

SCALING UP PARTICIPATORY WATERSHED DEVELOPMENT IN INDIA: A REVIEW OF THE LITERATURE

Cathryn Turton with Michael Warner and Ben Groom

Abstract

In recent years watershed management has become the focal point of agricultural and rural development in rainfed areas of India. Central and State governments, donors and NGOs have all been involved in implementing watershed programmes with varying degrees of success. The majority of the more successful projects share one or more of the following characteristics: (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.

This paper discusses the physical, social and institutional context for watershed development. It also considers the relationship between microwatersheds and the wider institutional and policy environment. It highlights the need to prioritise the watersheds to be developed on the basis of socio-economic and biophysical criteria. It warns that in some cases watershed development may not be the most appropriate programme.

If approaches to microwatershed development are to be rapidly replicable then the preconditions for scaling up have to be identified and incorporated into the project design. Ways of working need to be defined which allow the necessary degree of participation for interventions to be planned and function adequately, but at the same time are rapidly replicable. This will entail the creation of new partnerships between central and state government, district administration, panchayati raj institutions, NGOs, line agencies and communities and implies fundamental changes in their respective roles and responsibilities.

Many donors and NGOs have been criticised for giving insufficient attention to replicability in their programmes; expansion is dependent on replication of a blueprint model in another area. Government programmes provide funds far in excess of donors or NGOs and represent a unique attempt to institutionalise participatory approaches to rural development. There is a unique opportunity for all agencies to work together to support improvements in the effectiveness and efficiency of such programmes.

Careful monitoring in the coming years will be critical to enable decisions to be made over the optimum allocation of resources in terms of maintaining a balance between expanding coverage, whilst at the same time ensuring that the development process remains equitable and sustainable.

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Acronyms

CPR	Common Property Resource
DRD	Department of Rural Development
DRDA	District Rural Development Agency
GO	Government Organisation
GoI	Government of India
IGWDP	Indo-German Watershed Development Programme
IWDP	Integrated Wasteland Development Programme
MoAC	Ministry of Agriculture and Cooperation
MoEF	Ministry of Environment and Forests
MoRAE	Ministry of Rural Areas and Employment
NABARD	National Bank for Reconstruction and Development
NGO	Non Government Organisation
NWDPPRA	National Watershed Development Programme for Rainfed Areas
ODI	Overseas Development Institute
PIA	Project Implementing Agency
SGD	State Government Department
SWC	Soil and Water Conservation
WC	Watershed Committee

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SCALING UP PARTICIPATORY WATERSHED DEVELOPMENT IN INDIA: A REVIEW OF THE LITERATURE

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1 INTRODUCTION

Where efforts are being made to enhance the sustainable productivity of natural resources, there is major potential for improvement in management of the interface between common pool resources (forests, grazing lands, water) and private agricultural resources (crops, livestock etc.). This paper addresses one particular response to this challenge—microwatershed development—which adopts an integrated approach to the development and management of natural resources. It examines the growing body of evidence relating to watershed development emerging from India and draws on three case studies commissioned by the Overseas Development Institute (ODI) under the programme (Farrington and Lobo, 1997; Sjöblom, 1997; Krishna, 1996). It focuses on the policy and institutional aspects of watershed approaches thereby seeking to complement recent studies which have concentrated on the implementation aspects of watershed projects (Kerr *et al*, forthcoming) and those focussing on the lessons learned by Non Government Organisations (NGOs) operating in this field (Pretty *et al*, 1995; Hinchcliffe, 1995).

The paper begins with an introduction to the concept of microwatersheds as a unit of development and highlights recent investments by the state and others in their rehabilitation. The recent interest in microwatershed development has generated a number of success stories which are characterised by the improved management of the interface between common pool and private agricultural resources and consequent improvements in rural livelihoods. The majority of these successes share one or more of the following characteristics:

- they often occur under specific preconditions which are not easily replicable;
- approaches to development are resource intensive and cannot easily be 'scaled up' to new areas;
- there is uncertainty over the long term institutional and ecological sustainability of rehabilitated watersheds.

The paper examines these issues in turn. Section three highlights some of the complexity of the interfaces between resource flows, property rights and communities within the watershed. It also considers the relationship between microwatersheds and the wider macro institutional and policy environment. Section four reviews recent experiences in developing multi-institutional partnerships in microwatershed development. Section five provides evidence on the impact of watershed development and examines issues relating to equity and institutional and ecological sustainability. The paper concludes with an assessment of the limitations of the watershed approach and provides suggestions on how success stories can be scaled up.

2 WATERSHED DEVELOPMENT IN INDIA

Approximately 170 million hectares in India are classified as degraded land, roughly half of which falls in undulating semi-arid areas where rainfed farming is practised. Growing efforts—by the state and NGOs—to reverse this decline are often based on the rehabilitation of microwatersheds. A watershed can be defined at various levels, at a macro-level (district or regional levels), at village level (hundreds or thousands of hectares), at farm level or even within the farm. The microwatershed concept aims to 'establish an enabling environment for the integrated use, regulation and treatment of water and land resources of a watershed based ecosystem to accomplish resource conservation and biomass production objectives' (Jensen *et al*, 1996).

Although a microwatershed may be a sensible planning unit from a biophysical perspective, many would argue strongly against the appropriateness of such a unit for rural development. Social institutions to promote cooperation—necessary for the protection and rehabilitation of private and common pool resources—are usually village-based. Often however biophysical and socio-political boundaries do not coincide. The majority of projects do not therefore strictly entail the development of "a watershed", rather they adopt an approach to rural development incorporating principles of the watershed approach.

Investment in microwatershed development

Over the last decade, the Government of India (GoI) has set aside substantial budgetary provisions for microwatershed rehabilitation and development. This initiative underpins a shift in agricultural policy which acknowledges the neglect of rainfed and common areas during the period of the 'green revolution' and accepts a link between the degradation of rainfed areas and the poverty of large numbers of people. There has been strong growth in both government and non-government institutional capacity to implement wasteland and watershed development projects. This capacity has been directed predominantly at microwatersheds (500-1,000ha). The number and scope of watershed development programmes continue to increase; through a range of schemes and programmes the GoI is investing over £300m per year into the rehabilitation of microwatersheds. Within semi-arid areas one may often find co-existing (but rarely interacting) programmes under the auspices of several different agencies including the Ministry of Agriculture

and Cooperation (MoAC), Ministry of Rural Areas and Employment (MoRAE) and the Ministry of Environment and Forests (MoEF).

The National Watershed Development Programme for Rainfed Areas (NWDPA) was formulated in 1990 and by 1994 had covered 2,554 microwatersheds. In 1993, the GoI constituted a technical committee headed by Dr Ch Hanumantha Rao to review these programmes. Based on the committee's recommendations a new set of guidelines were formulated by the MoRAE which came into effect on April 1, 1995 and now apply to all the Ministry's watershed projects. They envisage a 'bottom up' planning approach, working where possible through NGOs and with community participation as a central principle. The guidelines set up a norm of Rs4000¹ per hectare for each watershed of about 500 hectares.

Forest land within watersheds remain the sole responsibility of the MoEF. Since 1990, the MoEF has been officially committed to the regeneration of degraded forest lands in partnership with local communities through the Joint Forest Management policy initiative. Approaches to the rehabilitation of degraded forest land are however not based on the watershed approach.

A range of other government initiatives and incentives also have an influence on watershed development. Some serve a supporting role in improving the benefits to be derived from watershed resources and include sectoral policies on markets and prices, policies and legislation on land, resource and water rights and the reorientation of extension and research services in the agricultural, livestock, forestry and wildlife sectors.

