

Gatekeeper 81

Participatory Watershed Research and Management: Where the Shadow Falls

Robert E. Rhoades

Between the idea
And the reality
Between the motion
And the act
Falls the Shadow

T.S. Elliot
The Hollow Men, 1925

Robert E. Rhoades is Professor of Anthropology and Programme Manager of SANREM's Andean Programme at the University of Georgia. He has worked more than thirty years in international development. His present research interests are in agricultural anthropology, mountain studies, and biodiversity. He can be contacted at Dept. of Anthropology, University of Georgia, Athens, Georgia, GA 30602-1619, USA. Tel: (706) 542-1042; Fax: (706) 542-3998; E-mail: rrhoades@arches.uga.edu.

Introduction

One of the most popular investments by development agencies and international donors in the post-Earth Summit years (1992-present) has been the funding and establishment of participatory watershed research and management projects. The appeal of this approach lies in a promise to satisfy Agenda 21's complex demands with a single coherent strategy of involving local stakeholders and communities at multiple scales and zones while addressing cross-ecosystem issues and interactions related to farming and natural resource conservation. Variants on this theme include community-based holistic research and development at the scales of landscape, catchment, river basin, or ecoregion.

In response to the US \$13 billion requested from committed governments between 1993-2000 (UNCED, 1992), a mushrooming of participatory watershed-type projects has taken place at national, international, and bilateral levels over the past decade. Enthusiasm for participatory watershed management is so high that virtually all major development organisations are promoting the approach in hundreds of communities found throughout North and South America, Asia, Africa, Europe and Australia. Watershed problems are universally recognised; projects are being implemented as enthusiastically in rich countries as poor ones. Agencies as diverse as the World Bank to the smallest local NGOs in developing countries are promoting the new paradigm. India, China, Philippines and Indonesia have large domestic programs aimed at watershed management. In Australia, Integrated Catchment Management (ICM) is being promoted as a strategic stakeholder-oriented approach for natural resource management (Queensland Government, 1991). In New Zealand,

the parallel framework is ISKM or Integrated Systems for Knowledge Management (Allen et al., 1995). In North America, participatory development is increasingly replacing the more conventional biophysical approaches to watershed management, e.g., the Kellogg-supported Ohio State University Killbuck catchment project (Grant et al., 1997) or the University of British Columbia's efforts in the Finger's Lakes area (Berkes and Gardener, 1997). These on-going field projects are generating a rather large volume of publications and conferences on the participatory watershed theme (FAO, 1986; Farrington and Lobo, 1997; Sharma and Krosschell, n.d.; Lal, in press; Farrington, et al. 1999).

Despite this flood of interest and outpouring of funds, however, strong evidence indicates that well-intentioned development agencies and specialists are venturing into unknown theoretical and management territory. The newness, complexity, and ambition of multi-purpose, multi-scale watershed approaches makes success elusive even in the best of circumstances. Project implementers have to manage an organisational complexity hitherto unheard of in their fields. In addition, co-learning methods and computer-based tools are needed to deal with plural stakeholders with conflicting goals operating at levels and time scales generally alien to most agricultural and natural resource scientists. Given a rather large audience of conventional critics who would prefer to return to the sectoral-commodity focus, adherents of the participatory watershed philosophy need to reflect seriously and continuously on how to make this innovative approach practical and effective. While the jury is still out, a few early evaluations of watershed projects indicate they are not yet living up to expectations. Some potentially innovative projects have slipped back into the business-as-usual top-down, sectoral, component approaches (e.g., hydrology without people, watershed models without local input) which pander to bureaucrats instead of addressing local people's needs.

This paper examines critically some of the central conceptual and operational issues for the purposes of recommending positive, practical steps for the future (see also Rhoades, in press). Four questions will be explored in the search for lessons learned and new directions gleaned from the now emerging literature on participatory watershed research and management.

1. What is the comparative advantage of combining participation and watersheds?
2. Is there evidence that the participatory watershed approach is viable?
3. Why are there 'landmines' along the road of participatory watershed management?
4. How can the participatory watershed initiative succeed?

Why Combine Watersheds And Participation?

