

Sri Lanka's Water Policy: Themes and Issues

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Abstract

Fresh water resources in Sri Lanka remain a free public good with the State acting as the trustee and custodian of the resource. Although the country is blessed with a seemingly plentiful supply of water, it encounters severe problems of temporal and spatial scarcity. Nearly five decades of efforts at formulating a national water policy with a view to introducing a bulk water allocation system have failed mainly due to a lack of understanding of the basic issues confronting certain elements that constitute the basic policy. This paper presents selected key themes and issues which help stimulate the formulation and adoption of an improved water resource policy statement.

The author argues that what is important in the case of water is not the question of 'ownership' of water but regulating the user rights of this common property resource, particularly since such use is always in a state of flux. In the course of its movement in the hydrological cycle, it can only be owned when it is captured in a receptacle or in an impounding tank or as treated water in a reservoir and water conveyed in an irrigation channel. But, it is this very right to abstraction of bulk water from its natural state that is not defined and left to the will of individuals and agencies – virtually resulting in the creation of a 'free for all' situation. While the domain of water is characterized by over 50 legislative enactments and a plethora of agencies numbering over 40, there isn't a single neutral agency to determine the appropriate balance between the demands for off stream consumption and the volume of water flows needed by the river system.

The objectives of this paper are: to clarify the meaning of the terms 'ownership', 'user-rights', 'common property rights', and 'right to water'; to analyze and suggest refinements to several water policy themes and issues such as 'bulk water entitlements', 'groundwater management' and 'user conflicts'; to outline the roles of institutions for clarity in implementation; to suggest elements that should constitute a future water policy. A better understanding of the issues relating to this finite and vulnerable resource will help clarify the policy concerns that are constantly overlooked – intentionally or unintentionally - in the domain of water.

Does Sri Lanka have the right water resource policies for the twenty-first century? Such concerns prompted policymakers to attempt several policy reforms in Sri Lanka's water domain during the last five decades. Several United State Agency for International Development

(USAID) and Asian Development Bank (ADB) efforts culminated in producing a ‘national water resources policy and institutional arrangement’ document with a water policy approved by the Cabinet of the Government of Sri Lanka in March 2000. Yet, public concerns expressed on certain sensitive issues, and the lack of consensus due to the changing hands of the subject of policy development among various successor ministries, resulted in the demise of this water policy formulation effort.

Ownership or User Rights

One of the most contentious issues in the national water resource policy process was the question of ownership. Skeptics alleged that ownership would pave the way for the sale of the water resource, which should be freely available to the people as a human right. Can water be owned? Ownership connotes a right to prevent others from using a ‘resource’. Yet water is a common property resource that is always in a state of flux. In the course of its movement in the hydrological cycle it can only be owned when captured in a receptacle. It is best defined as a common property resource, not a state or a private property and, as such, incapable of being owned. What is the value of expressing ownership for a fugitive and constantly changing asset? What is relevant is the right to use and acknowledging a human right to a basic water requirement. Under the Roman Law, the air, the rivers, the sea and the seashore were incapable of private ownership. This concept of common property, called, the Public Trust Doctrine maintains that the state holds navigable waters and certain other water resources as common heritage for the benefit of the people.¹ The doctrine can prevent the continued destruction of public waters (Stevens 2003).

Water rights are linked to land ownership. In Sri Lanka, a landowner is regarded as owning the water underneath his land and consequently has a right to pump all the water from the common aquifer, thereby lowering the water table. Furthermore, he may use or abuse all the rain which falls on his land. In Sri Lanka, all the streams that flow across a private land fall within the public domain. Right to abstract and use surface and underground water should be subject to a right of reasonable use without a permit. Extraction of water by mechanized means may not be a reasonable use, for which, a permit requirement should be recognized. A water right entitles a holder of the right to exclusive use of surface or subsurface (underground) water for a specified purpose. It does not, however, endorse a right to own the river or underground water. Consequently, a water right only permits the use of water up to the permitted quantity. Being a property right, its infringement by external parties can be prevented.

