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A review on water governance in Sri Lanka: the lessons learnt for future water policy formulation

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Abstract

Sri Lanka has no water scarcity within the country, and per capita, water availability is adequate to cater for the country's estimated peak population. Nevertheless, the frequent variability of spatial and temporal water availability and extreme events have built up a water scarcity in Sri Lanka, which has been observed during the last two to three decades. Therefore, effective and efficient water governance is most important in today's context, and regular review and amendment of policies, laws, and regulations are crucial to mitigate water scarcity. Although a few attempts were initiated, none of them succeeded. In this study, historical and present water governance mechanisms, including coordinating mechanisms and implementing water management agencies in Sri Lanka, were comprehensively reviewed. Further, the previously proposed water policies, their status and reasons for the failures of policies were discussed. Finally, the formulation of a novel institutional arrangement or altering the existing institutional arrangement with shared data and allocating non-shared responsibilities to each institution is suggested for better water governance in Sri Lanka.

Keywords: Coordinating mechanisms; Institutional arrangements; Sri Lanka; Water governance; Water policies

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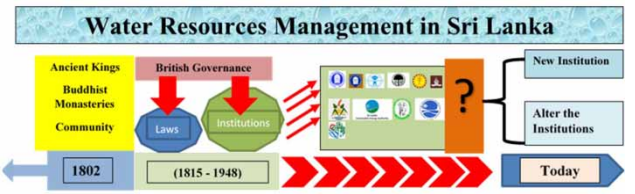
Highlights

- Monarchs guided by the Buddhist monasteries governed ancient WRM in Sri Lanka.
- Water Management Panel under the jurisdiction of Mahaweli Authority coordinates WRM.
- Donor organizations proposed economic value to irrigation water.
- Concept of privatizing the irrigation water hindered the acceptance of the water policy.

Graphical Abstract



Abbreviations

IWRM	Integrated Water Resources Management
ID	Irrigation Department
MASL	*Mahaweli* Authority of Sri Lanka
NWSDB	National Water Supply and Drainage Board
CEB	Ceylon Electricity Board
WRB	Water Resources Board
DAD	Department of Agrarian Development
PC	Provincial Councils
DoA	Department of Agriculture
CEA	Central Environmental Authority
NGO	Non-governmental organizations
CBO	Community-based organizations
Fos	Farmer organizations
WMP	Water Management Panel
CCCIM	Central Coordination Committee for Irrigation Management
NWSSSC	National Water Supply and Sanitation Steering Committee
NCWT	National Community Water Trust
DCC	District Coordinating Committee
DEC	District Environmental Committee
DAC	District Agricultural Committees
DvCC	Divisional Coordinating Committee
DO	Divisional Officer
MGDP	*Mahaweli Ganga* Development Program
WMS	Water Management Secretariat
DERS	Data Entry Retrieval System
SOP	Seasonal Operating Plan
DoM	Department of Meteorology in Sri Lanka
INMAS	Integrated Management of Irrigation Schemes
WRC	Water Resources Council
IMPSA	Irrigation Management Policy Support Activity

MANIS Management of Irrigation Systems
NWRA National Water Resources Authority
WRT Water Resources Tribunal

Introduction

The principle of 'water security' is of recent interest among scientists due to the climate change-induced spatial and temporal variability of global water, coupled with the uncertainty of precipitation and the disasters due to the precipitation extremes. Between 2000 and 2010, the application of 'water security' increased among an extensive range of disciplines in the Web of Science database and there is an increasing trend in the frequency of this term's use (Cook & Bakker, 2012). There are different interpretations of water security based on concepts such as water as a human need, water stress, water shortage, water-related hazards and vulnerability, water conservation, prevention and protection against contamination and terrorism, sustainability, military and environmental security, etc. (Zeitoun *et al*., 2016; Wickramasinghe, 2018).

Bakker (2003) elaborated that the governance dimensions of water security have not paved any significant consideration among scientific publications. Water governance can be comprehensively defined as the set of guidelines (i.e., laws, acts, and policies), implementations, and processes (i.e., political, organizational, and administrative) as to which decision is made and implemented for the administration of water resources by relevant legal institutions to achieve stakeholder interests (i.e., gains and benefits), and that decision-makers are liable in the development and management of water resources and provide water services equally and efficiently (Bakker, 2003; OECD, 2015; Stockholm International Water Institute, 2015).

An alarming rate of environmental degradation, including the exploitation of a scarce resource – water – triggers the necessity of continual amendment of existing governance, including laws, acts, and water resources management policies. The Dublin principles identified that extensive demand and overuse of water intensifies water scarcity and introduced the Integrated Water Resources Management (IWRM) concept in 1992. The donors focus on providing funds and innovative technologies for developing countries to amend water resources governance. Although many water policies were proposed, a limited number of policies succeeded. Therefore, understanding the reasons for the policies' failures would be advantageous for upcoming policy formulation processes. Therefore, this study reviews present governance mechanisms in water resources management in Sri Lanka, including institutional arrangement and proposed policies, and aims to identify the reasons behind failed policy proposals that can be omitted in future water policy formulations. There are about 52 legislations and 41 institutions affiliated with water management in Sri Lanka, and this study analyzed the mentioned legislation to identify the existing administrative coordinating mechanisms related to water. Further, the previously proposed policies which failed in implementation, such as (a) Water Resources Bill, (b) Participatory Irrigation Management Policy, (c) National Water Resources Policy, (d) National Drinking Water Policy, and (e) The Water Services Reforms Bills were reviewed. Complementary discussions with the responsible officials from the primary water sector institutions were carried out to harness the comprehensive information about water governance in Sri Lanka.

