

Participatory Water Allocation: A Survey of Definitions, Frameworks for Analysis

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Intro

The management, use of, and access to natural resources are at the cornerstone of a community's development. In particular, freshwater is increasingly the world's most limiting resource; Accessible freshwater accounts for only 0.4% of the world's total water resources and is unevenly distributed across ecosystems, national borders and cultural divides. Nevertheless, water is key to all aspects of life and paramount to sustainable development initiatives throughout the world. The variability, allocation and quality of freshwater resources are fundamental to food security, sanitation, economic growth, disaster mitigation, human survival, and ecosystem health. Because of this, endless time, money and manpower is allocated to developing technologies and strategies surrounding water resources management. This paper surveys the most recent global trend of collective action and stakeholder participation regimes in the water sector. The object of the paper is not to define "successes" and "failures" of the management approaches, but rather to synthesize relevant terminology and frameworks for analysis within the regimes, present a broad overview of "pros" and "cons", and relate these to the eventual use with specific case-studies in Latin America, such as the semi-arid region of the Brazilian Northeast.

In the following section, I will look at the components and definitions that transgress natural resource management literature concerning decentralization and stakeholder participation regimes. In the section "Analyzing Participatory Institutions and Systems: A Survey of Frameworks" I present some of the analysis tools and variables considered key for the analysis of collective action and stakeholder participation. The next section, "Participation and Water Resources", investigates the specifics of participatory systems that are specifically relevant, and/or commonly applicable to water resources management, which is followed by the sections "Analyzing Water Resource Management Regimes". This section concludes with suggestions of further incorporating policy methodologies into regional efforts of water management, with the hopes that future research will use this as an outline for better understanding case studies of participatory water management regimes in the Northeast of Brazil and other regions.

Decentralization and Stakeholder Participation: Components and Definitions

Globally, there has been a movement in the past twenty to thirty years towards the “decentralization” of environmental policy and the incorporation of local stakeholders in guiding and implementing natural-resource allocation, management, and use strategies. The question then arises: what are the underlying goals of the shift in management regimes? And are the goals being met? This paper is not going to explore the latter, complexities of regime analysis, however, the former question is key to the local development of analysis frameworks. According to the World Bank, one of the world’s leading funders of water-related projects:

The GOAL [of decentralization] is greater and more equitable control over resources, amplifying the range of options the less privileged people have (e.g. women, ethnic minorities, the landless), enhancing their involvement in policy making processes at the regional or national levels (providing space for more people to make their voices heard), as well as of improving the quality of their involvement (Vernooy, 1998).

The idea of community management and stakeholder participation, as according to Lammerink et al., is of partnerships between supporting agencies and communities: One in which both parties share the managerial responsibilities of the resources at hand. Consequently, the actual structure of the management relationship will vary and should be structured according to local variations in scale, stakeholders, and the specifics of the relevant natural resources.

Although decentralization policies are often mistakenly equated with increased foci on the participatory process, the two are not synonymous; It is important to make the distinction between the two. Decentralization, however, is often seen as a process that creates an environment for local-level participation (Jordans, 2001). Accordingly, it is important to consider the structure and incentives behind both decentralization and participatory action and the relationships formed/disbanded between government agencies and other stakeholders. For instance, what is the response and view of agency staff in having to deal with/outreach to local participants? How do they view the “transfers of power”? What are the capacities of stakeholders and what roles are they assuming in the new institutions/relationships being created? What are the limits of the current institutions (in regards to the goals of resource management for the area) and how are the development of partnerships, collaboration and enlargement of the relevant set of actors supplementing these institutions?

