Empowerment of Women for Equitable Participation in Watershed Management for Improved Livelihoods and Sustainable Development: An Analytical Study

TK Sreedevi, Suhas P Wani and V Nageswara Rao

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
Patancheru PO, Andhra Pradesh 502 324 India

Abstract

Watershed programs are recognized as potential engines for agricultural growth and sustainable development in rain-fed areas. Success and sustainability of watershed programs are directly related to collective action for conserving natural resources to enhance crop productivity, livelihoods for sustainable income development and gender equity. Women are key players as managers and direct actors in managing natural resources in the watershed and addressing the household food security. However, often they have passive role in decision-making process because of their low educational levels, social customs, and economic dependence.

Women participation awareness on development activities, workload dynamics in watersheds, empowerment of women and decision-making for livelihood activities in Adarsha watershed in Ranga Reddy district, Powerguda watershed in Adilabad district and Janampet watershed in Mahboobnagar district of Andhra Pradesh were studied. Similarly, capacity building needs and institutional framework for women empowerment and drivers of sustainable development in these watersheds were assessed and analyzed. In Kothapally watershed, women groups were collaborating to explore new livelihood opportunities to increase income. However, farmers got tangible benefits, 2 to 2.5 fold increase in crop productivity by conserving natural resources with collective action and good leadership. It was observed in Powerguda that women even without formal education worked collectively and managed watersheds efficiently to enhance crop productivity by 25 to 350 per cent and managed income-generating enterprises at community level to increase family income upto 77 per cent due to livelihood training, policy interventions and with good leadership of women. Increasing economic resilience of the poor by federating SHGs at *mandal* level, helped members to run commercial activities largely enabling women to realize

their socio-economic potential and improve the quality of their lives. The results from detailed case studies were used to analyze critical factors and institutions essential for enhancing collective action and impact of watershed programs for improving livelihoods and conserving natural resources. Through empowerment of women along with men, the issues of harnessing gender equity and enhancing collective action were identified as critical for efficient management of natural resources and income-generating livelihoods for sustainable development in the integrated watershed management.

Introduction

Women constitute more than 50 per cent of the world's population; own one per cent of world's wealth and 550 million women live below poverty line as reported by World Food Program (WFP). Two thirds of the illiterates in the world are women, have no property rights (women hold 1/1000th world's property) and have no economic independence (70 per cent of the world's poor are women) (UNDP 1997). According to Census of India, 2001 literacy among women in India was 54.2 per cent, while the literacy rate for men was at 75.8 per cent, leaving a gap of 21.6 per cent between men and women in literacy rate. According to "Draft National Policy for Women in Agriculture (2008)", women constitute 40 per cent of the agricultural workforce and this per centage is rising, currently 53 per cent of all male workers, but 75 per cent of all female workers and 85 per cent of all rural female workers are in agriculture. Women as economic providers, caregivers, and household managers, are responsible for ensuring that their families have basic resources for daily lives. They are often the managers of community natural resources, and have learned to protect these resources in order to preserve them for future generations (managers of sustainability). Although, women play a pivotal role in agriculture development, more than 55 per cent of female agricultural workers are considered labourers rather than being the owners themselves even when their family owns land. Participation of women and resource poor is of paramount importance for the effective implementation of watershed programs, to become effective vehicles for integrated development of communities and sustainable impacts.

In the drought-prone rain-fed areas watersheds are recognized as growth engines for agricultural as well as overall development to achieve food security. Community participation is an important aspect of watershed development programs, and it is necessary to include equity and gender parity into the program design itself. Inclusion of women and resource poor is of paramount importance for the watershed development to become truly participatory in both implementation and impacts.

Water is most important driver for four of the millennium development goals (MDGs) i) to eradicate poverty, ii) promote gender equity and empowerment of women, iii) environmental sustainability and iv) to build global partnerships for development. Gender equity and women empowerment are human rights that lie at the heart of development and achievement of the millennium development goals.

The Task Force report identified i) improving social capital investments in water infrastructure as a catalyst for regional development, ii) pivotal role of community-based organizations in water management as precursors for achieving listed MDGs. Similarly, improved water availability helps women to allocate more time for maintaining family hygiene and health, child care-giving and also more time for productive endeavors. This gives women the necessary leisure to build up the social capital and participate in economic and group activities. Water source closer home puts women at less risk for sexual harassment and assault. Promoting gender equality and empowerment of women is associated with other three MDGs of reducing poverty, building partnerships and achieving the sustainable development.