The demands of Agenda 21-inspired projects reach beyond component research with individual farmers or users on privately controlled pieces of land. The goal is to balance production and conservation at many scales over both short and long-term planning horizons. The watershed unit is ideal for these ends since it designates a layered natural and social phenomenon (multi-scale, diverse user, complex resource) which is also readily appreciated by lay persons, policy makers, and funders. From a biophysical perspective, a focus on the hydrologically-defined watershed offers a reasonable compromise between the small units of farmers' fields and large units

such as ecoregions or biomes. By studying interactions in the hydrological system instead of component research on crops or specific resources, watershed scientists and planners broaden the analytical framework to encompass cross-ecosystem linkages, including upstream and downstream dynamics. Since water and land use have reciprocal effects they should not be treated as separate development issues. Land use is water-dependent and water quality and quantity are impacted by land use. The watershed also allows scientists clearly to delimit the study unit, making it easier to conduct input-output studies, decision-making and simulation models, and expert systems (El-Swaify and Yakowitz, 1997; Yaalon, 1994).

The problems of focussing on hydrologically-defined units in sustainable development projects are well documented (Jinapala et al., 1996). The assumption that a precisely defined geophysical unit also serves as a socio-political or economic unit for planning and management is clearly flawed. People do not live, or manage resources, simply by how surface water flows, although this can sometimes influence their decisions. Watersheds as closed human management units are external bureaucratic or researcher fantasies, not indigenous ones. Within, across, and beyond a typical watershed are layered and interpenetrating human boundaries such as ethnic groupings, political boundaries, religious grounds, preservation parks, or individual farms. Often, the function of a human community located along mountain ridges is to bridge two or more watersheds.

In the past, the tendency to give priority to the biophysical framework of watersheds justified a top-down planning approach. Watershed planning based on land capability, rather than on the capacities and needs of local people who live there, typically promoted activities which forced residents and communities to conform to a reality determined by outsiders. More often than not, this lack of fit between human and biophysical boundaries has caused tensions and antagonisms between local populations and outside watershed project managers (Datta and Virgo, 1998).

One solution to resolving the messy overlay of human activity and naturally defined watersheds is to combine watersheds with 'participation'; that is, full involvement of local populations in the identification of priority problems and potential solutions with teams of scientists, planners, and development specialists (Blackburn and Holland, 1998). The planning unit in this scenario becomes the human managed area, not the hydrological unit. Participation is thus billed as the antidote to the failure of centrally-controlled, externally-driven watershed projects with no local ownership (Farrington and Lobo, 1997; Kerr et al., 1996). By respecting local voices and tapping local knowledge in making decisions on research and management questions, more sustainable, locally-relevant management systems can presumably be designed and accepted (Hufschmidt, 1986).

Local people, however, are not the only 'key actors' in this new ambitious paradigm. It also requires involvement of NGOs, government agencies, universities, international bodies, and the private sector in a 'participatory brew'. The 1980s Farming Systems teams comprised of an anthropologist, economist, and biological scientist would today be seen as naive and inadequate in our new age of Big Science and Big Development (Schwitters, 1996). In today's successful project proposals, yesteryear's 'top down' language of government agents and NGOs transmitting information or regulations to land users has been replaced with phrases describing grassroots workers who promote a two-way flow of information between land users and relevant outsiders (e.g., researchers, planners, and policy makers). These actors (sometimes called 'stakeholders') are seen as critical for addressing the complex

problems and challenges in multiple purpose, multi-scale, temporal and diverse watershed contexts.

Does The Participatory Watershed Management Approach Work?

While the participatory watershed rationale is appealing to funding agencies and implementing bodies (it directly answers several chapters of Agenda 21), operationalising such projects under real field conditions is proving to be difficult. The gap between the project idea and the grounded reality is creating a great deal of soul-searching among practitioners who have to execute the work. Some sympathetic observers even suggest that the participatory approach has not delivered the goods and should be re-evaluated. A few critics of bottom-up development are starting to argue wistfully that the participatory rhetoric, like communism, was a noble dream but not very practical due to a naiveté about human nature. These severest of critics argue that we should consider a return to component research, or, at a minimum, watershed management should not be burdened with the noise of participation. In fact, all too often, unwieldy participatory watershed projects end up as conventional hydrology or landuse studies despite the up-front courtesy to 'people and participation' in the project justification.

