

Diversion of Kalu Ganga to Hambantota: The dream of 1960

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WATER RESOURCES: The paper report appeared in the *Daily News* on March 13, 2006 titled "Massive Multipurpose Project for Kalu Ganga on the disclosure by President Mahinda Rajapakse at the foundation laying ceremony of the Administration Office Complex at Hambantota prompted me to invite the readers' attention to this gigantic proposal for water resources development in the current perspective. Before the implementation of the Mahaweli Project, the Mahaweli Ganga was the largest river with 10,000 sq.kms of catchment discharging 10,000 mcm of water annually to the sea. This amount of river flow has been now reduced to a large scale due to water regulations by massive reservoirs within the Mahaweli basin. In view of the above, today Kalu Ganga has become the number one with the largest amount of river discharge and it is of the order of 4000 mcm. The river has an uninterrupted catchment area of 2688 sq.kms and unfortunately this large quantity of water goes to the sea without any benefits to the nation.

Construction of reservoirs in Kalu Ganga basin at Malwala, upstream of Ratnapura town, at Kukule Ganga and Maguru Ganga were conceptualised along with Gin Ganga and Nilwala Ganga for flood control, hydro power and much needed water to South East Dry Zone (SEDZ). This SEDZ consists of Hambantota, Monaragala and Ampara Districts. This was proposed by Engineering Consultants Inc, Colorado, and USA in 1968.

This was a gigantic project where Nil, Gin and Maguru Ganga (Tributary of Kalu Ganga) were proposed to be dammed at Pitabeddara, Tawalama and Magura respectively to form a huge reservoir.

The water from this combined reservoir (Jasmin complex) was proposed to transfer water to SEDZ by an upper canal of 180 kms long at 120 m contour to Ampara via Hambantota and Monaragala. The lower canal commencing from the

reservoir across Nilwala Ganga at Pitabeddara was proposed to take water to lower parts of Hambantota district ending up at Yala sanctuary. Previous studies indicated that construction of reservoirs at Ratnapura and Kukule for hydro power development; flood protection and irrigation are the possible options for development of water resources in Kalu Ganga Basin. One option was to develop 580 GWH of annual electrical energy with 112 MW of installed capacity at Ratnapura and Kukule high dams without diverting water to SEDZ. Then the trans 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. Transfer of water was proposed by constructing a supply canal intercepting Walawe Ganga, Kirindi Oya, Menik Ganga, Kubukkan Oya and eventually ending up at Senanayke 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 rationale behind this proposal in today's context. In the view of above, followings factors have to be considered in reviewing the diversion of Kalu Ganga to SEDZ.

a) Accelerated Mahaweli Project increased the hydro power potential of the country by 700 MW since 1968 and therefore high priority to develop hydro power exhibited before the implementation of Mahaweli project no longer exist to the same level. Now the emphasis of the CEB is to boost up the thermal power to establish firm energy. The CEB shifted its emphasis from hydro power to thermal power due to frequent droughts and other reasons.

b) Udawalawe, Lunugamvehera, Mau Ara and Weli Oya projects did not exist at the time of conceptualisation of the SEDZ in 1960. These schemes now command some of the originally targeted areas under the SEDZ.

c) The new national parks for

wild life have been declared covering about 50,000 ha, which were originally targeted under the SEDZ.

d) Samanala Wewa did not exist and it was intended to divert tail race water of Samanala Wewa to SEDZ.

e) After the completion of Menik Ganga reservoir, which is under construction now, it will bring Menik Ganga water to Kirindi Oya.

f) The diversion of Uma Oya to Kirindi Oya was conceptualised. However, due to shortage of water than anticipated during the previous studies and the cost of 34 kms tunnel, the feasibility of this proposal to divert water from Uma Oya to Kirindi Oya is now doubted.

g) A mega city at Hambantota had been conceptualised with an international harbour and air port which needs more than 100 mcm of water annually.

h) Drinking and irrigation water for Tangalle, Beliatta and Weeraketiya has become so acute and water supply of Kirama Oya and Urubokka Oya has to be augmented from external resources. Water intake and overhead storage tank constructed to supply drinking water to Weraketiya about 10 years back by the NWS&DB is not inaugurated due to shortage of water in Muruthawela reservoir, which is across Urubokka Oya.

i) Development of lands in the Rakwana Electorate above the Uda Walawe reservoir is under consideration by diverting Rakwana Ganga in the upper reaches of Walawe basin. At present this cannot be implemented as lower walawe system at Liyangahatota depends on Rakwana Ganga water.