People may have an exclusive right to the use of water, but it can never be ‘owned’ as it passes through a particular point on its continuous journey through the water cycle. The government is the custodian of the island’s water resources, as an indivisible national asset

¹ Issuing its landmark judgment on the Water’s Edge Golf Course Case, in the matter of an application under Article 126 of the Constitution in S.C. (FR) No. 352/2007, the Supreme Court declared that the sovereign lands of a state are held in trust by the state for the benefit of all the people of the country and ruled that the tract of land acquired for the public purpose of providing water retention as a low lying area has “to serve needs of the general public as distinct from the elitist requirements of the relatively small segment of society in Sri Lanka.”

and has ultimate responsibility for and authority over water resources management, the equitable allocation and usage of water and the transfer of water between catchments. This principle recognizes that where resources are limited and the competition is increasing, some party has to have oversight and custodianship over those resources. This means that the government is not the legal owner of water but the overall manager of water. Ownership is a difficult legal concept. Property rights can vary significantly in nature and degree. There is a difference between right to access / right to use and the ownership of water.

Water rights can be broadly categorized into public, common or private property on the basis of the decision-making rights of allocation. In public water rights, the government asserts its rights over water by controlling the allocation directly through government agencies. People obtain water rights by acquiring water permits, which allow them to use but not own water. In common water rights, people can use water in ways that are specified by the given community as seen in many farmer-managed irrigation systems in Asia. Private property rights are those held by an individual or legal personality such as a corporate body. In some cases, private rights go beyond mere user rights to include a sale or lease to others as in Chile's tradable water rights systems (Ruth Meinzen-Dick et al. 2007).

Is there a human right to water? In 1948, when the Universal Declaration of Human Rights was adopted, but no explicit recognition of a right to water was made as water like air is so fundamental to preserve life. The International Covenant on Economic, Social and Cultural Rights (1966) recognized this right under two articles, namely, article 11 - the right to an adequate standard of living and article 12 - the right to health. The Committee on Economic Social and Cultural Rights adopted general comment No.15 in November 2002 in which water is recognized, not only as a limited natural resource and a public good, but also as a human right.² Although not legally binding, the right to water requires governments to increase progressively the number of people with safe, affordable and convenient access to drinking water. Access to basic sanitation is also included in the right to water. It is noteworthy that the right to water does not mean water is free, but rather that it be affordable and accessible to all.

Bulk Water Abstraction

Water has to satisfy multiple needs as it flows through a catchment. Currently, there is no proper bulk allocation system in Sri Lanka. Some large consumptive users allocate water to themselves. In the current situation, the agency that operates the structures also controls the water allocation. For example, in the upper reaches of the Kelani River, hydro-electricity producers control the water releases. At the lower reaches at Ambatale, the National Water Supply and Drainage Board (NWSDB), which controls the intake structures, decides water allocation and consequently determines the balance flow for ecological purposes. Wherever irrigation structures are found, the Department of Irrigation controls the quantity for diversion.

² The comment provides guidelines for State Parties on the interpretation of the right to water and that it emanated from and was indispensable for an adequate standard of living as it is one of the most fundamental conditions for survival. The right to health entails the underlying determinants of health, inter alia, access to safe and potable water. <http://www.unhcr.ch/html/menu3/b/a-cesr.htm>.

The most serious deficiency observed in water allocation has been the tendency by large water users to allocate water to themselves regardless of the needs of others.

Often, there are inter-agency conflicts, particularly during times of low flow. When consumptive users such as irrigators, urban water providers, industrial and commercial users appropriate the scarce surface water, who will ensure the minimum environmental flow for the preservation of river ecology, fishing and a host of other in-stream uses? The reasons for a neutral 'State Authority' involvement in managing water resources are to coordinate the sharing of water for the benefit of all existing and potential users, whether they obtain their water from watercourses, underground water or overland flow, and to protect the environment. The challenge for the proposed authority is to establish a set of allocation principles that are rational and can accommodate long-term demands.

Do we need to establish a formal water allocation system? Can we meet all our water needs in the domestic, irrigation, hydropower generation, recreation, navigation and fishery development sectors? Can we guarantee a basic water requirement to all the people for all the above competing needs without managing the resource? The dilemma we face as a nation is how to manage our water bodies in a sustainable manner, so that future generations too will inherit a healthy river system with the capacity to provide our drinking water needs, capacity to support productive agriculture and preserve an ecosystem with a diverse range of flora and fauna.