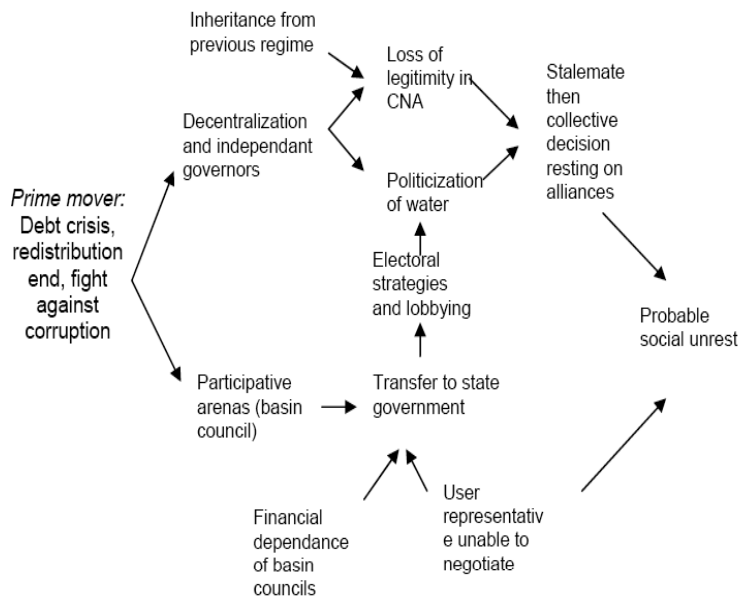
Agency support of participation requires bureaucratic reorientation toward a more service-oriented approach within the agency. Securing this support requires structure of incentives and training programmes, including for example study tours. (Jordans, 2001: 5)

Regardless of the system, as the above comments show, there are specific ‘needs’ that are commonly associated with decentralization and participation in resource management. In addition to structural adjustments, the actual management system calls for adaptive management—defined as a continuous process of design, action, monitoring and evaluation, and reflection and revision; As resource users learn more about their ecological and social systems, they may change their ideas about desirable and feasible resource

management alternatives. Furthermore, the actions and interactions of different stakeholders during the learning process have impacts—intended and unintended—on the systems, changing the set of desirable and feasible management alternatives, including the processes of decentralization and participatory management.

As Figure 1 below outlines, there are many causes and effects of social participation and decentralization in natural resource management. According to Mollard, some of the primary motivations behind these processes are issues of debt and corruption within government systems, the politicization of natural resources, and previous regime examples.

Fig. 1: Causes and effects of social participation and decentralization



(Mollard, 2004)

Accordingly, there are multiple ‘theoretical advantages’ of partnerships between government systems and local citizenry, which include the systems ability to address environmental problems outside of scope of centralized regulations, the incorporation of flexible policy tools for addressing environmental impacts, and the potential for more cost effective processes (Mollard, 2004). Another important component of the development and functioning of participatory management systems is the incorporation of regional “cultural capital” into the processes; The preexisting social and economic structures need to be incorporated into both the structure and implementation strategies associated with decentralization and participatory management:

Recovering these practices means preserving social and economic structures of reciprocity (mutual help, shared management of resources, etc.) and of redistribution that allow them, as well as the human values, which proceed from them. Maintaining and reproducing these

human values requires that the name, the knowledge and the gestures of the local actors, peasants, fishers and craftsmen be acknowledged. Their social being, their statute and their prestige depend on this...Transforming the nature of these practices, free and voluntary, might accelerate their disappearance (particularly if such a remuneration should come to disappear) or simply lead to the dismantling of social and economic structures of reciprocity and shared managing which regulate them by modifying the nature of rules and values (Sabourin, 2004.).

The example above speaks to the delicacy of incorporating new regulatory structures into the local context. As heretofore mentioned, there are many variables affecting the development and implementation of decentralized and participatory processes. Some results are considered 'positive', however, there are numerous potential constraints as well. Although the goal of this paper is not to outline the "successes" and "failures" of partnerships, but to better understand the criteria and frameworks available for analysis and the development of these systems, it is important to look at the many interpretations and varying implementations of the "decentralization" process. In some cases, this process is seen as an illusionary shift in responsibility and power from higher bodies to lower bodies, in which the former maintains rights to alter and/or negate agreements made (Leach, 2004). Additionally, critics of the process do not perceive the goal of "amplifying the range of options the less privileged have", as mentioned above, as an end result of the process:

Critics see devolution as a threat to democracy—a way to shift power from elected representatives (and the public administrators they appoint) to local groups of self-appointed stakeholders pursuing parochial interests. Some view devolution as a violation of the public trust in which state and federal agencies staffed by professional experts transfer their regulatory authority to eager (but unsophisticated and overextended) "interested citizens" and "volunteer monitors." Other critics of devolution fear that, in collaborative settings, polished and highly paid representatives of industry or government might intimidate of dupe environmental advocates, who generally are volunteers and laypeople (Leach, 2004: 1)

