

A Watershed Perspective for Water User Associations

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Introduction

Watersheds are natural units of surface water flows, comprising the land catchment area which drains into a common outlet (a stream or river). In recent years, water managers have given greater attention to the interactive effects within the watershed, recognizing that problems encountered in one part of the watershed may have their origin in another part of the watershed. The value of a watershed perspective is now generally accepted as the most useful planning unit for Intergrated Water Resources Management (IWRM), and a very large literature has emerged about the importance of taking the entire watershed into account.

The question which this module addresses is the value of a watershed perspective for water user associations. After overcoming so many obstacles to create a watershed association in the first place, is it really necessary to look beyond the WUA to the larger watershed, and interactions with other water users? The answer I wish to propose is, "Yes!." Every WUA needs to know about the watershed context of which the WUA is a part. Whether or not it makes sense to create a higher level organization at the watershed level, is a much more location-specific question. In some cases the interests of the WUA members can best be served through higher level coordination, either by creating a new organization, or simply by coordinating through existing institutional structures. In other cases, the coordination of water management may not be so important, but it is useful for the WUA to be aware of how water policies might affect their future access to water.

This module outlines a number of possible ways for WUAs to stay connected with what is going on in their watershed, and to become pro-active in influencing water management at the watershed level. Through taking an interest in watershed management beyond the WUA, not only can the watershed resources be put to better use, but the interaction with other organizations can also enhance the organizational health of the WUA itself.

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Part I

Why Watersheds Matter to Water User Associations

1. The Watershed Concept

A watershed is the basic unit of water supply and the basic building block for physical planning of land and water use. Watershed size can vary from a few hectares to thousands of square kilometers. Unless a watershed discharges directly into the ocean, it is physically a part of a larger watershed.

The hydrological cycle within a watershed is shown in Figure 1. It illustrates that rainfall is the main water source for the watershed. Water then either flows through and out of the watershed as surface or groundwater flow, is incorporated into biomass, or is lost through evaporation and transpiration processes while in the watershed. Not shown in the illustration is the deep subsurface hydro-geology, which, depending on the rock formations, can move water across surface watershed boundaries.

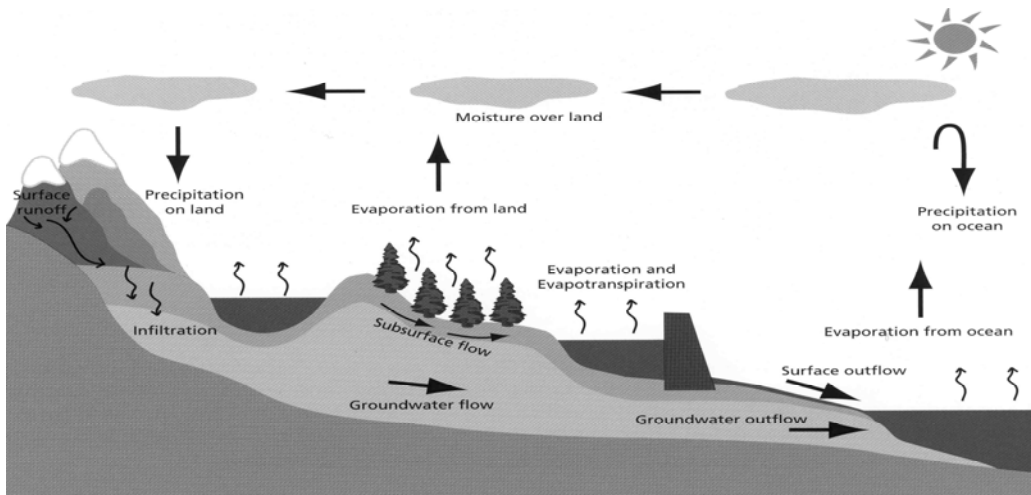


Figure 1: Hydrological cycle in a watershed

The terms “basin”, “watershed” and “catchment” can be used interchangeably but in common usage they refer to different size categories. *Basin* management typically refers to macro management at the level of the entire watershed system, sometimes across country boundaries and with a focus on institutional and policy issues. *Watershed* management typically refers to management at the level of the micro- or sub-watershed. *Catchment* is generally used synonymously with watershed. Some approximate reference for these scales is proposed in the following table.