When deciding water allocations, responsible agencies now have to take into account many more competing demands than in the past. And to this day, about 4.6 million out of the 20 million inhabitants in the country, predominantly those living in the rural areas, do not have access to safe drinking water (Wickramage 2008). They have to meet their water requirements from wells and rivers, the quality of which water is questionable. How can universal access to safe drinking water be ensured unless the freshwater sources are protected from ad hoc withdrawals by powerful vested interests?

Water use consists of three types: (a) intake uses (b) on-site uses and (c) flow uses. Intake uses for domestic, agricultural and industrial purposes, actually remove water from its source. On-site uses include water consumed by the wetlands, swamps, evaporation from surface water bodies, natural vegetation and wildlife. Flow uses include water for estuaries, navigation, waste dilution, hydro-electricity, fish and recreational uses. What is important is to determine whether the allocation for such uses has to be permitted as a 'free-for-all' or whether guidelines should be enforced by a neutral agency. The use of water for primary needs, like domestic use, and watering of plants and livestock, should be free without the need for a permit. However, any system of bulk water entitlements is likely to fail if the 'reasonable user' categories are not clearly specified in legislation. (Nanayakkara 2003).

User Conflicts

With less water available, the resource harbors a considerable potential for conflict, which may occur among individuals or community groups who require water for drinking or for cultivation or for commercial/industrial purposes. While the irrigation sector's head-end-tail-end problems are well known, and such conflicts are resolved at cultivation ('Kanna') meetings, there is no arbitrator for water conflicts between drinking or cultivation purposes. Furthermore, the urban population in Sri Lanka is projected to increase to 45 % by 2015 and 65 % by 2030

(Presidential Task Force on Housing and Urban Development, 1988, p.4). The expanding water requirements of growing urban populations are worsening the scarcity of water and seriously encroaching onto the water resources that were previously devoted to agricultural use, particularly in the dry zone. A case in point is the Anuradhapura Water Supply Scheme, which competes with irrigation requirements of the Thuruwila farmers. (Aheeyar et.al. 2008). With economic growth, new appropriation of water for commercial, agriculture, industrial or hotel use would disturb the earlier appropriations.

The water crisis in Sri Lanka's south-eastern arid zone has resulted in communities fighting with one another for their dwindling water supplies. A recent HARTI (Hector Kobbekaduwa Agrarian Research and Training Institute) study shows that the water sharing arrangement practiced in the Kirindi Oya Irrigation and Settlement Project (KOISP) between the 'old system farmers' and the 'new system farmers' is a clear example of inequity, where the old system farmers are provided with 70 % with only the balance for the new system users. While a large number of small tanks used by the farmers in the new system area were demolished for the KOISP, the farmers were denied equitable use since a 'prior appropriation' right taking precedence over 'riparian' rights (Aheeyar et al. 2008). Furthermore, it is observed that customary cattle watering places were not recognized in the development of the Kirindi Oya system (Ruth Meinzen-Dick, 2001). Farmers and pastoral groups in the Kirindi Oya area have different perceptions on water.

The dry zone is historically a water-stressed region. But what is the situation in the water-rich wet zone? The following case illustrates an instance of conflict among the farmers depending on small tank/anicut systems and the beneficiaries of rural village water supply schemes, for which water is drawn from the same supply source upstream of the small tank. The townships of Galaha and Deltota in the Kandy District suffer from a severe water shortage for domestic purposes. The rural water supply schemes are unable to cater to this fast developing area where human settlements have increased. In order to meet this demand for domestic water, extraction from Lookandura Oya has been mooted. However, the farmers in the Gabadagama area object to any diversion of water from Lookandura Oya as water from this stream has been used to cultivate paddy in Gabadagama north and south. In addition the villagers in Gabadagama obtain their drinking water requirements from this source.³

The absence of any principles for sharing water between upper and lower riparians as well as between drinking and irrigation purposes has hindered the development planning efforts of both the Irrigation Department and the NWSDB. Should the 'prior appropriation' doctrine prevent any beneficial use by later water users? Clearly, the rapidly growing populations in Galaha and Deltota townships foster fierce competition for the use of scarce water of the Lookandura Oya placing a strain on a fragile and finite resource. Who should get priority of use during times of shortage? Where, in the balance of competing interests, does natural justice lie? Climate change and population growth may exacerbate the ever more complex problems of water abstraction.