A close look in a typical watershed village in India provides insights in women's role in daily work schedule where about 50 per cent of work load of household chores is taken by women as against 13 to 15 per cent by men (Table 1). In overall farm production women contribute 55–66 per cent labour force (Venkateswaran 1992). In the Indian Himalayas on a hectare of land, annually women work in 3485 h as compared to men's 1212 h, which illustrates the significant contribution of women to agricultural production. Women accounted 93 per cent of total employment in dairy production (World Bank 1991); 16.8 million women were employed for animal husbandry in rural India. However, dairy cooperatives have women membership of only 14 per cent.

Table 1. Major activities performed by women and men in watersheds.

Activity	Malleboenpally		Mentepally	
	Women (%)	Men (%)	Women (%)	Men (%)
Household chores	54	15	46	13
Student	20	21	24	30
Hired labor	36	19	41	27
On-farm work	46	42	44	44
Off-farm work	2	17	3	7
Other	9	21	6	13

Several studies in the recent past while assessing the impact of watershed programs in India have documented important lessons learnt (Farrington and Lobo 1997, Samra 1997, Kerr et al. 2000, Wani et al. 2002, 2003, Joshi et al. 2004 and Wani et al. 2008a). Participatory watershed management is a multi-disciplinary, multi-institutional approach for NRM and providing food security through diversification of livelihood options and increased productivity. Evaluation of number of watershed programs indicated the extent of peoples' participation and its importance in success of development process, role of institutions for enhanced community participation. Watersheds with better community participation and sound technical inputs enhanced the impact. Supporting policies are must for effective watershed development programs (Joshi et al. 2009 and Wani et al. 2008).

An important concern in watershed development is the sharing of the costs of land and water resources development, equitable distribution of the benefits consequent to enhanced crop production. The focus on land development often gave projects a male orientation. Even though government guidelines encouraged greater participation of women in watershed groups, women were often not recognized as members of the watershed committee in their own right; they were viewed as being there to fill the quota required under the guidelines (Seeley et al. 2000). At present in some parts of India social customs do not allow active participation and involvement of women in functioning of committees and village organizations. Watershed development in India is gender insensitive as all the benefits accruing are being cornered exclusively by men (Angurana, 2003). Women were generally the losers in watershed development as thay lose the access to common lands for grazing of animals and fuel collection (Meinzen-Dick, 2004). Women generally paid the cost of development in most watersheds such as plantation programs in the common pool resources.

In most watershed programs insufficient attention was paid to the social, institutional and economic issues relating to the sustainability of investments. The eight arms of the holistic development as shown in the figure 1 are the impact pathways for the watershed programs.

The purpose of the current study is to identify the sustainable impact of watershed development programs by leveraging the institutions for collective action and harnessing the gender power through "Prosperity and Harmony" in watersheds. The specific objectives are i) to understand the constraints for promoting equity and empowerment for women in integrated watershed management programs (IWMP), ii) to identify critical areas for capacity building, and iii) to identify mainstreaming institutional and policy needs for gender perspective in IWMP.

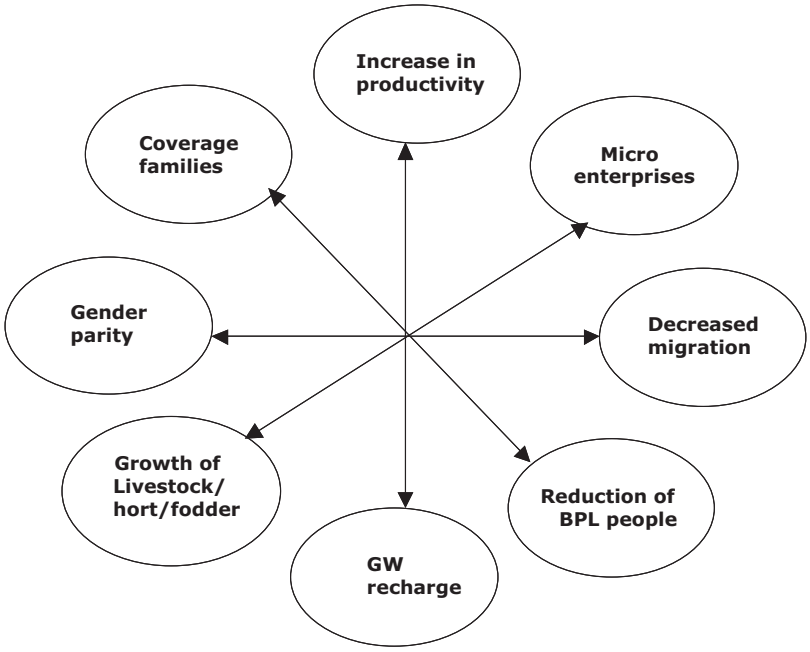

Figure 1. Eight arms of holistic development through watershed programs.

Methodology

In the state of Andhra Pradesh about 2500 micro-watersheds of 500 ha each are developed under various programs. For the purpose of study three watersheds were selected. In these watersheds the management was with community based organizations (CBOs) and women had significant roles to play.

