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# Water Resources Management in Mahaweli **Adjoining River Basins in Sri Lanka**

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### **ABSTRACT**

Sri Lanka is a classic example of

the "hydraulic civilization" and major irrigation schemes of Sri Lanka, as evident from the earliest written records in the "Mahawansa" date back to the fourth century BC. From then construction of irrigation systems by river diversions and building of reservoirs had continued. Then colonial period and successive governments carried out rehabilitation of ancient irrigation systems and new schemes as well. Polgolla Barrage was constructed early 1970's to divert water from Mahaweli River Basin to Kalaoya Basin with annual diversion policy as 875 MCM. Then in late 1970's and early 1980's there were several irrigation systems such as H, B, and C etc. developed in the basin under Mahaweli Accelerated Program.

## Introduction to Mahaweli River Basin



### Mahaweli Basin Characteristics

- Catchment Area 10266 sq km
- Annual Average Discharge to Sea 6452 MCM
- Basin Area 1,026,783 ha
- Agricultural Area 292,350 ha 28.5% Basin Area
- **Total Agricultural Land 15.2 %**
- Number of River Gauging Stations 11
- Many Rainfall Measuring Stations with Records nearly 100 years Span

**Global** (and Sri Lanka) Water Withdrawals Irrigation **70 %** (SL 88 %)

#### However during the last few

decades, demand of water has being increasing due to increasing trend of Population, urbanization & change food pattern. As such it is needed to meet the food demand of all population with decreasing land and water resources. Therefore water users of different sectors such as agriculture, hydropower, domestic & industrial have faced many challenges. In order to fulfill the water demand with limited water resources available in the country especially in basin level, it is important to get user involvement in water allocation & water resources planning.

## **HISTORY**

- Irrigation schemes of Sri Lanka, as evident from the earliest written records in the "Mahawansa" date back to the 4<sup>th</sup> century B.C
- King Pandukabaya, who made the Anuradhapura as his capital and ruled in  $5^{th} - 4^{th}$  century BC, is credited with the construction of Jayavapi the present Basawakkulama Tank (Reservoir)
- From then onwards construction of irrigation systems by river diversions and, building of reservoirs had continued by Kings, Queens up to the end of the Reign of Parakramabahu I, the Great Tank Builder King in 1189 AD

### Schematic Representation of the Mahaweli System



**BLOCK D** 

#### Industry 20 % (SL 6 %) Domestic **10 %** (SL 6 %) Total Irrigated Area 280 Mha (SL 0.52 Mha)



#### Three Hydro Power Complexes

National Total (Approximately)	3000 MW
Total Hydro	1345 MW
Other (Kalu/Kukule & Walawe River)	200 MW
Laxapana (Kelani River Basin)	335 MW
Mahaweli River Basin	810 MW



- In Sri Lanka two types of ancient irrigation schemes are available,
- 1. Anicut Schemes : A low diversion weir across across stream or river, to divert water to the fields directly or to a man made reservoir, for subsequent issues to the fields
- 2. *Reservoirs Schemes* : A storage created by constructing a Bund a across a tributary or the main river
- King Vasabha (65 AD) Diverted the Amban Ganga (River) at Elahera
- The Anicut at Hattota Amuna on Kalu Ganga, a tributary of Amban Ganga was constructed by Aggabodhi II in 608 AD
- To supplement the waters of Amban Ganga along the Elahera canal to feed a small reservoir build at Minneriya
- On the Main Mahaweli River, King Datusena in (459AD) built the Yakundewa anicut to divert water to irrigate the left bank fields

King Maha Parakramabahu (The Great Parakramabahu) [AD 1153-1186]

"Not let a single drop of rain water flow to the sea without first being used for the





Year	2007	2008	2009	2010	2011					
Downstream Areas (a)					-					
Farmer Families	93,418	94,106	95,225	96,835	97,024					
Non- Farmer Families	50,082	53,143	53,729	55,968	58,119					
Other	863	1,056	777	834	834					
Sub Total	144,363	148,305	149,732	153,637	155,977					
Upper Mahaweli (b)	7,891	9,061	9,269	9,295	10,292					
Total Sattlement	152,254	157,366	159,000	162,932	166,269					
	152,000	157,000	159,000	163,000	166,000					

#### Cultivated Extent, Production & Value Under Irrigated and Rain fed

	Unit	2007	2008	2009	2010	2011
Paddy						
Cultivated Extent	ha	147,709	158,973	129,393	172,492	175,113
Production	Mt	734,995	790,530	680,028	929,209	789,231
Values	Rs m	14,131	26,667	21,761	29,227	22,428
Other Field Crops (OFC)						
Cultivated Extent	ha	51,771	42,396	39,734	40,212	40,815
Production	Mt	362,429	326,935	296,516	346,336	340,778

## welfare of mankind<sup>\*</sup>



**BLOCK C** 

#### The Mahaweli Development Program

In 1951, the Government of Sri Lanka had obtained assistance from the government of Canada, under the Colombo Plan Program, to undertake a survey by aerial photography to evaluate and prepare an inventory of the land and water resources of the country including the Mahaweli basin. After several studies the Government of Sri Lanka has signed an agreement with the UNDP/FAO in 1963 to prepare a master plan to develop the Mahaweli basin, which has the largest potential for both hydropower generation and irrigated agriculture in the Dry zone. The master plan which was completed in 1969 proposed the development of Mahaweli basin in 3 phases over a period of 30 years (Cooke, 2003). This master plan envisaged the development of 350,000 ha of land; including 97,000 ha existing irrigable lands in Mahaweli and 6 allied basins, with install hydropower capacity of over 600 MW.

The Mahaweli Ganga (River Mahaweli) Development Programme, the largest integrated multi-purpose rural development programme ever undertaken in Sri Lanka was based on above master plan.. Main objectives were to increase agricultural production, Hydro-power generation, employment opportunities, re-settlement of landless poor farmer families with irrigated farm lands& home land and flood control. The programme originally planned for the implementation over a 30 year period was brought to acceleration in 1979, with incorporation of Mahaweli Authority, under the Mahaweli Authority Act No 23 of 1979.



