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Full Length Research Paper

Participatory technology development for improving animal-technical service system in Gongshan County, Northwest Yunnan Province, China

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The purpose of this article is to examine and analyze the animal-technical service system and participatory technology development (PTD) approach adoption in Gongshan County, northwest Yunnan Province, China. The results have shown that there is a completed organization pattern and service function in Gongshan County's animal husbandry system. Administrative interventions, system fragmentation and financial deficiency are primary barriers which result in lowering the efficiency and effectiveness of extension performance. The adoption of PTD approach was successful in solving problems related to the animal-technical service system and improves the livelihoods in Gongshan County. Finally, the paper suggests that it is necessary to combine the PTD approach into Chinese animal husbandry reforms.

Key words: Animal extension service, participatory technology development, Gongshan County, China.

INTRODUCTION

In China, animal husbandry and veterinary extension service plays an extremely important role during animal raising of farmers with technique supply, marketing supervision and management, finance credit/fund, and policy-making (Long et al., 2007). As an agricultural country, China has established a complete public animal husbandry extension system from central, provincial, county through to township levels. The total number of different government animal husbandry organizations and institutions is 44, 842, comprising 380,189 professional technicians and staff (Ye and Chen, 2003). The main objectives of the livestock extension services are to increase production efficiency through introduction of new and improved production techniques, equipment and methods, backed by adequate credit and marketing facilities (Ye and Chen, 2003; Zhang, 2002).

Northwest Yunnan of China has become a focus on biological and cultural diversity around the world, and belongs to agro-pastoralist livelihood (Xu and Wilkes, 2004). In this region, livestock play essential roles in rural livelihood, such as food support, natural manure for farming crops and selling as a cash income (Song et al., 2000). Livestock rearing has very important interaction and linkage with forestry, grassland, grassland and farming land (Shen, 2005). 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, especially young newly graduated technicians had poor understanding of villagers' needs, but because they rarely engage in rural extension work their understanding was not improving significantly. Existing technology extension efforts often lacked continuity, with 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 (Shen and

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Wilkes, 2007; Wilkes et al., 2006).

To address the above problems faced with livestock and extension, the program 'Enhancing Agro-Pastoralist Livelihoods in north-west Yunnan' was designed and implemented with a participatory technology development (PTD) component in Gongshan County, NW Yunnan since 2003. PTD is a people-centered approach to promoting endogenous development based on local capacities and resources (Maruja et al., 2004). The core of PTD is joint experiments involving technicians and villagers. Experiments are targeted at villagers' perceived problems and needs, and villagers are involved in the whole experimental process, including the subsequent extension of useful technologies. The aim of PTD is not only to produce locally suitable and relevant technologies, but also to support relevant stakeholders to be better able to engage in local processes of technological innovation (Li, 2005). Until now, the PTD approach and model have been developed and extended in Gongshan at both the county and township level by Center for Biodiversity and Indigenous Knowledge (CBIK) and Gongshan County Animal Husbandry Bureau (AHB).

The core of this approach is to establish villager experiment groups (VEGs) in each village, each group focusing on a different aspect of animal husbandry. Villagers take part in these groups on the basis of their own interests and needs and after being nominated by the community in a community meeting. Problems worked on are identified through participatory surveys, for which a simple survey process and survey tools have been developed. The VEGs design their own experiments with the support of the grassroots (township) technicians and implement them. Each month the township technicians facilitate sharing of experiences and experimental findings at a VEG meeting. When the members of the VEG feel that the experiment has produced clear results, they summarize their results and plan how to let other villagers know what the results have been. If the experiment has been successful, they also plan how villagers can get sustainable access to the technologies experimented with, as well as how knowledge and skills in using them can be spread among the villagers. Thus, successful technologies are extended by those villagers who mastered them during the experimental period. Experienced villagers also play an important role in extending useful technologies to other villages (Wilkes et al., 2006). This article explores the current situation and issues of Gongshan county animal-technical service system and the effects of the participatory technology development approach, and finally discusses some solutions for improving local livelihoods and animal technical service.

