



Strategic Assessments and Development Pathways for Agriculture in the Semi-Arid Tropics

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Collective Action for Integrated Watershed Management in Semi-Arid India: Strategic Policy and Institutional Options

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Introduction

Degradation of agroecosystems and declining sustainability are major concerns for agricultural development in many poor regions of the world where livelihoods depend on exploitation of natural resources. This is especially significant in the semi-arid areas, where water scarcity, frequent drought, soil degradation and other constraints lower agricultural productivity and the resilience of the system. Community-based integrated watershed management (IWM) is therefore being recognized as a suitable strategy for improving productivity and sustainable intensification of agriculture in drought-prone regions. This concept ties together the biophysical notion of a watershed as a hydrological unit with the social aspect of community and its institutions for sustainable management of land, water and other resources.

India is one of the countries that has accorded high priority to IWM as a key strategy for poverty reduction and improved natural resource use in drought-prone regions. Watershed development is seen as a suitable strategy to provide employment, income growth and sustained livelihood security in these regions. Since the early 1950s, India has invested more than Rs 170 billion (about \$ 4 billion) in IWM, covering more than 45 million ha (Table 1). In recent years annual expenditures exceed Rs 10 billion, reflecting the increasing commitment of the Indian government to the IWM program.

Table 1: Area covered and expenditure on watershed development in India over the Plan Periods.

Five Year Plan Period	Area covered (million ha)	Total Investments	
		Rs (million)	US\$ (million)
Up to 8 th Plan	18	48,419	1,126
During 9 th Plan period	16	54,062	1,257
During 10 th Plan (as of March 2005)	12	67,893	1,579
Total (as of March 2005)	46	170,374	3,962

Watersheds are ecologically and socially complex geographical units characterized by interdependence between overlapping resources and resource users (communities). Watershed resources (soil, water, trees, biodiversity, etc) are utilized by diverse groups of people often holding unequal use rights and entitlements. Social differentiation and unequal access often create conflict between those inhabiting and utilizing different components of the watershed resource (eg, upper, middle and lower reaches). Given this complex social and biophysical interdependence, collective action among diverse stakeholders is the key for effective and sustainable management of watersheds. This throws up a wide range of issues, such as institutional arrangements at different levels, social organization and property rights, which need careful scrutiny in order to sustain and improve the effectiveness of the program.

Global Theme on Institutions, Markets, Policy and Impacts:

To inform future R&D strategies for sustainable development pathways for the SAT

Based on review of experiences and the empirical evidence in implementing IWM programs in India, this brief highlights some of the remaining challenges and offers some insights on future strategies for strengthening institutions for collective action to enhance the poverty and environmental impacts of watershed programs in India.

Impact of watershed programs

The performance and impact of IWM interventions in India varies across watersheds. This may be attributed to agroclimatic conditions, type of technology and institutional arrangements of watershed implementation. Experience has shown that collective action is critical for the success of watershed programs. Impact studies also demonstrate its potential for improving livelihoods and alleviating poverty in rainfed areas. Cost-benefit ratios are found to be largely positive in medium rainfall (701-900 mm) and low-income regions (Joshi et al. 2005). In the drier areas, while water scarcity encourages collective harvesting, the extreme shortage of water and low rainfall patterns seem to diminish the returns from watershed interventions. In areas with high rainfall, the marginal net benefits from improved water and soil management seem to be quite modest, hence lowering economic incentives for collective action. However, in the medium rainfall rainfed areas where water shortages and vulnerabilities to drought exist, IWM interventions seem to generate higher payoffs. Based on current experiences, it is here in the medium rainfall region that payoffs seem to justify investment in appropriate technologies and institutional and organizational mechanisms to coordinate and regulate community resource use and management. Nevertheless, more work is needed to better understand the constraints and entry points for enhancing returns to IWM interventions in the other regions as well.

However, as large farmers control most of the water available for irrigation, especially in the low rainfall region, the impact of IWM interventions on poverty are, at best, limited (Fig.1) (Reddy et al. 2004). Women farmers, smallholders and marginal farmers are generally excluded from watershed benefits. Furthermore, several studies have questioned the

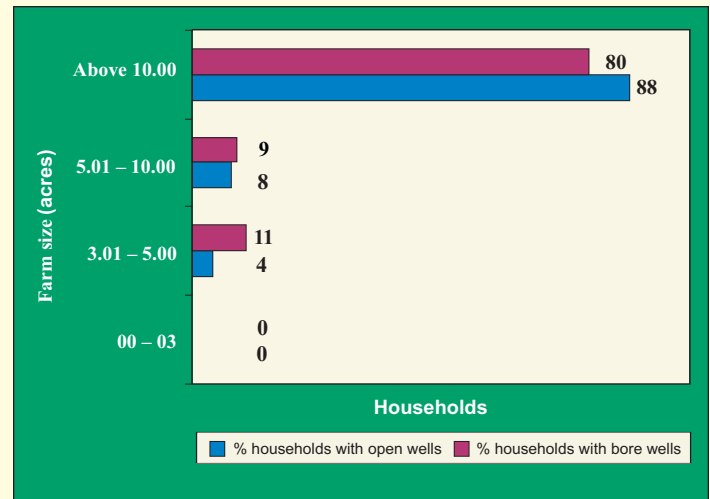


Figure 1: Distribution of wells across farm size classes.

long-term sustainability of the program in the absence of effective collective action and exit protocols that clearly define the role of communities and local institutions in managing IWM interventions once the projects phase out. Hence, the overall impact of the watershed program on poverty and environmental degradation has generally been fairly limited (Government of India 2001).