As Leach points out in the above quote, there can be structural inadequacies in the decentralization process. Additionally, increased stakeholder participation and decentralization is often developed when resources are already experiencing increased use pressures, degradation or related conflict (Sithole, 2000). In the face of many uncertainties surrounding the decentralization and participatory processes, the trend towards these environmental policy regimes remain and are seen by many to produce viable, sound policy systems:

Thus we are faced with a theoretical puzzle: despite the long intellectual and policy tradition of creating centralized institutions to deal with conflict between local actors, why is the policy process moving toward cooperative, decentralized institutions, and what factors make these solutions viable? (Lubell, 2002: 148)

As the above quote presents, questions remain: What factors make participatory, decentralized regimes viable? What are the specific components to these processes that are common throughout and contribute to the definition of decentralization and participatory management of natural resources? In the following section, these questions will be explored in depth through the compilation of multiple frameworks for analysis. Some of the commonalities that will be discussed are part of Ostrom's structural analysis of participatory resource management regimes, for example:

1. *What is the appropriate boundary for including those individuals who are the primary beneficiaries in jointly using or consuming particular collective goods?*
2. *What are the appropriate mechanisms for enabling individuals to articulate their demands for different quantities and qualities of local collective goods in relation to those who will represent their interests?*
3. *What mechanisms of revenue collection are fair and efficient means of obtaining the revenue to cover costs of such services?*
4. *What authority needs to exist to regulate the use of common facilities?*
5. *Which types of relationships to one or more public or private agencies will enable citizens to receive local services in an efficient, fair, and responsible manner?*
6. *What are the appropriate mechanisms for enabling those who represent consumers to articulate collective preferences to managers of producing agencies in an effective manner?*
7. *How do organizational arrangements affect the incentives and cost of monitoring the performance of production agencies?*

(Ostrom, 1983)

This section has provided an overview of definitions and components of decentralization and participatory management regimes of natural resources. We have seen how there is both controversy surrounding these two concepts and a diverse literature entailing key components of the processes and those necessary to promote the applicable "goals". In the following section, I will look at some of the methods for analysis presented in current literature surrounding participatory regimes/institutions.

Analyzing Participatory Institutions and Systems: A Survey of Frameworks

As was seen in the previous section, there are many contributing factors in the development and implementation of decentralization and participatory resource management regimes. These include: issues of power sharing between government and other stakeholders, the structural arrangement between contributing members, the temporal relationship between environmental factors and policy formation/structures/etc, and the integration of social networks and regulatory structures. In addition to these factors, it is important to understand the methodologies used to analyze the efficacy of variables heretofore mentioned. Ostrom et al identify several important concepts of the study of such institutions involving what she terms 'collective goods', which are often those natural resources that are subject to management through the processes of decentralization and participatory regimes. Firstly, she emphasizes the need to understand the specific characteristics of the collective goods. Secondly, she emphasizes the

separation of consumption and provision activities from those associated with production activities (a separation of supply and demand). In particular, Ostrom argues for a need to emphasize the provision, not production side in that voluntary arrangements often associated with participatory management regimes are likely not sufficient in order to:

1. Obtain revenue in a fair and equitable manner;
2. Articulate demands;
3. Allocate the goods and services to some individuals and exclude others;
4. Regulate the patterns of use among the community of users; and
5. Monitor the performance of producers.

Lastly, Ostrom underlines the importance of analyzing how the aforementioned attributes of the collective goods affect the organization for both production and provision (Ostrom 1983: 4). Similarly, Sithole prioritizes the **definition of terms** at hand, understanding the **dynamics of stakeholders** and how these contribute to the processes of decentralization and participation, and laying out the **driving forces** behind the decentralization process as key to the analysis of these regimes (Sithole, 2000). Likewise, it is also important to understand how **stakeholders' roles** shift and transform within the process itself.

Although Ostrom and Sithole do comment on key components which contribute to the general processes of decentralization and participatory resource management, Leach's framework for analysis of the participatory resource management regime presents a concise, broad-reaching methodology for analysis of these systems. As is seen in the following description, he uses six main categories to evaluate a participatory regime, including: inclusiveness, representativeness, procedural fairness, lawfulness, deliberativeness, and empowerment. These criteria are quite useful as components for qualitative analysis, however, the author's attempt to apply quantitative components to these categories was not convincing. Following, is an in-depth description of the above-mentioned components of participatory natural resource management as outlined by Leach:

1. **Inclusiveness**

An inclusive process places few formal restrictions on participation

- Is participation open to all or are there participation and "entry rules"?
- If there are rules, how are the rules established? By whom?
- Who is the "gatekeeper" and monitoring/enforcing rules?

