



## Country Report 2003

# Sri Lanka

### INTRODUCTION

Sri Lanka is an Island with a land area of 65,610 square kilometers. It is situated between the 5.55' and 9.51'N, 79.41 and 81.54E. The Island is 224 km. wide and 432 km. long at its furthest point. The mean temperature in most parts of the island ranges from 26 to 28 C. Rainfall occurs in Sri Lanka during the Southwest and Northeast monsoons. During the Southwest monsoon (mid May to September) rainfall is mainly confined to the Southwest of the Island, whereas during the Northeast monsoon (October to February) rainfall occurs in the North and East of the Island.

Sri Lanka's economy is mainly agricultural, based on the production and export of tea, rubber, coconut, garments, gems and minor exports crops. Paddy is the main domestic crop and rice is the staple food of the people, foreign employment and tourism play an important role in the economy of the country.

Sri Lanka's population is 19.5 million in year 2000 around 79% of the population live in rural areas. Buddhism is the main religion of Sri Lanka. Around 69% of the population are Buddhists and the rest belong to Christianity, Hinduism and Islam. Sri Lanka is a Socialist Democratic Republic headed by the Executive President. The country is divided into 9 Provincial Council, 25 Districts and into 264 Divisions for the purpose of administration.

### MAJOR NATURAL DISASTERS OF SRI LANKA

In Sri Lanka, floods, landslides, Cyclones, Droughts, Wind storms and coastal erosion are the main causes for Natural Disasters. These natural disasters have caused loss of life, and enormous damage and destruction to property. In addition to these natural disasters, the country also incurs heavy toll on account of man made disasters such as deforestation, indiscriminate coral, sand and gem mining, and industrial hazards besides ethnic conflicts and occasional political violence in the recent past.

#### Floods

Floods are more of common occurrence in Sri Lanka than the other natural disasters. The water resources map of 1959 identified 103 river basins of which about 10 rivers are considered as major. Among these major rivers Kelani, Gin, Kalu, Nilwala and Mahaweli are vulnerable to floods. The increase in population and subsequent need for land have forced more and more people to live and work in these vulnerable areas, thereby intensifying the risk to life and property in the event of major floods. Heavy rainfall and run off the large volume of water from the catchment areas of rivers, deforestation, improper land use and the absence of scientific soil conservation practices could be identified as the major factors for floods in Sri Lanka. Moreover with global heating due to the green house effect, tropical countries are expected to get less annual rainfall, but increased rainfall intensities. The average annual rainfall ranges from 500 mm. to 800 mm. The highest rainfall of 805 mm. At Kanukken in 1897 and 508 mm. at Nedunkerni in 1911. Due to the Southwest and Northeast monsoon rains, floods occur in the Island. The districts of Kegalle, Ratnapura, Kalutara, Colombo, Gampaha and Galle are subject to floods on account of Southwest monsoon rains, while Ampara, Trincomalee, Badulla, Polonnaruwa, Batticaloa, Matale and Monaragala suffer from the Northeast rains.

#### Landslides

Heavy rains and geological changes in the hill country, accentuated by the indiscriminate clearance of steep slopes in the mountainous areas, have increased the occurrences of frequent landslides especially during the last two decades in the mountain slopes of the Central and South Western regions of the Island. Landslides like any other natural disaster are a concern to us as they threaten the life and property of the people in the hill slopes. The landslides of January 1986 and again those of May and June 1989 surpassed all previous landslides in recent memory, On all counts of the extent of damage and personal tragedy. The 1986 January landslides were by far the most damaging one, claiming 51 lives, rendering nearly 100 families homeless and affecting more or less all the seven landslide prone districts of the hill country. A little over three years later, that was in May and June 1989, the landslide events surpassed all the earlier events in severity and magnitude, claiming more than 300 lives, rendering a large number of poor families homeless over an extensive part of the hill country. Most recently, October 1993, the landslide at Helauda in Ratnapura District resulted in the loss of 29 lives and destruction of many houses. A staggering statistics for the total loss due to landslide in 1989 alone was estimated to be in the region of Rs.142 million.

#### Droughts

Recently that is in 2001 we have experienced one of the serious droughts which has resulted in even interruption to power supply causing much hardships to people and serious effects to the National Economy. Every year, somewhere in the country, some people are faced with droughts of short duration which are only of local significance and they are seldom reported. Drought of regional significance do occur once in every 3 to 4 years. Severe droughts of national significance occur after a

considerable period of time, within 10 years or so. After the severe drought of 1935-1937, the other severe droughts of national significance occurred during the periods 1947-1949, 1953-1956 and 2001 had caused major setbacks to the economy. Although droughts cannot be classified as sudden disasters, they do cause hardship and financial loss mostly to farmers. In the drought of 1996, 181,095 families in 17 districts were badly affected and in year 2001, 370,541 families in 8 districts were affected.