| Watershed Management Unit | Typical Area (mi ²) | Influence of Impervious Cover | Primary Planning Authority | Management Focus |
|---------------------------|---------------------------------|-------------------------------|------------------------------------|--|
| Micro-watershed | 0.05 - 0.50 | Very strong | Property owner (local) | Best management practice and site design |
| Sub-watershed | 1 - 10 | Strong | Local government | Stream classification and management |
| Watershed | 10 - 100 | Moderate | Local or multiple-local government | Watershed-based zoning |
| Subbasin | 100 - 1,000 | Weak | Local, regional or state | Basin planning |
| Basin | 1,000 - 10,000 | Very Weak | State, multi-state, or federal | Basin planning |

Watershed Management Units and Characteristics

Important Features of Watersheds. Like irrigation systems, watersheds have many dimensions: social, technical, and environmental. Because watersheds encompass a larger land area and range of conditions than most irrigation systems, describing the features of even a small watershed can be a complicated challenge. Stakeholders include not only farmers, but all the people living in the watershed (villages, tribal groups, herders) plus urban residents, local government agencies, businesses, NGOs, etc. Technical infrastructure ranges from check dams and reservoirs upstream, to canals, pumps, wells, levees, etc. downstream. The environment may include forests in the upper watershed, riverine vegetation, grasslands, soil of varying types and erodability, water (both surface and sub-surface), fish and wildlife, and even shellfish and coral reefs that are affected by river flows (See table below):

| | <i>Upper Watershed</i> | <i>Middle Watershed</i> | <i>Lower Watershed</i> |
|-----------------------------------|--|---|--|
| <i>Social (stakeholders)</i> | upland villages, herders, tribal groups, Forestry Department, Parks Department | agriculture, towns and cities, industry, businesses, urban water supply, Ag and Irrigation Depts. | [same as Middle Watershed] plus: water transport, fishing |
| <i>Technical (infrastructure)</i> | check-dams and reservoirs, canal intakes | canals, pumps, wells, drains | [same as Middle Watershed] plus: levees, dykes |
| <i>Environmental</i> | forests, mountains, soils, protected areas, wildlife, fish | water quality, soils, vegetation, fish, wetlands, | [same as Middle Watershed] plus: estuaries and coastal zones |

Key Dimensions of Watersheds

2. Who Manages the Watershed?

Watersheds are natural topographic units, but they are rarely consistent with administrative units. With some notable exceptions (e.g., France, where watershed boundaries serve as the administrative basis for water management), the usual situation is

a mis-match between the natural watershed boundaries provided by nature, and the administrative units devised by governments. Villages and towns typically are situated inside a watershed, while the next larger administrative unit (e.g., a district or county) typically cross-cuts several watersheds. Central government line agencies (Irrigation, Agriculture, Forestry) sometimes use watershed units, but they work within their particular sector and cannot address inter-sectoral concerns.

In most watersheds, there is no comprehensive management arrangement in place. The use of land and water resources is governed not by any organization or governmental body, but through un-coordinated actions taken by the many diverse stakeholders, often at cross-purposes. (See Box 1)

Box 1

**Interactions in Watershed Management:
A Case from Northern Thailand**

In the Mei Lai watershed in Phrae Province, northern Thailand, the construction of an irrigation reservoir prompted a review of upstream natural resource management that could impact on the reservoir. Initially conceived as an irrigation project, the IFAD-funded Agricultural Diversification and People's Irrigation Project quickly grew into an integrated watershed management project as the upstream impacts were taken into account. Research into land use practices revealed that different government agencies and groups of stakeholders in the watershed were working at cross-purposes. Some examples:

- The Department of Agriculture was promoting the cultivation of soyabeans, and land-poor farmers were responding by burning sections of forest and illegally planting soyabeans, which was resulting in siltation of the newly constructed irrigation reservoirs. Since many of these farmers were from families who also owned irrigated land served by the reservoirs, their own actions were working at cross-purposes with other family members.
- The Forest Department was trying to enforce a logging ban in the upper watershed, but local villages dependent on forestry for their livelihoods ignored the ban. The ban also invited organized criminal elements into the logging business, which became more lucrative following the official ban. [Proposed solution: Establish tree plantations, or forestry zones, where local villages were permitted to engage in carefully-managed logging.]
- Upper watershed vegetable farmers were using high levels of pesticides (following extension guidelines) which polluted downstream drinking water.
- Indigenous tribal communities in the extreme upper watershed were not legally recognized by the government and were therefore not included in any government-sponsored development activities.

