

A “Tenth province” or Coastal authority to deal with climate change. A must for a 21st century constitution of Sri Lanka.

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abstract: This study deals with climate change and its effect on the Island of Sri Lanka in terms of Sea Level rise, and how it should be dealt with, both constitutionally and via structural changes, dykes etc. The effect on the low-lying Northern Peninsula of Jaffna is considered, and the total destruction of its water supply within a decade is predicted to be a possibility.

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The constitution proposed for Sri Lanka [1] has provoked much debate [2], but mainly within the framework of traditional thinking with emphasis on the usual issues, i.e., “Unitary and Devolved power, the place of Buddhism, or the executive presidency. Whether devolution should be district-based or province-based has been debated for at least 50 years, with the same arguments being brought out. While the demand for devolution originally came from the Tamil Nationalist politicians, the majority ethnic group has not supported this, as has been the case all over the world. The ensuing violence between the government and the Tamil minority led to the entry of India into the fray. Rajeev Gandhi kept two Indian armed frigates in the Colombo harbour to impose its solution in terms of provincial devolution. But, given the first opportunity, even Prabhakaran rejected the Indian solution, fought the Indian army and assassinated Rajeev Gandhi to show his capacity for vengeance. India failed to keep its side of the agreement, making it null and void. But Sri Lanka is still in labour with the fetus of a 13A, her legs held apart by international agents and NGOs, while the mistrust between communities has long snuffed out the fetus [3].

The two communities are still licking their war wounds and angling to wound the other with international tribunals and sanctions. They invent new words like “Aekeeya Rajya”, and “Orumitta Nadu” but threaten each other under their breath, and over their breath, hurling accusations of genocide or of creating terrorism to break up the country. They fail to see that a major threat of global scale has completely changed the stakes.

Climate change and its dramatic effect on the maritime region.

Just after the defeat of the LTTE, in 2009 the author presented a talk to a gathering of officials at the Presidential secretariat, entitled “Four Challenges to Sri Lanka and their Technological solutions” [4]. One of the challenges was the looming danger of global warming and the rising sea level. This is a national tragedy requiring a concerted national effort. The North and a good part of the East are the most affected, and will indeed go under water even if preventive steps are launched right now.

But politicians and constitutional experts are oblivious to the harsh reality of global warming and the rising sea levels all over the world. Sri Lanka, being at the equator will face a larger increase in the sea level than off-equatorial latitudes [5,6]. Current constitutional debates ignore the most urgent issues that Sri Lanka will face in the next decade due to climate change as well as the on-going technological tsunami. I discussed how we may harness the digital revolution to our advantage in a previous article (Island, 25 September 2017) entitled “Unit of Devolution – look in cyberspace” by the present author. Given that the physical space occupied is becoming increasingly irrelevant to cultural and mediatic aspirations of peoples, and given the small size of the Island, it is pointed out that there is little need for devolution in an extremely well-connected island.

One may ask “what has climate change to do with the constitution”? Here we try to show that it has everything to do with the constitution in enabling us to deal with the inundation of large parts of the

country that will occur in the coming decades. The creation of an over-arching supreme authority that transcends districts, provinces, and even religious monuments since the choice is between saving the maritime region of Sri Lanka, or letting it become part of the sea.

The inter-governmental panel for climate change (IGPP) and other bodies studying climate change have published predictions of the expected rise in sea level due to global warming [5,6]. Figure 1 shows the predictions done in 2013. Today it is believed that the more dangerous prediction (i.e., higher sea levels, marked RCP8.5) is most likely to hold, as most nations have defaulted in cutting down on carbon and green-house gas emissions. The rise in sea level may be as high as 0.5 to 0.8 meters within the next 15 years. This occurs with the warming of the oceans and melting of the polar caps. This is accompanied by increased humidity in the air. According to a law in chemical physics, the increase in humidity follows an exponential law, i.e., it is proportional to $\exp\{-H/T\}$ where H is the heat of evaporation and T is the temperature. Hence even a few degrees of heating can have a dramatic effect. The excess water and heat powers up tornadoes and torrential rain where precipitation is not in rain drops, but sheets of down pour! The world has already seen this intensified catastrophic weather events of recent times. Sri Lanka too has seen unprecedented floods, earth slips and inundation.

