

Sri Lanka
State of the Economy Report 2011

Chapter 13
Natural Disasters, Climate Change and Inclusive
Growth

by
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13. Natural Disasters, Climate Change and Inclusive Growth

13.1 Introduction

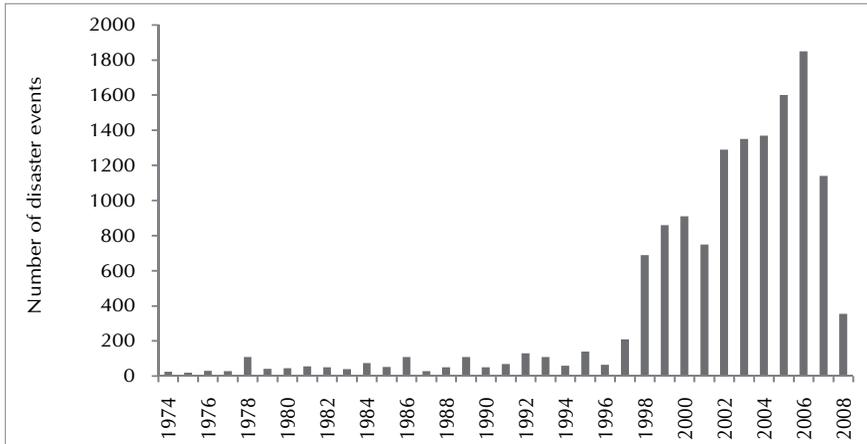
The increased intensity and frequency of natural disasters - and the attendant costs in terms of human, physical, financial and environmental losses - have a significant bearing on a country's growth prospects. The vulnerability to and impacts of natural disasters also differ across segments of society, thus posing added dimension with regard to issues of economic disparities.

Natural disasters affect inclusive growth by constraining the participation of vulnerable segments in the development process. They also lead to the diversion of resources, which otherwise could be allocated for pro-poor development activities. The impacts of natural disasters also tend to be unevenly distributed - physical vulnerability of different regions to various natural disasters varies across regions. In Sri Lanka, for instance, the Dry Zone is highly vulnerable to droughts and certain districts of the Wet Zone are at risk of recurrent floods. Moreover, disaster vulnerable areas host a large proportion of the poor population, who are dependent on weather-reliant livelihoods such as agriculture and fisheries.

As the frequency and intensity of natural disasters heighten, their impact in aggravating existing disparities may worsen. The most recent floods in late 2010/early 2011, impacting Sri Lanka's formerly conflict-affected provinces of the N&E, has slowed down ongoing post-conflict development activities and affected livelihoods recovery. In this context, this discussion looks at the impacts of natural disasters on inclusive growth, to review the present disaster management system in relation to this and, provide policy inputs for managing natural disasters to support inclusive growth in Sri Lanka.

In the midst of the challenges brought about by global climate change, Sri Lanka has to be better prepared to manage the differential socio-economic impacts of natural disasters

Figure 13.1
Chronological Trend of Disaster Events in Sri Lanka



Source: Disaster Profile in Sri Lanka, (www.desinventar.lk).

13.2 Profile of Natural Disasters in Sri Lanka

Although there are year-to-year fluctuations, the number of disaster incidents in Sri Lanka shows an increasing trend over the years. The sheer number of incidents, sudden disasters such as landslides, floods, extreme wind events, etc., indicates a significant increase over the past two decades (Figure 13.1).

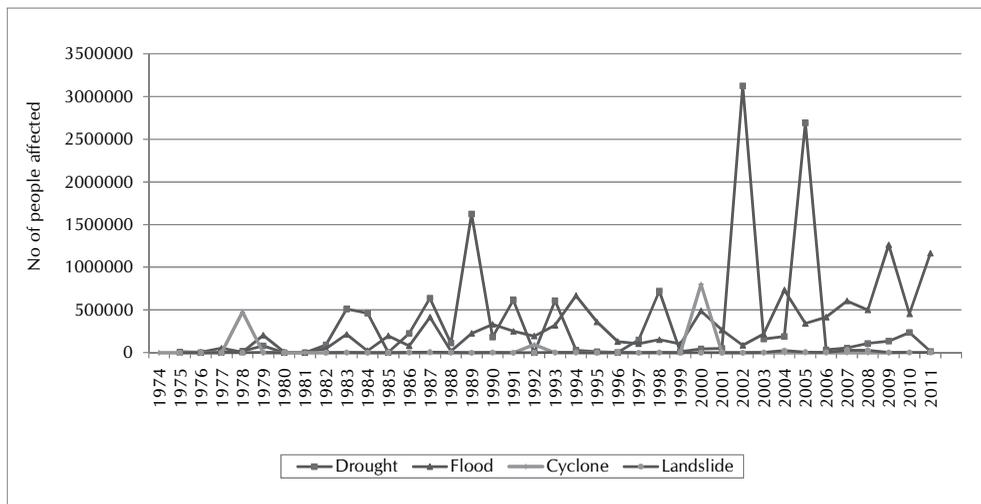
The geographic distribution of disaster events is not heterogeneous across the country. According to the 'Disaster Profile in Sri Lanka',¹ the distribution of natural disaster events for the period of 1974-2008 indicates that the highest number of natural disaster events has taken place in Anuradapura, Polonnaruwa, Matale and Kurunegala districts and certain DS divisions in the Southern part of the country. However, the number of disaster incidents alone does not reveal their true impacts. For instance, droughts are not significant in terms of the number of events, but in terms of the number of people affected, it becomes one of the most critical natural disasters in Sri Lanka.