Table 2. Profile of selected watershed villages for the case study.

	Adarsha watershed, Kothapally	Powerguda	Janampeth
Proximity to city	Yes	No	Yes
Social background	Mixed community	Tribal – homogenous community	Mixed community
Watershed interventions	SWC + productivity enhancement + limited income generating activities such as vermicomposting, nursery raising and livestock rearing	SWC + limited income generation activities such as oil extraction unit, nursery	SWC + commercial activities – Mahila Samakya undertake financing, highway restaurant, etc.
Managed by	Women SHGs for specific activities + WC representatives	Women SHGs, watershed implemented by women	SHGs are federated under Mahila Samakhya commercial activities
Emphasis	Productivity enhancement	Service provider using NRs and technologies	Commercial activities for income generation

The details of the selected watersheds are described in the Table 2. Out of the case studies Adarsha Watershed in Ranga Reddy district, Powerguda in Adilabad district and Janampeth in Mahboobnagar district were studied in detail for the process and the impacts as well as the drivers of the success (Wani et al. 2003, Sreedevi et al. 2004, and D'Silva et al. 2004).

In all the three case study watersheds as well as Lucheba watershed in southern China, we organized focused group discussions (FGDs), using the common questionnaire with the women and men groups separately. The FGD interviews revolved around the issues related to women, particularly in terms of rights, workload, decision making, access to information and earnings, social capital development, nature of the institutions, drivers of the success, and the type of benefits accrued and their distribution amongst the men and the women members. Information documented includes collection, compilation and analyses to study the relationship amongst studied variables and the type of interventions, and approach adopted for watershed development. We described watershed development processes below.

Adarsha Watershed, Kothapally, Medak District

In Adarsha watershed, Kothapally, ICRISAT-led consortium adopted the farmer-centric, holistic, and participatory approach for developing the watershed to increase the agricultural productivity and incomes. Based on the meta analysis results and the interlocking constraints faced by farm households prompted ICRISAT to launch its learnings of 25 years in strategic and on-farm development research. ICRISAT-led community watershed approach espouses the Integrated Genetic Natural Resources Management (IGNRM) approach where activities are implemented at landscape level by the community (Wani et al. 2003). Research for development (R4D) interventions at landscape level are conducted at benchmark sites representing the different SAT agroecoregions. The entire process revolves around the four E's (empowerment, equity, efficiency and environment), which are addressed by adopting specific strategies prescribed by the four C's (consortium, convergence, cooperation and capacity building). The consortium strategy brings together institutions from the scientific, non-government, government, and farmers' groups for knowledge management and sharing. Convergence allows integration and negotiation of ideas among actors, resulting in convergence of various programs addressing the core issue of improving livelihood and protecting the natural resources. Cooperation enjoins all stakeholders to harness the power of collective action. Capacity building engages in empowerment of the communities for sustainability.

The important components of the new model, which are different from earlier models, were:

- collective action by farmers and initiating participation from the beginning through cooperative and collegiate mode in place of contractual mode;
- integrated water resource management (IWRM) and holistic system approach through convergence for improving livelihoods as against traditional compartmental approach;
- a consortium of institutions for technical backstopping;
- knowledge-based entry point to build rapport with community and enhanced participation of farmers and landless people through empowerment;
- tangible economic benefits to individuals through on-farm interventions by enhancing efficiency of conserved soil and water resources;
- low-cost and environment-friendly soil and water conservation measures through out the toposequence for more equitable benefits to larger number of farmers;
- income-generating activities for landless and women through allied sector activities and rehabilitation of waste lands for improved livelihoods and protecting the environment.

Crop Production Activity

Reducing rural poverty in the watershed communities is evident in the transformation of their economies. The ICRISAT model ensured improved productivity with the adoption of cost-efficient water harvesting structures as an entry point for improving livelihoods. Crop intensification with high-value crops and diversification of farming systems are leading examples that allowed households to achieve production of basic staples and surplus for modest incomes.

A case in point is Kothapally watershed. It is a prosperous village on the path of long-term sustainability and has become a beacon for science-led rural development. A significant reduction in mean runoff (44 per cent) and peak runoff rate were responsible for the significant reduction (69 per cent) in soil loss. Due to additional groundwater recharge, additional 200 ha in rainy season and about 100 ha in postrainy season were cultivated with different crops and cropping sequences. The productivity of maize increased by 2 to 2.5 times under sole maize and four-fold under maize/pigeonpea intercropping system. The area under maize/pigeonpea and maize-chickpea has increased by more than three-fold and two-fold, respectively. Farmers could gain about Rs 16,510

and Rs 19,460 from these two systems, respectively. The average household net income has increased to Rs 15,400 within watershed as compared to Rs 12,700 outside the watershed area. Farmers' incomes from crop production were doubled in 2001 compared to the 1998 levels.