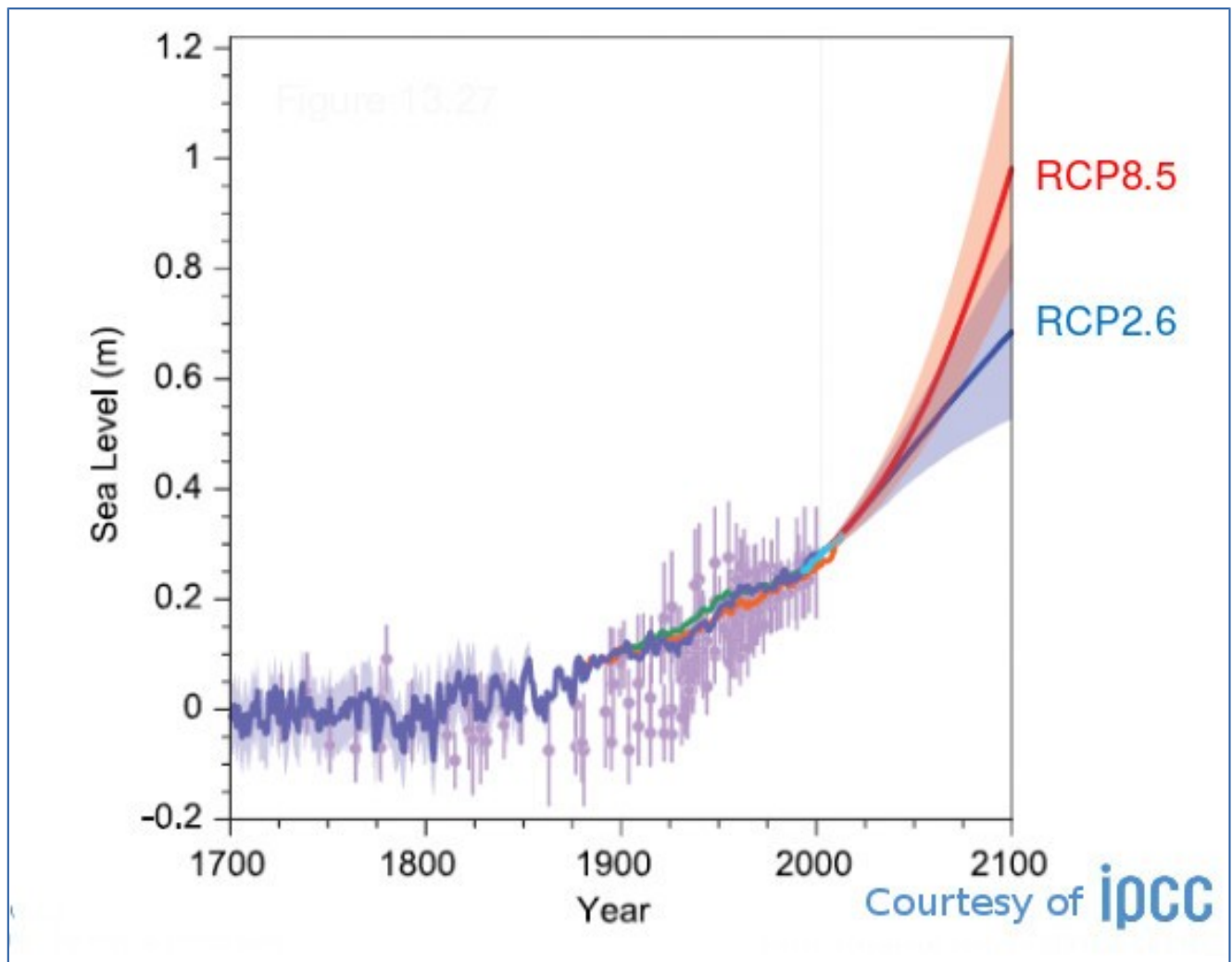


Fig.1 Rise in sea level with time [5].

The flooding pattern from recent storms are a guide to how much inundation can occur. Topographical maps show the extent of Sri Lanka's coastal low-lying areas that go under with a one meter sea rise. In fact, the Tsunami inundation gives an extreme measure of what could happen when the sea flows in. In figure 2, the left panel shows the region inundated in the January 2011 floods, while the right panel shows the areas affected by the 2004 Tsunami, adapted from an official emergency response map issued at the time. The region marked is not just what went under water, but the area needed for the emergency response. Waves varying from one to twelve meters in height hit the shores of Sri Lanka, with the bigger waves hitting the Eastern province and the Northern province.