## **Cyclones**

Sri Lanka has been affected mostly by cyclone activity occurring in the Bay of Bengal. The Eastern, Northern and North Central regions are the cyclone prone areas of Sri Lanka. Although cyclones do not occur frequently in Sri Lanka, these are not totally outside the range of disasters. The records show that cyclones have affected the Eastern, Northern and North Central Provinces. Sri Lanka has been hit by cyclones during the past 70 years causing severe damages to the economy. The 1978 cyclone alone affected more than one million people, killed nearly a thousand persons, partially and completely damaged nearly 250,000 houses, destroyed 90% of the coconut plantation in the Batticaloa district and resulted in the government having to spend over Rs.600 million to bring immediate relief to those affected. Also cyclones of severe intensity struck Sri Lanka in 1922, 1931 and 1964.

## **Sea Erosion**

Sri Lanka has a coastline of 1585 km. More than half of her 19.5 million population live in villages, towns and cities of the coastal district. The economic importance of the coastal areas has increased further with the rapid urbanization, the development of commercial harbours (Colombo, Galle and Trincomalee). Fishing harbours and anchorage, main lines of communication (road and rail) recreational facilities and tourism.

It has been estimated that over 50-55 percent of the shoreline is subjected to or threatened by coast erosion. The most critically affected areas are those between Kalpitiya in the Northwest and Matara in the South. The erosion trends in selected reaches of the coastline. One of the worst affected reaches is the coastal sector from Maha Oya to Lansigama, where erosion rates of 3.4 : 4.5 m/year have been recorded.

Shoreline retreat due to sea erosion has been a severe problem in Sri Lanka resulting in damage to and loss of property and infrastructure facilities, and development efforts.

# **DISASTER MITIGATION IN SRI LANKA**

## **Flood Mitigation**

Sri Lanka is rich in ancient culture. The hydraulic civilization found in the Dry Zone by ancient Sinhalese Kings display evidence of remarkable human effort taken to mitigate the drought hazard. The major features of this civilization were the construction of an intricate system of reservoirs for storing water for agriculture. There is no doubt that the rural population in the dry zone whose survival there today as a result of the timely and proper disaster plans initiated by the ancient monarchs. In the past community lived on the riverbank in perfect harmony with the nature. The challenges faced by local communities led them to develop their own mechanisms to reduce the impact of the flood. There are two approaches to flood mitigation. One is to take water away from the people and the other is to take people away from water. The first method is also known as the structural approach; this is adopted along the basins of Kelani, Gin and Nilwala rivers as a measure to control inundation and the consequent damages. The other approach is the non structural approach where timely flood warning is given to the people to move out of the area before the breach of floods. This method is practiced to some extent in the lower Kelani Ganga (Ganga = river) and in the suburbs of Colombo.

Flooding of Kelani Ganga has serious consequences as the outfall being near the capital city of Colombo. When the flood level of Kelani Ganga is between 5 and 7 ft. the flood is defined as a major flood and when it exceeds 9 ft. the flood is considered to be dangerous. The heaviest storm probably occurred in 1832 with maximum recorded height of 13.5 ft. at Nagalagam and thereafter the occurrences had been in October 1913.

May 1927, May 1928, October 1930, May 1933, May 1936, May 1939, August 1947, October 1966, October 1967 and July 1989.

During the period of 1980 to 1985 both banks of the Kelani Ganga near the city of Colombo were provided with flood protection bunds. These Bunds are capable of providing safety to the Colombo city for a 25 year period. However, due to encroachment and poor maintenance, a complete rehabilitation of this flood protection scheme has now become absolutely necessary.

The Gin Ganga flood protection scheme was launched in 1975 with the financial support from the People's Republic of China. Protection is provided against a flood of 10 years return period and an extent of 5000 ha. Of paddy has been protected from frequent flooding. Ten electrically driven pumping units were installed to cater to the local drainage on the protected side.

The Nilwala Ganga flood protection scheme was completed in 1993 and it provides protection to 5600 ha. Of paddy lands with three diesel driven pumping units. Of the three stages of project implementation, only two stages were completed leaving out the last stage unattended. Even though the scheme was originally designed for flood protection, the project was launched to provide drainage facilities for low lying lands and therefore the pumps have to be run everyday. Due to the non completion of the third stage of the project and due to several other reasons, the scheme has not been very successful. The non completion

of the stage 3 of the project has also increased the flood threat to Matara town. In addition, about 2000 ha. Of developed lands are located in the unprotected area as the location of the newly constructed flood bunds are away from the river banks.