2. **Representativeness:**

A representative process ensures that the interests of all affected individuals are effectively advocated, either in person or through proxies

- Resource constraints will often preclude certain people/user groups from participation (distance, time, economics, etc);
- Shifting the burden from the government to the citizenry; and
- Different effectiveness level of each interest's representatives (and intimidation).

3. **Procedural Fairness:**

A fair process treats all parties equally and respectfully, gives each part an appropriate degree of voice and influence, and establishes clear procedures for collective decisionmaking

- All parties being treated respectfully and perception of equality is key;
- Clear rules of decisionmaking contribute to perception of “fairness”; and
- Transparency can increase confidence.

4. Lawfulness:

A lawful process seeks to uphold the letter and spirit of all existing laws and regulations

- Fear that agencies will become too focused on committee and forget the “larger picture”; and
- Are the collective management institutions contributing to the greater effectiveness of legal mandates? (supposedly representing “people’s mandate in a democracy”).

5. Deliberativeness:

A deliberative process allows participants to brainstorm, examine each other’s assumptions, identify common interests, build a shared knowledge base, and develop mutual trust and empathy

- Devolution will help to spur creative solutions and outside-of-the-box thinking; and
- Communication is usually focused towards interests, not policy positions.

6. Empowerment

An empowered process enables participants to influence the decisions of elected officials or public administrators

- Direct contact between users and issues.

(Leach, 2004:1-4)

The above criteria, although there is some overlap between the components, are fundamental to developing a methodology for analyzing a participatory resource management structure. However, these components do not take into account the importance of scale in the analysis of any type of environmental policy regime. Ostrom comments that as user-groups get larger in scale, the analysis and monitoring of actions become more difficult; There is often a need for external monitoring and “cost-sharing” institutions to aid in the participatory process (Ostrom, 1983). Accordingly, she argues that as groups get larger, the organization is also not effective under voluntary arrangements in that the individual becomes “anonymous” in the crowd and the “share” of the individual becomes insignificant in reference to the greater group or larger stakeholders:

Thus, each is tempted to free ride unless each can be coerced to contribute a proportionate share of the cost. Collective good situations usually require access to some form of coercive action where each individual can be compelled to share in the costs. The advantage may be such that each user has incentives to create arrangements so that each user pays a proportionate share of the cost: the aggregate benefit exceeds the aggregate cost (Ostrom, 1983: 7).

As is shown in the above remarks from Ostrom, the scale of the participatory regime is key to the structure and implementation of resources management. The number of stakeholders and methods for determining group-size for environmental policy are key to the functioning of the system on all levels. As we will see in the following section, this is particularly true in regards to water resource management, in that the resource does not often follow political or even cultural boundaries and can vary greatly in scale. In this section, I have compiled some of the key components of methodologies for analysis of decentralization and participatory resource management regimes. In the following section, I will continue to use concepts from these methodologies and combine them with some of the specific components of water resources. As was mentioned in this section, we will see how the nature of the resource is key to development of environmental policy and management regimes.

Participation and Water Resources

The use and provision of water resources are highly complex issues. In many developing countries, water systems agencies face enormous obstacles in the implementation, operation and maintenance of water resources to often disperse water systems. In many instances, the commitment and collaboration of users to varying aspects of existing systems are key to provisional institutions. As was heretofore mentioned, many agencies are shifting roles in regards to resource management through decentralization, resulting in many moving from providers to facilitators of communities. In this section, I will look at some of the components of these shifts, as well as, components of participatory water resource management. Accordingly, the concepts and implications of “decentralization” and “participatory” in regards to water resource management are repeatedly discussed in the following sections. Following the frameworks for analysis outlined in the previous section, I have created working definitions of these concepts below to be used throughout the remaining sections:

Decentralization of Water resources

Decentralized management incorporates the ‘subsidiary principle’, where decision processes flow across spatial scales and there is some transfer of control and/or responsibility from federal management issues to the levels most local relatively next to the citizen (cities, hydrological basins, etc.) (Magalhaes, 2001).

