

Water Resources Management - Part II

Holistic Approach

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Continued from yesterday

Development of water resources of Kalu Ganga:

As mentioned in the first part of this article, the Kalu Ganga carries the largest volume of water to the sea. There is no significant water use in Kalu Ganga basin. Construction of reservoirs in Kalu Ganga upstream of Rathnapura town and at Kukule across Kuda Ganga were conceptualized for flood control, hydro power and much needed water to South East Dry Zone (SEDZ) consisting of Hambantota, Monaragala and Ampara Districts.

In the recent memory floods of May 2003, caused havoc in many parts of Kalu Ganga basin including Rathnapura town. Damages during this flood event had been widespread throughout the Kalu Ganga basin and it was around Rs. 4520 million. Of this amount damages due to flood had been estimated as Rs. 1480 Mn by deducting the damages due to land slides. The damages that could have been avoided during the 2003 flood event were estimated to be around Rs 700 million if the Rathnapura reservoir had been in position. Following this event, development of water resources of the Kalu Ganga basin was renewed by the Irrigation Department.

Previous studies indicated that construction of reservoirs at Rathnapura and Kukule for hydro power development, flood protection and irrigation are the possible options for development of water resources in Kalu Ganga Basin. The proposals were made in 1968 to develop 580 GWH of annual electrical energy with 112 MW of installed capacity with both Rathnapura and Kukule high dams. Tran basin diversion of Kukule Ganga water was alternatively investigated to transfer 636 MCM of water via 112 Kms. long canals and tunnels, to develop 33,615 ha. of lands in the SEDZ. Hydro power benefit in this option was reduced to 128 GWH and 20 MW installed capacity. In a recent study by the irrigation Department the Rathnapura dam was reviewed by considering the hydropower development as the secondary objective while giving priority for flood protection and drinking water.

One of the major objections to have large reservoirs is the reloca-

tion of people from the reservoir bed and submergence of lands. Therefore a different approach for the resettlement of the families in the reservoir bed was considered different to the traditional approach. This is based on the concept of integrated flood management policy under the consideration.

Kalu Ganga is the source of supplying drinking water to coastal towns in between Kalutara and Colombo and during the low flow in February and March, base flow in Kalu Ganga is not enough to meet the water requirement in year 2025. Therefore impounding water in a reservoir at Rathnapura and gradual release will enhance the base flow of Kalu Ganga. This will remove the necessity of a salinity barrier across the river as proposed in the previous paper article.

Diversion of water to South East Dry Zone (SEDZ):

According to this original study it was proposed to utilize Kalu Ganga water at Kukule by diverting water to Hambantota, Monaragala and Ampara Districts (SEDZ). Transfer of water was proposed by constructing a supply canal at 400 ft contour intercepting Walawe, Kirindi Oya, Menik Ganga, Kubukkan Oya and eventually ending up at Senanayaka Samudra in Gal Oya. Recent developments related to water resources taken place since 1968 in the SEDZ are also important for one to review this original proposal and also to understand the rational behind this proposal in today's context. In the view of above, followings factors have to be considered in planning development of SEDZ in future.

a). Accelerated Mahaweli Project increased the hydro power potential of the country by 700 MW since 1968.

b). CEB shifted its emphasis from hydro power to thermal power due to frequent droughts and other reasons.

c). Udawalwe, Lunugamvehera, Mau Ara and Weli Oya projects did not exist at the time of conceptualization of the SEDZ. These schemes now command originally targeted areas under the SEDZ.

d). The new national parks for wild life have been declared covering about 50,000 ha, which were originally targeted under SEDZ.

e). Samanala Wewa was not existing and it was intended to divert tail race water of Samanala Wewa to SEDZ.

f). After the completion of Menik Ganga reservoir it will bring Menik Ganga water to Kirindi Oya.

g). Diversion of Kubukkan Oya to Menik Ganga is being conceptualized.

h). The diversion of Uma Oya to Kirindi Oya was conceptualized, but it is not feasible due to the limited water in Uma Oya (120 MCM) and the excessive cost of 35 kms of tunnel.

In view of the above by considering the present stage of development it is worth while to study the possibility of Kukule high dam and transfer of water at least up to Kirindi Oya. The main argument behind this concept is that there are

efits of generation of hydropower and augmentation of drinking and industrial water in Colombo and suburbs.

