Water Policy 8 (2006) 51–67

Limits to donor-driven water sector reforms: insight and evidence from Pakistan and Sri Lanka

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Received 10 January 2005; accepted in revised form 7 February 2005

Abstract

Two countries in South Asia, Pakistan and Sri Lanka, have embarked upon innovative measures for restructuring their institutional framework for water resources management. Both of these countries have a colonial heritage. Most of their current institutional arrangements for water resources management, particularly in the irrigation sub-sector, are greatly influenced by the laws and administrative procedures introduced during the British colonial period. In the wake of massive investment programmes sponsored by international development aid after independence, each of the two countries has collaborated with donor agencies in designing new institutional development packages. Despite similarities in terms of donor interests, the two countries seemed to be proceeding along different reform paths. Pakistan experimented with an overall change in the irrigation institutions, whereas, Sri Lanka focused on coordinating mechanisms for integrated water resources management at both river basin and national levels. In both of these cases, the progress of reform attempts seems to be grinding to a halt owing to lack of an internally generated demand for reforms.

Keywords: Institutional reforms; Integrated water resources management; International donors; Pakistan; Participatory management; Sri Lanka; Transaction cost; Water policy

Introduction

The water sectors of Pakistan and Sri Lanka are similar in character in some aspects and are very different in many other aspects. Similarity is in their common colonial heritage, in the legal framework and other key features of their water sector governance, and in the significance of water resources within their respective economies. Disparities range from geographical and demographic size of the two systems, to their different socio-cultural background. Both countries have made irrigation a major economic endeavour, but their irrigation traditions vary from a little over 200 years in Pakistan, to over 2500 years in Sri Lanka. Pakistan's irrigation accounts for 14 million hectares, whereas Sri Lanka has

doi: 10.2166/wp.2005.026

only less than one million hectares of irrigated agriculture. However, despite the difference in size, the socio-economic significance of irrigation is very similar in both countries.

A shortage of good quality water, inadequate maintenance of the large contiguous canal system and deviations from operational rules characterized Pakistan's irrigation system in its pre-reform stage. These constraints were further compounded by the daunting irrigation-induced environmental problems of waterlogging and salinization, which were popularly known in Pakistan as its "twin menace". The institutional structure was static and centralized in character and reflected the hierarchical society in which it was embedded. Difficulty in ensuring adequate supervision over operations in the long and widespread canal system tended to promote the practices of free-riding and rent-seeking in the field. The combined effect of these problems amounted to an increasing inequity and a declining productivity in the irrigated agriculture sector. The dominance of irrigation in Pakistan's water sector also meant that irrigation claimed a higher proportion of the overall water-related problems.

Sri Lanka's challenges in water resources management included seasonal shortages of water, a high degree of spatial variation in the availability of water, as well as degradation of water quality through domestic and industrial effluent and agricultural runoff. In contrast to what was observed in Pakistan, intersectoral competition for water was greater in Sri Lanka, and the country's institutional framework for water resources was also much more complex than in Pakistan. One strong similarity between the two countries' water sectors was the high level of donor assistance they were able to attract for resources development and resources management. While the World Bank was taking the initiative and the leadership in providing foreign aid for Pakistan's water sector reforms, a similar leading role was played by the Asian Development Bank for reforms in water resources management in Sri Lanka.

Primarily prompted by donor initiatives, both the Pakistan and Sri Lanka authorities responded to their respective water-related constraints by considering possible institutional remedies to address the problems. Considerable attention was given to the steps to be taken in transferring management responsibility to organized farmers' groups, encouraging private sector involvement and markets for surface and groundwater. In addition, there was a growing concern about the management of vertical drainage tube-wells and the maintenance of surface drainage networks in Pakistan. Recovery of operations and maintenance (O&M) costs was a major issue for both countries, although Pakistan already had a land-related water charge. Sri Lanka introduced O&M cost recovery in the early 1980s, but owing to pressure from political groups against this "water charge", the scheme had to be abandoned. In Pakistan, even when the rate of water charges increased from 1983 to 1987, the revenues as a percentage of O&M cost declined during the period.

The proposition that is being evaluated in this paper is that unless an internally generated demand for reforms is forthcoming in a country, institutional changes cannot be sustained regardless of the level of support and pressures from international funding and donor agencies. This proposition is evaluated using the recent water sector reform efforts observed mainly in Pakistan and Sri Lanka. However, the reform experiences of other developing countries are also considered in a few relevant contexts. The paper relies on the methodological approach based on the institutional decomposition and analysis (IDA) framework introduced by Saleth & Dinar (2004) that considers both the institutional structure and the institutional environment governing the water sectors of the two countries studied. The contextual variations in terms of historical development, culture, resource base and the significance of water in the overall economy explain the differences in institutional reform processes undertaken to solve a largely similar set of water sector problems in the two countries. These differences could further be clarified by analysing the countries' respective political economies of water management and the transaction costs of

implementing reform measures (Saleth & Dinar, 2005; Livingston, 2005). In Pakistan, some micro level agitation for institutional change emerged, but was thwarted by a stubborn resistance from the vested interests. In Sri Lanka, designs for water reforms were basically driven by the donors and the national planners, with little consultation and concurrence with micro level stakeholders.

Thus, a particular common feature of the strategies adopted by the two countries for introducing water sector reforms was the neglect of the micro level local demand for institutional changes. Consequently, the outcomes of their different reform paths eventually converged on the failure to establish a strong institutional framework for improved water resources management.

The case of Pakistan

Historical development of the physical system

A reference to Pakistan's water resources has invariably accompanied the statement that the country has the largest contiguous canal irrigation system in the world. The large resource base of the Indus river basin and its tributary basins shows the cumulative effect of more than a hundred years of consistently made investment in irrigation development (see Table 1 and Figure 1). Initiated by the British colonial administration, the development of the extensive canal irrigation system in Pakistan was initially supported by the Punjab Regiment and the management of the canal irrigation system had its roots in the Canal and Drainage Act of 1873, introduced by the British. Investment in developing the water resource system continued even after the departure of British in 1947.

