

THE ROLE OF GENDER ANALYSIS TO EFFECT SUSTAINABLE CHANGE IN AGRICULTURAL PRACTICE – A CASE STUDY FROM SHANXI, CHINA

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Abstract

For knowledge and/or technology exchange to occur at the community level it is necessary to identify factors that can bring about a change rather than those that merely provide the means for change. Hence during the development of new or improved technology such as conservation agriculture, its potential for adoption by local communities should be assessed during an early stage of a project. A study was carried out to obtain gender dis-aggregated, baseline data of farmer activity and access to resources at two locations in China's Shanxi Province, towards identifying constraints to adoption of conservation tillage and identify target groups for extension. The study consisted of two stages: the first, a pilot study through field observations and the second stage consisted of focus group interviews. A gender analysis framework was used to obtain baseline information on the farming communities. Acceptance of conservation farming varied within and between the two communities suggesting an interaction with socio-economic levels. The outcomes indicated that though women contributed equally to men and in some cases dominated agricultural production they had unequal access to livelihood opportunities. Women had a strong desire to be included in technology transfer and technical training including alternate income-generating activities.

Additional Keywords: soil, conservation, sustainable development, mechanization

Introduction

Rural women in China have played an increasingly significant role in agriculture production since the establishment of the Rural Household Contract Responsibility System (RHCRS) in 1978 (Yinghui, 1993; Lin, 1988). RHCRS revolutionized agriculture by abolishing the "People's Commune System" and giving farming households the right to make independent decisions on using their contracted land. A major consequence of this reform is that the number of "woman-headed" households is increasing with male out-migration for wage labour to urban and industrial sectors. The female labour force of 209.5 million (UNDP, 1997) accounted for 46.6% of the total rural labour and contributed to 50-60% of the total value of agricultural output (1998 statistic from the China Women's Federation). This study, which was part of larger project entitled "Sustainable Mechanized Dryland Grain Production", was carried out to obtain gender dis-aggregated profile of farming communities as a first step towards identifying factors influencing adoption of conservation tillage in two project areas, Linfen and Linyi in Shanxi Province. The local government was committed to increasing crop yields and reducing soil erosion, which yielded about 20-50 t ha⁻¹ of sediment into the Yellow River. Conservation tillage and mechanization were seen as a strategy to increase yields through more efficient water use and better planting methods.

Although technology offers benefits such as labour-saving devices and increased productivity, agricultural mechanization can have negative impacts on rural women (FAO, 1999; Binswanger, 1987). For example there can be reduced opportunities for paid work as women get replaced by machinery. Women's unpaid workloads can increase if meeting production quotas meant that women could not work on small plots that provided the family's food security and also if households found that they needed more money for technological inputs. Despite this, women-headed households can benefit from energy-saving technology provided women had access to and derived the benefits of mechanization, particularly for jobs that require great physical strength and labour time.

This exploratory study was aimed at providing a platform for participatory development within the framework of the larger project. The objectives were to identify specific issues leading to constraints to adoption of the technology and also to identify target groups for technology transfer. The study had two components: the first component was a reconnaissance study through field observations and private interviews. The purpose of this was to gather data for structuring the second component of the study. The second component was data acquisition using focus group interviews. The field sites extended from Linfen to Linyi both in Shanxi province and lay within the area of larger project that was aimed at introducing agricultural mechanization to the region. The first stage of the study encompassed villages in Shaoyang County close to Linfen and Linyi. The second stage was located at Chenghuang township (Linfen) and Zhuoli township near Linyi.

Methodology

The reconnaissance study consisted of field observations and private interviews to become familiar with the nature of farm activity in the region, method of agricultural production, and types of resource use. Participant observations were recorded through field note-taking and qualitative data collection through open-ended, unstructured interviews with key informants including China Agricultural Mechanization Bureau officials, village elders and community leaders from each of the two locations, and members from four farming households of which seventy five percent were women.

