



Addressing water needs of the poor in watershed management

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PARTICIPATORY WATERSHED DEVELOPMENT has proved to be an attractive approach to rural development over recent decades (see for example, Farrington *et al.*, 1999; and Hinchcliffe *et al.*, 1999). Projects and programmes have been implemented across Latin America, Africa and South Asia, but it is perhaps in India where the approach has been most popular and enduring. Here, central government investment has been running at over US\$ 500 million a year.

This paper considers the impacts of participatory watershed development on rural water supplies for domestic use. Do watershed development projects lead to improved water resource availability and supply? Do they help to address the increasing competition for scarce water resources between domestic users, industry and irrigation? Or can they worsen the water supply situation in villages? It is focused on dryland India.

Several recent studies and papers have documented the impacts of watershed development efforts (Farrington *et al.* 1999; Kerr, *et al.* 1998). Many programmes in India, especially those implemented by government, have been widely criticised for a lack of impact (Rhoades, 1998; Malla Reddy, 2000). Weaknesses in participation, and inflexibility in choice of technology have been blamed in many cases and guidelines for watershed development have been improved. Where watershed development projects have achieved significant impacts, it is often the landed (and not the poor) who have benefited. Positive impacts of projects in dryland India include improved agricultural production, and development of local-level institutions (Batchelor *et al.* 2000). But less positive aspects reported are:

- capture of water resources by certain groups at the expense of the poor,
- the emphasis on development, rather than management, of water resources,
- planning at village-level that ignores upstream-downstream and inter-village issues, and
- watershed development publicity or propaganda that is often misleading as it suggests quick-fixes to water resource problems in semi-arid areas.

In order to address the lack of impacts on the poor, several donor-supported projects are now moving towards more livelihoods-focused watershed development projects. So called 'watershed-plus' projects include a wider range of activities to support non-land based income-generating activities such as basket weaving, pot-making, and brick-

making (Farrington & James, 2000). Improved rural water supplies, along with other infrastructure such as roads, electricity, communications and markets, are vital for such micro-enterprises. Since a lack of safe domestic water, especially during the summer season and droughts, is often the major concern of the rural poor and especially women, watershed development projects are being increasingly challenged to facilitate improved rural water supplies.

Few impact assessments have addressed in detail the impact of watershed development on rural water supplies. This is, perhaps, not surprising. Improving water supplies, for drinking and other purposes, has rarely been a stated objective of such projects and monitoring has not been put in place. Water supply (and sanitation) was not included in the revised guidelines. Where improved drinking water availability has been an aim, typically few activities have been programmed. Improvements were expected to be derived indirectly from increased groundwater recharge and raised water-tables, ignoring problems of insufficient delivery infrastructure and allocation of water between potential users.

Water resources and domestic supplies

There are many reasons for domestic water supply problems in rural India, including a lack of investment in sound water supply infrastructure and poor operation and maintenance. But competition for the resource itself is becoming more common. As populations increase and per capita demands rise, leading to perhaps a doubling in demand for domestic water over the next 20-30 years, competition and conflicts over water resources are going to get a lot worse unless radical steps are taken.

Drinking water supplies drawn from traditional wells and boreholes have been severely affected over recent decades by widespread over-abstraction of groundwater for irrigation. Both irrigated areas and the total amount of groundwater abstracted have increased dramatically, associated with policies to increase food production, subsidies and increased access to loans for farmers to sink wells and purchase pumps, and incentives such as free or cheap electricity. Under effectively open-access regimes, such policies have led to widespread declines in groundwater levels. In large parts of semi-arid India extraction is exceeding recharge, except during years with rainfall patterns that are conducive to high rates of recharge. The shift from traditional large-diameter dug wells for drinking water supply to deeper borewells has failed to provide sustainable sources. Many village water supplies now fail routinely

during the dry season, and they are increasingly vulnerable to periods of drought. Tankering of supplies is a costly emergency solution and unpopular with communities.

In specific areas, high levels of toxic elements such as arsenic and fluoride are a major problem with severe impacts on the health of communities.

Water, Households and Rural Livelihoods (WHIRL) project

The WHIRL project has been established by Indian, South African and UK partners to promote access of the poor to sustainable water supplies for domestic and productive uses in areas of water scarcity. Action research is being carried out with communities, government departments and NGOs involved in watershed development (India) and catchment management (South Africa) projects to identify how water resources for rural water supply can be better protected and sustainably managed. Guidelines for rural water supply and watershed development/catchment management are being developed. Further details about the project can be found at <http://www.nri.org/WSS-IWRM/>

Pollution of surface- and ground- waters is also a major concern.