The high water mark of this development process was the Indus Basin Project (IBP) of the 1960s, which saw an increase in the total water supply for irrigation from about 79 billion m^3 at the time of independence to almost 135 billion m^3 by the end of the IBP effort. During the First Five-Year Plan period (1955–60) in Pakistan, the share of public investment in agriculture and irrigation was around 30%. This share increased to about 46% during the Second and Third Plan periods (1960–70) when the Indus Treaty projects were implemented, but since then declined rapidly to a level of about 17% in the Sixth Plan period in the 1980s (Hamid & Tims, 1990). Although the share of the government budget for development work gradually declined after the completion of the IBP, the government continued to allocate resources for upgrading and enhancing the system to meet an increasing demand for irrigation benefits.

The heavy investment in irrigation development in Pakistan since 1960 resulted in substantial increases in farm gate availability of water and the area irrigated (Table 2). During the period 1960–87, the supply of canal water increased only by 27%, whereas the supply from private tube-wells increased by 786% and accounted for 57% of the total increase in supply for the period. The increase in the quantity of water used per acre seemed to be mostly attributable to increased private tube-well water. The advent of groundwater development highlighted two important features of Pakistan's irrigation environment. One was related to the traditionally identified, and more commonly acknowledged, function of groundwater extraction in controlling the water and soil balance, which initially prompted the government to initiate a programme of deep wells. The other was an aspect of greater significance, which related to the presence of a usable underground system of storage of water, much more in volume than all the surface storage reservoirs in the Indus basin. Of an annual recharge to this groundwater reservoir, estimated at 46 million acre feet, some 36 MAF has been assessed as usable.

Table 1. Chronological sequence of canal construction in Pakistan.

Canal	Diversion site	River	Year	CCA (million acres)	Cumulative CCA (million acres)
1. Central Bari Doab	UCC/BRBD	Chenab	1859	0.649	0.649
2. Sidhnai	Sidhnai	Ravi	1886	0.869	1.518
3. Lower Swat	Munda	Swat	1890	0.182	1.7
4. Kabul River	Below Warsak	Kabul	1890	0.048	1.748
5. Jamrao	Jamrao Head	East Nara	1899		1.748
6. Lower Chenab	Khanki	Chenab	1892	3.03	4.782
7. Lower Jhelum	Rasul	Jhelum	1901	1.500	6.282
8. Paharpur	Chashma	Indus	1909	0.104	6.386
9. Upper Chenab	Marala	Chenab	1912	1.441	7.827
10. Lower Bari Doab	Balloki	Ravi	1913	1.670	9.497
11. Upper Jhelum	Mangla	Jhelum	1915	0.544	10.041
12. Upper Swat	Amendra	Swat	1915	0.398	10.439
13. Eastern Sadiqia	Suleimanki	Sutlej	1926	0.969	11.408
14. Pak Pattan	Suleimanki/Islam	Sutlej	1927	1.049	12.457
15. Fordwah	Suleimanki	Sutlej	1927	0.426	12.883
16. Qaimpur	Islam	Ravi/Chen	1927	0.043	12.926
17. Bahawal	Mailsi/Bahawal	Ravi/Chen	1927	0.605	13.531
18. Upper Depalpur	UCC/BRBD	Chenab	1928	0.360	13.891
19. Lower Depalpur	Balloki/Suleimanki	Ravi	1928	0.615	14.506
20. Mailsi	Sidhnai/Mailsi	Ravi/Chen	1928	0.996	15.502
21. Panjnad	Panjnad	Sutlej	1929	1.348	16.85
22. Abbasia	Panjnad	Sutlej	1929	0.154	17.004
23. North West	Sukkur	Indus	1932	1.215	18.219
24. Rice	Sukkur	Indus	1932	0.519	18.738
25. Dadu	Sukkur	Indus	1932	0.584	19.322
26. Khairpur West	Sukkur	Indus	1932	0.417	19.739
27. Rohri	Sukkur	Indus	1932	2.561	22.3
28. Khairpur East	Sukkur	Indus	1932	0.373	22.673
29. Eastern Nara	Sukkur	Indus	1932	2.176	24.849
30. Rangpur	Trimmu	Chenab	1939	0.344	25.193
31. Havali	Trimmu	Chenab	1939	0.179	25.373
32. Thal	Kalabagh	Indus	1947	1.641	27.013
33. Pinyari	Kotri	Indus	1955	0.758	27.771
34. Fuleli	Kotri	Indus	1955	0.923	28.694
35. Lined Channel	Kotri	Indus	1955	0.502	29.196
36. Kalri Baghar	Kotri	Indus	1955	0.592	29.788
37. M. R. Link(Int)	Marala	Chenab	1956	0.158	29.946
38. D. G. Khan	Taunsa	Indus	1958	0.909	30.855
39. Muzaffargarh	Taunsa	Indus	1958	0.809	31.664
40. Pat	Gudu	Indus	1962	0.747	32.411
41. Desert	Gudu	Indus	1962	0.328	32.739
42. Begari	Gudu	Indus	1962	1.002	33.741
43. Ghotki	Gudu	Indus	1962	0.858	34.599
44. CRBC Stage-I and II	Chashma	Indus	1986	0.140	34.739

(UCC/BRBD - Upper Chenab Canal/Bambawala Ravi Bedian Depalpur).
Source: Water and Power Development Authority (1979) and Federal Planning Cell (Water Sector Investment Plan, 1990).

