From piloting to scaling up

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Potato plays an important role in the livelihood and food security of farming communities in Nepal. As the fourth most important food crop in the country, potato cultivation extends from the southern plains to the remote northern mountains. Yet Nepal has one of the lowest national yield averages globally and for the developing world. Diseases are a major limiting factor in improving potato productivity in the country. Use of low-quality seed, and poor crop management practices are among the key factors contributing to the widespread occurrence of disease. In addition, potato farmers are rarely reached by formal research and extension services. Government agencies are constrained by limited resources and capacities to respond to problems faced by potato farmers in far-flung areas.

Participatory research and development often begins with a pilot activity that involves a small number of participants within a limited geographic area. No matter how successful, these pilot activities inevitably face the challenges associated with scaling up successful experiences beyond the pioneering farmer groups and farming communities.

Piloting Action Research

From the late 1980s to early 1990s, a local research institute conducted several diagnostic activities to assess serious crop losses faced by potato farmers in Kaski district. Researchers from the Lumle Agricultural Research Centre (LARC) and local farmers jointly identified bacterial wilt disease as the single most important problem facing potato farmers: losses in yield were documented as being from 10 percent to over 90 percent. Its occurrence was mainly associated with the use of infected seed, along with planting in infested soil and poor crop management practices.

Introducing a socio-technical innovation (1993-98)

Since the early 1990s, the International Potato Center (CIP), through the Users' Perspectives With Agricultural Research and Development (UPWARD) programme, has worked with various public and private sector organisations in Nepal to help potato farming communities address disease constraints. In 1993, UPWARD and the Lumle Agricultural Research Centre initiated a research project to help local potato farmers manage bacterial wilt. Drawing on previous research, including control measures for bacterial wilt based around seed and soil health, the project team formulated an Integrated Disease Management strategy with the technology components as presented in Table 1.

Table 1. Technical and social components of the Integrated Disease Management strategy for bacterial wilt

Key technical components
- Elimination of infected planting materials
- Three-year moratorium on potato cultivation
- Use of clean seed and quarantine scheme
- Rouging and field sanitation
Key social components
- Reaching community consensus on IDM implementation
- Formation of a village level committee to oversee IDM implementation
- Enforcement of community-agreed incentives and sanctions
- Regular monitoring of IDM implementation by community members

However, in implementing this strategy, it became clear to the project team that the proposed technical solutions were not adequate to manage the disease problem. There were crucial socio-cultural and economic factors that hindered implementation of the technology components. For example, enforcing measures to control the spread of infected seed implied restricting the use of seed potato as a cultural symbol in traditional rituals (e.g. as wedding gifts). Most importantly, carrying out the entire Integrated Disease Management strategy required full community participation, since if only one farmer refused to stop planting potato this would create conditions for the pathogen to persist in the soil and spread in the community.

During a series of community meetings and with the guidance of the project team, local farmers identified the social measures needed to accompany the technical components of Integrated Disease Management (Table 1). To oversee its implementation, a village-level committee was formed to promote incentives for participation (e.g. introducing alternative food crops during the three-year ban) and to enforce sanctions for non-compliance with the jointly agreed strategy (e.g. imposing fines on farmers found to have planted potato during the three-year ban).

Impact evaluation

Project implementation was sustained in one village for a three-year period. All of the 51 farming households fully complied with the technical and social requirements of the strategy. In contrast, implementation of the same strategy came to an early end in the second village after the committee disbanded within a year of launching the project. Among the key reasons were: farmers' perceptions about the committee's lack of formal authority to assume "police" powers; the resignation of key committee members due to emerging conflicts with farmers in the latter's performance of their assigned tasks; and the inability of individual farmers to cope with pressures to meet immediate food and livelihood needs of their own households.

The contrasting experiences unwittingly provided an opportunity to compare outcomes between the two communities. Post-project evaluation carried out after three-year implementation period revealed that in the first village, bacterial wilt was completely eliminated. In comparison, a disease incidence of 75 percent was observed in the second village.

