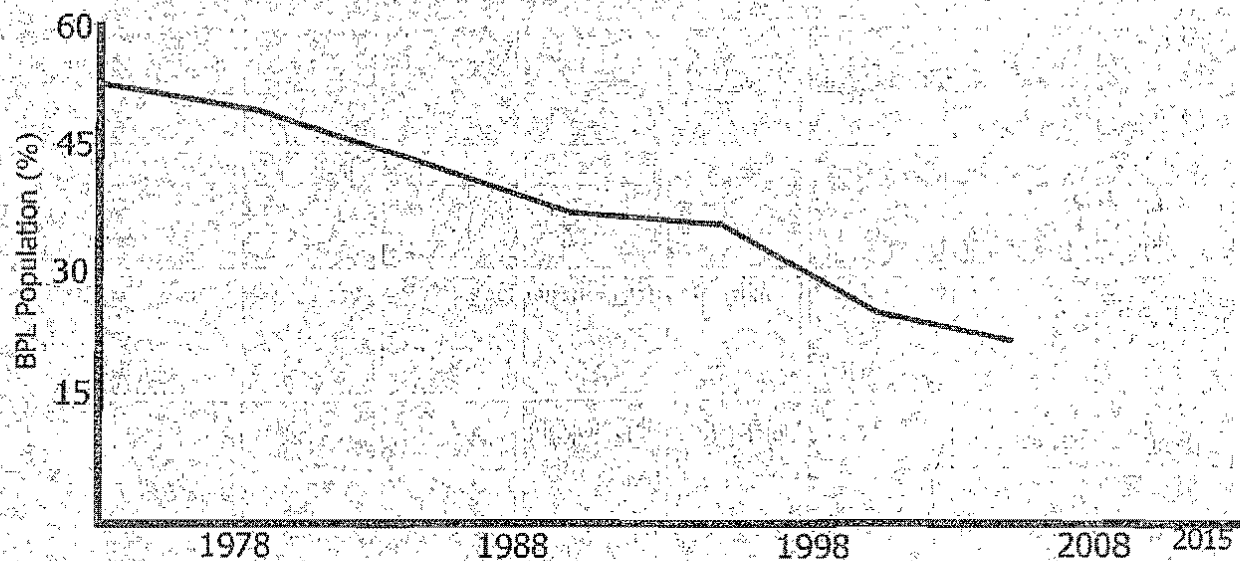


Empowering the Poor in the Era of Knowledge Economy

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Leveraging Institutions for Enhanced Collective Action in Community Watersheds through Harnessing Gender Power for Sustainable Development

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Introduction

In the drought prone rain-fed areas watersheds are recognized as growth engine for agricultural as well as overall development to achieve food security. Sustainable management of a watershed entails rational utilization of land and water resources for optimum production but minimum hazard to natural and human resources. For the benefits of community-based watersheds to maximize and reach all stakeholders 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. Two thirds of the illiterate in the world are women, have no property rights (women hold 1/1000th world property) and have no economic independence (70% of the world's poor are women) (UNDP 1997).

Water a finite resource, the very basis of life and the single most important feature of our planet, is the most threatened natural resource today. Water is most important driver for four of the millennium development goals (MDGs) as shown

in the Figure 1. In the context of four MDGs contribution of water resources management through direct interventions are suggested to achieve the milestones by 2015.

The Task Force reports for achieving MDG have identified social capital investments in water infrastructure as a catalyst for regional development, community-based organizations play pivotal role in water management. Similarly, reduced time, health, and care-giving burdens from improved water services give women more time for productive endeavors. This gives them the necessary leisure to build up the social capital and participate in economic and group activities. Water source closer to home put women at less risk for sexual harassment and assault. Promoting gender equality and empowerment of women is related with other three MDGs of reducing poverty, building partnerships and achieving sustainable development. Women are key players in the management of natural resources as managers and direct actors for protecting the environment for sustainable development. They are also

