

# INTRODUCTION

This volume presents proceedings of the Asian Regional Workshop on Preparing the Next Generation of Watershed Management Programmes, which was held in Kathmandu from 11 to 13 September 2003. The workshop formed part of an FAO global initiative to review existing watershed management programmes and produce guidelines for future strategies, approaches and projects. This review, the first of its kind for more than 15 years, was to comprise a stocktaking exercise, analysis of case studies, a series of regional workshops – in Africa, Asia, Europe, and Latin America – and the dissemination of results.

The Asian workshop was co-hosted by FAO and the International Centre for Integrated Mountain Development (ICIMOD), with funding from the Government of the Netherlands<sup>1</sup>.

The objectives of the workshop were:

- to assess watershed management programmes and projects throughout Asia by identifying and quantifying their achievements and gaps;
- to identify lessons learned and major issues emerging from past watershed management experiences in the region, especially during the decade 1990 to 2000;
- to identify guidelines for formulating and implementing the next generation of watershed management programmes and projects in Asia.

After the opening address and welcome, Moujahed Achouri of FAO presented an overview of the FAO initiative<sup>2</sup>. Papers on various topics related to watershed management in Asia were then presented. On the second day of the workshop, three working groups were convened to discuss major themes in watershed management. The group themes are given in the following sections, along with a summary of each group's findings and conclusions<sup>3</sup>. The working group presented their conclusions at a plenary meeting on the third and final morning of the workshop.

## WORKING GROUP 1: WATER CONSERVATION AND USE

This group explored innovative approaches and methodologies for effective watershed management, with a special focus on the conservation and sustainable use of water resources.

Watershed management has evolved and passed through several stages of development. In the initial stages, it concentrated on forestry and forestry-related hydrology, and the involvement of people was not an issue. Watershed management was solely the business of government forest departments, and activities were directed mainly towards symptoms. During the second stage – the integrated watershed management stage – it turned to land resources management, including finding activities that would bring economic benefits. At this stage, the focus was on

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1. The workshop programme, including titles of the papers presented and the names of their authors, is presented in Annex A. Names and contact addresses for all the participants are given in Annex B.

2. This presentation is given in Chapter 2 of these proceedings.

3. The list of working group participants is presented in Annex D.

beneficiaries. It is now at the participatory, integrated watershed management stage, which includes the involvement and contribution of local people. Participatory integrated watershed management looks at symptoms, as well as causes. Hence, watershed management has moved from treating the symptoms to treating the causes.

Today, most decisions on watershed management activities/projects are driven by political and other major national objectives, and even areas for treatment are chosen on these grounds rather than on the basis of studies and surveys.

In watershed management, “approach” is defined as a way of tackling issues, or as the concept of planning watershed management with objectives and implementation strategies. “Technology” includes all the methods, tools and techniques available to achieve objectives. Among new technologies, Geographic Information Systems (GIS) have become particularly important in watershed management. GIS is a useful tool for identifying and justifying areas of intervention, particularly for larger areas where problem assessment can be difficult.

### **Lessons learned**

From its assessment of recent watershed management approaches and methodologies, the group concluded that watershed management and decision-making are becoming increasingly decentralized and now involve more groups, including government ones. Alongside this decentralization, new watershed management organizations are emerging, and the capacity of community-based groups is improving.

Watershed management is now taking a more bottom-up approach. As part of this, participatory research is a good way of developing appropriate technologies, including those based on indigenous knowledge. Human resources need to be developed through capacity building at all levels.

Upstream–downstream linkages continue to be an issue, and involvement tends to be limited to local upstream participants. It is important that different stakeholders, including people in downstream areas, are involved in watershed management. There is also need to identify upstream–downstream issues more clearly and to look for ways of cross-linking with other sectors.

It is clear that treating causes is as important as treating symptoms, however many programmes and projects do not pay sufficient attention to causes.

### **Gaps**

Among the gaps identified was a lack of policies to guide integration and varying degrees of inconsistency among the government departments, donors and other agencies involved in watershed management programmes. For example, different agencies have different management boundaries. Related to this, appropriate legislation is often lacking, resulting in legal issues remaining unsettled.

There are weaknesses in communications, including inadequate documentation, dissemination and networking (vertical/lateral), and there is a failure to mainstream key lessons learned into practice. Even frontline workers are often not fully aware of new technologies and policies.

Regarding the environment, environmental feasibility assessments often pay insufficient attention to human well-being, and some environmental issues – such as biodiversity and climate change – are not addressed at all. At the same time, financial commitments are often too short-term, making it difficult to sustain and replicate beneficial interventions after projects have finished.

Participation still needs to be increased. At present, participation is often restricted to local communities, and there is only very limited inclusion of resource-poor people in watershed management programmes.

### **Technologies**

Among useful technologies identified by the working group were water budgeting as a monitoring tool, appropriate technologies that make use of indigenous knowledge, GIS tools, and cost-effective tools, including 3D modelling.