Water resources of Sri Lanka in brief

Sri Lanka is a country that has an ample amount of water resources (Samad, 2005). It is blessed with 103 rivers, which have a total length of 4,560 km, and river basins cover 90% of Sri Lanka (Ministry of Forestry & Environment, 1999; UNEP, 2005). Twenty basins are perennial (i.e., carry half of the annual surface runoff) while the rest are seasonal rivers (UNESCO, 2006; Ministry of Land & Land Development, Sri Lanka, 2014). *Mahaweli* River is the longest river in Sri Lanka, and the basin covers approximately one-sixth of Sri Lanka (De Silva, 1985). The annual rainfall of Sri Lanka varies spatially between 800 mm to more than 5,000 mm, and the total annual runoff in Sri Lanka is estimated to be 52 km^3 (FAO-AQUASTAT, 2011; Samad *et al*., 2016). Large-scale natural reservoirs are not available in Sri Lanka. However, about 14,000 ancient human-made reservoirs with the cascade system (interconnections of several reservoirs), including networks of irrigation canals, are located in the dry zone of Sri Lanka (Figure 1) (Madduma Bandara, 1995). After the British colonization, many medium- and

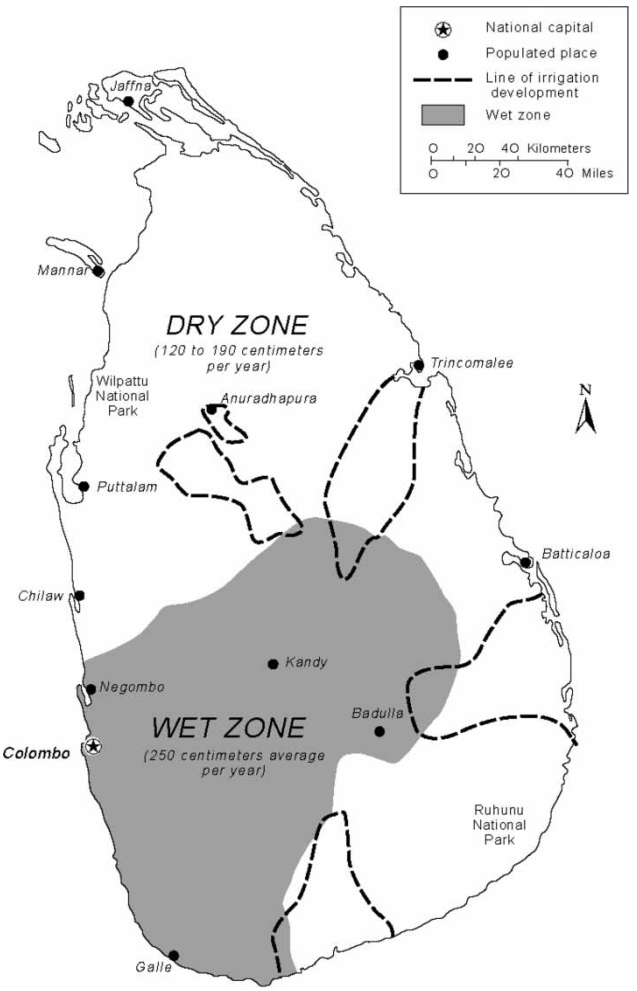


Fig. 1. Schematic representation of the dry zone of Sri Lanka. Source: Wikimedia Commons (2018).

large-scale irrigation reservoirs were built under new irrigation schemes and historical reservoirs were rehabilitated to present conditions. In addition to the mentioned water resources springs, more than 20 significant wetlands and groundwater resources (i.e., annual renewable groundwater resources are an estimated 7.8 km^3) contribute to water resources in Sri Lanka (Ministry of Environment & Natural Resources, 2008).

Sri Lanka is a country known for the absence of water scarcity where annual water supply per capita (i.e., 2,329 m^3) is adequate for its estimated peak population (Samad *et al*., 2016). However, spatial and temporal variability of water due to the bimodal pattern of the annual rainfall have caused uneven water availability (i.e., deficits and excess) within the country. The irrigation sector uses 85% of water, and 70% is used for paddy production, with the remaining 15% used for drinking, domestic water use, industrial, and ecosystem management. The staple food of Sri Lanka is rice, and about 90% of irrigated lands are cultivated with paddy. One hundred per cent paddy cultivation is practiced in *Maha* season (primary cultivation season from September to March) and during the *Yala* season (minor or second cultivation season from May to August) when rice cultivation is coupled with other field crops (OFC) based on the availability of water. *Laxapana* is the first hydropower plant that started in Sri Lanka in 1950 and since then the largest contribution to the electricity generation has come from hydro-development projects until the mid-1990s. Thereafter, the dominant electricity generation source changed to the mixed hydrothermal system and, currently, it is from oil. Sri Lankans use different sources of drinking water: pipe-borne water (49.2%), protected wells (36.4%), unprotected wells (4.4%), river or reservoirs (5.4%), tube wells (3.2%), and rainwater harvesting (1%) (Fan, 2015). Communal bathing in rivers, shared wells, and reservoirs are meant not only for basic needs but also for recreation and social interaction (UNESCO, 2006).

Historical water resources governance in Sri Lanka until the colonial era

The Indo-Aryan (early ancestors of Indian-Sri Lankan) settlements, which started in the 5th century BCE were initially located on the banks of major rivers and west-central coasts of Sri Lanka. During the 3rd to the 7th and 12th centuries, Sri Lanka had an advanced hydraulic civilization where the ancient kings made rules and regulations for water management. At that time, the governance implemented many hydraulic structures to conserve and manage the water (Abeywardana *et al*., 2018). Ancient Sri Lanka owned a dense irrigation facility at a high technical level such as *Yoda Ela* (Great canal); lowest gradient at its time, *Biso Kotuwa*; flow control structure attached to sluice, *Anicut* system; control water flow to downstream and reservoir schemes, *Sigiriya* (the Lion Rock); famous water-based recreation kingdom, tank cascade systems; recycle and reuse of water by a networking series of small- to large-scale reservoirs (Madduma Bandara, 1995; UNESCO, 2006; Mahatantila *et al*., 2008; Peiris & Wijesinghe, 2008; Bebermeier *et al*., 2017). Abeywardana *et al*. (2019) studied 560 lithic inscriptions and ancient chronicles and found that nearly 222 text passages were on the management of water in ancient Sri Lanka. Further, the first governance text related to water was published in the 4th century BC. These texts were regarding income, grants, ownership, and the job titles for management of irrigation water, official announcements, etc.

