Photo: Yu Hua

A farmer explains his fodder storage methods to other villagers.

Improving service delivery in Yunnan, China

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The Center for Biodiversity and Indigenous Knowledge (CBIK), a Chinese NGO, has been promoting participatory approaches to technology development and extension in the animal husbandry sector in Gongshan County, Yunnan, China. Here, villagers' livelihoods are based on mixed farming or agro-pastoralism where livestock has a central role. But all villages experience problems in animal raising which increase the costs and risks of livestock production. Although many practical technologies exist which could be helpful to farmers, these are not known of or adopted by both farmers and technicians. Many technicians had a poor understanding of villagers' needs, and existing extension efforts lacked continuity; technologies often being demonstrated for one year with no follow-up the following year, and although adoption rates were low there was little systematic assessment of the reasons why.

PTD in Gongshan County

In 2003 CBIK began to implement the "Enhancing Agro-pastoralist Livelihoods in north-west Yunnan" project. To address the problems faced with livestock and extension, the project included a Participatory Technology Development (PTD) component. PTD is a people-centered approach to promoting development based on local capacities and resources. The core of PTD is joint experiments involving technicians and villagers. Experiments are targeted at villagers' problems and needs, and villagers are involved in the whole experiment process, including the extension of useful technologies. The aim of PTD is to produce locally suitable and relevant technologies, as well as supporting relevant stakeholders to be better able to engage in local processes of technological innovation. PTD requires a range of skills – including technical skills, facilitation and communication skills, and analytical skills. For leaders of the township and county animal husbandry officials, PTD also requires leadership and organisational management skills. Learning to apply these skills effectively requires a long process.

Initially, the purpose of introducing PTD approaches in this context was to resolve technical issues in animal husbandry in the villages. However, as our work progressed, it became clear that participatory approaches also induce processes of learning among technicians and officials about a range of issues, including technical and interpersonal skills and problems in organisational management. We have learned that PTD can contribute to the organisational reorientation of service delivery agencies. This article describes how this process of learning was brought about.

Facilitating farmers' experiments

When the project began in 2003, a meeting attended by CBIK project staff and staff of the county Animal Husbandry Bureau (AHB) was held, at which the PTD approach was described and discussed. In order to identify issues which villagers were interested in working on, six CBIK staff and one county technician spent two weeks in Dimaluo village, using rapid appraisal methods to understand livelihoods and issues in livestock raising, and holding meetings with community members. The team learned that almost all households face a shortage of fodder in winter, and that livestock diseases result in significant losses each year. So experiments were agreed, focusing on fodder technologies (exotic grass species and silage

fodder) and preventive medicines for poultry diseases. In June 2003, 36 villagers volunteered and were chosen to take part in the experiments.

All experiments were conducted by the farmers on their own land or using their own fodder resources. No subsidies for involvement were paid, as those who took part had expressed interest and motivation of their own. For exotic grass species experiments, CBIK agreed to provide seed to cover only three square meters, to reduce the risk to farmers if the introduced grasses proved unsuitable. Apart from this, the location, timing and all other aspects of the experiments were decided by the farmers themselves. CBIK staff – and initially one county technician – visited and interviewed the experimenting farmers each month to learn what changes had taken place, how the villagers understood and explained these changes, the outputs the technologies were producing and villagers' assessments.

Photo: Gao Zhixiong

Technicians discussing the establishment of a revolving fund with villagers after a successful experiment with preventive medicines for animals.

Soon after the monitoring work began, the participation of the county technician decreased. County technicians and officials thought that the scale of the experiments was too small to have any impact. They were more interested in planting large 'demonstration' plots which could be used to show both villagers and visiting officials the benefits of fodder grasses. This is the usual way the government agencies encourage superior officials to give more project funds. The county technician also felt that it was unnecessary to interview the villagers so often, explaining that, according to his experience, many villagers do not tell technicians the truth and will say one thing to their face, but another behind their back.

From CBIK's point of view, the experiments showed that (at least some) farmers were interested in and capable of doing technology experiments. An evaluation of the experiments found, however, that even though an individual experiment might be successful, and that the experimenting villager might be able to master a technology, other villagers did not necessarily know the results of the experiment. So experiments by individual households did not necessarily lead to spread of knowledge and skills within the community. Similarly, an evaluation of a large AHB demonstration plot, found that even though many villagers knew about the plot, they did not know the result of the experiment taking place and would rarely ask those who had been involved.

Learning to collaborate

In spring 2004, the township veterinary station near Dimaluo village – which had not been involved in the first year's experiments – approached CBIK staff saying that they had heard about the successes of the first year's work and were interested in learning how better to work with the farmers. They explained that the township staff were all young and recently graduated from technical college, and they were therefore interested in putting the skills they had learned in college into practice, thereby improving their technical skills as well as learning how to work with farmers.

In order to deal with the problem of information flows within the community, the project decided to work with groups of experimenting farmers instead of individual households. Following the participatory surveys, Villager Experiment Groups (VEGs) are set up. Each group focuses on a different aspect of animal husbandry. Villagers take part in these groups on the basis of their own interest and after being nominated by the community in a community meeting. The groups design their own experiments with the support of the township technicians and then implement them. Each month the technicians facilitate the sharing of experiences and experimental findings at a group meeting. When the members of the group feel that the experiment has produced clear results, they summarise their results and let other villagers know what the results have been. If the experiment has been successful, they make a plan to get sustainable access to the material required and for spreading the knowledge and skills required among the villagers.