Over the past decade, the States limitations in responding to the diverse and complex needs of the rural poor in semi-arid areas have been recognised. Agencies involved in watershed development are increasingly looking to partnerships with NGOs and the civil sector to increase the effectiveness and reach of its services. For instance, one of the functions of the Department of Wasteland Development within the MoRAE is to administer a grant-in-aid scheme, in which funds are allocated from central government to registered voluntary agencies specifically for wasteland and microwatershed development. The 1994 guidelines also paved the way for participation of public bodies such as NGOs, educational institutions, corporate houses or banks in the form of Project Implementing Agencies (PIAs), leading to a massive growth in the number of NGOs. Over 800 environmental NGOs and voluntary agency projects or programmes involving wasteland or watershed rehabilitation had been established in the last twenty years.

Finally, increasing support to watershed development is being extended by a number of international donors. The number of bilateral (including Sweden, the UK, the Netherlands, Germany, Switzerland and Denmark) and multilateral (World Bank and European Union) funded projects is projected to increase.

Objectives of microwatershed development

Watershed development has multiple objectives. The MoRAE guideline objectives include productive (optimum utilisation of the watershed's natural resources), social (employment generation and development of other economic resources in the village), ecological/environmental (easy and affordable solutions that build on indigenous knowledge) and equity (emphasis on improving the economic and social condition of the resource poor) (MoRAE, 1994). Given the scale of recent investment, questions over the extent to which these objectives are being met are critical. In particular, there is a need to know more about three key issues.

Baseline conditions and the watershed development process

The success of many watershed projects can be related to specific socio-economic and biophysical preconditions. Thus for example, successful natural resource rehabilitation in the case of Sukhomajri² was partly attributed to the proximity of markets, a small homogenous community, the proximity of the forest, well defined forest boundaries and committed leadership (Hobley and Shah, 1996). Recent research in Africa has also shed light on the socio-economic and biophysical contexts for natural resource rehabilitation. For instance, Tiffen *et al's* (1994) analysis of agricultural intensification processes in Machakos (Kenya) where farmers have terraced their farms and used soil and water conservation (SWC) techniques suggests that the following factors encourage farmers to adopt SWC technologies: (i) the evolution of land tenure from communal to individual forms; (ii) the existence of a considerable body of both indigenous and exogenous knowledge; (iii) a tradition of community organisation; (iv) favourable access to markets; and (v) remittances from migrants which can be invested in SWC technologies. This work has highlighted the fact that we not only need a better classification of watershed problems, but an understanding of the general changes in processes from which communities and support staff can evolve workable solutions. It is essential therefore to develop our understanding of the conditions under which success occurs; and how representative of the wider context are the settings where successful projects have been implemented.

Watershed approaches which are replicable and can be 'scaled up'

Traditionally, the State and NGOs have adopted contrasting approaches to watershed development. The NGO approach has been characterised by its small scale and high cost per unit area. The approach generally begins with the facilitation of local groups to design responses to simple problems, whilst introducing solidarity strengthening measures such as group savings and credit schemes. Only after the group has gained sufficient confidence does it venture into the more difficult area of land-based activities. That this approach has had demonstrable success on a local scale is not in question. However, this intensive NGO approach is effective only across small geographic areas as resources are rarely present to enable 'scaling-up' to any significant extent (Hinchcliffe, 1995).

The challenge is to identify how sustainable benefits gained from watershed development can be scaled up to reach larger numbers of the rural poor. Scaling up presents unique challenges in comparison with other areas of agricultural development. Although the benefits of a new crop variety may spread rapidly via farmer to farmer dissemination of seed for example, watershed technologies do not generally travel independently of key, well-informed individual technicians. They also tend to be labour intensive and often require group action to reap the full benefits which may not be observable over the short term.

Institutional and ecological sustainability of watershed development

There is little evidence relating to the longer term sustainability of watershed development. Watershed development 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). The ultimate indicators of success are the ability of communities to take advantage of new opportunities and to what extent these benefits are sustained in the post project phase.

3 BASELINE CONDITIONS AND WATERSHED DEVELOPMENT

A review of literature suggests that while there are certain threads which run through most watershed development programmes, the end result in any particular community is highly site specific and depends on various factors. These include the physical characteristics of the watershed and technical choices regarding resource development, the nature of property rights and the social structure and organisation of the community. At a macro-level, the policy, institutional and economic environment play a critical role in supporting or undermining the watershed development process.

Physical characteristics of the watershed and technical choices

There is surprisingly little discussion in the literature of the physical and environmental conditions where watershed approaches work best³. There is likely to be considerable variation in the potential returns to investment in watershed development according to variation in rainfall (annual totals, intra- and inter-annual variation), hydrological characteristics of the watershed (including runoff, potential for groundwater recharge, water storage and conservation structures) and land use patterns.

Turton and Botterall (1997) suggest that the potential for development through the adoption of water-based technologies extends across a wide spectrum of

technical and institutional complexity. At the simpler end, in low rainfall environments, improvement may be limited to in-situ land management practices on individual fields. As rainfall increases, more complex technologies such as continuous bunding, drainage control and gully plugging—all of which require joint action—become feasible. Although the choice of potential alternatives expands as rainfall increases, watershed programmes are often implemented in villages where physical conditions are most challenging. The Indo-German Watershed Development Programme (IGWDP) in Maharashtra for example, chooses to work in villages in dry and drought prone areas having assured irrigation on no more than 20 per cent of net cultivated area and villages with notable erosion, land degradation, resource depletion or water scarcity problems (Farrington and Lobo, 1997).

A further factor affecting the impact of watershed development activities are the links between adjacent watersheds. Where watershed programmes are implemented on a cluster basis, benefits in hydrological terms are likely to be enhanced. The District Rural Development Agency (DRDA) in Jhabua, Madhya Pradesh applies the concept of 'milliwatersheds' of 50,000 ha, where 10 adjacent microwatersheds are developed simultaneously (Turton *et al*, 1998).

The devolution of natural resource management to the communities is an integral part of watershed development. The links between the nature of resources and the potential for local level management has been thoroughly explored for the case of common pool resources such as forests (Shepherd, 1996; Hobley and Shah, 1996; McKean, 1995; Uphoff, 1992; Chopra and Kadekodi, 1993; Ostrom, 1990; Lawry, 1989; Wade, 1987) and provides useful lessons for assessing the potential for participatory watershed development under certain biophysical conditions.

The more clearly defined the boundaries of the resource instance the better the chance of success. Unlike irrigation schemes or forests which tend to have easily recognisable physical boundaries, watershed limits are difficult to demarcate, making it difficult for local institutions to establish clear areas of jurisdiction. Chances of success are improved the more predictable the flow of benefits from the resource. Benefits resulting from watershed development are often deferred and/or accrue to those not directly involved. Investments in SWC for example do not give immediate results and benefits may accrue off site. Other factors to consider include the level of users' knowledge and the nature of links between common and private property resources: the greater the dependency on common pool resources (up to a limit) and the more vital the resources are for survival, successful development of resources is more likely.

Box 1 Fodder development in Sukhomajri

Sukhomajri village was originally targeted for development when it was identified as the major source of silt deposits in Sukna Lake in Chandigarh. The Central Soil and Water Research and Training Institute began discussions with villagers and the Haryana Forest Department. The government invested in water harvesting structures to provide irrigation and the villagers consented to restrict the use of the forest. After initial success, the concept of water sharing—around which the programme was designed—was eroded. Prior to 1982 when the project was revitalised, grass leases for forest department lands were auctioned and the contractors who won the bids leased them to villagers on a monthly or seasonal basis. They generally allowed a combination of grazing and harvesting in exchange for a fee and harvest continued to be low due to overgrazing. In 1982 however villagers were allowed to lease the fodder grass directly, significant increasing productivity. Grass leases have another major advantage over irrigation as a means of protecting the forest lands within the watershed, since with little additional investment the forest area under community protection increased dramatically. Prior to this, villagers interest had been restricted to the areas surrounding the catchment of water harvesting structures.

