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WORKING PAPER 107

# "Institutional Adaptation" for Integrated Water Resources Management: An Effective Strategy for Managing Asian River Basins

D. J. Bandaragoda

International Water Management Institute

FUTURE HARVEST
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# "Institutional Adaptation" for Integrated Water Resources Management: An Effective Strategy for Managing Asian River Basins

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# Abstract

In many developing countries, their governments dominate the field of water resources management. Even in "participatory irrigation management" efforts, the governments play a dominant role. As these efforts are rarely based on any internally generated demand from the water users, they usually fail to create viable organizations at the local level. A similar setback can be seen in the more recent institutional reforms in Asia's water sector, which are promoted by the donor agencies and, national and international development professionals. A survey of experiences in Asian countries shows that no country has successfully completed establishing new water sector policies and laws and river basin organizations, as prescribed.

The need to improve current performance of water resources management is widely appreciated. In managing the scarce water resources, a change in attitude and approach is seen to be essential. Participatory learning and action methods conducted in a study of selected river basins in five Asian countries surfaced a distinct need for coordination at the river basin level. They also indicated a clear stakeholder preference for establishing coordinating mechanisms, by way of adapting the existing institutions, as an initial step towards greater stakeholder control of river basin management. Essentially, cost-effective and contextually appropriate institutional arrangements were preferred over the prescribed standard models, in order to meet the varying needs related to integrated water resources management.

## INTRODUCTION

A persistently low return on investment in water resources development has been one of the major concerns among the donors and the governments of developing countries. Although the major causes of this low return could be related to the decline in real prices of agricultural commodities and the increase in real capital costs for water resource development (Svendsen and Rosegrant 1994:78), the effect of inefficient water management and uncoordinated water use cannot be discounted as another important contributing factor.

Tracing the cause of this inefficiency to a lack of institutional effectiveness in the water sector of these countries, the donors and other international development agencies increasingly promoted solutions associated with institutional reforms. The first spate of reforms was in irrigation water management, tried in several developing countries during the last two decades. Their main emphasis was on some form of decentralized management, usually with water users' associations taking at least part of the responsibility for water resources management (Uphoff 1993; Vermillion 1991).

Asian experiences in promoting participatory management through transferring at least some management responsibility to water user associations (WUAs) have been well documented (Pradhan and Sharples 1990; Bruns and Soelaiman 1992; Sakthivadivel et al. 1992; Uphoff 1992; Johnson et al. 1995; Vermillion 1996, 1997; Sarkar et al. 1999). A number of countries in Asia—Philippines (Korten 1989), Indonesia (Bruns and Soelaiman 1992), Sri Lanka (Uphoff 1992)—became known among the development professionals as "success stories" of irrigation management reforms, and were often mentioned along with other "successes", such as Turkey, Mexico and Colombia (Vermillion 1991 and 1997).

Research has shown that strategies to establish participatory irrigation operations can produce some real benefits, although most of such benefits are difficult to quantify (Meinzen-Dick 1994). Some also argue that the popularity in "farmer participation" has been mostly due to the received orthodoxy for irrigation reforms, but generally, the results have been disappointing (Merrey 1997).

The more tangible results of participatory efforts have mostly been in what the governments would like to see: higher rates of cost recovery, reduced capital and O&M costs, and reduced incidence of water thefts and water-related disputes. Though not totally unproductive in themselves, they however characterize the results of most pilot projects of irrigation management reforms, whereas instances of forming successful local organizations to take over actual management of irrigation systems have been rare. In none of the Asian countries whose participatory management attempts were reviewed, have the local stakeholders taken the initiative for any meaningful management responsibility.

The failure to realize the full benefits of participatory irrigation management was often attributed to policy and institutional constraints. The disappointing partial successes of irrigation management transfer, and the emerging institutional constraints against its further progress, encouraged the development professionals and donors to promote institutional changes in the whole water sector. Attention was drawn towards new water policies, laws, and organizations, with particular emphasis on using the river basin as the unit of planning. Prescriptions for water sector reforms, covering "sustainability", "integrated water resources management", "participatory approaches", and the use of the river basin as the unit of planning and management, started to appear at various international forums.

The 1987 report of the Brundtland Commission (World Commission on Environment) emphasized on the concept of "sustainable resources development", which was defined as "the process of satisfying society's current needs without jeopardizing the ability of future generations to meet their own needs". The Dublin Conference (International Conference on Water and

Environment held in 1992) has set out four guiding principles associated with water use, that, water is a finite and vulnerable resource; participatory approach is essential; the role of women is important; and water needs to be managed as an economic good. The 1992 Rio Conference (U.N. Conference on Environment and Development), in its Agenda 21 initiative, focused on seven water management programs, the first of which was integrated water resources management(IWRM). Agenda 21 identified three key objectives for national integrated water management: priority for satisfying basic human and ecosystem requirements, river basin as the basis for managing water resources, and preparation of national action and sustainable water use programs by 2000 (Radosevich 2003).

By the early 1990s, the concept of IWRM had been widely disseminated. The term IWRM was to imply "an inter-sectoral approach, representation of all stakeholders, all physical aspects of water resources, and sustainability and environmental considerations" (Savenije and van der Zaag 1998). The definition that came to be popularly known, however, was the one given by the Global Water Partnership (GWP), in which two broad conceptual bases of water resources management, namely, "integration" and "sustainability" were consolidated. Accordingly, IWRM is "a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems" (GWP/TAC 2000).

With the growing international interest on water, there was almost a paradigm shift from irrigation management reforms to water sector institutional reforms. The latter focused on reforms at levels above farms and irrigation systems, and on integrated water resources management within a river basin context. In Asia, this view was reinforced at regional conferences sponsored by the Asian Development Bank in 1996 (Arriens et al. 1996). An integrated approach to water resource management, with a focus on the river basin context became a key component of the Asian Development Bank's policy on water (ADB 1998 and 2001).

Just as reforms in the irrigation sub-sector resulted in very little replication of the few sporadic success stories, mainly due to lack of local interest, the new thrust of water sector reforms also confronted difficulties at the start itself. Where they were tried, the higher-level water sector institutional reforms were found to be much more difficult to achieve than the reforms in the irrigation sub-sector (Vermillion and Merrey 1998). With many water use sub-sectors and high competition among them, and with multitude of vested interests, the political economy of water sector reforms was found to be much more problematic than that in dealing with just irrigated agriculture (Wester et al. 2003). No Asian country could fully succeed in introducing institutional reforms as prescribed.

The purpose of this paper is to explore why water sector institutional reforms have failed to gain root in Asia, and also to suggest an appropriate strategy for establishing effective institutions for IWRM in Asian river basins.