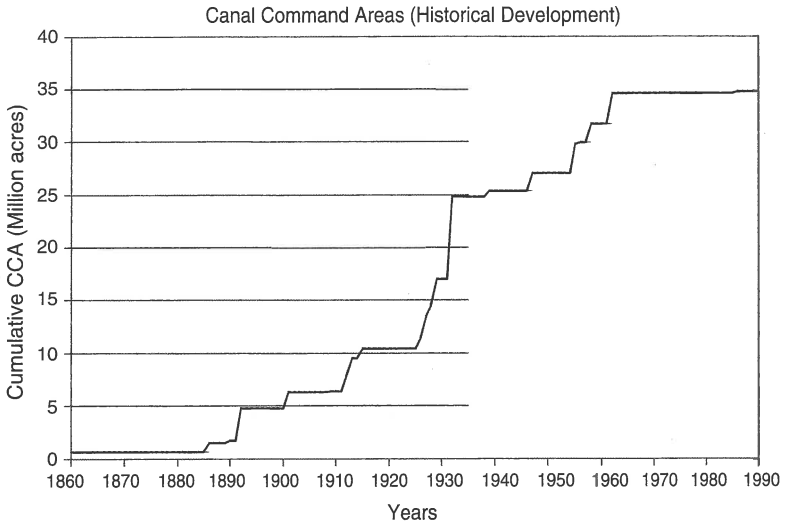

Fig. 1. Historical development of canal construction in Pakistan.

The expansive irrigation development in Pakistan is linked to some important environmental implications. A significant feature of the country's irrigation environment is its high incidence of waterlogging and salinity, which according to conventional wisdom have been linked together as the "twin menaces" of irrigated agriculture. Most of the salinity in many parts of the country is identified as ancient, resulting from original soil forming processes and pre-dates the rise in water tables based on canal irrigation. Despite attempts at the design stage to exclude high salinity areas from canal commands, the inclusion of some saline land patches among large tracts of good soil was inevitable. Thus, salinity in itself has been a separate problem independent of rising water tables. While the problem of waterlogging has been and is being arrested by groundwater extraction, secondary salinization emerged as a more disconcerting problem and tended to become isolated as a persistent and growing menace of its own.

The O&M of this extensive irrigation system and its related drainage and flood protection measures have largely been a responsibility of the government. While the federal government ministries were concerned with major decisions for water allocation, provincial irrigation departments (PIDs) were responsible for the O&M of the main and secondary canal sub-systems. Farmers attended to the maintenance of the tertiary sub-systems at the watercourse level. Despite the increases in water charges, averaging 5% per annum from 1983 to 1987, the revenues as a percentage of O&M cost declined from

Table 2. Irrigation and irrigated-area expansion (1960–87).

Availability of water (million acre foot)	1960/61	1967/68	1977/78	1985–87 (average)
Canal	48.35	56.82	61.62	61.63
Public tube-wells	0.47	1.97	6.21	8.80
Private tube-wells	3.70	9.75	21.61	32.09
Total	52.52	68.54	89.44	102.32
Irrigated area (million acres)	25.71	30.86	35.14	39.80

Source: National Commission on Agriculture (1988: 288).

53–38% during the period (Water Sector Investment Plan, 1990). Increases in O & M costs, low assessment of water charges and low recovery rates, all combine to form this imbalance.

Within this environment, the composite irrigation system did not show much progress towards performance improvement. Crop yields have remained generally low, or progressed only very slowly when compared to other countries, even to those with much less resource endowment. Similarly, poverty has stubbornly persisted in rural areas despite their proximity to irrigation development. It is therefore appropriate to look carefully beyond a favourable resource base and related technological advances and try to isolate other probable factors that may cause unsatisfactory performance. With the fast growing population, the possibility of a substantial food deficit in the near future has also been identified as a daunting aspect of unsatisfactory results from irrigation (Water Sector Investment Plan, 1990).

The large size of Pakistan's contiguous canal irrigation system and the complexity of related irrigation institutions made the allocation water resources to the various political units a burning policy and administrative issue. The difficulty was mainly related to its high political sensitivity, dating back even to the pre-independence period. The gravity of this issue could be seen in the long iterative series of evaluations and deliberations and the agreements reached during the pre- and post-independence periods (Water Sector Investment Plan, 1990).

2.2 *Institutional developments in Pakistan's water sector*

The 200-year long experience in canal irrigation in Pakistan led to the evolution of a strong irrigation tradition, which has sustained a broad-based community interest in irrigation. The result is a very complex institutional milieu in which a set of formally established irrigation rules and organizations stand side by side with an intricate set of informal social institutions. The two sets have tended to act like a dual system, often in conflict with each other (Bandaragoda & Firdousi, 1992).

Another form of dualism came into existence when the clearly integrated physical system sharply contrasted with its relatively more complex and uncoordinated institutional framework. The complexity of Pakistan's irrigation institutional framework was characterized by a number of interacting features:

- federal government responsibility for resource allocation
- provincial government responsibility for irrigation management
- large organizations with centralized administration
- large numbers of water users with little involvement in irrigation management decisions
- difficult coordination among agencies and their sub-units and functions
- numerous laws and procedures mixed with traditional concepts and occasionally amended enactments and promulgations, and
- countervailing forces that would act against formal rules and regulations.

Concurrently, sporadic changes were introduced to the irrigation management organization, based on *ad-hoc* project-based requirements, making the management structure rather ineffective in a fast changing socio-economic context.

Thus, efforts to achieve stability through enhanced physical infrastructure and technological inputs were mostly subverted by poor institutional support, resulting in low agricultural yields, widespread irrigation misconduct, severe tail-end deprivation, low productivity of manpower and financial resources

and persistent rural poverty. In 1990, the average per capita income in Pakistan's rural areas (where about 70% of the population lived) was assessed to be less than half that in urban areas and value added per worker in agriculture (which employed about 50% of the work force) was less than one-third of the rest of the economy (Hamid & Tims, 1990). Absolute rural poverty dropped by only one-third in 20 years, a much lower rate than in Sri Lanka, and a lower rate compared to achievements in some states of India (John Mellor Associates and Asianics Agro-Dev, 1994).

