

## **Diversion of Gin and Nilwala Rivers for Augmentation of South-East Dry Zone in Sri Lanka**

*A.K.D.N. Atukorala, Sri Lanka*

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*Abstract: A large extent of arable land available in the southern part of Sri Lanka is severely short of water for irrigated agricultural development and industry and most of it remains undeveloped or underdeveloped. The already developed lands under the command area of several irrigation and settlement projects in these areas are currently experiencing severe irrigation water shortages. The only option available at present is to augment the water resources of the southern area by transbasin diversion of water from neighbouring wet zone river basins. It is technically feasible to divert water from the upper reaches of Gin and Nilwala river basins to the southern dry zone (SDZ) area by constructing reservoirs and water conveyance systems. Such river basin development should be envisaged as multi-purpose including hydropower generation, irrigated agriculture, flood control and resettlements. The objective of this paper is to identify the most probable means to meet at least a part of the current water shortages in the SDZ using surplus quantities of Gin and Nilwala waters.*

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### **Introduction**

The southern dry zone (SDZ) is defined as the area, which extends eastwards approximately a north-south line passing the city of Tangalle. The mean annual rainfall in this area ranges from 1100 to 1900 mm and falls in the months between October to December and March to April. The mean annual temperature in the area ranges from 24 to 32<sup>o</sup> C and free water surface evaporation exceeds the mean annual rainfall.

The topography in this area is gently undulating with subdued relief. The land below the contour 120 meters above sea level (masl), slopes gently towards the sea and is topographically well situated for irrigated agriculture. The largest productive sector in the southern Sri Lanka is the agricultural sector. Rice being the Sri Lankans staple food, agriculture occupies an important place in the Sri Lankan economy.

The majority of this land has already been developed under several irrigation schemes but a number of reports produced recently have proved that an acute shortage of water is present in the area with the cropping intensity in different areas varying between 1.3 to 1.8. The crop failures due to drought in these areas are also significant. There is a prime need for supplementing the existing irrigation systems to firm up the irrigated agriculture in the already developed areas of the SDZ. In addition to this, other areas, which are suitable for irrigated agriculture, can also be developed provided sufficient water is available.

Contrarily, the river basins situated in the wet zone and west-ward boundary of the SDZ receive an average rainfall of 3000mm and flows to the sea without this water being made much use of this water but causing flood damages in the low-lying areas. In this report the water resources in the Gin and Nilwala basins are reviewed in order to provide supplementary flow to the SDZ in the most effective and economical manner.

### **Historical Background**

The multipurpose development of Gin, Nilwala and Kalu rivers has been studied since 1968. Engineering Consultants Inc. USA, had proposed development schemes considering in-basin developments to reduce flood damages in the low lying areas of the respective basins by constructing large storage reservoirs and thereby generating electricity. In the Kalu Ganga (river) basin, both in basin and trans-basin development have been considered. In the trans-basin development of Kalu Ganga, the above report recommends the diversion of Kalu Ganga water to the SDZ using a series of reservoirs with a system of canals and tunnels. However, Kukule Ganga, which is one of the major tributaries of Kalu Ganga, is being developed as a single purpose hydropower project and hence no trans-basin diversion could be expected in the future.

In the same report the Nilwala and Gin basins with the Maguru basin which forms the 'Jasmine Complex' was considered for flood protection of paddy cultivated lands and for the protection of low lying areas from sea water intrusion during dry weather periods. These reports have not made a significant contribution to the supplemental