## BASIS OF THE PAPER

This paper is primarily based on the results of a recently conducted regional study on "Developing Effective Water Management Institutions", involving five selected river basins in five Asian countries (Fuyang river basin in China, Ombilin in West Sumatra, Indonesia, East Rapti in Nepal, Upper Pampanga in Philippines, and Deduru Oya in Sri Lanka)[1]. The study design included, in addition to the five basin studies in the selected developing countries, three case studies in river basins with an advanced stage of water resources development and management. Murray-Darling in Australia and Omonogawa in Akita Prefecture of Japan were studied with the objective of identifying key elements of successful water resources management that may serve as useful lessons for transfer to developing countries. In Brantas, Indonesia, the objective was to assess how a single river basin organization could be developed and installed to cover multiple uses of water in a large river basin in a developing country.

As agreed with the ADB, the main sponsor of the study, the overall study objective was to "improve the management of water resources in river basins, which are affected by growing inter-sectoral competition for water, and related environmental, socio-economic and institutional issues arising from scarcity of water". The short-term expectation in the study was to have some action plans designed for each country, and action initiated wherever feasible, for establishing IWRM in a river basin context.

However, fairly early in the study period, despite the excellent cooperation of the national partners of the regional study, it was noted that the study objectives were difficult to achieve. In-depth basin studies could identify the gaps in management and the needed integration, and also the broad institutional requirements to introduce IWRM, but securing cooperation from multiple stakeholders and prompt government action for change was a very complex and time-consuming task, which needed much more time and resources than the study could provide for.

Despite this constraint, the overall study process was a productive experience. Participatory learning and action methodology[2] was used to engage the stakeholders in planning and initiating study-related actions to establish appropriate institutional mechanisms for integrated water resources management in the selected river basins. A series of national and regional workshops, and several field consultation meetings were held to mobilize support from policy makers and other stakeholders for designing and implementing relevant institutional reforms in the water sector. Stakeholders participated in these PLA activities with enthusiasm. All of the five study teams were able to conduct diagnostic investigations in the basins and draw some action plans. Only three were able to initiate some actions.

Participatory research methods, combined with physical measurements and investigations, helped in identifying problems and issues related to water management in the five river basins. Some key features of the basins are indicated in table 1.

[1]Results of this regional study are extensively reported in Bruns, Bandaragoda and Samad eds. (2002); Bruns and Bandaragoda eds. (2003); Bandaragoda ed. (2003); and International Water Management Institute (2003).

[2]For details of the participatory methodology used in the study, see Jinapala et al. (2003); and Bandaragoda (2005).

*Table 1. Key water-management issues in five river basins.*

| Issues | Basins | | | | |
|---|---|---|---|---|---|
| | Fuyang | Deduru Oya | East Rapti | Singkarak-ombilin | Upper Pampanga |
| Water Scarcity | Acute (quantity-wise) | During dry some scarcity (spatially and temporally) | Scarcity during the dry season (spatial) | Scarcity in terms of depth of flow | Scarcity during dry season and flooding during wet season |
| Inter-sectoral competition | Very high, agriculture worst affected | Competition between drinking water and agriculture | Competition between environment and irrigation | Competition between hydropower and irrigation (trans-basin diversion) | Competition between industry, drinking and agriculture (especially groundwater) |
| Environmental issues | Groundwater decline in quantity and quality; degradation of the quality of surface water | Seawater intrusion; sand-mining; waste from hospital and rice mills; siltation | Ecological health of flora and fauna affected; watershed degradation; O&M | High surface water treatment cost; watershed degradation | Rubber factory; duck and fish rearing and small-scale industrial pollution |
| Water resources development/ conservation/ allocation | Water conservation and increasing productivity are increasingly adopted | Potential for water resources development; performance of irrigation system low | Potential for conjunctive use of groundwater at low cost exists; very low use of surface water and groundwater | Allocation of basin water and participation of stakeholders important | Efforts are extended to conserve surface water and rainwater; better irrigation management |
| River flow and reservoir status | Flow over the years decreased rapidly; reservoir levels are decreasing | River management is poor; siltation of tanks has reduced the capacity | No storage structure along the river; run-of river scheme; quite large variation in river flow | Trans-basin diversion; lake level decreasing; low depth of river flow | Flooding and drought occur alternately; huge uncommitted outflow |
| Groundwater status | Large-scale extraction of groundwater; water table declining fast; groundwater contamination | Very limited groundwater; quality of groundwater bad at middle and tail reaches | Very limited groundwater is used; good quality groundwater available | Not much groundwater is in use | Groundwater is on the increase; competition for groundwater exists |

A key hypothesis of the regional study was that river basins evolved and changed over time, both from a bio-physical and socio-economic development perspective, and as the population gradually increased, the growing demand for water and its rising value induced technical and institutional changes (Samad 2003). Basically, this proposition was found to be true, as more developed river basins had multiple water use groups, creating a greater competition for water, and a greater need for coordination. They also had more institutional arrangements than less developed basins, to cope with their more numerous water management needs.

Applying IWMI's "water accounting" methodology[3] described by Molden and Sakthivadivel (1999), three distinct stages in the development of water resources in a river basin were noted:

(i) the development stage, where water would tend to be plentiful and low in value;

(ii) the transition stage, where the emphasis was on harnessing available water, and

(iii) the allocation stage, in which the river basin would become "closed" in the sense that all available water has been fully allocated.

## DISCUSSION: STRATEGIC QUESTIONS ARISING FROM THE STUDY

The outcomes of the regional study raise four key questions, for which this paper explores some answers:

(1) Is it necessary to have hydrologically based river basin organizations (RBOs) for the promotion of integrated water resources management (IWRM)?

(2) Can the developed-country models of RBOs be successfully replicated in developing countries?

(3) Why have the IWRM institutional reforms failed to gain root in Asia?

(4) What would be an appropriate institutional strategy for IWRM in Asian river basins?

### (1) IWRM and River Basin Organizations

The regional study of five river basins confirmed that the concept of IWRM and the management of water in a river basin are intrinsically linked. A conclusion of the stakeholder consultations was that the coordination of water resources development as well as different water uses, and the management of water scarcity as well as competition for water, could all be greatly facilitated by a basin-wide analysis. Each study basin has shown at least one easily identifiable need for integration in terms of water resources management, within the basin. A few examples are outlined below.

[3]IWMI's water accounting definitions include, "Gross inflow": total amount of water flowing into a domain from precipitation, surface and subsurface sources; "Net inflow": gross inflow +change in storage; "Depletion": use of water, that renders it unavailable for further use; "Beneficial depletion": depletion that generates productive outcomes; "Process depletion": depletion in private economic uses; "Non-process depletion": depletion in non-private, socially valued uses; "Non-beneficial depletion": depletion that generates no economic or non-economic, private or social benefit; "Committed water": outflow committed to other or downstream uses; and "Available water": net inflow–committed outflow - non-utilizable uncommitted outflow.