The annual O&M (O & M) allocations for the PIDs gradually became insufficient owing to inflation and heavy inter-sector competition for resources. The management of O & M became increasingly ineffective owing to changing institutional conditions associated with irrigated agriculture. Despite the increases in water charges (e.g. an average of 5% per annum from 1983 to 1987), the revenues as a percentage of O & M costs declined (e.g. from 53% to 38% during the same period). Increases in O & M costs, low assessment of water charges and low recovery rates have all combined to form this imbalance (Water Sector Investment Plan, 1990).

With inadequate maintenance, the canal system started to deteriorate. Donors and government planners sensed the impending decline in performance that could deprive the country of its expected return on heavy investment in irrigation development. Pakistan's crop yields remained generally low and poverty stubbornly persisted in rural areas despite their proximity to irrigation. A daunting aspect of this unsatisfactory irrigation performance, despite the favourable resource base and related technological advances, could well be a substantial food deficit in the future, particularly in view of the country's fast growing population.

Illustrating a growing international concern, the World Bank funded four projects: the On-Farm Water Management Projects I and II (1981–92), the Irrigation System Rehabilitation Project (1982–87) and the Command Water Management Project (1984–92) to address the major system management and institutional issues. All of these four projects, at an investment level of US$175 million, were to concentrate on reducing drainage and saving water using existing infrastructure, rather than building new dams, and had a specifically designed institutional component. The importance of this shift of emphasis was further accentuated by continued donor pressure for institutional reforms, which resulted in a slow movement towards change. The path towards institutional change had identifiable landmarks:

1. In the early 1980s, legislation was passed by the four provincial governments allowing the formation of Water Users Associations (WUAs) at watercourse level. The On-Farm Water Management (OFWM) Directorate, a newly created organizational unit in the Provincial Agriculture Departments, launched an extensive programme of forming WUAs. Along with the OFWM programme, the Command Water Management Program (CWMP) was launched in selected command areas to achieve some degree of inter-agency coordination.
2. Evaluations of a decade of this experience were not very encouraging in terms of institutional development. Farmer involvement in the management of the irrigation system was not as expected in the project design stage. The World Bank's post-project evaluations later confirmed that the projects achieved their physical components (water losses in watercourses were reduced from about 40% to 25–30%), but failed in most of their institutional objectives (World Bank, 1996).
3. The World Bank in its report on *Pakistan's Irrigation and Drainage: Issues and Options* (World Bank, 1994) proposed a reorganization of the whole irrigation sector, including the establishment of autonomous public utilities for irrigation management. Many government officials found this approach too radical, but recognized the need for some institutional change. Concurrently, donors

initiated a series of discussions with government policy makers on possible institutional reforms. Interactions with selected local opinion leaders to discuss the implications of suggested reforms led to explicit view points, some of which were later expressed in published form (e.g. Asrar *et al.*, 1996).

4. A seminar on "Participatory Irrigation Management", co-sponsored by Pakistan's Ministry of Water and Power and the World Bank's Economic Development Institute (EDI), held in Islamabad during 2–6 October 1994, saw a major breakthrough in gaining initial government agreement on the need to change.
5. This initiative was followed by another EDI sponsored workshop held in October 1995, during which representatives from four provinces worked out tentative action plans for institutional change. In the midst of considerable pessimism about participatory irrigation management and its validity in Pakistan's large canal systems, a consensus started to be developed on the need to undertake some pilot projects in selected locations.
6. The International Water Management Institute's study results on irrigation system management, policy and institutional analysis in Pakistan coincided with, and probably helped to catalyse, these newly emerging concerns and interests (Bhutta & Vander Velde, 1992; Vander Velde & Murray-Rust 1992; Bandaragoda & Firdousi, 1992; Bandaragoda, 1993; Restreppo *et al.*, 1994; Bandaragoda & Saeed ur Rehman, 1995).
7. Subsequently, there was a growing awareness regarding the necessity for farmers to be involved in O&M, mostly prompted by donor concerns and also based on the realization that declining budgetary capacities would soon have adverse effects. Yet, there was considerable pessimism among many government officials about being able to form effective farmers organizations and their impact on the productivity and sustainability of irrigated agriculture.

Several preparatory steps for institutional reforms were taken. They included the enactment of new laws to introduce changes to existing institutional arrangements, establishment of initial structures for transforming state controlled irrigation agencies into financially autonomous Provincial Irrigation and Drainage Authorities (PIDAs), one for each province and planning Area Water Boards (AWBs), initially on a pilot basis in selected canal command areas.

Action research programmes, already conducted at various pilot sites in Pakistan by the International Water Management Institute, found that organizing water users at the secondary level of Pakistan's contiguous canal irrigation system was socially feasible. This was contrary to the popular belief that existed both within and outside Pakistan. The popular notions referred to constraints of an integrated socio-technical system, illiterate farmers, social pressure from big landowners and obstacles caused by a hierarchical society. These popular notions were proven to be invalid under conditions of a participatory process of social organization. The methodologies used in the action research programme had the common focus on building self-reliance among the farmers, and using field training and other forms of capacity building as the major motivating influences. This focused effort successfully achieved the formation of a number water users associations (WUAs) at the tertiary (watercourse) level and a few water users federations (WUFs) at the secondary canal (distributary) level in the selected pilot sites in Punjab and Sindh provinces (Bandaragoda, 1999).

Encouraged by pilot scale results and pressed by the demand from the newly awakened stakeholder groups and the donors, the Government of Pakistan initiated action to establish PIDAs and pilot-scale AWBs in each of the four provinces. Organization of farmers at a distributary level was also launched in all provinces. The idea of a complete management transfer to the user organizations at this stage was not

readily acceptable by either the state agencies or the water users. The action research programme concluded that a combined property rights regime for possible joint management arrangements is a conceptually sound strategy to pursue in these circumstances. The programme was appreciated by many as it coincided with a policy resolve in Pakistan and several other countries in the region to introduce major reforms aimed at improving the effectiveness of water resources management institutions.