In 2001, the average village income from agriculture, livestock and non-farming sources was US$ 795 compared neighboring non-watershed village, which had US$ 622 (Fig. 2). The villagers proudly professed, "We did not face any difficulty for water even during the drought year of 2002. When surrounding villages had no drinking water, our wells had sufficient water". To date, the village prides itself with households owning 5 tractors, 7 lorries and 30 auto rickshaws. People from surrounding villages come to Kothapally for on-farm employment.

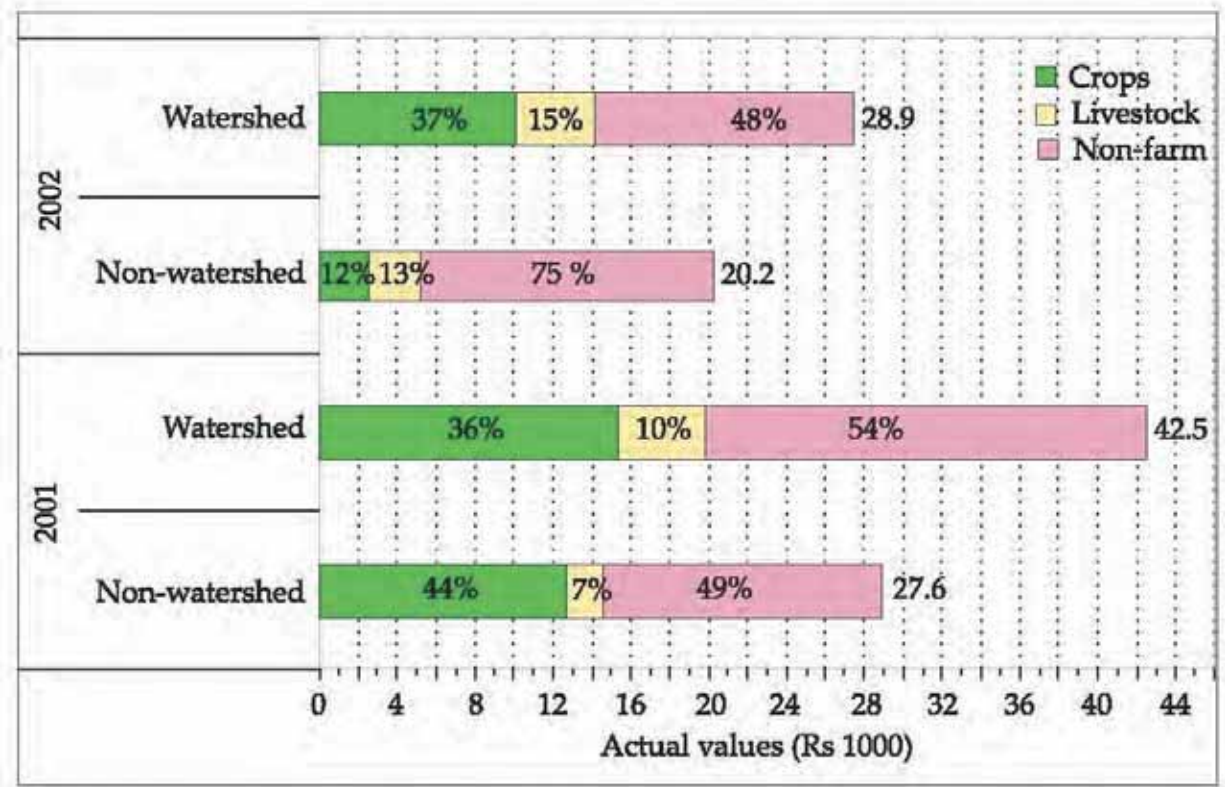

Figure 2. Income stability and resilience effects during drought year (2002) in Adarsha watershed, Kothapally, AP, India.

Income-generation Activity

Building on social capital made the huge difference in addressing rural poverty in watershed communities. In this watershed, emphasis was laid on farm-based interventions as well as agriculture related allied income-generating activities for landless/women group members with the objective of increasing the income

(Wani et al. 2003; Sreedevi et al. 2004). For empowerment of community members and technical backstopping, a consortium was formed comprising research organizations, university, development workers, policy makers, and farmers. Enhanced participation of the vulnerable groups like women and the landless through capacity building and networking was observed. Many women adopted vermicomposting as micro-enterprise and became earning members of the family (Wani et al. 2008; Sreedevi et al. 2009)

