

Capitalization of Experiences: Water, Land and People in India

Watershed Development in India

In India, rainfed areas constitute about 65 percent of arable land that are characterized by low productivity and about 70 percent of the population in this region is dependent on agriculture. These areas were bypassed with respect to investment on infrastructure and technology intervention as compared to irrigated areas due to a general misperception that investments in these areas would be less productive (Joshi et al., 2004). But an analysis into the government investments in India by Fan and Hazell (1999) showed that rainfed areas (less favored areas) offer greater growth for an additional unit of investment apart from having a much larger impact on poverty alleviation as compared to irrigated areas. As growth opportunities in more favorable zones are exhausted, the need to improve the productivity of less favored regions (rainfed areas) has become more compelling on the grounds of equity, efficiency and sustainability (Shiferaw et al., 2003).

Millennium development goals (1996-2015) include eradication of extreme poverty and hunger while ensuring environmental sustainability. The growing scarcity and competition for water, however, stands as a major threat to future advances in poverty alleviation. Watershed development offers a unique approach to address these issues. A watershed is a hydrological unit that can serve as a physical-biological unit and as a socio-economic and socio-political unit for planning and implementing resource management activities (Springate-Baginski et al. 2002). Watershed

Watershed development (Turton et al. 1998) is fundamentally about the creation of new opportunities, **in an institutional sense** (through increased capacity of local communities to organise and protect their resource base and to draw on the services of external organisations) and **ecologically** (in term of increases in resource productivity and enhanced nutrient flows within the watershed).

development aims to ensure availability of drinking water, fuelwood and fodder and raise income and employment for farmers, landless laborers, women and other vulnerable groups through improvements in agricultural production and productivity in the areas with marginal lands that are prone to soil erosion and moisture stress (Hanumantha Rao, 2000). The watershed program envisages a great opportunity for improving the productivity, profitability and sustainability of dry farming areas through social mobilization.

Changes in watershed concept and guidelines

The watershed development focus evolved from *technically oriented* soil conservation and soil and water conservation and finally to *participatory* watershed development. It is now projected by different agencies as a comprehensive program for rural development that promotes rural livelihoods, especially of the poor and disadvantaged (World Bank, 2004).

A white paper on water in Gujarat (IRMA) suggests a new approach using river basin as a basic unit for overall planning for water resources development and management since the physical systems affecting the overall water availability include groundwater, surface water, base flows (surface water- groundwater interaction), catchment and return flows from irrigation and waste water flows into surface water and aquifers.

The watershed development guidelines and approaches have evolved since the early 1990s. Ministry of Rural Development (MoRD), Ministry of Environment and Forest (MoEF) and Ministry of Agriculture (MoA) each had their own guidelines. The efforts to have comprehensive guidelines resulted in the 1994 guidelines (Hanumantha Rao Committee under the MoRD), Hariyali guidelines (2004) and the recent Parthasarathy Committee report (2006).

Watershed Development guidelines of 1994

The Watershed Development guidelines of 1994 drawn up by the MoRD, govern around one-third of Government of India expenditure on microwatersheds and represent a major effort to implement the strengths of NGO approaches on a wider scale (Turton and Farrington, 1998). The guidelines allowed for devolution of decision-taking power at district and local levels, financial allocations made to local level organizations and their provisions for partnerships between government, NGOs and people's organizations.

Hariyali guidelines of 2003

There was a shift in focus from NGOs to Panchayat Raj Institutions (PRIs) for implementing watershed activities. The role of NGOs was limited and project funds for group formation and social mobilization were reduced from 10 to 5 percent. The most important change brought about by *Hariyali* is the overhaul of institutional structures. Watershed Associations and Committees were replaced with the Gram Sabha (at the village level) and the Gram Panchayat (at the Panchayat level) respectively (Vania and Taneja, 2004). But this shift faced the constraint of weak capacities of the PRIs in financial management systems and human resource capacities (World Bank).