Although it has been a slow process of change, Pakistan's plan for institutional change in this vitally important water sector can be seen as a very practical and also a contextually appropriate strategy. Sensing the initial objections to the concepts, such as "privatization of irrigation" and "irrigation management turnover", the planners consciously shifted to a strategy of organizational reform as an initial step. While many other countries including Sri Lanka floundered on this essential requirement, Pakistan put forward the ideas of "decentralization" and "participatory irrigation management" to neutralize initial objections. The reforms started with the enactment of new laws in the form of Provincial Irrigation and Drainage Authority (PIDA) Acts of 1997 and the appointment of PIDA Boards. Further, an area water board was envisaged for each main canal system and a farmer organization for each distributary canal. However, the transformation of the old institutional system into this new set up has been rather slow. After the initial enthusiasm was over, almost all actors relaxed into their respective missions causing the whole process to slow down. Seizing this opportunity, the opponents of the new reforms acted quickly to dilute the reform process so that the entrenched vested interests would be safeguarded for some more time. But, the fact remains that while the opposition can slow or delay the reform, it cannot block the pressures for change altogether. Thus, the Pakistan case clearly shows that there is an internal pressure for change, but it remains weak owing to strong, though transitory opposition.

The case of Sri Lanka

Historical development of water resources in Sri Lanka

The history and archaeology of Sri Lanka suggest that the Sri Lankans have been very skillfully developing and managing their natural resource base for several thousands of years. The most significant of their efforts was in the development and management of water resources. Contrasting with other ancient civilizations, which were established in fertile river valleys and flood plains, the early Sri Lankan human settlements started and flourished around man-made reservoir (tank) systems. Evidence of this widespread effort can be seen on ground today as most of the country in its dry zone is dotted with thousands of these tanks. The traces of ponds and fountains, in addition to the irrigation tanks of ancient times in the old kingdoms of Anuradhapura, Polonnaruwa and Sigiriya bear testimony to the ability of Sri Lankans to establish and manage integrated multi-purpose water resource systems. The historical evidence of a sustained water resources management system in Sri Lanka had prompted the historians to characterize the country's early society as a "hydraulic civilization".

The old chronicles of Sri Lanka, such as Mahawansa, Chulawansa, Deepawansa, Pujawali and Rajavali (University of Ceylon, 1959), refer to the development of water resources as the primary achievement of the Royalty. It is customary, therefore, to associate the existing reservoirs built during the past 2500 odd years in Sri Lanka with the various kings and their deputies, who apparently had direct supervision over the construction of these water resources systems. Table 3 provides an outline of the

historical development of water resources in Sri Lanka, with specific mention of the various kings and their deputies mainly responsible for each of the key items of development. Evidently, by the 7th century, the Sri Lankans had developed high skills in building small and medium scale dams and gravity canals to convey water from the reservoirs to appropriate user groups.

Surveys made in modern times, as in the case of the Maduru Oya dam built by Canadians in the 1980s, surfaced the technological marvels of ancient times and implied that the Sri Lanka had some precision instruments at that time. For instance, the contour levelling of the Jaya Ganga canal built in around 2nd century AD, conveying water along a distance of 86 kilometres from Kalawewa to Tisawewa, is so precise that it has a gradient of less than one foot in a mile (about 20 centimetres to a kilometer). While the Kalawewa reservoir was mostly for irrigation purposes, Tisawewa was a multipurpose facility, providing water for the domestic and municipality needs of Anuradhapura, the country's capital city at that time. The total length of major canals built by that time was well over 400 kilometres (University of Ceylon, 1959).

Institutional developments in Sri Lanka's water sector

The long tradition of irrigation development and management in Sri Lanka had a strong element of farmer participation. There is no evidence that the state had a large central bureaucracy, or otherwise a strong role, in managing the vast network of tank cascades spread out over the island. Instead of state control, people's organizations managed individual tanks through some collective effort, as was evident from some of the surviving practices in irrigated agriculture (Samad & Bandaragoda, 2000).

Table 3. Some key items of water resources development in Sri Lanka.

Item of work	Location	Sponsoring dignitary	Period
1. Basawakkulama Tank	Anuradhapura	King Pandukabhaya	400 BC
2. Tisa Wewa	Anuradhapura	King Devanampiyatissa	300 BC
3. Hundaravapi,Viharavapi and 13 other tanks	In southern Lanka and Anuradhapura	King Dutugemunu and King Saddhatissa	200 BC
4. Mahavillachchiya and 10 other reservoirs; Elahara and 11 other major canals	North Central region	King Vasabha	65–109 AD
5. Nuwarawewa	Anuradhapura	King Gajabahu I	114–136 AD
6. 16 tanks including Minneriya, Kavudulla, Huruluwewa, and Mahakandarawa	North Central region	King Mahasen	275–301 AD
7. Kalawewa, Yodawewa, Panankulam	North Western and North Central	King Dathusena	159–477 AD
8. Thannimurippukulam	Feeding from Minneriya tank	King Aggabodhi I	571–604 AD
9. Kantale Tank	Trincomalee District feeding from Minneriya Tank	King Aggabodhi II	604–614 AD
10. 53 water resource systems, including Parakrama Samudra	Polonnaruwa	King Parakramabahu I	1153–1186 AD

Sources: University of Ceylon (1959); Navaratna (2003).

There seemed to be an integrated system of managing natural resources, with an identified relationship between land and water resources being defined by a combination of property rights: the *de facto* ownership of all land by the king, and common property arrangements for land and water use (Weerawardena, 1988).