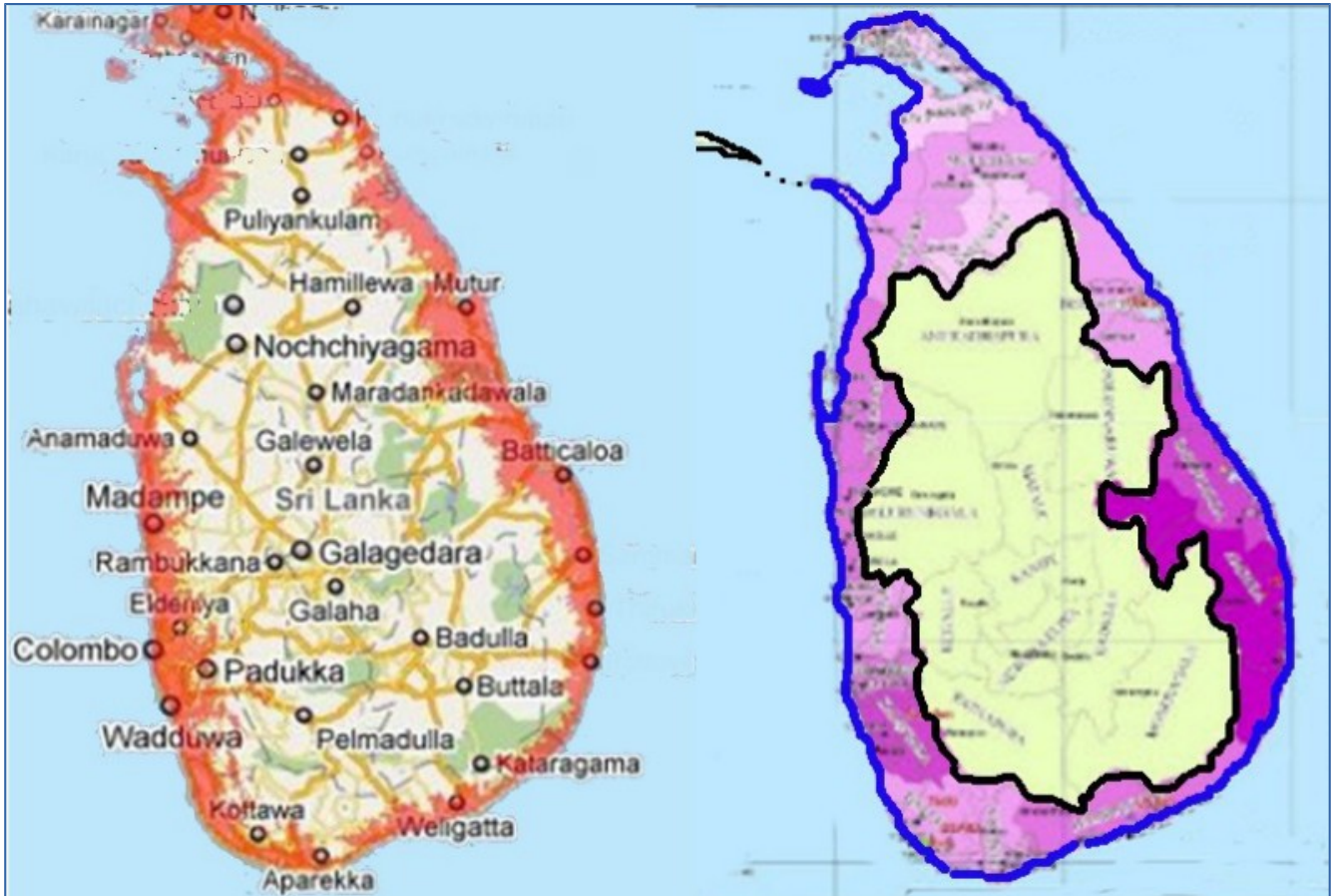


Fig. 2 (a)The map on the left [7] shows the inundation from the floods due to rain storm in Jan 2011. (b) The right panel [4] shows the extent of the area needed for Emergency Response to the 2004 December Tsunami to varying degrees.