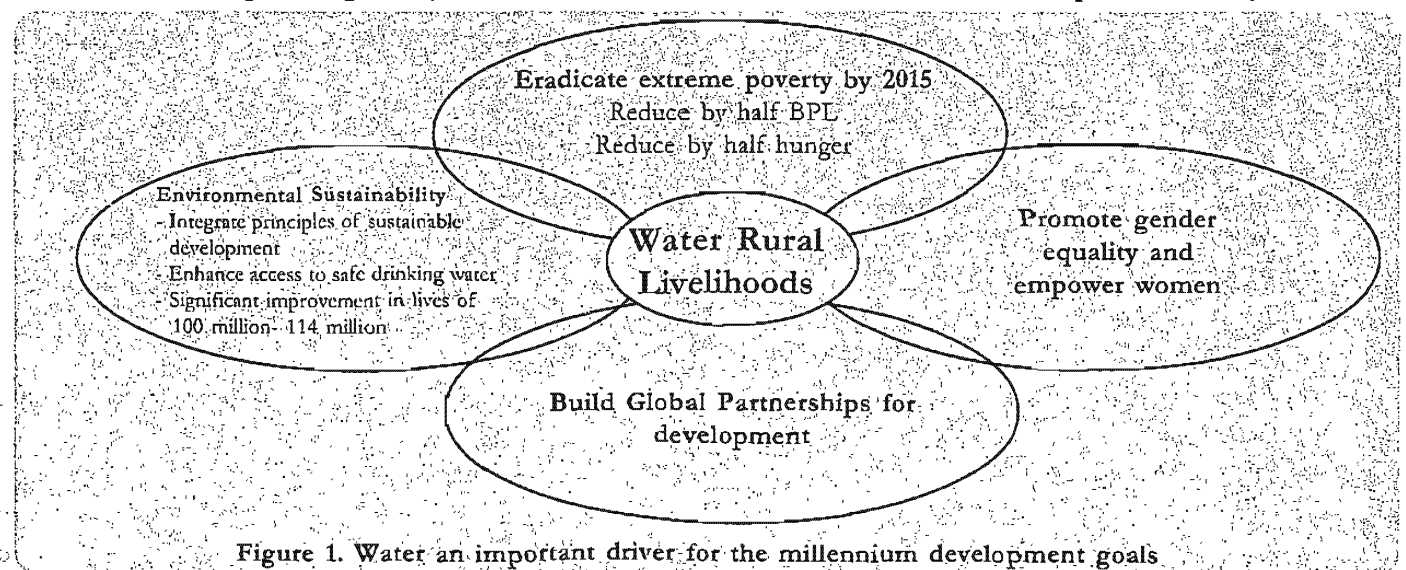


Figure 1. Water an important driver for the millennium development goals

custodians of household food security and child development at family level. However, women are passive decision-makers in the traditional watershed programs and men generally occupy critical decision-making positions. Social customs in many countries restrict women's participation in collective action. A close look at a typical watershed village in India provides insights in women's role in daily work schedule where about 50% of the household chores is

better community participation and sound technical inputs enhanced the impact. Supporting policies are a must for effective watershed development programs (Wani *et al* 2003, Joshi *et al* 2004, Sreedevi *et al* 2004).

An important concern in watershed development is the equitable distribution of the benefits and sharing of the costs of land and water resources development and the consequent biomass

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

Activity	Malleboenpally		Mentapally	
	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

taken by women as against 13 to 15% by men (Table 1).

In farm production, women contribute 55-66% of the labour (Venkateswaran, 1992). In the Indian Himalayas, women work for 3485 hours as compared to men who work 1212 hours on a hectare of land annually. Similarly, women account for 93% of total employment in dairy production (World Bank, 1991). However, only women membership is only 14% in the dairy cooperatives.

Women in Watersheds-Some Facts & Concerns

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, and Joshi *et al* 2004). Participatory watershed management is a multi-disciplinary, multi-institutional approach for NRM for providing food security through diversification of livelihood options and increased productivity. Evaluation of number of watershed programs has indicated the importance of people's participation and the role of institutions for enhanced community participation. Watersheds with

production. The focus on land development often gave projects a male orientation and predominance. 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). Women generally lose out in watershed development through losing access to the common lands for grazing animals and fuel collection (Ruth Meinzen-Dick, 2004). Women generally paid the cost of development in most watersheds such as plantation programs in the common pool resources.