Source: Hobley and Shah (1996)

Resource development options

Traditionally, approaches to watershed development have focussed on land-based activities. The emphasis of projects is now shifting towards the integrated development of all watershed resources⁴.

Evidence suggests that activities should be planned around a more holistic understanding of rural livelihoods (Box 1). Sjöblom (1997) reports that a major contributing factor to the limited impact of the Swedish-funded PAHAL project was the fact that development efforts did not take into account the “ecological scope and limitations of local land-based livelihoods, but instead operated from a pre-determined and general development discourse about land and formulated measures accordingly. SWC activities—notably the construction of bunds—are the cornerstone of the project, however, research has shown that the lack of SWC measures is not perceived as an acute problem of land-based production”.

Activities designed to support livestock production systems have shown promising results. Ironically, many watershed projects play little explicit attention to water development. In many instances, water development is treated as an integrated part of SWC activities rather than an explicit objective in its own right. For instance, villagers in the PAHAL project place a high priority on water conservation—although the project claims to be focussing its efforts on soil conservation, most of these measures (like field bunding and soil traps) are seen by the people as water harvesting or conserving structures. People place far more importance on in-situ moisture retention than soil conservation (Sida, 1997). The project is now assisting in the construction of farm ponds and considering whether to initiate lift irrigation activities. Initial reluctance stems from the inexperience in water-based activities of line agencies involved in watershed development. Fears that the impact of water development activities will necessarily be inequitable—a concern stemming from experiences of (even small-scale) irrigation projects in the 1980s. However it is now increasingly accepted that unless rainwater conservation, harvesting, recycling and efficient use becomes the focal point of watershed management and development, it cannot create a significant impact on rainfed agriculture.

Links between private and common pool resources

Concern over the degraded state of common pool resources has been a driving force of watershed development efforts. The GoI quotes figures such as 170 million hectares of ‘degraded’ land to justify increased investment in wasteland and watershed development. It is hardly surprising therefore that measures to rehabilitate these areas have been a central feature of most watershed programmes. It is also increasingly clear however that insufficient thought has been paid to the nature of the relationship between common and private resources.

Table 1 Contribution of common pool resources to livelihoods

Collectively Managed Common Pool Resources						
Contribution	Community forests	Pasture/wasteland	Ponds/tanks	River	Watershed drainage	River/tank beds
Physical Products						
Food/fibre	T		T	T		
Fodder/fuel/timber	T	T	T			T
Water				T	T	
Manure/silt	T	T	T		T	T
Income and employment gains						
Off-season activities	T				T	T
Drought period sustenance	T	T				T
Additional crop activities			T	T		T
Additional animals	T	T				
Petty trading and handicrafts	T					T
Larger social/ecological gains						
Resource conservation	T	T				
Drainage/recharge ground water			T	T	T	
Sustainability of farming systems	T	T	T		T	T
Renewable resource supply	T	T	T			
Better micro-climate, environment	T	T		T	T	

Source: Jodha 1986; 1992

Common pool resources make a key contribution to rural livelihoods and are critical for sustainable agricultural production (Table 1).

The contribution of common pool resources is especially critical for the rural poor. Surveys conducted for the Karnataka Watershed Development Project show that three quarters of the rural poor in the watershed areas depend on common pool resources for fuel, fodder and some food (KAWAD, 1995).

The nature of the relationship between private and common pool resources, is dynamic and highly site specific. Where the link is strong, communities are likely to be more willing to invest time and resources in the rehabilitation of common resources. In such a context, common pool resources provide a focal activity around which communities can organise themselves. Where the relationship is weak or where the ratio of common pool to private resources is low, group action is likely to be more difficult to organise.

Questions over resource productivity and the precise role of common pool resources in the watershed production system add further complexity to the development process. It is commonly assumed that most village common lands in India are 'wastelands' and contribute little to the maintenance of rural livelihoods. In a study of pasture development projects in Rajasthan however, Kerr (1996) found that so-called undeveloped degraded common pastures were in fact quite productive when compared to managed and protected pastures. Although the result may not be representative (the study relates to 1991, a year of unusually high rainfall), the important point to note is that pastures may be more resilient than previously assumed. Activities aimed at the rehabilitation of apparently degraded wastelands must incorporate 'theories of new ecology' which emphasise dynamics and change in natural ecosystem processes. This will entail a more detailed understanding of people-environment relationships than was achieved in the traditional interpretations of the 'tragedy of the commons' scenario, around which many interventions are designed.

Property rights within watersheds

Theoretically, four basic 'property' models can be identified within a watershed: collective; open access; private; and state. In practice, the distinction between these categories is blurred and land tenure and natural resource property ownership can be more usefully viewed as a bundle of rights held by different people at different times with respect to different aspects of land and resources (Riddell *et al*, 1983). This makes local management of watershed resources a more complex challenge than is the case for other resources such as forests or irrigation systems. Watershed rehabilitation therefore involves the development of institutions⁵ to govern the use of private and common resources.

Local management of common pool resources involves the continuation, resurrection or devolution of local property rights, adherence to group-based rules and norms and in certain cases, the establishment of new institutions. These packages of property rights and management

arrangements we refer to as the common property resource (CPR) regime. Shanmugaratnam defines CPR regimes as having a "clearly defined physical boundary ... owned or controlled by an identifiable group with its individual members holding rights to use the resource by virtue of their membership of the group and in accordance with its rules and norms of appropriation and management of the resource" (1996). A critical distinction is made between the overlying property rights (who controls the land and/or the resource) and the attendant management arrangements (how the resource is managed and exploited and how conflicts are resolved). Though not mutually exclusive, all CPR regimes encapsulate these two basic domains (Uphoff, 1992; Oakerson, 1986; Ostrom, 1990). Property rights can be either formal or informal—and or resource tenure, for example, may be codified as legally enacted written law (*de jure* rights) or part of the unwritten but commonly understood rules of a particular society (*de facto* rights).

The status of common pool resources in India is changing. There are two dimensions to this change which need to be considered in the watershed development process: (i) the disappearance of indigenous institutions and their replacement with modern regimes; and (ii) a trend towards privatisation of common pool resources.

Indigenous management regimes are often characterised by relative abundance of resources and low population densities (Shepherd, 1996). Management is based around informal cooperation and moral or spiritual control, with collective action motivated by the status and the rewards of reciprocity. Management regimes intensify as resources become scarce and are vulnerable as external pressure increases, causing the regime to collapse and reducing CPRs to open access resources. This is the stage that the majority of watershed 'wastelands' are at in semi-arid areas in India.

A central feature of watershed development is the development of modern regimes, characterised by externally organised user groups, overseen by village committees, district authorities and/or local traditional heads. In many cases however, the new regimes fail to build on existing management arrangements. Furthermore, where new regimes assume that common pool resources belong to the watershed community as a whole, they may threaten the traditional users of the resource—raising questions about the equity of the rehabilitation process.

A second dimension of change is the privatisation—both *de facto* and *de jure*—of common pool resources. Commonly, the more wealthy bribe local officials to turn a blind eye to encroachment, whilst in other cases it is the desperate action of poor and landless households. Encroachments such as these are evident throughout rainfed areas and are legalised by state governments from time to time. In some watershed development programmes, granting of common pool resources to the landless and poor households (usually the most degraded land) is an integral part of the programme (pers. obs.). Many of the private land plantations developed under the Sida-funded PAHAL project are located on encroached land previously under the jurisdiction of the

revenue department. The project recognised that a fair amount of consensus prevails about the rights of these areas and proceeded with the plantations, despite the lack of legal entitlement (Sjöblom, 1997).