3. Why Worry about the Watershed?

Why should water-user associations take an interest in the larger watershed? Is it really in the best interest of a WUA member when his WUA president becomes involved in watershed management? The answer depends partly on the location of the WUA within the overall water system. If the WUA is organized around a secondary or tertiary canal, then the logical upstream focus of the WUA would be on the main canal system, and

perhaps not the watershed. But if the WUA is already at the main system level, and takes water directly from a river diversion or reservoir, then the WUA managers have a responsibility to their members to ensure the sustainability of their water supply. That assurance comes through interacting with competing water users, representing the interests of the WUA members, and at the same time, seeking to understand the interests of the other water users within the watershed.

The following reasons for WUAs to become involved at the watershed level illustrate the logic for watershed-level interactions, though not all reasons will be relevant to all WUA situations:

1. *Safeguarding the WUA's water supply.* In many areas, WUAs are under pressure to use less water, in favor of more profitable water uses outside the agriculture sector, such as urban drinking water, industrial uses, etc. Depending upon local politics, farmers interests may or may not be well represented, and in any case, the best representation is through direct participation. The WUA managers can represent the interests of their members through interacting with the representatives of the many competing uses for that water: city or district officials, business representatives, officials from the urban water service provider, and perhaps officials from the Forestry Department as well.
2. *Safeguarding water quality.* Agriculture needs good quality water, particularly for organic certification programs where chemical residues from upstream sources could interfere with compliance, or aquaculture where the health of the cultivated fish is at stake. Through interaction with upstream water users and water planners, the WUA managers can learn about current or potential pollution threats.
3. *Economic opportunities.* Networking with other watershed stakeholders can yield unexpected dividends: new clients for agricultural products, agro-tourism possibilities, or perhaps contracts for ecosystem services. Networking with other WUAs and farmer groups within the watershed can also bring benefits through cooperative marketing.
4. *Sustainable resource management.* The water used by WUA farmers depends upon a healthy watershed with stable soils, vegetative cover, etc., plus a healthy stream/river system, and a stable aquifer. Protecting the land and water resources of the watershed is in the long-term interest of farmers, and all other long-term residents of the watershed. To avoid the classic "tragedy of the commons" someone needs to act on behalf of the watershed. Since irrigation typically accounts for the majority of water used within a watershed, it makes sense that the irrigators take action.

Part II

Institutional Options for Managing Watershed Resources

1. Who Can Manage the Watershed?

In theory, the government should bring order to the state of anarchy prevailing in many watersheds. But in practice, governments are ineffectual at this level, and the more practical options are for local actions that do not depend on government support. In this section we consider the theoretical role of government, and then focus on a few practical possibilities that do not depend on direct government involvement.

Governments have a responsibility for overall public welfare, and within the realm of natural resources management, to facilitate resource use that is consistent with public welfare. In other words, governments should fill the management gap at the watershed level, and oversee the wise use of watershed resources. There are some well-known examples of government stepping into the watershed management vacuum: The Tennessee Valley Authority in the USA was established by the national government and serves as an executive body regulating land and water use within its very large water basin. Similar authority structures have been set up in many countries where the coordinated management of resources is considered to be so important to the national welfare that the national government steps in. Examples include the Mahaweli scheme in Sri Lanka, the Muda scheme in Malaysia, and more recently and controversially, the Narmada scheme in India.

All three of these authorities seek to integrate the needs of irrigated agriculture, power generation, domestic, municipal, and industrial water supply, and land management including upper watershed forests. The establishment of these inter-sectoral authorities is a testimony to the need for an integrated institutional governance framework at the watershed level. But national governments are not as interested in small local watersheds as they are in large river valleys. Can provincial or state-level governments handle the inter-sectoral governance needs of local watersheds? Perhaps, but I am not aware of any examples of watershed-level authorities established by a provincial government.