In June 2004, three Villager Experiment Groups were set up in one pilot village: a poultry disease prevention group, a fodder group and a pig breed group. Each month, the township technicians convened a meeting of each group and discussed the progress of the experiments. Through six months of experiments the technicians improved their understanding of production conditions in the village and the issues villagers are concerned with in livestock raising; improved their abilities to communicate effectively with and organise the villagers; and also learned about the use of various technologies under real production conditions.

After six months, some of the experiments came to a successful end, but it proved impossible to proceed into an extension phase. One example concerned experiments on the impact of inoculations (against Newcastle's disease and bubonic plague) on poultry survival rates. Although the results of the experiment had been very clear – participating households had high survival rates, while non-participants did not – the county veterinary station had run out of its stock of vaccinations, and it would be months before the next stock would be bought in. This example revealed that a successful collaboration with the villagers also required continual support from the county agencies, but that existing management arrangements were not likely to bring this support about.

Learning to change

Every three months, the township station wrote a report on the experiments' progress, and oral presentations were made by the township veterinary station head to county officials. The head of the county AHB was most impressed by the improvements in

Table 1: Stages in the learning process 2003-6

Period	Main activities	Changes in relationships	Changes in service providers' concerns
Pre-project	Infrequent and ineffective extension activities	• Little cooperation between townships and villagers • No formal mechanisms for partnerships	• How to fund organisation through applying for project funding
2003-4	CBIK facilitate experiments in 1 village (12 hamlets)	• Little involvement of township or county; • CBIK works with villagers and attempts to 'bridge' villagers and county	• How to use experiments to secure more project funding
2004-5	Township facilitates experiments in 1 village (2 hamlets)	• Township begins formal collaboration with villagers • CBIK supports township	• How to collaborate effectively with villagers
2005-6	4 townships facilitate experiments in 4 villages (8 hamlets)	• County supports township to collaborate with villagers • CBIK supports county and township	• How county can support township • How to clarify county roles and support improved service provision

grassroots technicians' technical, organisational and writing skills. In June 2005 the county AHB invited CBIK to support a similar learning process for three other township veterinary stations. In August 2005, CBIK provided training for township and county staff on PTD, and accompanied township technicians to undertake participatory surveys and establish experiment groups in pilot villages in each township.

The surveys revealed many common problems throughout the county, such as slow growth of pigs, lack of winter fodder and the prevalence of disease and mortality among pigs and poultry. Experiments with off-the-shelf technologies were designed and implemented in each pilot village. The survey and experiment process raised several issues. In addition to the stocking of poultry vaccinations by the county veterinary station, it was realised that vaccinations were only available in bottles sufficient for 300 birds – much too large for cost-effective use in the small hamlets in the county, but the county veterinary station had no alternatives to suggest. Another issue was the weak skills of grassroots staff in disease diagnosis.

By late 2005, the county animal husbandry bureau began to seriously consider how it could provide better support to the experiment processes in the villages. At a technical level, it was clear that the grassroots technicians needed support with diagnosis. The county has begun to implement several measures, including: facilitating experienced vets at the county level to provide training and consultation on specific cases to younger colleagues at the township level; using the newly established county animal health laboratory, not only to meet state epidemiological reporting requirements but also to meet the needs of the grassroots technicians for diagnostic support; and developing a system by which results of epidemiological and case monitoring can feed into decisions on the stocking of vaccinations and inoculations at the county veterinary station. The county veterinary station is now actively seeking information on suitable technologies outside the county.

These changes require new mechanisms for collaboration between county and township service agencies. A bi-monthly county and township station leader's meeting has been instituted at which township veterinary station leaders can voice their needs, and county station leaders can exchange their information, needs and plans. The county and township agencies are now discussing a new set of procedures through which the county stations interact with each other and with the township veterinary stations, so that the county agencies help support the township stations as the "frontline" of service delivery in the county.

A process of learning

Our experiences of introducing PTD in Gongshan suggest that participatory technology development and extension approaches are a practical way to begin to addresses issues of performance, effectiveness and efficiency. Engaging in PTD in this context has been useful for:

- enhancing the skills of service providers including technical as well as other skills required for effective work in rural areas;
- inducing grassroots technicians to engage more frequently and more effectively in extension work in rural areas;
- reorienting county and township agencies' service delivery activities towards the needs of the farmers;
- promoting reform of organisational management structures and procedures; and
- enhancing collaboration between service agencies within the county.

Several factors were essential in bringing this learning about. The approach addresses the needs of villagers (options for improving production) as well as of technicians and officials (capacity building). Development of the approach has been based on practical work in which both technicians and CBIK have been involved, so a consensus has developed over what works and what does not. CBIK staff played key roles in facilitating technicians and officials to analyze issues and problems faced in terms of production problems in the villages, capacity building needs of staff and organisational issues. ■

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