Analysis of tank cascade systems shows that water management was primarily based on the hierarchy of the social system at that time. The ownership of the large reservoirs was basically among kings, however from governance, sources granted private ownership for Buddhist monasteries and a few individuals too.

These individuals were called *Parumaka* (chief), *Vapihamika*, or *Vavihamika.* The village-level small reservoirs were owned by the king as well, but administered by the village headman (*Gamarala*) (Figure 2). The Buddhist monasteries had the highest reputation in the kings' era and were collaboratively involved in the water management and governance structure. Historically, the cascade systems were maintained through the ancient practice of compulsory labor called a *Rajakariya* system and using hired labor. Ancient records showed that the irrigators had to pay a fee (i.e., by means of money or a portion of a harvested crop) to the king for water, and farmers were even charged a penalty for overuse of water and delayed land preparation. Abeywardana *et al.* (2019) stated that although the revenue system was well maintained since the 1st century, no rigid penalties and punishments were mentioned in the ancient announcements. The ownership of irrigation works and their income was regularly traded in the past.

Although the community of farmers historically were responsible for the maintenance of reservoirs, eventually, with time, farmers' eagerness to sustain the system was also reduced (Madduma Bandara, 1985). However, as conservation methods '*Bethma* farming' and '*Madathawalu* farming' were practiced. *Bethma* farming was a method of paddy farming during water-scarce situations such as droughts, which applied the saving of reservoir water by minimizing conveyance losses, using agreed rules for sharing water only for farming lands near the reservoir. During the drought, the village headman defined the paddy cultivable area using a measuring scale called *Diyaketapahana* (i.e., water dividing timber block placed on the canals). If the drought persisted longer than the expected duration, farming in a reservoir bed – '*Madathawalu* farming' was recommended to conserve seed paddy for the following season (Dalupotha, 2002; Geekiyanage & Pushpakumara, 2013). However, there were several historical famines observed due to prolonged drought in Sri Lanka; therefore, ancient kings secured the required level of water in the reservoirs by implementing rules and regulations for the maintenance of the reservoirs and canal systems (Siriweera, 1987).

Ancient *Sinhala* Buddhist ancestors in Sri Lanka believed in water as a symbol, which led to the prosperity of a country and, therefore, people willingly protected the water. The governance of the cascade system was predominantly based on the village level and, therefore, the ancient reservoir systems developed with the socioeconomic agreement of villagers (Avsadahamy, 2003). Furthermore, religious and spiritual norms, rites and rituals helped to manage the reservoirs and irrigated agriculture (Dissanayaka, 1992; Dharmasena, 2010).

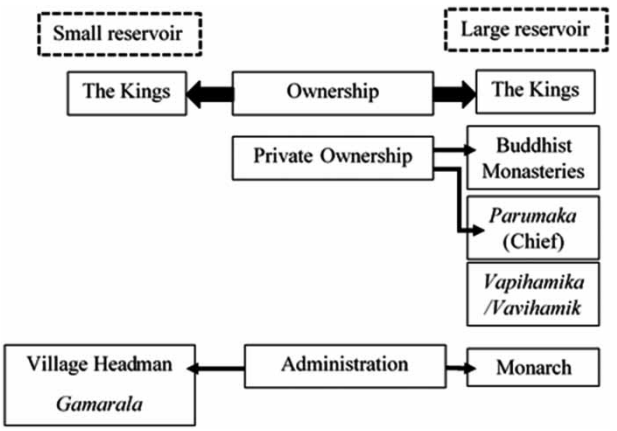


Fig. 2. Schematic illustration of historical ownership and administration of water in Sri Lanka.

Present water resources governance in Sri Lanka

Chandrasekara & Gunawardena (2011) showed that about 41 institutions and 52 legislations cover all the water sector requirements in Sri Lanka. Public (administrative) water allocation is practiced in Sri Lanka, where national agencies mutually decide what amount of water is needed to meet the demand (i.e., based on the available water in the multipurpose reservoir cascades), and allocate and distribute water within different users (De Silva & Hornberger, 2019). The responsibility of water allocation is vested upon the national institutions historically or by legislation. The water allocation priorities are not declared, but are commonly shared based on necessity. Irrigation Department (ID), *Mahaweli* Authority of Sri Lanka (MASL), National Water Supply and Drainage Board (NWSDB), Ceylon Electricity Board (CEB), and Water Resources Board (WRB) are the major national institutions for water resources management in Sri Lanka. Responsibility for irrigation water management is as follows: ID and MASL are responsible for major irrigation schemes (i.e., command area of more than 400 hectares); Department of Agrarian Development (DAD) and Provincial Councils (PC) for medium schemes (i.e., 80–400 hectares of command area); Provincial IDs for minor schemes; NWSDB and Department of National Community Water Supply for drinking water management and tariff management for drinking water (Seneviratne, 2000); CEB for mega-hydropower generation and Sri Lanka Sustainable Energy Authority for mini-hydro power generation; and WRB for groundwater management. The other governmental line agencies (i.e., Department of Agriculture (DoA), Central Environmental Authority (CEA), Department of Coast Conservation, Department of Fisheries and Aquatic Resources, Department of Wildlife Conservation, etc.) and local authorities (i.e., municipal authorities, PC, *Pradeshiya saba*, etc.) also have authority over the management of water resources by supporting the major institutions (Figure 3). These organizations are independent and operate under different ministries.