Most commonly, insufficient attention is bestowed upon social, institutional and economic issues relating to the sustainability of investments. The eight arms of the holistic development as shown in the Figure 2 are the impact pathways for the watershed programs. The eight arms are intertwined with each other in such a way that unless productivity enhancement takes place through efficient use

of water resources in a watershed, impacts on women and other vulnerable sections of the society would not be evident. For example, unless groundwater productivity is increased, marketable surplus will not be generated for value addition. The useful by products are enhanced employment opportunities, increased incomes and reduced migration. Moreover, these interactions amongst the different arms of development are complex and non-linear in terms of impacts.

Studies indicated clear benefits of watershed programs in terms of productivity enhancement,

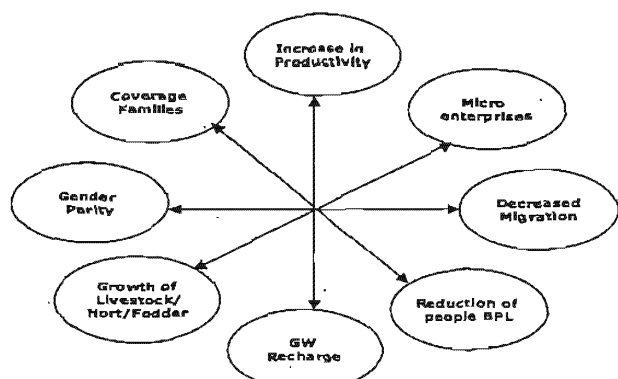


Figure 2. Eight arms of holistic development through watershed programs.

increased cropping intensity, increased greenery, reduced soil loss, growth of agriculture allied sectors and micro-enterprises, conservation of rainwater and improved groundwater availability, reduced migration and reduced number of people below poverty line (Wani *et al* 2002, Kerr *et al* 2000, and Joshi *et al* 2004). However, the major gaps in the programs identified include reaching the poorest of the poor, achieving gender equity, sustainability of the interventions, and sustainable use of the natural resources. Ironically, although women share major workload the benefits of the watershed programs largely bypass them.

The purpose of the current study is to enhance 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 of 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.

Study Approach

In the state of Andhra Pradesh about 2500 micro-watersheds of 500 ha each are developed under various programs. For the purpose of this study, three watersheds are selected. Interestingly, in these watersheds the management is with CBOs and within which women have a significant role to play. The details of the selected watersheds are described in the Table 2. Out of the three case studies, Adarsha Watershed in Rangareddy and the Powerguda Watershed in Adilabad districts have been studied in detail for the process and the impacts as well as for identifying the drivers of the success (Wani *et al* 2003, Sreedevi *et al* 2004, and D’Silva *et al* 2004). The third watershed Janampet in Mahboobnagar district

Table 2. Profile of the case study watershed villages selected

	Adarsha watershed, Kothapally	Powerguda	Janampet
Proximity to city (<35 km)	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 Samakhyas 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 samakhyas commercial activities
Emphasis	Productivity enhancement	Service provider using NRS and technologies	Commercial activities for income generation
Implemented by	M.V. Foundation and READ	ITDA, Uttoor	Adarsha Women Welfare Society
Funded by	DPAP and ADB	IFAD	APRLP
Technical Support	ICRISAT	ICRISAT	ICRISAT

is managed by women self help groups' (SHGs) who have federated at Mandal level under the Mahila Samakhya. The federation runs a bank and also leverages developmental activities in the 17 villages of the mandal.