³ Information obtained as per interview on May 25, 2009 with Ms. Illangasinghe, Project Director, Towns South of Kandy Water Supply Project, National Water Supply and Drainage Board.

There is no mechanism or institutional arrangement for decision making with regard to bulk water allocation as the above case illustrates. The absence of such a bulk water allocation policy compels ad-hoc decision-making by reference to political authorities who are dictated to by pressure groups rather than by any consensus among the stakeholders. It is essential to develop principles for equitable sharing of water between the upper and lower riparians.

Groundwater Management

A vastly under-valued resource, groundwater, is one of the keys to solving the water crisis, but lies hidden out-of-public-sight. It represents 97 % of the planet's accessible freshwater reserves, and currently supplies innumerable farmers, many industries and 2 billion people with their daily water needs, and is also an essential source of water for countless springs and wetlands, for dry-weather flow in the upper reaches of most rivers, and contributes significantly to species diversity in coastal estuaries. Yet in many nations, unsustainable groundwater practices are contributing to significant and irreversible damage to the resource base. Groundwater extraction can be traced in great part to the use of flood irrigation to mass produce food – the driving factor behind the Green Revolution. Since 1950, the global acreage of land under irrigation has tripled (Maude Barlow 2007).

A water policy should address not only surface water but also the groundwater resource. Currently, a doctrine of territorial sovereignty is applied in groundwater extraction, which means that “what is beneath our feet is ours to use.” Groundwater, though not as visible as surface water, is ubiquitous in the island's land mass and its use is rapidly increasing in Sri Lanka, intensifying smallholder cultivation and improving the standards of living of poor farmers in the dry zone. The dry-zone farmers lament the lack of water for their crops at the end of the growing season, because over extraction has dried out aquifers. In some areas, like Kalpitiya Peninsula, high concentrations of nitrates and agro-chemicals are already being found in the groundwater (IWMI Water Policy Briefing, Issue 14, p.2). Despite the intense use of agro wells during the last couple of decades, groundwater use has so far been unregulated. Ownership of the overlying land should not permit the occupier to pump underground water through mechanical means. Guidelines should be established prescribing the spacing norms for pumps and wells.

The groundwater management necessitates proactive intervention because high abstraction rates and uncontrolled developments require management policies, which strive to balance the needs and interests of all water users and affected stakeholders in a particular region. A survey conducted by IWMI revealed that “...in Sri Lanka, some aquifers are already being pumped dry by the end of the dry season, and some communities have been left without drinking water.” Furthermore, farmers in the lower reaches of the Hakwatuna scheme in the Deduru Oya basin, for example, are lamenting that heavy pumping upstream has reduced the availability of both groundwater and surface water in their area (IWMI, Water Policy Briefing, Issue 14, p.4). Water rights may offer a way for poor irrigators to protect their river water from being stealthily stolen by wealthy and powerful investors through induced seepage and reduced base flow caused by heavy pumping.

Over-extraction also has far-reaching economic and environmental effects. Aquifers are naturally discharged into rivers and other water bodies during dry periods, thereby sustaining

important wetlands and native vegetation. Because Sri Lanka's aquifers are shallow, they are particularly vulnerable to pollution. Safeguarding water quality is vital, especially as 66 % of rural drinking water comes from open dug-wells (DCS 2008). Additionally, other pollution problems have also emerged. Several deep tubewells constructed recently to provide drinking water in the dry zone have been abandoned because of high iron and fluoride concentrations.

The Water Resources Board is mandated to collect, collate, analyze, interpret and disseminate groundwater-related data in Sri Lanka. All groundwater sources used for domestic and livestock purposes should be subjected to a detailed water quality analysis at the implementation of the scheme. The microbiological, physical and chemical parameters should be included in such a water quality surveillance programme. All wells need to be registered to monitor trends in groundwater development and its use. Agro-chemical pollution of aquifers and soil salinization also need to be monitored, particularly in areas where groundwater is used for drinking and where there is not enough rainfall to flush out salts and other contaminants (*ibid*, p.2).