It is not just the rise in mean sea level that matters. The dynamic level, driven by wind, waves and currents is what counts. If the sea rises by a meter, and if we can expect tsunami-like high waves due storm conditions aggravated by a heated ocean, we need a strong raised wall (bund or dyke) along the marine periphery of the Island to hold off the sea. A protective maritime region and its facilities have to be designed from the outset with a grand vision if we are to reap some benefits out of this unavoidable calamity. The protective dyke also holds a track for an electric “bullet train”, communication lines, security and heliports (for landing drones), pumps to send out flood waters and

power supplies integrated into it. Constant security is essential as a breach in the bund is unthinkable.

Some one will say, “is this pure futuristic dreaming”? Not at all. drone delivery may well be an only approach under extreme conditions of flooding. Defeating terrorism was claimed to be an impossible dream. The de-mining and infra-structure development just after 2009, inclusive of the completion of the Yal Devi train in 2014 seemed an impossible dream to some economists who pointed to the 2008 market collapse. They predicted that the 300,000 IDPs rescued from Nadikadal will still be there in Manik Farm, even after a decade! They were wrong.

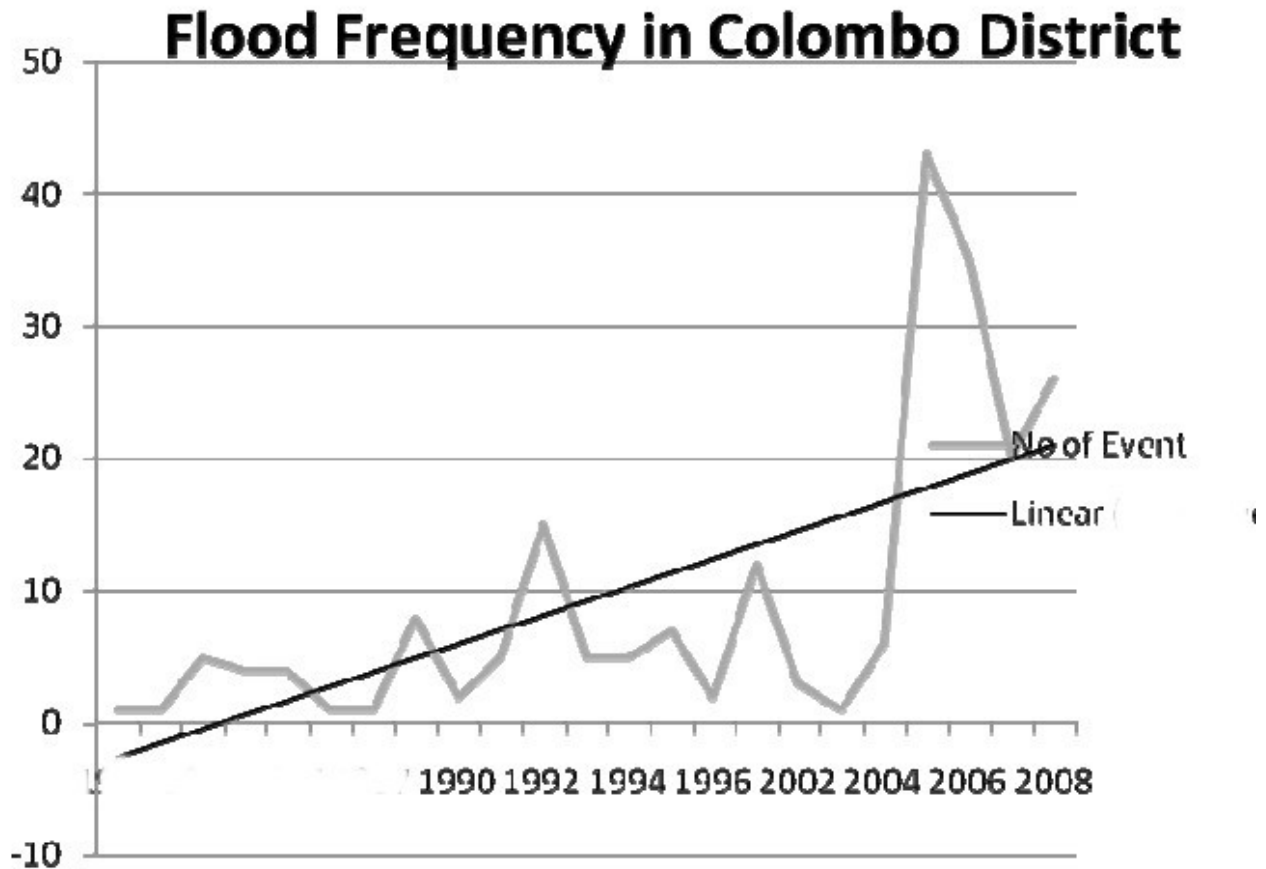


Fig.2 (c). This figure shows the increasing frequency of floods in the Colombo district. See: Ajith Silva, Climate Change and Sri Lanka (power-point presentation, National Council for sustainable development, Presidential Secretariat. Undated Document).

The region that is likely to go under water should be declared a “Tenth province”, but in effect an entity similar to the Mahweli Board, and held under the central government because of its encompassing nature, affecting the security of the whole island. The width of the maritime strip will vary as the need changes. The “10th Province is empowered to acquire any inland areas that it may needed. We have precedents for this, in the over-riding trans-provincial mandate vested in national projects like the Galoya project or the Mahaweli Project. The newly launched port city, the capital city and many other maritime cities and ports will automatically fall under the purview of the 10th province. If necessary,

we may avoid the name “10th Province” and call it the Maritime Protection Authority (MPA) to avoid misunderstandings. In effect, Sri Lanka already has advanced legislation for a coastal development authority in its 19812 Coast conservation Act, that came into being in its effort to protect the island from sea erosion, guarantees public access to beaches, and for ensuring that 300 meters inland from the high-water mark, and 2 kilometers seawards from the mean low-water mark are enshrined in the republic, thus ensuring spatial integration [8]. Here we must also take note of the proposals undertaken within a University of Rhodes Island study (1992), some of which were implemented in the revised Coastal Zone Management (CZM) Plan of 1997.