As shown in table 1, the Fuyang river basin in Southern China is characterized by a high level of water scarcity, high competition for water and heavy extraction of groundwater. As the basin has been almost fully developed in terms of water diversions, the Fuyang is facing the adverse effects of excessive groundwater withdrawal, and therefore, its main management requirement is a regime with groundwater-surface water integration. In the Deduru Oya basin in Sri Lanka, the requirement is for integrated management to cater to urban-rural demands and water quantity-quality concerns in the context of high competition for water among different users. In the scarcely developed East Rapti basin in Nepal, having only some seasonal scarcity of water resources, integration between environmental concerns and developmental requirements is a felt need. The Ombilin sub-basin of West Sumatra in Indonesia has been trying for long to solve an issue of the disputed location of a hydropower plant. Obviously, the requirement is for an integrated water management approach to achieve a balance between hydropower generation and irrigation management. The Upper Pampanga in the Philippines is part of the composite Pampanga river basin, but in the sub-basin itself, there are problems arising from competition for water by agriculture and industries, the two major users, and hydropower facilities located upstream of the river. Clearly, the felt need is for an upstream-downstream integration. Thus, in a basin analysis, the need for inter-sectoral and basin-wide coordination in water use is invariably emphasized.

In all of the five countries, there was an explicit recognition of the importance of considering the river basin as the unit of analysis, but none of the river basins studied were managed by a formal river basin organization. While the stakeholders of all of the five basins identified some common reasons that converged on the need for IWRM, no basin group desired to have a full-scale river basin organization (RBO) of the type that was illustrated by the Brantas basin in Indonesia, or one that was promoted by the international development agencies. As they could not see a fully stakeholder-controlled RBO for each river basin in the immediate future, they feared any further advance by the government to involve itself in a formal organization at each river basin level. In their view, this would be another instance of mismanagement of state agencies, for the authorities to use the newly formed RBOs as a basis of recruiting unnecessary staff, disregarding the current need for efficiency and effectiveness of sustainable resources management.

Although the current management of water resources within the basins was effected by multiple of government agencies with little inter-agency coordination, the stakeholders preferred not to plan one organization for each river basin. Therefore, the question arises as to how IWRM could be implemented in an uncoordinated management environment. In the final consultation meetings, the proposed alternative institutional arrangements to cope with IWRM, and these “home-made” solutions can be presented as an adaptation of existing institutions, which will be discussed later in the paper.

The existence of varying degrees of development in different river basins implies that one common organizational format of an RBO, as often prescribed by international development agencies, would not suit all situations. The institutional framework that is suitable for the Fuyang river basin in Northern China, which is the most developed of the five river basins studied, would not be appropriate for the East Rapti basin in Nepal, which is the least developed as at present. In short, both these river basins do not need the same type of a formal full-fledged River Basin Organization, with all the recommended criteria, including complete autonomy and full self-sufficiency in funds. Clearly, the five situations required different types of coordinating mechanisms.

The case studies of two “advanced river basins”, Omonogawa in Japan (Makin et al. 2002) and Murray-Darling in Australia (Hatton MacDonald and Young 2002) showed that formal river basin organizations were not an essential feature of successfully managed water-scarce river basins.

The Omonogawa river basin in the Akita Prefecture of Japan is a fairly well-developed basin, and its water allocation is controlled by the central government (Ministry of Construction), which is constantly monitored by the Prefecture Government, and water distribution, drainage facilities and environmental protection are managed by a number of stakeholder-controlled LIDs (Land Improvement Districts). Flood control, drainage management, watershed management and environmental protection are handled by a well-coordinated management system involving the central and prefectural governments and LIDs. All in all, there is a well integrated water resources management within the basin, although there is no single RBO for the Omonogawa basin.

In an assessment of water institutions in California, the conclusion was that RBOs are not an essential feature of USA's institutional arrangements in the water sector (Svendsen 2000). In fact, other arrangements, including various types of committees and networks, can often work just as effectively, but there needs to be a clear legal framework, including clarity on water rights, and a regulatory framework to make such arrangements work to make IWRM effective.

Table 2 shows comparative figures (in terms of percentage) on annual per capita water diversions for three main water use sectors in selected countries. Asian countries include the five countries selected for the regional study, along with India and Pakistan, and they are to be compared with some developed countries in the West, where river basin organizations have been well established.

*Table 2. Annual per capita water diversions (%) for different uses.*

| | Irrigation | Domestic | Industries |
|---|---|---|---|
| China | 89.5 | 4.8 | 5.7 |
| Indonesia | 93.5 | 3.3 | 2.7 |
| Nepal | 97.1 | 2.1 | 0.8 |
| Philippines | 65.8 | 15.8 | 18.4 |
| Sri Lanka | 97.5 | 1.25 | 1.25 |
| India | 95.6 | 1.8 | 2.5 |
| Pakistan | 96.9 | 1.5 | 1.6 |
| | | | |
| France | 17.0 | 15.5 | 67.5 |
| Germany | 3.3 | 16.7 | 80.0 |
| Switzerland | 4.0 | 22.9 | 73.1 |
| Sweden | 9.0 | 36.0 | 55.0 |
| Netherlands | 18.9 | 6.1 | 75.0 |
| USA | 41.5 | 12.1 | 46.4 |

Source: International Water Management Institute (2002).

The comparison shows that all Asian countries in Table 2 do not have considerable water-use competition, or a strong sectoral competitor to irrigated agriculture, unlike in developed countries. The dominance of irrigation is clearly depicted. Only in the cases of China and Philippines, increasing rates of river basin development seem to have created greater competition among the water use sectors. The pattern of annual water diversions by sector clarifies the main distinction between developing and developed country water sectors. Figures for developed countries such as: France, Switzerland, and Netherlands explain the existence of RBOs in those countries.

Although considerable efforts are being made to draw the attention of developing countries to establish RBOs, the few examples of functioning river basin organizations are all in developed countries (Buller 1996; Malano, Bryant, & Turral 1999; Pigram 2000; Wester et al. 2003). This implies that the prescriptions for institutional reforms with RBOs are basically for transposing developed country organizational models into developing countries.