The rationale for funding participatory approaches is to redress the sins of the top-down, heavily subsidized approaches of the past which alienated local populations and often contributed to further land and water degradation. But does it work any better than the top-down approach at the watershed or other multi-scale level? Unfortunately, the boom in participatory watershed projects is fairly recent and the first assessments are only now starting to be made available (see, however, Farrington and Lobo, 1997; Thompson and Guijt in press). Evidence of success or failure at this point is almost entirely anecdotal. To make the situation worse, the unrealistic expectations have been created by the 'true believers' in participatory watershed projects. Not only do they promise that their holistic, interdisciplinary, people-driven method will deliver rather immediate production results (typically demanded by donors) but they promise to conserve resources at community, regional, national, and global scales. This is, of course, just what Agenda 21 ordered. In the next few years, we should expect to see more empirical evaluations of the successes and failure of this new and ambitious approach. In the meantime, this paper is an attempt to alert the development and research communities to potential conceptual and implementation problems now emerging. Many of the observations here come from the author's own direct involvement in participatory watershed projects in Ecuador and the Philippines (Hargrove et al., in press) and through several consultancies and advisory roles to other projects and implementing agencies.

What are the Landmines Along the Participatory Watershed Road?

Two challenges are presently emerging in the new paradigm: conceptual and operational. Although theory and praxis criss-cross and overlay, they can be analytically separated for discussion. Eight conceptual and implementation symbolic 'landmines' will be discussed here, although the list of potential pitfalls is much longer. If these challenges are left unattended, they will surely provide cannon fodder to the critics who will argue that is just so much social science and ecological hoopla and buzz words anyway.

The Conceptual Landmines

****Landmine No. 1: Scale Confusion and Scale Wars**

Despite a large and thoughtful literature in geography and ecology on scale and hierarchy theory, designers and implementers of participatory watershed projects have seemingly read very little (Allen and Starr, 1982; Fox, 1992; Stone, 1972). A great deal of confusion in watershed research comes from different disciplines studying different scales without reference to their location in either the spatial or socio-demographic hierarchy. Physical scales are confused with human organisational scales and vice versa. Planners typically plan with the same confusion. Scaling down or up between levels and across sites seems crucial, but this exercise is rarely carried out either in the planning stage or during project implementation. A great deal of pushing and shoving has taken place in projects to get funds and resources focussed on whatever scale level is comfortable to each of the diverse stakeholders. Reductionist agricultural research (e.g., agronomist and his plot) operates on very fine spatial scales and for short time periods (an annual cycle) while landscape ecologists fix on broader areas involving complexes of plant and animal communities. Economists may look at regional markets while the NGO fixates on the community since this is their organising scale. Local people have their own political scales as well (class, gender, ethnicity, etc.). Provincial governors insist on the province, the district agricultural officer on the planning district, while the donor insists on ecoregional or global impacts. Ideally, all these people are to work together in harmony but frequently 'scale wars' are waged at the conscious and unconscious levels leading to project tensions. The challenge is integrating results between disciplines/organisations and transferring results from one scale to another. No project should begin until theoretical and methodological attention has been given to scale and scale wars (see Farrington and Lobo, 1997).

****Landmine No. 2. The Participatory Methodology Fetish**

Recent years have seen the growth of participatory research methodologies (Participatory Rural Appraisal, Rapid Rural Appraisal, etc.) best known through the writings of Robert Chambers (1994) and his colleagues. While these methods are a fresh counterpoint to the unimaginative questionnaire, the present application of such approaches may have become counterproductive and a violation of their original intent (IDS, 1998). A series of publications in the past few years has called for an increased focus on rigour, validity, and quality, and an emphasis on the processes rather than the methods (IIED, 1995; Blackburn and Holland, 1998; Guijt and Kaul Shah, 1998; Mosse et al., 1998; Scherler et al., 1998). While this

awareness has led to the correction of the problems of poorly executed participatory methods in some quarters, many watershed projects have not benefited from the critical discussions which have taken place, largely in Europe and Asia, on potential pitfalls. In these situations, the stress on interaction and speed can lead to superficiality in the way communities are approached. Due to locally controlled points of entry, direction of the participatory process can be usurped by powerful community factions. Representativeness in decision-making of different status groups and research sampling is thus questionable. Ironically, much participatory methodology becomes condescending and patronising of local populations, just the opposite of the original intent of dispensing with researcher-driven agendas which once alienated local people. Rather than treating local people with respect and as colleagues, participatory methods sometimes treat them more like school children by playing titillating games, drawing exercises, and other fly by night remedies.