Participatory water management

Participatory water management is one that does not rely solely on government control, rather incorporates the participation of multiple sectors of society, including water users are civil society representatives (Magalhaes, 2001). The participatory management of water resources infers the collaboration of stakeholders to identify priority limitations, evaluate potential solutions, make recommendations, and monitor and evaluate impacts of decisions (Johnson et al, 2001).

Watershed partnership:

According to Kenney et al., a watershed partnership is defined as:

A primarily self-directed and locally focused collection of parties, usually featuring both private and intergovernmental representatives, organized to jointly address water-related issues at the watershed level or a similarly relevant physical scale, normally operating outside of traditional governmental processes or forums, and typically reliant on collaborative mechanisms of group interaction characterized by open debate, creativity in problem and solution definition, consensus decision-making, and voluntary action. (Kenney et al., 2000: 2)

Additionally, Johnson et al. notes that effective participation in watershed resource management often requires flexibility in the stakeholder identification of boundary and scale for participatory organization and institutions. Depending on the size of the community, watershed, or political/economic district, there also may be a need for “second-level” organizations in order to fulfill watershed management goals and needs:

Participatory watershed management will often involve a process in which stakeholders jointly negotiate how they will define their interests, set priorities, evaluate alternatives, and implement and monitor outcomes (Johnson et al, 2001:4).

Partnerships at the watershed level often serve as institutional settings that bring together diverse usergroups for negotiations concerning the use of common pool resources (CPR). However, the presence of multiple ‘collective-choice’ or participatory institutions on differing, but dependent, scales (i.e. state and federal) may compete with the interests, responsibilities, and implementation of the watershed partnership (Lubell January 2002). As was mentioned in the previous section, the scale of the partnership is key to the components of the resource management regime. In regards to water resources, there appear to be many differing theories on the efficacy of grouping in reference to the spatial components of the resource itself, social groupings, political boundaries, etc.

According to Lubell, watersheds themselves provide a naturally-defined unit for the analysis of partnerships, in that they have an inherent spatial scope that contains many of the resource-related issues (Lubell et al., 2002). Watershed management, according to Johnson et al, is about ‘managing the invisible’, where outcomes of management processes and their effects on the resource are often incremental, or unnoticeable in the short-term. Subsequently, it is often difficult for these processes to be self-sustaining, in that participants cannot readily observe the results of their efforts. The role, then, of research concerning participatory watershed management is to ‘make the invisible visible’ through outreach, monitoring, and other methods (Johnson et al, 2001). In order to guide this research, there are key issues relating to the watershed that must be understood and defined before research and analysis can take place. Similar to those frameworks reviewed in previous sections, there is a lot of literature concerning these issues, presenting varying views on those topics critical to watershed management and the participatory components maintained within. Three topics of particular relevance are:

- *Scales and boundaries;*
- *The roles and costs of facilitation; and*

- *Development of indicators and monitoring systems so that the impacts of changes in land use can be assessed by the group.*

(Johnson et al, 2001:5)

In the following section, I will explore the above ideas in greater depth, with emphasis on the watershed and the groupings within the watershed as the chosen spatial scales of reference. In the remaining parts of this section, I would like to further outline some basic assumptions that are often made concerning water management regimes, as well as, how these assumptions and observations may affect the development and implementation of participatory water management techniques. Below are some of the key assumptions that are relevant to most water systems that are important to keep in mind throughout:

1. *There are differences in the types of water sources available to different groups;*
2. *Rights to water from different sources need to be conceptualized for different uses and for use at different scales;*
3. *There are fundamental differences between different types of stakeholders about the nature of their understanding and need for certain types of rights to water; and*
4. *Existing relations between [usergroups] are not accommodative of each other's requirements for water.*

(Sithole, 2000:8).

One of the arguments for participatory watershed management is that “top-down” approaches are often externally driven, and are either non-reflective of the realities of local populations, or they fail to acknowledge the value of already-existing systems. Much of the literature reviewed commented on the subsequent, potential advantages of increased stakeholder participation and organization on the watershed level:

Supporting a more prominent role for communities as managers of improved water supply systems has several advantages. It can lead to greater efficiency in system performance, improve cost-effectiveness for both communities and agencies and has better prospects for the long-term sustainability of water supply systems (Limmereck, 1998: 25).