In their great rush to “devolve” power to the provinces, the important principle of spatial integration of the CZM may be sacrificed to satisfy regional pressure groups. However, the existing legislation does not take account of climate change. A new MPA need be legislated to deal with climate change, unstoppable rise of the sea level, tsunamis and floods, sea erosion, refugees, smuggling and naval operations, mineral rights in the sea etc. Evacuation of the residents in the coastal cities of Sri Lanka and re-settling them in higher ground will be one of the major tasks of the MPA. These are traditional powers of the central government and they can be delegated as needed. But where necessary, the constitution can be amendment. Furthermore, the “Tenth province” will effectively create a geographic “ceinture” ensuring the unitarity of the country at a level unmatched by any constitutional tinkering.

The first maps seen in Fig. 2 shows the flooding from heavy rain that we can expect in the future. The 10th province has to acquire *all of the Jaffna province* and initially about 20 km inland (compared to the 300 meters now divested with the CZM) in most provinces, even from the very outset, while this width may need further increase as the threat increases. The boundary of the 10th province will not “split” any intervening cities, but include them whole, with the need for security from the effects of global warming as the primary criterion to be satisfied.

Colombo residents know of frequent floods stretching from Colombo to Padukka, and how even the parliament in Kotte became accessible only by boat. The frequency of floods in the Colombo district, Fig. 3(c) is typical of the phenomen in all provinces. An additional cause of storms (besides heated oceans) hides in the Indonesian sea bed. The 2011 rains storms and simultaneous flooding in many parts of the world may have been triggered by the effect on the weather due to the tipping of the Indo-Australian Plate. According to the Zetas ThinkTank, tipping up to a predicted three-meter rise along the curve under Sumatra and Java or a drop on the western side may have happened. Indonesia has likewise started to slowly sink since December 2010.

Once a dyke or bund is built to prevent the water coming in, heavy rain cannot flow out into the sea. In fact, even without the bund, the recent flood waters remain blocked by human constructions. Hence the coastal regions marked in the maps as the protective 10th province (maritime strip) will become flood basins. Existing rivers will also overflow. Their banks need to be strengthened, widened and raised – a program cutting across provincial boundaries. In addition, large-capacity flood pumps to lift the water above the dyke and discharge to the sea are needed. The energy needed has to be generated by innovative harvesting of solar and wind forces that trigger the storms, and waves in the overheated ocean. The Dutch, with a third of the land below sea level used their windmills for pumping out the water. Today electric pumps coordinated by computers and sensors do the job. Holland has voted two billion euros (in 2016) for their new “flood freedom for rivers” project addressing global warming, while Sri Lanka has no programs in place.