The implications of stream-aquifer connectivity and the need for a conjunctive management approach are the most under appreciated issues in Sri Lanka. A management policy should clearly stipulate that groundwater should not be regarded as a resource separate from surface water. The policy should recognize that both surface and groundwater are hydrologically connected and are complementary components of a larger single system.

Governance and Institutions

The complexities of water use require that all the players – water users, policymakers and planners at all levels be actively involved in decision-making, planning and implementation of water management. Centralized and sectoral approaches to water resource development and management are insufficient to solve local management problems. The role of government needs to change to ensure a more active participation from people, local institutions, NGOs and Community Based Organizations (CBOs). The management of a resource at the lowest appropriate level requires the fundamental principal of a decentralized approach. Yet, such an approach would fail if it were to operate in an institutional vacuum. Figure 1 depicts the sectoral and non-sectoral players at national and sub-national levels that handle various aspects of the management of water resources.

The quasi-federal character of the Sri Lankan polity after the enactment of the Thirteenth Amendment to the Constitution has some particular implications for water management. The confusion governing the allocation of the subject of irrigation within the provincial, central and concurrent jurisdictions is illustrated in Table 1 by juxtaposing the subjects and functions assigned to the Central Government and the Provinces. The Provincial Council list empowers the centre to handle inter-provincial irrigation and land development projects, which utilize water from rivers flowing through more than one province. It also empowers the centre to handle all schemes where the command area falls within several provinces, such as the Mahaweli Development Project.

There is a need for an institutional arrangement at the national level, such as a proposed National Water Resources Authority (NWRA) capable of defining the overall water policy directions and adjudicating disputes. The complex functions of a national authority lie in the

establishment of effective integration of the overall socioeconomic and environmental decision-making process. Figure 2 depicts the sectoral and sub-sectoral areas dispersed in the domain of water with a need for a central apex body to provide a system of linkages between existing organizations, including basin authorities for harmonizing policy approaches.

Figure 1. Institutional setting.

<i>National Level</i>	
Non-sectoral Players	
• WRC (Proposed)	Policy formulating body for Water Resource Allocation
• NWRA (Proposed)	Water Rights, Bulk Entitlements
• CEA	Environmental Quality Standards, EIA Procedure (Tolerance limits for discharge of effluents into inland waters)
Sectoral Players	
• Irrigation Department	Irrigation development and maintenance
• CEB	Power generation, transmission and distribution
• Mahaweli Authority	Water and related infrastructure development in designated basins; Water panel
• NWSDB	(1) Regulator for drinking water : (2) Operator of integrated urban schemes, small town schemes
• Department of Agrarian Development	- Village irrigation
• Department of Fisheries	Aquaculture, fisheries management
• NARA*	Aquaculture and fisheries research
• Water Resources Board	Hydro-geological investigations into groundwater
• NAQDA**	Development of aquaculture and inland fisheries
<i>Provincial Level</i>	
Provincial Ministry of Irrigation	
Provincial Ministry of Local Government	
<i>Divisional Level</i>	
• Divisional Secretary	Divisional Agricultural Committee, Kanna meetings
• Farmer Organizations	O&M of field channels, and distributory channels, Village irrigation
• Local Government Level	
Municipal Councils	Urban water supply systems
Urban Councils	Unintegrated urban systems, small towns water supply schemes,
<i>Pradeshiya Sabha</i>	Rural water supply schemes
<i>Village level</i>	
CBOs/NGOs	Community water supply schemes (piped, gravity schemes, rainwater harvesting schemes.)