As is heretofore mentioned, the potential benefits, as well as the withdrawals, that are associated with both the decentralization process and increased stakeholder participation are not the focus of this paper. However, it is important to mention the results of relevant regimes and understand how they relate to the development of other water management systems. For example, the conclusions above denote a strong relationship between increased user participation in water management and increase efficiency and sustainability. Observations such as these are quite prevalent in those international aid agencies that are funding water-related projects throughout the developing world and are, therefore, key to understanding the importance of understanding the methodology of analyses for water-related management regimes:

As a result there is a growing trend in most countries in the South to encourage rural communities to manage their water supply schemes. Support agencies also promote decentralization and greater community involvement in decision-making and management,

placing more emphasis on water resources management on the lowest appropriate level (Limmereck, 1998: 25).

Implementing a participatory water management process involves the transformation of roles and power structures within a community and across communities and institutions. Sithole warns that some national governments have used the universal push towards participatory water management structures to ignore their local-level responsibilities and that, oftentimes, governments retain a “power of veto”, not actually ceding any national-level or governmental power to other stakeholders. This creates a situation where local populations are unfairly “burdened”, while gaps remain in water resource management structures and programs (Sithole 2000). Increased participation in water management does not promise equity in the allocation, use, or availability of water resources in a community or watershed. An example of this is in the case of a Zimbabwean, participatory irrigation scheme below:

The way water especially excess water will be allocated seems to still favour those with infrastructure namely the white commercial farmers and the state who previously had monopoly over water anyway, therefore, rural farmers representing waterboards and subcatchment councils do not see what and how they are going to be involved in the consultative process. As one participant from Goromonzi district council stated, “such consultations involve rural people so that we hear first hand how they are giving each other water so that when we question it, they will say, but you were there, how can you fight such a system?” (Sithole 2000:8).

It is important to note the biases that exist within a system, particularly when analyzing regimes for issues of equity. There are many questions that need to be asked, including: Do the participants/stakeholders have equity in the amount of power allocated to committee decisions and how are their needs are represented within this power? Additionally, it is important for researchers, funders, and stakeholders alike to keep in mind that the results of management regimes do not translate equally across landscapes, political boundaries, and differing ecosystems; Not only are the general components of the water management regime important, but also the locally-specific details and flexibility of the system are key to its overall function.

In this section, I have discussed some of the general terms and components of participatory water resources management. Furthermore, I have attempted to relate these components to the importance of organized research initiatives used to assess the functioning of these regimes. In the following section, I will take a closer look into suggestions for frameworks in the analysis of water resource management regimes.

Analyzing Water Resource Management Regimes

Research into the watershed must be done at various scales “ecosystem approach” and balance with social and administrative scales. Accordingly, one must reconcile socially-defined boundaries with physically-defined barriers, while understanding the institutions and technology available at various scales. The extensiveness of water resources and the

subsequent interdependency of user groups at the watershed level allow for increased stakeholder participation in the development and implementation of watershed management practices. As was discussed in the previous section, exclusion within the watershed may allow for the dominance of powerful stakeholders and less of a regard for the system synthesis and equality within the system, also leading to inequity in costs, allocation, and use of water resources. The involvement of civil society and other stakeholders in the management of water resources depends greatly on the guarantee of access to information and motivation. Furthermore, the development and maintenance of individual confidence, while understanding the 'local identity' and how this relates, or doesn't relate, to the 'regional' or 'national identities' is key (Dino). Still, many questions remain: Who maintains authority and how is legitimacy established within the system? At what levels? What are the types and qualities of the interactions between relevant agencies? How do the "partnerships" change in the face of water scarcity? Surplus? (Mollard, 2004).

