

**The Status of Climate Change Vulnerability and Resilience in Jaffna Peninsula****Ranasinghe D.M.S.H.K.**

*Department of Forestry and Environmental Science, University of Sri Jayewardenepura, Nugegoda  
Sri Lanka  
hemanthi.ranasinghe@gmail.com*

**Abstract**

Sri Lanka's average annual temperature could rise by 1.0°C to 1.5°C by 2050 even if carbon emission reduction measures are taken as recommended by the Paris Agreement of 2015. Approximately 19 million people live in locations that could become moderate or severe hotspots by 2050 under the carbon-intensive scenario. Several provinces in the country including the Northern Province emerge as hotspots for climate change vulnerability. This paper analyses the resilient capacity of Jaffna Province to climate change challenges. Secondary information taken from government sources supplemented by observations of the researcher are used for this analysis. Jaffna is one of the 25 districts of Sri Lanka and located in the far north of the country in the Northern Province. It has an area of 1,025 square kilometers. The climate is considered to be tropical monsoonal with a seasonal rhythm of rainfall. The temperature ranges from 26° C to 33° C. Annual precipitation ranges from 696 mm to 1,125 mm. The north east monsoon rain (October to January) accounts for more than 90% of the annual rainfall. The peninsula is mostly surrounded by water, connected to the rest of the island by a small strip of land. Its underground water is used for drinking, agriculture and industry. Paddy cultivation is rain fed but only for three months during the North East monsoon period. The unique geomorphological set up in Jaffna peninsula area is characterised by the underlain Miocene limestone formations which are generally 100 to 150 m thick and distinctly bedded, well jointed and highly karstified, thus giving rise to the shallow aquifer of the peninsula which consists of the channels and cavities (karsts) of this Miocene Limestone. The total population of the district is around 600,000. Agriculture and fisheries have been the principal economic activities of the district. Over 60% of the work force in the district depends on agriculture for their livelihood. About 86,000 families are engaged in agriculture while 15,000 families engage in fishing. Agriculture in the district contributes substantially to the GNP of the country. The average land holding area is around 0.5 to 0.75 acres (3,000 m<sup>2</sup>). Unemployment in the rural areas is 27.9% while in the urban area it is 25.8%. From the meteorological records from 2008 to 2018, it is shown that the annual average rainfall shows a decline from 2015 onwards although a peak of 1800 mm was shown in 2015 causing severe floods in the entire Peninsula (2,247,225 cum). The average annual temperature also showed a peak in 2016 and then showed a declining trend thereafter. The minimum temperature also showed a similar pattern having a peak in 2016 and then a declining thereafter. According to the climate predictions in 2080, Jaffna Peninsula will have an average annual temperature increase between 4.10°C to 4.50°C under very severe climate change scenario. Similarly the change of rainfall will be 0.1% to 20.0% in 2080 (Punyawardene, 2013). The thin fresh water lens over the saline water makes the Peninsula very vulnerable by way of water quality as salt water intrusion can happen if not careful. Already there is a threat from over extraction of water from the tube wells with the influx of population after the war. The existing storm water drainage system in the Jaffna Municipal Council (JMC) is functioning sub optimally due to non maintenance and irrational behaviors of inhabitants who use the drains and ponds as dumping channels of solid waste and waste water. This reduces the ground water recharge which will reduce the fresh water further. In addition to this, due to the discharges of industrial, agricultural and domestic effluents, the water is polluted. The relatively high percentage of families with low incomes (below 5,000 per month), small and medium scale commercial entities show poor environmental consciousness. Poor law enforcement and institutional capacity of the institutions especially JMC makes matters worse thus causing the Peninsula very vulnerable to climate change related disasters.

**Keywords:** Jaffna Peninsula, Climate change, Vulnerability, Resilience, JMC