In all the three watersheds, focus group discussions using the common questionnaire were held with the women groups as well as men groups separately. The focus group discussions/interviews revolved focused on women related issues 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 between the men and women members. The data were collected, compiled and analyzed to study the relationship amongst the variables studied and the type of interventions as well as the approach adopted for watershed development. The results of the three case studies are described below:

Impact of watershed development in the three case study areas

The basic goal of watershed management in rain-fed systems is to reduce rural poverty and improve livelihood security while protecting or enhancing the sustainability of the environment and the agricultural resource base. Watershed development generates various types of benefits – tangible and non-tangible – some captured by individual farmers and some by the entire community or society as a whole. Watershed programs in

India so far have typically focused on natural resource conservation in the form of soil and rainwater conservation and to some extent afforestation on forestlands. Most activities being land-based, vulnerable sections such as landless and women generally get excluded. In fact, it was observed that watershed programmes increased the workload on women without the concomitant benefits in terms of social status, financial or decision making powers. The issues of gender equity, community participation, sustainability and efficient use of conserved natural resources have not been addressed adequately. If these issues are addressed, the impacts of watershed programs could be enhanced as observed in the three case studies reported here.

Watershed Development Approach

The results from meta analysis as well as the interlocking constraints faced by farm households prompted ICRISAT to use its research learnings of 25 years of strategic and on-farm development.

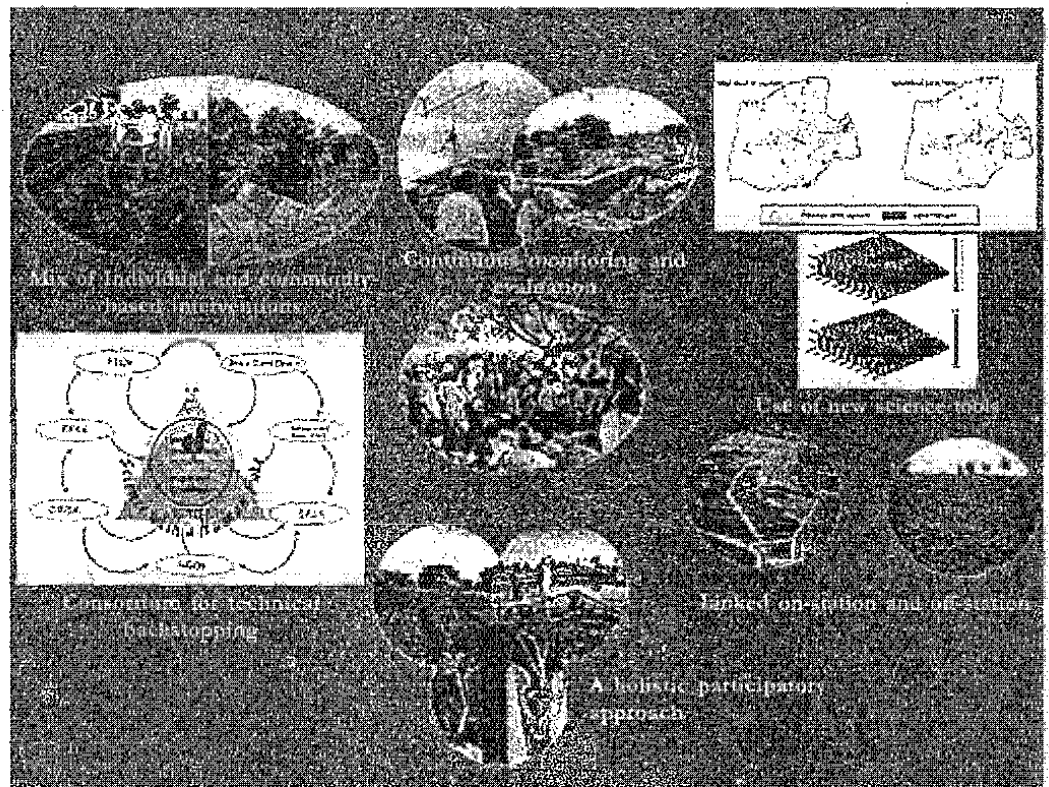


Figure 3. Farmers participatory consortium model for integrated watershed management.