* National Aquatic Research Agency

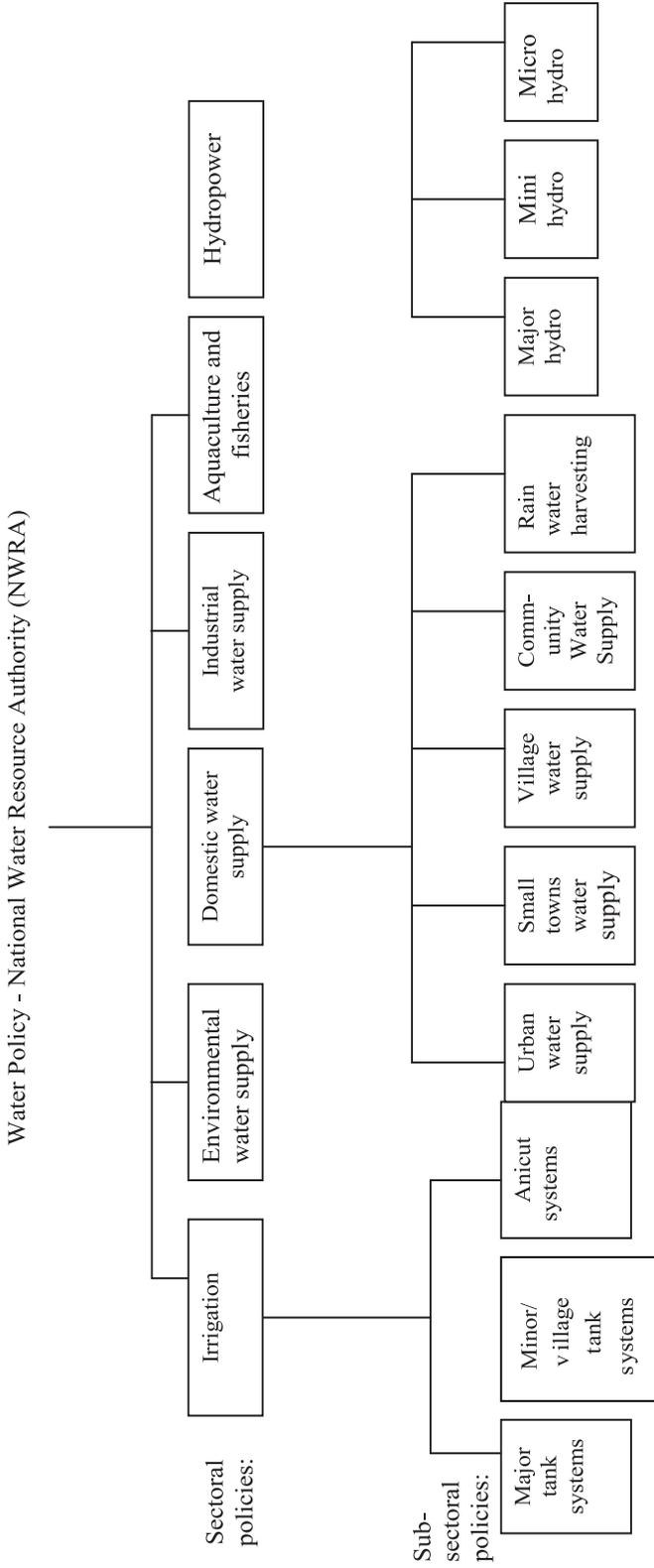
** National Aquaculture Development Authority

Table 1. Competence jurisdiction relating to irrigation in the Thirteenth Amendment.

List 1 - Provincial	List 2 – Reserved	List 3 - Concurrent
9.2 Rehabilitation and maintenance of minor irrigation works	National Policy on Irrigation	17. Irrigation -
19. Irrigation – Planning, designing, implementation, supervision and maintenance of all irrigation works, other than irrigation schemes relating to rivers running through more than one province or inter provincial irrigation and land development schemes.	Rivers and waterways; shipping and navigation: maritime zones including historical waters, territorial waters, Exclusive Economic Zone and continental shelf and internal waters; state lands and foreshore, except to the extent specified in item 18 of List 1. Inter-provincial irrigation and land development projects 2.1 Such projects would comprise irrigation and land development schemes- (a) within the province initiated by the State and which utilize water from rivers flowing through more than one province: a Provincial Council however, may also initiate irrigation and land development schemes within its province utilizing water from such rivers; (b) within the province which utilize water diverted from water systems located outside the province; and (c) all schemes where the command area falls within two or more provinces such as the Mahaweli Development Project. 2.2 These projects will be the responsibility of the Government of Sri Lanka. 2.3 The Government of Sri Lanka will be responsible for the administration and management of such projects.	17.1 Water storage and management, drainage and embankments, flood protection, planning of water resources. 17.2 Services provided for inter-provincial land and irrigation schemes, such as those relating to rural development, health, education, vocational training, co-operatives and other facilities.

