

Nurturing watershed and water resources management



BY NIMAL WIJESINGHE
ANURADHAPURA ADDITIONAL DISTRICT GROUP CORR.

Ancient irrigation systems in Sri Lanka reflect the unique irrigational and hydraulic Engineering skills of our ancestors. The construction of complex systems of interrelated dams, canals and tank cascade systems for mingling the river water flowing in different directions is a magnificent achievement in the art of water management in the ancient Sri Lanka. With the increase in population, the demand for water is increasing. The main challenge the dam owners have been facing is the catering these increasing demand for water facilities.

Water in the major reservoirs is used for several purposes such as for hydro electricity generation, irrigation, drinking, industrial and agricultural purposes. This emphasises an urgent need to manage and allocate the country's water resources at the most efficient manner and effectively by adopting sector wide approach to swapping individual interests to maximise shared management of water resources and the environment.

There is recognition among the water sector's leadership and principal stakeholders that to be successful the country's past infrastructural driven approach to water exploitation must quickly transition to an integrated water resources management approach. Such an approach must address all the key interconnected issues such as water prioritisation among sectors, watershed planning, groundwater exploitation, surface water capture and usage, increase in reliability through investment and rehabilitation adaptation for climate variability and establishment of a modern institutional and legal framework.

Watershed conservation

The project launched on Integrated Watershed and Water Resources Management has been designed to improve watershed conservation and management and ensure sustainability of adequate water resources for socio-ecological wellbeing and economic development.

The Integrated Watershed and Water Resources Management project is a world bank funded five years (2020-2025) project. The capital to be invested on the project under the supervision of Irrigation ministry is 75.03 million USD.