ICRISAT-led community watershed espouses the Integrated Genetic Natural Resources Management (IGNRM) approach where activities are implemented at landscape level by the community (Wani *et al* 2003, Wani *et al* 2006). Research and development (R&D) interventions at landscape level are conducted at benchmark sites representing the different SAT agroecoregions. The entire process revolves around the four Es (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 group for knowledge management and sharing. Convergence allows integration and negotiation of ideas among actors (Figure 3) resulting in convergence of various programmes 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 are:

- 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 (Fig. 3);
- 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 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; and,
- Income-generating activities for landless and women through allied sector activities and rehabilitation of waste lands for improved livelihoods and protecting the environment.

Impacts

The use of new science tools (i.e. remote sensing, GIS, and simulation modeling) twinned with an understanding of the entire food production-utilization system (i.e. food quality and market) and genuine involvement of stakeholders, ICRISAT-led watersheds effected remarkable impacts to SAT resource-poor farm households.

Integrated watershed management deals with conservation and efficient use of rainwater, groundwater, land and other natural resources for increasing agricultural productivity and improving livelihoods. They also build up communities' resilience to shocks due to natural calamities such as drought and flooding as well as the climate variability due to global warming.

Water management is used as an entry point to increase cropping intensity, increase productivity through enhanced water use efficiency, and also to rehabilitate degraded lands

Table 3. Rainfall, runoff and soil loss from Adarsha Watershed, Kothapally, Ranga Reddy district, A. P., India, 1999-2004

Year	Rainfall (mm)	Runoff (mm)		Peak runoff rate (m ³ /s/ha)		Soil loss (t/ha)	
		Untreated	Treated	Untreated	Treated	Untreated	Treated
1999	584	16	*	0.013	*	*	*
2000	1161	118	65	0.235	0.230	4.17	1.46
2001	612	31	22	0.022	0.027	1.48	0.51
2002	464	13	Nil	0.011	Nil	0.18	Nil
2003	689	76	44	0.057	0.018	3.20	1.10
2004	667	126	39	0.072	0.014	3.53	0.53
2005	899	107	66	0.016	0.014	2.82	1.20

in the catchments with the aim of increasing productivity, enhancing biodiversity, increasing incomes and improving livelihoods. Such an approach demands integrated and holistic solutions from *seed to final produce* with involvement of various institutions and actors with diverse expertise such as from technical, social, financial, market and human resource development.

Adarsha watershed: *The Farmer-centric Experiment*

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.

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 successful examples.

Enhanced participation of the vulnerable groups like women and the landless through capacity building and networking was observed. The self-help groups (SHGs) common in the watershed villages of India and an improved initiative in China provided income and empowerment of women. The environmental clubs whose conceptualization is traced from Bundi watershed of Rajasthan, India inculcated environmental protection, sanitation and hygiene among children who are the important stakeholders in the sustainable development.

Building on social capital made a huge difference in collective action. A case in point is Kothapally watershed. Today, it is a prosperous village on the path of long-term sustainability and has become a beacon for science-led rural development. In 2001,

the average village income from agriculture, livestock and non-farming sources was Rs.35775 (US\$795) compared with the neighboring non-watershed village with Rs. 27990 (US\$622) (Fig. 4). 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 owning 5 tractors, 7 trucks and 30 auto rickshaws. People from the surrounding villages come to Kothapally for on-farm employment. Evidences from other watersheds suggest that with more training on livelihood and enterprise development, migration reduces substantially. Taking the cue, between 2000 and 2003, investments in new livelihood enterprises such as seed oil mill, tree nursery, and worm composting were made which returned increased average income by 77% in Powerguda, a tribal village in Andhra Pradesh.

In this model, 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.

The implementation of soil and water conservation activities resulted in reduced runoff and rise in the groundwater level: "The mean of 7 years runoff in treated sub watershed was 70% and in untreated sub watershed was 40% of seasonal rainfall. The mean of 7 years data reveals that about 44% of runoff and 69% of soil loss were reduced in the treated sub watershed compared to the untreated sub watershed. Significant reduction in peak runoff rate was observed in the treated sub watershed, thus checking the soil erosion (Table 3).