Source: Damayanthi and Nanayakkara (2008), Impact of the Provincial Council System on the Smallholder Agriculture in Sri Lanka, Colombo HARTI, p. 21

Figure 2. Policy areas in the domain of water use.



Unfortunately Sri Lanka does not have a single water administration, which is responsible for the freshwater resource, as a whole. But, it does have multiple authorities for the sectoral aspects of water administration. Where traditions of inter-jurisdictional jealousy and distrust preclude opportunities for coordination of the economy, fragmentation remains an impediment to productivity gains. Consequently, the responsibility for the development, apportionment and management of the freshwater resource is ad-hoc, tentative and confusing.

What does the sectoral organization of society imply with regard to demands on water? The health authorities are interested in water supply and sanitation to protect against water-related diseases, high morbidity and mortality. To date, around 6 million inhabitants in the country have to meet their drinking water requirements from wells and streams, the water quality of which is questionable. How can universal access to safe drinking water be assured unless the freshwater resources are protected from ad hoc withdrawals by powerful vested interests?

The agricultural authorities are responsible for crop production, in ensuring food security, excessive increasing of water requirements for intensive land use, often leading to land degradation. Irrigated agriculture claims the lion's share of the island's water use, accounting for over 70 % of total withdrawals. The Central Environmental Authority is responsible for habitat protection to avoid ecosystem degradation and maintenance of water quality. The economic development authority is responsible for industrial production, thereby increasing water requirements, may also leads for generating pollution loads.

In-stream use of water also serves fisheries, transportation and recreation needs. Although hydro-power is a non-consumptive use, it requires public water allocation through decisions to build dams and the operating rules that change the flow pattern of rivers. Public allocations to fisheries, wildlife and navigation are embodied in the restrictions on the development or withdrawal of water for other uses. The primary challenge in Sri Lanka is, and will be, how to cope with the rising competition for water between multiple kinds of users in ways which are equitable, efficient and sustainable.

At the national level, a large number of ministries, departments and public corporations have responsibilities impinging on water resource management. These institutions, numbering over 30, perform various functions such as irrigation, drainage, water supply, hydropower and ecological purposes (Imbulana et al. 2006). Central agencies are categorized according to water use (irrigation, drinking water, hydro-electricity, forest, land), and each is vested with multiple functions (policy, regulatory, commercial and conservation). It is easy for an agency to compromise one function in favor of another. The tunnel-view tendency in each of these sectoral bodies introduces incoherence in decision-making that explains many of the difficulties in coping with emerging problems.

Responsibilities for management of the water resources are scattered over different agencies within provincial, district and divisional administration. The management of some of the major and medium sized irrigation reservoirs and minor tanks/anicut schemes has been entrusted to the Project Management Committees/Farmer Organizations with shared responsibilities. Some of the large reservoirs serving multi-purpose objectives are also managed by agencies such as the Ceylon Electricity Board, Irrigation Department, National Water Supply and Drainage Board and the Mahaweli Authority of Sri Lanka. A multiplicity of institutions is sometimes unavoidable. Water resource, by its very nature is cross sectoral, whereas administrative arrangements of the government are based on the sectoral approach.

The above institutions also fall into the category of water users when they function as service delivery agencies, playing a dual role at the same time. There isn't an integrated approach to water resources management or a system that separates development and service delivery functions of an authority responsible for the management of the resource. There is also a lack of a legally empowered authority or agency to allocate water for different water users although the Irrigation Department in certain critical situations assumes such a responsibility.