METHODS

Study site

Gongshan is situated in the northwest end of Yunnan province, between latitude 98° 08 – 98° 56 and longitude 27° 29 – 28° 23 . To the west it borders Myanmar, to the north it borders Chawo County in Tibet, and to the east shares borders with Weixi County and Deqin County in Yunnan province. The Nujiang (Salween River) runs through the county roughly from north to south. The elevation from is 1170 - 5128 m, and the typical climate is characterized by both raining season of heavy rainfall with 90% humidity and dry season of few rains with drought. The rainfall is about 2700 - 4700 mm per year. The sun shines for approximately 1100 - 1400 h per year and the
frost-free period is 280 days (Shen et al., 2007).

Gongshan is one of the poverty stricken counties, with typical mountainous area and mix of ethnic groups. According to the Gongshan County People's Government (2008), there are 5 townships with 26 administrative villages, and 242 natural villages; the total population is 34560, in which the agricultural population is 28811 accounting for 83.3% in 2008. There are 15 ethnic groups, of which the population minority nationality is 33256 occupying 96% of the total population. The main minorities are Nu, Lisu, Tibet and Dulong people.

Field data collection

Field work was carried out between January and April, 2008. In order to explore the current situation and issues of the animal-technical service system, the research examined the administrative, finance and organizational structure of Gongshan county Animal Husbandry Bureau. 40 veterinary officials and technicians at county (28 staff) and township (12 staff) levels, including 11 female and 29 male were interviewed using questionnaires, group discussion and interview methods in the field. Moreover, some secondary data on organization and personal constitution, financial situation, objectives and tasks, as well as extension measures of Gongshan AHB were collected through county AHB.

To examine the performance of PTD on local livelihoods and the animal-technical service system, six administrative villages (Danzhu, Dasuo, Shandan, Maxidang, Shuanla, Ridang) being participated PTD, works in three townships of which Gongshan County was selected. Primary information on the respondent characteristics, income situation, and veterinary technicians' participation and impacts of PTD were obtained through semi-structured questionnaires, complemented by free interviews and informal conversation. Our survey sampled 20 households at random in each village and the total households were 120. Interviewees were selected to opportunistically represent diverse social groups. All primary data was entered in Excel and summarized into means and frequencies using SPSS 12.0.1 for windows.

RESULTS

Animal husbandry service system in Gongshan County

According to the characters and institutions, the animal husbandry service system in Gongshan County can be divided into two compartments: the public (government) service system and the private sector. Table 1 shows the public and private framework of the animal husbandry service system, in which the public sector covers eight different agencies at county level, and five agencies at township level. These agencies of the public sector are under control of the county government directly, and their institutions are organized in a hierarchical system. The

Table 1. Animal husbandry service system in Gongshan County.

Unit	Type	No.	Responsibilities
Government	County level	8	Improving breeds of poultry and livestock, preventing disease for poultry and livestock
	Township level	5	
Association	County level	1	Providing information, training and network
	Township level	0	
	Village level	2	
Commercial company or personal	Fodder sell	2	Providing technology
	Drug sell	1	
	Animal raising	3	

private sector of the animal husbandry service system is mainly composed of farmers' associations, commercial companies or personnel's, such as pig raising association, goat raising association and fodder selling stalls, etc. These associations are organized by the farmers' willingness and sponsored in fact by some departments of local government, though in principle they are non-governmental by nature. There are some other companies and personnel's that undertake commercial activities, such as selling livestock forage, animal medicine and meat, or living animals in the county and township.

The services of Gongshan AHB at county and township level are mainly focused on enhancing breeding of pigs and cattle, preventing disease for poultry and livestock, and implementing the allocation tasks of county government and superior government. In contrast to the private sector, Gongshan Animal Husbandry Bureau (AHB) possesses predominately human resources, financial support and equipments in the whole Gongshan animal husbandry service system. The private sector provides simple services, and currently only occupies a small proportion in the whole animal husbandry service system in Gongshan County. There are three associations in Gongshan County; two village animal husbandry rearing associations sponsored by other government departments, and one county veterinary association supported by Gongshan AHB. There are six small commercial companies or personnel's in Gongshan County, four belong to county level, and two to township level (Table 1).