Due to additional groundwater recharge, about

200 ha in the rainy season and about 100 ha in post-rainy season are cultivated with different crops and cropping sequences. Adoption of improved practices like use of high-yielding cultivars and integrated nutrient and pest management by the farmers resulted in increased crop productivity and profitability. The productivity of maize increased by two and half fold under sole maize and four-fold under maize/pigeonpea intercropping system (Table 4).

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.

Powerguda watershed: Women show the way

In Powerguda, though the approach adopted was similar to the Adarsha watershed, the distinguishing factor was the implementation by the tribal, women self-help groups (SHGs), with access to the forest resources. In Adilabad

Table 4. Crop yields in Adarsha watershed Kothapally during 1999 -2005

Crop	1998 Baseline	Yield (kg ha ⁻¹)						
		1999	2000	2001	2002	2003	2004	2005
Sole maize	1500	3250	3750	3300	3480	3920	3420	3920
Intercropped maize (Traditional)	-	2700 700	2790 1600	2800 1600	3080 1800	3130 1950	2950 2025	3360 2275
Intercropped pigeonpea (Traditional)	190	640 200	940 180	800 -	720 -	950 -	680 -	925 -
Sole sorghum	1070	3050	3170	2600	2425	2290	2325	2250
Intercropped sorghum	-	1770	1940	2200	-	2110	1980	1960

The area under maize/pigeonpea and maize-chickpea has increased more than three-fold and two-fold respectively. Farmers could profit Rs. 16,510 and Rs. 19,460 from these two systems, respectively. The average household net income has increased by Rs. 15,400 within the watershed as compared to Rs. 12,700 outside the watershed area. Farmer income from crop production has doubled in 2001 compared to the 1998 levels. Many women have adopted vermicomposting as a micro-enterprise activity and contributed to the family income thus becoming distinct earning members.

To sum up, demand driven selection of the watershed, more participation by 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

district, it was observed that SHGs with the watershed programs had six-fold higher savings than those without such programs. The introduction of improved land management practices such as broad-bed and furrow and bullock-drawn tractors, along with high-yielding cultivars increased the agricultural productivity anywhere between 20 and 350%. Powerguda farmers, particularly 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).

A women SHG managed an oil extracting machine [worth Rs 375,000 provided by the Integrated Tribal Development Agency (ITDA)] to support income-generating activities in the community. Seeds of Pongamia, neem and other

trees are used to extract oil which soon became an important source of income. To ensure continuous supply of seeds, the SHG members planted about 8,500 Pongamia trees during 2002-03 and 10,000 in 2004. Further, since October 2003, Powerguda discovered a new income-generating activity in tree nurseries. The community decided to invest in a Pongamia nursery Rs 30,000 received from the World Bank as part of environmental service payment. For the first time, 147 tons of CO₂ - C was sold from India to the World Bank by tribal women SHG (D'Silva et al 2004).

Average family income increased by 77% 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 the villages is minimal. The watershed and agricultural development, complemented by other investments, are found to have provided adequate employment and income opportunities to the people to escape poverty and forced migration.

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 old village and other neighboring hamlets. The people, specially 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 salient, defining features of social capital in Powerguda.

Interestingly, in Powerguda, it is the women who pay men for the work done. Men are paid the

same wage as women, except for a few specialized tasks in which men excel. Men have accepted the role reversal that has come about. They admit women are better managers of money, more transparent in financial dealings, and more successful in getting new development work for the village. So long as there is sufficient work, and they are paid a decent wage, men seem unlikely to complain.

Powerguda is unique in that the women SHGs are the dominant institutions in the village. These SHGs have gone farther than thrift. They now deliver some of the services which previously were the responsibility of government agencies. For example, the village runs a Pongamia nursery with a capacity for 20,000 saplings. Also, the SHGs have replaced private contractors in implementing some of the public works. For example, local residents under the management of SHGs have built all the watershed structures in the village. These activities have helped to build the confidence of the SHG leadership while also increasing the coffers of the group. In the watershed contracts, there is an opportunity to save between 18% and 25% of the cost of the structures.