A number of repetitive foreign invasions and later the onset of malaria caused many tanks and their command areas to be abandoned, with the population gradually moving into the wet zone of the country. Along with this transformation, the tradition of stakeholder involvement also faded away and went into oblivion, never to be revived in that natural form. After some centuries of neglect and decay, the abandoned infrastructure formed the basis for renewed interest in an "irrigation renaissance" during the colonial period. An attempt was made to revive and formalize some of the traditions, with the promulgation in 1856 of Sri Lanka's first formal water-related law "an Ordinance to Facilitate the Revival and the Enforcement of Ancient Customs Regarding Irrigation and Cultivation of Paddy Lands". A people's organization was to undertake the responsibility for water distribution, conflict resolution and maintenance of irrigation works. The proprietors (farmers) of irrigation systems selected the irrigation headman (Vel Vidane) to implement the agreed decisions at the proprietors' meetings. However, with the advent of the new exchange nexus, the cooperative behavior tended gradually to decline and the state stepped in to intervene more in irrigated agriculture. Under the Irrigation Ordinance No. 2 of 1887, major irrigation systems became the total responsibility of an Irrigation Department. In designing new structures and rules, the colonial planners tried to retain the old institutional elements, but the changes were inevitable in the context of supervision and compliance relationships. Centralism in administration was strengthened, official hierarchies were established, village leadership was formally appointed and rules and procedures were formalized.

The colonial period was followed by yet another period of attention, by successive policy makers after Independence in 1948, to their often-expressed desire to provide food for the growing populations. Since the country had arable land in abundance, rather inefficiently used by its largely agrarian society, the provision of irrigation was seen as a logical development strategy. The idea was to improve productivity of land and, thereby, enhance domestic food production and accelerate social development. For the "grow more food" campaigns, incentives had to be built into the administration of irrigated agriculture, with incentives in the form of support prices and subsidies. The welfare policies adopted by successive new governments resulted in making the farmer community largely dependent on the government. The amendments to the Irrigation Ordinance in 1946 and 1951 reflected this changing scenario and in the 1950s, the participatory element in irrigation administration substantially deteriorated. Even the irrigation headman (Vel Vidane) was no longer selected by the proprietors, as the position was filled by a government appointee, so that the new policies led to the collapse of the old community-based cooperative behaviour.

As the government established infrastructure for large irrigation schemes, it also retained their management as a social responsibility. Thus, the dominant role of the public sector currently experienced in irrigation development and management has its roots in the interest shown by the country's colonial administration, as well as its post-independence national governments. Sri Lanka started to experience an increasing demand for water in view of the growing population, urbanization, industrialization and agricultural intensification. The government expenditure on O&M of the system gradually increased over the years and became unaffordable through the annual budget, which was also facing ever-increasing pressure from the rising expectations of the growing population. The government had to look for alternative strategies to meet this situation.

With the initiatives taken by the donors of international aid, the planners sought to achieve a package of reforms. In 1964, the government established a Water Resources Board to advise the minister responsible for irrigation and water resources on issues such as the formulation of national water policies, integrated water resources planning, river basin management and trans-basin development coordination and project coordination in general and the prevention of water pollution. However, the newly introduced reform package did not take root in Sri Lanka. The Water Resources Board has not functioned to date as a water management advisory body, but has proceeded to carry out hydro-geological investigations and the development of ground water through tube-wells. Again in 1980, a draft Water Resources Bill was prepared providing for bulk water allocation to various sectoral agencies and for the establishment of a National Water Resources Council as an advisory body under a minister in charge of water resources planning. However, the legislation could not be submitted to parliament owing to a lack of support at the highest government and political level.

Postponing the broader water sector reforms for a future date, the government approved the policy of "Participatory Management of Irrigation Systems" in 1988, anticipating a substantial shift in responsibility to farmer organizations. This decision was based on a set of recommendations presented by a workshop conducted by the International Irrigation Management Institute (IIMI) and a subsequent cabinet paper jointly initiated by the Ministry of Lands, Irrigation and Mahaweli Development and the Ministry of Agricultural Development and Research. Following up this initiative, IIMI conducted the "Irrigation Management Policy Support Activity" (IMPSA) with USAID assistance. IMPSA was executed through a systematic and analytical planning process, involving a series of policy consultation meetings attended by a wide range of stakeholders including specialists, policy makers, irrigation managers and farmer representatives. The emphasis was on achieving a broad consensus on future direction. The project highlighted the need to address competing demands for water in the light of the limitations of available water resources. IMPSA's final report of 1992, recommended that the government should establish a high-level, advisory National Water Resources Council and Secretariat. The functions of the proposed council would include the development of a national water resources policy and law and a national water resources master plan. The IMPSA report also recommended "a comprehensive water policy that looks at water in a holistic way, to put water to the most beneficial use at the least cost, to conserve it without degrading the environment, sustaining it for future generations as well".

The Sri Lanka government appears to have pursued vigorously its interest in water sector reforms. In 1992, a proposal to carry out a water resources master plan was presented to external support agencies and in 1993, the Asian Development Bank (ADB) funded the "Institutional Assessment for Comprehensive Water Resources Management (IACWRM) Project" to assess the institutional capacity for water resources management. Its outcome was a strategic framework and an action plan for comprehensive water resources management, which focused mainly on the need to develop a National Water Resources Policy, to establish a permanent institutional arrangement for water sector co-ordination, prepare and enact "The National Water Act" and amend other related legislation, establish a system to provide information and data for decision makers and carry out comprehensive planning in selected watersheds. The strategic framework and the "Action Plan for Comprehensive Water Resources Management" had the aim of establishing an improved institutional framework over a three-year period.