Organization and personnel constitution in Gongshan AHB

Gongshan county AHB was formally separated from Gongshan Agricultural Bureau and became an independent department in Gongshan County in 2006. The location of the county AHB is situated in the center of Gongshan county town and Cikai Township. The new three-floor office was built in 2006, with several office facilities such as meeting rooms, a finance office, grassland station, technology extension center, etc. Figure 1 shows the relationship and interaction within Gongshan AHB, and between AHB and the local government. The program and administrative offices of Gongshan AHB have a strong interaction with county government and all sub- agencies of AHB, while they have a weak relationship with the township government, village part-time vet and parat vet. The township government has strong interaction with the county government, and the township Veterinary Station interacts actively with the village part-time vet or parat vet, the program office and the administrative office of Gongshan AHB (Figure 1).

The complexity of the administrative system in Gongshan AHB increases the difficulty in maintaining a good relationship and interaction among various departments, agencies, technicians and officials. The total staff of Gongshan AHB, including both county and township level was 53 in 2008, including 37 county staff accounting for 69.8% and 16 township staff occupying 30.2%. Besides two administrative officials, the remaining staff in the AHB is professionals. There are no senior veterinarians or senior engineers (namely, senior titles); Eight staff are veterinarians and engineer (middle titles) accounting for 15.1%, 19 staff are junior (assistant) veterinarians and engineers occupying 35.9%, and 26 staff are technicians accounting for 49% (Table 2). These results from the professional structure of the AHB staff show that the professional qualification level of the AHB is relatively lower than national and provincial levels.

From the professional title distribution of AHB and according to the selection criteria and condition of professional title, 84.9% of the staff belongs to junior title and technicians, indicating that most staff are very young and have just worked a few years. Moreover, they have little working experience and little outstanding contribution in their work. With regard to educational background, and with the exception of six staff members, 47 staff members graduated from vocational secondary colleges in various aspects of animal science. Table 3 shows the educational background situation of AHB staff in 2008. There are only