Janampet watershed: *Federating to benefit*

The Janampet watershed village is a step further than the Powerguda and Adarsha watersheds. With enabling government policies, the SHGs at the village, mandal, and district levels are federated to increase their bargaining power as also 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. At the mandal-level federation meetings, women of different castes and classes come together. This solidarity enables them to share their problems and seek help. Also, by standing guarantee to SHGs, the federations help the SHGs borrow money from financial institutions at lower interest rates. These loans are found particularly useful for value-added services such as running a highway

restaurant and micro-enterprises. The federation takes care of book keeping and training functions of SHGs. The Janampet SHG is also a member of the Mahila Samakhya Adarsha Women Welfare Society. The impact in terms of increasing the family incomes, building the social capital as well as trust amongst the women members from Janampet is superior to Powerguda or Adarsha watersheds.

Gender analysis of the case study watersheds

Results from the studies in all the case study villages over the period and the findings of the focus group discussions revealed that the IWMP approach adopted was different from the traditional watershed approach. In Adarsha watershed, Kothapally and Powerguda, it was an integrated approach with emphasis on productivity enhancement as well as agriculture/ NR 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 commercialisation over the Kothapally where collective action was mainly for enhancing the productivity of their lands with a limited opportunity for direct economic gain through other income generating activities. In Janampet, the approach for improving livelihoods was through commercial scale operations 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 to small group level constricting learning opportunities. Transaction costs were higher in terms of increased work load on the leadership.

The impact of the model/approach adopted was distinctively evident in the case study villages (Table 5). In terms of rights, the results revealed that Janampet 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 cases of women-headed households. The nature and the extent of collective action provided different exposure to the members. In Janampet, 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 members earned more money, the control of family financial resources rested with men. In Kothapally, the activities provided employment to women members mainly because of the type of the activity undertaken. In Powerguda and Janampet, the collective action of women created employment opportunities for men as well as women. Women's right to education still has a long way to go. In Kothapally, the education of boys and girls is distinctively same as in this village no child labour exists. Every school age child is in school where as in Powerguda or Janampet child labour exists. The social status of women in all the three study watersheds is found to be better than the normal watershed village. However, amongst the three watersheds Janampet women enjoyed higher social status in the society than the women in Kothapally and Powerguda. The nature and extent of collective action was also directly related with the awareness of the women members (Table 5). The women members in Janampet 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. 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 with agriculture were taken jointly by men and women. Men members did not resist the progressive measures

of women in all the case study watersheds although, in Janampet, there was some initial resistance by men.

In terms of workload on women, it was higher in Janampet than Kothapally and Powerguda. Looking at the extent of commercial activities undertaken by the women SHGs and the workload in Janampet is in order. However, 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 carrying out specific activities and paid them higher wages than women. Similarly in Janampet also the women members compensated their family labor by hiring additional labor from the market. The financial independence permitted women SHGs to workout alternative arrangements to tackle their workload. However, in all the three watersheds the wage differences between men and women labor existed; men were paid higher (Rs 50 per day) than women (Rs. 30 per day). In Janampet only women undertook marketing of agricultural produce where as in Powerguda and Kothapally men undertook this activity (Table 5).

The results of 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 5. In all the three watersheds, only women had 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 under taken. In all the three case studies the new watershed approach encompassing productivity enhancement and livelihoods approach had direct and positive impact on reducing the distress migration of men and women from the

villages. 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 a very capable leader, able to channelise the energies of women for the sustainable development of the village using NRs. In Kothapally the main driver of the growth and success was increased availability of water resources resulting in increased agricultural productivity and triggering the agriculture related allied activities such as vermicomposting. In Janampet, 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, 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 successful collective action. Table 6 describes the type of participation and the associated control from outside. Along with increased level of participation, the sustainability of the initiative also increases with the diminishing control from outside. Using this matrix of community participation in the collective action the women SHGs from the three watersheds were evaluated Figure 5, Janampet 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

Table 5. Analysis of the three case studies

Sl.No	Description	Powerguda	Janampet	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 fully 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	-
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

a. Limited scale for supplying vermicompost to farmers

b. + - Less, ++ - Moderate and +++ - Heavy

Source: Cheetham 2002

more collective action and explore the new opportunities to increase the income from the collective action.