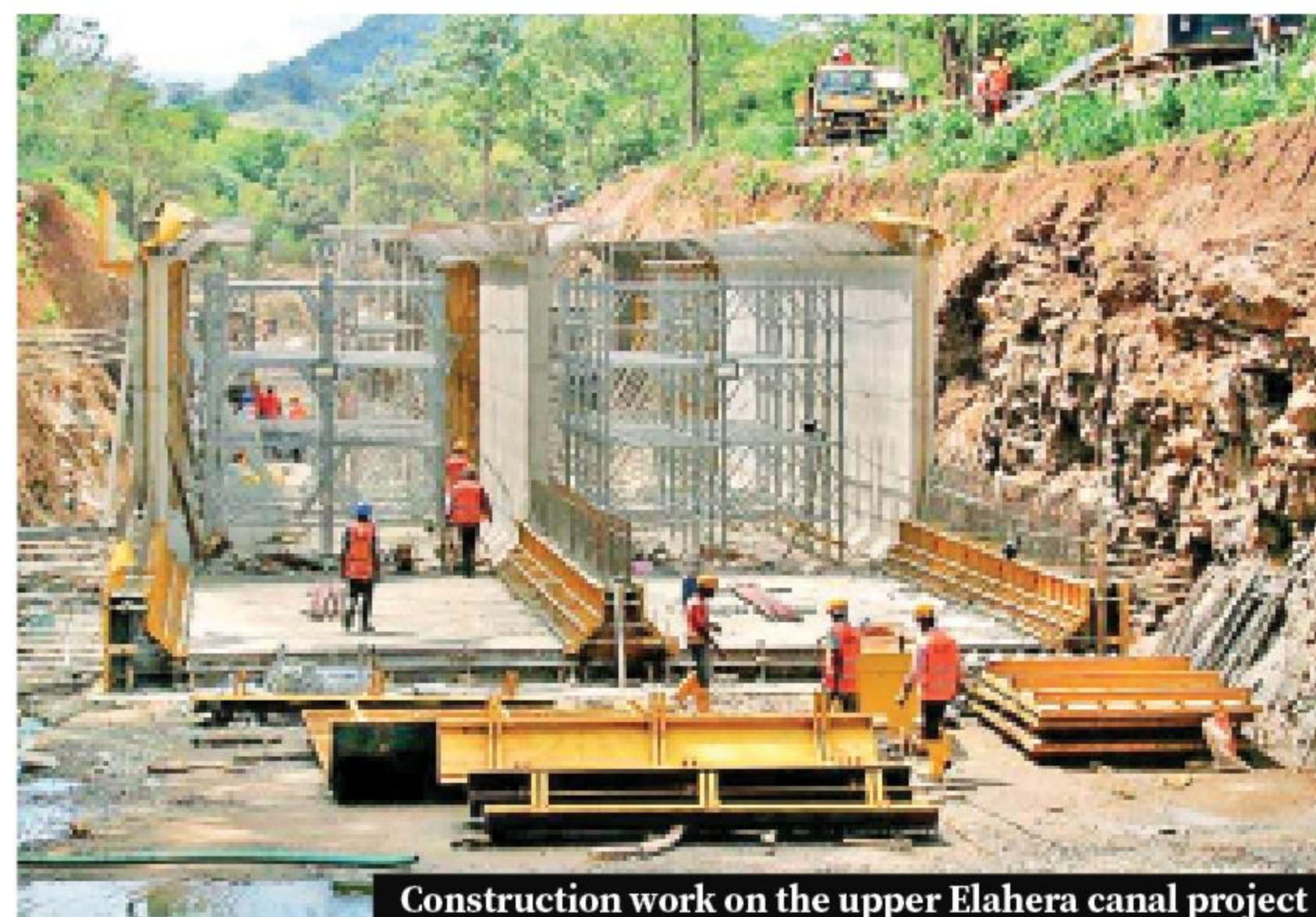
The project comprises three main

components among others such as watershed and water resources planning (13.7 million USD), development of irrigational infrastructure (57.8 million USD) and project management (2.5 million USD).

When looking at the project background being a tropical country close to the equator, Sri Lanka is highly susceptible to adverse effects of climate changes. The global climate risk index 2019 having analysed to what extent countries have been affected by the impacts of weather-related loss events such as floods, storms and heat waves, ranks Sri Lanka, as the second among the most affected countries.

The impact of the climate change is evident from the severe and long duration droughts as well as severe flooding in occurring almost every year in many parts of the country, hindering the development activities livelihood empowerment of the low income group people and environment protection.

Sri Lanka's water resources are critically important to sustain the country's socio-ecological integrity development goals. The island's major rivers originate from the mountains in the central region and radiate out to the lowlands to distribute water across the country. Mountains are supposed to be the water towers for the country and are critical for sustaining life and economic development as planned. However, forest cover in the upper watershed has extensively degraded with remaining forests dispersed as small fragments. The natural wetlands and marshlands supposed to be the water retention areas that filtrated and percolation, have been converted to agricultural lands and many other uses.



Construction work on the upper Elahera canal project

SRI LANKA'S WATER RESOURCES ARE CRITICALLY IMPORTANT TO SUSTAIN THE COUNTRY'S SOCIO-ECOLOGICAL INTEGRITY DEVELOPMENT GOALS. THE ISLAND'S MAJOR RIVERS ORIGINATE FROM THE MOUNTAINS IN THE CENTRAL REGION AND RADIATE OUT TO THE LOWLANDS TO DISTRIBUTE WATER ACROSS THE COUNTRY

Extreme weather events

These episodes have resulted in increased incidence of flash floods, soil erosion and landslides with extreme weather events attributing to climate changes. The lowered capacity for water infiltration and retention in the upper watershed areas has also contributed to water shortages in the mid-country and lowlands affecting agricultural and industrial development and the livelihood of people. Unplanned settlements, industrial projects and maladaptive agricultural practices are creating additional water stresses.

Conservation and integrated watershed management in the mountains and basin - scale management to include the lowlands to ensure socio - economic integrity and economic growth will require land use, land management and strategic forest restoration to increase ground water recharge, improve and maintain water quality while ensuring increased dry weather flow mainly to the lowlands. It is evident that impact of soil erosion on water resources as a result of poor land management has created a problem. However, its intensity has increased due to encroachments of stream and reservoir reservations and illegal gemming.

There should be policies and guidelines regulating the use of ground

water to ensure that its use is sustainable and not over exploited, with consequent lowering of water tables causing significant impacts on forest cover, soil salinisation including soil moisture. For example, low water flows in the Mahaweli river have resulted in drinking water shortages and salt water intrusion in the river.

Many dams and reservoirs in the country are ageing and suffering from various structural deficiencies. There is a severe threat to public lives, related infrastructural facilities and for active operations of the water management systems. In the event of dam failure, the adverse results and consequences would be massive and sometimes irreparable.

Potential danger

Considering the potential danger and the requirement of increased operational efficiency of the systems in 2009 - 2018, the World Bank funded 154.6 million USD under the Dam Safety and Water Resources planning project. Special attention has been given for upgrading and rehabilitating 63 dams belonging to the Irrigation department, Mahaweli Authority, Ceylon Electricity Board, National Water Supply and Drainage Board and Northern Provincial Council. The dams and reservoirs that were not rehabilitated under the DSWRPP are facing various structural shortcomings. Most canal systems are facing deficiencies such as malfunctioning of regulators, scoring of canal banks causing considerable loss of water.