2. Practical Options for Watershed Governance.

In practice, there appear to be three basic approaches to integrated management of watershed resources: (1) Community-level integrated management (i.e., focus on the immediate locality near the concerned community, without even trying to cover the whole watershed); (2) Watershed-level meetings and negotiations (i.e., covering either the whole watershed or particular issues within it; and (3) A formal watershed-level organization which seeks to represent all stakeholders and resolve cross-sectoral issues. Each of these is discussed below:

2.1. Community-based integrated natural resources management. There is a long history of organizing community-level initiatives for coordinated management of natural resources. In India, this approach was adopted to address resource challenged areas termed "wastelands" (usually semi-arid, over-grazed, and over-populated). The social orientation of Indian NGOs working on these issues also injected a strong element of community participation into the strategy. Today we can distinguish between grass-roots driven community-based NRM, typically initiated through NGOs, and more top-down efforts of government-run programs to induce communities to take responsibility for implementing catchment treatments (construction of bunds, terraces, and check-dams), tree-planting, controlled grazing, etc. The "bottom-up" approach of NGOs vs the "top-down" approach of government agencies is partly a reflection of differences in scale as governments attempt to "mainstream" NGO-led pilot projects. But there is normally also a difference in the development philosophies of the NGOs and government agencies, with the former treating participation as a social objective in itself, and not merely a strategy for encouraging local labor inputs or even for ensuring sustainability.

Box 2

Community Watershed Plans²

One common element in development projects using the community-based NRM approach is the preparation, implementation and monitoring of watershed management plans. The objective of these plans is to integrate the concerns and interests of the concerned stakeholders, and to come to an agreement within the community and then between the community and the concerned government agency program on a set of interventions that aim at both sustainable natural resource management and livelihoods improvements. The plan is also the instrument by which the watershed management program seeks to factor in program objectives beyond the micro-watershed, e.g., downstream benefits and externalities.

The community ideally designs plans with the assistance of a multidisciplinary team of technicians. Once agreed, the plan becomes the basis of a contractual agreement between the community and the program, with assignment of responsibilities and cost sharing. Watershed management plans can be done at various levels from farm to landscape level, although the complexities and risks increase with scale.

In a World Bank-funded project in Brazil (Parana Land Management), the use of the micro-watershed as the project's geographical planning unit permitted farmers and extension workers to better understand and synthesize the land management problems and solutions. Planning at the micro-watershed scale stimulated the integration of the participating institutions and the organization of the farmers around a common objective. It motivated group discussions and participatory action and allowed more rational use of human and financial resources. Once a watershed management plan was created, annual work plans were agreed upon with well-defined responsibilities for implementation agencies and beneficiaries

² Adapted from an unpublished World Bank report, Watershed Management Operations: Approaches and Emerging Lessons", May 2006.

An example of an NGO involved with community-based watershed management is the Watershed Organisation Trust, based in Maharashtra, India. According to their website, "WOTR is a committed development support team that motivates and empowers rural men, women and children and other organisations for integrated watershed development and enhancement of quality of life on a sustainable basis" (www.wotr.org). By working directly through local communities and partner NGOs, WOTR and other similar organizations are able to maintain a focus on participatory processes, with less emphasis on meeting project targets.

One very popular element within nearly all watershed efforts, whether or not government agencies are involved, is the formulation of a watershed plan. Whether the location is rural India, China, Colombia, or the United States, planning is a logical first-step and is particularly important as an initiating activity around which the watershed stakeholders can gather and discuss their views (see Box 2).

2.2 Watershed-level negotiations. Convening a general meeting where concerned citizens can present their views and listen to others, is a very basic, and indispensable approach to coordinating the management of watershed resources. Such meetings can be organized by anyone, although stakeholders with a widely recognized standing in the watershed are more likely to attract meaningful participation from other stakeholders. Typically a government agency convenes this type of meeting, but it could also be an NGO, a temple, a political leader, or a water user association.