The assessment of the impact of participatory water management regimes relates to the degree with which established objectives are achieved, and thus focuses predominantly on technical, productivity and financial impact. The categories of performance indicators typically used in the literature are therefore:

- *Technical impact/sustainability of the schemes (water availability, equitable distribution, expansion in irrigated area, efficient delivery of water, improved upkeep of systems and environmental protection);*
- *Productivity impact/direct benefits to the farmers (the tangible benefits of increased yields, increased food production, intensified cropping patterns, and improved farm incomes, household food security); and*
- *Financial impact (reduced irrigation costs and increased cost recovery).*

(Jordans, 2001: 11)

Water allocation without clear land-use rights and practices is uncertain; The two are very closely interlinked and inclusion of the understanding of property right schemes and their relation to water resources is very important (Jordans, 2001). According to Jordan's framework for analysis of Water User's Associations (WUA's) and their role in irrigation system performance and rural poverty alleviation, there are two main categories of factors that contribute to the performance of WUAs: *Internal* and *external*, of which the former includes policy, environmental and socio-economic factors affecting water use, incentive structures, etc. And the latter, which includes the origin of WUAs, specific conditions of the association as well as info on internal dynamics of the association or committee:

Policy and governance factors:

- *Policy environment*
- *Agency support and incentives*

Physical and technical factors:

- *Water availability*
- *Technology and infrastructure*
- *Social and economic factors*

- *Local social organization and local power structure*
- *Farmer incentives*
- *Financial viability*
- *Land tenure situation*

(Jordans, 2001: 3)

According to the analysis of community-based watershed management in Central America by the World Bank's CBRNM Initiative, there are specific requirements for the sustainable management at the watershed-level. Their allotted requirements, which are undoubtedly reflected in their funding strategies and project evaluation criteria, assume that sustainable, participatory watershed management must include:

- **Identification of stakeholders** (*recognizing that stakes could change over time which requires a continuous analysis of the configuration of stakeholders and stakes*);
- *In order to allow the stakeholders to participate it is important to provide a **forum for analysis, discussion and negotiation** in which ideas can be exchanged and initiatives planned;*
- *An **appropriate level of community or grassroots organization**, based on managerial capacity at the local level involving both rural institutions (rules and regulations) and rural organizations;*
- ***Local-level monitoring of resource use** is required to ensure compliance and regulation;*
- *The **integration of government into the local planning process** so that interests and concerns are taken into account and the sourcing of technical assistance and know-how transfer;*
- ***Integration and concertation** are important objectives of the organizing process. The integration of planning efforts, from the farm to the micro-watershed to the watershed level, is the ultimate goal of developing more sustainable management practices. This requires bringing together the direct users of the resources who are living and/or working in the watershed;*
- ***Facilitators for analysis and action**, building bridges between local knowledge, local initiatives and forms of organization and external sources of information and resources (local people are often very interested in new knowledge but they frequently lack the channels to get access to it); and*
- ***Flexibility in technology development and organizational development** is required.*

(Vernooy and Ashby, 1998).

The CAPRI, 2000, meeting organized watershed management research into the following categories:

Collective action and property rights

- *Effective management requires coordination that includes various stakeholders use of and investments in water resources;*

- Collective management efficacy is directly dependent on extent of already-existing community organization and “social capital”;

Development of new organizations should play the role of increasing level of inclusion in already existing community organizations

- It is best to begin with social and administrative boundaries, not biophysical boundaries of watershed when making collective action organizations, etc Using social lines may help strengthen collective action;
- Administrative boundaries may aid in monitoring, financing, etc;

Segmentation into smaller groups and then collective action among these groups can allow for most effective action within watershed

- Insecure property rights can get in the way of collective action and reduce incentives for efficient/conservation, etc use of water resources;
- Forums for negotiation and conflict management are crucial due to diversity of user groups, etc.

There are many common themes within the frameworks for the analysis of participatory water management regimes. Again, the importance of defining both the terminology, as well as components of the natural resource, usergroups, institutional capacity and responsibilities, and other complex variables are key to the analysis of these systems. Furthermore, incentives can take on many forms, both quantitative and qualitative and both internal and external to the actual provision of water. In participatory systems, much depends upon the presence of sufficient incentives for stakeholders to participate and sustain ‘membership’; Participants must see a return on their investment of time, materials and associated fees (Jordans, 2001).

As was discussed in previous sections, the inclusion of stakeholders may promote alternative strategies to resource use and may strengthen those policies that are inclusive in nature. However, including participatory processes in negotiation, decision-making, management, and conflict resolution, is complex due to the need to look at social, institutional, economic and biophysical components. Within this, one must identify, document, and develop specific indicators to be used for the measurement and valuation of outcomes. Evaluation of water-related management regimes must take into account diversity of direct and indirect causes and be careful in attributing impact to watershed projects, in that many of the components are hard to quantify or measure.

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