

Capacity building and external linkages assist use and integration of technology options for research and development projects

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Abstract

Effective research and development strategies rely on satisfactory capacity within all levels of the agricultural sector. One common avenue for local staff to access capacity building opportunities is through engagement with research and development projects. The project described in this paper supported capacity building for extension staff and farmers, through the implementation of on-farm research and by providing training and learning opportunities in key areas identified by the project and by local stakeholders. A skills-based needs assessment was undertaken to determine training requirements. Priorities for district staff were based on data analysis and reporting, project management and computer skills. For farmers, the needs were more technically based, mainly incorporated into cross-site visits for learning and knowledge exchange. The project provided over 450 training places, including participants from private companies, regional universities and other local projects. Likewise, 500 people participated in cross-site visits over a broad range of topics and locations. Enhanced capacity, and familiarity with what others had tried, assisted the teams to implement their technologies in several focal villages. A survey of project staff generated feedback on project activities and the resulting changes to staff and farmer's skill development and experiences. Semi-structured interviews were conducted with key informants in the project leadership, district staff and farmers. Major benefits noted by both farmers and district staff were increasing knowledge and improving farm productivity. Additionally, the project engaged with a wide range of external stakeholders, including research and development projects, private companies, NGOs and Educational Providers in southern Laos.

Keywords

Implementation; extension; research; agricultural development; competencies

Introduction

Agricultural research and development are fundamental platforms on which rural communities rely in order to improve food security, reduce poverty and sustain economic development (Beye, 2002). Effective research and development strategies rely on adequate capacity within all levels of the agricultural sector, including individuals, public and private organizations, and research, extension and educational institutions. In many developing countries, this capacity is often lacking. For this reason, capacity building is often a key component of research and development projects, whether it is an explicit objective or not (Posthumus et al., 2012). While it is a desirable outcome in its own right, it is also often necessary in order to be able to achieve planned project activities. Capacity is a multi-faceted concept that incorporates a range of competencies (Fowler and Ubels, 2010); in an agricultural research and development setting, individual capacity incorporates technical knowledge, basic research skills and extension approaches, as well as 'soft skills' such as communication and facilitation (Ifenkwe, 2012; Okorley et al., 2009). As approaches to agricultural research and development become more multi-disciplinary, multi-organisational and multi-stakeholder, there is a noticeable focus on these soft skills that are becoming increasingly important (Posthumus et al., 2012).

An integrated research project on 'Developing improved farming and marketing systems in rainfed regions of southern Lao PDR' (hereafter referred to as 'the project'), funded by the Australian Centre for International Agricultural Research (ACIAR), was implemented in southern Laos from 2010 – 2014. The project was set up as a partnership between the National Agriculture and Forestry Research Institute (NAFRI) (the in-country project lead) and several international research organizations, and linked with provincial and district agriculture staff for implementation of on-farm research in eight districts. Capacity building was an explicit goal of this multi-disciplinary project from the outset, which worked across the farming system in crop agronomy, livestock, water and hydrology and socio-economics and marketing.

At the commencement of the project, knowledge sharing activities focussed on delivery from individual components, rather than the whole. With recruitment of additional Lao-based staff, the focus broadened to build on the technical training program, orienting more towards trying to build skills in integrating, reporting and outscaling project activities (see Bouahom et al, this issue). In addition, priorities were identified for the production and dissemination of information, and stakeholder linkages identified and established.

Avenues for capacity building

Involvement with research and development projects is a common avenue for capacity development of local staff (Photakoun, 2010). Staff working with the project were provided with formal learning and training activities (workshops, training sessions, study tours, cross-site visits), as well as ongoing informal mentoring and on-the-job training opportunities through interaction with and implementation of on-farm research sites.

Training and study visits

In total, the project provided over 450 training places (targeting a consistent group of provincial and district staff and farmers). Initially, training within the project was predominantly focused on developing staff technical skills to allow them to fulfil requirements for project activities. A skills needs assessment was undertaken to determine training requirements for farmers and district staff, to ensure that sessions developed were relevant and useful for all parties. Priorities for district staff were based on data analysis and reporting, project management and computer skills, with some technical requirements also. For farmers, skills needed were technically based, and were mostly incorporated into cross-site visits to relevant areas for learning and knowledge exchange. The training sessions were designed to build on each other, and to make use of previously acquired knowledge. They reflect the needs of the project, starting with a focus on technical topics, and subsequently orienting more towards trying to build skills in integrating and reporting on project activities. The aim of these training sessions was to start to draw together the various technical skills that had been built, with some more 'fundamental' professional skills, to allow these technical skills to be outscaled. Fundamental professional skills included topics such as research design and methodologies, data analysis, documentation and presentation skills, computer skills, and case study writing.