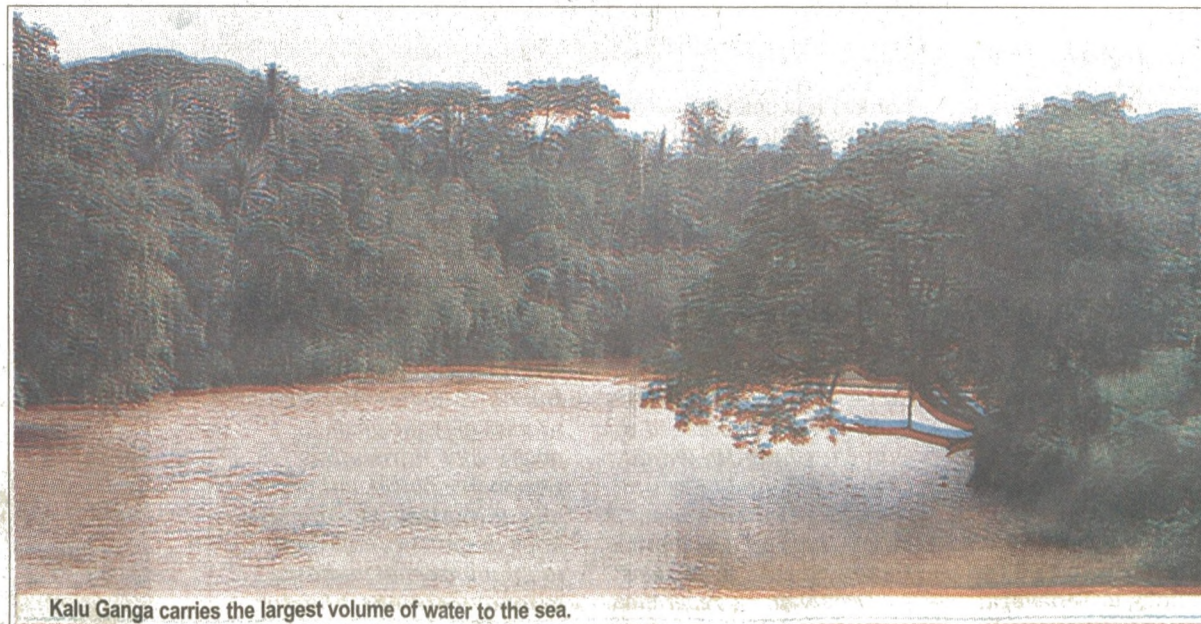
There are two dykes on either sides of Kelani Ganga, constructed by the British in 1930 to provide flood protection to Colombo City. Observations of flood levels at Nagalagam Street gauge were commenced in 1872 and since 1927 there were 11 dangerous floods, 28 major floods and 59 minor floods. Due to if

for quick mitigation of floods. Present safety level of the Kelani Flood bunds is in the range of 25 years. Therefore Colombo city has to be protected to a level of 100 year flood frequency to avoid a bigger calamity as the situation is very critical.

It is proposed to improve the levees along the Kelani Ganga for unregulated flood discharges and a construction of a major reservoir at Nawatha in Yatiyantota. This flood

the present shortage of drinking water in Gampaha District too can be met easily from this reservoir. In addition the concerns of the Irrigation Department for heightening the flood bunds will also be not required when a large reservoir is constructed as the reservoir is capable of regulating floods.

In conclusion I would like to say with certainty that 65 % of available water in rivers in Sri Lanka escapes to the sea and therefore there is potential for rational development of water resources in the country. The surplus water creating floods in the wet zone has to be tamed and water shortage during the droughts has to be overcome by river regulation. The preliminary studies and pre feasibility level studies have been already completed by the Irrigation Department for the development of water resources in major rivers such as Kelani Ganga, Kalu Ganga, Nilwala Ganga, Menik Ganga, Kubukkan Oya, Heda Oya, Mundeni Aru, Yan Oya, Deduru Oya and Maha Oya. Some of these proposals are at the conceptual stage and some have been studied in details and developed to the pre feasibility level and have been forwarded to the Department of External Resources to seek funds for feasibility studies. These proposals are mostly multifunctional and not confined to the irrigation sector. Due to large number of ministries, the responsibilities in the water sector have been disintegrated as mentioned above. It is difficult for a single Minister in charge of one water sector to promote these projects as these are multifunctional. Therefore until the establishment of a single apex body to have the overall control of country's water at least inter ministerial committee of few ministers should be in a position to promote these projects in future for the economic development of the country.



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alternative way to generate electrical power, but water is needed for agriculture, drinking and industrial development. Therefore hydropower we harness today at Kukule can be met from some other source when country increases its power capacity. Then Kukule water can be used for agriculture and other needs of Ruhuna. The Kalu Ganga at Kukule has more than 600 mcm of water and this water can be diverted through 25 kms tunnel and 82 kms of open canal to Menik Ganga.

Development of Water Resources of Kelani Ganga

The Kelani Ganga is one of the largest rivers in Sri Lanka and flows through the capital city of Colombo. Floods in Kelani Ganga are of great importance, because of its geographic location having the sea outlet near the capital city of Colombo. In addition the principal source of water for drinking to Colombo is also the Kelani Ganga and therefore base flow of Kelani Ganga is also an important characteristic in addition to floods. Therefore it is rational to regulate the water by construction of a reservoir upstream to control both flood hazards and drinking water problems during droughts. The proposed measures of construction of upstream reservoirs will protect the lower part of the basin including Colombo and its suburbs from floods in addition to other ben-

not for the bunds protecting the city of Colombo, even places like Cinnamon Gardens and Thimbirigasyaya would have gone under water. There was also a belief among the public and policy makers that due to various changes in the river morphology during the recent past, there will be no more dangerous floods. As a result of this thinking several industries and housing schemes came up in the unprotected areas of Kelani Ganga on both banks. This led to the encroachment of the river reservations, which should have been normally reserved

bund from Colombo to Awiaasawlla also can act as a major high way parallel to the present High level road. These new levees along the river have to be designed to withstand for a 100 year flood.

The Nawata reservoir would create multi-purpose benefits while modifying the requirement of downstream levees and providing reasonable amount of hydro power. This reservoir will solve the water shortage in Colombo for drinking and therefore salinity barrier across Kelani Ganga to prevent salt water intrusion will not arise. In addition