Biological scientists who become exposed to these methods often become more enthusiastic than seasoned social scientists. NGOs often position themselves as 'facilitators' of participatory events which, in turn, gives them power as gatekeepers of the project. In this context, the social scientist who attempts to raise analytical points about stratification, differential access to power and resources, and other social shaping dynamics are accused of being 'top-down' and then marginalised by turf-guarding NGOs and overzealous biological scientists. Depth and precision in understanding social aspects are all too often sacrificed to the participatory fetish.

**** Landmine No. 3: Social Underdesign of Projects**

In many participatory watershed projects the age-old pecking order of the agricultural and conservation establishment continues. In this order, biological scientists are expected to take care of 'hard science' while social scientists/NGOs (the distinction is often blurred since project management often sees them as birds of a feather) take care of 'soft systems', e.g., community involvement. The very science we need most in watershed research - a solid and professional social science - is the one seen as the most dispensable (cf Sidersky and Guijt, in press). Serious social and economic questions about watershed dynamics require as much care in research design as in the biological sciences (e.g., questions of social boundaries, authority patterns, inter and intra-group dynamics). Participatory methodologies facilitated by NGOs should not be confounded with high quality social science research. Although the tendency is for NGO community facilitators to hold a first degree in an applied social science, they are not experienced in research design or data collection. Reliance on them, and the participatory fetish, for guiding social information may instead lead to a syndrome of the social underdesign of projects (Kottak, 1995). Social workers and community development practitioners are professionals in their fields of application and extension, but they cannot be expected to provide the kind of rigorous science required for the new watershed paradigm. 'Participation' is not synonymous with 'social analysis'.

****Landmine No. 4: Re-invent the Wheel Syndrome.**

Although a few comparative lessons on watershed projects are beginning to emerge, most projects start out in a vacuum with seemingly little interest in experience elsewhere. Few honest published evaluations (as opposed to propaganda pieces to keep the money flowing) have appeared and to date the results of international conferences held specifically for the purpose of sharing experiences have not been published or widely disseminated (although see Lal, in press; Farrington, et al., 1999; Hinchcliffe et al., 1999). The available publications which evaluate successes

and failures or lessons learned have been published in-house or at donor request, thus limiting their influence. One excellent paper (Sharma and Krosschell, nd) on lessons learned from case studies of people's participation in Asia is only available if you happen to be on the FAO/UNDP Participatory Watershed Project in Asia mailing list. After reviewing recent watershed experiences in Asia to see what worked and what did not, they delineated three approaches:

1. indigenous in situ;
2. building on local cultures by projects; and
3. implementation without regard to local culture.

These three types also represent a gradation from success to failure, implying that using local knowledge, building on indigenous world views, and encouraging ownership are the best predictors of long-term sustainable success. This is valuable information for project managers in search of answers but at present few are receiving or heeding such advice.

The Operational Landmines

**** Landmine No. 5: Great Expectations**

Projects which promise to answer multiple, often contradictory objectives and trade-offs, can inadvertently become their own worst enemy. To start, unrealistic expectations are created in the participatory process itself, when in meeting after meeting with local people, NGOs, scientists, and government officials hope to attract attention to their interests and agendas. This is especially true when budgetary priorities are participatorily established. Demand-driven research and development means that stakeholders will talk about all problems, not just water or crops. This talk then gets confused with what can be realistically accomplished in the project's time frame and budget. Given the democratic spirit, a fully engaged 'participatory project' - more so than the component project with its clear focus (e.g., a crop, a resource) - creates its own set of expectations far beyond the project itself. Furthermore, conflicting objectives embedded in participatory watershed projects create confounding ambivalence (research and development, food production and environment, development and environment, economic maximisation and conservation, individual and societal costs). Is it really possible to accomplish all of these, given that many are countervailing? Some project funds are mainly for research but how is this resolved with the emphasis on participation where people are asked to set their development priorities? The project may be evaluated on research outputs (publications, high quality science) and not on attention to people's needs. Then, when funds are cut, local people are often left with no tangible outputs, although they expended a great deal of time in the participatory process.

