

DEVELOPMENT PRIORITIES OF SRI LANKA AND CLIMATE CHANGE IMPACTS

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INTRODUCTION

In Sri Lanka, there is a downward shift in agriculture GDP; 20% in 2000 to 13% in 2010. The predicted value for 2020 is 8%. In 2020, the share of industrial and services sector GDP is estimated as 32% and 60% respectively. According to agriculture sector development targets the expected annual food requirements by 2014 are 6 million mt (5.2 mt/ha) of paddy, 0.8 million mt of other field crops and 1.0 million MT of fruits. Similarly huge increase is expected from export crops by 2020; cocoa 511%, cinnamon 73%, pepper 201%, cloves 7%, cardamoms 925%, and nutmeg 330% as against 2005. The anticipated total export crops produce by 2015 is 68,700 MT. This is 135% more than the production in 2005 and 25% more than the production in 2011. Coconut and rubber productions by 2016 are expected to increase by 24% and 32% as compared to 2012. In the fisheries sector the annual marine fish production by 2014 is expected to reach 620,000 MT, which is a 60% increase compared to 2011 and similarly inland fish output is expected to reach 80,000 MT (34% increase). In livestock sector self-sufficiency in milk production (750 million liters / annum) is expected by 2020 and achieving 50% by 2015. Plans are well set to achieve all above tasks; the country to sustain progress towards a US\$100 billion economy and a US\$ 4,000 *per capita* income.

The biggest challenge the country has to face in sustaining the anticipated progress is climate change; global temperature rise. In Sri Lanka, the average temperature has increased at the rate of 0.16°C per decade since 1960. The rainfall trend

indicates a decline over the past 30-40 years, with a trend towards one day heavy rainfall events leading more droughts and floods. These have serious consequences on agriculture, water resources and infrastructure. Rains with intensity higher than 25 mm/hr can accelerate soil erosion ('erosive rains'). There is a high probability of landslides when daily rainfall exceeds 200 mm in landslide prone areas. Erosion leads to siltation of reservoirs; for instance *Polgolla* dam (44% silted by 1988) with a 2.8% annual rate of siltation, *Rantembe* (54% silted at present with an annual siltation rate of 4.3% and minor tank at 2.4%). These tanks cannot be operated at the designed capacity. Temperature increase causes rise of sea level leading to coastal erosion and salinization of river water. Already, 30 - 35 % of the coastline is eroded at the rate of 0.30-0.35 meters per year. Also salt water intrusions are experienced during dry period, for example in *Kelani* river. This too will increase with anticipated sea level rise.

Climate change impacts; increase in air temperature reduced rice yield by 5.9%, in 2010-12 around 470,000 ha of paddy fields destroyed due to flood, drought and floods in 2012 disrupted livelihood of 1.3 million families and washed away 160,000 cattle, damaged 15,000 houses, contaminated 45,000 drinking water wells. Government had to spend enormously on disaster relief and allocated Rs. 2263 million. Impact of climate change is so vast and unpredictable and is the biggest ever challenge in the history of mankind. It is more difficult than fighting against terrorism.

Adaptation; adjustments in ecological, social, or economic systems in response to actual or

expected climatic stimuli and their effects or impacts is the immediate response to climate change impacts. It refers to changes in processes, practices, and structures to moderate potential damages or to benefit from opportunities associated with climate change. Adaptation may reduce impacts and vulnerability to climate change. Vulnerability is the outcome of exposure, sensitivity and the adaptive capacity. Adaptation measures can be sectorial, cross sectorial, or multi sectorial. Based on the timing, goal and motive of their implementation it can be reactive or anticipatory, planned or autonomous. The approach of adaptation measures and strategies can be technological, behavioral, managerial and policy-oriented.

Sri Lanka's National Adaptation Strategy includes five strategic thrusts *viz.* Mainstream climate change adaptation into national planning and development, Enable climate resilient and healthy human settlements, Minimize climate change impacts and food security, Improve climate resilience in key economic drivers and Safeguard natural resources and biodiversity from climate change impacts. The sector vulnerability profiles are agriculture and fisheries, water, health, urban development, human settlement and economic infrastructure, and biodiversity and ecosystem services.

The food sector adaptation measures are sustainable land management, crop diversification and precision farming, ecological pest and disease control, rain water harvesting, solar-powered drip irrigation, development of appropriate breeds, development of appropriate varieties, responsive agricultural extension, and sustainable culture-based fisheries.

The health sector adaptation measures are transfer of knowledge and skills to health personnel, diagnostic facilities to detect water borne diseases, technology to detect, prevent and control water borne diseases, technology for early warning systems and net-working for information exchange on extreme events and other climate change related events, research to identify the magnitude of diseases and other aspects affecting human health due to climate change, drinking

water quality improvement through continued surveillance during and after extreme weather events, technology to improve urban health inputs to adapt to climate change and extreme weather events related adverse health impacts, technology to enhance adaptability of the people to overcome traumatic effects due to climate change related extreme events, and technology for management of health care waste.

The coastal sector adaptation measures are restoration of coral reefs, replanting of sea grasses and sand dune rehabilitation as soft defense mechanisms, beach nourishment, restoration of mangrove habitats, construction of dikes, floating mariculture for sea weeds, floating mariculture for fish, and construction of groins and sea walls (revetments).

The biodiversity sector adaptation measures are restoration of degraded areas inside and outside the protected area network to enhance resilience, modeling the impact of climate change on biodiversity to predict changes for conservation and management, increasing connectivity through corridors, landscape/matrix improvement and management, protecting refuges which are less vulnerable to climatic changes, managing and monitoring invasive alien species, reducing other stresses on species and ecosystems, adaptive management and monitoring programs of species and ecosystems, focusing on conservation of resources and carrying out special management for restricted range, highly threatened species and ecosystems, improving management of existing protected areas, increasing extent, creating buffer zones and new areas in vulnerable zones, reviewing and modifying existing laws, regulations, and policies relating to biodiversity and natural resources and incorporating climate change adaptation considerations (ensuring implementation) and *ex-situ* conservation for highly threatened species and possible reintroduction.

The water sector adaptation measures are rain water harvesting from roof tops for drinking and household uses, surface runoff rain water harvesting, household drinking water treatment and safe storage, boreholes / tube wells as a

drought intervention for domestic water supply, solar distillations, restoration of minor tank network and desalination of brackish water by reverse osmosis.

The most important message for the scientists is to support the national planning process by

developing accurate models to predict extreme climate events such as monsoon failures, droughts, floods *etc.*, well ahead for allocation of funds. Otherwise when disasters occur without warning the state has to transfer funds from votes allocated for important development works affecting the national development plan.