Scaling up the innovation (1999-2005)

Following positive outcomes of the community-mobilisation approach, a follow-up project was launched in 1998 that aimed to implement integrated disease management in other key potato-growing areas across Nepal. CIP-UPWARD teamed up with the Department of Agriculture through its Potato Development Section. In planning to scale up the innovation for community management of bacterial wilt disease, the project team recognised that the innovation cannot exclusively focus on bacterial wilt because farmers in potato-growing areas face several disease constraints at any one time. In many cases, bacterial wilt is part of a broader set of problems that includes diseases, seed supply and quality, and general crop management, which need to be taken into account. In addition, to reach more farmers more quickly, a more extensive approach needs to be employed for facilitating group learning to help farmers manage location-specific constraints to growing a healthy potato crop.

The Integrated Disease Management innovation subsequently evolved into Integrated Crop Management of potato through

participatory group training, based on the farmer field school (FFS) approach.

Institutionalisation

While the lack of any previous experience in potato FFS was a major bottleneck, the project benefited from an earlier programme in Nepal which focused on integrated pest management in rice. The approach for rice was adapted to suit the potato crop and the constraints being addressed. For example, rather than weekly training sessions, the schedule was adjusted to fit with the growth stages of the potato crop. Because there was a wide variability in potato systems and constraints among FFS sites, each group of facilitators and farmers developed their own locally-relevant training curriculum. Thus, although they had a common focus on seed health and late blight, each FFS decided to include bacterial wilt, true potato seed, and/or crop management. From 1999 to 2003, 1320 farmers in 14 districts across the country participated in FFSs on potato Integrated Crop Management.

Photo: Dindo Campilan

Farmers monitoring the progress of field experiments with potatoes in Nepal.

At the national level, the project realised that sustaining these FFS activities would require longer-term funding commitment from the government. Extension workers were keen to implement FFS, but needed funding support to travel to remote potato farming communities and to secure clean seed and training materials. On the other hand, government funds can only be accessed if there is an officially approved allocation for potato FFS from the annual budget for agricultural extension.

Thus the project published and distributed training manuals for use by local extension workers, in partnership with CARE Nepal. These materials were crucial for FFS facilitators in remote villages with limited access to information sources. The project team also joined an informal advocacy network that sought to mainstream the FFS approach in Nepal's agricultural extension policy. Consequently, the national government officially adopted the FFS approach as part of the agricultural extension strategy, under Nepal's national development plan for 2003-2007.

This policy support paved the way for district-level agricultural extension offices to access government funds for implementing FFS activities. Similarly, NGOs have adopted the FFS approach to extend their outreach programmes, having found this to be consistent with the principles of community empowerment and locally-driven development that they promote. Between 2003 and 2005, 130 FFS activities on potato Integrated Crop Management were implemented and funded by various organisations in Nepal. By 2005, over 4000 farmers had already taken part.

Lessons from the experience

An initial impact evaluation was conducted in 2002 to assess changes in farmers' knowledge and practice. Over 80 percent of FFS participants correctly answered a knowledge test on the judicious use of chemicals, and adopted the practice of using healthy seed. The evaluation also revealed wide diffusion of innovation, where an FFS participant shared information with an average of 18 other farmers. A follow-up impact evaluation in 2005 assessed longer-term outcomes, particularly the socio-economic benefits of the FFS to farming households. Similarly, findings indicated that maintenance and use of clean seed was the most common Integrated Crop Management practice adopted by farmers two years after the FFS. Economic analysis showed that gross and net returns to land and labour significantly increased post-training as compared to before the training.

However, the evaluation revealed that producing adequate supplies of clean seed remained a continuing challenge for farmers. Thus in 2006, the FFS approach was further adapted to focus production of clean seed through true potato seed technology, which makes use of botanical seeds rather than whole tubers. With funding from the Japanese government, local Nepal partners have since then conducted a national program to conduct FFS activities, this time with a curriculum centred on using true potato seed in on-farm seed production.

Agricultural innovations successfully introduced in pilot projects cannot be expected to have the same level of outcomes and degree of relevance when scaled up beyond the pioneering farmers and farming communities. Variability in needs, opportunities and conditions require that these innovations need continuous adaptation when introduced to other communities. Scaling up also requires a careful re-examining the means of dissemination and sharing. While the community mobilisation approach was shown to be effective in introducing an integrated socio-technical innovation, scaling up efforts required other learning mechanisms in order to reach more farmers. ■

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