The project recommended the formation of a temporary Water Resources Council (WRC), for a period of three years, to oversee the implementation of the Action Plan and to recommend permanent institutional arrangements for water resource management. Concurrently, the second project funded by

ADB, "Institutional Strengthening for Comprehensive Water Resources Management", along with the "Water Law and Policy Advisory Programme" funded by the FAO and the Netherlands were to develop water legislation and assist groundwater policy development. On the basis of these project recommendations, Sri Lanka Government's Cabinet approved, in 1995, the implementation of the Strategic Framework and Action Plan for the "Institutional Strengthening for Comprehensive Water Resources Management" (ISCWRM). Consequently, in 1996, the government also established a Water Resources Council (WRC) and a Water Resources Secretariat (WRS).

The National Water Resources Authority, as currently proposed, is to comprise three entities, namely, the Water Resources Council (WRC), an National Water Resources Authority (NWRA) and a Water Resources Tribunal (WRT). The NWRA is at the top of the hierarchy covering the entire domain of water, seeking to coordinate water use by various sectors and to supervise the existing sectoral agencies. The intended primacy by the apex body and its strong legal framework did not appease the existing water-related agencies, which in terms of their long-term power relationships were already entrenched in the socio-political system. Therefore, not much help was forthcoming from them in creating a favourable public opinion in which to promote new reform measures.

Table 4 outlines the main functions of the proposed apex body in the water sector of Sri Lanka, the National Water Resources Authority. The NWRA will be responsible for coordination, planning, regulation and monitoring of national water resources. It will carry out these functions, either through its own office, or by delegating or contracting some of them to other national or sub-national agencies. The NWRA will not be responsible for project planning, or O&M of infrastructure, or other similar operational responsibilities.

Despite persistent pressures from the ADB and the World Bank, which were exerted through their respective project funding activities, the reform process is now almost at a standstill. The earlier momentum seems to have waned away, and even the ministerial arrangements for taking the anticipated reforms forward appear to be unclear after the recent changes in the portfolios. The main reason for this setback is the resentment from the stakeholder groups against the reform processes.

Table 4. Functions of National Water Resources Authority (NWRA), Sri Lanka.

Functional area	Specific role of NWRA
1. Water Resources Management Policy	Formulation of policy proposals. Co-ordination with catchment management, environmental aspects
2. River basin planning and other water sector planning	National, regional and long-term river basin planning. Involvement in seasonal planning
3. Coordination and collection of water-related data	Including monitoring, evaluation and commissioning of research
4. Water allocation	Issuing of water entitlements to bulk and large water users; monitoring and enforcement
5. Promotion of water conservation and protection of water sources	Water conservation programmes through river basin plans and conservation agreements
6. Drought/flood management	Advisory on responses to disasters
7. Control of riverine activities	Policy guidelines, advice and monitoring of implementation
8. Public information and awareness	Education, dissemination of information

Institutional barriers and transaction costs

The foregoing sections referred to why and how the two countries initiated water sector reforms and described the developments that progressively led to the reform process. Why the reforms in both Pakistan and Sri Lanka were initiated and why they have not gone forward to the extent required can also be explained in terms of the institutional transaction cost approach developed by Saleth & Dinar (2004, 2005). As outlined above, there was a long drawn out effort in both countries to rectify an increasing inefficiency in water resources management and the ever-rising cost of O&M of water resources systems. The inefficiencies and costs were interrelated. These real costs of poor management led to the initiation of reforms, but when actual reform programmes get under way, they tend to be subverted by vested interests. The pressure of entrenched politico-administrative forces against the reform efforts make them increasingly ineffective until they gradually slow down to a halt, as has happened in both countries.

Pakistan's case is more illustrative of the role played by the political economy and the high transaction costs involved in reforms. Since Pakistan's massive canal irrigation system, which dominates its water sector, is so widely distributed, covering most of the country, any quick reliable information exchange is practically impossible. In order to avoid a system-wide involvement in institutional change efforts, a number of pilot canal systems were chosen to try out pilot-scale experiments for introducing water management organizations managed by local stakeholders. As two pilot projects conducted by the International Water Management Institute (IWMI) (one in the Hakra 4-R Distributary Canal in the Punjab Province and the other in three distributaries in the Sindh Province) proved to be socially viable, the Government of Pakistan, with funding support from the World Bank has decided to replicate the efforts in all of the four provinces (Bandaragoda, 1999).

Although the organized water users at the pilot distributaries were very keen to move forward and encourage water users in other distributaries to go along with them, the officials to whom the task of replication was entrusted were not so enthusiastic; the stakes were too high in transferring power and resource management responsibilities to local stakeholders. A grand alliance between the water professionals, politicians and the big land owners (most of them came from the same social strata) tended to make the flow of information and any negotiations between the majority of local stakeholders and the policy makers extremely difficult and expensive. The alliance was so powerful that an informal rule system was able to override the formal law and order system (Bandaragoda & Firdousi, 1992). The transaction costs involved in at least trying to liberalize this stranglehold were at the level of billions of dollars, as the World Bank had to provide massive funds for infrastructure projects to which thee institutional reform proposals were attached. More importantly, the political costs have also proved to be too high to bear for the groups interested in promoting the reforms.

A very similar situation existed in Sri Lanka, with the Asian Bank insisting on the finalization of water policies and laws as a covenant for future project funds. The Asian Bank had already spent considerable amounts of funds to formulate draft water policies and laws through the involvement of external agencies such as the FAO and the deployment of foreign experts. Their main efforts were to draft these instruments on the basis of experience elsewhere and a thorough consultation process had not taken place before the drafts were published. As it transpired, a late reaction from the public against the policy and the draft legal enactments when they were presented to the parliament was basically due to a lack of common awareness among the majority of water users of the proposed policies. The absence of the National Policy and related documents in the national languages could have prevented a meaningful

dialogue and consultation and the common people had to be content with the interpretations of the policy and the law, as provided by the English speaking, Colombo-based NGOs and other interested parties. The government instruments dedicated to addressing these issues were also mostly limited to the academic and professional fora, rather than being aimed at the general public.