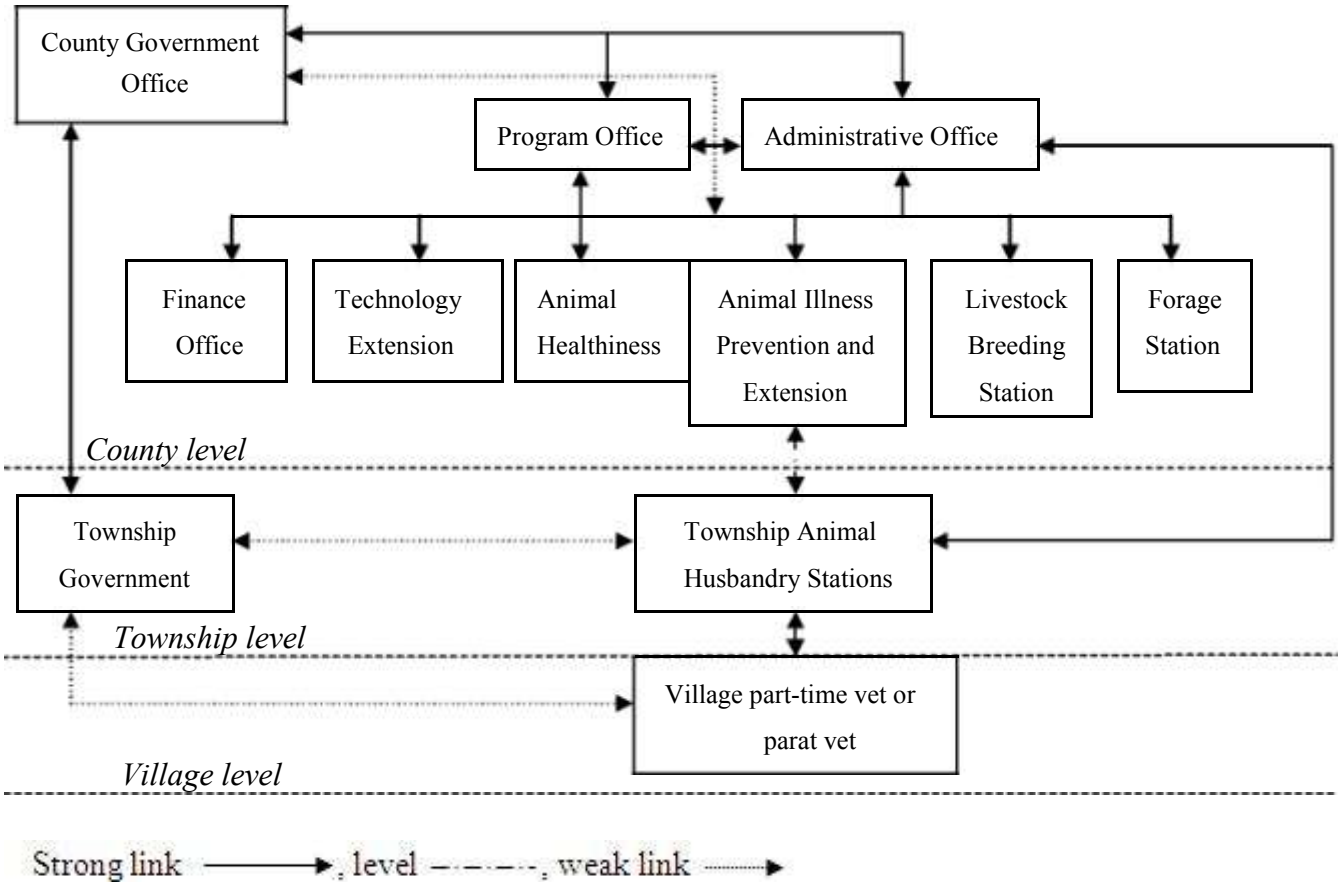

Figure 1. The administrative organizational chart of county AHB.

Table 2. Professional structure of Gongshan AHB staff.

Senior title		Middle title		Junior title		Technicians and non-technicians	
No.	%	No.	%	No.	%	No.	%
0	0	8	15.1	19	35.9	26	49

two staff who have graduated from a university, one is a senior school graduate, and majority of them have graduated from a vocational secondary college. This means that a lot of their experience comes from normal education, which means further training to increase and gain skills and knowledge through their work is crucial. These new technicians and new recruits who have graduated from school will face a lot of challenges from various villages such as 'new' rural techniques of disease, disease symptoms and fodder technology, and different living customs and culture. Most of the technicians do not know how local farmers make their livelyhood, and what purposes the farmers have for livestock rearing. This is because when technicians go to villages, other than providing the requested and professional service they have few chances to know such things.

Majority of the Gongshan AHB staff, exactly 84.9%, belongs to ethnic groups, mostly coming from Gongshan County and Nujiang Prefecture. Only 8 Han (Chinese) people occupying 15.1% of the total come from Gongshan County and other outside counties. Generally, most ethnic group staff of AHB can speak and listen to part or full local ethnic group languages compared with Han people, presenting an inborn opportunity to establish a good relationship and interaction with local villagers and communities. The average age of the 53 employees in Gongshan AHB was merely 30.8 yrs in 2008. There are 28 staff members accounting for 52.8% with ages below 28 yrs, who have just worked a few years and have less experience and knowledge of animal husbandry. Only 13.2% of staff, totaling 7 people belongs to the age group of over 39 years, having more work experience and

Table 3. Educational background distribution in Gongshan AHB staff.

Bachelor's degree		College diploma		Technical diploma		Senior diploma	
No.	%	No.	%	No.	%	No.	%
2	3.8	15	28.3	35	66	1	1.9

knowledge in animal husbandry. This kind of age distribution of Gongshan AHB staff shows that most of the AHB staff are very young and have strong energy to be in charge of more work and tasks. However, their inadequate work ability, lack of practical experience and insufficient work approach are the main problems, and requires long-term work practices along with short-term intensive training programs for further improvement.

Financial situation in Gongshan AHB

The Gongshan AHB is under the administration of the county government, so in principle, the government should finance all outlay for it. But in fact, due to local financial difficulties, the local government only offers most of the operational costs (salary, welfare etc.) and part of project funds which is applied for from the provincial level every year. As for the rest of the income, the AHB staff must earn it from other sources, such as profits from fee-based services and commercial activities.