### **Improved approaches**

In order to promote greater and more committed participation of local people, innovative approaches are needed to promote local value addition, to address the needs of resource-poor and marginalized groups, and to ensure short-term economic gains. Improved dissemination and communications would help in this area, especially better learning frameworks, more effective feedback channels (both bottom-up and top-down), and tools/mechanisms for documenting best practices and lessons learned.

Planning needs to be improved, and adequate institutional, organizational and coordination arrangements put in place. Upstream–downstream linkages are still not sufficiently understood and would benefit from the development of appropriate mechanisms. Two other major needs are innovative monitoring and evaluation methodologies for impact assessment of watershed management, and ways of addressing rangeland management issues.

Regarding the environment, improved approaches could include using water budgeting as a monitoring tool (focusing more on water to avoid complications), and incorporating clean development and management principles into watershed management. A better balance between human well-being and protecting the environment is also required.

### **Technology gaps in that require research**

Watershed management research should be practical, applied and appropriate for local inhabitants, and should include cultural and socio-economic research. Its outputs should be targeted to different levels of education and income. Research results are often specific to a particular agro-ecology, ecoregion or ethnic group, and may not be easily replicable.

Among the areas requiring more research are site-specific land husbandry; new approaches and technologies; water budgets and household water use for demand management; improved solar energy for pumping water and for greenhouses; nutrient input loss management, particularly leachate; the impact of land use on hydrology, sediment transport and water availability; and

bioengineering, particularly root systems and their usefulness – including suitable vegetation for rehabilitation and production – and weeds.

Technologies need to be demonstrated – so that people can see for themselves – and simplified for easier adoption. They also need to be affordable (low-cost).

In the area of information collection and dissemination, the group recommended that databases be amalgamated to form decision support systems. Climate change baselines should be set up, and rainfall information from watersheds collected, taking into account the great variability in mountain areas and the introduction of new crops.

Appropriate procedures and information would also make it easier to prioritize critical watersheds, identify appropriate technologies at the farmer level, and value upper watershed services for downstream areas.

### **Watershed management global network**

It is necessary to establish a forum for dialogue, which would act as a focal point for watershed management. Practitioners could use this as a source of information. For example, an on-line library would be an effective way of storing information, including research results, case studies and links to other Web sites, watershed workers and projects.

### **Best elements of watershed management**

The best watershed management has the following features: decentralized operations with sensible controls that are executed by communities; the contribution of beneficiaries; participatory design, including local consultations and empowerment; a focus on water, with improved water management at its core; regional networking; education; conservation of environments and biodiversity; and a good philosophy of watershed management.

### **Scope of the next generation of programmes**

Watershed management develops entry points, and so has been hijacked as it provides opportunities for others. For example, poverty alleviation is high on donors' agendas, and the World Bank now emphasizes natural resource conservation projects.

Watershed management programmes of the future need to identify primary and secondary activities in watershed management. Interventions should be watershed-specific (needs-based) and needs should be reflected in project design. Funding and planning must be decentralized if integrated resource development projects are to succeed.

Specific to Asia is the issue of focus, which appears to be a problem in that region, but not in the Americas or Europe.

## **WORKING GROUP 2: RESEARCH NEEDS**

This group investigated appropriate strategies for meaningful research and linkages between research and implementers; and strategies and approaches for technology transfer and dissemination. It also identified technology gaps in watershed management that need more research.

The two main conclusions the group drew were: 1) research should be applied; and 2) social and cultural research on watersheds should be incorporated into all the other research needs.

More specifically, the group identified the following gaps in the current state of watershed management research and technology transfer: hydrometrological and sediment data at the watershed level; tools for land managers to assess the impacts of catchment management interventions; farm-based technologies; bioengineering for stabilization and rehabilitation; assessment of downstream costs/benefits of upstream interventions; adaptive research on indigenous technologies; tools for modelling “what if” scenarios; effective weed control (e.g. Lantana); effective biodiversity management (including agrobiodiversity); and an efficient framework for water assessment through multi-linked catchment landscape.

Possible solutions to these gaps include: well-designed extension packages and approaches; farmer-led demonstrations; improved networking at all levels (from farm to policy); appropriate technologies adaptable to the farm level; researcher-to-researcher and -policy-maker links; awareness raising on watershed approaches; and appropriate curricula for watershed concepts (from school to university).

Institutional issues for watershed management research include a lack of coordination and dialogue, which would be resolved by appointing a coordinating body as a focal point. Institutions’ weak commitment (low priority, low investment) would be strengthened if the economic benefits were understood and communicated better. There is also a need for institutions to allocate sufficient time to projects and programmes.

Regarding watershed management programmes and projects that are driven by donors and/or researchers, a national research framework for watershed management needs to be in place, research should reflect local priorities, and research programmes should be taken forward collectively by all stakeholders (communities, scientists and donors).