Whilst such trends cause some concern (Jodha, 1995), Kerr (1996) claims there are several reasons why the advantages of preserving common pool resources should not be overstated. For instance, it is evident that the livestock economy of India has changed greatly, perhaps in ways that make the commons less important. Crop residues, private cultivation of green fodder and purchased fodder and concentrates play an increasingly important part in livestock feeding systems and extensive management systems are on the decline (Turton *et al*, 1997).

Social characteristics

Increasingly microwatershed development efforts are targeted at the poorest societies in the most marginal areas. Priority for GoI programmes is given to watersheds with an acute shortage of drinking water, a preponderance of scheduled castes and tribes, a preponderance of wastelands and common lands and lower than average wages (MoRAE, 1994). Similarly the criteria used by IGWDP for the selection of watersheds include: (i) assured irrigation on no more than 20 per cent of net cultivated area; (ii) notable erosion, land degradation, resource depletion or water scarcity problems; and (iii) villages should be poorer than average with a high proportion of scheduled tribes and scheduled castes (Farrington and Lobo, 1997). This has important implications for the forms of intervention, which must recognise that the ability of communities to invest in land-based activities and the potential returns from such investments will remain limited.

Implicit in the participatory watershed approach is the idea that local level organisations effectively regulate the use of natural resources (usually) for subsistence in the community's collective interest. However, there is a growing perception that the practical implementation of what is termed community-based sustainable development often falls short of expectations (Leach *et al*, 1997). Communities are often dominated by local political elites prone to using their powers for patronage rather than broad based equitable change. Indeed, some argue that they are more susceptible to such forces than central authorities since they are more accessible to powerful pressure groups or individuals (Carney and Farrington, 1996). Inadequate attention to community tensions can lead to further replication and legitimisation of the hierarchies that exist between sub groups within a community.

Tensions between communities are also an important consideration. The adoption of village-based planning can miss existing inter-village arrangements relating to natural resource management. Although to some extent this can be overcome through the establishment of watershed committees (WCs), this does not address the issue of communities who utilise resources but do not live permanently within the watershed. For instance, clashes between local people and migrating shepherds are on the increase over the imposition of management regimes

incompatible with livestock systems (Kerr *et al*, 1996a). Communities complain that Rajasthani shepherds clog their highways and compete for scarce fodder resources. Evidence from other areas suggests that migrant households (both seasonal and occupational migrants) are often losers in development activities based on village-level institutions (pers. obs.).

The above findings have led some to conclude that watershed programmes are most likely to succeed in villages with homogenous communities and where differences in socio-economic status are small. Thus the IGWDP stipulates that there should not be wide disparities in the size of land holding in project villages and villages should "have shown a concern for resource conservation and have a long history of coming together for common causes" (Farrington and Lobo, 1997). Putnam (1993) argues that "working together is easier in a community blessed with substantial stock of social capital, defined as features of social organisation such as network, norms and trust that facilitate coordination and cooperation for mutual benefit". It is easy to see the importance of these functions in the context of watershed development.

Where norms and networks of civic engagement are lacking, the outlook for collective action looks bleak (North, 1990). In such cases, Ostrom (1990) stresses the importance of small and incremental steps through which knowledge is built up and shared. In those communities which have been burdened historically with ineffective and inefficient institutions, it may not be easy to shift to another path, suggesting that watershed development may not be an appropriate programme for all communities.

Relationships between watersheds and the external environment

Watershed development projects are as much affected by the external economic, political and institutional environment as by internal characteristics. Sustainability is dependent on identifying the relevant local institutional and technical response to particular economic and political contexts.

Policy and institutional environment

There have been significant changes in the options for local institutional development over the last five years. Recent legislation has increased the powers of the lowest level of India's structure of democratic government—the *gram panchayats*⁶. The current policy environment is therefore more favourable to the development of local user groups with rights to plan, manage and retain certain benefits. The new guidelines issued by the MoRAE for watershed development illustrate this trend particularly well (Turton *et al*, 1998). They embody an unprecedented devolution of decision-taking power to district and village level. This is backed up by financial allocations from central government to district level and then to village level organisations. They provide for the creation of partnerships through coordination among the technical departments of government, but also between government, NGOs and people's organisations.

Macro-economic policies

Microwatershed projects are not exempt from the wide ranging effects of macro-economic policy changes and distortions. It is the interplay of appropriate technologies, social infrastructure *and* economic incentives that govern the productivity and ultimately the sustainability, of watershed projects. The following section outlines in brief the principal types of macroeconomic interventions influencing the farmers' decisions.

Subsidisation of agricultural inputs such as pesticides, fertilisers and herbicides, (sometimes up to 70 per cent of world prices, (Conway and Barbier, 1990) has a distortionary effect on farmers' practices. Access to subsidised fertilisers may act as a disincentive to control soil erosion since it can artificially boost yields even on severely degraded soils (Barbier, 1988). Kerr *et al* (1996a) state that watershed development is threatened by the adoption of unsuitable technologies encouraged by subsidies. Subsidies in the form of wages for the construction of SWC technologies can leave a legacy of dependency once support is withdrawn. High subsidies for rural electricity encourage the use of electric pumps, leading to over-exploitation of newly created ground water resources in rehabilitated watersheds (pers. obs.).

Governments can affect the price of agricultural produce grown for export by imposing *export duties*, effectively buying the commodity from farmers at less than world prices. Taxes can change farmers' evaluation of worthwhile practices: "SWC practices ... based on high value perennials ... have less chance of succeeding if the returns to producers are reduced by export taxes" (Conway and Barbier, 1990).

In India, *pricing policies* are a key factor influencing farmers' decisions. The most important of these policies is the support prices for cereals such as wheat and rice, which encourage farmers to switch production away from traditional drought tolerant crops such as millet and sorghum into less water efficient crops such as rice. In many watersheds, gains arising from more efficient conservation of runoff water are often offset by greater demands for irrigation water for rice production (pers. obs.).

The *external terms of trade* can affect crop choice and participation and investment in SWC measures. Over-valued exchange rates can reduce the returns from exported crops and reduce incentives for long-term investment by farmers. The subsequent worsening

Table 2 Baseline conditions and watershed development

Watershed characteristics	Comments
Physical	
Clarity of boundaries	The more clearly defined the boundaries of the watershed the better the chance of success.
Resource flows and productivity	The more predictable the flow of benefits and the better the prospects of multiple yields in the short term, the greater the chances of success; activities should be planned to ensure benefits both in the short and long term.
Nature of dependency	The stronger the dependency between private and common pool resources the better the returns from watershed development.
Users' knowledge	The better the communities knowledge of resource dynamics within the watershed, the better chances of success.
Property rights	
Existing institutions	The stronger the existing institutions, the better the chances of success. New institutions must recognise and build on existing institutional and management arrangements for common pool resources.
<i>de facto</i> vs. <i>de jure</i>	New rules and institutions which take account of <i>de facto</i> ownership and access arrangements have a better chance of success.
Stage of evolution	The clearer the understanding of where property rights are situated along the state/common/private transition the better.
Community	
Size	The smaller the community the better the chances of success—group agreement is more likely to collapse as numbers increase, but tasks cannot be performed effectively once community size falls below a minimum threshold.
Relative power of sub-groups	The greater the better otherwise certain social groups are likely to be marginalised by community development initiatives.
History of collective action	The better developed the existing arrangements for discussion of common problems, the greater the chances of success.
Extent and nature of social capital	The greater the extent to which users are bound by mutual obligations and the more important social reputation is, the better the chances of success.
Relationship to adjacent communities	The stronger the links with neighbouring watersheds the better.
External environment	
Relationship between users and the State	The less the State can, or wishes to, undermine locally-based authorities and the less the State can enforce private property rights effectively, the better the chances of success.
Economic policies	The more supportive agricultural production policies are to dryland farmers the greater chance of success.
Links with external agencies	The better developed the links between watershed communities and line agencies, banks etc. the greater the prospects for sustainability.

internal terms of trade for agriculture (the terms of trade between agricultural and non-agricultural goods), due to a high degree of protection for non-agricultural sectors, leads to a reduction in the relative price of agricultural products. Barbier (1988) describes how an increase in the terms of trade for growing vegetables, combined with their high relative price compared to other crops (both attained by government import control policies), led to an increase in the production of vegetables in upland areas of Indonesia. This resulted in a corresponding disincentive to invest in SWC, since the long-term benefits of doing so were outweighed by the improving terms of trade and the short term gain.

