

## June 05 — World Environment Day

## Impacts of large dams: The Sri Lankan experience

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Sri Lanka has a long history of large scale damming and constructing reservoirs. The Mahaweli, the Samanalawewa and the Lunugamvehera are some examples for such dam projects. Among these reservoirs, the largest one "Victoria" filled only in 1996 for the lifetime that is after 17 years. The Samanalawewa reservoir cannot be filled due to leakage in the dam. It is now being subjected to various experimental remedies such as grouting, wet blanketing, etc.

The Lunugamvehera reservoir was constructed in a wrong place in a wrong size due to faulty political directions and the result is insufficient water for irrigation. The authorities now plan to divert some other rivers to bring water to this reservoir. Though none of these development projects were sustainable they spent billions of rupees in the process inundating our heritage and some of the most fertile lands in the country.

All these dams and reservoirs resulted in the relocation of thousands of families. While some families are now having good earnings, most are suffering severe hardship. Some suffered from malaria and others died due to snakebites and wild animal attacks. Some of them who got rocky lands with "Mana" in the up-country are suffering from various illnesses because of the hard work they have to undergo in order to make those lands fertile.

## Introduction

The Aryan civilisation started the construction of tanks in Anuradhapura (Central province) which is the most ancient city in Sri Lanka. According to historical records, more than 12,000 major tanks were built by various kings before the British colonised Sri Lanka. The 87-kilometer long Jaya Ganga and 27-km long Minipe Ela (Canal) are major constructions among these works. The 6.5-km long and 12 meter high Kalawewa Dam and 13.7-km long and 12 meter high Parakrama Samudraya dam are major dams during this era. The tank system created the world's most sophisticated hydraulic civilisation in Sri Lanka. This tank system was called the cascade system and it did not entail damming the river. During the period of colonisation by the Portuguese (1505), the Dutch (1658), and the British (1815) no development in the tank system took place.

## Mahaweli Master Plan

Sri Lanka has 103 river basins. Mahaweli is the longest and the largest river among them. It starts from the central hill and passes through several cities before flowing into the sea at Trincomalee in the east of Sri Lanka. This river drains 16% of the country's land. Prior to the large-scale development of the Mahaweli basin for agricultural production, more than 50 percent of the land area was covered with mature tropical humid, sub humid, or dry forests.

In 1961, two reports were produced to look at the feasibility of damming this river. A report called the Mahaweli Master Plan prepared by the FAO was published in 1968 and passed by the Parliament. The main objective was to tap 6900 million cubic meter water for electricity generation and irrigation. The Plan envisaged 15 reservoirs, 11 of which were for electricity generation. It was also proposed to provide water for 3,64,372 hectares and out of this it was proposed to develop 253,968 hectares of new lands. About 143,564 hectares were forests. The expected electric generation capacity was 933 MW by 1990. For this scheme a separate Authority was created in 1970.

The entire scheme was to be completed in 30 years. Unfortunately, due to political reasons, it was accelerated to complete it within 6 years. The accelerated Mahaweli development programme was implemented in 1977 to provide solutions for the acute unemployment problem, loss of foreign exchange for agricultural imports and shortage of electrical energy.

The lower Kotmale project, Polgolla Project, Victoria project, Randenigala, Rantembe, Minipe, Maduru Oya, Bowatenna, Elahera Diversion and Angammodilla Diversion were completed. The funding for this project came from the World Bank and various European governments.

These large-scale reservoir projects have failed to provide adequate water to settlers from the wet zone. They have also failed to solve the water problem of the traditional dry zone farmers. Since these projects were not planned in accordance with the natural environment, the expected results have not accrued. Most farming communities continue to eke out a hard subsistence life.

## Promises and failures

The largest of the major irrigation schemes is the Mahaweli Multipurpose Irrigation Scheme. The main objectives of this were to provide water for farming in the Northern, North-Central and Eastern provinces and to generate electricity. In the process of diverting the waters of the longest river in Sri Lanka, thousands of acres of forest and community land were lost. Thousands of the Mahaweli were diverted to the Eastern and north-Central provinces, numerous colonies were established in these areas. People who had lived in fertile, cool and hill-country villages, whose wet zone land was lost, were settled in these colonies.

The Mahaweli has failed to bring about the promised prosperous life. Those cultivating with the diverted Mahaweli waters live amidst their shattered dreams. The Mahaweli Scheme, which was launched against nature, has failed to provide adequate water for the farmers. In the meantime, repayment of the massive foreign debt utilized for launching the accelerated Mahaweli project has become a burden for the entire nation.

In recent times it has become a great problem to provide adequate water for dry zone farmers. But it was the same areas that had sustained a majority of farming communities in the past. The main reason for this has been our ancient irrigation system. Their method was to collect water from diverting the rivers to a tank, which was so constructed as to collect even rain water. The water thus collected was used for farming during dry periods. New large-scale irrigation schemes have submerged and destroyed the ancient irrigation system.

Thousands of tanks in the dry zone were bulldozed for the Mahaweli Scheme. The Scheme planned to supply water only to the larger tanks and to fill-up the smaller tanks. This destroyed the ancient system to having a tank for each village. The villages have been denied the ability to irrigate their farms with their own tanks.

Until the end of April 1992, more than 111,400 families or about 700,000 people were resettled as a result of the Mahaweli project. This was one of the biggest projects in the world, which resulted in massive displacement.

## Public opinion: Environmental and social disaster

People who are affected by these large-scale reservoirs and dams have very negative comments. During a series of Public Hearings conducted by social action groups in 1991-1992, these opinions came forward:

An environmental assessment prepared by USAID in 1980 predicted many of the major adverse environmental changes that would result from or affect the Accelerated Mahaweli Development Project (AMDP), including degradation of the watershed, declining water quality, loss of wildlife habitat and populations, and incomplete social infrastructure developments.