### (2) Replication of Developed-Country Models in Developing Countries

Undoubtedly, developed contexts such as Murray-Darling in Australia and Omonogawa in Japan offer some useful lessons that can be adopted in developing country water sectors. Consultation processes practiced by the Murray-Darling Basin Commission, and local adaptation of new technologies and stakeholder control in Omonogawa basin are replicable examples. Strategies of water pricing, transferable water rights and basin organizations practiced by European countries are those that need to be carefully evaluated before adoption by developing countries. A recent study that deals with water sector reforms in three developed countries concludes that "deciding what is relevant to developing country situations is a task that is best left up to those with local expertise" (Turral 1998).

As seen in the regional study, the concept of RBO, or that of integrated water resource management in a river basin context, is hardly practiced in Asian countries. The study encountered two exceptions: the Brantas basin in Indonesia, which has *Jasa Tirtha*, a specifically designed river basin organization. However, even Jasa Tirtha, a show-piece of donor initiatives in the region, is by and large an effort mostly propped up by the government interests and funds, and a close analysis of its functioning shows that there is no active stakeholder participation in its financing or in its institutional arrangements. Even in this essentially effective para-statal form, Jasa Tirta has not yet been able to see any other replication of itself anywhere else in the country. The Mahaweli Authority of Sri Lanka (MASL) is another similar instance in Asia of an organization specifically established to cover a river basin. But, it is basically a basin organization set up for infrastructure development and initial human settlement[4].

None of the five countries covered directly by the study, or any other Asian country reviewed along with the study, had succeeded fully in establishing any meaningful organizational structure for effective integrated water resources management.

***Lack of local interest:*** In the countries studied, there have been major efforts launched to introduce water sector reforms. The regional study revealed that the countries had embarked on institutional reforms mainly due to external pressure. There was no clearly discernible internal demand for change, on which the reform efforts were launched. Also, there was little internal discussion on prescribed institutional solutions for current water management problems. Any noticeable enthusiasm on the part of political and administrative authorities, as found in Indonesia, Sri Lanka and China, could also be traced to some impulse originating from an external source, such as donors or foreign experts. Some countries, like, Pakistan, Sri Lanka, Philippines

[4]In fact, the original sponsors of the Mahaweli Program, including the World Bank, have been engaged in a long, drawn-out effort to restructure the MASL into a river basin management organization to undertake post-construction water resources management. So far, they have not been successful.

and Indonesia, have entered the path towards reform, on which they have been slow-marching for some time. In Pakistan and Sri Lanka, whose interests for reforms have been sponsored and nurtured by the donors, under the leadership of the World Bank and the Asian Development Bank, respectively, the reform processes are clearly approaching a blind alley (Bandaragoda 2006). In both cases, the deceleration of reform programs is mainly due to lack of real interest by stakeholders and policy makers. In both instances, heavy pressure from donors seems to have generated a polarized effect against the reforms among some of the local stakeholders. More importantly, the failure to install any institutional set up has been mostly due to the reluctance of the majority of local stakeholders to transplant institutional models, which are recommended on the basis of experiences in other countries.

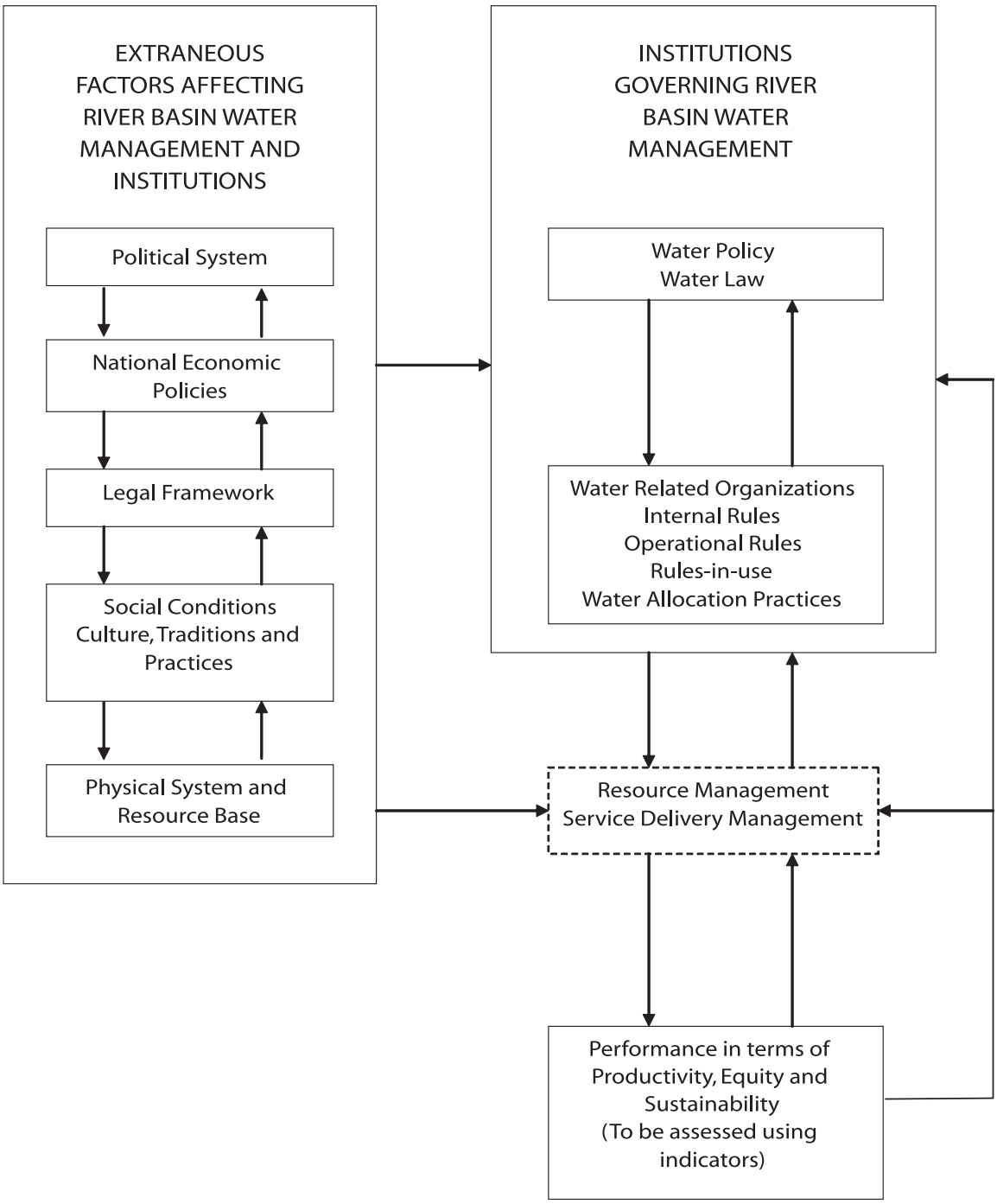
One major reason for this rather alarming revelation is the fact that appropriate institutional framework for river basin management is essentially contextual. Shah et al. (2001) in their seminal paper on "Issues in Transposing Successful River Basin Management Institutions in the Developing World" have raised the question as to whether it is possible for developing countries to adopt models which are working well in developed countries. The paper leaves us with a distinctly clear negative answer, while referring to four realities in a river basin: hydro-geological, demographic, socio-economic, and organization of the water sector, all of which make the choice of the institutional framework highly situational. The paper argued that institutional arrangements in a river basin with one set of these realities would not suit another basin with a distinctly different set. Because of these realities of a river basin, to do an "institutional leapfrog" in order to quickly approach a stage at which developed-country basin institutions find themselves today, is extremely difficult, if not impossible.