Nonetheless, all these organizations, in one way or another, have to be involved in the decision-making process in water allocation since they are all identified as prominent institutions affiliated with the development of water resources of the *Mahaweli* river vested in *Mahaweli* Authority Act No. 23 of 1979 (Government of Sri Lanka, 1979). The responsibilities for each institute are vested in them by government legislation. Non-governmental organizations (NGO), community-based organizations (CBO) (i.e., CBO – user groups formed or rural community organizations capable of community engagement on the arrangement of safe drinking water and sanitation facilities to their membership) and farmer organizations (FOs) also play a role alongside the mentioned institutions. Furthermore, many international advisory and donor agencies collaboratively work with a mentioned local institution to develop the water sector in Sri Lanka.

Table 1 summarizes the pros and cons of historical and existing water governance.

Coordinating mechanisms in water resources management in Sri Lanka

There is an administrative coordinating mechanism – Water Management Panel (WMP) – at the inter-sectoral level and three implementing agencies at the national level in Sri Lanka at an intra-sectoral level, namely, (a) Central Coordination Committee for Irrigation Management (CCCIM), (b) the National Water supply and Sanitation Steering Committee (NWSSSC), and (c) National Community Water Trust (NCWT). The District Coordinating Committee (DCC), District Environmental Committee (DEC), District Agricultural Committees (DAC), and the Divisional Coordinating Committee (DvCC)

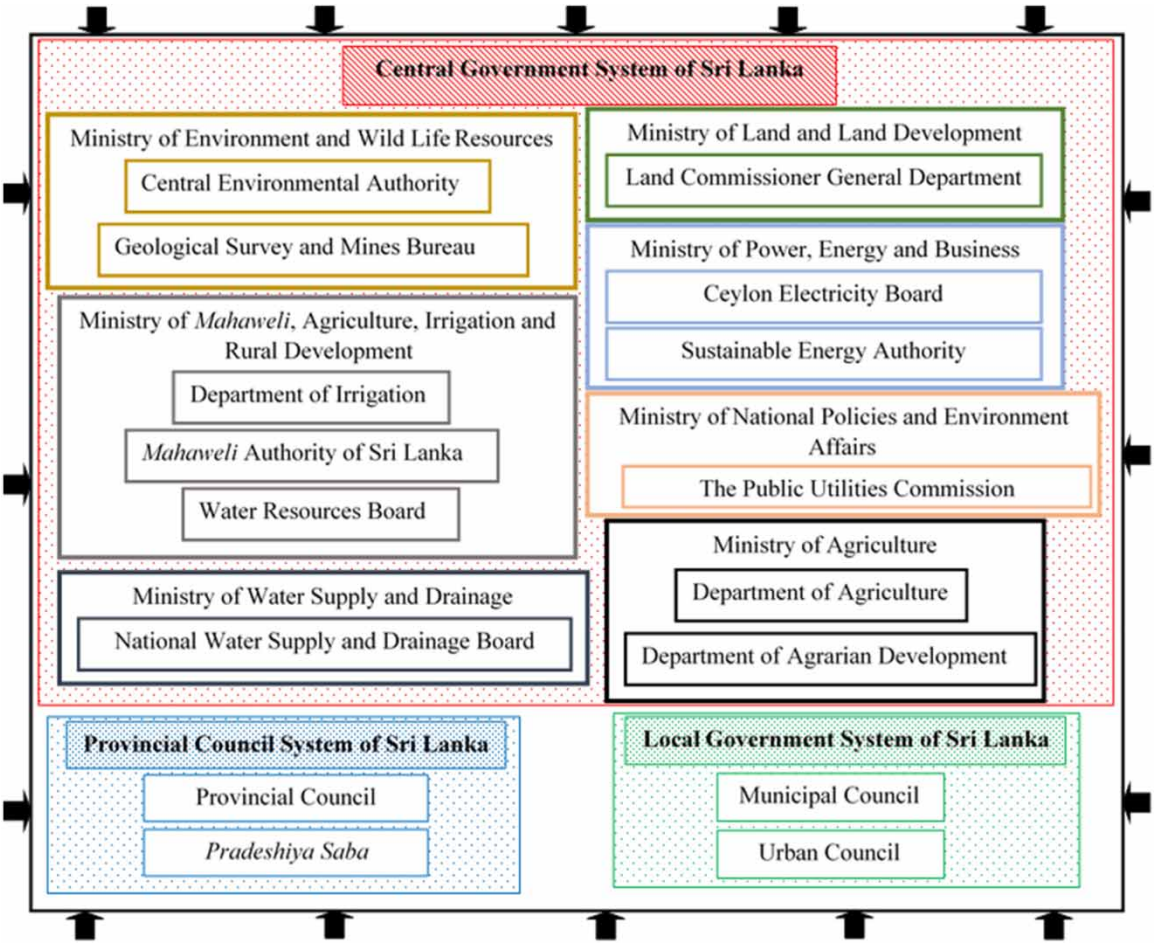


Fig. 3. The respective ministries and significant institutions involved in water resources management in Sri Lanka (shown inside the box) with arrows illustrating the line agencies.

are the existing administrative arrangements for inter-sectoral coordination beneath the national level (Chandrasekara, 2011). FOs are the field-level administrative system in Sri Lanka legitimized by the Agrarian Service Act No. 4 of 1991 for the participatory maintenance of medium and minor irrigation schemes coordinated by the Divisional Officer (DO) of the Department of Agrarian Development. More than 3,000 FOs are registered in Sri Lanka.

Water management panel

National level coordination. The WMP was established in 1985 to allocate, manage, and monitor bulk water primarily for the drinking, irrigation, and hydropower sectors within MASL jurisdiction. Further, WMP is the decision-making body accountable for the governance of water in the *Mahaweli* system. The WMP is headed by the Director-General of MASL and consists of all Heads of Government Agencies concerned with the *Mahaweli Ganga* Development Program (MGDP), which was completed

Table 1. Pros and cons of historical and existing water governance.