## **WORKING GROUP 3: ECONOMIC AND SOCIAL ISSUES**

This group concentrated on innovative approaches and methodologies for effective watershed management, with special reference to economic and social considerations. It did this by discussing four specific themes and posing questions for each of these.

### **Topic 1: Watershed management policy and legal environment**

In answer to the question “What are the fundamental policy and legislative weaknesses associated with the contemporary watershed management programmes, with special focus on economic and

social considerations?”, the group concluded that policy lacks focus in terms of classifying projects with regard to site-specificities and that it pays insufficient attention to monitoring and evaluation mechanisms. In order to improve policy, there is need for a master plan-type mechanism to identify hot spots, and for frequent reviews of policy that has been promulgated.

Legislation is often absent or inadequate with respect to interdepartmental collaboration, funding allocation, sharing of resources and decentralization of authority. Another common problem is lack of enforcement, owing to legislation being out of date or for other reasons.

The group recommended reviewing existing legislation and formulating new legislation to address policy issues such as interagency collaboration, decentralization of authority and sustainability of resources.

## **Topic 2: Watershed management planning**

In answer to the question “What are the major issues associated with contemporary watershed planning methods, with special focus on economic and social consideration at the national, watershed and local levels?”, the group identified several significant gaps.

A lack of information makes it impossible to prioritize watersheds for treatment, or to decide what to focus on. As a result, insufficient attention is paid to either biophysical or socio-economic issues. There is also a lack of national master plans and holistic approaches. In addition, planning methodology is weak at all levels, there is no assessment mechanism to define watershed-specific requirements, and interdisciplinary collaboration is insufficient.

In response to these gaps, the group recommended bottom-up preparation of watershed plans, with top-down screening to ensure their technical feasibility and policy consistency with master plans. Best practices should be documented, field tested for local adaptability and included in implementation plans, which should also consider upstream–downstream linkages and benefit sharing. There should be coordination among ministries, among stakeholders and among disciplines, including in planning.

Investment should be made in information collection, national database infrastructure and easy data access (such as through the Internet), and modern technologies such as GIS should be used to analyse problems. Cost-effective technologies should be emphasized, and proper attention paid to indigenous knowledge.

## **Topic 3: Watershed management field implementation**

Next, the group turned its attention to the question “What are the major issues associated with implementing watershed programmes/projects, with special focus on cost-effectiveness, synergy, sustainability and equity at the national, watershed and local levels?”

Many of these issues were related to the institutional and legislative set-up. For example, the group identified a lack of implementation authority at the local level, poor inter-agency coordination, contradictory legislation and a lack of clear rules and guidelines for implementing legislation, and cases of political interventions working against the prescriptions of management plans.

In addition, the use of inappropriate approaches is an issue. This is often the result of donors' involvement in programme planning. There is a proliferation of development paradigms, with each donor pushing others to join its "bandwagon". Some programmes pay lip-service to donor priorities and fashionable terms, indiscriminately replicating best-bet options approved by research and using high-tech solutions, without investigating lower-cost, indigenous technologies.

Achieving adequate resources is often a problem. Funding is inadequate and erratic, and there is no clear cost sharing for policy and enforcement. In addition, extension workers and local leaders often lack the capacity for implementation – in terms of both technology and number.

Among the recommendations for resolving these issues, the group mentioned the need for adaptive research, testing, demonstration, replication and dissemination of best practices. Training in implementation capacity at all levels should be strengthened.

There is need for greater harmonization between donors and recipients. Governments and donors should consider making longer-term commitments, and donors should be more flexible. Governments should create mechanisms in which revenue from watershed resources is used at the local level for community activities, and coordination capacity should be enhanced through legislation and regulatory measures. Governments also need to establish greater clarity in cost-sharing and incentive policies.

#### **Topic 4: Monitoring and evaluation (M&E)**

In response to the question "What are the major issues in M&E that are associated with successes and failures of watershed management projects/programmes in the context of participation, sustainability, cost-effectiveness and equity?", the group pointed out that inadequate M&E has led to mismanagement, wasted resources and mismatched interventions

At present, there seems to be no will to carry out M&E, and capacity for monitoring at the field level is inadequate. There are no effective and transparent M&E systems, and projects often fail to include M&E plans. Post-project evaluations are often lacking, and best practices are not included in the preparation of follow-up phases. Where M&E plans do exist, they are usually too top-down, use inappropriate indicators, with target monitoring predominating over impact monitoring, and lack baseline information for determining economic feasibility and input/output analysis.

The group's recommendations regarding M&E included creating data sets and increasing access to information; carrying out M&E from the beginning of a project and on an ongoing basis; involving all stakeholders in M&E; ensuring post-project evaluations; and including both external and internal M&E.

M&E must look at both the biophysical and the socio-economic aspects; it must be flexible; and guidelines for M&E must ensure effectiveness and transparency.