One of the major constraints to the success of agricultural development and more specifically microwatershed development, is *high interest rates and a lack of credit facilities* for farmers. In general, small farmers turn to the informal lending market where interest rates of up to 60 per cent are charged (World Bank, 1987). Microwatershed projects make possible the introduction of new technologies—the use of which often requires a large initial investment—but the lack of credit facilities and the high interest rates of the informal sector act as a disincentive to medium and long-term investment. However, just as subsidies can undermine the sustainability of watershed projects when applied to technologies and wages, there is concern that subsidising credit schemes for particular projects may adversely affect their sustainability through directly altering economic viability.

Prioritising areas for watershed development

There is a need to understand more about how baseline conditions affect the process and outcome of microwatershed development. Table 2 draws together some of the underlying factors which contribute to a more efficient, equitable and sustainable development process.

Projects are beginning to build on these findings through the development of selection criteria for watershed projects. The Department for Rural Development (DRD) in Andhra Pradesh has developed a system for prioritising microwatersheds, awarding weightings to the following groups of criteria:

- biophysical variables such as rainfall, evapo-transpiration, vegetative cover, ground water potential;
- social variables such as scheduled caste or scheduled tribe population, literacy levels, agricultural labour;
- livestock related variables such as number of sheep, goats, cows and buffaloes and the status of fodder and pasture in the village;
- community amenities and socio-institutional variables such as drinking water, functioning of self-help groups and the presence of NGOs in the village.

Turton *et al* (1998)

4 SCALING UP WATERSHED DEVELOPMENT THROUGH NEW PARTNERSHIPS

This section examines the prospects for joint action in watershed development. It analyses approaches which have allowed primary stakeholders (the communities) to interact successfully with secondary stakeholder institutions (donors, the State, NGOs etc.) and questions whether the development of new partnerships will allow a significant scaling up of watershed development efforts.

Participatory watershed development

Participatory management has been defined as a process whereby “those with legitimate interests in a project both influence decisions which affect them and receive a proportion of any benefits which may accrue” (ODA, 1996). It is now widely accepted that if the productivity of natural resources is to be enhanced in a sustainable fashion, then those engaged in and affected by management of the resource—the communities—must participate in plans for its rehabilitation and management. Their participation will generate a stake in the process and enhance the prospects of both institutional and ecological sustainability. The substance of participation is however often ill defined and clarification is needed regarding what it is that people are participating in and who it is that is participating. Despite the ‘feel good’ factor associated with participation, it must be recognised that it is not a neutral concept and involves a set of political issues concerning who has decision making power and who has access to resources (Hoggarth and McGregor, 1997). Pimbert and Pretty (1997) provide a useful summary of the main forms of participation (Box 2).

NGO approaches have traditionally focussed on the lower end of the spectrum—concentrating on strengthening

Box 2 A typology of participation

Typology	Components of each type
<i>Passive participation</i>	People participate by being told what is going to happen or has already happened.
Participation in information giving	People participate by giving answers to questions posed by extractive researchers and project managers.
Participation by consultation	People participate by being consulted and external agencies listen to their views. External agencies define problems and solutions.
Participation for material resources	People participate by providing resources, for example labour in return for cash or food.
Functional participation	People participate by forming groups to meet predetermined objectives relating to the project, which can involve the development or promotion of externally initiated social organisation
Interactive participation	People participate in joint analysis, which leads to joint action plans and formation of new groups or strengthening of old ones.
Self-mobilisation	People participate by taking initiatives independent of external institutions to change systems.

rural people's capacity to articulate their requirements, form groups, plan for and undertake joint action and so on. However, a route which insists on long-term, face-to-face empowering approaches in individual villages, may achieve institutional sustainability at the cost of extremely slow spread (Farrington and Boyd, 1997). This approach contrasts with those adopted by some government departments and donors in which large amounts of funding are provided and area-wide adoption is an explicit programme objective. Participation has been limited to the provision of labour at worst and information giving or consultation at best. Consequently such projects have performed poorly with respect to long term sustainability (Jain, 1995). More recently, government programmes have increased the scope for participation in watershed planning and management (MoRAE, 1994). The fundamental question is: can participatory approaches to watershed development be scaled up to cover larger numbers of villages, or are they by their nature, resource intensive and therefore only possible on a small scale?

A participatory approach implies a major, but not exclusive role for local populations in exercising responsibilities and receiving benefits. It will involve partnerships with other interest groups at micro and macro levels, such as district line agencies, local political bodies, ministries of finance, policy makers etc. A key concern for microwatershed development is to identify approaches which ensure that the interface between communities, NGOs and the State is managed in a way which is most likely to enhance efficiency, effectiveness and accountability (Carney and Farrington, 1997).

Joint action

The main stakeholders in the watershed development process include government agencies, NGOs, the private and banking sectors, political institutions and communities.

Government not only provides services related to renewable natural resources but also much of the fabric necessary for the functioning of civil society (in the form of legal and administrative systems). Government responsibilities for watershed development remain dispersed across three ministries, with a consequent tendency to miss important ecosystem linkages and an inability to support an integrated approach to watershed development. An important step forward in overcoming this problem was made in 1994 when the MoRAE published its new guidelines for watershed development. These move away from sectoral funding and mutually exclusive targets for line departments. Under the new system, line departments can act as PIAs at the watershed level. They operate through their own multi-disciplinary teams, drawn from relevant line departments including forestry, agriculture, horticulture, livestock etc. The Project Director of the DRDA coordinates the programme, with the district collector acting as advisor and reviewer (Krishna, 1996).

An increasingly important dimension of any process of 'scaling-up' local level management is the demand it places

on the public sector (Lobo, 1996). As local communities gain awareness of their new rights and responsibilities in resource management, demands for legal, financial, technical and logistical support from the public sector increase. These increasing demands on the State are ironic given that one of the founding reasons for the decentralisation of natural resource management has been the inability of government departments to manage common pool resources due to insufficient human resources.

During the last decade, the role of NGOs in the development scenario in India has intensified. In the eighth five year plan, the Indian government explicitly stated that attempts would be made to involve NGOs as collaboration partners in various development programmes. The NGO sector is however characterised by great disparity both in terms of size, professional qualifications, geographical and sectoral areas of work and also by diversity in approaches, scales of financial support, networks and linkages (Honore, 1997). Increasingly watershed projects are beginning to develop criteria to assist in the selection of NGOs (Box 3).