Parthasarathy Committee report of 2006 (Neeranchal guidelines)

The Parthasarathy committee report laid down the recommendations for future watershed projects (called the Neeranchal guidelines) and has recently been put up in the public domain for discussion and approval by the Government of India.

The major recommendations of the committee regarding institutional aspects

Areas that need major improvements in Indian watershed development program (Parthasarathy committee report):

- Issues regarding conceptualization of program
- Participation, equity and transparency
- Appropriate end users of harvested water for sustainable livelihoods
- Institutional issues
- Capacity building
- Monitoring
- Research
- Public-private partnership
- Administrative problems

were the restoration of the role of Village Watershed Committee (VWC) and acceptance of Gram Sabha in place of watershed association as per the Hariyali guidelines. The VWC is expected to function as a committee of Gram Panchayat. It also recommended replacement of present management structure of the program with an All-India Authority, National Authority for Sustainable Development of Rainfed Areas (NASDORA).

The Neeranchal guidelines envisaged future watershed programs to have duration of 8 years with 3 phases: Preparatory phase (2 years), resource augmentation and institution building phase (4 years) and a sustainable livelihoods and productivity enhancement phase (2 years) with a cost outlay of Rs. 12,000 per hectare (maximal figure).

The crucial role of Panchayats in watershed development has been emphasized in all the recent watershed guidelines (Hariyali guidelines, 2003; Neeranchal guidelines, 2006). Strengthening of panchayat system through capacity building and leadership development was identified as a critical element for sustainability of watershed programs, although the primacy of VWCs is restored in the Neeranchal guidelines, with the panchayats having more of a governance than an implementation function.

The majority of the more successful projects share one or more of the following characteristics (Turton et al. 1998): (i) they often occur under specific preconditions which are not easily replicable; (ii) approaches to development are resource intensive and cannot easily be 'scaled up' to new areas; (iii) there is uncertainty over the long term institutional and ecological sustainability of rehabilitated watersheds.

Central and State governments, donors and NGOs have all been involved in implementing watershed programs with varying degrees of success. The experiences and lessons learnt during the processes provide tacit and implicit knowledge that would be valuable to future policy formulations and programs. Such experiences have been extensively documented in past by organizations such as DANIDA, World Bank, DFID, CISED etc. The common methods and approaches in these past activities included literature reviews, workshops, case studies based on baseline data collection, questionnaires, selected field visits etc.

Hanumantha Rao (2000) put in a nutshell the major issues still plaguing watershed programs and their sustainability that are also reflected in the Parthasarathy committee report. These are mainly:

1. Institutional building and leadership formationCapacity building through trainings at various levels
3. Expert and independent evaluation of the program
4. Convergence of agriculture development programs with watershed development
5. According high priority to rainfed farming in the country

The major recommendations pertaining to institutional design aspects that emerged from these studies were:

- To provide for institutional arrangements for equitable distribution of benefits
- Strengthening the capacities of local bodies in terms of implementing tasks and management of resources
- Proper legal status to the local bodies
- Formal allocation of user rights for sustainability of common property resources

Capitalization of Experiences: Water, Land and People

Background

The Swiss Agency for Development and Cooperation (SDC) / Intercooperation initiated a process of Capitalization of Experiences in Water, Land and People (CE-WLP) that brought together practitioners with experience in implementing and designing water sector projects as a 'Learning Group' for a process of collective learning over a period of one year (2005 - 2006). The Learning Group consisted of a core group of organizations and individuals involved in the water sector and an outer resource group.

The main objectives of CE-WLP were to access lessons across regions and evolve strategies to institutionalize and scale up success factors, understand the constraints and challenges in water management and generate knowledge that can contribute towards improved program design and policy dialogues. Sharing of knowledge and lessons learned among the learning group members formed the basis for the CE-WLP process. Apart from this, building alliances and networking was looked at as a positive offshoot of the whole process.