Historical water governance Pros	Cons
'Kings' governance focused on water security on the aspects of securing (a) water in scarce period, (b) as a human need, (c) as a means of reducing contamination (i.e., reduce siltation), (d) means of food security, (e) disaster mitigation and, most importantly, (f) as military security	The compulsory labor system was identified as a mode of slavery. Therefore, it was abolished by the British Government in 1832. However, abolishment caused the gradual abandonment of cascade systems (Madduma Bandara, 1985; Panabokke *et al*., 2002)
Synchronized development and management of water for irrigation, drinking, sanitation, recreation, urban development (i.e., transportation and security of the kingdom), and environmental management	The migration of ancient kingdoms within Sri Lanka caused the deterioration of tank cascade systems in Sri Lanka (Siriweera, 1987)
Polycentric governance was practiced where participatory decision-making on water management was observed among the stakeholders	
Diligent cooperation from hydraulic civilization, governance between monarchs and guidance of Buddhist monasteries secured water resources in Sri Lanka	
Existing water governance	
An abundant amount of decentralized institutions and legislations related to water resources management	Although the legislations are mandated and the responsibilities vested in each institute, some officials are ignorant of mandated responsibilities of the institution and cause overlapping of responsibilities while implementing them
Frequent amendment of legislations	

in mid-1980. They consist of (a) Director-General of ID, (b) Director-General of DoA, (c) Chairman of CEB, (d) Chairman of NWSDB, and (e) Government, Agents/District Secretaries of the respective districts within *Mahaweli* and six allied basins (i.e., *Malwathu-Oya* basin, *Kala-Oya* basin, *Yan-Oya* basin, *Kantale* basin, *Maduru-Oya* basin, and *Mundeni Aru* basin). The WMP works collaboratively with a technically specialized Water Management Secretariat (WMS) constituted within the MASL. The WMS provides technical information and recommendations to the WMP to facilitate its operational policy decisions by coordinating and monitoring operations throughout all reservoirs which receive *Mahaweli* river water. Once the decisions are made, the monitoring of the water allocation is directed by the WMS. The Director of WMS acts as the Secretary to the WMP.

Technical agencies of WMP meet weekly every Friday at 11 a.m. at WMS, MASL-Colombo, Sri Lanka and, further, have discussions on current weekly reservoir water levels, weekly predictions and monitoring of inflow for the river basins, weekly water demand for various sectors (i.e., hydropower generation, domestic and industrial water supply, irrigation and agriculture water supply, etc.) and negotiate the requested demands to finalize the WMP approved weekly plan for water management operations. The technical departments at WMS run through ACRES Irrigation Demand Model: uses previous 30 years of hydrological data and computes a monthly water demand series for irrigation schemes; ACRES Reservoir Simulation Program: develops the water balance requirement; and Data Entry Retrieval System (DERS): generates the technical Seasonal Operating Plan (SOP) for stakeholders.

Further, pre-seasonal meetings are held in every district at DAC, and WMS collects proposals. Based on all the information provided by the inter- and intra-agencies concerning their water requirements, the

draft SOP, which gives operational plans, allocation/distribution priorities and programs for the season for *Mahaweli* and other allied basins, is prepared by the WMS biannually (i.e., *Maha* season and *Yala* season). The prepared draft SOP is discussed at the pre-seasonal WMP meeting, which will be held with the participation of all concerned agencies, Ministry officials, and farmer representatives before the beginning of each two seasons at *Gannoruwa*, Kandy, Sri Lanka. This meeting has extensive, active, participatory decision-making of all the water stakeholders' representatives from the field level to the administrative and political levels. The decisions and changes agreed at bi-annual WMP are incorporated into the final SOP, continually monitored, and adjusted jointly with technical support from critical technical agencies weekly every Friday (Figure 4(right)). Decisions of the meetings and weekly operation plan and SOP are available at the web site of MASL at http://mahaweli.gov.lk/en/water.html. If there is an emergency (i.e., weather extremes: droughts and floods; technical failures: the collapse of hydropower plant, breaching of trans-basin diversion canals; and practical needs: over-cultivation and delayed cultivation), WMP would take participatory decisions to cope with the situation immediately.

District level coordination. DCC, DEC, and DAC work in parallel with the WMS and disseminate required district-level decisions between both ends, i.e., negotiations of additional farmer requests, existing situation on district-level water resources, WMP decisions on water allocation, etc. However, these institutions perform other different responsibilities parallel with water management in their jurisdiction. The DCC is the primary administrative mechanism that coordinates activities at the district level, which