****Landmine No. 6: Tragedy of the Participatory Commons**

Another operational problem is a sort of organisational 'tragedy of the commons' (whatever belongs to everyone belongs to no-one). It is very hard to get a consensus if all stakeholders have the same weight in deciding what should be done (everyone has an agenda played out in 'scale wars'). Then, when those agendas are compromised or people are not allowed to do what they do best (initiative and ideas are often killed through cumbersome group decision-making), they turn away from the process. This same phenomenon occurs in top-down projects which are infamous

for alienating local people, but poorly managed participatory projects can yield the same result. When project budgets are democratically open and competitively available, each stakeholder group entrenches in terms of its own short-run goals, instead of opting for what is best for the whole group. Like the tragedy of the commons, no one takes responsibility for the whole project. Organisationally, we pasture our livestock (or fish) until the resource is depleted, always blaming others in the process. Unfortunately, rather than blaming organisational greed and poor management as the point of failure, the concepts of 'participation' and 'watershed' may ultimately be the ones to catch the blame. No one disagrees with the position that all stakeholders should have a voice, but with few people agreeing upon assumptions, methodologies, goals, and operating procedures, a lack of structure can spell doom for the project.

****Landmine No. 7: Duplicating Management Structures**

A corollary to the 'lack of focus' and 'commons tragedy' is the tendency to create artificial, externally conceived committees/groups through which the watershed project managers and workers can operate. Outsiders to a location (NGOs, foreign scientists, government agencies) strive for a recognisable, organised structure to work through. Locally, it is not always clear with whom you negotiate within watersheds (a watershed is not a socio-political reality except in the fantasies of conventional watershed scientists). In traditional cultures, there may be no formal structure and leadership often rotates on an annual basis. A project's need for a formal structure is akin to the colonial lord's need for tribal 'chiefs', even when they did not exist before. Most participatory watershed projects are rich in on-the-ground gossip about local manoeuvring between political rivals who are using the project as a stage upon which to build alliances, garner resources, and ultimately unseat the competition (local politicians are keen on using projects as career launching pads). This dynamic of local and external politics sets the stage for project-created committees which assume lives of their own beyond any local indigenous structure. A locally established project co-ordinating office can become another layer of bureaucracy, with its own vested interest, needs for resources, and control games. A strategy that uses existing in vitro user-based institutions rather than setting up new organisations or committee will likely be more successful (Sharma and Krosschell, nd) but this option is rarely selected. New organisations might be needed, or new arrangements added, but any imposed structure has a greater chance to succeed if the project uses and strengthens existing structures. Only in those cases where there are relatively separate populations with conflicting use rights, will it be necessary to build new institutions capable of mediating between and communicating with diverse stakeholders (Fisher, 1995).

****Landmine No. 8: Stakeholder Complexity and Competition**

By definition, the watershed framework involves diverse stakeholders with both mutual and conflicting interests. This leads to high transaction costs. When the interests are compatible the problems are reduced but more typically interests are irreconcilable and conflictive. From my own experience in large Ecuadorian watersheds, in 1997 local Ecuadorian farmers burned down a foreign-owned mining camp in protest over open pit extractive methods and subsequent pollution of the rivers. This event soon created a series of conflicts between local farmers and absentee landlords, among different agencies of the Ecuadorian government (different ministries controlling mining, forestry, and health) as well as between foreign conservationists and the Japanese government. The local incident quickly elevated to global debate. As the number of stakeholders increase, the likelihood of conflict increases. This reality runs counter to a participatory rhetoric which envisions

good-willed people sitting down around mythical 'conservation or debate tables' to resolve their differences. Resolving such differences will involve more than just dialogue. NGOs are promoted as gatekeepers or mediators to help resolve such differences. But the interests of NGOs are sometime short-term and financial and their own roles can, in turn, weaken the very governments they purport to strengthen (Post and Preuss, 1997). Participatory natural resource contexts are complex political arrangements, with an intensity of interaction brought about by gathering NGOs, local organisations, governments, universities (several disciplines) into a single watershed, all groups which have never worked together in the past.

How Can the Participatory Watershed Challenge Succeed?

Can the participatory multipurpose watershed project live up to its expectations? Or will this bold initiative go the way of other development 'white elephants'? At the present time, two conclusions can be drawn from the rather inconclusive information available.

1. Despite the enthusiasm for and the appeal of the approach, there has been little in the way of empirical impact studies. It is perhaps unfair that such projects are being hit upon so quickly to produce results when any thinking person will realise that natural resource changes take decades, not a couple of years. Nevertheless, powerful forces in the development community would just as soon dispense with the messiness of grassroots participation and get back to the business of trickle-down economics and parlaying to the rich and powerful. Proponents of the new approach need to defend their case soon with empirical evidence that indeed participation at multiple scales can work.