Tool to identify focus areas: Story telling method

Methodology adopted for sharing of experiences and identifying focus areas included a narrative **story telling process**. The story telling method involved thinking from individual experiences and telling about a time when important lessons or turning points occurred. The Learning Group members were encouraged to contribute their story about a time when they learned a valuable lesson about the importance of a good institutional set up for sustainable management of water resources.

Focus areas identified

Based on narrations of experiences in story telling and subsequent discussions, the focus areas under the broad subject of “**Institutional dimensions of water resource management**” were identified for further deepening of experiences as part of intermediate activities by the learning group members.

Focus areas identified:

1. Rules, regulations and systems for improved water resource management
2. Bridging information asymmetries to strengthen community organizations
3. Models for convergence, linkages and collaborations among institutions (for sustainability and upscaling)
4. Experiences of Watershed development for growth

All these focus areas would be looked through the “lens” of sustainability, equity (including gender equity) and poverty.

Sustainability

Joy et al (2004) succinctly summarize the necessary elements for sustainability of watershed activities. According to them there is a need to 1) promote sustainable productivity enhancement measures, 2) regulate biomass extraction rate, 3) plan watersheds on the basis of ridge to valley without taking a dogmatic position about it, 4) be aware of the balance while planning run-off suppression measures, 5) study and monitor unintended hydrological effects, 6) regulate groundwater extraction, 7) do integrated planning, prioritise and socially regulate water use, and 8) make applied water part of project design.

Equity

Inequality exists in various forms in the society. It could be unequal distribution of land, income, and assets, gender inequality or social inequality due to caste system or any other such delineation. It was found that by itself, watershed development accentuates inequity: favours those owning land and the lower reaches; as well as those who have the wherewithal to invest in wells and pumps (Joy et al. 2005). Gender disparities are also an issue in watershed programs. The contribution of rural women to household income is often regarded as secondary, despite the fact that women's income is often as important as men's and significant disparities exist even in the wages paid to men and women for agricultural labour (Pangare, 1998). On the positive side D'Souza (1998) avers that watershed development, if addressed in a gender focused and sensitive manner from the beginning, can provide space for women to capitalise on new opportunities. It calls for an inclusive and sustained effort that acknowledges the contribution of self-confident women to society.

Poverty

It is important to keep in mind the livelihood needs and priorities of the small and marginal farmers and landless poor in the watershed areas who do not directly benefit from land based interventions. According to Turton (2000), watershed development can provide new opportunities for households to diversify their livelihood strategies through the formation of self help groups for women, the landless and other marginal groups which can then undertake a number of activities ranging from traditional crafts (such as leaf plate making; weaving and basket making) to mushroom cultivation, forestry activities and so on.

Focus area 1: Rules, regulations and systems for improved water resource management

The terms “rights and “rules” are frequently used interchangeably in referring to uses made of natural resources. It should be recognized that “rights” are the products of “rules” and thus not equivalent to rules (Schlager and Ostrom, 1992). “Rights” refer to particular actions that are authorized (Ostrom 1976). “Rules” refer to the prescriptions that create authorizations.

Watershed systems involve resources that are frequently characterized by multiple uses and multiple users. The resources and the institutions for managing them span multiple scales requiring a need for forums for negotiation and mechanisms for conflict resolution among the different stakeholders. Rules for sharing the resources comprise property rights, which are often useful in resolving conflicts and creating incentives for investment for watershed development (Knox and Gupta, 2000).

Although many people equate property rights with “ownership” of a resource and the ability to do whatever one wants with it, it is more useful to think of bundles of rights that different parties may hold (Bruns and Meinzen-Dick, 2005). Property rights define differing relationships among persons depending on the bundles of rights that people hold (Schlager, 2005). These bundles of rights (refer box) are cumulative and mutually interlinked. Coordination of the exercise of property rights requires rules to guide behavior and commitment to following those rules. Commitment problems are reduced to the extent that it becomes difficult and costly to evade the rules (Schlager, 2005).