Increasingly unable to develop local groundwater resources for drinking water supplies, district government and state development agencies have sought large-scale engineering solutions to harness surface water resources. Large dams, water treatment works and extensive pipeline networks have been given priority – each one often serving hundreds of villages. However many disadvantages associated with this approach have emerged, and schemes can seldom be sustained at desired levels of service. Regional piped water supply schemes have suffered from poor and unreliable infrastructure, and as responsibilities are decentralised, high operation and maintenance costs are a major burden (e.g. DFID-supported schemes in north-western Maharashtra). Local solutions are now increasingly being sought to manage water resources better, address water quality issues and secure sustainable resources for consumptive (drinking, washing etc.) and productive use (backyard irrigation, watering livestock etc.) at lower cost.

Watershed development is consequently attracting interest and support from the rural water supply sector, and elements have been incorporated (as source protection measures) in new sector policies and projects (Tripathi & Kumar, 2000).

The impacts of watershed development

The intended impacts of watershed development are, among others, to increase groundwater recharge and increase overall water resource availability. Soil and water conservation measures (especially bunds), drainage-line treat-

ments such as check-dams, and tree planting, aim to reduce runoff and increase percolation. However, there are a number of problems with this approach:

- less runoff can have negative impacts on downstream users, reducing tank inflows and affecting the viability of surface-water irrigation projects,
- improved resource availability is negated by increased water use for irrigation

The most fundamental problem is the often-false assumption that water problems are due to a lack of water resources at local level. Rather, the problems arise from the high levels of water use for irrigation (and inefficient use of irrigation water). Improving resource availability may lessen the competition for scarce water resources for a few years, but should not be expected to have a lasting long-term effect.

Watershed development projects may actually contribute to increased competition between water use for irrigation and domestic use, because extending the irrigated area is often an explicit objective or an unintended outcome. Lobo & Palghadmal (1999) report how watershed programmes focusing on land-based activities such as soil and water conservation, can in turn have huge impacts on water use through investment of income in new wells and pumps (e.g. number of wells up by 85%, electric pumps up by 527%, and the area irrigated up by 500%). The improved resource, cash from subsidies, enhanced returns from dryland agriculture, more organised groups, and direct promotion of irrigation all provide powerful incentives to irrigate new land - and returns from irrigated cropping are very attractive compared to dryland farming.

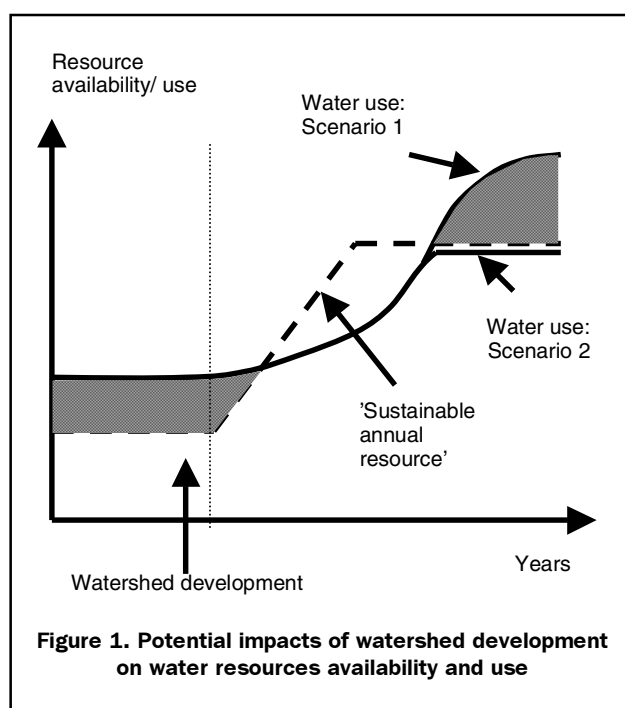


Figure 1. Potential impacts of watershed development on water resources availability and use

Figure 1 illustrates two possible scenarios resulting from a watershed development project. In both cases, implementation leads to increased local water resources due to enhanced groundwater recharge. In scenario 1, water use rises, perhaps due to increased irrigation and greater water use by rainfed crops and trees, to a level much greater than is sustainable. Over-abstraction (shaded area) might be expected to result in falling groundwater levels or more rapid exhaustion of the aquifer each year. In Scenario 2, water use increases but only to a level that matches the increased resource availability. The latter scenario could be an objective of watershed development projects but would require management interventions such as restrictions on water use for irrigation.

Some isolated watershed development projects do seek to promote better management of water resources through measures to restrict irrigated development, for example, rules prohibiting the cultivation of certain water-demanding crops like sugar cane. Such rules need to be supported by communities and backed up by regulatory powers, enforcement and sanctions.

Watershed development projects have had positive impacts on water supply in other ways. In a few cases, rural water supply has been an entry point activity (a small proportion of project funds spent on an initial activity to promote community involvement and participation with rapid results) through installation of a new borewell or handpump. Elsewhere, handpump maintenance has been improved by training. And in some cases, the presence of external agencies and development of community organisations has improved the ability of a community to leverage support from rural water supply departments. However, at present these remain isolated examples and don't address the problems relating to competition for scarce water resources.