The advantage of a general meeting is that, aside from the meeting itself, there is no organizing or fund-raising that needs to be done. While stakeholders may wish to make preparations for the meeting, or even conduct research, a meeting does not require advance work. A series of meetings might lead to an informal organization, and perhaps eventually to a formal organization (See Option #3, below). As with the community-level watershed groups, the formulation of a watershed plan can serve as the focus for a watershed-level meeting, or the meeting could revolve around some particular issue of concern (e.g., water quality). Two closely related approaches to watershed-level meetings are the "negotiated approach" and "multistakeholder platforms". Each of these approaches has attracted a body of literature (see the Suggested Readings at the end of this module).

*The Negotiated Approach*³. Negotiation occurs at and between the local, regional, national, and international governance levels. The 'negotiated approach' includes and responds to local initiatives. It starts from the basis that management policies should build on existing local practices of integrated land and water use. It recognizes the potential of local resources and knowledge to meet the challenges of integrated water management. It does not call for decentralization or the implementation of the subsidiary principle. These are essentially top-down approaches that would allow local stakeholders to take only those decisions that

³ Taken from *River Basin Management: A Negotiated Approach*, published by BothEnds and Gomukh, 2005, p. 17.

directly concern them. The negotiated approach calls for the reverse, allowing local actors to develop basin management strategies specific to their local context, which are then incorporated in the larger basin management plan. This allows their knowledge to influence regional and national decisions, ultimately resulting in a truly bottom-up process of policy development and management.

It is possible to adopt a negotiated approach within any existing legal and institutional framework. In fact, negotiated approaches are both about developing appropriate legal frameworks and participatory platforms as well as putting in place an integrated, bottom-up approach to IRBM.

Box 3

Negotiated Approach in Peru

In Peru, the diversity of stakeholders makes sharing water a complex issue in which class, ethnicity and gender issues figure prominently. Over the past ten years, AEDES has initiated round-table negotiations, called mesas in Spanish, with many different stakeholders, which have helped resolve several issues and re-established communication between various stakeholders. Now, these mesas are being connected with regional and national water negotiations, amongst others through the nationally operating Institute for the Promotion of Water Management (IPROGA). The innovative mesa is a distinctive element of this initiative. Private individuals as well as public institutions, including the city mayor and CSOs, are part of working groups for policies and programmes related to water resources development, allocation and management. The 'mesa' is used for negotiating with state authorities about changes in existing laws related to land and water use.

*Multi-Stakeholder Platforms (MSPs)*⁴ are a logical companion to Integrated Water Resource Management (IWRM), integrating

- Relations between surface and groundwater, quantity and quality
- Relations between water and land use (environment)
- Relations between water and stakeholder interests
- Relations between water-related institutions

Integrating these four dimensions requires a radical change in the culture of water management. After all, IWRM is not just the sum total of all the isolated facets of water management; it requires a totally different, de-compartmentalised institutional set-up. Boundaries between use, functions, disciplines, experts and lay people need to be torn down, while administrative boundaries must give way to unified management at catchment level.

⁴ Based on Jeroen Warner (2005): *Multi-Stakeholder Platforms: Integrating Society in Water Resource Management?* (<http://www.scielo.br/pdf/asoc/v8n2/28602.pdf>).

But what actually **makes** a multi-stakeholder platform? A widely accepted definition defines a platform as a 'decision-making body (voluntary or statutory) comprising different stakeholders who perceive the same resource management problem, realise their interdependence for solving it, and come together to agree on action strategies for solving the problem'. It is like a roundtable, where people are gathered with very different perspectives. When people come together in platforms, they have multi-stakeholder dialogues. A multi-stakeholder dialogue is not just a conversation, but an interactive approach to getting things done - 'a contrived situation in which a set of more or less interdependent stakeholders in a resource are identified and invited to meet and interact in a forum for conflict resolution, negotiation, social learning and collective decision-making towards concerted action'

Box 4

Public Hearings as a Multi-stakeholder Platform⁵

Public hearings if used in the proper sense and vision can serve as powerful tools for people to voice their concerns on issues affecting their resource base and livelihoods, generate public opinion and reduce the gap between the actual felt needs of the people and the projected needs of the policy makers within the formal Government framework. Public Hearing is perhaps the only formal institutional platform, which can bring both the upstream and downstream river dependents together to address their problems to the Government directly.