In general, the income sources of the county AHB include government budget, profits from fee-based service and commercial activities. The government finance is also called the operational cost, including the salary and welfare of staff and government projects, and is required to be spent on ear-marked purpose. Meanwhile, each sub-agency also could get some profits from fee-based service and commercial activities.

Tables 4 and 5 show the distribution of income and expenditure in Gongshan AHB from 2006 to 2008. The data shows that the Gongshan AHB is mostly dependent on the government budget; which accounted for 97.7% in 2006, 97.6% in 2007 and 97.6% in 2008. As new staff increased annually, from 2006 to 2008, the salary and welfare were increased, but the project funds were decreased. This situation has meant that the local government has been trying to reduce project budgets, at the same time, encourages AHB to operate more commercially – self-supported by fee-based services. Profits from the mark-up (fee-based service) on medicines and market inspections, and commercial activities such as housing are very small per year and only account for 2.3 %, 2.4 % and 2.4 % of the total income in 2006, 2007 and 2008 respectively. Due to very limited profits, many entertainment activities have to be funded from project funding. This means that applying for projects is extremely important in keeping the organization going. The total expenditure of Gongshan AHB was overspent from tens of thousands Yuan to over a hundred thousand Yuan in comparison with the total income from 2006 - 2008 (Table 5). Every year, in order to maintain the whole organization, Gongshan AHB needs basic office maintaining outlay and vehicle use outlay. To build relationships with the superior government and apply for project funds, leaders of the Gongshan AHB will travel to prefectural and provincial governments, which requires travel and living costs. When higher officials visit the Gongshan AHB, they are taken for a meal and arranged hotels at the lower officials' expense because they have the power to ensure disbursement of funds that the lower officials need. All of these extra-budget expenditure outlays extremely exceed the income from fee-based charge and commercial activities, so the county AHB has to recover this deficit from the government project fund.

Similarly, all sub-agencies and technicians of the AHB in Gongshan County have the same problems. Most of the technicians' income is paid from a salary, which consists of a basic salary, position salary (an addition paid to station or deputy leaders), a rank salary (an addition paid according to the professional title), and a frontier posting subsidy. Besides the salary, every agency has its own source of income which can be distributed among staff in the form of bonuses. This income comes from the sale of medicines and other products, such as growth enhancers, and provision of services, such as artificial insemination of pigs.

The income from this fee- based service is very small and is usually referred to as 'work funds' by the agency leader. The average income from fee- based service of each township Veterinary Station was 4500, 5120 and 5400 Yuan in work funds in 2006, 2007 and 2008. This income is also usually used to pay for travel, vehicle, office maintaining and leader reception costs. The staff has to pay out of their pocket, if these costs are over the 'work fund'. Sometimes, some sub-agencies have several hundred Yuan left in their 'work fund' as the spring festival approaches. Even if all of this is paid out in staff bonuses, it does not have much difference compared to overall income levels.

Objectives and tasks in Gongshan Animal Husbandry Bureau

Before 2006, there were no open and written objectives and tasks in Gongshan AHB. In 2007, they finished their strategic objectives and posted them on the wall in the

Table 4. The distribution of income in Gongshan AHB (6.73 Yuan 1 US $).

Year	Operation cost			Profits from fee-base services	Commercial activities	Total
	Salary	Welfare	Project			
2006	1.020.720	190.071	819.389	35.000	12.000	2.077.180
2007	1.106.163	192.872	735.712	36.790	14.000	2.085.537
2008	1.353.344	213.736	650.000	40.500	14.500	2.272.080

Table 5. The distribution of expenditure in Gongshan AHB (6.73 Yuan 1 US $).