Schlager and Ostrom (1992) define five types of distinct rights that may be bundled together in a variety of ways:

- Access: the authority to enter a resource
- Withdrawal: the authority to remove units from a resource
- Management: the authority to make decisions about how the resource is to be used
- Exclusion: the authority to decide who may enter the resource
- Transfer: the authority to sell, lease, or bequeath the resource.

Common property resources such as pastureland, forests, groundwater, surface water such as tanks and ponds provide an array of social and economic benefits for a wide variety of users. But the institutional arrangements governing the use of these resources are ambiguous and sometimes lead to social conflicts and resource degradation. For example, groundwater is an open access resource and uncontrolled abstraction has led to depleting water tables and low quality water. Groundwater management has never been part of watershed development planning even though most of the model watersheds sustained the success in post-project period due to rules formed during pre-watershed activities that include restrictions or banning of bore wells (Parthasarathy committee report, 2006). Joy et al. (2004) suggest that watershed associations and gram sabhas should be enabled to enforce a consensus on social regulations on

groundwater abstraction such as restricting tapping of deep aquifers through borewells. It has been argued that access to water can be ensured only through delinking water rights from land rights along with clearly defined property rights on water (Soussan and Ratna Reddy, 2003). Most of the tanks (traditional water systems) have, over time, degraded into open access resources due to weak property relations. Encroachment, privatization and government appropriation of the tanks have been the main outcomes of the failure of local authority system to enforce the institutional arrangements under common property resources management regime. Watershed development encompasses most of these resources and management of these resources results in both positive and negative externalities that impacts different sections of the communities. It is important to understand that different sources of water cannot be viewed in isolation since groundwater, tank resources and watersheds are hydrologically interlinked and policies have to be conceptualized considering these aspects.

Communities devise rules that guide and constrain members' exercise of their shared property rights in relation to one another. Ideally, the rules should provide appropriate incentives for individuals to exercise their rights in ways that sustain the water system, that is, they should serve as incentive generators (Schlager, 2005). The successful model watersheds of Ralegan Siddhi and Hivre Bazar in Maharashtra that formed a code of conduct and rules for managing their resources were mainly based on the leadership and initiatives of Mr. Anne Hazare and Mr. Popatrao Pawar respectively. The compliance of the *rules* framed followed by the *rights* to access and withdrawal of common resources (pastures, groundwater, etc.) were propelled by these leaders who commanded trust and respect among their respective communities.

Rules and regulations at Hivre Bazar, Maharashtra

The 'panchasutri' or five principles collectively adopted in the gram sabha:

1. Restrictions on free grazing
2. Ban on tree felling
3. Ban on alcohol
4. Adoption of family planning
5. Voluntary labour

Apart from these:

- (a) Ban on borewells in agriculture
- (b) Ban on cultivation of water-intensive crops (except if cultivated using drip or sprinkler irrigation)

The rules and regulations evolved and their effective enforcement have implications on the strength of the institutions created during the project period and their sustainability during the post-project.

Under this broad topic, the CE-WLP members felt the need to focus on:

- Dynamism: The ability of institutions to change, adapt and grow with the project's development to meet the changing needs of communities (shift of focus from hardware to more management aspects, market linkages etc as the soil and water conservation measures start yielding results)

- Sustainability of the systems/institutions developed, especially in the post-project period
- Renewal of leadership and value systems in the collective to ensure principles of joint management, equity etc are followed in the post project period (existence of a participatory democratic culture rather than a hierarchical leadership).

Focus area 2: Bridging information asymmetries to strengthen community organizations

Although social aspects of watersheds are coming to the fore there are still questions to be answered on such technical aspects as: the use of machinery versus labour, and who decides which is the most appropriate when there is a need to provide employment, or to accept labour as a contribution to the community (DFID, 2003).

Many NGOs have over the last decade been specialising in 'capacity building' skills, which provides an ideal basis for informing people of their rights and encouraging them to act collectively to claim them. These efforts are complemented by the *Right to Information Act* that came into force in

2005, which imposes a positive duty on government to disseminate information to the people and extends the right for people to seek and receive information held by government bodies (Paul, 2006).

