MAJOR FLOODS IN CUDDALORE IN THE LAST DECADES OF THE 19th CENTURY

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Abstract
Natural disasters like cyclones, floods, earthquakes and landslides affect almost all countries in the world. Tropical cyclones can be considered to be the most destructive natural hazard when viewed in terms of their occurrence, intensity and area affected by the disaster. Amongst the average of 80 to 90 cyclones recorded per year all over the world, at least five to six occur in the Indian subcontinent. This is because of the unique nature of the coastline, the shallow coastal ocean topography and the physical characteristics of tides in the Bay of Bengal region.

In British India, South Arcot was a district in the Madras Presidency. It encompasses the area of the present-day districts of Cuddalore, Viluppuram and Thiruvannamalai of Tamil Nadu state.

Introduction
Natural disasters like cyclones, floods, earthquakes and landslides affect almost all countries in the world. They destroy substantial human and economic resources and stand as formidable barriers against regional, national or global development at regular intervals, almost every year. Tropical cyclones can be considered to be the most destructive natural hazard when viewed in terms of their occurrence, intensity and area affected by the disaster.

Amongst the average of 80 to 90 cyclones recorded per year all over the world, at least five to six occur in the Indian subcontinent. India ranks high among the countries prone to cyclonic storms. This is because of the unique nature of the coastline, the shallow coastal ocean topography and the physical characteristics of tides in the Bay of Bengal region. Besides, the high density of population, low awareness of the community about cyclones and their risks, inadequate preparedness and cyclone warning systems add to the severity of the problem.
India has a coastline of about 7,516 km, 5,400 km along the mainland, 132 km in Lakshadweep and 1,900 km in the Andaman and Nicobar Islands.

The objective of the study

The aim and objective of the study are to understand the character of floods and cyclones; document their occurrence in Cuddalore during the colonial period; the impact of floods and cyclones on administration, urbanisation, economy and society.

History of Cuddalore

In British India, South Arcot was a district in the Madras Presidency, which covered the areas of the present-day districts of Tamil Nadu state, i.e. Cuddalore, Viluppuram and Thiruvannamalai. Cuddalore district was divided into eight taluks and covered a total area of 13,510 square kilometres. The administrative headquarters of the district was Cuddalore town.

South Arcot was an integral part of the Chola and the Pallava kingdoms during ancient times. The British existence in the district years back to 1690 when the British East India Company set up a factory of Fort St. David at Cuddalore. South Arcot was the sight of confrontation between the British and the French and also between the British and Tipu Sultan. The British took over the administration of this area in 1781 and assumed full sovereignty in 1801.

During ancient times, the northern part of South Arcot was ruled by the Pallavas while the southern part was under the rule of Cholas. In the 14\textsuperscript{th} century, South Arcot was subjugated by the Delhi Sultanate and later by Vijayanagar kings. In 1646, South Arcot came under the rule of Bijapur sultans who ruled till 1676, when it was captured by the Marathas. The Mughal Emperor Aurangzeb took Gingee and founded his rule over South Arcot in 1698.

The British occurrence dates back to 1682 when the British East India Company founded a factory at Cuddalore and Kanimedu. Later, the Company setup one more factory at Fort St David near Cuddalore.

From 1746 onwards, the Fort St David functioned as the temporary headquarters of Madras Presidency, until 1752, when Madras was taken by the French East India Company.
Again, from 1758 to 1760, Cuddalore was taken by the French. Hyder Ali and his son Tipu Sultan stirred repeated attacks on the region from 1767 to 1790. Complete sovereignty over the region was given to the British by the Nawab of the Carnatic in 1801. The district of South Arcot was created as a part of Madras Presidency at about this time.

**Meteorological information**

Cuddalore’s weather is classified as tropical climate. The summers in Cuddalore are much rainier than the winters in Cuddalore. This district receives the average rainfall of 1448 mm on an average. It includes rainfall from both the South West and the North-East Monsoons (423 mm, 1025 mm). The minimum rainfall was 593 mm, and the mean rainfall was 972 mm. The annual maximum temperature recorded in the district was 37.15°C. The minimum and mean temperature recorded were 19.93°C and 28.12°C, respectively.

**Flood in 1864**

The archival data reveals that there were ten inches of rain fell at Cuddalore from 17th to 19th October 1864. The Gadilam, the river passing through the city of Cuddalore, came down on the 19th in the overflowing floods. The flood swept away eight of the arches of the bridge, which then connected Manjakuppam and Tiruppathiripuliyur. As a measure to renovate it, a construction of twenty brick spans of thirty feet each had been built between 1843 and 1847 partly from pagoda funds and partly with convict labour. The Manjakuppam Maidan situated at the centre of the Cuddalore city was flooded all that day, and the patients of the hospitals had to be hurried out to the verandah of the court, and two women were drowned close of the gate of the collector’s house, and water came up to the doorway of the building. In Pudupalayam, nearly all the huts were washed down, and hardly a house escaped some damage or other.

During the floods, a large number of people were left homeless. Later, Rs.3,700 was spent in relieving them. In the inland parts of the district, the harm done was confined principally to the taluks of Cuddalore, Villupuram and Tirukkoiyilur but there it was very considerable. The roads were everywhere washed into pieces the three check dams (anicuts) on the Gadilam River were all badly damaged. The Perumal Tank, Wallajah Tank and sixty smaller tanks were breached. The total amount of the repairs which would be essential was estimated at the time at over a lakh of rupees.
Flood in 1884

The worst floods the district has ever known were those of 1884. There were two of these one in November and another even more severe in December. In both occurrences, the Ponnaiyar River, Gadilam River and Vellar River were overflowed, and the Gingee River in the Tindivanam Taluk was also affected by the heavily.