Participatory watershed development also requires new channels for distributing funds to implementing agencies and communities. The banking sector therefore has a potentially important role to play, although it remains an area which is poorly exploited. IGWDP has gained some experience in this area (Farrington and Lobo, 1997). It distributes funds through the National Bank for Reconstruction and Development (NABARD) and identifies the following advantages of bypassing the usual disbursement channels:

- it creates central government interest in the programme;
- NABARD has an interest in raising the repayment rates it has achieved historically in rain-fed areas and so is committed to the programme;
- individual NGOs and Watershed Committees can receive funds channelled through NABARD

Box 3 Working with NGOs in the IGWDP in Maharashtra

Criteria for the selection of NGOs to support village organisations include:

- their reputation and history, the extent to which they have achieved rapport with organisations of the people and of government, their perspective on watershed development and their technical and managerial capability;
- the length of time they have been active in the area;
- demonstrated willingness (in the event of weak familiarity with watershed management) to undertake exposure visits elsewhere, to send village youth and others on specific training programmes, to prepare and implement a demonstration project of at least 100 ha;
- willingness to accompany village organisations through a capacity building programme and meet the qualifying criteria before undertaking full implementation.

The IGWDP decided not to work with some larger NGOs experienced in microwatershed rehabilitation, as consultations with them suggested they were likely to be predisposed against effective collaboration with government agencies, against improved technologies coming from outside the project and against rapid scaling up.

Source: Farrington and Lobo, 1997

without having to go through the complexities of registering for foreign exchange registration;

- several NABARD staff have technical qualifications in natural resource management and therefore command the respect of line agencies and NGOs;
- procedures developed through NABARD for the disbursal of foreign funds in this way will lend themselves to any subsequent disbursal of GoI funds.

Local political institutions are also becoming more powerful. In the past, many NGOs insisted on bypassing local political systems, claiming that domination of these bodies by the local male elites undermined their effectiveness as a development body (Runge, 1986). Many have argued that the new watershed institutions should, as far as possible, be democratic bodies composed of representatives of different socio-economic groups. As Campbell (1990) notes, "the arguments for increased community control of common property too often call for the complete restructuring of society ... [and] ... a wholesale change in the patterns of political life".

On the other hand, others have argued that new bodies, such as WCs, must have the support of local political institutions if they are to be successful. Decision-taking and action at the village level in the IGWDP for example, involves a combination of traditional authorities, political bodies and new agencies. The *gram sabha*—the gathering of all those within the village who have voting rights—has traditionally taken decisions on matters facing the village. Its role is to consider the watershed development plan and nominate a WC with adequate social representation. Without *panchayat* support, NGOs (as temporary bodies within the village) and newly formed bodies such as WCs are unlikely to succeed. Politicisation of watershed development activities is likely to increase in the coming years and many now argue that the way forward is to manage the process as best as possible.

Operationalising partnerships

One of the main difficulties lies in identifying appropriate roles and responsibilities for the various stakeholders. The problems of finding the appropriate institutional 'mix' has been noted for donor programmes in general (Cernea, 1988) and for watershed programmes in particular (Hobley and Shah, 1996; Berkes, 1989). The appropriate balance of power and responsibility will depend on preconditions such as the extent of conflict endemic within communities, the existence of entrepreneurial traditions and the effectiveness of government civil services and will be highly site specific (Uphoff, 1992). 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.

Partnerships between the concerned agencies need to be structured with each playing a role according to its comparative advantage. Governments for example can provide technical assistance and guidance, economic incentives (especially where resource use generates externalities or users are the poor), an enabling legal

framework with clear territorial rights, formal conflict resolution mechanisms and financial and technical support for decentralised monitoring. Communities contribute local ecological information, knowledge of economic and social conditions which enables them to devise well adapted rules and procedures, low cost customary conflict resolution mechanisms and self monitoring mechanisms.

The success of the IGWDP can in part be attributed to the fact that care was taken from the outset to ensure that each was allowed autonomy in their own sphere of competence, whilst maintaining joint responsibility for successful project management. Whilst IGWDP recognises the skills of NGOs in social mobilisation it also recognises their weaknesses in technical matters and emphasises the importance of introducing appropriate technical skills from outside.

Much of the literature on partnerships in natural resource management focuses on relationships between the State and NGOs (see for example Farrington and Bebbington, 1993) and is relevant to the field of watershed management. It highlights the frequent tensions between the working styles of GOs and NGOs. Some projects are beginning to develop guidelines to promote more constructive ways of working. The IGWDP for example has endeavoured to build 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). A set of guiding principles has evolved that encourage and enable state government departments (SGDs) and NGOs to relate their work to the expected end result and encourages them to develop a joint plan of action (Box 5).

Promoting closer institutional links

New institutional economics offers 'a set of tools to inform institutional design'. It starts from the idea that information is rarely complete and that individuals have different ideas of the way in which the world around them works (Harris *et al.*, 1995). The following concepts are useful in understanding why and how stakeholders cooperate in the watershed development process.

Box 4 NGOs as project implementing agencies

Krishna (1996), for instance, reports a conversation with a district collector who noted that the greater involvement of NGOs as PIAs has both advantages and its disadvantages. "Many of the PIAs have got into the act merely to create a base for themselves, as the only qualification required of them is to be registered for three years. Though we do take care to see that the right NGO or any other public body is selected for the PIA there are areas where there is no strong NGO presence and therefore we have little choice." From the other side, there is general dissatisfaction among the NGOs acting as PIAs with the attitude of the government machinery towards them. "We are often treated as sub contractors," says one vehemently, "the special strength of the NGOs is in their social base, but government officials expect us to also take responsibility for the implementation of the works in time and for auditing and submitting all the bills to the government".

Incentives

Put simply, an incentive is something that motivates a person to act. In practice, incentives are influenced by rules that affect how government, community, donor or other individuals are recruited, monitored and rewarded and by the values of individuals, user groups and local and macro institutions. Aumann (1976) argues that a prerequisite is a high level of common understanding amongst the participating institutions of each others incentive structures: “True participation means working together for a common vision—this will not be possible if incentives to mislead and deceive exist”.

Two recent studies of the MoRAE watershed programme have highlighted the shortcomings and inconsistencies in incentive and reward structures. Krishna (1996) reports that the success of the programme is hampered by structural rigidities and internal pressures of government machinery, with the performance of key officials measured in terms of the money received and spent. Turton *et al* (1998) highlight the confusion over lines of accountability, status and allowances for government officers seconded to the watershed programme.

Subsidies are one form of incentive operating at the community level. They are intended to simultaneously support improved land management and generate employment opportunities and commonly take the form of contribution to the labour cost of constructing SWC structures. For example in Dungapur, works on private land are subsidised to 75 per cent and many of the works are carried out on private land by owners in order to maximise benefits from labour wages (Sjöblom, 1997). Heavy subsidies are a component of virtually all agricultural and rural development projects in India. Rural development programmes everywhere find it difficult to operate without subsidies because communities act as though they are entitled to handouts, but not responsible for solving their own problems (Kerr *et al*, 1996a). In this way, using subsidies can undermine other objectives of

watershed programmes such as the development of local planning skills and developing community capacity in local level planning and to draw down the services of line agencies and external organisations. The key questions in relation to the use of subsidies remain unanswered—how much, for what, for whom and for how long?

Transaction costs and social capital

Watershed development is a complex process, involving a range of interest groups and distinct operations. Transaction cost theory⁷ addresses the ways in which information flow can be facilitated within such a complex process. To some extent, whether transaction costs are high (thus constraining effective joint action) or low, will depend upon the degree of trust that exists between local and macro institutions. Where government departments or large scale NGOs have constructed operating environments characterised by established reputations and participatory relationships, these institutions will not have to invest such a high proportion of their time in seeking information and building rapport with communities. To this end, NGOs often have an advantage over government departments, the latter frequently operating in environments where an impasse has been reached with local people over the management of local resources. The existence of trust serves to lower transaction costs and serves as a social lubricant. Trust is also developed within an institutional context and is furthered by the actions of societal norms, political organisations, regulation, professional standards and networks (Williamson, 1993).