According to Joy et al. (2004), priority should be to choose technologies characterized by:

- Equal or comparable performance or function as compared to conventional technology
- Cost reduction
- Energy saving
- Higher component of local labour and local materials
- Amenability to modular design and modules that can be fabricated or manufactured in dispersed rural industries or work places and assembled at site
- Opportunities for development and improvement of local skills
- Scope for easy comprehension and acceptance by local communities

Most often, community involvement in watershed activities is dependent on the how well they understand the processes and techniques. This has a direct bearing on their participation in the planning, implementation and monitoring aspects of watershed development. It also prepares the platform for post-project period sustainability.

Based on discussions among the learning group members it was felt that some of the important steps towards community empowerment include:

- Demystification of information through constant update of information to the community
- Promoting transparency and developing a sense of right to information among the community
- Provision of technical skills and information

Focus area 3: Models for convergence, linkages and collaborations among institutions (for sustainability and upscaling)

Although substantial gains have been made due to various watershed programs, the ability to scale up successful experiences is clearly a major policy issue (Soussan and Ratna Reddy, 2003). To scale up and replicate successful watershed models, it becomes imperative for the various stakeholders (government, NGOs, communities) involved in the watershed development to collaborate and partner to pool their strengths and work towards the common goal of rural development and poverty alleviation.

Projects funded and implemented by government routinely marginalized participation for expediency, while at the other extreme some NGO-funded and implemented projects have been quite successful, particularly where they have had the strength to follow their own models, to hire staff who may not have been as well qualified technically but who were committed to the principles of participation, and to take time over the initial preparation and capacity-building work with the communities (Vania and Taneja, 2004).

Pre-conditions for scaling up watershed activities, based on the experiences of Indo-German Watershed Programs (Farrington and Lobo, 1997):

- Close engagement of stakeholders, and marshalling of political support at different levels and the creation of confluences of interest (and corresponding checks and balances) within and between levels
- Creation of a participatory local watershed planning methodology with a provision for appropriate capacity building and technical support to community-based organisations (CBOs)
- Existence of a framework for local-level collaboration among NGOs, CBOs and government departments, including the setting of preconditions for NGOs and CBOs to join the Program
- Creation of mechanisms which channel funds to local organisations with as few intermediate stages as possible
- Existence of a mechanism for promoting the approach across major political and administrative boundaries.

Many of the structural conflicts over power and resources are manifested in differences over work patterns, incentive structures, and work cultures between PRIs, NGOs and the state administration (Bauman, 1998). The Indo-German Watershed Development Project (IGWDP) strived to promote constructive approach of working between Government and NGOs by building on the goodwill and respect between NGOs and government agencies by facilitating meetings and dialogue to develop mutual understanding of strengths and how each might mobilise each others' support (Honore, 1997).

According to Turton et al. (1998), one of the main difficulties in operationalizing partnerships lies in identifying appropriate roles and responsibilities for the various stakeholders. For joint action approaches to be successful, there must be agreement on the respective roles of different partners and a shared vision, where partners agree on and share common goals and objectives. Several

generations SDC supported projects have focused on refining this over the years with a growing role and ownership of the project by the community based institutions.

The Indo-Swiss Participative Watershed Development Project – Karnataka (ISPWDK) experience provides evidence towards the importance of vibrant village-level organizations in supporting transparency and accountability within gram panchayats. From the perspective of gender, the experience of ISPWDK in promoting gender integration resulted in distinguishing gender integration from gender mainstreaming. It was felt that mainstreaming goes beyond integration and addresses gender at personal, inter-personal, organizational and community level. In the end, gender integration should lead to gender mainstreaming.

Lessons from ISPWDK regarding local-level institutions

- Transparent, demographic village based organizations (such as Village Development Societies (VDS) in ISPWDK) can play a complementary role to gram panchayats
- Through intensive capacity building:
 - Villagers can organize themselves to take transparent, accountable decisions over large sums of money and handle the same in implementing development activities
 - Gender and equity aspects can become embedded in village decision making process
- Sustainable development initiatives are better implemented through institutions with a sense of permanence, rather than those that are time-bound to project implementation periods.

