

# How the Ancient Cascade System Functioned and Current issues; A case study at Kappiriggama in the Dry zone in Sri Lanka

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## Background

Sri Lankan civilization based on hydraulic system. It is a major component of the history of Sri Lanka. Sustainable management of limited water resource is a major challenge in everywhere, therefore even our history ancient civilization flourished in the dry zone had store water for agricultural purpose, because that generated adequate physical and natural resources for our irrigation and agriculture according to that there are many small tanks in Sri Lanka. Traditional wisdom in agriculture and the living has not been developed within few decades. It is a long time-tested knowledge, which created an environmentally adapted, disaster tolerant and sustainable living system. In the traditional system agriculture had been motivated. Their agriculture had been adjusted to absorb any weather vagaries by shifting the cultivation time and selecting farming practices. 'Village tank Cascade Systems' - an ancient, small scale

irrigation technology is examined as it could be observed in the North Central Dry Zone of Sri Lanka. A 'cascade' is defined as 'a connected series of village irrigation tanks organized within a micro-catchment of the dry zone landscape, storing, conveying and utilizing water from an ephemeral rivulet'.

The main objective of the study is to examine how the ancient cascade system functioned and current issues in Kappiriggama cascade system.

## Methodology

In this research information based on primary and secondary data. 50 samples have been collected by questionnaires survey. Those 50 samples were distributed to different stakeholders including Welvidane, fishermen, some village people and student. The primary data were collected from field surveys through interviews and questionnaires. Secondary data were collected from

news papers, magazines, extended reports and interviews. Both qualitative and quantitative analysis were conducted. Kappiriggama is a one of cascade system in dry zone of Sri Lanka. It is situated Rambewa DS Division. There are 11 villeges, 3 GN Divition 597 families and 26 small tanks and anicuts in Kappiriggama cascade system. This cascade system also threaten by human activities.

### **Result and the discussions**

Sustainability of the traditional tank system had been maintained in te past simply not only from structural maintenance. Each and every component of the eco- system was given due consideration. The attention was paid not only on macro-land usage such as paddy land, settlement, chenaland, tank bed etc. but also on micro- land usage such as godawela, iswetiya, perahan, kattakaduwa, tisbabe, kiul-ela etc. This steps bind with village tank in the geological setting of these land uses and descriptions and importance of them.

Traditional communities made every attempt to conserve soil, water, and natural habitat. There was a broad diversity in flora and fauna. Sharing resources equally and the equity of ownership were the most striking features of their culture, which led to build up a peaceful and sustainable rural society. Environmental pollution had never been an issue for them to bother. With the disappearance of

these features the whole system was subjected to collapse socially, physically and economically making the community vulnerable to disasters. When a community becomes unstable in living environment the people are vulnerable to sudden physical, social and economic stresses. Then many problems occur in Kappiriggama area in agricultural potential has severely declined in this environment due to low fertility of farming lands, water shortage, poverty, tank sedimentation, high tank water losses etc. Those thing occur because people are more greedy then they use more chemicals and modern fertilizers and catch the Kattakaduwa like environmental friendly and others area for cultivation and also other most important factors are low level of crop and water management, lack of proper weed pest and diseases management, poor tillage operations and lack of proper drainage. Cultivable extent from small tanks decreases gradually due to tank siltation and high tank water losses. The tank bund would create a shallow water body spreading over a larger surface area. This makes the situation more complicated creating several other problems.

They are inundation of upstream paddy lands, development of salinity conditions in the upper area, increase of tank water losses, disappearance of the tree strips in the high flood region (Gasgommana) and the grass cover (Perahana) underneath; and etc

disappearance of some indigenous fish species, which cannot survive in shallow waters or do not find a helpful breeding environment. Water losses from small tanks are very high. Within a period of 2 – 3 months since the seasonal rains cease, most of the tanks appear as somewhat marshy lands infested with aquatic weeds. Further analysis shows that Kappiriggama cascade has been disturbed ecologically and some historic value. This poses a serious threat to the well-being of the future of the system.

#### **Conclusion and recommendation**

In conclusion, cascading system as a traditional irrigation technology, due to a variety of its positive features, is worthy of preservation, enhancement and popularization. This may be approached through a systems approach, rather than through a sectorial or piecemeal approach. Because all components of the system have been disturbed and lost by various human activities and many functions are broken down without proper concern for them. Restore the system in order to keep the balance of resources and relations. Particular areas to be attended to immediately are the management of invasive aggressive plants and the use of eco-friendly fertilizers with organic farming. There should be strengthening of permanent organizations, which is required in

management with proper processes. It also has been created with good integrated institutions getting qualitative implementation and planning better programs. Traditional interventions should be bounded with water and culture. Doing all of these things will make sustainable development of water management in dry zones.

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