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Institutional Change in the Agricultural Support Sector in Nepal

Improving poor farmers' access to better crop varieties

Summary

More than 85% of people in Nepal live in rural areas, where agriculture is central to their way of life. However, most farmers do not have access to new varieties of seed, so they grow landraces or obsolete varieties that yield less, and are of lower quality, than newer ones.

Using a participatory approach, farmers were given 1 kg packets of seed of new varieties, and conducted simple field trials, growing the new varieties alongside a traditional cultivar in the area. Within three years, participating farmers were devoting, on average, half their land to new varieties. Since the initial participatory trials, farmers have become more active in selecting preferred germplasm. It is recommended that the successful district-level collaboration between governmental and non-governmental organisations be scaled up to the national level to provide farmers throughout Nepal with a choice of crop varieties.

Farmers in Nepal found that new varieties of rice and maize were of better quality and gave higher yields than traditional varieties.

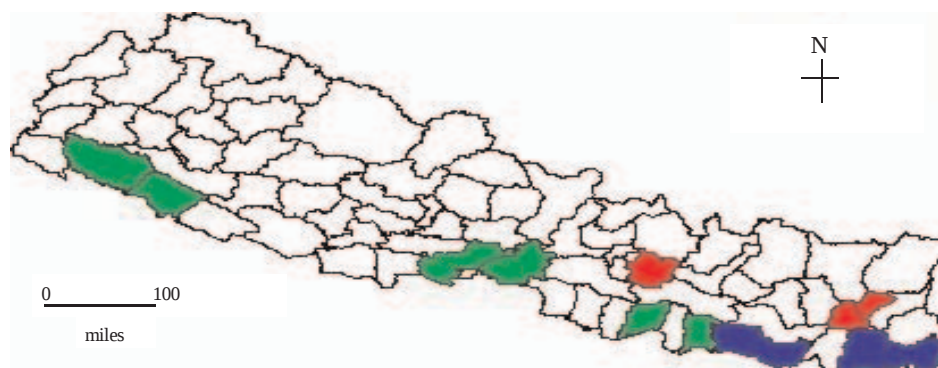


Even if economic development fulfills the most promising forecasts in Nepal, agriculture will remain central to the livelihoods of most Nepalese people for at least the next 20 years. More than 85% of the population lives in rural areas, and more women than men are involved in agriculture. Yields of major crops such as rice and maize are low, and in maize there has been no increase in average yields for several decades. In many other agricultural systems increasing yields have been driven by the adoption of new varieties that have promoted changes in farming systems.

However, because of poor access to new seed, most farmers in Nepal grow landraces or obsolete varieties that yield less, are of lower quality, and fit less well into the farming system than the best

For example, in the terai in Chitwan and Nawalparasi in the spring (Chaite) season of 1997, over 96% of the farmers grew CH 45, a variety released in 1959. In the main season, the variety Masuli, first introduced by farmers into Nepal from India in the 1970s, occupied an average of 66% of some parts of the terai, and over 90% in one district (West Chitwan). In the 1990s only 6% of the maize area grown in the eastern midhills was sown with seed of new varieties having high yield potential. In the village of Patle, a representative site in Dhankuta district, 95% of farmers in 1999 were still using unimproved seed saved from their last harvest.

The major constraints to the adoption of new crop germplasm include the limited number of varieties officially released through the formal



Districts in which LI-BIRD and DADOs are collaborating in the scaling up of newly identified rice varieties (green); areas with rainfed rabi cropping (blue); and regions where farmers are involved in participatory breeding and varietal selection of hill maize (red). L-r: Kailali, Bardiya, Nawalparasi, Chitwan, Kavre, Sarlahi, Dhanusa, Siraha, Saptari, Dhankuta, Terathum, Morang, Jhapa.

new varieties. This limits their choice of what to grow and therefore their ability to try out new germplasm and adapt it to local conditions. Making seed available to farmers, then supporting them in multiplying and disseminating their choice of germplasm, demands change to both institutional structures in the agricultural support sector and to the

ways in which they carry out their work.

Participatory research on new varieties has focused on farmers' current practices and farming systems. Only one component, the variety, was initially changed. But new varieties have proved to be a key technology that can catalyse major changes to farmers' livelihoods. With higher, more stable yields, farmers can afford to risk additional investment of purchased inputs and labour, securing even higher and more sustainable yield increases.

Using informal research and development (IRD), farmers were provided with seed of entirely new varieties, some that had already been officially released, 'pipeline' varieties from the Nepal Agricultural Research Council (NARC), other farmers' varieties from Nepal, and some imported from India. Farmers were given packets of seed of the new varieties.

Each farmer conducted simple field trials, growing the new varieties alongside the traditional cultivar in the area, under the farmer's normal management practice. Within three years participating farmers were devoting, on average, half their land to new varieties originally introduced in 1 kg packets of seed. Farmers had used farm-saved seed and also distributed seed of the new varieties to relatives, neighbours and friends.