Improving the natural resource base (especially of water) is also essential for the promotion and success of complementary allied activities such as dairy or horticulture. Besides, success is critically linked to policy support in terms of financial and technical services at the community and household levels. This may also include strengthening of institutions for coordinating resource management, production and marketing functions at the community level, and policy and infrastructure support at the macro level. Major policy changes are imperative in order to correct the distortions at various levels. The policy and institutional factors that have contributed to this outcome are highlighted in the following sections.

Current policies and their shortcomings

Although there are exceptions, most ongoing watershed development programs have concentrated on physical interventions such as contour bunding and check dams that are intended to improve groundwater recharging and reduce land and soil degradation. These physical interventions are often not balanced against nonstructural measures or measures to improve the production process or open up new livelihood opportunities. These

measures include policy changes that bring about cropping pattern shifts and changes in livelihood strategies. Equity is seen as a major policy issue, with past watershed programs often failing to reach the poorest households. Equity is also identified as critical for the success of collective action.

The newly proposed watershed guidelines (*Neeranchal*) have tried to address the equity issue through institutionalizing the livelihoods dimension. However, as most of the proposed livelihood components are linked to irrigation water, the spread of livelihood benefits to marginal farmers will be limited, especially in areas that rely on groundwater. The equity safeguards provided in the guidelines are neither new nor effective in practice. The continued supply-side focus of the policies in the absence of demand management and clearly defined property rights in common resources are likely to perpetuate the inequities.

Furthermore, watershed development is not influenced by watershed policies alone. A range of other policies influence agriculture, water management and land management. Power tariff pricing (which influences groundwater exploitation), the guaranteed purchase of rice and wheat, and other protection measures greatly influence the structure of incentives for watershed management in rainfed areas. While some policies (like water pricing) strive to improve the economic efficiency of water, agricultural price policies indirectly promote inefficient use of water. For example, subsidized power tariffs for agriculture are leading to widespread depletion and inequitable distribution of the groundwater resources.

Collective action in watershed management

Several case studies have shown that community participation in watershed activities in India has been generally poor. Various factors spanning the biophysical conditions and institutional and policy environments have contributed to this outcome. The incentives for collective action seem to be lower when biophysical conditions are either too good or too bad. The potential for collective action seems to be higher under moderate biophysical conditions. Similarly, the effect of group size seems to follow

an inverted U-shape where effectiveness is highest with medium sized groups with shared objectives to facilitate coordination and communication. The role of heterogeneity in influencing collective action is highly contested. Collective action is more likely in a community with shared interests. Homogeneity in economic and social structure (eg, ethnicity) of the community generally facilitates collective action.

Distribution of program benefits is one of the most vital factors in determining watershed collective action. Equitable distribution of benefits, especially to the poor and marginal farmers, increases the incentive for cooperation. Participation in linked income-generating options like collective marketing could further improve incentives for watershed collective action. The Kenyan experiences with producer marketing groups (PMGs) provide a good example of the benefits of collective marketing. The PMGs are registered welfare societies operating at the community level. Their objectives include better access to markets, technologies and inputs at affordable prices, better prices for produce, and development of business skills. Recent studies have shown that compared to other buyers PMGs offer better prices (>22%) to smallholder farmers (Obare et al. 2006).

The absence of clearly defined property rights is at the root of the failure of participatory watershed development in majority of the cases. Property rights are clearly biased against the landless and the landed poor as far as the distribution of benefits is concerned. While collective action can lead to establishment or changes in the existing system of property rights, few communities have actually adopted new property rights systems that promote equitable and sustainable management of watershed resources.

Sustainable watershed management: Future strategy

While technological and institutional options for watershed development are well understood, scaling up of such options in an efficient and effective manner is proving to be the main bottleneck. Watershed management therefore calls for policy and institutional interventions that enhance collective action among the diverse resource users.

Markets and enterprise development: In current watershed development projects, collective action is more focused towards resource management and production and enhancement, while input and produce marketing get largely neglected. Extension of collective strategies to output marketing could lead to substantial benefits to smallholder and marginal farmers who now face high transaction cost in marketing their small marketable surplus. Providing institutional and infrastructure support to ease the information and marketing bottlenecks is critical for the success of watershed projects. There is a pressing need for innovative strategies like the cooperative marketing model of dairying (India) and PMGs (Kenya) that improve farm-gate prices. Such interventions have the potential to improve economic incentives for the poor and marginal groups to participate in collective action.

Policies and institutions: Future watershed policies need to reflect and influence the wider policy environment, especially policies related to agricultural development, agricultural input and output marketing, and other linked sectors like infrastructure and power. Appropriate policy support is needed to reduce the gap between producer and consumer prices and to enhance the distributional benefits of watershed projects.

Groundwater: The most pressing issue in relation to collective action is equitable access to common pool resources within watersheds, especially groundwater. Equitable and sustainable management of water can be ensured only through de-linking water rights from land rights. Legislation and enforcement of clearly defined rights for groundwater, however, require appropriate legal frameworks and effective institutional arrangements.

Beneficial conservation: Along with suitable policies and institutional arrangements, there is a need to develop pro-poor and innovative watershed interventions that reduce inequality and improve incomes for marginalized groups. These include: (a) improvement of small on-farm water storage structures; (b) improved livestock production; (c) promotion of marketable and high-value products (eg fruits, vegetables) using water-saving strategies; (d) production of biofuel crops (eg sweet sorghum, pongamia, jatropha); and (e) marketing of environmental services generated by community watershed programs. More work is needed to evaluate the economic benefits and investment payoffs to enhance the adoption and impact of these emerging strategies for stimulating beneficial conservation.

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