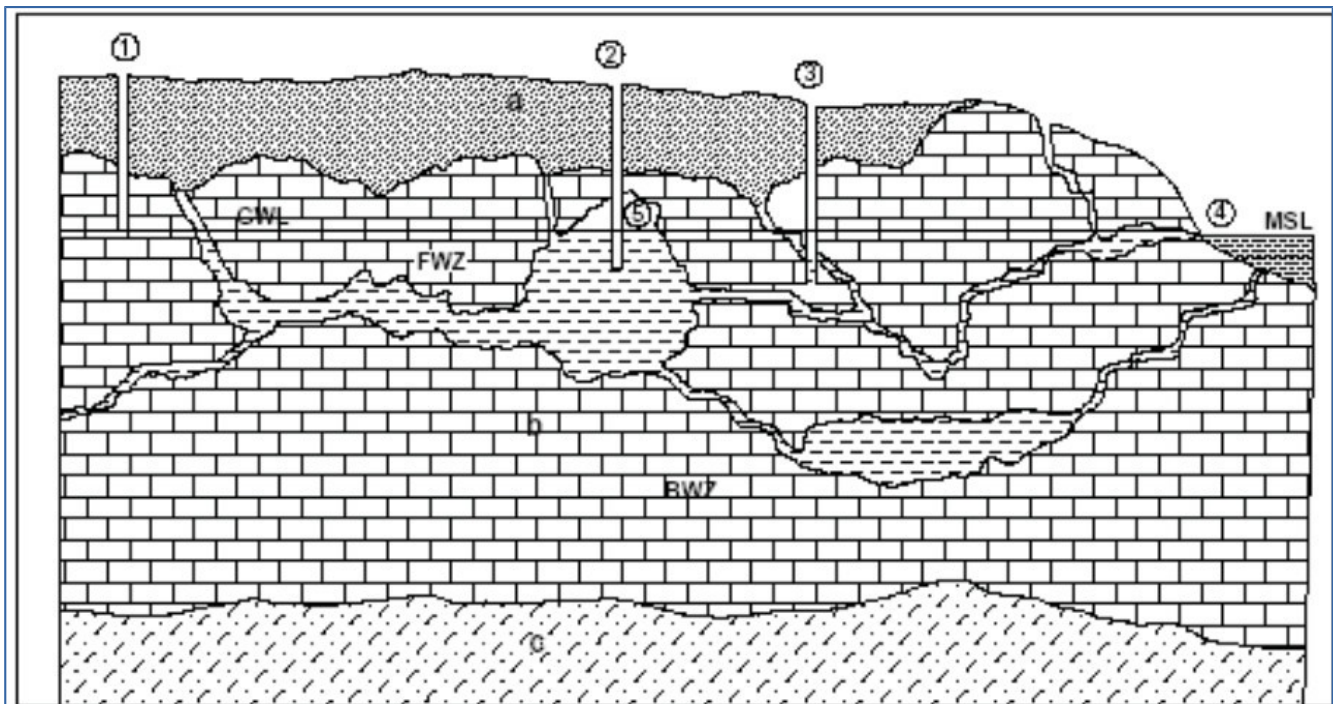
The fate of the Jaffna Peninsula.

The Jaffna peninsula is doomed for several reasons. It is a series of low-lying locations connected by

causeways built during the days of the D. S. Senanayake government and prior to it, often in the face of dire opposition from Northern MPs who feared “low-caste” villages becoming “uppity” if free access becomes available. The low elevation of peninsula makes it an easy victim of inundation, as testified by both maps (a) and (b) in Fig. 2.

Another serious problem arises from the unusual hydrology of the Peninsula. The fresh water of the Jaffnese depends on the existence (via the so-called Herzberg mechanism) of several “lenses” of fresh water supported by an underlying lens of brackish water (see Fig. 3 extracted from Sirimanne’s 1952 [9]). The maximum thickness of a freshwater lens is roughly the thickness of the soil above the mean sea level. Hence, the rising sea will drive out and destroy the fresh water lenses. That is, besides the permanent inundation of the Jaffna peninsula, **Jaffna will completely loose its water supply**. Before this happens, archeological and other irreplaceable objects, places of worship etc., should be raised and protected, while the population has to be evacuated to the south. The destruction of the fresh water limestone aquifers will happen long before the actual rising of the sea level, due to more frequent marine storms and waves generated by the heightened low-pressure conditions in the Bay of Bengal.