Focus groups were used for rapid information acquisition. At each location, there were four groups. The groups were based on levels of affluence (designated as high income and low income) and gender (male and female). Each focus group consisted of ten individuals, with 50% of the individuals using soil conservation techniques and the other 50% using traditional practice only. The selection of participants was carried out by the respective village leaders from their roster of households. The leaders were required to make their selection based on wealth ranking and farming practice. The gender analysis framework of Overholt *et al.* (1991) was used to obtain baseline information on the farming communities studied. The components of the framework were based on the knowledge acquired from the first component of the study i.e. field observations and private interviews, and had included the following:

- An activity profile to delineate the economic activities of the adult population by gender.
- An access and control profile to identify the resources individuals can command to carry out their activities and the benefits they derive from them.
- A seasonal calendar of farming activities (Thomas-Slayter *et al.*, 1993) to identify the pattern of labour over 12 months.

In addition six informal, open-ended questions were asked to obtain information on community attitudes to change. The questions encompassed the following:

- Current soil management practice
- Type of benefits obtained from current practice
- Attitude to mechanization and change in management practice
- Attitude towards training in technology use
- Methods used for information acquisition
- Perceived constraints to change

Analysis and Discussion

General profile of agriculture in the study area

The reconnaissance study showed that women were highly active in agriculture production in the study area and in some instances were in charge of the farming household. Coal-mining was the main non-agricultural activity. The main cash crops in the region were maize and wheat. Other crops grown were vegetables such as watermelon, cabbage and beans (10% of land), sorghum, millet, potato, soybean. The cash crop is bought by the government on a compulsory quota basis but vegetables were for the local market. Farmers bought their own chemical fertilizer and seeds annually, which came as a package from a private company. Organic fertilizer (human and animal waste) is applied only to local market produce. Data collected from Shaoyang indicated that the villages were semi-mechanized and in one village (Tzun Ai) 200 out of 880 households women managed agriculture while their spouses were in business or in outside employment. There were almost equal numbers of males (800) and females (750) in the farming labour force. Animal power was used by 30% of farmers and mechanized equipment by 70%. Large machinery was collectively owned, whereas small machinery (<50 horse power) was individually owned. Animal power was mainly used for small land areas where there was poor access for machinery. Though most farmers used contract labour for mechanical cultivation all women farmers used contract labour for all cultivation because women perceived cultivation as heavy work.

Focus groups

Despite the short notice (1 to 2 days) given to the participants at Chenghuang and at Linyi, there was enthusiastic response for the focus group interviews with turnouts of 100% for all groups except in one where there was 90% turn out. The main cash crop in this region was wheat. At Linyi participants were selected from villages in two townships (out of a total of twenty), Xi Tuan and Zhouli. One third of the households (485) at Xi Tuan were “female-headed” with 480 male agricultural labourers and 500 female labourers. In 1996, 105 mu were under conservation farming and the area had risen to 1,500 mu in 1997 and included three townships. In 1998 it was anticipated that conservation tillage would be practiced in a total of eleven townships. The focus group participants

were selected from two townships one of which was actively involved in conservation tillage and the other involved in both conservation tillage and traditional practice. Some farmers practiced conservation tillage only on “extension” plots run by the government as these plots were provided with subsidized or free mechanical planting. Where such assistance was not given the farmers practiced traditional tillage, indicating that a possible constraint to conversion to mechanization and adopting conservation tillage would be the cost associated with mechanization. Mechanization in this context would include either purchase of the mechanical equipment or employing contract labour for mechanical planting and harvest (of wheat). The Chenghuang township consisted of thirteen villages and a land area of 400 mu was under conservation tillage. 150 out of 400 households were female-headed. Husbands were occupied in wage labour in non farming sectors such as construction, transport, steelworks. Women were confined to farming due to other commitments such as childcare, housework and through choice.