The long-term perspective of the State Government Departments and NGOs should be the development of a watershed committee in which all main social economic groups will be represented and which will take care of watershed management activities beyond the project period.

For the CE-WLP, the main focus was on convergence of institutions in a system. This convergence spans the entire spectrum from government line departments to convergence between support agencies, community level institutions and convergence with the development agenda of the panchayats. Linkages between community based organizations and PRIs, collaborative approach in gender relations from the perspective of water resource management institutions are the other topics that came up for discussion under this focus area.

Focus area 4: Experiences of Watershed development for growth

The goal of watershed development should be sustainable productivity enhancement and, consequently, increased livelihood options and support (Joy et al. 2004). The review as part of the Parthasarathy committee report examined the crucial concern of sustaining the benefits of the program beyond the project period. The review revealed two key requirements for this: (a) Development of

sustainable livelihoods on the basis of the augmentation of the natural resource base through the program; and (b) development of people's institutions that would provide leadership to voice interests of the area and ensuring transparency, accountability and performance of state institutions.

There is a need to move from water and soil conservation measures alone to land and water management that includes production process and that is linked to livelihood development opportunities for specific target groups (Soussan and Ratna Reddy, 2003). In rainfed areas significant improvement in income from livelihoods would come not only from enhancement of productivity but also through collective marketing of produce and the watershed program provides a unique opportunity to institutionalize the concept of collective marketing since developmental efforts are carried over a concentrated area, community is organized and common fund available with them as part of project intervention (Sanghi et al. 2005).

Livestock is an important source of income and employment for millions of landless and small landholders particularly in the less favored environments and in general, livestock wealth is more equitably distributed than land (Birthal et al. 2002). Therefore growth in livestock production can be expected to reduce interpersonal and interregional inequities, and alleviate poverty. Livestock production not only serves the purpose of augmenting income, employment, and food security, but also acts as a storehouse of capital and an insurance against crop shocks (Parthasarathy Rao and Birthal, 2002). The Parthasarathy committee report, therefore, rightly recommends that improving the productivity of livestock and other land-based livelihoods such as fisheries should be brought into the focus of watershed programs. CALPI (2005), puts livestock at the core of watershed development since livestock concerns three of its main components, namely, (i) natural resources management (livestock as natural resource); (ii) productivity enhancement (livestock as part of production system); and (iii) livelihood improvement (livestock enhance livelihoods of poor). At the same time, livestock associated environmental issues such as overgrazing and land degradation should also be considered in terms of maintaining right stock size, breeds, access to quality inputs and health services etc.

Integration of livestock as an active component of watershed program (CALPI, 2005)

- Integration of breeding, feeding and health measures into watershed programs
- Strategies to facilitate easy access to credit, providing grazing rights to the poor, developing CPRs and fixing norms for its sustainable use
- Improving access to knowledge, skills and information

Key constraint: Lack of coordination, synergy and convergence amongst different policies and departments are serious impediments for forging effective and efficient integration.

Conjunctive use of surface and groundwater is an important step towards improving water use efficiency. Water saving technologies such as drip (high cost to low cost) and sprinkler irrigation can go a

long way in enhancing water productivity. Improved crop practices such as System of Rice Intensification (SRI) can help reduce strain on limited water resources. Risk reducing techniques such as five percent technology (promoted by PRADAN) where a pit representing 5% of the total area of a farmer's land is dug at the most upstream spot of the plot to collect runoff water and store it to supply water to upland paddy during critical stages during dry spells.

The general focus for CE-WLP group corroborates with the above discussion. The group felt the need to move beyond conservation and towards growth-oriented development in a watershed program that has implications for post-project period sustainability. Even though conservation of soil and water is an important objective, it was felt that it is also important to focus on improving the productivity of the conserved resources and the scope of livelihood strategies to cope with uncertainties and associated risks.