2.3. Formal Watershed Organizations. The challenges of integrated watershed management may be more complicated than can be handled through infrequent meetings of stakeholders. In some situations, there is no substitute for a formal organization which focuses exclusively and holistically on the watershed. In Europe, watershed organizations are becoming part of the standard approach to water management (see Box 5). In the United States, the Environmental Protection Agency is promoting the

Box 5

The European Approach to Watershed Management

In the *European Union*, integration at the watershed level is an important part of a “nested” planning approach promoted through the EU Water Directive. For many European countries the watershed is viewed as the starting point for sustainable water management. For example, *France* has created a water parliament system where government has modified its water management role from central controller to facilitator of local decisions in the context of river basins and watersheds. A management authority for the basin develops policies and plans that address basin-wide problems. These provide guidance to the management bodies of smaller, nested watersheds, which develop detailed action plans tailored to local conditions.

⁵ National Workshop on *Deliberative Democracy –negotiated development: Prospects for multi-stakeholder platforms (MSPs) in water resources management in INDIA*, edited by Shriprakashsingh Rajput, February 2003, p. 17 [Full document available through the MSP portal; see Suggested Readings.]

establishment of watershed associations as a means of protecting water quality, and many of these watershed groups also serve as a forum for discussing inter-sectoral water allocation. But outside of Europe, watershed associations as management entities, representing the full range of watershed stakeholders, and with some degree of authority over land and water use, remain a rarity (see Box 6).

Box 6

The Need for Watershed-Level Organizations in India⁶

In recent decades, various agencies including state governments in the Indus-Gangetic Basin upper watersheds, have invested tremendous effort and resources to build local organizations, seeking to institutionalize farmer user groups, water user groups and other community based organizations. The major shortcoming of these resource-specific institutions, however, has been their ineffectiveness in resolving inter-sectoral conflicts. As a result, these institutions have not been able to address the problems of resource management at a watershed level due to the increasing complexities of managing multiple natural resources. For example, each year landslides triggered by haphazard road construction activities wreak untold damage to forests, agricultural land, irrigation infrastructure, and human settlements in the hills of Nepal and India. Effective watershed-level management would help in reducing such calamities.

With increasing focus on integrated natural resource management there is a need for watershed level institutions to facilitate integrated approaches to the management of natural resources.

What do formal watershed organizations look like? The most typical case would be an organization that has no basis in water law, and no special authority granted by government except that it is recognized as a legally constituted organization. The organization may evolve from meetings and negotiations (described in Option #2, above), when a few of the more active stakeholders decide that a formal organizational structure would be preferable to ad hoc meetings.

There are many similarities between a watershed association and a typical WUA: They are both non-governmental, non-profit, representative organizations. Their mission is to ensure sustainable water (and land) management to all members, or residents, of the watershed. An important difference between a watershed organization and a WUA is in the control of the resource. While most WUAs can control water deliveries below the intake point, and can impose sanctions on water users who do not follow the rules, watershed organizations rarely have any real control over their members. The inherent weakness of a watershed association which has no authority, becomes a strength in serving as a neutral place for discussing water allocation, land use regulations, and other potentially controversial issues. An association that has no real power is also easier to establish, as it is not obviously threatening to existing agencies or powerful individuals.

⁶ Adapted from, "Forest-Watershed-Irrigation Linkages: Policy Support for Integrated Management," by Dhruva Pant and Christopher A. Scott; IWMI Proceedings on *Water Management Challenges*, 2005, p. 260.

Box 7

The Santa Fe Watershed Association (USA)⁷

The Santa Fe River flows from high mountains to the East of Santa Fe City, and runs easterly to the Rio Grande, about 65 kms from the headwaters. In this arid region, the river was the reason that the early Spanish settlers established the city in the 17th Century, yet today the river is dry. Its waters are impounded in an upper watershed reservoir which supplies drinking water to the rapidly growing city. The once thriving agriculture sector which supported more than 30 small-scale canal irrigation systems diverted from the river, has been reduced to only three canal systems fed by downstream springs. Nearly 100% of the watershed yield goes to urban water supply.