In both countries, as at present, an advantage of path dependency exists (Livingston, 2005). Both countries have followed a long journey of reform efforts and reached some stage of maturity, though ironically this has reached an impasse in both cases. In Pakistan, the local stakeholders have derived some benefits from external help in being aware of the pros and cons of water sector reforms, and finally confronted a stumbling block of stubborn resistance at a higher level, which is characteristic of the political economy of the country's water sector. In Sri Lanka, an unenlightened community of local stakeholders has stopped the advance of a top-down approach to reforms. But all concerned people in both countries are now aware of the path they have trodden so far and are sensitive to the fact that they would lose in stepping back. "Analytically, path dependency refers to the fact that potential changes in institutions are both constrained and enabled by past institutional configurations" (Livingston, 2005). While the major constraints against reforms in both countries have come from past institutional configurations, some of these arrangements have started to be adjusted by the initial steps in the reform process. Therefore when the need is felt to solve the present impasse, it would seem costlier to reverse the process than to go forward. For instance, in Pakistan, the old irrigation departments in the four provinces have already been replaced by four Provincial Irrigation and Drainage Authorities. In a vested system of institutional arrangements, as one part of the system changes, there are effects on all other parts. Therefore, the resisting groups would soon realize that it would be better to proceed with the proposed changes at the area command and at the canal command levels. Only, they would try to reconfigure their advantages in the new system.

In Sri Lanka, the political economy of the water sector management tilts towards the local stakeholders. In terms of the numbers and political power in the recently elected political instruments, the greater strength rests with the farmers and their allied economic entrepreneurs. Once they become aware of the proposed changes, and their benefits and constraints, they are mostly likely to remove the most unfavourable elements from the reform package and allow the process to continue. However, one moot point remains that the planners have disregarded the voices of the local stakeholders at the initial stages, as they understand, at the behest of donor pressure. As long as this mistrust continues, the reform package will not be able to advance further.

Conclusion

The extreme centralism in administration that was practiced during the colonial period was reflected in a similar administrative style during the post-independence period of national government. The significant change during these nationalist democratic governments was their need to pursue populist policies, which invariably favoured subsidies and free services. Decades of ever-increasing populism have inculcated a deep-rooted dependency syndrome in the rural society. For many services, the people still expect the government to deliver. Democratic elections are generally won and lost on the basis of which political party promises more of these free goods and services to the common people. Even the sporadic military governments in Pakistan could not escape this populist syndrome. This behaviour on the part of the rulers strongly reflects public opinion, perhaps a mistaken notion.

Another entirely different dimension in the present day dilemma of the stakeholders' reluctance to accept donor-driven policies of O&M cost recovery and stakeholder participation in water resource management is the deeply entrenched vested interests associated with state agencies and professional groups to maintain the status quo. In both countries, there has been a visible lack of interest in the proposed reforms, to put it mildly, among the government agencies involved in irrigated agriculture. An alliance of the agency staff and the rural elite tended to work against the progress of implementing reform policies. This alliance is undoubtedly a strong political lobby.

The success of water sector reforms depends on multiple roles of multiple actors. Among them, the roles of local stakeholders, officials and politicians have been well articulated. The role of the donors and their professional representatives is less analysed. Usually, they genuinely act on the basis of their scientific and theoretical understanding and expect complete objectivity from other actors. Often, they fail to understand or consider the political and cultural constraints that governments can ill afford to ignore in their constant struggle to survive. A satisfactory confluence of these diverse requirements by the two parties is not always easy to achieve. Governments often agree with donors only until they get the funds, and later bring up their political difficulties and appeal to donors to release the pressure of their conditions. The donors may settle down at that stage to rationalize the situation and try to achieve what is possible in the reform package, as has happened in Pakistan.

A strong case for the genuineness of donor-driven proposals and for the rationality of such proposals cannot be easily made in view of the donor procedure that exists. Particularly, it is difficult to argue the case when confronted with the disproportionately high share of project funds that are spent on salaries and benefits for foreign consultants. At a project evaluation seminar in Pakistan, a consultant made an interesting public statement that the main "beneficiaries" of the project would be the manufacturers of four-wheel drive vehicles and the foreign consultants!

If the political economy factors of water management in a society are to be taken as given, then the facilitators of water sector reforms need to work around them, so that those factors could favour rather than constrain the reform process. The strategies and tactics that could be used to shift the political economy factors in favour of reform include institutional prioritization, sequencing and packaging (Saleth & Dinar, 2004). In this direction, an institutional adaptation in which the existing institutions are adjusted, modernized and rationalized could be an appropriate methodology for reform. This requires prioritization of various reform elements and a strategy to consider placing those elements which are not politically feasible immediately on the back burner until after the more acceptable elements are implemented. Packaging institutional reforms with other interventions is another strategy for avoiding social constraints. For instance, in Sri Lanka, the relative success of reforms in the 1980s can be attributed to the fact that they were packaged as part of a larger investment programme where users could see some direct benefits, but those proposed in the 1990s, as macro level institutional changes without being linked to any investment package, failed to gain root (Samad, 2005).

However, attaching certain elements, which are politically unpalatable, as covenants in a package of investments is unlikely to generate the desired results for forging ahead with reforms. This was the experience of Sri Lanka in the recent donor-sponsored reform package that was aborted owing to pressure from an ideologically charged hostile environment. One fundamental requirement for water sector institutional reforms in any given country is the need to have an internally generated demand as a starting point for such reforms. Secondly, the transaction cost involved in successfully launching a reform package needs to be drastically reduced. A cost-effective way of identifying or generating a local demand for change has to be found. In both countries, the water sector reforms have gradually slowed

down and are reaching zero velocity. Tracing the path of reform processes, as the paper has attempted, one cannot find any particular party totally responsible for this collapse.

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