The need for a "contextual fit" means that the uncritical imposition of developed-country institutional models on developing-country river basin contexts may prove "dysfunctional and even counter-productive" (Shah et al. 2001). Both the Brantas and MASL seem to confirm this fear, as more and more government funds are being absorbed by them on a regular basis, in the context of a declining performance, both economically and socially.

The development in river basins responds to the changing pattern of demand for water over time, linked to population growth and economic development, and the institutions are crafted accordingly. Apparently, none of these river basins had demanded such institutional needs for a river basin organization, and no government program had required such needs, either. In the typology of the five river basins studied, only the Fuyang river basin in China has reached full development level, but even in the Fuyang basin the need for a locally established basin organization has not been felt so far, possibly due to the socio-political context in China.

Figure 1, extracted from the regional study's framework documents (Bandaragoda 2000), shows that a country's contextual features, such as the overall economy, political system, legal system, cultural background and its physical resource base would circumscribe the policies and actions in the water sector. These parameters would also contribute towards determining the style and content of water resources management in any river basin. While the political and legal systems in Philippines and Sri Lanka were found to be conducive to the formation of stakeholder organizations in a participatory and consultative process, in China those systems could not be mobilized to have an influence on the same task. For this reason, action to establish stakeholder organizations in the Fuyang basin in China could not be pursued during the study period.

*Figure 1: Institutional Environment of River Basin Management.*



The initial appraisal of the five countries indicated that similar water laws and policies were being contemplated for all countries, irrespective of their many differences. An orthodoxy in standard reforms was being imposed on the countries. Figure 1 shows that the contextual determinants play a considerable role in the level of performance in a river basin. Therefore, it is unlikely that a single normative model promoted by donors or expert groups could be uniformly applicable to all countries and all river basins.

### (3) Failure of Water Sector Reforms in Asia

A historical overview of the development process in Asia shows that it has been punctuated by intermittent attempts at institutional change, mostly introduced by external influences. Some of these attempts were to introduce modern democratic institutions, some others were to bring about greater coordination, and yet others to improve the quality of governance or management performance. Of the five selected countries, Philippines, Indonesia and Sri Lanka are among the Asian countries, which have inherited from their colonial administrations a number of modern institutions related to governance, judiciary and the economic enterprises. China and Nepal, being two countries least influenced by colonialism have yet absorbed many institutional changes from interactions with various international collaborations. This characteristic difference in external influence between the two sets of countries could also be seen in their respective water sectors. Following the advent of project-based development aid, donor interest in promoting improved institutions has been a conspicuous feature of performance improvement efforts. The water sector, which attracted a larger amount of project-based development aid than any other sector, saw a proportionately higher incidence of attempts at such donor-driven institutional change.

In terms of institutional development, creation of new organizational mechanisms was the most popular institutional reform device among the donors as well as the governments. In Sri Lanka, the Irrigation Management Division (IMD), Mahaweli Authority (MASL), and National Water Resources Council and Secretariat are examples of major attempts at structural change in the water sector institutions. In Philippines, the Irrigation Department was converted to a more autonomous National Irrigation Administration (NIA), while a National Water Resources Board was newly established to handle bulk water allocations to various water user groups. Similarly, a National Water Resources Committee was set up in Thailand, while continuing to have its Royal Irrigation Department intact. Sri Lanka's experiment to introduce the IMD to the traditionally construction-oriented Irrigation Department was not fully successful and the government later had to annex it to the Ministry in charge of irrigation. Similar structural changes have been attempted in Indonesia as well. Characteristically, most of these changes were at the behest of the donors. These new organizational units were extensions of the public bureaucracy, and often they added to the burgeoning annual budget of the government, and to increase the power of the bureaucracy. Being fully funded government organizations, they were not supported by any local stakeholder participation or their representation. Often these structural changes mattered very little as far as the economic performance of water use was considered.

Among some of the other institutional changes, were the new procedures and mechanisms for O&M cost recovery. Again, basically a donor-driven initiative, this effort is now being increasingly appreciated by governments as an essential change to meet increased O&M costs. Both Philippines and Sri Lanka embarked on these changes with the main objective of minimizing the government burden on maintaining irrigation systems. For instance, Sri Lanka introduced O&M cost recovery in early 1980s, basically in response to a World Bank covenant associated

with a loan facility. As the political pressure against this "water charge" was too strong, the recovery rates gradually declined and the scheme had to be abandoned. The lack of preparedness among local stakeholders once again failed the reform process.

Along with this setback came the idea of encouraging the water users to share part of the O&M efforts or costs. As many other countries were showing an increasing interest to involve the users in the management of infrastructure facilities, Sri Lanka encouraged the farmers to bear the cost of maintaining tertiary and secondary canals in irrigation systems. This time, the obstacles were from some government agencies, which were apprehensive about the transfer of any meaningful responsibilities to the water user groups, based on the argument that water users were not equipped to handle the new responsibility and that valuable state-owned assets would deteriorate. The political forces were generally divided on this issue, not necessarily on a permanent basis, or on ideological grounds, but depending on who was in power and who was in the opposition at any given time. The governing political party usually went along with the donor requests, while the opposition parties tended to use the populist platform against "the recovery of costs from poor farmers".

In another dimension, recent political imperatives for devolution of power led to some decentralization of responsibilities to various geographical sub-units, and the Center had to relax its hold on the water sector. In most of Asia, irrigation and water management became a state or provincial responsibility, and the states or provincial governments established their own irrigation and water resources management agencies. Although as a result, the original tilt towards centralism has undergone some change, aberrations still exist; the devolution has only transferred power from the Center to the Provinces, while the water resources management is still very much centralist in character. The reforms failed again, because they did not capture the essence of reform objectives, which was to involve the local stakeholders in the management process.

