households of the village, so that each household got to cultivate one particular variety. On the other hand, in the year 1996, LI-BIRD had sent us 25 species of paddy and we had also cultivated them. Among the 25 species, our farming community had selected one particular variety on the basis of the harvest production, the height of the straw, the taste of the rice, the shape of the rice grain, etc.

Summary

Among the 144 varieties from 1996, only 30 species were selected, and from the 30, three (the process of selection is continuing).

In 1999, from among the 25, one variety was selected. This species was cultivated by Maheswor Poudel in 1999 in two separate fields, and in 2000, he is planning to cultivate it in three fields. Moreover, at the instigation of the local club, we are planning to cultivate that single variety at the rate of 5.5 and 9 by buying the seeds ourselves. We do not know the name of this paddy. Now in the year 2000, under the joint auspices of LI-BIRD, the Mothers' Group, and the Youth Club, we are going to give it a name.

The basis of selection made by the Youth Club and Mothers' Group

1. The height of the straws and the productivity of the paddy crop
2. Falling/not falling
3. Less chance of disease and size of the rice grain
4. Capable of tolerating the cold and wet conditions and quick ripening period

The above-mentioned basis for selection was made after the field inspection and discussions in the group meetings among our participant farmers and club members. In this, the local organization relays the information and also teaches us how to do the work. In the end, we review the whole matter and with the participation of the entire farming community, we select the paddy species.

Participatory plant-breeding program

We appreciate this program highly, for it respects our experiences and the traditional technology that we have been following in farming. When looking into the statistics available, we found that without the participation of the farming community at the national level, there had been recommendations made for more than 42 species of crops, although this sort of selection had not much affected the people living in the high hilly areas. Therefore, it is most necessary that we have a participatory plant-breeding program among us. For example, we can take the case of paddy species M-3 and M-9 that we have been cultivating in our own village.

Necessity of a plant-breeding program

1. A participatory program means the collective presence of the farming community: they can select for themselves the paddy species that suit their soil and climatic conditions.

2. The farmers themselves are more aware of their own needs and requirements.
3. In the selection of the paddy species, the farmers themselves are participants.
4. The farmers learn the technology about how to breed between two species to create several varieties.

Reasons

1. Climatic conditions differ according to altitude and have different affects on farming.
2. Land and climatic conditions differ in the hilly region.
3. When improved species are selected according to the suitability of the particular place and climate, they have a high degree of tolerance and survivability.

The drawbacks of the participatory breeding program

The disappearance of the local species. For example, after the introduction of M-3 and M-9, the local species called *Kalo patle* and *Reksali* have gradually disappeared.

Important suggestions

In the process of developing a plant-breeding program, we must remember to include the local species so that the genes of the local will not disappear completely.

Role of the local organizations

Important and active organizations in our village are the Progressive Youth Club and Creative Mothers' Group—two local organization that have worked closely with the Participatory Plant-Breeding Program since 1996. The most important work has been to develop M-3 and M-9 improved seeds and so we have sent to LI-BIRD and other agricultural organizations about 5 *muri* of improved seeds in 1998. The local organizations continue to develop the improved seeds and distribute them for cultivation. For example, in areas like Lumle, Paudur, and Salyan VDC, the improved varieties like M-3 and M-9 have already been sent.

Plan of the local organizations

- to give continuity to the work carried out by the Participatory Plant-Breeding Program
- to develop and distribute the improved Machhapuchhare-3 and -9 paddy species
- to conserve, develop, and distribute the selected species
- to distribute to the farmers the newly developed improved seeds sent by other research centers
- to increase the village's agricultural production under the leadership of local organizations
- to develop systematic and sustainable methods of paddy conservation from the nursery to storage
- to increase our own learning skills and technology among ourselves
- to develop new improved paddy species

Leaders among the farming community

Priority is given to persons who have been successful in order to encourage and bring maximum participation of farmers. Or the farmers have themselves selected one among them or have won the confidence of their farming community.

Among the 25 species, one variety was selected and it is cultivated in the field of Maheswor Poudel. This species of paddy was cultivated at his initiation. He has said that he took this initiative because this species has all the good qualities to be found in paddy. As he says, this variety has good taste to eat, long straws, solid grains of rice kernel and the grains are not likely to fall off easily from the plants. Therefore, this species of paddy without name as yet, has the great possibility of becoming popular in this village.

The official and scientific research from LI-BIRD was carried out under the leadership of Indra Bahadur Poudel.