A dyke around the Peninsula will not protect the land or its water since the sea will percolate through the lime stone via the brackish-water lens. The only way to avoid total abandonment is to build an artificial elevated city dependent on rainwater and desalination for its drinking water.



Sirimanne 1952.

Fig 3 The hydrology of the Jaffna peninsula after Sirimanne, 1952. The salt water lens is marked “BWF”, while FWZ indicates Fresh Water Zones. The numbers (1)-(4) indicate four types of wells. Arumugam [9], or *Panabokke and Perera, Ground Water resources of Sri Lanka* (2005) [10].

The effect of global warming will have a similar serious effects on the coastal regions of Tamil Nadu. Jaffna can expect no help from TN, but there may even be refugees arriving from TN to Sri Lanka. Given that the Jaffna Peninsula will go under the sea, and also loose its drinking water, it will be

abandoned. But it is still important to have a raised dyke to access the area. The land (i.e., the peninsula) under salt water may be used for marine culture of lobsters, shrimps, crabs, cephalopods, bony fishes, sharks, batoid fishes etc. The low-lying Madakalapuwa (Batticaloa) area will also need evacuation. However, unlike in Jaffna, the Eastern coast need not lose its fresh water.

The Problem of IDPs

The rising sea level will displace everyone from the Jaffna peninsula and large parts of the remaining NP. The coastal Eastern province too will produce many IDPs. This is seen from the 2011 flood pattern as well as the 2004 map of Tsunami affected regions. As many of these IDPs will be Tamil speakers from the less fortunate strata, direct absorption into any region will be resisted by the host populations, even in preponderantly Tamil regions. Bambalapitiya, Wellawatte and such areas in the coastal belt of the 10th province will need evacuation, and the available free land will be severely limited as priority will be for coastal buffers of flood basins. Ironically, the IDP camps in Menik Farm, Dollar Farm, etc will have to be reopened and maintained indefinitely welcoming a constant stream of IDPs as the sea level rises. Judging from the Mahawamsa account, the “Manik Farm” region was known as “Mahathalithagama”, and even then housed refugees, e.g., in the 9th century, during the invasions of the Pandyan king “Sri Vallabha”[11]

The IDPs evacuated from the low-lying parts of the coastal cities in the south can be more easily accommodated in the central high ground. Thus we see that a major responsibility of MPA is the evacuation and re-settlement of displaced people.

The role of the remaining provinces.

Given the impact of global warming on a tiny island like Sri Lanka, she has no option but to take drastic steps. They may seem draconian today, but the more we wait, the more difficult it will be. At the beginning it will be surveyors and scientists marking out the topography and planning how to tackle the project, just as with the Mahaweli program. Once it is recognized that Jaffna is doomed, and that much of the Eastern coast will be a lake of brackish water, the leaders of the Jaffna peninsula well entrenched in Karuavkaddu (Cinnamon Gdns) will find little solace or logic in devolution of power to the beleaguered North or East. The south has never supported such devolution. Hence the provincial administrations can be disbanded and replaced with local bodies (as existed prior to 13A) to have a more efficient and inexpensive government.

In any case, all administrative entities will be subject to trans-provincial authorities like the Mahaweli Board, or the MPA, i.e., the proposed 10th Province along the coast. Here we digress to review a peculiar proposal to re-demarcate the provincial boundaries along the river boundaries. In our view, it is a very retrograde proposal because one side of the river, e.g., the left bank, will be placed under one administration, while the other side of the river (right bank) will be under another administration, splitting villages bound by close kinships and commerce. In reality, the communities on both sides of the river are unified by the river itself, use it as a conduit for transport, fishing, social and economic activity. They are linked by ecological concerns and should not be under different administrations, as proposed by Dr. Madduma Bandara. However, since the Provincial Councils (i.e., 13 A) model becomes irrelevant under the “permanent-emergency” conditions created by global warming, PCs can be disbanded.

The cost of the project.