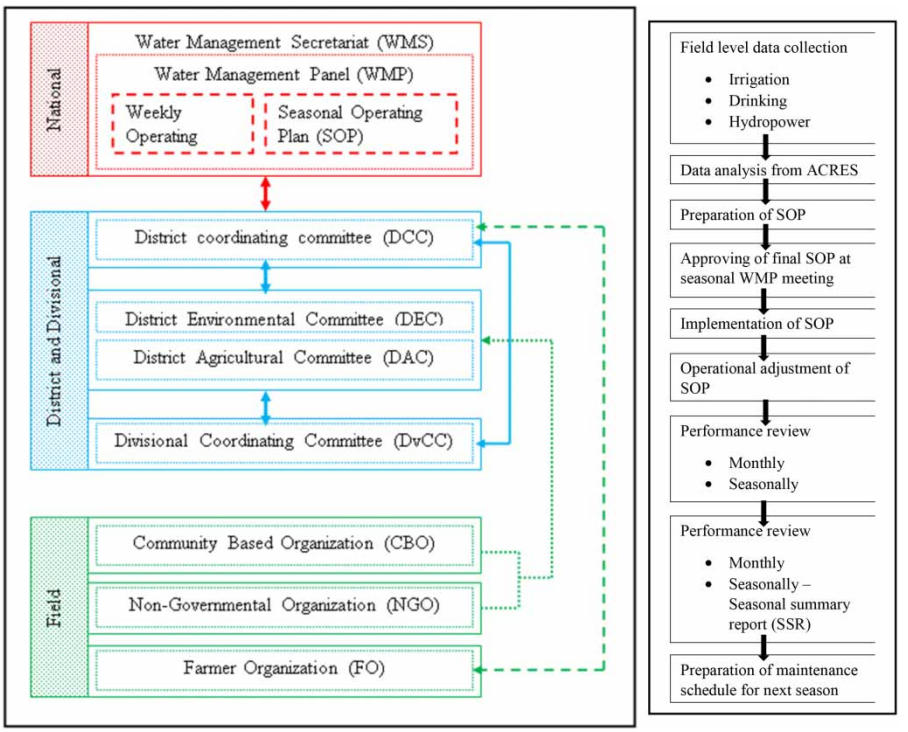


Fig. 4. An existing administrative coordinating mechanism of the water resource management at the national, district, divisional, and field levels in Sri Lanka (left) and schematic diagram of the preparation of SOP at WMS (right).

consist of representative members of parliament, provincial council, *Pradeshiya Sabhas*, municipal councils and urban councils in the district and all administrative officers including heads of provincial councils and regional/district officers representing major agencies (Figure 4(left)). It is chaired by the senior Member of Parliament or the cabinet minister or deputy minister representing the district and is co-chaired by the Chief Minister of the Provincial Council. The District Secretary (Government Administrative Officer) serves as the secretary to the DCC.

On the other hand, DEC and DAC consider affairs related to the environment and agriculture and representing the relevant district-level institutions. DEC and DAC are platforms for NGO representatives and FOs, respectively. However, these committees are not responsible for governing water allocation at the district level and meet once a month. DvCC collects the information on the divisional level and communicates with district-level institutions.

Field-level coordination. From the field-level onwards, FOs take the responsibility to distribute among farmers, with a water master (*Wel Vidane*). The representative farmers in FOs meet biweekly to discuss alterations in water allocation. Furthermore, to distribute water adequately and evenly to the fields, FOs are responsible for the maintenance of field canals (tertiary canals), collect operation and maintenance (O&M) taxes if necessary, and distribution of other agricultural inputs (Gamage, 2002). FOs ensure active, participatory decision-making as stakeholders at the national- and local-level administrative systems shown in Figure 4(left). Even though the decision on exact dates to start and end the cultivation is discussed during the biannual meeting, some farmers start cultivation late or over-cultivate, leading to difficulties in managing bulk water allocation.

The unique characteristic happens in the administrative system shown in Figure 4(left) because related information flows from bottom to top and subsequently top to bottom within the system, which helps make regular dynamic decision-making. According to the experts, this unique characteristic could not be found in any other system. The summarized mechanism of the SOP preparation and implementation is demonstrated in Figure 4(right). However, there is a lag in coordination between review performance and preparation of maintenance schedules for Headworks at a later phase.

Central Coordination Committee for Irrigation Management and the National Water Supply and Sanitation Steering Committee

The process of the empowerment of communities in the water sector was initiated in the 1980s, and this program was guided by the two national level working arrangements. The CCCIM and the NWSSSC were expected to coordinate irrigated agricultural and domestic water supply sectors, respectively. These institutions made headway not only in driving the program, but also in creating awareness and building capacity of professionals that helped to receive the administrative and political will to implement the program successfully. A large number of professionals trained, construction of a fair number of community-managed rural water supply projects on agreed methodology, and protocols between the agency and the community were intended credits of these committees to the water supply sector in Sri Lanka. Unfortunately, since 2002, these working arrangements at national levels have been relegated to a state of neglect, mostly due to frequent changes of ministries involved in the water sector (Chandrasekara, 2011). Lack of integration due to the abandonment of these working arrangements has resulted in many problems with developing a clear policy and taking this program forward.

National Community Water Trust (NCWT)

In 2011 NWSDB developed an efficient institution – NCWT – to achieve sustainable CBO service provision in NWSDB-governed community-based water supply schemes. The NCWT was to (a) assist CBOs to save, manage, and upgrade capital generated by the government or any other organization, (b) increase the sustainability of existing community water supply and sanitation services, and (c) increase the capacities and maintain the relationship of the communities.

The officers of the Ministry of Urban Development and NWSDB were on the board of NCWT and the NWSDB provides a platform to discuss cross-cutting issues in the rural water supply and sanitation sector. The formation of the NCWT was a positive development for the sector; however, later on, NCWT became an ineffective bureaucratic entity due to weaker successive leadership.

The WMP is the only one that is operating effectively at present. The need for water sharing among different stakeholders made it essential for WMP to function for the last 35 years. However, the incorporation of government institutions that are currently not participating in the WMP meeting but which could support the decision-making process in WMP could be advantageous in the governance of water in Sri Lanka. The Department of Meteorology in Sri Lanka (DoM) is abundant in meteorological data and technical resources on climate monitoring and prediction compared to the rest of the governmental institutions; however, it is not yet recognized as an authorized stakeholder in the WMS. Importantly, there is an increasing tendency towards the participation of private institutions (i.e., research, seed growers, fertilizer companies, etc.) and NGOs in SOP meetings of MASL, which strengthens the decision-making at WMS.

Water policy evolution in Sri Lanka

Having a water policy is a crucial part of water governance. Even the absence of a legitimized written water policy but with other mutually exclusive legislation could be necessary for water governance. Water policy must address information on (a) ownership and entitlements of water, (b) accessibility of users to affordable clean water, (c) institutions and legislations responsible for the water policy, (d) the economic value of water and taxation. Sri Lanka has had various water policy proposal consultations with local and foreign aid institutions.