Many of these environmental problems continue to persist in the Mahaweli basin. The problems generally represent a constraint to some of the original objectives of the AMDP, and contribute to a degradation of the quality of both human and non-human lives in the basin.

Today water availability is not sufficient for rice cultivation and farmers are forced to cultivate low water-use crops such as onions, green gram or gherkin and other cash crops while importing tons of rice. For these crops, farmers have to use tons of fertilisers and pesticides. In 1996, the electricity generation was dropped by 28% due to the drought condition. There were serious power cuts during this period.

## Lunugamwehera Dam: Bad siting

The farmers of the Hambantota District in the Southern Province also face a lot of uncertainties. The Kirindi Oya, which originates from the central hills and reaches the sea at Kirinda in the South, was dammed at Lunugamwehera with massive foreign loans in 1986 to provide water for the farmers in the South. Colonies were established under the scheme for people from the Hambantota District and other parts of the Southern Province. They too now face hardships because of scarcity of water. This scheme has by and large, failed to provide water as expected and the farmers are waiting for the day when they can get sufficient water.

The government is now planning the diversion of Uma Oya in order to provide water to the Lunugamwehera reservoir. As the government has not specifically disclosed details of this programme, the farmers surrounding Uma Oya have fallen into a situation of uncertainty. Today, the people in the Uma Oya area talk about their heritage with a mixed sense of sadness, fear and forcefulness. They express their strong protest against the Uma Oya reservoir project. This project includes a 27-km, long canal to divert water through the hills.

## Samanalawewa: the Political Dam

The Samanalawewa (which is Sinhala means "Butterfly Lake") hydro power project in Sri Lanka is an interesting case study on how millions of dollars of official development assistance (ODA) from developed countries have been spent on an ill-conceived project which has caused

considerable environmental and social damage.

The project, located in South-Western Sri Lanka, was intended to generate 120MW of hydro power, needed to meet the rising demand for electricity by exploiting a 300 m elevation difference between the Walawe River and a tributary flowing below an escarpment nearby. A 100-m high dam was built, creating a reservoir of 254 million cubic metres.

The original proposal for this project was made by American consultants in 1966, and later revised by Australians in 1973. Between 1973 and 1986 Soviet, British and Swiss teams were associated with further studies and change of plans. The original site was changed, and the project was scaled down in size. When the Russian scientist warned that inadequate geological studies had been done on the new site, there were politely asked to leave Sri Lanka. Finally, in 1986, the project construction work started with co-funding from Britain and Japan. After a Japanese team studied the revised plans, the Economic Co-operating Fund (OECF) approved loans totaling more than 30 billion-Yen between 1986 and 1991.

There were concerns about the viability and suitability of the project from the very beginning. The Samanalawewa project displaced over 500 local families and flooded more than 1,000 hectares of valuable wet zone forests. But the most compelling doubts were about the manner in which construction engineering work was done by reputed British and Japanese companies. In 1989, tunnel construction work hit the area's water table, and for months afterwards, a large area was totally drained of ground water. But the contractors were not too worried. In an interview given to 'The Island' in January 1990, the principal British designer (Sir Alexander Gibb and Partners) dismissed these problems as "minor glitches", and assured that everything was under control. But alas, this was far from the truth.

Between 1990 and the end of 1992, the dam and tunnel developed a number of leaks, largely because the area's geology had not been studied in detail, and adequate precautions had not been taken. In 1991-92, an additional Yen 3,364 billion was spent on "grouting" the dam, i.e. injecting thousand of tones of cement. But this was a temporary relief: when the reservoir started filling up in late 1992, the right bank leak intensified, leading to a massive outflow of water threatening villages downstream with floods and earth-slips. At least 5,000 local families had to abandon their homes and flee to safety. There was a major national outcry that bureaucrats and engineers had blundered repeatedly. Questions were raised why

the Britain and the Japanese were continuing to fund this "political dam" which was ill conceived from the very beginning. Students of ODA now cite this as yet another sorry case where well meant development assistance went utterly wrong, threatening man, beast and land alike.

On October 2, 1992, the then president of Sri Lanka ordered a full-scale inquiry into the entire project, which has recently completed its public hearings. Its report is expected to be made public soon.

People affected by the disaster are skeptical about such "post-mortem" processes. They say that it is easy to be wise in retrospect. At the end of a prolonged inquiry, some obscure designer may be faulted, a massive report may be released, and then the matter may be forgotten by most people. But who is answerable to Sri Lankans who lost their property and livelihood due to dam leaks? Who will account for the taxpayers in UK and Japan whose money was spent to perpetrate this crime against people and their environment?

## Conclusion

Our national planners have not learned a lesson from past mistakes. They still try to implement foreign technology in this country.

Our peasants are still uncomplicated and small folk. The stream that flows by their village is still an integral part of their life. They use it to obtain drinking water, for farming, to wash themselves and their clothes. The loss of a waterway is taking away a part of their lives. Villagers accustomed to the system of farming by filling the anicuts with river water now see large reservoirs built by using bulldozers and heavy machinery, destroying and often submerging forest and villages. In fact, increasingly they reject them. They had lived in relative contentment, and now feel robbed of their rights. They who lived self-sufficiently, independently and with a sense of pride now find themselves weak and dependent both physically and mentally.

Many people in Sri Lanka are aware of the plight of these peasants. Therefore the majority do not support large-scale irrigation schemes. It is true that various activities have to be carried out to satisfy the complicated consumerism-based life-style brought about by modernization, industrialization and development. But people do not agree that the answer lies in large-scale irrigation schemes that they feel have only expropriated their heritage and independence, destroyed their villages and brought in their wake, a host of new problems.

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