Year	Operation			Travel/Reception	Office maintaining	Technical extension	Total
	Salary	Welfare	Project				
2006	1.020.720	190.,071	685.389	120.200	67.000	56.000	2.139.380
2007	1.106.163	192.872	578.712	115.000	72.341	56.000	2.121.088
2008	1.353.344	213.736	501.000	132.400	75.420	56.000	2.331.900

county AHB office as follows: 1) Improve animal husbandry production and productivity, and enhance the farmer's income; 2) Enforce the dissemination of appropriate animal husbandry technologies and improve the research capacity of staff; 3) Improve animal husbandry production for satisfying local market with animal and animal products; 4) Enforce the health and safety of animals and humans; and 5) Continue to enforce local animal husbandry exploitation and develop special animal husbandry industry.

According to the aforementioned objectives, the tasks of the Gongshan AHB are: 1) Animal disease control and prevention; 2) Livestock breeding improvement; 3) Research and exploitation of natural grassland and natural fodder resources; 4) Extension and service of animal husbandry science and technology; 5) Ensuring the health and safety of livestock and humans; and improving the technology and capacity of animal disease prevention, disseminate related laws for animal husbandry and provide a public consulting service.

Most of the objectives and tasks of the whole AHB, or the tasks and responsibility of sub-agencies are general official descriptions and are not operational. As the requirement of Gongshan AHB, each sub-agency should design its objectives, tasks and responsibility for department and staff. However, due to various reasons, all sub-agencies did not have a set of actual and complete documents until now. There remains an obvious gender division between female and male staff in different agencies of AHB. Normally, the female staff is responsible for logistic and light work in each agency, such as cleaning houses, taking care of the office or clinic, preparing documents, etc. The male staff is usually in charge of professional services and field work, such as field inspections, training on the spot, disease treatment, and organizing meetings.

Extension measures in Gongshan Animal Husbandry Bureau

Every year, the Gongshan AHB employed some different methods to implement in government projects and superior government's tasks, including demonstration on the spot, field inspections, village meetings, advisory services; propaganda/information through mass media (TV in county's broadcast), and administrative control. Through reviewing some extension project documents and discussing with officials and technicians at county and township level, the research found that three main extension measures were being practiced:

Livestock rearing contract

This method is the most common extension approach used by all agencies of Gongshan AHB. To ensure the animal's sustainable development, when farmers gained the pigs and goats from the township Veterinary station or county AHB, this livestock rearing contract was signed between government and farmers. Given one female pig or one female goat, farmers are required to return two piglets or two lambs when the litter is produced to the township Veterinary Station after two years. Then, the township Veterinary Station hands these small animals on to new farmers or new villages by signing the same contract.

Establishing demonstration farmer

This is a traditional extension method in Gongshan AHB. At the extension project site, 5 - 6 farmers were selected from the village to participate in extension activities.

Generally, these participants' houses are near the village market, located in the center of the village or near the highway, so that many farmers or superior leaders could observe these demonstration technologies conveniently. This approach is efficient in increasing experience-based learning and information sharing, and usually also used as a strategy to deal with the inspection of superior governments.

Propaganda on the spot

This method is useful and effective in carrying out larger activities and events in the whole county. Every year, to increase the awareness and consciousness of farmers on disease prevention and control, animal healthiness and food safety, several instances of propaganda on the spot are held in the township and county town by the county AHB. The propaganda measures include poster making, video playing and counseling.

Required key improvements in Gongshan AHB

In order to compare the relative severity of different problems and constraints in Gongshan AHB, 40 officials and technicians at county and township levels were asked to express their point of view among seven required key improvements.

Problems of Gongshan AHB

The problems and constraints of different sub-agencies in Gongshan AHB are nearly similar to those existing in the whole AHB. The main problems of sub-agencies are the shortage of training funds and lack of basic equipment, followed by the working approach, techniques and incentive (Table 6).

A lack of funding and institutional incentives exist everywhere in the whole AHB and imply that technicians rarely go to the field and often do not effectively provide services for villagers and communities, especially in the case of livestock disease prevention and treatment. The inadequate technical ability and insufficient professionals are caused by lower educational background, younger age and inadequate work experience. There are no basic office facilities, such as computer, printing machine and camera in many sub-agencies, especially in the township Veterinary Station. The traditional incentive system is poorly effective due to lack of funding.