Demand driven selection of the watershed, more participation by the farmers, integrated approach, team effort and collective action by the stakeholders, social vigilance and transparency in financial dealings, increased confidence of the farmers, low-cost water harvesting structures, which provided benefits to several farmers, tangible economic benefits to a large number of small farm holders, good local leadership, and concerted local capacity building efforts were some of the drivers of higher impact. (Sreedevi et al. 2004; Shiferaw et al. 2008)

Powerguda Watershed, Adilabad District

Crop Production Activity

In Powerguda, though the approach adopted was similar to the Adarsha watershed, it was distinct as the women self-help groups (SHGs) implemented the watershed program and being a tribal area the community had access to the forest resources. The SHGs with the watershed programs had six-fold higher savings than those without such programs in Adilabad district. The introduction of improved land management practices such as broad-bed and furrow and bullock-drawn tropicultor, along with high-yielding cultivars increased agricultural productivity by 20 to 350 per cent. Powerguda farmers, particularly many women, learnt new techniques in planting, land preparation, and intercropping. Many of them grew vegetables for the first time. Over three years, there was a remarkable change in cropping patterns shifting from cotton to soybean and vegetables (D'Silva et al. 2004).

Income-Generating Activities

Between 2000 and 2003, investments were done in new livelihood enterprises such as seed oil mill, tree nursery, and vermicomposting. A women SHG managed an oil extracting machine [worth Rs 375,000 provided by Integrated

Tribal Development Agency (ITDA)] to support income-generating activities in the community. Seeds of *Pongamia*, *neem*, and other trees are crushed in this machine to extract oil that is sold in the market. The oil mill has become an important source of income to Powerguda. The women SHG planted about 8,500 *Pongamia* trees in 2002 and 2003 and 10,000 in 2004 to augment the oilseeds supply in future. Since October 2003, Powerguda has discovered a new income-generating activity in tree nurseries. The community decided to invest in a *Pongamia* nursery about Rs 30,000 received from the World Bank as part of environmental service payment. For the first time, 147 tons of carbon was sold by women SHGs from India to the World Bank (D'Silva et al 2004). Women had developed a full-fledged nursery facility and are supplying seedlings to the forestry department and earning regular income

Average family income increased by 77 per cent in three years from Rs 15,677 in 1999–2000 before the government invested in watershed development, to Rs 27,820 in 2002–03. Seasonal migration from villages has ended totally, or is negligible. It appears that watershed and agricultural development, complemented by other investments, have provided sufficient employment and income opportunities for the rural people to escape poverty and to stay in the village.

Since 1999, Powerguda has charted a new path of development using watershed management as the growth engine, women SHGs as institutional anchor, and a total ban on the consumption of alcohol in the village as a social platform. These steps have enabled Powerguda to march ahead of the other neighboring hamlets. The people, especially the women leaders, are very proud that they have been able to outperform other villages in social, financial, institutional, and environmental development. Powerguda is distinguished from other hamlets due to the strong leadership provided by women through SHGs. Three of the four SHGs are run by women who dominate most of the development activities in the village. Trust, social cohesion, a sound local leadership and democratic functioning of local institutions are among the features of social capital in Powerguda.

Janampeth Watershed, Mahboobnagar District

Income-Generating Activities

The Janampeth watershed village is a step farther than the Powerguda and Adarsha watersheds. With the supporting policies from the government, SHGs

at the village and *mandal*, federated to be known as the Mahila Samayka Adarsha Women Welfare Society, increased their bargaining power as well as the financial and political leverage. The women SHGs federation provides a forum for women to discuss common problems. The SHG members consider the unity and solidarity among women to be one of the most important benefits of SHG membership. Also by standing guarantees for SHGs, the federations can help the SHGs to borrow money from financial institutions at lower interest rates. These loans are particularly useful for value-added services such as running a highway restaurant and other micro-enterprises. The federation takes care of book keeping and training functions of SHGs. The impact in terms of increasing the family incomes, building the social capital as well as trust amongst the women members from Janampeth is superior to the Powerguda or Adarsha watersheds.

Gender Analysis of the Case Study Watersheds

Collective Action

The results from the studies in all the case study villages over the period and through focused group discussions revealed that the IWMP approach adopted was different than the traditional watershed approach. In Adarsha, Kothapally and Powerguda watersheds had, it was an integrated approach with emphasis on productivity enhancement of major crops and natural resource related allied income enhancement activities. In Powerguda, the collective action was mainly for the service providing function, which was a step higher in the ladder of commercialization over the Kothapally, where collective action was mainly for enhancing the productivity of their lands with a limited opportunity for direct economic gain. The nature and extent of collective action was also directly related with the awareness of the women members (Table 3). The women members in Janampeth had high level of awareness about the activities undertaken. In case of Powerguda, the women leader Ms. Subhadrabai was well aware but the group members were not much aware about the operations as well as rules and procedures to be adopted. In Janampeth, the approach for improving livelihoods was on the commercial scale and direct economic gain was the main purpose. The women SHGs were federated and the collective action was at a macro-level and could get the benefits of common learning, exposure and opportunity to interact with more and diverse group members as well as reduced transaction costs. In Kothapally and Powerguda, the collective action was restricted at small group level in the village, exposure for

the members was restricted and transaction costs were higher in terms of load on the leadership.