Table 1. Activity profile obtained from focus groups at Chenghuang and Linyi

ACTIVITY	Chenghuang		Linyi	
	Male	Female	Male	Female
<i>HOUSEHOLD</i>				
Cooking		X	X	X
Laundry		X	X	X
Childcare		X		X
Sick / elderly care		X	X	X
Household marketing	X	X	X	X
Courtyard garden	X	X	X	X
House repair	X	X	X	
Small livestock		X	X	X
Sewing		X	-	-
<i>FARM</i>				
Land preparation	X	X	X	
Seedbed preparation	X	X	X	
Planting	X	X	X	X (manual)
Weeding(manual)	X	X	X	X
Spraying	X	X		X
Mechanical farm work	X		X	
Harvesting	X	X	X(mechanical)	X(manual)
Transporting farm goods	X	X		X
Repair bunds/irrigation	X	X	X	
Carrying livestock	X		X	-
Cattle	X			
Vegetable	X	X	X	X
Orchard	X	X	-	-
<i>OFF-FARM</i>				
Sale of produce	X	X	X	X
Buying seed/fertilizer	X	X	X	
Buying machinery	X		X	
Wage labour	X		X	X
<i>COMMUNITY</i>				
Village meeting	X	X	X	X
Festival preparation	X	X	X	X
Village road building	-	-	X	-

Activity profiles, access and benefits of resources and the schedule of activities indicated no difference between the low and the high income groups in these communities. Hence the results presented in Tables 1-3 are for the combined income groups. The activity profiles (Table 1) for the communities showed that women at Chenghuang had greater household responsibilities compared to their counterparts at Linyi. Visual assessment indicated that at Chenghuang the community was wealthier than at Linyi, which might have brought about this difference. The women played a dominant, in most cases exclusive, role in traditional activities such cooking, laundry, childcare, sewing etc., as well as being very active in farm production activities. The men on the other hand had exclusive roles in the mechanical activities and activities that required strength such as carrying loads. There was no gendered difference in the perception of the extent of these roles. Women’s perception of their ability to do mechanical work differed within groups. In discussion it was found that some women feared that mechanical work, such as tractor driving and repairs, was beyond their intellectual and practical ability whilst others were willing to undergo training

Access to and control of resources indicates the extent to which individuals have the opportunity to participate in change. Access to and control of resources in Table 2 show that in both communities men dominated or had sole access to and control of farm machinery and draught animals whereas women had some access and control of animals only for transporting goods. Access to education and training was male dominated in both communities as was access to political power, prestige and benefits derived. Given the large number of women farmers the lack of access to education and training can produce a significant constraint to the adoption of technological interventions in these communities. The lack of access to positions of power for women was stated to be due to poorer level of education, lack of time, and a general inability to perform in public office. This effectively excludes women from decision making processes within the community.

At Linyi, men controlled land on which cash crops were grown but women had greater access and control of small plots. Land in China is allocated to families or individuals officially designated as farmers. Distribution of land was based on the number of family members, the age of the adult members and land quality. The system of land ownership and inheritance, therefore, does not exist. In return, farmers are expected to produce and sell a set quota of the main cash crop (maize or wheat) to the government. Hence, men's control of the land was not through the right of ownership but due to the perceived importance of the land in producing an income and meeting the goals of the government.

Table 2. Combined responses to access and control of resources obtained from Chenghuang and Linyi

Resource	Access	
	Chenghuang	Linyi
Equipment	Males had access and control of all equipment, mechanical as well as animal draught. Some females had access to mule for farm goods transportation	Males had access and control of all equipment and animal draught in low income groups. Some females had access to mule for farm goods transportation in high income.
Labour	Males had access to and control of wage labour	Males controlled access to labour. Some women negotiated access.
Capital and Education	Only males had access to loans, but both males and females had control of the loan. Men and women had greater access to education but men had control of education	Men accessed and controlled loans. Men had preferential access to education and training
Who derived benefits	Males had priority within a household. Men had greater access and derived benefits to political power and prestige.	Men had greater access and derived benefits to political power and prestige.

The schedule of activities varied little between communities. The schedule at Chenhuang is presented in Table 3 as being fairly representative for all groups. Contrary to an ESCAP study (ESCAP, 1997) where women's labour was found to be seasonal and limited to weeding and harvest, at Shanxi, both men and women had heavy workloads throughout the year. Activity schedules facilitate the planning of training and other educational programs for the target populations. Such information can be used to promote opportunities for women by providing greater access to such programs.