Future Directions

As a growing population will increase needs and expectations for water use, and as supplies become further stressed and polluted, the government needs to refocus its approaches to water management. What could be the elements of such a comprehensive, integrated and sustainable countrywide water policy? The ensuing policy directions present a number of principles that can be applied at all levels in the polity. We must acknowledge the doctrine of reasonable and beneficial use to mean that water must be allocated fairly and used efficiently. All users should avoid actions that impair the quantity and quality of water available for other users. This public resource must continue to be managed by the State to further the benefit of all who live in the country.

Despite public ownership, there isn't a single custodian for the natural resource. A neutral agency should determine the appropriate balance between the demands for water for off-stream consumption and the volume of water flows needed by the river system. The growing competition for water between irrigation use for food production and domestic use by both urban and rural dwellers needs to be resolved by a nonpartisan body at the apex, such as the earlier proposed National Water Resources Authority (Bandaragoda 2006). It should determine the sharing and allocation of water between multiple kinds of users in ways which are equitable, efficient and sustainable. Currently, there is no administrator for the water rights system. Like air, water is a resource that transcends society's boundaries. Watersheds and aquifers cross private property borders as well as national, sub-national and local government boundaries.

At the national level, a dilemma has arisen concerning appropriate degrees of centralization and decentralization of water planning and administration. Water resources planning and management frequently fail to use the river basin as the natural unit for hydrologic management, resulting in the inefficient use of water and inadequate concern for in-stream and ecosystem values. Therefore, it is imperative to recognize the environment as a legitimate user of water. The maintenance of stream flows in keeping with minimum water levels for in-stream uses has never been implemented in Sri Lanka. Consequently, environmental concerns such as the loss of biodiversity, salinity intrusion and seasonal drying up of wetlands have arisen. A percentage of the flowing water in streams must be dedicated to the environment for fish and stream reservations.

Many water problems stem from a failure to take an adequately large 'systems viewpoint' (like upstream-downstream relationships on major rivers), while day-to-day administration and public participation call for a more localized approach. The appropriate resolution of this issue requires delineation of administrative boundaries to conform to river basins. This is a complex issue that can retard the progress in the implementation of devolved responsibilities as set out in the Thirteenth Amendment of the Constitution.

Apart from the creation of a single new institution at the apex, the mandates of existing sectoral agencies need to be re-examined in order to sharpen the regulatory role of the government. Furthermore, the roles and responsibilities of the existing water agencies would have to be re-oriented to reflect their revised mandates of service delivery and to keep such functions separated from resource management functions, given the unclear and overlapping nature of institutional roles and responsibilities. The need to separate the policymaking and regulatory roles from the implementation, operation and service management functions of institutions is paramount. The mandates of sectoral agencies as structured currently do not address some important issues such as water sharing, conjunctive use and basin management.

Can our land stewardship be separated from water stewardship? Since the mode of land use also helps determine the water balance, an integrated view of land and water use must be taken into account for water management planning. Such planning must presuppose that a watershed-based approach is adopted, which often cuts across administrative boundaries. Improved water governance will thus require a revision of the present system, which is a 'free for all' system, through the development and enunciation of a shared, comprehensive vision of water resources. Integrated Water Resources Management (IWRM) assists communities to improve the ways they share, manage and protect water resources. Groundwater is inextricably linked and physically connected to surface water and must be managed conjunctively and sustainably. There is a need to legally recognize the principle that the overlaying property owner is not vested with a right to private ownership of the groundwater beneath his feet except to the extent of a reasonable user right.

Because of a general perception of water abundance, Sri Lanka's laws from colonial times never reflected any urgency for conservation. Hence, the policy has evolved over the last two centuries as if water had no cost and there were no limits to its availability. It is an axiom that there is not enough water in the island to permit every user to do with the resource as he or she pleases. Like other laws governing scarce things, a water law must encourage desirable activities and prevent or discourage undesirable conduct. There is an urgent need for a comprehensive water resources legislation to fill this void of legal regulation.

It is important to recognize that water is not simply a free 'gift of nature'. In all its competing uses, water has an economic value. Some form of cost recovery is evident in the domestic water supply sector, which includes the recovery of operation and maintenance costs plus the greater part of debt service or depreciation of revenues derived from tariffs. Managing water as an economic good (certainly not as a commercial good to be traded in the market) is an important way of achieving equitable and efficient use and encouraging conservation.

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