Women Rights and Gender Equity

The impact of the model/approach adopted was distinctively evident in the case study villages (Table 3). In terms of rights the results revealed that Janampeth ranked on top for property rights where women held the property rights along with men. In Kothapally and Powerguda the property rights were with the men except in the exceptional and circumstantial cases where women headed households due to death of male member. The nature and the extent of collective action provided different exposure for the members. In Janampeth the commercial nature of the collective activities resulted in control of family financial resources by women. In Kothapally as well as in Powerguda although women family members earned the money the control of family financial resources rested with men. In Kothapally women group activities provided employment to women members mainly because of the type of activity undertaken. In Powerguda and Janampeth the collective action of women created employment opportunities for women as well as men.

Education and Social Status

The right education rested more with men and the results to tilt education in favor of women will need longer time. In Kothapally the education of boys and girls is distinctively same as no child labour exists in this village. However, in Powerguda, women are aware now about educating their daughters. Interestingly, female literacy (52 per cent) is higher than male literacy (48 per cent). The social status of women in all the three study watersheds was better than the normal watershed village. However, amongst the three watersheds Janampeth women enjoyed higher social status in the society than the women in Kothapally and Powerguda.

Women Workload and Wages

In terms of workload on women, it was higher in Janampeth than Kothapally and Powerguda where the workload was in the decreasing order. Looking at the extent of commercial activities undertaken by the women SHGs, the workload was imperative in Janampeth. Although Powerguda SHGs undertook higher scale of commercial activity than the Kothapally SHGs, the workload on Kothapally women was more than in Powerguda. The Powerguda women

employed men for undertaking specific activities and paid higher wages for men than women considering the nature of the works undertaken. Similarly, in Janampeth women members compensated their family labor in field by hiring additional labors from the market. The financial independence permitted women SHGs to workout the alternate arrangements to reduce their workload suitably. However, in all the three watersheds the wage differences between men and women labors existed where men were paid higher (Rs 50 per day) than the women labors (Rs. 30 per day). Traditionally men and women undertake specific farm activities and as observed in Powerguda, women felt that the specific jobs done by men need to be paid differently. In Janampeth, only women undertook marketing of agricultural produce where as in Powerguda and Kothapally men took up this activity (Table 3).

Table 3. Gender impact analysis of three case studies in India

Sl.No	Description	Powerguda	Janampeth	Kothapally
1	Rights			
	Property	Men	Men/Women	Men
	Financial resources of the family	Men	Women	Men
	Employment	Men/Women	Men/Women	Women
	Education	Men	Men	Men
	Social status of women	Medium	Good	Medium
	Awareness among women	Leader is completely aware?	Very good	Not to the mark
	Agricultural decision making	M/W	M/W	M/W
	Resistance by men	Nil	Initial	Nil
2	Workload on women	+	+ + +	+ +
	Wages (Rs/day)			
	Men	50	50	50
	Women	30	30	30
	Load of invisible work	Same	Same	Same
	Work load on men	No	No	Yes
	Time spent on economic work by women	+	+++	++
	Time on social/ community work	-	-	Medium
	Marketing of agriculture produce by women	-	Yes	-

Continued...

Table 3. Continued

Sl.No	Description	Powerguda	Janampeth	Kothapally
3	Access to Assets			
	Access to community assets	Men/Women	Men/Women	Men/Women
	Access to credit	Women	Women	Women
	Access to income	-	Women	-
	Access to information	Yes	Yes	Yes
	Access to service	Nil	Yes	Yes
4	Control on financial resources	Low	High	Low
5	Self-confidence	Slowly building-up	High	Low
6	Opportunities for exploration	Minimum	Very high	High
7	Understanding on health	Medium	High	Medium
8	Distressed migration	0	0	0
9	Driver identified	Leader	*Mahila Samakhya* (federation of women)	Improved water availability

*M=Men, W=Women
** +=Low, ++=Medium and +++= High

Women Empowerment and Decision-making

The results of the parameters such as access to credit, common pool resources, income, information, control of financial resources, self confidence and extended horizons for women are presented in (Table 3). In all the three watersheds only women had the access to financial credit, as the SHGs are for women only. This is attributed to the current policy of the government. The women members had good access to information. However the new opportunities for exploration were directly in tune with the extent of commercial nature of the activities undertaken. In all the three case studies the new watershed approach encompassing productivity enhancement and livelihoods approach had direct and positive impact on reducing the distressed migration of men and women from the villages. In case of Kothapally the awareness amongst the members was low, as most of the banking and financial transactions had to be done at *mandal* level bank situated 15 km away from the village. Decisions related to agriculture were taken jointly by men and women. This is a step in the right direction for sustainable management of the natural resources (NRs). Men did not resist the progressive measures of women in all these case study watersheds although there was some resistance by the male family members in Janampeth initially.