Appendix: Some relevant lessons from various watershed programs

Karnataka Watershed Development Program (KWDP), DANIDA	World Bank	DFID
<p><i>Flexibility:</i> Policy framework for new pilot projects should allow the project to deviate from normal government department norms and standards.</p> <p><i>Participatory:</i> Community participation can be enhanced if the duties and responsibilities are sub-divided.</p> <p><i>Involvement of youth:</i> Local youth can provide very useful services if they are trained and given a chance.</p> <p><i>Gender:</i> Women can take lead and mobilize resources, but need support from their families.</p>	<p>Strengthen the link between watershed programs and water-based livelihoods including agriculture, horticulture and livestock.</p> <p>Likelihood of collective action and equitable distribution of watershed development benefits is more where there are innovative pro-poor resource use arrangements among different groups in communities based on <i>quid pro quo</i> whereby project implementation is contingent on advance agreement to share benefits of enhanced natural resource productivity.</p> <p>Building local organizational skills and facilitating negotiations among groups can support innovative local institutional arrangements for collective action.</p> <p>Supportive government policies in clear specification of common property rights to water could create a more supportive environment and encourage innovative local programs.</p> <p>Watershed programs need to be supported by robust monitoring and evaluation systems that can provide quantitative technical and socio-economic information for program and policy analyses.</p>	<p>Design projects to include convergence, build in withdrawal strategies from inception, set realistic time frames and incorporate learning from traditional systems into new ways of working.</p> <p>The involvement of, and need for Panchayati Raj Institutions (PRIs) should be incorporated into the exit strategies of a project's overall design.</p> <p>Incentives and accountability are required for coordination, and potential conflicts need to be identified so that relationships can be managed. It should be recognized that local-level initiatives will be able to develop and thrive only within an enabling policy environment.</p> <p>It is necessary to promote improved livelihood strategies for the marginalized and landless, and to shift project focus from watershed development to livelihood improvement.</p> <p>Increase emphasis on building the capacities of CBOs/SHGs/UGs to plan and manage development and maintain links with GO/PRI/markets/services.</p>

References

- Bauman P. 1998. Panchayati Raj and watershed management in India: Constraints and opportunities. *Working Paper 114*. Overseas Development Institute.
- Birthal PS, Joshi PK, Anjani Kumar. 2002. Assessment of research priorities for livestock sector in India. Policy paper 15. National Centre for Agricultural Economics and Policy Research (ICAR), New Delhi, India.
- Bruns BR and Ruth Meinzen-Dick. *Frameworks for Water Rights: An Overview of Institutional Options*. Water Rights Reform: Lessons for Institutional Design (Eds) Bryan Randolph Bruns, Claudia Ringler, and Ruth Meinzen-Dick. Pub. International Food Policy Research Institute. 2005.
- CALPI. 2005. Livestock Environment and Development in Watersheds, Intercooperation India Programme series 1, Intercooperation Delegation, Hyderabad, India. 28pp.
- D'Souza M. 1998. Watershed development - creating space for women. *AgRen Network Paper No. 88b*, ODI
- Fan S and Hazell P. 1999. Are returns to public investment lower in less-favored rural areas? An empirical analysis of India. Environment and Production Technology Division Discussion Paper no.43. International Food Policy Research Institute, Washington, D.C.
- Farrington J and Lobo C. 1997. Scaling up participatory watershed development in India: Lessons from the Indo-German watershed development program. *Natural Resource Perspectives* No. 17. Overseas Development Institute.
- Hanumantha Rao CH. 2000. Watershed Development in India: Recent experience and emerging Issues. *Economic and Political Weekly* (Nov. 4): 3943-3947
- Honore, G. 1997. Indo-German bilateral project 'watershed management'. Strategy and approach. GTZ, New Delhi.
- IRMA. 'White paper on water in Gujarat'. United Nations Children's Fund.
- Indo-Swiss Participative Watershed Development Project. 2006. Integrating gender in watershed development: Lessons of experience. ISPWDK Programme Series 2, Intercooperation Delegation, Hyderabad, India.