Someone will say, what about the cost? At the start it is only a “bund” some 900 miles along the shore, and a region with a floating inner boundary set at least 20 km inland. The MPA may have to

spend as much as the state spent to fight the Eelam wars in fighting the sea. The economic cost of the war to the Sri Lankan government can be estimated to be between \$200-300 billion, having cost over 30% of the national budget during Eelam IV in direct costs. In this case it is a recurring expense that we have to maintain for decades to come. If the project is delayed the costs will mount fast, especially as other countries also face the same problems and lock up the available engineering talent and raw materials. Not doing so will devastate the whole country irrevocably and cause human suffering. The next round of floods may well engulf Meethotamulla and float the rotting garbage back to the Presidential secretariat alleged to be part of the “toxin-free nation”! A weak government cannot engage or galvanize the people to do it. It will be an immense challenge involving much pain and hardship. But doing it is a “do or die”, while the “do” will create jobs, stimulate economic activity and innovation. The modern Sri Lankans can be proud of an achievement paralleling the genius of their ancient hydraulic civilization. But if they fail, a large part of their land will become a brackish swamp, with 22 million people crowded into the middle area of the right-hand map of Figure 2, with little to eat, poor housing and subject to frequent bad weather, disease and untrammelled crime. We see it in Haiti, a land buffeted by hurricanes and other forces of nature.

The initially needed money can be raised by abandoning stupid projects destined to create more urban concrete, asphalt, and polluted spaces. The already technologically obsolete megalopolis project should be replaced by a modern eco-friendly re-planning of the whole country. A good part of the “meagalopolis”, being in the 10th province, will be marked out for buffer flood basins. The towns will have to evacuate to the country. Commuting to office is unnecessary as most work can be done from home online. Video-conferencing and social media usage from playing bridge to courting and flirting are now routine. All that can be personalized and less “robot-like” since holographic reality is almost at the market place. A developing country has an advantage as it can leap-frog over several stages of technology, just as Sri Lanka moved to cell-phones while skipping land-line phones. Commuting to work causes enormous traffic jams, pollution and stress. Costs of maintaining multi-lane highways, office buildings and services are staggering. They will not be viable with the battle against the sea. Cost of having office space in Colombo estimates to at least Rs. 20,000 per year per employee. It will cost more with global warming. Cost of bringing them to office is 70% of the cost of the imports of the petroleum corporation. Health costs due to stress, causing diabetes and hypertension, congestion and crime in cities etc., are incalculable. The petroleum and diesel fumes, particulate dust and other class-I toxins are more deadly than anything banned in Ven. Ratana's plan for a so-called “toxin-free nation”.

The planned coal-fired power stations, needed to keep the megalopolis running, and the mounds of garbage that it will generate add to this megalopolis-pollution that will asphyxiate the whole nation and its ecosystem. Every roof top should be mandated to carry solar panels, and the power will be sorely needed to run the pumps pushing the regularly occurring flood waters out to sea.

We are forced to abandon the megalopolis and re-structure work, commuting etc., to save money and build the 10th province that will girdle round the island and protect it from the sea. Of course this cannot be done overnight – it will take decades. But the moment it is written into the constitution or legislated as a Maritime protection authority, defining its scope and powers, it will have a start. All the traditional provinces will give up their maritime areas in forming the 10th province. We expect ready movement of people and cultural integration within it, linking closely with the Port city being built by the Chinese.

Of course, while we are barely thinking of all this, Singapore and even Maldives have already got planners working on such protective structures that will ring their lands and keep the sea away. Holland, the masters of dykes and below-sea level lands are spending big money. All this can be true

in Sri Lanka only if it can dare to have the vision and legislate for it.

The 10th Province will also ensure the unitary integrity of the land by its geographic encirclement of the whole country and administered by the central government. We can also take a cue from Singapore, which has ensured ethnic harmony by requiring that no local region will have a preponderantly mono-ethnic or mono-cultural character. The ocean will claim the “traditional homelands” claimed by Eelamists to be its own. The cry of a dissident Tamil writer speaking for the “depressed” citizens of the North will come true due to the forces of nature. Sebastian Rasalingam was a frequent voice about a decade ago. His essay on the need to “Sinhalize the North and Tamilize the South” (Sri Lanka Guardian, June 29, 2007 [12]), should be compulsory reading for the constitution makers of Sri Lanka. Ironically enough, the people of the North and the South will be forced to live in the high ground of the land, irrespective of their respective ethnic prejudices.

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