

Participatory Technological Empowerment of Women Groups in Rainfed Agriculture: An Action Research in Andhra Pradesh State

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ABSTRACT

Women play important role in Agriculture. In rainfed farming owing to male migration women dependency on farming for livelihood has been increasing. Women are constrained with credit, inputs and technology that support livelihood. A participatory action research (PAR) in Mahabubnagar district of Andhra Pradesh was initiated to address production constraints and empower them both technologically and economically through identification of problems, provision of technological solutions and reducing drudgery. Women groups of 10- 15 members were formed to facilitate access to productive resources. Results from PAR in crop production indicated significant improvement in productivity of crops and household income. Similarly, livestock health was improved with mineral mixture supplementation increasing milk yield. Drudgery reduction through small tools were successfully demonstrated. Woman collective participation accrued more benefits of credit, inputs, technology to group members enabling significant impact on productivity of rainfed crops and as well to their own capabilities.

Key words: Women groups; Gender; Empowerment; Participatory; Rainfed ;

Women constitute two-thirds of work force in agriculture. In terms of overall farm production, women are estimated to contribute to 55-65 percent of the labour. Women role in farming mostly found unrecognized. 78 percent of active woman are involved in agriculture constituting 35 % as cultivators and 43 % as labourers. In rainfed farming of semi arid areas due to male migration the proportion of women participation seems to be still higher (Rangnekar, 1999). Rainfed farming is risk prone and diverse, usually characterized with mixed crop- livestock farming as crop production being uncertain and livestock constitutes important livelihood strategy of farm household. According to Nitya Rao 2006, on increasing male migration, women are left behind to cultivate agricultural crops and tend animals. Therefore, provision of land rights through policies help improve women's access to credit, inputs by which women could farm on her own in absence of male household head.

Several studies have indicated women essentially to be provided with need based training in crop and livestock production activities in order to improve quality

of their work. Training needs identified in crop production were storage and harvesting, weeding, transplanting, nursery raising and plant protection (Urmila and Verma, 2009); housing for dairy animals, selection of breeds, compounding balanced feed using locally available ingredients and vaccination were some of the training needs identified in livestock field (Rani and Subhadra, 2009). Women drudgery was viewed as serious problem in rainfed areas development. Drudgery, generally conceived as physical and mental strain, agony, monotony and hardship experienced by human beings. Women constrained by illiteracy, malnutrition and poverty, and drudgery continue to add more to women's mental agony which makes working conditions more difficult.

The National Policy on Agriculture of GOI, 2003 emphasized the need for achieving the social equity objective encompassing women rights to land titling and also focusing on strengthening conditions of female farmers and labourers for better household food security. There is enough evidence to indicate women have inadequate access and ability to adopt emerging

technologies and one of the causes was poor access to agricultural extension services as most extension workers perceive women as home makers and less of decision makers (Arya, 2007). Studies highlighting significant women’s role in agriculture have suggested that not only women’s economic role need to be given recognition but also to empower them for economic development by reducing production constraints of access to land, credit, extension and technology and capacity building for technological change. This paper aims at understanding women groups or *mahila sanghams* as institutions in rainfed areas while addressing their problems in crop and livestock components leading to technological adoption and empowerment.

METHODOLOGY

A Participatory Action Research (PAR) program based on action research design for women groups was carried out to improve women technological capabilities in farming systems. Devendra and Chatalakhana 2002 defined participatory research, as a problem-oriented approach which mainly responds to needs, resource availability, capabilities and opportunities of small farmers for developing viable strategies.

This study had followed a sound conceptual methodological framework with women as central to and focus of participatory action research. Innovations

in institution building, with a paradigm shift from individual to collective farming in a farming systems perspective that includes both crop and livestock components and expertise of NGO partners in community mobilization have been considered in order to address productive constraints faced by women cultivators.