Table 3 gives a comparative assessment of the interests shown by various actors in the five selected Asian countries. The dominant role of the donors, consultants and governments, and the passive role of the water users can be seen in this assessment. In Indonesia, Philippines and Sri Lanka, the government's initiative is shown as high. However, in this initiative, both Philippines and Sri Lanka governments appear to have been interested in linking stakeholder participation with cost recovery programs. As the broader perspectives of integrated water resources management emerged, transcending the earlier narrow focus on cost recovery for irrigation management, both the governments have shown less interest in promoting genuine participatory roles for the stakeholders.

*Table 3. Initiative by Various Actors in Reform Processes.*

| Country | Government | Donors | Users | Others (NGOs, Experts) |
|---|---|---|---|---|
| China | High | Medium | Low | Low |
| Indonesia | High | High | Low | Low |
| Nepal | Medium | High | Low | Medium |
| Philippines | High | High | Medium | Medium |
| Sri Lanka | Medium | High | Medium | Medium |

Source: Author's Assessment based on study reports.

Low enthusiasm on the part of the government in some countries is basically a reflection of the apathy of their bureaucracies. Despite the sporadic institutional changes over time, the water resources management agencies in many of the Asian countries appear to remain conspicuously static. Within the water sector, qualitatively, the changes in institutions lag behind the changes

that have taken place in the resource base and technology over the years; they also lag behind the changes that have taken place in other sectors. For this reason alone, the institutional framework for the water sector in Asia is seen to be inadequate in terms of present needs of social and economic development. Existing institutional arrangements for water management are often found to be inappropriate and a major constraint for achieving sustainable water management (Cosgrove & Rijsberman 2000; Merrey 1997).

The size and complexity of the water resource system have also been cited as important factors for failure in large-scale institutional changes in developing countries. The exceptionally successful local level institutions are mainly in traditional irrigation systems (e.g., communal systems in Philippines and small tanks in Sri Lanka), which Robert Hunt (1989) analyzed as "irrigation communities" having their own systems of rewards, rights and duties. He posed the question whether the modern large-scale canal irrigation systems can be successfully converted to such cohesive social systems having complete control over the performance of the physical system. A similar question can be raised for river basin management as well, particularly, because a basin is a vast area of water, land other natural resources with different groups and large numbers of stakeholders. The issue relates to both the ability, as well as the willingness, of users' groups to have complete control or even shared control over water resource systems. Thus, the basic consideration is an internally generated demand for taking over the management responsibility.

Another characteristic of developing country situation, particularly in Asia, is the large numbers of small users in the water sector, in which irrigation is invariably the dominant sub-sector. The success of user associations in countries like the USA and Australia, where small numbers of large users are a common feature, cannot be easily replicated in developing countries. The main reason why the institutional models of developed countries generally break down when transposed in developing countries is that large numbers of small stakeholders who face such diverse constraints in their livelihood systems are at best apathetic towards these institutional reforms (Shah et al. 2001). Average income levels of these large numbers of small water users in developing countries in general are so low compared with small numbers in developed countries; the commercial type of enterprises cannot be sustained in the former, unless special institutional strategies are designed to meet the constraints.

An instance of such stakeholder demand for establishing local organizations for water resources management was seen in the Land Improvement Districts (LIDs) in Japan[5]. In terms of numbers, the Japanese water user community is comparable with developing countries, though not readily so in terms of income levels. The LIDs also seem to counter Robert Hunt's doubts about the viability of large scale stakeholder-managed water resource systems, and can therefore be an appropriate system to draw lessons from, in designing institutional strategies for developing-country water sectors. The system of LIDs is outlined below.

In sum, at least four factors can be identified as being mainly responsible for the failure of water-sector institutional reform attempts in Asia:

- Inability to create genuine local interest for reforms;
- Assumption that developed-country institutional models could be successfully transposed into developing country settings;

[5]An opportunity to study the functioning of LIDs was gained when the case study of the Omonogawa river basin in Akita, Japan was conducted. In fact, the authors of the Omonogawa case study were specifically given the clarification by the LID members that in LIDs, the preferred term would be "farmer involvement", and not "farmer participation".

- Willingness of developing-country governments to accept reform proposals as part of a development aid package; and
- The neglect of both governments and donors to evaluate the compatibility of reform proposals with the type, size and complexity of the system before they are enforced.

These factors explain to a large extent the failure of government-dominated policy decisions to establish successful user-oriented institutional arrangements.

### (4) Institutional Adaptation: An Appropriate Strategy for Asia

The regional study's participatory methodology provided favorable results. Its success in both data collection as well as action planning illustrated the usefulness of stakeholder consultations for enlisting common cooperation in implementing programs for developing and managing water resources. In all cases studied, there was a clear indication from the stakeholders after the consultative processes that they would be willing to eventually own the local water resource systems and to undertake their operation and maintenance through collective efforts. In all of the selected river basins, consultation meetings brought out the message that the stakeholder groups were clearly in favor of forming local level organizations for coordinated management of water resources in the basins. This positive outcome leads us to an alternative approach for local-level water resources management.

The consultative processes of the regional study helped to conclude that the transposition of RBO models for each river basin was not essential for implementing IWRM in developing countries. Instead, the stakeholders in their discussions opted for "institutional adaptation" as a strategy in which the existing institutions could be improved and built upon for establishing IWRM, without having to replace them totally with new ones, and with minimum disruption to the whole institutional framework.

The recommended requirements for implementing IWRM include "appropriate information systems to support decision making, innovative new ways of improving water management, a thorough look at economic, social and environmental aspects, and a long-term focus". Above all, Agenda 21 strongly advocates that "a total systems approach should be adopted, that this should address all aspects of water cycle management and include not only all relevant parties within a state but should extend beyond state borders since water knows no boundaries" (Radosevich 2003).

### *"Farmer Involvement, Not Farmer Participation": Lessons from LIDs in Japan*

The system of Land Improvement Districts (LIDs) in Japan is one of the more successful innovations in Asia to support user involvement in management of irrigation and water resource systems. Farmers in the LIDs are involved in effective water use to increase their income in response to the price signals for agricultural produce. Farmers have a sense of ownership over the water and irrigation facilities. The sense of ownership and shared responsibility are essential trends in farmers' self-governance of irrigation and in attaining effective, equitable and sustainable use of water.

The LIDs in Japan have proved to be socially and economically viable organizations at the grass-root level, and some have become fairly large organizations with a sound financial basis. Another interesting feature is that LIDs operate within a strong national legal system designed to promote proper water resources management, and under a protective coverage of government institutions.

In Japan, the Ministry of Construction has the predominant role in river-basin development and management, a position that has been maintained for over 100 years. The role of the public sector is central to water-resources management in Japan, particularly in river basin development and river regulation, but it also encourages farmer groups to have a well-established role based on participatory development and management of natural resources for protection of agricultural water resources. In recent times, numerous land improvement district (LID) schemes have been undertaken in the Omonogawa basin. Although the LID system plays a secondary role in water resources management in Japan, it can be considered as an excellent example of user involvement in management of irrigation and water resources systems.