Specific technical needs were addressed by study visits; for example, 16 farmers visited northern Laos to gain an understanding of forage and livestock systems, as experience was limited in the south. Eight district staff visited Thailand to become familiar with livestock production and research facilities there. Researchers also visited Cambodia to see progress in direct seeding, mechanisation and water management. In total, over 500 cross-site visit places were provided for knowledge exchange. These cross-site visits covered a broad range of topics, which reflected interest from farmers and provincial and district staff, as well as successful project trials and demonstrations.

On-farm research

Participants highlighted the value of training and study visits undertaken in conjunction with the on-farm research approach implemented by the project; this was seen as successfully incorporating formal training with hands-on experience. In a survey of farmers who participated in project activities, 75% indicated that practical and applied learning through on-farm research was one of the best learning methods for them. The consistency in the responses was such that 50% of farmers surveyed stated verbatim "het/long tua jing" (do/try the real thing), and two farmers talked about "bung/hin tua jing" (watch/see the real thing), using the same words to express their preferred learning style. This pragmatic approach is reflected in many farmers' comments, for example that on-farm research is "*relevant to our daily lives and concerns*".

Stakeholder linkages

External links are important for outscaling and for building local capacity. It was important to be flexible in terms of who the project linked with and how, given that there were different agencies working in each province, and they had different needs and capacities. Broadly, the links established were through two-way training and learning (research and development projects and funding bodies, private companies, non-governmental organisations), and engagement with educational providers to provide learning experiences for students, who also aided the project with research implementation and data collection (universities and agricultural colleges). An agri-network was also established in one province to link with projects working on similar issues and in the same locations, for sharing information and understanding operational challenges.

Capacity building benefits and outcomes

Links between cause and attribution can be hard to define for capacity building approaches (Posthumus et al., 2012), but in this case the project process provides a background for this. A survey of project staff was conducted to generate feedback on project activities and triangulate responses in changes to staff and farmer's skill development and experiences. Semi-structured interviews were conducted with key informants in the project leadership, district staff and farmers. There was substantial skill acquisition and improvement by district staff over the course of the project and increases in overall working capacity, despite the relatively short timeframe under consideration (2010 – 2013). Major benefits noted by both farmers and district staff were increasing knowledge and improving farm productivity. Additionally, district staff noted that the on-farm research was beneficial for increasing links and building rapport with farmers.

These identified increases in capacity ranged across both technical skills such as subject matter competency, research, and extension, as well as personal skills such as communication, confidence, and critical thinking. Based on the skills self-reported during interviews with district staff, technical subject matter competencies in either crop or livestock areas were most frequently mentioned, according to the specialization of the staff member's field of work. Technical research skills were overall the most frequently mentioned improved skill as they span across both crop and livestock specialists. Despite limited (or no) research experience prior to the project, in many districts local staff became capable of implementing research protocols with minimal oversight. In some cases it was observed that understanding of the research process had reached the level where staff could communicate research objectives and methodologies to others. Staff could take complex information and transfer it in a manner that allowed farmers with very limited education to understand.

In reviewing the project management assessments of district staff performance across the eight districts, communication and attitude emerged as two key concepts critical to working success. It is interesting to note that technical skills, while important, did not factor most prominently here. Communication, particularly with farmers, is one of the skills that most distinguished the most effective districts from the others; 75% of district staff interviewed ranked their own skills in "communicating new information to farmers" at least 1 point higher after the project compared to before, on a 5-point scale (range 0-5). One participant reported an increase from 2 to 4.5 in the "communicating with farmers" category, showing marked improvement during the project despite having 11 years experience already working in the district. This district staff noted that, *"Even after working all these years I didn't have a strong extension method."* Notably, this district was also rated most highly by project leadership in terms of increased capacity, and project activities here were very successful, including implementing forage based feeding systems, improved rice varieties and dry season cropping. Similarly, improvements in extension capacity became much more prominent when respondents were asked to describe changes in their work since the project: *"I had nothing to talk [about] when I met farmers before working with the project. Now I know how to get information ... and give them recommendations"*. Communicating research problems to farmers in the local context, and being able to explain both the experimental procedures and the potential benefits of the results helps to generate farmer interest in participating with the project and also facilitates better collaboration.