Mahabubnagar district in Andhra Pradesh was selected purposively based on two criteria. The first criteria being the district was drought prone receiving 500 mm of rainfall with low fertile soils and poor socio economic conditions of region. The second criteria being that the NGO partners- Andhra Pradesh Mahila Samatha Society (APMSS) and Society for Elimination of Rural poverty (SERP) were found active in mobilization and formation of women groups in two villages-Masayapally and Goplapur. Each women group constituted about 15-30 members majority falling in 14-40 year age group with 78 per cent illiteracy and 30 percent possessing primary level of education. The participating women groups were *Shanty Mahila sangham* (women group) of Goplapur village managed by Andhra Pradesh Mahila Samatha Society (APMSS) and *Sadpurna Mahila sanghams* of Masayapally village.

Institutional arrangements for reducing production constraints for women : As women cultivators are facing many production constraints, the NGO partners initiated innovations in institutional building so as to

Table 1. Problems identified during participatory rural appraisal exercise and Technology solutions offered for demonstrations to women groups

Village	Problems and technology solution	Cropping Systems	Livestock	Drudgery reduction
Women group of Goplapur village	Problems identified	Low productivity and low income from local varieties of Bajra and pigeonpea.	Low Milk yield and frequent occurrence of diseases.	Weed management
	Technology solutions	Bajra (WCC) + pigeonpea (LRG-30) (2:1)	Vaccination and immunization for foot and mouth disease, supplementation with mineral mixture.	Manual weedeis
Women group of Masayapally village	Problems identified	Low productivity and low income from pigeon pea due to Root wilt	Low Milk yield and frequent occurrence of diseases.	Weed management
	Technology solutions	Sole Pigeonpea crop. (Lakshmi variety resistant to root wilt	Vaccination and immunization for foot and mouth disease supplementation with mineral.	Manual weedeis

facilitate them to access important productive resources such as land to women groups through leasing-in land facility. By leasing in land by women groups has created ownership rights for women to cultivate own crop collectively. It has also opened up avenues to access credit from banks, exercise ownership rights, adding more responsibility and accountability to own actions and decisions.

Need assessment and planning technological solutions on farming system perspective: Farm women in drought prone areas rely on both crop and livestock for additional household income and livelihood. Two aspects of farm - crop and livestock components were considered for need assessment and framing suitable strategies to improve skills and income which were planned in joint consultation with women and NGO's. For this purpose a PRA survey and focused group discussion were carried out with women groups. Preferences of women members with regard to crop selection, intercropping systems and their package of practices were gathered for better understanding of their production problems.

Based on the problems identified by women groups in crop and livestock units, suitable technology solutions were suggested (Table 1). Accordingly, recommended technology package with seed and fertilizer inputs were provided for on-farm demonstrations which were conducted in the leased in lands of the farm women during *kharif* season. It was also decided by women members to contribute labour for the various operations of sowing to harvesting to marketing, just as family labor, but work under technical guidance from CRIDA multidisciplinary team consisting of agronomists, entomologists and soil and water conservation engineers' and extension specialist.

RESULTS AND DISCUSSION

Results of participatory action research with women groups were presented in order of problems in relation to low productivity of crop and livestock components and drudgery reduction aspects. Quantitative, Qualitative information and insights have also been presented and discussed in order to have better understanding of group farming and feedback on improved technologies.

Impact of improved crop technology on productivity and farm household income in Goplapur and Masayapally villages: The problem of low productivity

of crops and low income from farm were common for both the women groups of Goplapur and Masayapally villages; however preference of crops differed between two groups. Woman group of Goplapur village preferred Bajra with pigeon pea as intercrop while second woman group opted for pigeon pea as sole crop, an improved variety having resistance to root wilt.