However, the LID system has grown out of a long experience in communal management of land and water resources. This experience has included many years of bitter and painful conflict among farmers concerning water allocation. The prevailing system of water management has been developed gradually by farmers themselves, subsequently being formalized by the Land Improvement Act, promulgated in 1949.

The Land Improvement Act of 1949, allows the stakeholders of any irrigated agriculture area to form an LID (Makin et al. 2002). The initiative is taken by the actual cultivators (not the land owners) from a defined area of irrigated agriculture, with at least two-thirds of all cultivators in that area agreeing to form an LID. With this locally generated interest, the members (at least fifteen in number) should apply to the Prefectural Government, along with a set of by-laws, activities and patterns of cost sharing agreed among themselves. Once established, the LID has powers for managing the water resources in that defined area, and can force all its cultivators to become members and share the costs and benefits.

Omonogawa river basin had 99 LIDs, having on an average 740 hectares per LID, 690 cultivators per LID, and 2.7 staff per LID. The basin's LIDs are affiliated with the Akita Prefectural Federation, as well as the National Federation of Land Improvement Associations. The whole of Japan is reported to have approximately 8,000 LIDs, covering an area of 3.3 million hectares and a total membership of about 4.7 million. In 1992, LIDs were responsible for approximately 78 percent of operation, maintenance and management of reservoirs, ponds, headworks, and irrigation/drainage pumping stations (Sarker et al. 1999). With all of these positive features, the Omonogawa still does not have a composite river basin organization, but its basin management by the government and the LIDs has fulfilled the essential conditions of IWRM.

Being a corporate, decentralized and financially autonomous association of farmers, the LID in Japan illustrates the character of the participatory management mechanism that can evolve through an institutional adaptation, that is proposed in this paper as an alternative to the failed models in Asia. The LID system also illustrates the element of responsibility by the government, to provide the necessary legislative support, to facilitate the formation of the autonomous group and to protect it from external barriers against its progress.

Comparing with the LIDs, the major missing element in most of the well-intentioned strategies for promoting institutional reforms in Asia's water sector has been the genuine involvement of local stakeholders. The way the relevant issues were deliberated and the alternative solutions developed was flavored with an authoritative culture among the higher levels of the authorities. In almost all the instances, there was no popular demand for change arising from the water user community, but often, they were coerced to accept the changes by an authoritative government, as if there was a cultural obligation for the people to accept. The governments and international agencies have both failed to make these reforms gain root in the Asian societies.

In assessing what is needed for the IWRM system in selected river basins, the following key requirements were identified during the consultation meetings:

- Some mechanism for basin level negotiation among the stakeholders;
- Adequate authority and resources to implement the negotiated outcomes;
- An appropriate legal framework within which these negotiations and actions can take place; and
- An appropriate set of economic instruments which can facilitate IWRM.

In three out of the five study basins, these ideas were pursued and some institutional arrangements were formulated[6].

They are outlined below.

***Indonesia***

In attending to the chronic water-allocation problem in the Ombilin sub-basin, the affected water users along the Ombilin river proposed a "water board", consisting of all of the stakeholders in the sub-basin, which will have the full authority to take allocation decisions. This would be in the form of a coordinating committee (PPTPA in the local language) at the sub-basin level to ensure that the water-allocation rules are effectively enforced in accordance with the basis provided by the national water resources policy. Already there is a water resources management coordinating committee at provincial level (PTPA).

To facilitate these committees, the country needs to have an adequate legal framework guiding the water sector. The Government of Indonesia is currently reforming its water resources and irrigation management policy. The reforms have four objectives:

1. Improving the national institutional framework for water resources development and management;
2. Improving the organizational and financial framework for river-basin management;
3. Improving regional water-quality management regulatory institutions and implementation;
4. Improving irrigation management policy, institutions and regulations.

The consultation meetings proposed two reform items in terms of the first objective mentioned above, namely: government regulations that emphasize on the participation of stakeholders in provincial and river basin committees; and merging provincial water-management committees with existing provincial irrigation committees.

***Philippines***

During the final stages of the study, stakeholder consultations were mainly based on the following:

- Institutional collaboration for effective water management;
- Strengthening the capacity of the irrigation agency;

[6]Fuyang in China and East Rapti in Nepal could not proceed beyond the initial consultation meetings to identify institutional strategies.

- Adoption of operational mechanisms for water accounting;
- Advocacy for use of proper water-management technologies; and
- Strict enforcement of existing policies and regulations to protect water quality.

Finally, the stakeholders decided to form the Upper Pampanga River Basin Coordinating Council (UPRBCC) to implement IWRM within the basin. A consultation meeting was held at Central Luzon State University, on 27 November 2001, attended by 22 representatives of the various stakeholders, who were initially identified by all stakeholders to constitute the UPRBCC. The Provincial Governor of Nueva Ecija was selected to chair the council, since Nueva Ecija constitutes the biggest portion of the basin. The terms of reference (TOR) or the roles and responsibilities of each of the stakeholders were identified and included as an integral part of a concept paper. A Declaration of Commitment was signed by the initial members of the Council at the Office of the Provincial Governor of Nueva Ecija on January 18, 2002. This activity signaled the formal establishment of the UPRBCC.

At the first two organizational meetings, held on April 2 and May 7, 2002, the organizational structure of the council was finalized. Development plans of each of the various agency stakeholders were presented to identify activities to be undertaken by the council. Among the priority activities initially identified by the council are:

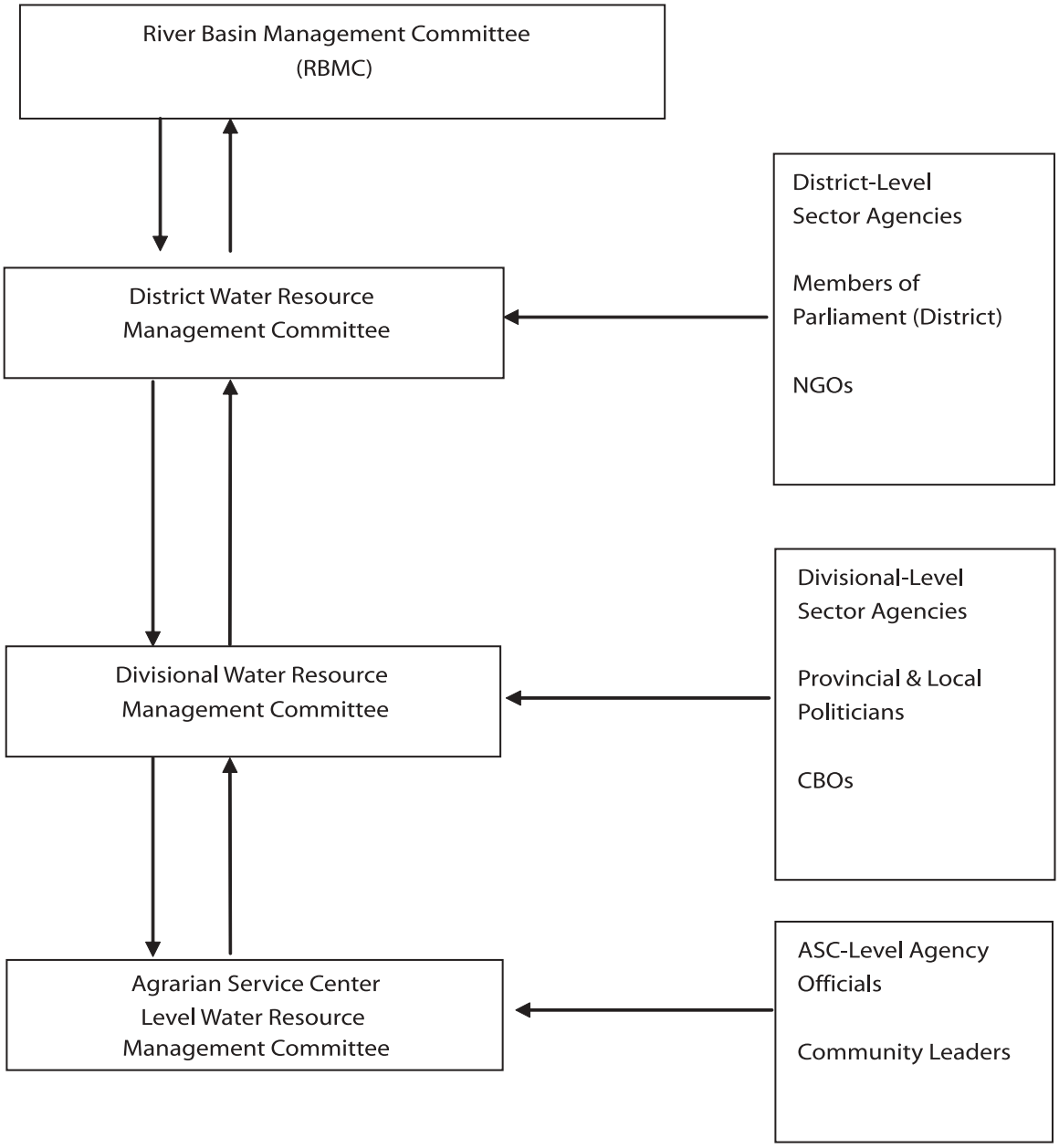
1. Advocate effective and efficient water management.
2. Support the anti-water-pollution campaign of the local government units.
3. Develop a UPRB database.
4. Watershed management.
5. Monitor water quality.
6. Strengthen Irrigators' Associations.
7. Research and development.

***Sri Lanka***

The Deduru Oya stakeholder meetings decided that, instead of having a permanent river basin organization dedicated to undertake IWRM in each basin, a three-tier committee system (figure 2) would be preferable. The committees at the three levels would be responsible for taking water allocation decisions and for other key IWRM functions, for a single river basin or a cluster of river basins, through a hierarchy of delegated authority regimes.

This proposed arrangement is similar to what Berkes' ladder illustrated with varying levels of co-management (Bruns 2003). Starting from face-to-face contact for initial consultation, the community then cooperates with the government to provide local knowledge, and gets involved in a two-way communication process to influence government decisions, and enters into a partnership with the government in the form of "advisory committees". Going up further in the ladder, the community is given an opportunity to participate more meaningfully in the "management boards". In this instance of the Deduru Oya proposal, the "management committees" are at that level. Following the principle of subsidiarity, the next step is to establish local level self-sustained basin organizations managed by the local stakeholders.

*Figure 2. Proposed new organizational structure for Deduru Oya basin.*



## CONCLUSION

The results of the regional study including reviews of institutional development efforts in Asia's water sector show that, almost in all the countries studied, there has been strong external pressure on the stakeholders to undertake institutional reforms and establish river basin organizations. The results also show that the changes introduced have been characterized by a dominant role played by the government. In almost all the contexts studied, the changes introduced have not been sustained beyond a few years, and in some cases, the laws drafted have not even been passed by the legislature. Considering the strong linkage between external pressure and the failure in institutional change as a result of the passive attitude of the local stakeholders, the paper proposes to look for more workable and sustainable solutions, by involving local stakeholders in basin-level planning and actions.

The local stakeholders' ability and willingness (their expressed demand) to take over responsibility from the government for water resources management in a river basin would largely determine the viability of new institutional arrangements for river basin management. These two attributes are normally fashioned by the extent to which the water users are convinced of the desirability and profitability of their involvement. Thus, as a prerequisite to any change towards participatory management in any given context, the social and economic viability of a meaningful community take-over of the management responsibility needs to be assessed by all parties concerned. A common opinion among the stakeholders at the consultation meetings in most of the study sites was that: they would acknowledge the need for some arrangement to allocate water among various water users within the basin; that they would like to participate in developing appropriate institutional mechanisms and internalizing the process of water resources management at the local level; and that they would initially prefer to have broad-based coordinating mechanisms with their direct representation along with the government agencies, before undertaking full stakeholder control of river basin management.

Given a choice that the policy makers might have between two basic strategies, either radical change imposed from the top-down, or encouraging change through an iterative bottom-up long term process, the approach suggested in this paper is the latter. Genuine involvement of local stakeholders is essential. While planning for water resources, development and management is best accomplished at river basin level; the main features of IWRM, including water allocation among the different water use groups, can be achieved with coordinating mechanisms established at national and sub-national levels. Basically, as a point of departure from the current practices, the government's role will be perceived as one of facilitating the process of establishing a participatory management mode, while initially helping the local stakeholders to actively participate in appropriately improved and adjusted forms of existing water sector institutions to suit integrated water resources management.

Thus, instead of attempting to form river basin organizations as an initial reform in the water sector, the following strategies are recommended:

- Establish essential laws and policies for inter-sectoral allocation of water resources;
- Establish coordinating mechanisms at national and sub-national levels with representation from all water use sectors;
- Through these coordinating bodies, prepare basin-level plans for developing and managing resources available within the basins; and
- Use existing water sector organizations, appropriately adapted to suit the different contexts, to implement the agreed basin plans.

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