Attitude was also frequently cited as improved both in district staff self-assessments and in project leadership responses. Attitude in this case includes motivation, cooperation, willingness to learn, and confidence. Motivation has been previously recognized as playing a critical role in improved capacity (Ifenkwe, 2012; Okorley et al., 2009). As one project leader said, *"Capacity building is also about getting people enthused about a subject – in a lot of cases, we've been successful in this"*. Farmers also reported positive changes in district staff attitude, for example stating *"District staff are better than before; it is good because they are interested"*. Most district staff noted improved attitude and increased confidence over the duration of the project; personal characteristics and attitude have been identified as key factors that can enhance or constrain capacity building efforts (Posthumus et al., 2012). This self-assurance coupled with technical subject matter competency helped farmers have more confidence in the capacity of extension staff as well. Farmers reported this increase in staff capacity, saying that *"DAFO are really different than before, better than before. They have more specific and relevant information to suggest"*.

In addition to increases in a wide range of technical, research and interpersonal skills, there were also numerous positive examples of increases in working capacity among the district staff during the course of the project. Positive changes were reflected in the district staff self-assessments, in the project leader assessments, and in the comments from farmers. Farmer feedback on the working capacity of district staff over the course of the project confirms that staff are more active (56%) and knowledgeable (50%), reflecting

farmer comments that district staff now have more technical knowledge to share and have better relationships where they are more engaged with farmers than before.

Farmers

Nearly all farmers interviewed (15/16) noted technical skill improvement in the various areas of research conducted on their farms, generally focusing in either crop or livestock production depending on the specific research activities. Four farmers reported increases in both crop and livestock technical skills where multiple research activities were undertaken with a single household. This is a positive outcome reflecting effective extension from the research activities, where previously farmers in many cases were working from very traditional, no- or low-input systems with limited technical management or intervention. In addition to the technical agricultural knowledge and skills, farmers also noted a gain in many interpersonal skills such as communication, attitude and technical confidence.

As a result of this capacity improvement, farmers reported a number of changes to their farming practices following the commencement of the project. Many of the responses indicated changes to rice production systems, other crop production systems, and livestock systems; frequently farmers also noted that their overall productivity and livelihoods were increased as well. Referring to the benefits of an on-farm trial with forage production and cut and carry livestock feeding, some of the changes reported by farmers are quite dramatic, including 2- to 4-fold increases in income; “*Now we get bigger cattle, higher prices. In the past I only got 7-800,000 kip, but now I can sell for 2,000,000 kip at the same age cattle.*” Other benefits included fewer losses and better health of animals as a result: “*Last year I lost 7 cattle. But this year the cattle come on their own and we have no loss...the cattle have enough to eat and aren't dying. They are still free-ranging but they stay nearby.*” Higher farm productivity directly improved farmer livelihoods as well, as seen in one family's comments on changes in their farming systems, “*before the event rice production was our normal work but rice was not enough for consumption. Now, we can sell rice*”.

Conclusion

The project developed a portfolio of activities in order to build capacity and promote application of technical outputs. Significant effort was devoted to capacity building activities for provincial and district staff, and to providing opportunities for farmers to experience and discuss technologies they were interested in exploring further. Additionally, the project team made links with institutions in the provinces for capacity building and outscaling purposes. As a research project, enhanced capacity meant achieving better research results; but from a general capacity building perspective, the ultimate aim was to help people and organisations perform their roles more effectively. Capacity building outcomes included improved technical, research and interpersonal skills, which then lead to improved extension capacity and more effective working approaches for district staff. By improving research skills, district and provincial staff were better able to do their job and were more motivated; this was reported by project management, staff themselves and the farmers they engaged with. District staff also reported having stronger networks and improved communication, both with farming communities and their institutional colleagues. These improvements led to noticeable impacts for delivery of services to their farming communities, who were then able to practically integrate new technologies into their farming systems.

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