While gathering this data it was noticed that men in general were more specific with timing of the farming operations compared to women at both locations. This may indicate that they took a more dominant role in the planning of field operations, whereas women mainly supplied their labour. Orchard work included weeding, planting, spraying, watering trees, pruning etc. Women spent time that was saved by machinery on the cash crop plots e.g. planting and harvesting, by more weeding or working in household food production.

The winter months, from November to February, were the least busy times for all groups. At Linyi, the general perception was that, on a daily basis, men had freer time than women (5-6 hours compared to 3-4 hours for women). Whereas men spent their free time on recreational activities such as chatting and tea drinking, playing cards, mahjong, watching television, and playing table tennis, women spent their free time on activities such as knitting, sewing, visiting relatives, shoemaking etc. The women seemed unaware of the greater extent their

“recreational” activities contributed to the household economy compared to the men’s. Selling produce occurred intermittently throughout the year in most cases and depended on market price as well as on immediate cash requirements of the household.

Table 3. Schedule of activities obtained from the women’s focus groups at Chenghuang

ACTIVITIES	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
<i>Farm</i>												
Land Preparation				X					X			
Seedbed Preparation				X								
Planting				X					X			
Weeding					X							
Spraying				X	X	X						
Fertilizers									X			
Transporting farm goods				X		X			X			
Harvest					X	X	X	X	X	X	X	X
Orchard work			X									
Planting trees												
<i>Market/Off Farm</i>												
Selling produce	X	X	X	X	X	X	X	X	X	X	X	X
Buying fertilizer			X	X				X				
Buying seed			X	X				X				

Attitude towards conservation tillage and adopting change

Responses to questions on farming practice and adoption to change indicated that both men and women at each of the locations were intimately connected with agricultural production. Both communities had been practicing residue incorporation since the “Straw Back to the Field” policy initiated by the Chinese government in 1990. Some farmers who practiced conservation tillage periodically (every three years) sub-soiled to invert the surface organic matter. This was done mechanically using contract labour and the technique was believed to improve yields.

A common view was that any new technology needed to be assessed before adoption rather than adoption for the sake of change. A reason given for the continued practice of traditional tillage was its ease. This perception may be due to familiarity with the technique, as well as the greater accessibility to this way of farming for women. Conservation tillage involved mechanization, which excluded women and could not be used on small plots. With some participants believing that there was no yield benefit to be derived by conversion to conservation tillage, mechanization would be considered a constraint to farming. During the period of the study, the government subsidized the cost of mechanical inputs necessary for conservation farming. There was a planned reduction in subsidies in future years. Hence it was not possible to assess the full cost of mechanization during the course of this study.

Women had a positive attitude towards being trained and were willing to undergo training in technical skills; however, amongst women at Chenghuang there was concern that if training workshops were limited to one member of a household, men would get preference. Women mainly accessed information through village meetings, television programs, and newspapers, but many others were informed through a secondary source, commonly through their husbands thus indicating that these women may have little control over decision-making.

Study Outcomes

The gender analysis carried out in this study has provided a mechanism to examine possible constraints and benefits that might emerge within communities undergoing technological change. Qualitative information gathered on the roles of men and women indicated that women contributed equally and in some cases dominated agriculture production in the groups studied. Mechanical technology and education were male-dominated indicating that men controlled adoption of technological innovations. In this regard this would suggest that men and women had unequal access to livelihood opportunities. Lack of machinery and finance may pose constraints to adoption of conservation tillage as only subsidized farmers practiced conservation tillage at present. Women had a strong desire to be included in technology transfer and technical training as well as in alternate income-generating activities.

The study has highlighted the need for more detailed and quantitative information on specific issues with respect to the introduction of mechanization and conservation tillage in the Shanxi province. Such a study would illustrate the extent as well as the seriousness of the issues. For example there was a strongly perceived need for education and training by women, but the requirements in terms of levels and types need to be identified. Also, participants had reservations with respect to the adoption of conservation tillage in preference to traditional tillage, which were not fully vocalized either by the women or men.

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