Drivers of Success

The drivers of success varied in all the three case study watersheds. In Powerguda, the success was directly associated with the strong and capable leadership provided by Ms. Subhadrabai. It may be noted that through training and exposure, illiterate Subhadrabai could become very capable leader and channel the energies of women for the sustainable development of the village using NRs. In Kothapally, the main driver of the growth and success increased availability of water resources resulting in increased agricultural productivity and triggering the agriculture-related allied activities such as vermicomposting. In Janampeth, it was the collective action and supporting government policy which enabled the women SHGs to undertake commercial activities successfully with the help of the leadership.

Looking at the matrix of community participation (Table 4), the mode of participation starts or is initiated through a co-opting or contractual process and slowly moves towards cooperative, consultative, collaborative and finally reaching to the successful collective action. Table 4 describes the type of participation and the associated control from the outside. Along with the increased level of participation the sustainability of the initiative also increases with the diminishing control from the outside. Using this matrix of community participation in the collective action the women SHGs from the three watersheds were evaluated (Figure 3). Janampeth watershed was found on the highest ladder of community participation where collective action or collegiate mode of participation is reached. This level of participation in the collective action is quite sustainable and the group can overcome most of the problems through their collective wisdom and opportunities. The Powerguda watershed is one ladder below for participation and they are acting together through co-learning. However, as there are limited market opportunities due to poor infrastructure facilities their sustainability relies on outside support. In case of Kothapally the women groups are collaborating together and have to graduate for achieving the sustainability through more collective action and explore the new opportunities to increase the income from the collective action.

Figure 3. Comparative level of women participation in three watershed case studies.

Table 4. Matrix of community participation

Mode of participation	Type	Outside control	Potential for sustainability
Co-opted	Tokenism		
Co-operating	Tasks are assigned Outsiders decide agenda		
Consulted	Local opinion sought. Outsiders analyze data and decide on the course of action		
Collaborating	Working together but outsiders directing the process		
Collective action	Local people set agenda and mobilize to carry it out, utilizing the outsiders as required and not as initiators or facilitators		

Source: Cheetham 2002

Based on these three case studies on watersheds, to analyze the achievement of gender equity for women through integrated watershed management approach, the following issues need to be addressed. Most important need is to make available the technical know-how and do how for the women groups.

The existing institutions - formal and informal with the supporting government policies as is the case in Andhra Pradesh can be harnessed in the IWMPs for achieving more impact and sustainability. As functional literacy is able to enable the members and leaders to act collectively and harness the benefits, efforts must be undertaken to achieve higher functional literacy for women through quality trainings. Enhanced awareness of women's rights through deliberate efforts is critical for sustainable development of watersheds by harnessing the women power equitably. There is a need to involve younger generation of women in building up the social capital. There is need to harness the gender power through harmony in the watersheds at all the levels starting from the family to watershed. The new common watershed guidelines provide resources and policy support to address issues of gender and vulnerable groups' equity. However, without concrete actions by the implementing and co-ordinating agencies these provisions would not mean much.

References

Angurana AK. 2003. Gender orientation to watershed development. Jharkhand Journal of Development and Management studies. XISS, Ranchi, Vol. 1, No. 3, June 2003, PP 393-395.

Cheetham N. 2002. Community participation: What is it. *www.advocatesforyourth.org.* Transitions, Vol. 14, No. 3.

D'Silva E, Wani SP and **Nagnath B.** 2004. The making of new Powerguda : community empowerment and new technologies transform a problem village in Andhra Pradesh. Global Theme on Agroecosystems Report No. 11, Patancheru 502 324, Andhra Pradesh, India: International Crops Research Institute for the Semi-Arid Tropics. 28 pp.

Farrington J and **Lobo C.** 1997. Scaling up participatory watershed development in India: lessons from the Indo-German watershed development program. Natural Resource Perspective, Number 17, February 1997, London, UK: Overseas Development Institute.

Joshi PK, Vasudha Pangare, Shiferaw B, Wani SP, Bouma J and **Scott C.** 2004. Socioeconomic and policy research on watershed management in India: Synthesis of past experiences and needs for future research. Global Theme on Agroecosystems Report. no. 7. Patancheru 502 324, Andhra Pradesh, India: International Crops Research Institute for the Semi-Arid Tropics. 88 pp.