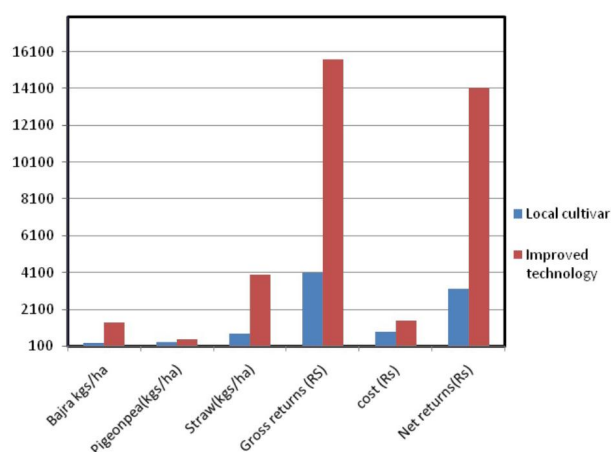


Fig 1. Yields and returns on Bajra + pigeonpea intercropping system (Goplapur)

The findings of Fig -1 revealed that there was significant yield increase over local practice to the extent of 500 percent and 83 percent in bajra crop and pigeon pea intercrop respectively. The overall significant net returns obtained from improved cropping system were Rs 11,000 per hectare. Similarly, the yield and income from sole cropping with improved pigeon pea variety was found to the extent ranging between 18-57 percent over local variety (Table 2). There was significant increase in income levels from pigeon pea sole cropping with yield fetching good market price.

From the above findings it could be explained that technology interventions has broken yield barriers and problem of low productivity resolved with proper crop management and scientific practices. From women's responses it was understood that the yield increases of 5-6 q/ha was considered the best in the village. Mula *et al* 2008 had stated the technological interventions in pearl millet, traditional crop of semi-arid zone cultivated in marginal land provided secure and nutritious food supply to poor households, besides hybrids produced quality grain and fodder yields than any other crop.

Table 2. Yields of pigeon pea Masayapally

Treatments	Yield (kg/ha)	Returns (Rs/ha)
local (control)	825	15,675
Improved variety -LRG-30	975 (18.2%)	18,525 (18.2%)
Improved variety ICPL-85063 (Lakshmi)	1301(57.7%)	24,719(57.7%)

Figures in parenthesis indicates yield and returns per cent increase over local

Qualitative information obtained from the feedback had brought out interesting learning experiences and insights for both women and researchers. Women had effectively participated in most of the operations right from sowing to harvesting to marketing as a result of cooperation and understanding among fellow members. *Bantilan and Padmaja (2008)* reiterated that in a patriarchal society like India, women evolved to organize themselves into a formalized group to support livelihoods. Many social interaction processes like conflict, cooperation, comparison surfaced in work sharing during crop demonstration period. Women group in Masayapally village had tough time with time allocation between family plots and demonstration plots that had invited wrath of their husbands. *Sen (1990)* had clearly indicated that household being an arena of both cooperation and conflict where men and women differ in resource allocations. Therefore, study highlighted labour allocation as an issue within households affecting woman's participation, and a need was felt for researchers to intervene and resolve the issue by

educating both men and women on benefits' derived from woman's collective farming. *Mula et al (2010)* had indicated user orientation essential prior to project implementation that takes into account equal opportunities for both sexes and improves women participation in gender related projects. Woman member's realization of benefits from group approach was tremendous as their personal experiences had clearly indicated that access to bank credit, inputs and markets was much easier than earlier times. *Moser (1993)*, proved that emergence of these capabilities among women illustrated the need to address both practical and strategic needs which will significantly bring best in women's performance; the process of negotiation, joint decision-making and self determination becomes natural when a farmer realizes potential of a technology (*Roling and Van Der Fliert, 2000*).

Impact of improved livestock management on milk production: Women groups have also enlisted problems in livestock management. Overcoming low milk yield from milch buffalo possessed by women groups was common in two villages and was given top priority. Technology intervention related to livestock health management package consisting of immunization, deworming and mineral mixture supplementation was demonstrated to the groups. *Ramana et al (2011)* stated low productivity of large ruminants could be attributed to factors of imbalanced feeding, poor genetic potential, high incidence of preventable diseases and improper breeding management.