In 1997 a group of environmental activists established the Santa Fe Watershed Association in an attempt to restore the health of the river. While the immediate focus was on environmental flows, this concern quickly led to issues of stream channel rehabilitation, erosion control along the intermittent tributary streams, and forest management in the upper catchment. But while the physical management activities are useful for public awareness, the most important contribution of the Association is as a forum to discuss water management. The problem of future water availability has no easy solutions, and the objectivity of this non-governmental forum is essential to promoting open dialogue about options and trade-offs.

The same skills required for establishing a WUA can be re-used in establishing a watershed association: organizing a core group of interested stakeholders, identifying one or more community leaders to support the cause, formulating goals, a vision, a mission, and an organizational charter, etc. Problems of financing the watershed association can be minimized by relying on partner organizations (including the WUAs) to provide in-kind services (e.g., office space, clerical help, etc.). The temptation to simply broaden the scope of the WUA to encompass watershed management, should be resisted, however. The moral authority of the watershed association derives from its independence from any one group of stakeholders, and that independence is the foundation from which the association can be effective.

3. Conclusions

The fact that a WUA has the capacity to launch a watershed association is not in itself a reason to do so, but the option should at least be considered. Irrigated agriculture is nearly always the biggest water user within any given watershed, and it is also under the most pressure to use less and less water in favor of other sectors. WUAs have both an incentive (to safeguard their water quantity and quality) and a natural legitimacy (as significant water users) to take a leadership role in watershed management. The WUA's response to the challenge of the watershed might take the form of establishing a new organization, organizing watershed meetings, or working with local community groups in one part of the watershed.

⁷ For more information see the website: www.santafewatershed.org.

Examples of Watershed Organizations

Case 1. A pilot river catchment organization in South Africa⁸

The Sand River Catchment in South Africa has its source in a mountainous area, and rapidly descends into a semi-arid region. The major part of the catchment area is lowland savannah. Available water resources in the catchment are insufficient to support the entire population and its current economic activities. Due to the colonial history of the country, where apartheid policies of ethnic segregation turned the area into ‘homelands’ for the black population, population densities are extremely high for a so-called ‘rural’ area. In addition, the conversion of the natural forest cover into plantations has damaged the riverine ecosystem. Consequently in times of drought river flows are reduced, wetlands dry up, and topsoil is lost. In sharp contrast to all the other places visited during the trip, the government in this area has chosen to decentralize water management. People’s participation, as well as sound environmental management, are the main pillars under this decentralized strategy. In fact, the National Water Policy and the National Water Act (1998) and Water Services Act (1997) include participatory water management marking a shift away from a solely top-down technical approach to water management to a more community-based one. The legal framework explicitly established the need for an ecological reserve and a minimum volume of water per capita as absolute priorities for water allocation.

According to the new laws all citizens have the right to be involved in the allocation and management of natural resources. However, after years of exclusion from democratic involvement people have little familiarity with this participatory process. In addition people lack a basic understanding of the ecosystem since they were forcefully displaced from their ancestral homes and prevented from earning a livelihood from their lands during the Apartheid regime. A lack of ecological understanding and wisdom cannot be filled by mere legislation.

Supported by the Departments of Water Affairs and Forestry (DWAF), and Agriculture (DALA), the Association for Water and Rural Development (AWARD) is co-ordinating the Save the Sand Project in the catchment. This project addresses the rehabilitation and sustainability of the Sand River, its tributaries and the catchment in an integrated and comprehensive manner. It recognizes the social dimension in the implementation of integrated river basin management.

⁸ Adapted from *River Basin Management: A Negotiated Approach*, published by BothEnds and Gomukh, 2005.

AWARD, which has also been involved in developing national policies, has been focusing on negotiated approaches for the management of water resources at the catchment level. The organisation has evolved several ways of involving local inhabitants in negotiated approaches to IRBM. In order to involve people properly, awareness raising and skills development are central. AWARD has developed and is implementing the so-called spiral model: a method of reflexive learning that adapts to the political and environmental context as well as to the specific stakeholder group. The spiral model ensures continuation in learning and caters to different needs of different interest groups. The project currently focuses on public participation where the water management cycle forms the basis for public involvement and negotiation.