Trends towards watershed management

It is increasingly recognised that watershed development projects must develop towards watershed management (Batchelor et al., 2000). To build upon the positive effects on rural water supply and to avoid or mitigate the negative effects, they need to tackle water resources management issues at the local level. Supporting legislation and intermediate-level institutions (basin, macro-watershed or district etc.) will also be essential towards this aim. The shifts underway in some watershed development projects (such as the KAWAD project in Karnataka) to look at resource management issues and opportunities at a macro-watershed scale, and to build decision-making upon detailed water resources audits, offer some of the solutions in this direction (Batchelor et al., 2000b; KAWAD, 2001).

Challenges in better integration of RWS

Of course there are enormous challenges in promoting more effective integration or co-ordination of rural water supply in watershed development projects (or vice versa).

Foremost are the institutional constraints arising from the existing separation of rural water supply, watershed development and irrigation within government structures. The need to move beyond supply augmentation measures to address demand management and water allocation issues is also challenging and controversial. Win-win solutions are unlikely to be found in most cases and improving rural water supplies will mean reduced irrigation water use by some farmers. However, on paper, it is government policy in India and most other countries to give priority to domestic water needs. Concepts such as a 'reserve' to meet human needs, catchment management agencies to promote equity in resource allocation, and demand management measures - as have been developed in South Africa - should be explored as possible ways of putting such policies into practice.

Conclusions

Watershed development programmes in India typically don't address water resources management or rural water supply needs. However, they can have significant impacts upon the availability of water resources available for rural water supply. On the one hand, watershed development projects increase the availability of groundwater at a local scale, while on the other, they frequently lead to greater irrigation water use and competition for a scarce resource.

Watershed development and rural water supply programmes talk a very similar language (emphasising participatory approaches, community management etc.) and they often propose similar activities (afforestation, soil and water conservation, check dams and percolation tanks etc.) but they don't work together or even in a co-ordinated fashion. This results in several missed opportunities. Watershed development projects could perhaps provide some of the elements required for successful local water management to address competition for scarce resources between irrigation water users and domestic water needs, such as effective local institutions and resource management rules. Without improvements in rural water supply, where access to water is one of the crucial factors in the livelihoods of poor people (affecting health and productive activities dependent upon a water source), watershed development projects cannot be expected to significantly improve the livelihoods of poor people.

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References

- Batchelor, C., Rama Mohan Rao, M., & Mukherjee, K. 2000. Watershed development - or should it be watershed management? Case study 12 for Land-Water Link-

- ages in Rural Watersheds Electronic Workshop, 18 September-27 October 2000, <http://www.fao.org/ag/agl/watershed/>.
- Batchelor, C.H., Rama Mohan Rao, M.S., & James, A.J. 2000b. Karnataka Watershed Development Project: Water Resources Audit. KAWAD Report 17, KAWAD Society, Bangalore.
- Farrington, J., Turton, C., & James, A.J. 1999. Participatory watershed development: challenges for the Twenty-First Century. OUP, New Delhi.
- Farrington, J. & James, A.J. 2000. Opportunities for strengthening livelihood diversification in low-income rural households through watershed rehabilitation. Paper presented at the International Conference on Land Resource Management for Food, Employment and Environmental Security, Soil Conservation Society of India, November 9 - 13, 2000, Vigyan Bhavan, New Delhi.
- Hinchcliffe, F., Thompson, J., Pretty, J., Guijt, I., & Shah, P. 1999. Fertile Ground: The Impacts of Participatory Watershed Management. IT Publications, London.
- KAWAD. 2001. A fine balance: managing Karnataka's scarce water resources. Karnataka Watershed Development Society, Bangalore.
- Kerr, J., Pangare, G., Lokur-Pangare, V., George, P.J., & Kolavalli, S. 1998. The role of watershed projects in developing rainfed agriculture in India. Study for the Indian Council for Agricultural Research. World Bank, Washington DC.
- Lobo, C., & Palghadmal, T. 1999. Kasare - A saga of people's faith: a case-study of participatory watershed management, pp 247-258 in Fertile ground: the impacts of participatory watershed management (Eds. Hinchcliffe, F., Thompson, J., Pretty, J., Guijt, I., & Shah, P.). IT Publications, London.
- Malla Reddy, Y.V. 2000. A participatory approach to watershed development programmes: understanding constraints and exploring solutions. *Waterlines*, 19(2), 13-15.
- Rhoades, R.E., 1998. Participatory watershed research and management: where the shadow falls. IIED Gatekeeper Series, IIED, London.
- Tripathi, S.K., & Kumar, A. 2000. Rural Water Supply Programme in India - Peoples participation in drinking water supply sector reforms: the emerging scenario. Rajiv Gandhi National Drinking Water Mission, New Delhi, India.
- WHIRL. 2001. Summary report of a collaborative workshop on 'Water Supply & Sanitation and Watershed Development: positive and negative interactions'. Andhra Pradesh, India, 5-14 May 2001, <http://www.nri.org/WSS-IWRM/>.
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