In the recent memory floods of May 2003, caused havoc in many parts of Kalu Ganga and Nilwala Ganga including Ratnapura and Matara. Damages during this flood event had been widespread throughout the Kalu Ganga basin and it was around Rs. 4520 million and 122 deaths and damages to 2544 houses have been reported... The cost of flood damages in Nilwala Ganga was estimated as 4000 Mn with 82 deaths and damaging 2600 houses. After the great flood of 2003, the Irrigation Department

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Proposed reservoir site at Ratnapura

reviewed the proposals for Ratnapura dam across Kalu Ganga and Pitabeddara dam across Nilwala Ganga purely for the protection against floods. During this review the hydropower development was considered as the secondary objective while giving priority for flood protection and drinking water.

One of the major objections to have large reservoirs is the relocation 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 while framing proposals, deviating from the tradition approach. This is based on the concept of integrated flood management policy under consideration.

Kalu Ganga is the source of supplying drinking and industrial water to Horana and coastal towns in between Kalutara and Colombo. During the low flows in February and March, base flow in Kalu Ganga is not enough to meet the water requirement in year 2025 and therefore supply of water has reached a critical stage. A recent study of main Kalu Ganga during the low flow period indicated that any further extraction of water for industrial or any other use cannot be permitted without interfering with the minimum environmental flow required downstream. Therefore impounding water in a reservoir at Ratnapura and gradual release will enhance the base flow of Kalu Ganga. For this purpose 70 m dam was proposed to project the Ratnapura town from 50 year flood similar to the flood of 2003. This will remove the necessity of having a salinity barrier across Kalu Ganga as proposed by some consultants to the National Water Supply and Drainage Board.

Regarding the supply of water to Hambantota and beyond, it is important to discuss some views expressed by those who seek to meet the water shortage in the SEDZ.

Often diversion of water from Kalu Ganga at Ratnapura to Hambantota is mentioned by forming a large reservoir at Ratnapura. While it is feasible to have a reservoir at Malwala above Ratnapura across Kalu Ganga, this water cannot be diverted to Hambantota due to the low elevation of the Ratnapura reservoir site. Therefore the benefit

of Ratnapura reservoir would be for flood protection to Ratnapura city and for hydro power generation. As the targeted area for development in the SEDZ is above 120 m contour, the Kukule site is at the correct elevation for diversion and in addition this source will be closer to the SEDZ.

Other proposal is to divert Newalla Ganga to Hambantota by constructing a large reservoir. It is true that this was conceptualised in 1960 with a high dam submerging large extent of lands with a large dead storage volume to divert water at a higher level. Like Kalu Ganga the proposed site for the Nilwala Ganga reservoir at Pitabeddara too is at a low elevation of 15 m to 20 m approximately. Therefore what is feasible is to go for a medium size reservoir of 20 m high dam for the purpose of flood protection.

A dam of 20 m height can protect Matara and Akuressa from a 50 year flood similar to the flood of 2003. It has to be noted that even at this label about 1400 ha will be inundated and water has to be diverted at 20 m level limiting the command area below 20 m contour. Therefore if at all the proposed reservoir across Nilwala Ganga has to be designed for further flood protection and hydro power development only. Therefore the diversion of Nilwala Ganga water to Hambantota may not be feasible with a medium size reservoir.

Regarding the views expressed by the President regarding the possibility of diverting Kalu Ganga to SEDZ, one has to examine the feasibility of constructing a reservoir at Kukule while keeping the 16 m weir already constructed in the year 2000 intact. This present dam is more or less at the same location and has a small capacity of 1.6 mcm. However it has a capacity of 80 MW and power generating capacity of 317 Gwh. According to the studies done in 1968 there are two possible dam sites at Kukule and therefore one has to examine the possibility of having the high dam above the 16 m weir so that high dam will be complementary to the work already done.

As the first stage of the proposal diversion of water up to Kirindi Oya can be considered with possible extension beyond. In order to divert water to Kirindi Oya, 25 kms

long tunnel and about 80 kms of open canal will be required. The open canal will follow the 120 m contour intercepting Walawe Ganga, Weli Oya and Kirindi Oya. The Kalu Ganga at Kukule dam site has the potential of having 900 mcm of water about 600 mcm can be conveyed to SEDZ. It is worth to undertake a feasibility of this proposal as there are no options available to meet the growing water demand at Hambantota and beyond. In addition there are no other options to utilize 4000 mcm of Kalu Ganga water now going to the sea.

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 as stage I. The main argument behind this concept is that there are no feasible options to meet the drinking, industrial and agricultural water requirements of Hambantota mega city and the periphery unless the Kalu Ganga is diverted. Further there are alternative ways 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 with thermal power. Then Kukule water can be used for drinking, industrial, agricultural and other needs of Ruhuna.

In conclusion I would like to say with certainty that 65 percent 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 and trans basin diversion. The proposed diversion of Kalu Ganga to SEDZ was the dream in 1960 and is a better example to demonstrate the rational planning of water resources in the country.

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