Since 1855, the British Governors showed significant interest in the restoration of ancient irrigation works in Sri Lanka. Therefore as a first step, in 1887, an ordinance was passed, creating a Central Irrigation Board to serve the irrigation facilities, and in 1900 the present Irrigation Department was initiated. After independence from the British in 1948, ID contributed massively to the development of irrigation infrastructures. After colonial independence, the development of water resources of Sri Lanka was boosted and the government of Sri Lanka (GOSL) introduced many legislations and new institutions for the water sector in Sri Lanka. Most of the legislation was amended to cater to the changes in the social, economic, and environmental requirements of Sri Lanka.

In the early 1950s a national water policy was proposed to form an agency to undertake water resources management in Sri Lanka. After a decade, WRB was established in 1966 to advise the minister vested with irrigation and land development. However, the agency did not succeed in its main objective of developing water policy, but focused on technical aspects of hydrogeological investigation and groundwater development. Therefore, some donor agencies have claimed the absence of unambiguous national and sectoral policies is a vital limitation in the water sector in Sri Lanka (European Union, 2017).

Thereafter, several water policies were proposed and some of them failed due to various reasons. Table 2 shows the controversial water policies proposed for Sri Lanka and the reasons behind their failures.

Challenges for future water policy formulation in Sri Lanka

As mentioned in the previous section, the policy formulation for water resources management in Sri Lanka had been done on several occasions; however, Sri Lanka still owns neither an approved water policy nor a follow-up procedure for a policy. Therefore, it is necessary to understand the reasons behind the unsuccessful legal approval of the policies or the policy implementation gaps: the difference between what is stated in the policy and what is happening at ground level.

Menard *et al*. (2018) identified four major categories of reasons for the failure of a water policy. They are: (a) gaps in the policy formulation process, (b) gaps in the operationalization of the policy, (c) gaps related to the characteristics and behavior of stakeholders, and finally, (d) gaps related to the overarching country governance situation.

Almost all proposed water policies were developed based on either the principles of IWRM or achieving water security through amending existing water governance. The major gap in the policy formulation process is the lack of understanding of the cultural and social aspects of water resources in Sri Lanka by policy formulators. Even the water is a scarce resource in today's context, and the public is not aware of the importance of the priority to develop sectors that give high returns for water and the objective of the pricing of irrigation water for securing water. They were misguided that the main purpose of the pricing of irrigation water was to charge farmers. It is essential to realize that only domestic and industrial water is charged in Sri Lanka, but 100% is recovered for neither. Therefore, strong opposition from the public and political groups arose when the water policy focused on securing water through taxation. The situation amplified when policy documents were not transparent enough. The policy formulations were carried by official stakeholders and published only in the English language, where most ground-level water users were ignored due to the language barrier. Therefore, the importance and necessity of water policy for Sri Lanka has to be introduced to the public in advance of the formulation process of the policy. Furthermore, lack of pre-analysis in neglected areas, such as mitigation of frequent water-related disasters, pollution and contamination of surface and groundwater, overexploitation of groundwater, minimizing non-revenue water, urbanization influenced downstream riparian right violation, etc. must be considered in future policy formulation processes.

The GOSL failed when implementing most of the proposed policies because donors support financially at the policy formulation process only, but GOSL is inefficient in bearing the rest of the costs of implementation. Furthermore, the monopolistic behavior of accomplishing the responsibilities by the water institutions and less willingness in data sharing caused most of the policies to fail. Therefore, amending the existing institutional arrangement for water resources management could be advantageous before implementing future water policies in Sri Lanka. Incorporating private partnerships for the implementation process could be advantageous, but privatization of water or profit-oriented private partnership should not be guaranteed.

The political instability of GOSL is hindering water policy formulation and implementation. The corruption in the ruling and opposition parties makes the situation worse if critical topics such as privatization of irrigation water are discussed in the platform. Further, after the 30 years of civil war, GOSL focused more on other development activities than formulating water security policies. Still,

Table 2. The salient features of selected water policies proposed for Sri Lanka and the reasons for their failures.

Policy name	Year	Policy proposer	Features	Reasons for failure or remarks	References
Water Resources Bill	1980	Ministry of Irrigation, Power and *Mahaweli* Development at that time in Sri Lanka	Full-cost pricing of bulk water allocation. Setting a coordinated body; Water Resources Council (WRC)	Pricing of bulk water for irrigation purposes was politically unaccepted	Samad, (2005), World Bank, (1992)
Participatory Irrigation Management (PIM) policy	1988	GOSL introduced the policy with financial support from USAID and consultation of MASL	GOSL finance the irrigation institutes for the O&M of Headworks and main canals. FOs must bear the O&M of distributary and field channels (secondary and tertiary systems), and farmers were exempted from paying for irrigation water if they organized themselves to do so. Implemented in several major and medium schemes under three government-sponsored programs: (a) Integrated Management of Irrigation Schemes (INMAS), (b) the Management of Irrigation Systems (MANIS) program, and (c) the systems under the *Mahaweli* Development Project. The management of minor irrigation was vested in the Department of Agrarian Development	The Cabinet did not approve-Irrigation Management Policy Support Activity (IMPSA). Field levels officials were not aware of the newly established responsibilities under PIM. **Although the policy was not implemented, the continuous O&M of distributary and field canals are carried by FOs	Aheeyar *et al*., (2012), Samad, (2005)
National Water Resources Policy and Institutional Arrangements	2000	Asian Development Bank with the consultation of GOSL	To provide water entitlements and water tariff scheme for the irrigation water to secure against overuse of water and assure equity among the users. To allocate water resources based on IWRM principles. Stakeholder empowerment in the decision-making process and priorities their water needs. Introduction of three-tier institutions: National Water Resources Authority (NWRA), WRC and Water Resources Tribunal (WRT), which would work based on IWRM. NWRA would be the centralized regulatory body at a national level to empower water users and river basin organizations which are at the river basin level. The protection of traditional and customary water rights. WRC would be a coordinating advisory body. WRT would be an independent appeal institution coming within the purview of the Judicial Services Commission, and responsibility would be a final conflict resolution between users and NWRA	Public opposition for pricing of water. Ignorance of historical and cultural aspects of irrigation water. Lack of communication with the stakeholders. Lack of transparency of the policy due to language. The policy was mainly donor-driven. Policy was formulated to give more attention to the users which have a higher return for the water (i.e., irrigated paddy cultivation gives a low return for the water). Frequent changes in the ruling party of GOSL, the ministries responsible to the WRS and WRC changed rapidly	International Water Management Institution, (2013), Ariyabandu, (2008), Ariyabandu & Aheeyar, (2004), Gunatilake & Gopalakrishnan, (2002)