2. Most grassroots workers and their institutions steadfastly remain convinced about the promise of such an approach. They argue it is Luddite to turn back to the techno-economic production mentality which ignores scale, resource multi-functionality, trade-offs, and the importance of involving people in the process. Most of us who are engaged in the field reality agree with the new philosophy, but are struggling with the 'how' not the 'why'. There is now a need for a mechanism to share information (electronic conferences, symposia, published articles, etc.) and manuals which guide people in the management issues.

When confronted with multiple local stakeholders with the sanctioned right to press for their needs (not those of Agenda 21-inspired scientists), grassroots workers need not only a 'paradigm shift' but good science, appropriate methods, organisational skills, workable technologies, sufficient money, and donor patience. Indeed, many projects promise through interdisciplinary, intersectoral, and inter-institutional mechanisms to conduct quality research leading to impact-oriented development which is locally defined but globally relevant. All in one project! The danger is real that transaction costs growing from poor organisation skills will not yield the output expected by those who fund such projects (who, by the way, are not unified either). The easy way out then will be to blame participation and fuzzy social scientists as excuses to return to normal science and conventional development through élites. There is evidence that this regression is already underway in some cases. It is easier to reduce investment and interaction at the grassroots level and reinvest in a powerful university, government agency, or NGO who will pursue Agenda 21 at a

distance (e.g., simulation models, expert systems, decision support to policy makers, etc.).

Is this the price to be paid? Will local communities, which all over the world are exerting for the first time their rights to determine what kind of activities go on in their homelands, continue to buy the idea that outsiders can run around their villages conducting experiments, running participatory rural appraisals, or modelling the landscape? Will they continue to buy the idea that an urban-based NGO is necessary to link them with the outside world? Are we ruining the opportunity because too many short-term agendas of the development world are getting in the way? Local communities are becoming 'development weary'. My impression, despite my rather critical remarks in this paper, is that the participatory watershed approach is greatly appreciated by rural peoples directly affected. But if we do not convene soon to share experiences, learn from our mistakes, and provide hard-hitting assessments of lessons learned, the baby may indeed go out with the bathwater. Our hearts are in the right place, but where are our heads?

References

- Allen, T. and Starr, T. 1982. *Hierarchy Perspectives for Ecological Complexity*. The University of Chicago Press, Chicago.
- Allen, W.J., Bosch, O.J.H., Gibson, R.G. and Jopp, A. J. 1996. Co-learning our way to sustainability: an integrated and community-based research approach to support natural resource management decision making. In: El-Swaify, S.A. and Yakowitz, D.S. (eds.) *Multiple Objective Decision Making for Land, Water, and Environmental Management*. Lewis Publishers, Boca Raton.
- Berkes, F. and Gardner, J. 1997. *Sustainability of Mountain Environments in India and Canada*. Report of a project under the CIDA-SICI Partnership Programme. Natural Resources Institute, University of Manitoba, Manitoba, Canada.
- Blackburn, J. and Holland, J. (eds.) 1998. *Who Changes? Institutionalizing Participation in Development*. Intermediate Technology Publications, Ltd., London.
- Chambers, R. 1994. The origin and practice of Participatory Rural Appraisal. *World Development* 22(7): 953-69.
- Datta, S.K. and Virgo, K.J. 1998. Towards sustainable watershed development through people's participation: lessons from the Lesser Himalaya, Uttar Pradesh, India. *Mountain Research and Development* 18(3): 213-233.
- El-Swaify, S.A. and Yakowitz, D.S. (eds.) *Multiple Objective Decision Making for Land, Water, and Environmental Management*. Lewis Publishers, Boca Raton.
- FAO. 1986. *Watershed Management in Asia and the Pacific: Needs and Opportunities for Action*. Rome: FO/RAS/85/017. Technical Report. FAO, Rome.