We can begin to see that strong family and kinship connection may undermine the potential for a community to work together. If social capital is a resource available through social networks, the resources that some individuals claim come at the expense of others (Portes and Landolt,

Box 5 Guiding principles for successful partnerships

1. SGDs and NGOs will develop an annual joint plan of action and keep each other informed of progress
2. Programmes and activities should focus on the needs and problems of landless farmers
3. Development of self help groups with strong women's participation is expected to be a main activity of NGOs
4. Assets and infrastructure created by NGOs should be in the name of local institutions
5. Within a given watershed the NGO should begin its activities ahead of the SGD having a lead time for preparing the community
6. The activities must be based on the principles of sustainability, equity and social justice. Partner organisations must strike a balance between developing community resources and providing individual benefits.
7. The long term perspective of the SGDs 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.

Source: Honore, 1997

Box 6 Forms of social capital

- family and kinship connections—relating to the household, the extended family or the clan.
- wider social networks or associational life—relating to groups and organisations that link individuals to different family or kinship groups in common activities for different purposes.
- cross sectoral linkages—that link organisations belonging to different sectors of society (NGOs, government agencies, private firms) in the search for solutions to complex problems by combining different resources and different kinds of knowledge.
- political capital—constituted by the norms and networks that shape relations between civil society and the state. The informal institutional arrangements that may lead on the one hand to rent-seeking and exclusion and on the other to effective representation, accountability and participation.
- institutional and policy framework— the set of formal rules and norms (constitution, laws etc.) that regulate public life in a society.
- social norms and values— widely shared cultural beliefs and the effects these have on the functioning of the society as a whole.

Source: Harriss and De Renzio (1997)

1996). All too often ideas over scaling up social capital neglect considerations of power and the fact that consequences of organisation or of social capital can be negative for many members of society, especially those who are relatively powerless. Mosse (1996) reports that, even in tribal areas, villages are far from homogenous units. Social relationships are determined inter alia by inter-hamlet or inter-clan conflicts, related dependency, mortgage relations and the operations of brokers or guarantors for money lenders and land disputes. Village wide institutions are often dominated and sometimes manipulated by powerful leaders and apparent social homogeneity of villages conceal inequalities of power. Furthermore women frequently have a very limited role in the planning process.

5 SUSTAINABILITY OF WATERSHED DEVELOPMENT

The objectives of watershed programmes combine a range of targets which include:

- the generation of benefits (either through better management of existing resources and prevention of further degradation and/or through schemes to invest in improvement of the resource)—*the productivity objective*
- a fairer distribution of benefits from the resource and their spread to a wider group of people—*the equity objective*
- institutional and ecologically sustainable development at local and national levels—*the sustainability objective*.

Productivity

Given their relatively recent history and the challenges which watershed development programmes have set themselves, it is difficult to make a detailed assessment of the performance of watershed development programmes. It is perhaps not surprising that there have been few economic appraisals of completed projects due to their complex nature (Kerr *et al*, 1996b). A useful compilation of studies is found in the July-September 1991 issue of the Indian Journal of Agricultural Economics. They estimate overall returns to investments in watershed development to be generally high, with cost benefit ratios ranging from one to greater than two⁸. What is not clear however is who are the winners and losers in the development process?

Sharing the benefits—issues of equity

Evidence suggests that certain social groups have been consistently marginalised by community development initiatives (Hinchcliffe *et al*, 1995; Hoblely, 1992). Studies suggest that this is also true of watershed development projects. In a case study of MYRADA's project in Karnataka for example, Fernandez (1993) identifies four groups in particular who do not seem to benefit from watershed development; the landless, families in the upper levels of catchments, women and marginalised tribal groups.

Concerns over equity are perhaps most apparent where

development efforts focus on the rehabilitation of common pool resources. Drawing on experience with community involvement in forest management in Nepal and India, Hoblely and Shah (1996) observe that inequalities tend to be most acute at the front and back end of the process of building common pool resource institutions. During the early stages, when CPR regimes are first introduced, the poor are affected most adversely. Their greater dependence on what were previously *de facto* open access resources, means that constraining access during the necessary period of environmental recuperation has a disproportionate impact on the poor. At the other end of the process, as the CPR regime matures, the increased value of the resource frequently attracts local (and not so local) commercial and political interests which also rarely benefit the poor.

Where watershed development has the explicit objective of providing greater access for poorer groups, such a shift in power is bound to be contested by those who lose out. The sustainability of such efforts are therefore intricately linked to changes in local institutional and power structures.

The impact of watershed development efforts on women is also a key issue (see papers by Lokur Pangare and D'Souza in this mailing). Turton *et al* (1997) note that access restrictions imposed on common grazing areas encourage a shift to stall feeding systems. The main bulk of the work of collecting fodder for livestock is undertaken by women, who have to spend extra time cutting and carrying feeding materials.

Allsebrook (1996) notes that "scaling up ... tends to distance organisations further from the weakest members of society". It is therefore essential that agencies act to protect the interests of the poor and women. Although explicit efforts are often made to overcome their exclusion through community participatory techniques, the limited public airing of conflict which results is generally insufficient for achieving social consensus (Mosse, 1996). Mechanisms need to be identified which promote the interests of the disadvantaged and increase their access to resources.

Sustainability

Watershed development is fundamentally about the creation of new opportunities—both in an institutional sense (through an increased capacity of local communities to organise and protect their resource base and to draw on the services of external organisations) and ecologically (in terms of increases in resource productivity and nutrient flows within the watershed). The ultimate indicator of success is the ability of communities to take advantage of new opportunities and the extent to which benefits are sustained in the long-term.

Communities need to be able to call on adequate technical help and advice from elsewhere, at least until such a time as they feel confident in their abilities to manage the improvements they have adopted. Agricultural support programmes need to be strengthened and reoriented in order to maximise the benefits from other physical investment. As the benefits of SWC begin to show, the production possibility frontier is pushed outwards creating demand for new varieties, soil management technologies etc. which can

and should serve to stimulate long-term engagement with external agencies. In the IGWDP, farmers are expected to obtain loans or invest their own funds in downstream improvements such as dairy production, horticulture, wells and new crop varieties to take full advantage of the SWC measures (Farrington and Lobo, 1997).

Even where groups for joint action have been formed successfully over a period of years, they remain vulnerable to external 'shocks'. These include the emergence of political conflict within the group as members ally themselves differently to political parties in local elections or conflicts with other villages over management of the shared resources. To speculate that one third of groups formed with NGO support collapse within five years of NGO withdrawal may not be unreasonable.

It is becoming increasingly apparent that links between watershed institutions and local political structures are essential for sustaining the new institutions. There have been numerous deliberate attempts by political bodies to undermine watershed development activities (Mukherjee, pers. comm.). Watershed associations have become a hunting ground for political parties, partly as a result of the considerable funds at their disposal (Krishna, 1996). Sida (1997) noted the potential conflict arising as new leaders emerge in the villages and existing systems are challenged. In some villages, the watershed organisations are trying to influence the *panchayats* and other establishments that support development activities, pressuring them to explain the differences in wage rates and asking for more transparency in their way of working. They conclude that the distinction between the long term roles of the watershed organisation and the village *panchayat* warrant serious consideration by the project.

The assumption is that the village organisations promoted for planning and implementation of watershed activities will be capable of maintaining both on-going and new activities into the future. However NGOs—some with more than a decade of experience of watershed development through village organisations—have found that withdrawal after a fixed period can derail the process. Because of the importance of sustainability, planning for the graduation of the village, from a large degree of external dependence at the beginning of the project to a small amount at the end of four years, should start at the selection and planning stage. This should include a strategy to bring in the external agencies, government and private, whose increasing involvement will be needed as the project progresses. This process would enable the villagers to learn about these agencies, about what they have to offer in the way of help and advice and how to utilise that help and advice.