Joshi PK, Jha AK, Wani SP and **Sreedevi TK.** 2009. Scaling-out Community Watershed Management for Multiple Benefits in Rain-fed Areas. *In:* Rain-fed agriculture: Unlocking the Potential, (Wani SP, John Rockstrom and Theib Oweis, eds.). Comprehensive Assessment of Water Management in Agriculture Series, CAB International, Wallingford, UK. pp. 258-275.

Kerr J, Pangare G, Pangare V and **George PJ.** 2000. An evaluation of dryland watershed development in India. EPTD Discussion Paper 68. Washington, DC, USA: International Food Policy Research Institute.

Ruth Meinzen-Dick, Monica DiGregorio and **Nancy McCarthy.** 2004. Studying collective action in rural development. Elsevier. Agricultural Systems 82(2004)197-214.

Samra JS. 1997. Status of research on watershed management. Dehradun, India: Central Soil and Water Conservation Research and Training Institute.

Seeley J, Meenakshi Batra and **Madhu Sarin.** 2000. Women's participation in watershed development in India. Gatekeeper Series no. 92. London, US: International Institute for Environment and Development. 20 pp.

Shiferaw Bekele, Bantilan Cynthia and **Wani SP.** 2008. Rethinking policy and institutional imperatives for integrated watershed management: Lessons and experiences from semi-arid India. Journal of Food, Agriculture & Environment Vol. 6(2). pp. 370-377.

Sreedevi TK, Shiefraw B and **Wani SP.** 2004. Adarsha watershed in Kothapally: understanding the drivers of higher impact. Global Theme on Agroecosystems Report No. 10, Patancheru 502 324, Andhra Pradesh, India : International Crops Research Institute for the Semi-Arid Tropic. 24 pp.

Sreedevi TK and **Wani SP.** 2009. Integrated farm management practices and up-scaling the impact for increased productivity of rain-fed systems. Pages 222-257 in Rain-fed agriculture: Unlocking the Potential. (Wani SP, John Rockstrom and Theib Oweis, eds.). Comprehensive Assessment of Water Management in Agriculture Series, CAB International, Wallingford, UK.

Venkateswaran S. 1992. Living on the Edge: Women, Environment and Development, Friedrich Ebert Stiftung, New Delhi.

Wani SP, Pathak P, Tam HM, Ramakrishna A, Singh P and **Sreedevi TK.** 2002. Integrated Watershed Management for Minimizing Land Degradation and Sustaining Productivity in Asia. *In*: Integrated Land Management in Dry Areas. Proceedings of a Joint UNU-CAS International Workshop (Zafar Adeel, ed.), 8-13 September 2001, Beijing, China. pp. 207-230.

Wani SP, Pathak P, Sreedevi TK, Singh HP and **Singh P.** 2003. Efficient Management of Rainwater for Increased Crop Productivity and Groundwater Recharge in Asia. CAB International 2003. Water Productivity in Agriculture: Limits and Opportunities for Improvement, (Kijne W, Barker R and Molden D, eds.) pp . 199-215.

Wani SP, Singh HP, Sreedevi TK, Pathak P, Rego TJ, Shiferaw B, and **Shailaja Rama Iyer**. 2003. Farmer-Participatory Integrated Watershed Management: Adarsha watershed, Kothapally India, An Innovative and Upscalable Approach. A Case Study. *In:* Research towards Integrated Natural Resources Management: Examples of research problems, approaches and partnerships in action in the CGIAR (Harwood RR and Kassam AH, eds.) Interim Science Council, Consultative Group on International Agricultural Research. Washington, DC, USA: pp. 123-147.

Wani SP, Joshi PK, Ramakrishna YS, Sreedevi TK, Piara Singh and **Pathak P.** 2008. A New Paradigm in Watershed Management: A Must for Development of Rain-fed Areas for Inclusive Growth. Conservation Farming: Enhancing Productivity and Profitability of Rain-fed Areas. (Anand Swarup, Suraj Bhan and Bali JS, eds.). Soil Conservation Society of India, New Delhi. pp. 163-178.

Wani SP, Joshi PK, Raju KV, Sreedevi TK, Wilson JM, Shah Amita, Diwakar PG, Palanisami K, Marimuthu S, Jha AK, Ramakrishna YS, Meenakshi Sundaram SS and **D'Souza Marcella.** 2008. Community watershed as a growth engine for development of dryland areas. A Comprehensive assessment of watershed programs in India. Global Theme on Agroecosystems Report no. 47, International Crops Research Institute for the Semi-Arid Tropics. Patancheru. 36 pp.

UNDP. 1997. Human Development Report, Oxford University Press, New York.

World Bank. 1991. A World Bank Country Report: Gender and Poverty in India, World Bank, Washington, DC. USA.