The results indicated that the intervention on supplementation with mineral mixture to milch buffaloes had effectively enhanced the milk productivity (Fig-2). Women's participation found particularly important in implementation of such animal health interventions such as timely immunization, mineral mixture supplementation and deworming practices. Through demonstration of wholistic technology package on health management the women groups readily perceived visible benefits like the milk yield increase by 94 per cent; no single animal was effected with epidemic diseases; calf mortality was brought to zero per cent in buffaloes and reproductive problems were being checked to the maximum extent. *Nisha and Subramanian (1997)* stated that farm women level of knowledge was higher in feeding management and breeding but lower in disease control and marketing. However, the present participatory action

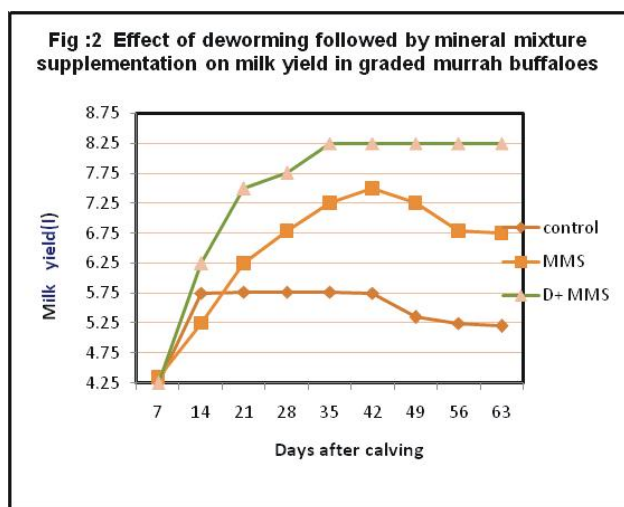


Table 3. Performance of weeding implements on women's drudgery reducing factors for women

Field Operations	Field capacity ha day-1	Weeding efficiency %	Saving in time %
Goplapur (Bajra+PP intercrop)			
T1: weeding with manual weeder	0.074	78	37.2
T2: Weeding with sickle	0.047	98.1	
Masaypally (Sorghum + PP intercrop)			
T1: weeding with manual weeder	0.06	71.5	30
T2: weeding with Sickle	0.04	95	

research had successfully addressed and bridged knowledge gap in disease control in large ruminants.

Drudgery reduction of farm women through tools and implements: Another problem that was raised by women during PRA was drudgery in weed management, which has been viewed by researchers as serious problem in women empowerment projects. Utility of small improved tools for crop production such as manual weeders were demonstrated and compared with local practice to demonstrate the efficiency of tools in reducing drudgery.

From the Table 3 below, revealed that the weeding efficiency with manual weeder was 78% and 71.5% in Goplapur and Masaypally villages respectively, which found to be lower than manual weeding i.e., 95-98%. This is due to the fact, in the later practice the weeding operations was carried out in sitting posture slowly having better visibility and control over the weed uprooting. Where as in case of long handle tools the operation carried out cautiously in standing position to avoid crop damage and keeping the blade little bit away from the crop rows. Some labor to the extent of 30-37% can be saved with uprooting of the left over weeds. Similar evidence from *Badiger et. al. (2004)* had indicated that drudgery from simple manual weeding

can be reduced with either adoption of twin wheel hoe or grubber hoe.

CONCLUSION

Technology demonstrations to women groups have many benefits over demonstrations to individual woman. Women production constraints like land, credit, technology and extension services have been bridged through institutional arrangements of group formation and participatory action research. Group farming provided confidence to women and also has improved visibility to farming and technologies. Women identified with groups that acted as a binding force and helped in speeding up the process of technology transfer and its adoption in rainfed areas development. Studies reported that new agricultural technologies have both positive and negative effects such as increasing women's burden, a negative impact, while increasing their control over the output considered to be a positive effect (*Doss 2001*). The present action research project had addressed most of the women farm problems along with increasing women workload and time but have compensated as work load was minimized by women group members by sharing work load in shifts like few taking care of sowing and some involved in marketing of produce etc., Inclusiveness of women in every aspect of agriculture development particularly in capacity building and technology demonstration programs has wider implications on meeting gender needs leading to empowerment (*Agarwal, 2001*). Technology transfer through women groups or *mahila sanghams* would improve women farm income and confidence bringing both technological empowerment along with economic independence. Providing access to suitable training and extension would further improve confidence, participation and decision-making powers needed for overall development leading to sustainability of rainfed agriculture.

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