- Farrington, J., Turton, C. and James, A.J. (eds). 1999. Participatory Watershed Development: Challenges for the 21st Century. forthcoming.
- Farrington, J. and Lobo, C. 1997. Scaling up participatory watershed development in India: lessons from The Indo-German Watershed Development Programme. *Natural Resource Perspectives* 17: 1-6.
- Fisher, R. 1995. Collaborative Management of Forests for Conservation and Development. IUCN and World Wide Fund for Nature, Geneva.
- Fox, J. 1992. The problem of scale in community resource management. *Environmental Management* 16(3): 289-297.
- Grant, L., Payne, T. and Stinner, B. 1997. Report to the Kellogg Foundation. Ohio Agricultural Research and Development Center. Ohio State University, Wooster, USA.
- Guijt, I. and M. Kaul Shah (eds). 1998. The Myth of Community: Gender Issues in Participatory Development. London, Intermediate Technology Publications Ltd.
- Hargrove, W.L., Garrity, D.P., Rhoades, R.E. and Neely, C.L.. In press. A landscape/lifescape approach to sustainability in the tropics: the experience of the SANREM CRSP at three sites. In: Rattan Lal (ed). *Integrated Watershed Management. Special Issue of Soil and Water Conservation*. CRC Press, Boca Raton.
- Hinchcliffe, F., Thompson, J., Pretty, J.N., Guijt, I. and Shah, P. (eds). 1999. *Fertile Ground: The Impacts of Participatory Watershed Management*. Intermediate Technology Publications Ltd., London.
- Hufschmidt, M.M. 1986. A conceptual framework for watershed management. In: Easter, J.A. Dixon, and Hufschmidt, M. (eds). *Watershed Resources Management*. Westview Press, Boulder.
- IIED. 1995. PLA Notes special issue on critical reflections on practice. PLA Notes 24. IIED, London.
- IDS. 1998. Reflections and recommendations on scaling-up and organizational change. In: Blackburn, J. and Holland, J. (eds) *Who Changes? Institutionalizing Participation in Development*. Intermediate Technology Publications, Ltd., London.
- Jinapala, K., Brewer, J. and Sakthivadivel, R. 1996. Multi-level participatory planning for water resources development in Sri Lanka. Gatekeeper Series 62. Sustainable Agriculture and Rural Livelihoods Programme, IIED, London.
- Kerr, J., Sanghi, N. and Sriramappa, G. 1996. Subsidies in watershed development in India: distortions and opportunities. Gatekeeper Series 61. Sustainable Agriculture and Rural Livelihoods Programme, IIED, London.
- Kottak, C. 1995. Participatory development: rhetoric and reality. *Development Anthropologist* 13(1 and 2): 1-7.

Lal, Rattan. In press. Integrated watershed management. Special Issue of Journal of Soil and Water Conservation. CRC Press, Boca Raton.

Mosse, D., J. Farrington, et al. 1998. Development as Process: Concepts and Methods for Working with Complexity. ODI Development Policy Studies. Routledge, London.

Post, U. and Preuss, H-J. 1997. No miracle weapon for development: the challenges facing NGOs in the 21st Century. Development and Cooperation 6 (November and December).

Queensland Government. 1991. Integrated Catchment Management: A Strategy for Achieving the Sustainable and Balanced Use of Land, Water, and Related Biological Resources. Queensland Department of Primary Industries, Brisbane, Australia.

Rhoades, R.E. In press. The participatory multipurpose watershed project: nature's salvation or Schumacher's nightmare. In: Lal, Rattan (ed.). Integrated watershed management. Special Issue of Journal of Soil and Water Conservation. CRC Press, Boca Raton.

Scherler, C., R. Forster, et al. (eds). 1998. Beyond the Toolkit: Experiences with Institutionalising Participatory Approaches of GTZ-Supported Projects in Rural Areas. GTZ, Eschborn, Germany.

Schwitters, R. 1996. The Substance and Style of "Big Science". The Chronicle of Higher Education. (February).

Sharma, P. and Krosschell, C. nd. An Analysis of and Lessons Learned from Case Studies of People's Participation in Watershed Management in Asia (manuscript).

Sidersky, P. and Guijt, I. In press. Matching participatory agricultural development with the social landscape of Northeast Brazil. In: Hinchcliffe, F., Thompson, J., Pretty, J.N., Guijt, I. and Shah, P. (eds). Fertile Ground: The Impacts of Participatory Watershed Management. Intermediate Technology Publications Ltd., London.

Stone, K. 1972. A geographer's strength: the multiple-scale approach. The Journal of Geography 71(6): 354-362.

Thompson, J. and Guijt, I. In press. Sustainability indicators for analysing the impacts of participatory watershed management programmes. In: Hinchcliffe, F., Thompson, J., Pretty, J.N., Guijt, I. and Shah, P. (eds). Fertile Ground: The Impacts of Participatory Watershed Management. Intermediate Technology Publications Ltd., London.

United Nations Commission on Environment and Development (UNCED). Agenda 21: Program of Action for Sustainable Development. United Nations Publications, New York.