Although the intervention from watershed management projects contained the problem to a certain extent, the watershed degradation has continued unabated due to many drivers such as increased population, lowland per capita, less investment on soil and water conservation, inability of the land users to invest resources on soil and water security, exploitation of natural resources owing to low income, unregulated sewage and solid waste disposal. Lack of coordinated and coherent approach by organisations to manage the resources within the watershed doesn't help to address

the issues. Administratively, the upper Mahaweli watershed cuts across four districts: Kandy, Nuwara Eliya, Matale and Badulla.

As the extent in the Matale district is small, only three districts were included in the project. Within these three districts, there are 31 Divisional Secretariat divisions and 1,662 Grama Niladhari units. The Mahaweli river is the longest and the largest river in the country. This river basin covers about 1/5 of the total land area of the country. The land valley fed by the Mahaweli river is about 10,800 square kilometres. The Kelani river basin is about 2,500 square kilometres. The Mahaweli river is 335 km, Malwathu oya is 164 km, Kalaoya 148 km, Kelani river is 145 km and Yanoya is 142 km in length. A few decades ago, the river valley on either side of our rivers was overgrown with majestic looking trees such as Kumbuk, Mee, Atamba, Kaluwara, Burutha, Ingini, Wewarana, Halmilla, Kolon, Palu, Weera and Koon and in the underneath Bokala, Puswel, Kiriwel, Eraminia, and various other shrub varieties, strengthening the watersheds. Today, such groves have vanished due to human activities affecting watersheds and catchment areas of the water sources.

The dam network of Sri Lanka comprises 80 large dams, 270 medium and over 14,000 small dams within 103 major river basins. Most of these dams were constructed during the reigns of ancient kings and later renovated and rehabilitated on many occasions, as a result of damage caused by floods, drought or other calamities.

Water losses

Some earthen dams were created by the Governments in 1960 and several modern dams were built after 1970 adhering to the latest technologies. Most canal systems in many irrigation schemes are now in a dilapidated condition and experiencing heavy water losses and hence water management would be critical in the future climatic uncertainty. The improvement of canal system is of great importance to enhance irrigation efficiency.

As the maintenance expenditure often depends on the funds allocated from the national budget, sufficient money has not been received for maintenance and repairs.

The arresting of watershed degradation became important with the implementation of the multi-purpose Mahaweli development program mainly for providing hydro-electricity and de-

veloping the irrigated landscape in the dry zone. Four of the largest reservoirs built under the MDP such as Kotmale, Victoria, Randenigala and Rantambere were within the upper part of the Mahaweli river called Mahaweli upper watershed. The Asian Development Bank initiated the upper watershed management project in 2006 - 2007.

Under the component one of the ongoing IWWRM project, it has been planned to launch pilot projects in selected watershed areas in Delhotota, Pathahewaheta, Walapane, Hanguranketha, Welimada, Uwa - Paranagama Divisional Secretariat Divisions covering the Mahaweli upper watershed at a cost of US\$ 13.7 million. It is envisaged to identify the suitable water sources including ground water deposits after a systematic scientific study jointly with the NWSDB to ensure the fulfillment of water resources for the human consumption.

Institutional arrangements

Under component two (57.8 million USD), it is proposed to assist the institutional arrangements for guaranteeing the efficiency in infrastructure related to water, its security and the durability enhancement. Thirty-six dams and 19 canal systems in seven provinces will be renovated. The program is implemented jointly with 23 government agencies including the Sri Lanka Mahaweli Authority, Wildlife and the Forest Conservation, Agriculture, Irrigation, Agrarian Development, Land Development and Export Agriculture Departments. It is learnt that already tenders have been called to implement programs worth 12 million USD. Under this phase, the following work items will commence under the Sri Lanka Mahaweli Authority, Irrigation Department and the Northern Provincial Irrigation Department.

With the increasing demand for water, parallel to population growth, the main challenge the dam owners are facing is the catering these increasing and competitive demand for water. Today, water in major reservoirs is used for various purposes mainly for drinking and irrigational. In a situation of growing urban and rural demand for water, competition for water among different uses has increased. This emphasises the urgent need to manage and allocate the country's water resources efficiently and effectively by adopting a sector-wide approach to exchange individual interests to maximise shared management of precious water resources in Sri Lanka.