Among the non-structural flood mitigation methods, a flood forecasting system has been introduced only on the case of Kelani Ganga. Forecasting of water levels in the river is done by means of four upstream gauges and the data transmission is done with radio equipment. An organizational setup and the necessary standing orders are available to facilitate coordination among several institutions during a flood. This scheme prepared in 1968 was updated by the Irrigation Department in 1993 which can be considered as a comprehensive study to provide a detailed mitigation plan for the city of Colombo. Ratnapura is a town in the upper basin of Kalu Ganga which is subjected to frequent flooding. However due to limited travel time of the flood wave, it is not possible to warn the people. At present, there is no structural plan to mitigate flood in Kalu Ganga.

Among the structural measures taken during the recent past by the Government to control floods, both Gin Ganga and Nilwala Ganga flood projection scheme can be highlighted. These two projects are provided with safety measures against a flood of 10 year return period.

A flood protection study for Kelani Ganga was done in 1990 under DANIDA aid and this project provided the necessary computer facilities and software to model Kelani Ganga. Action is being taken by the Department of Irrigation to prepare a proposal for funding by the world meteorological organization to install a real time flood forecasting system for Kelani Ganga. This will serve as a pilot project.

Amidst the above situation, Sri Lanka was confronted with heavy floods, and landslides in May 2003 due to torrential rains.

This instance, approximately 138,000 families in 5 Districts were affected. This resulted in 236 deaths and 17 persons are missing. The floods and landslides situation which took place in Sri Lanka made it evident that more emphasis should be made before urbanization. When locations are identified for resettlement, it is extremely essential to co-ordinate with the National Building Research Organization, Urban Development Authority, Local Authority, Irrigation Department, National Housing Development Authority, Central Environmental Authority, NGOs to minimize the damages which could be caused by such disasters.

## **Erosion control strategies**

The coast Conservation Department is statutorily responsible for taking mitigatory measures to combat sea erosion. The strategy adopted is two fold. Where vital infrastructure is threatened, coast protection measures such as revetments and groynes are constructed. Depending on the urgency, either a planned/designated revetment or protection is installed or an emergency revetment consisting of mix material is dumped from tipper trucks or in areas of limited access, gabion boxes filled with rubble (150mm-225mm) would be used. The work is carried out by the Department.

Such protection measures are classified as short to medium term solutions and require annual maintenance. However these measures specially revetment may hinder or obstruct the continuance of beach user activities such as beach since fishing, boat beaching, and even recreation (tourism).

Long-term measures are based on the Coast Erosion Management Plan (CEMP) and the Coastal Zone Management Plan. Both these plans are now being implemented. The CEMP considers that in the reaches of erosion prone critical areas termed as key areas, impacts on the people would be minimized if a solution is adopted. Storm surges, though not a frequent phenomenon, do occasionally cause large scale inundation of areas and damage to infrastructure and housing specially in the East. The strategy adopted in this area is to delineate setback zones and improve the coastal vegetation.

The Coastal Zone Management Plan (Coastal Erosion Management Plan) seeks to regulate development, by legally enforcing 'No-Build-Zone(Setback)'; these setbacks vary with location and the type of development. With the enforcement of the "No-Build-Zone", through the Coast Conservation Act and its amendments, the pressure on the beach is reduced. In addition, the Department also undertakes Public Awareness Programmes (PAP) whereby coastal communities are educated on the basics of coastal resource management, and the need to adapt appropriate action to minimize the adverse effects of erosion.

## **CONCLUSION**

It may appear that the severity and frequency of the natural disasters in Sri Lanka may not be on the same high scales as one finds in some countries. Nevertheless, the damages, hardship and the relocation arising from natural disasters taken together with the man made disasters including civil conflicts and political violence are indeed very grave for a small country such as Sri Lanka.

The government of Sri Lanka is therefore deeply committed to turn the tide towards preparedness to meet any natural disasters, that will eventually ensure high degree of safety and minimum losses.

It is useful to note that no amount of legislation and institutionalization will provide all the answers to disasters. What is needed is a plan that will note signals and quickly set in motion a state of preparedness, to face disasters and set of action to provide speedy relief to the

affected persons and property. This is a responsibility of the entire country where the government is naturally expected to act as a prime mover action.

» **Page Top**

» **Country Report Top**