National Drinking Water Policy	2001	Ministry of Water Supply and Drainage (presently the Ministry of City Planning and Water Supply)	To address the key issues and challenges arising while providing safe drinking water. Policy addressed two sub-sectors: (a) rural water supply sub-sector and (b) urban water supply sub-sector		
National Policy for Rural Water Supply and Sanitation Sector	2001	Ministry of Urban Development, Construction and Public Utilities	To give additional focus on more community participation including CBOs, NGOs, and private sectors for water supply and sanitation sector. Focused on the provision of people-centered and demand-driven water supply and sanitation to rural areas (i.e., which population is less than 6,000 people in a *Grama Niladari* (GN) division (smallest administrative boundary in Sri Lanka)). Women's empowerment in decision-making on water resources management. GOSL would facilitate the formulation of the legal framework with three institutions (i.e., Provincial Councils, NWSDB, and CBO) and necessary provisions within which Provincial Council and the Local Authorities may be administrated by-laws	Meager asset management of rural water supply schemes. Failure of procurement procedures due to the high political intervention. Corruption within the water supply system. Private agencies more focused on profit multiplication than the declared responsibilities	Ariyabandu & Aheeyar, (2004), Ministry of Urban Development, (2001)
National Policy on Water Supply and Sanitation	2002	Ministry of Housing and Plantation Infrastructure	Provided a framework for the supply of safe drinking water and access to sanitation services. Policy included: structural amendments in the institutional and regulatory structure, tariff collection to manage O&M costs, provide subsidies, investments, water source conservation, capacity building and research	**Succeeded by only achieving coverage of national water supply connections to the increasing number of households and low-cost recovery aspects of NWSDB	Ariyabandu & Aheeyar, (2004)
Urban Water Supply Policy	2002	NWSDB	Basically for drinking water allocation for the urban population. Included more or less similar responsibilities vested by National Water Supply & Drainage Board Law No. 2 of 1974	**Although the policy failed, the functions are still ongoing because the declared functions by the policy are similar to functions borne by NWSDB	Ariyabandu & Aheeyar, (2004)

(*Continued.*)

Table 2. (*Continued.*)

Policy name	Year	Policy proposer	Features	Reasons for failure or remarks	References
The Water Services Reforms Bill	2003	GOSL	To initiate private sector participation in the activities of water supply services. Regulate water tariffs. Specify standards and regulate water quality etc. The responsibilities of NWSDB and local authorities would be decentralized by handing the pipe-borne water supply in urban and rural areas to commercial water service providers who have a license from the Public Utilities Commission	Did not provide adequate information for safeguarding the interests of consumers and fundamental rights as referred to in the constitution. Absence of vital importance on the preparation of water policy due to the ambiguous political situation in the country at that time. Anxiety of charging additional levy by commercial water providers from consumers as a tariff recovery other than recommended by the Public Utility Commission	Ariyabandu & Aheeyar, (2004), Supreme Court of Democratic Socialist Republic of Sri Lanka, (2003), Rajapaksa, (2003)

** These policies failed to get approval of GOSL, but the mandated functions are implementing in Sri Lanka.

there is an opportunity for the development of water policy for Sri Lanka because several donors are willing to support Sri Lanka on this matter.

Take-home message for potential users

Finally, the formulation of a novel institutional arrangement for water governance in Sri Lanka would be a sufficient or efficient solution. The centralized institution for decision-making would minimize the monopolized behavior of existing institutions. However, it may consume additional financial resources and time. The alternative option is to alter the existing institutional arrangement with shared data and allocate non-shared responsibilities to each institution for better water governance in Sri Lanka. Further, the water institutions in Sri Lanka could be strengthened with academically qualified human resources, and their knowledge without the political interventions could help develop future water policy for Sri Lanka.

Conclusion

The historical water governance of Sri Lanka was mainly on the concept of IWRM and secured limited available water. However, after the foreign invasions (i.e., Portuguese in 1505, Dutch in 1638, and finally the British in 1796), the ancient water governance system of Sri Lanka was abolished and in 1948, after independence from the British Government, the legislation and Irrigation Department was introduced to manage the water resources in Sri Lanka. Since then, nearly 52 legislations and 41 institutions have emerged. However, improper water resources management continues unabated despite the presence of all these regulations and institutions.

The only functioning administrative coordinating mechanism observed at the national level in Sri Lanka is WMP. The DCC, DEC, DAC, and DvCC are the existing administrative arrangements for inter-sectoral coordination at the local level in Sri Lanka. The FO and CBO are the field-level informal administrative systems in Sri Lanka to manage water in the fields. These coordinating mechanisms mostly tally with the principles of IWRM rather than the concept of water security.

While having its legislation and vested responsibilities, each institution tends to monopolize its responsibilities over the water resources of Sri Lanka. Although the responsibilities are declared among the institutions, due to the lack of awareness of some officials, an overlapping of the responsibilities between institutions could be seen. Therefore, GOSL intermittently introduced water policies and even made new coordinated institutions for effective water sector management in Sri Lanka. However, when it comes to 'pricing of irrigation water,' policies failed due to the objections made by the public, opposition parties, and media. Finally, (a) introducing a novel institutional arrangement or (b) amending existing institutional arrangements are suggested for better water resources management for Sri Lanka.

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All relevant data are included in the paper or its Supplementary Information.

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