Based on the three watershed case studies for achieving gender equity 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 can enable the members and leaders to act collectively and harness the benefits, efforts must be undertaken to achieve higher functional literacy for women. 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 the younger generation of girls in building up the social capital. The educational and nutritional needs of girls should consciously be addressed to promote a more equitable society for tomorrow. Considering the basic rule of collective action that under stress people

cooperate better and greed for higher personal benefits affects collective action there is need to harness the gender power through harmony in the watersheds at all levels starting from the family to watershed.

Conclusion

In conclusion, it is clear that mere presence of women in watershed committees is not enough for achieving welfare of women. New approaches such as productivity enhancement in developing community watersheds and targeted income-generating activities along with specific targeted activities such as drinking water availability, good energy source for cooking to reduce drudgery are needed. Further, empowerment of women is critically important for enhancing impact through enhanced collective action. For example, a tribal illiterate woman, Ms. Subhadrabai in Powerguda, with training and functional literacy could sell Carbon units to the World Bank with facilitation and help. The higher the commercialization of income generation activities, the better is the status and decision making powers that accrue to women in the family and village. For harnessing gender power, holistic livelihood approach in the community watershed programs is needed rather than traditional compartmental approach of rainwater harvesting and conservation.

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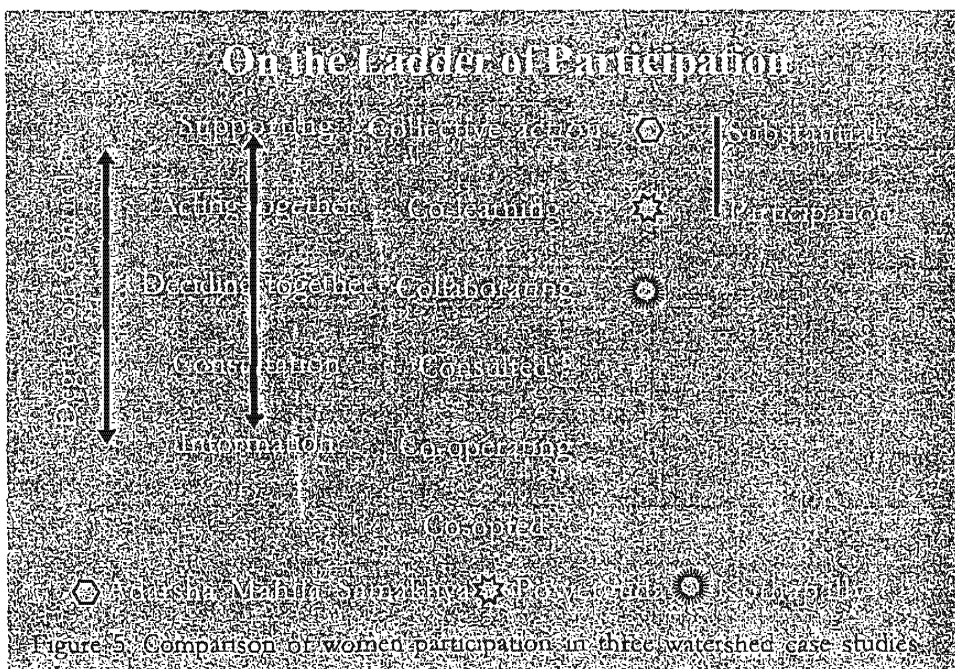


Figure 5. Comparison of women participation in three watershed case studies.

Ranga Reddy district, Andhra Pradesh, India; Integrated Tribal Development Agency (ITDA), Government of Andhra Pradesh; Jungubai Self-Help Group, Powerguda, Adilabad district, Andhra Pradesh, India; Andhra Pradesh Rural Livelihoods Programme (APRLP), Hyderabad, India; Adarsha Mahila Samakhya, Addakal, Mahabubnagar district, Andhra Pradesh, India for their help, logistical and technical support.

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