Indo-Swiss Participative Watershed Development Project. 2005. Empowering the people: Experience with village development societies in promoting local governance. ISPWDK Programme Series 1, Intercooperation Delegation, Hyderabad, India.

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.

Joy KJ and S Paranjape. 2004. Watershed development review: Issues and Prospects. Technical Report. Centre for Interdisciplinary Studies in Environment and Development (CISED), Bangalore.

Knox, Anna and Subodh Gupta, 2000. CAPRI technical workshop on watershed management institutions: a summary paper, CAPRI working paper no. 8, CGIAR System-wide Program on Property Rights and Collective Action.

Ostrom V. 1976. John R. Commons's Foundations for Policy Analysis. *Journal of Economic Issues*. 10(4): 839-57.

Pangare VL. 1998. Gender issues in watershed development and management in India. *AgRen Network Paper No. 88a, ODI*

Parthasarathy Committee Report. From Hariyali to Neeranchal, Report of the Technical Committee on Watershed Programmes in India. Department of Land Resources, Ministry of Rural Development, Government of India. 2006.

Parthasarathy Rao and BIRTHAL PS. 2002. Strategic assessments and development pathways for agriculture in the semi-arid tropics. Policy Brief No 1. *Published by International Crops Research Institute for the Semi-Arid Tropics Patancheru 502 324, Andhra Pradesh*

Paul, Sohini. The right to information and panchayati raj institutions: Chattisgarh as a case study, ed. Charmaine Rodrigues, Commonwealth Human Rights Initiative, 2006.

Sanghi NK, Ravindra A, Ramachandrudu MV, Suresh K, Rahul Sen, Tucker SP, Narasimha Reddy NL, Ravindranath, Narendra Babu P, Lobo C, Samuel A, Satyanarayana KV, Reddy VK, Renuka Rani B, Sai Maheswari K. 2005. Upscaling of successful experiences in the mainstream watershed programme in India: Mechanisms, instruments and policy considerations. Pub. WDCU, WASSAN, PLF, WOTR and MANAGE.

Schlager E and Ostrom E. 1992. Property-Rights Regimes and Natural Resources: A Conceptual Analysis. *Land Economics*. 68(3): 249-62.

Schlager E. and E. Ostrom. 1992. Common property and natural resources: A conceptual analysis. *Land Economics* 68 (3): 249–252.

Schlager E. *Getting the Relationships Right in Water Property Rights*. Water Rights Reform: Lessons for Institutional Design (Eds) Bryan Randolph Bruns, Claudia Ringler, and Ruth Meinzen-Dick. Pub. International Food Policy Research Institute. 2005.

Shiferaw BA, Wani SP and Nageswara Rao GD. 2003. Irrigation investments and groundwater depletion in Indian semi-arid villages: The effect of alternative water pricing regimes. Working Paper Series no. 17. Patancheru 502 324, Andhra Pradesh, India: International Crops Research Institute for the Semi-Arid Tropics. 24 pp.

Soussan J and Ratna Reddy V. 2003. Andhra Pradesh: Evolving appropriate watershed policy. *Economic and Political Weekly*, January 4.

Turton C and Farrington J. 1998. Enhancing rural livelihoods through participatory watershed development in India. *Natural Resource Perspectives* No. 34. Overseas Development Institute.

Turton C. 2000. Enhancing livelihoods through participatory watershed development in India. Working Paper 131, Overseas Development Institute.

Turton, C., M. Warner and B. Groom. 1998. Scaling up participatory watershed development in India: A review of the literature, *AgRen Network Paper No. 86*

Vania F and Taneja B. *People, Policy, Participation: Making Watershed Management work in India*. Pub. International Institute for Environment and Development (IIED) and the Institute for Development Studies. 2004.

World Bank. 2004. 'Managing Watershed Externalities in India'. Agriculture and Rural Development Sector, South Asia Region.