6 CONCLUSION

The success of participatory watershed development will be judged according to the extent to which improvements in productivity are both equitable and sustainable. The key question is whether the scaling up of participatory approaches, necessitating a move away from resource intensive approaches to the formation of new partnerships, undermines the extent to which this is achieved. Several conclusions can be drawn.

Rural livelihoods and watershed development

It is essential to warn against over optimistic expectations of watershed development programmes. Two issues are central. One is the question of whether even an improved natural resource base can provide adequate livelihoods for a growing rural population. It is clear that whilst watershed development can provide a strong contribution, it cannot be expected to be the sole source of livelihoods.

The second issue relates to the equitable distribution of benefits. Recent debates on the notions of communities have shed light on the challenges and potential pitfalls of community-based development programmes (Leach *et al*, 1997). The evidence suggests that to ensure even a moderate degree of equity requires high levels of social organisation and an ability to articulate their requirements among women and the poor, together with continuing vigilance to ensure that their rights are not overridden. With much time and effort, progress can be made towards meeting these conditions. However, it is clear that watershed rehabilitation, though a desirable (some would argue, *necessary*) condition for enhancing livelihoods in an equitable fashion, it is not a *sufficient* condition (Turton and Reddy, 1998).

Expectations therefore need to be more sober. Watershed rehabilitation cannot be a panacea for rural development. The programme is trying to revive community-based action so should be seen as a catalyst rather than directly tackling poverty alleviation. Other measures need to be introduced within a long-term strategic perspective to strengthen social organisation among the poor and women prior to watershed rehabilitation, to augment the funds generated by people during rehabilitation by 'matching' contributions from government and to link them to a wider range of economic and social activities. Careful thought needs to be given to what programs should supplement watershed activities to increase the likelihood of achieving equity, sustainability and productivity objectives. New concepts such as social capital can assist in furthering our understanding the complexities involved in community development. Research is needed on the different forms of capital that are most supportive to watershed development programmes and how social capital can be scaled up to levels at which it is politically and economically efficacious.

Institutionalising participation and partnerships

A recent report summed up the magnitude of the task facing watershed development, emphasising that 'the strategy of participation is as much an indicator of the successful implementation of the programme as the increase in production, groundwater recharge etc.' (Eswaran Committee, 1997). Operationalising the concept of participation brings many challenges to PIAs, district administration, *panchayati raj* institutions, line agencies and the communities themselves. It implies fundamental changes in the roles and responsibilities of those involved in watershed development. There are wide differences in the level of

staffing, skills, experience and commitment of all PIAs, as well as some systematic differences between government and NGOs in their mode of operation. There is therefore a need to make better use of the relative strengths of government and NGOs and provide better opportunities for government and NGOs to learn from each other.

Scaling up watershed development

If approaches to microwatershed development are to be rapidly replicable then the preconditions for scaling up have to be identified and incorporated into the design of projects. Several factors are important.

Baseline conditions

At this early stage in the watershed programme, it is essential to create 'successful and replicable watershed models', which can act as demonstrations to other communities, thereby giving momentum to the scaling up process. It is therefore essential to know more about the relationship between physical and socio-economic characteristics and the likely success of adopting a watershed development approach. A wide range of conditions may inhibit the ability of communities to respond to continued degradation and the identification of these underlying factors is crucial before decisions regarding investment in a specific watershed. Prioritisation of watersheds to be developed needs to be initiated, building on the criteria outlined in Section three. In some cases, watershed development may not be the most appropriate programme (either for social or biophysical reasons).

Forward planning

Ways of working need to be defined which allow the necessary degree of participation for interventions to be planned and function adequately, but at the same time are rapidly replicable. For several years before the start up of the IGWDP its architects were driven by one principal concern: that participatory watershed development should be replicable over large areas. To achieve this objective it is essential that projects share a vision beyond the immediate boundaries of the project and begin to develop and test mechanisms for eliciting participation, delivering funds etc. that can be replicated at low cost in other areas (Farrington and Lobo, 1997). Upscaling of individual success stories to large scale programs also calls for a perspective of macro-management which has to be rooted in and responsive to the micro level. Unless there is continuous cooperation between key sectors and actors such a process is bound to come unstuck.

Expansion pathways

Although many projects highlight the need to develop replicable approaches, the expansion pathways whereby these can be taken up are usually ill-defined. Different expansion pathways can be identified including: (i) geographical/sectoral expansion within the local area; and

(ii) replication of whole projects as 'blueprint models' in other areas.

In the IGWDP, nodes of approximately 1,000ha of watershed are used as a central demonstration for neighbouring villages and a potential training ground. In addition WCs are encouraged to register themselves as NGOs to obtain the funding support and serve as a type of farmer-to-farmer extension (Farrington and Lobo, 1997). On the other hand, Turton *et al* (1998) suggest that village selection should take into account the advantages of clustering microwatersheds. Jhabua for example, applies the concept of 'milliwatersheds' of 50,000 ha, whereby 10 adjacent microwatersheds are assigned to one PIA. This strategy has several advantages including increasing PIA operational efficiency and providing scope for mutual reinforcement among communities.

Many donors have been criticised for giving insufficient attention to replicability in their programmes. Expansion implies replication of a blueprint approach. Clearly, the benefits of working outside the government structures are substantial in terms of flexibility of project design and ease of implementation. The danger is that innovative approaches generated in this way are difficult to scale up, precisely because they do not adequately take into account the operational constraints faced by government. The guidelines of the MoRAE provide funds far in excess of that which any donor can provide and represent a unique attempt to institutionalise participatory approaches to rural development. Donor initiatives should therefore be designed primarily to support improvements in the effectiveness and efficiency of State and national government programmes and avoid creating parallel delivery systems.

In the foreseeable future the major challenge will be to strengthen the capacity of all stakeholders—communities, NGOs and the state—to implement programmes at a pace compatible with national development imperatives and the availability of funds. A period of consolidation is called for to allow implementation capacity to 'catch up' with the scale and vision of the watershed programme. It is perhaps too early to tell to what extent scaling up the process of watershed development achieves greater coverage at the expense of qualitative concerns. Careful monitoring in the coming years will be critical to enable decisions to be made over the optimum allocation of resources in terms of maintaining a balance between expanding coverage whilst at the same time ensuring that the development process remains equitable and sustainable.

ENDNOTES

- 1 \$1 equivalent to Rs43
- 2 The case of Sukhomajri is legendary amongst Indian environmentalists. For more details see Box 1.
- 3 Watershed programmes are being implemented across a wide range of environments. Even if we limit ourselves to semi-arid environments, we find huge variation in annual rainfall totals—ranging from less than 400 mm in Rajasthan to more than 1,400 mm in parts of Orissa.
- 4 Many projects also incorporate non-land based activities such as the development of cottage industries and the establishment of credit groups.
- 5 Institutions are the rules of the game of a society, or, more formally, the humanly devised constraints that structure human interaction. They are composed of formal rules (statute law, common law, regulations), informal constraints (conventions, norms of behaviour and self imposed modes of conduct) and the enforcement characteristics of both (North, 1995: 23).
- 6 The 74th constitutional amendment delegates increasing powers to locally elected bodies, such as the *gram panchayats* and *zilla panchayats*.
- 7 Transaction costs can be divided into the costs of searching and delivering information, bargaining and negotiating, the taking of decisions, policing and enforcement (Dahlman, 1979).
- 8 Such results may not be representative of the wider picture in general. Studies have only been conducted on a small number of, usually very well-managed, watersheds. There is no distinction made between the long and short term impacts and there is also little evidence to suggest that the benefits from projects are sustained.

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