Generally, the individual problems in Gongshan AHB are the same as the problems of the local agencies. The main problems faced by individual staff are inadequate communication accounting for 78% of respondents, poor technique accounting for 70% of respondents, and inadequate working approach occupying 73% of respondents. Technicians do not know how to communicate with villagers, which is the result of little field work and practice for younger technicians. There are no extra or basic subsidies to pay when officials and technicians visit villages and work in the field, so they do not have the motivation to go to the field.

Required improvements of Gongshan AHB

According to the respondents, the required improvements of Gongshan AHB can be divided into three levels: Immediately required improvement, medium required improvement and lowest required improvements. Given this analysis and comparison, it can be seen that the incentive system, M/E (the approaches to assess the work situation and performance) system and working approach are immediately required to improve. More than 70% of respondents reported that their situation was either bad or very bad, while less than 2.5% of respondents thought their situation was good or very good (Table 7). The task/mission and structure belong to the medium level, with less than 32.5% of respondents confirming that their situation was bad or very bad, and more than 35% of respondents thought their situation was good or very good. The objective and basic regulation of AHB belongs to the lowest level, with more than 67.5% of respondents thinking their situation was good or very good (Table 7).

Achievements of PTD

Staff's participation in PTD

Through reviewing the PTD guide, and discussing with project staff, technicians and villagers at different levels, the research found that PTD in the study area can be divided into three main processes including problem identification, decision-making and implementation, and monitoring and evaluation. In six villages, the respondents were asked to express their point of view about how local government officials and technicians participated and their roles in different PTD processes. The results have shown that government officials and technicians made various contributions to the three processes of PTD.

Within the problem identification of PTD, 40.9% of respondents reported that government technicians have either a strong or very strong role, while a medium role was given by 38.6% of respondents. 20.5% of respondents believed that government technicians have weak or very weak role in this stage (Table 8). With regard to the role of government technicians in the decision-making and implementation of PTD, 43.2% of respondents confirmed that government technicians have a strong or very strong role, and about 40.9% thought government

Table 6. Problem distribution of sub-agencies by respondents.

Fund (%)	Technique (%)	Work approach (%)	Incentive (%)	Equipments (%)	Others (%)
75	65	63	53	78	3

Table 7. Required key improvements of Gongshan AHB by respondents.

	Objective (%)	Task/mission (%)	Structure (%)	Working approach (%)	Basic regulation (%)	M/E system (%)	Incentive system (%)
Very weak	17.5	0	0	0	10	0	0
Weak	50	35	42.5	0	60	2.5	0
Medium	17.5	32.5	37.5	7.5	25	27.5	7.5
Strong	15	32.5	15	80	5	52.5	45
Very strong	0	0	5	12.5	0	17.5	47.5
Total	100	100	100	100	100	100	100

Table 8. The role of government technicians in different processes of PTD.

	Problem identification (%)	Decision-making and implementation (%)	Monitoring and evaluation (%)
Very weak	2.3	6.8	0
Weak	18.2	9.1	15.9
Medium	38.6	40.9	40.9
Strong	29.5	31.8	31.8
Very strong	11.4	11.4	11.4
Total	100	100	100

technicians played a medium role. Only about 15.9% of respondents said that government technicians have a weak or very weak role (Table 8).

The data from the monitoring and evaluation of PTD showed that more than 93.2% of interviews reported that village leaders had weak or very weak role in M&E. 43.2% of respondents thought government technicians played a strong or very strong role in M&E, while less than 15.9% of interviews said the government staff has a weak role (Table 8).

People's livelihoods improved

So far, there have been 11 administrative villages and more than 3200 farmers who have participated in PTD activities, and the project has altogether paid 1.1 million Yuan and only 0.21 million Yuan as labor subsidies to AHB officials and technicians, and the remaining funds as technology and capacity building fees to households. On the other hand, many animal husbandry technologies have achieved good economic benefits. In my/our discussions with different villagers, 98% villagers reported that their household income has increased from several hundred Yuan to several thousand Yuan since participating in the PTD.

From the evaluation documents of CBIK in 2007, the proportion of output and input of PTD project was as high as 13:1, with the output including direct and indirect economic benefits.