From 4th November to 7th November, the rainfall at Cuddalore was no less than 32 inches, and 11.75 inches was registered on the 7th alone. The stopbank at Edaiyar River constructed to keep the Ponnaiyar from flowing down its old bed the Malattar in flood time was breached, and part of the fresh in the Ponnaiyar consequently swept down the Malattar into Gadilam (which was already charged with more water than it could carry), and two rivers overflowed. The railway lines were breached in two or three places between Cuddalore and Port Novo, and also the running of the trains was stopped all the three check dams on the Gadilam were damaged, and tanks and roads all over the eastern part of the district were washed away.

Cuddalore New Town was significantly suffered. The Gadilam overflowed to its right bank just above the railway bridge near the town and poured into Tirupathiripuliur by way of a strip of low lying ground. The place was flooded, and as the height of the embankment on which the railway then ran barred the water from escaping to the sea for some time many houses were destroyed, and some lives were lost. Four arches of the road bridge connecting Manjakuppam and Tirupathiripuliur over the Gadilam River near railway station collapsed, and the Maidan in Manjakuppam was underwater.

On the 17th December heavy rain again fell the amount received from then to the 20th was no less than 25.55 inches, and 15.40 inches were registered on the 19th alone. The remainder of the Edaiyar River stop bank collapsed, and the Ponnaiaayar rushed into the Gadilam with even greater impetus than before. From the afternoon of the 18th till the evening of the 19th, the combined waters of the rivers swept through Manjakuppam and Pudupalayam to the sea. The flood was five feet deep on the Maidan at Manjakuppam and lads were carried away by the force of the current just opposite the judges’ house. The then the Collector of South of Arcot District, Huntley Gordon also protected in a boat a man who was being brushed away near the time gun on the maidan. Tirupathiripuliur was flooded 3 ½ feet deeper than in November, and eleven lives were lost, and nine more of the arches of the Gadilam bridge leading to it were destroyed, and the
Ponnaiyar bridge gave way in the evening of the 18\textsuperscript{th} and during the night its arches were heard to breakdown one after the other with a booming as of heavy guns up until the morning and thirteen of them had disappeared.

Outside the headquarters, the damage was also considerable. The bridges over the two mouth of the GingeeRiver the Kilinjiyar River and the AriyankuppamStream were also destroyed and so was that across the Malattar River on the road from Panruti to Tirukkoyilur all the three check dams(anicuts) on the Gadilam once more suffered and the PelanduraiAnicut was again breached the Wallajah and thePerumal tanks under the Lower Anicut was one sheet of water. The railway was swept away in slashes of places to an aggregate length of same four miles the worst times of damage being the seven 150 foot spans of the bridge over the same river on the Pondicherry branch. The Ponnaiyar River and Gadilam River girder bridges stood, but the water was within 5 feet 10 inches of the rail level of the former and within 1 feet and 3 inches. Communication with madras was cut off for more than a month and with the south for an even more extended period.

The collector reported that 956 irrigation sources 177 imperial and 776 miner works were breached twenty bridges large and small wrecked or injured and according to the village officials figures, 13,595 habitations were destroyed and 13,724 cattle sheep and goats were drowned.

To minimize the damage liable to occur in Tirupathiripuliyur from a repetition of such a flood an embankment was made from the edge of mount capper near the TiruvanthipuramAnicut to keep the Gadilam within confines the height of the railway bank from the bridge over the Gadialm down to CuddaloreOld Town Railway Station was lowered to allow the water to discharge across it to the sea and additional channel was provided in this part of the line. The EdaiyarDam was also again rebuilt to keep the Ponnaiyarfrom spilling into the Gadilam. The four ruined bridges between new town and Pondicherry were eventually reconstructed at higher levels. These steps prevented the great flood at the end of 1903 referred to below from making as much mischief as it would otherwise have affected.

**Flood in 1898**

In October, November and December 1898 heavy showers of rain caused the Ponnaiyar and Gadilam rivers again to overflow. The line was breached near Serndanur, a hamlet of Malaiperumalagaram in the Cuddalore Taluk was
underwater for some days and could only be approached with difficulty the Manimuktanadi overflowed its banks at Vriddhachalam, and part of that town was inundated the Raja Vaikkal and Khan Sahip’s Canal in Chidambaram both breached 87 major and 232 minor irrigation works were more or less damaged, and considerable remissions had to be granted for land which had been damaged by the flood. The Velar River was almost as high as in 1884, but luckily there were no abnormal freshes in the Coleroon.

**Conclusion**

Among the natural hazards, the cyclone is one of the devastating phenomena that strike the Coromandel Coast. Tropical Cyclones are penetrating low-pressure systems which advance over warm sea. They are adept of causing immense damage due to strong winds, torrential rains and storm surge. The occurrence of the Tropical Cyclones in the Bay of Bengalis 4 to 5 times more than in the Arabian Sea. About 35% of initial disturbances in the north Indian Ocean reach Tropical Cyclone stage of which 45% become severe like cyclones and storm surges.

Historically all the tropical cyclones crossing the east coast had their landfall near the major deltas like Ganges, Mahanadi, Godavari, Krishna, Pennar, Palar, and Cauvery delta Worldwide attention has been focused on the need for better disaster mitigation programmes towards all the natural hazards. According to the dates Madras, Nagapattinam, Cuddalore, Tiruchirappalli were vulnerable to cyclone, most of the vortex of the cyclone crossed in these areas only. In Cuddalore District, the soil, slope and rainfall play decisive role in creating floods which profoundly affected the administration, urbanisation, society and the economy too.
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