Inexpensive research

An important finding was that this research is inexpensive, and can promote the adoption of better varieties. In rice these varieties were often those that had been introduced from India, but which had not previously been identified for commercial use in Nepal. An NGO, Local Initiatives for Biodiversity Research and Development (LI-BIRD) conducted

Further information

An Exchange of Experiences from South and South East Asia, Proceedings of the International Symposium on Participatory Plant Breeding and Participatory Plant Genetic Resource Enhancement, CGIAR Program for Participatory Research and Gender Analysis (PRGA), Cali, Colombia, Sept. 2001.

Specifically:

Biggs, S. and Gauchan, D. The broader institutional context of participatory plant breeding in the changing agricultural and natural resources R&D system in Nepal. pp. 61-74.

Joshi, J.D., and Witcombe, J.R. Participatory varietal selection, food security and varietal diversity in a high-potential production system in Nepal. pp. 267-274.

Tiwari, T.P., Virk, D.S., Sinclair, F.L. Participatory crop improvement for intercropped maize on Bari land terraces with trees. pp. 249-260.

Witcombe, J.R., Subedi, M., Joshi, K.D. Towards a practical participatory plant breeding strategy in predominantly self-pollinated crops. pp. 243-248.

this type of research in Chitwan and Nawalparasi districts in the terai. The local District Agricultural Development Office (DADO) in Chitwan saw the results of this work and its impact on farmers and collaborated to scale up the research in Chitwan.

Several tonnes of seed of varieties identified in the participatory research were distributed to thousands of farmers. The varieties preferred by farmers were multiplied in a decentralised system run by individual farmers and farmer groups. Most of these varieties have not yet been officially released in Nepal. The scaling up was further advanced by agreement to collaborate with four more DADO offices in Kailali, Bardiya, Sarlahi, and Dhanusa districts.

Popular varieties

A recent monitoring tour reported on the acceptability of some of the varieties first identified in Chitwan in all these districts. These include introductions from India, such as Pant Dhan 10 and Sarwati. Farmers adopt these varieties not only for yield, but because they have a greater overall utility within their livelihood system. Both varieties are early maturing, and Sarwati has a higher market price because of its long, slender grains. The farmers' variety Ekhattar was also popular in the scaling up in new districts.

For hill maize the critical requirement for farmers to adopt new varieties is to combine higher

grain yield with system compatibility. Farmers grow maize in heterogeneous conditions across the midhills, generally relay cropped with millet and often in association with fodder trees grown on crop terrace risers. In addition to grain yield, farmers have many other traits, such as taste and market value, that they consider important, and they use high seed rates to achieve high initial plant densities, which are then progressively reduced with thinnings fed to livestock. The ultimate crop residues are also an important source of livestock fodder.

Population 22, germplasm introduced from CIMMYT and modified on-station to meet farmers' requirements, produced 30% and 16% higher yields than the traditional varieties with which farmers compared them in 1999 and 2000 in extensive farmer-led trials in Dhankuta and Terathum districts. The initial network of participatory trials has led to farmers becoming more active in selecting preferred germplasm on the basis of pre- and post-harvest traits, and in multiplying seed of the varieties they prefer.

Building on success

Large-scale reform of the agricultural support sector in Nepal is most likely to succeed if it builds upon scaled-up successes at local level. In addition to general changes bringing activities of the national research and extension system closer to farmers, reform should include substantive technology



A happy farmer with his new variety, Barkhe 2001. It is an outstanding new variety of rice from participatory breeding that is being promoted in a partnership between governmental and non-governmental organisations.



Women farmers selecting new maize varieties through comparison with traditional ones.

components upon which participatory and decentralised models can be tested. New varieties are a key technology, and the institutional reforms required to enable support for participatory crop improvement would provide an appropriate component of a reform agenda that would bring immediate gains to poor farmers. Early and demonstrable success from reforms will also be important for maintaining the momentum of change.

Enabling participatory crop improvement requires a three-pronged approach to change that involves:

- Decentralisation – a new institutional model in which central activity is driven by local needs;
- Closer interaction between research and extension activity in both the governmental and NGO sectors;
- Liberalisation of the regulatory framework for release of new varieties and the certification of seed.

The successful collaboration between NGOs, the Department of Agriculture (DoA) and NARC to provide farmers with a choice of crop varieties at district level, currently enabled by external funding, should be scaled up to national coverage. To achieve this, a mechanism should be put in place to deliver flexible, long-term funding for such joint activity. The impetus for, and means to commission and monitor, activity should reside at district level.

activities of the national research (NARC) and extension (DoA) systems should be more fully integrated at national and district levels. Maintenance of too firm a distinction between research and extension is artificial. It risks reducing the relevance of the research and of not making full use of vital inputs from farmers to crop improvement.

Farmers need new material generated through research, but for this to result in timely impacts upon people's livelihoods, they need fast access to new germplasm, and their reactions to it should drive the national research agenda.

In practice, extension staff and their interactions with farmers are a vital component of crop improvement research and development. Greater integration will also help break down unnecessary barriers between conventional plant breeders and those espousing participatory methods, and harness the potential synergy of the two methods.

The present regulations surrounding release of new varieties and certification of seed can block farmers' access to new varieties. While some controls are vital for plant sanitation, the current situation, in which farmers are told which germplasm to grow and where, needs to change to one in which farmers evaluate and multiply promising material themselves. Only in this way will modern varieties become widespread, and yields increase.

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