Improvement in ecological environment

When it comes to preparing food for household members and building houses, every year, almost all villagers in Gongshan County have to collect a huge amount of firewood and house materials from farmland and forestry. This amount decreased through using the health livestock-pen and silage fodder silo built with air sticks and stones through PTD.

In addition, bio-fencing and grassland establishment on waste and erosion lands have improved the vegetation cover rate. Generally, each household could reduce 1/3 cost of firewood and 1/7 house building materials respectively with the use of these technologies. So the PTD has effectively reduced damage from soil erosion, and improved the ecological environment in the Gongshan.

Animal husbandry reform enhanced

During the process of PTD, a series of advanced (modern) animal husbandry technologies and work skills and approaches, including exotic grass, veterinary medicine and techniques and some participatory methods were introduced, which have not only had a far-reaching and profound influence, but have strongly challenged conventional rules and thinking in traditional animal husbandry inherited from the planned economy scheme. The implementation process is actually a process of shifting from a traditional to a modern participatory approach concept. Until now, the Gongshan AHB has successfully applied eleven projects from the superior government through using the similar animal husbandry technologies and participatory technology development concepts. This situation has never happened before PTD implementation which indicates that the superior government also is interesting in PTD approach and model. 73% officials and technicians of Gongshan AHB have now started to work, think and cooperate with local farmers with a participatory technology development approach in their routine work. Before PTD implementation, almost all staff of Gongshan AHB never used or heard PTD approaches in their work.

Network built

The PTD has been successful in establishing a broader network within the provincial, county, township and village level. Over 85% officials and technicians of AHB at county and township levels have more chance to learn and understand local situation and farmer's livelihoods from the field through this network. On the other hand, local farmers are also more familiar with those government officials and their agencies. Based on the network, the knowledge, information and experience can be shared between local farmers and outsiders. Until now, eight county level PTD experience sharing meetings held in Gongshan County which involved 850 participants (90% villagers). Moreover, good relationships and a broader network were established through these meetings, which resulted in female farmers being more visible and being asked to teach new participants in other villages.

DISCUSSION AND CONCLUSION

As an agricultural country, China has established a complete public animal husbandry extension system from central, provincial, county to township levels. Generally, the public animal husbandry extension institutions at the County level implement field work and projects, and link directly with local villagers and research institutions. Thus, it is a substantial intermediary that provides the most direct way for bridging farmers and researchers. Similarly, the Gongshan AHB is responsible for providing the animal husbandry services throughout the county.

Gongshan County has a completed animal-technical service system that is directly under the control of the county government, and the institutions are organized in a hierarchical system. Gongshan AHB possesses human resources, financial support and equipment from the county government. The services of Gongshan AHB are mainly focused on enhancing breeds of pigs, preventing disease for poultry and livestock, and implementing the allocation tasks of the county government and superior government. However, the fragmented extension system and administrative intervention make implementation of government projects more difficult and furthermore, reduce service efficiency. The financial difficulty, reduced profits from the mark- up (fee-based service) and result in loss of motivation for villager services. Furthermore, the professional and educational levels of Gongshan county AHB are lower in comparison with the provincial levels (Ye and Chen, 2003).

The most common work products of the Gongshan county AHB are livestock rearing contracts, establishing demonstration farmer and propaganda on the spot. The main problems of sub-agencies in Gongshan AHB include a shortage of training funds and lack of basic equipment, inadequate working approach, and poor incentive system. The immediately required improvements of Gongshan AHB are the incentive system, M/E system and working approach. Traditionally the local government has adopted top-down approaches in carrying out animal husbandry projects, animal husbandry management, featuring non-participatory or passive ways of local people's participation in rural communities.

The successful application and extension of the PTD approach has been featured in Gongshan AHB at county and township levels since 2003. Local farmers and veterinary technicians have benefited greatly from the PTD approach. Firstly, the livestock production and ecological environment have improved in the PTD project activities. Secondly, different stakeholders, especially farmers and local technicians, built good relationships and broad networks. Finally, the animal- technical service system of Gongshan county AHB has been improved. Through the PTD approach, the inability of local technicians and shortage of funding were solved.

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