This method allows for a targeted and gradual development of participation, using different stakeholder groups according to their interests and competence. Following its success, the Sand initiative has become the first pilot Catchment Management Agency in the country, setting an example to be copied in other South African catchments. Currently, SSP is supporting the creation of the Sand Catchment Management Agency, in which 14 representatives of different stakeholder groups will be nominated.

Case 2. Nan River Basin, Northern Thailand⁹

The Nan Civil Society Co-ordination Centre (NCSCC), which functions from within a small provincial hospital, has been working in the field of water management for ten years. Competition for water resources in the Nan basin exists at all levels, between different interests and user groups, between different users within communities, between upstream and downstream communities, between communities and business interests and between communities and state authorities.

Out of discontent with present, centrally-led policies that pay little or no attention to local needs and knowledge, the NCSCC has become involved in water management discussions. The NCSCC has studied the traditional ways of managing conflicts used by the indigenous peoples of the Nan basin, as a first step towards informing national and state level decision-makers. Their research shows how, given a chance to interact directly, communities resolve their problems and reach sustainable solutions. One of the NCSCC studies shows how villagers achieved their own voluntary compensation mechanism. The beneficiaries of the dam agreed to assign farmlands to the affected families. In a conventional, top-down system, such a step could have led to a permanent rift between the 'majority and minority' sections. The NCSCC-research is becoming the basis for local people's engagement in discussions with regional and national stakeholders on compensation, water-related legislation and water pricing.

⁹ Adapted from *River Basin Management: A Negotiated Approach*, published by BothEnds and Gomukh, 2005.

Case 3. Loess Plateau Watershed Rehabilitation Project (China)¹⁰

In the Loess Plateau in northern China, barren, heavily eroded hillslopes are the source of heavy sedimentation of the Yellow River, which is by far the most silted of the world's major rivers. Yet the area is also heavily populated, and the livelihood of the inhabitants depends on the sustainability of their steadily eroding land resources. Following a 2-year identification period to identify what improvements could work, the World Bank prepared a project, beginning in 1994, to construct terraces using local community involvement. When the soil can be contained, it is fertile and produces excellent crops. The climate is good for fruit trees, and the agricultural potential is high.

Project activities included terracing on slopes less than 25 degrees, tree planting on all available slopes, and check dams to trap the silt and create smooth, gentle slopes where crops can be grown. The project investment was shared by a government subsidy (33%) and loans to the farmers (67%). Planning was coordinated at the national, provincial, county, and village levels. Results have been dramatic and easily visible, creating a rapid momentum. Today over 3,000 villages are actively involved on 30,000 square kilometers and over 1,200 micro catchments. By the end of the second phase of the project (which started in 1999), the number of project beneficiaries will surpass 3 million people.

The project tackled land tenure and grazing rights issues simultaneously with introduction of new agricultural and conservation practices, in concert with local government efforts. The farmers participated at all stages, organized according to micro-catchments of one to 3 villages, initially through participatory planning and then in implementation. Within two years, crop yields doubles and even tripled in some areas.

¹⁰ Adapted from an unpublished World Bank report entitled, "A Watershed Approach to Rural Development," Dec. 2000.

Suggested Readings and Resources

New Strategies for America's Watersheds (1999) [Full text is available on-line in HTML; Summary is available as a PDF file]
<http://fermat.nap.edu/catalog/6020.html#toc>

US Environmental Protection Agency "on-line training in watershed management"
[many downloadable modules on various aspects of watershed management]
<http://www.epa.gov/watertrain/index.htm>

Watershed Organisation Trust in Ahmednagar, Gujarat (India) is a "best practice" case of local watershed development (with substantial external financing) and now promotes innovative watershed development.
<http://www.wotr.org>

Multi-stakeholder Platforms portal:
This site contains a wealth of detailed information about participatory planning exercises, as well as studies of MSPs.
<http://portals.wi.wur.nl/msp/>

Negotiated Approach:
Gomukh (India) and Both ENDS (Netherlands), together with seven partner organisations, present innovative, locally initiated basin management strategies, that show how bottom-up, ecosystem-based approaches are replicable and can be up-scaled to effectively influence decision-making on a national and basin level:
<http://www.bothends.org/strategic/RBM-Boek.pdf>