The impacts of natural disasters can be demonstrated using the number of people affected, loss of properties, impacts on livelihoods, etc. As evident from Figure 13.2, based on data compiled in the Disaster Information Management System in Sri Lanka, the number of people affected has clearly risen over the last decade. The data also indicate that during the period 1974-2008, around 92 per cent of the people affected by natural disasters were prone to adverse effects of floods (48 per cent) or droughts (44 per cent). Flooding has been occurring almost on an annual basis. Therefore, in terms of the number of people affected, climatological disasters have been the most critical.

In terms of number of deaths, extreme winds and landslides are the key natural disasters in Sri Lanka. These are responsible for 77 per cent of total losses of life during the period of 1974-2008, with the exclusion of the tsunami disaster of 2004. In terms of destruction and damages to houses, strong winds, tsunami and floods have been the most important natural disasters. Over time,

¹ Available online at <http://www.desinventar.lk/>.

Figure 13.2
Number of People Affected due to Disasters



Source: Compiled using data from www.desinventar.lk.

Polonnaruwa district has experienced the highest level of destruction and damages to houses - the result of extreme winds and floods. Droughts, floods and extreme winds are the major causes of crop damages due to natural disasters, and accounted for 52, 39 and 4 per cent, respectively of agricultural crop losses. The geographic distribution of disaster-induced agricultural crop losses shows that Kurunegala and Ampara districts have experienced the highest crop losses during the period of 1974-2008.

13.3 Increased Disaster Vulnerability due to Global Climate Change

Foremost among a number of impacts of global climate change in Sri Lanka are increased frequency and intensity of natural disasters, changes in the rainfall pattern, sea level rise and changes in temperature. By and large, Sri Lanka is expected to experience more droughts and prolonged dry spells which can accelerate water scarcity in the

country's agricultural districts. Floods are also expected to be more frequent along with changes in climate and rainfall patterns. Therefore, climate change can be expected to intensify the impacts caused by natural disasters on agriculture and other livelihood activities.

Climate change induced impacts are often coupled with other socio-economic dynamics. It is estimated that by 2025, with the projected increase in population, the demand for both irrigation and domestic and industrial water is expected to rise, and the country as a whole, and the Dry Zone in particular, will reach a status of medium water scarcity by 2025.² Although there are uncertainties and information gaps in relation to likely real impacts of climate change, it can be presumed that climate change will make the problem of water scarcity worse in the coming decades.

² Amarasinghe, U.A., L. Mutuwatta, and R. Sakthivadivel, 1999, "Water Scarcity Variations within a Country: A Case study of Sri Lanka", Research Report 32, Colombo: International Water Management Institute.

With the sea level rise, the coastal regions of the country are expected to experience increased frequency and intensity of flooding and storms, increasing the pressure on coastal ecosystems and habitats.³ Due to high population density in Sri Lanka's coastal area, inundation will directly affect low lying coastal settlements and coastal wetlands. The impacts will create a number of social and economic implications on the coastal sector.

13.4 Impacts of Natural Disasters on Inclusive Growth

Although the actual cost of natural disasters is difficult to measure in monetary terms at macro level, sector-wise evidence suggests that the costs are substantial. The cost of natural disasters is dependent on a number of factors including intensity of the disaster, extent of localization, etc.

13.4.1 Direct Economic Costs

The major impacts of natural disasters and climate change come in the form of loss of lives, injuries, destruction of houses/buildings, damages to infrastructure, loss of agricultural and other livelihood activities and disturbances of day-to-day activities. The agriculture sector is particularly vulnerable as climate variables have direct and significant impacts on agricultural productivity. On one hand, it holds implications for food production and food security, and on the other, implications for the country's export earnings via impacts on plantation agriculture. The performance of the latter, which includes primarily tea, coconut and rubber, shows significant variations with extreme droughts observed in particular areas. Annual

tea production has been highly susceptible to droughts over the years,⁴ indicating drastic declines in 1982, 1989, 1992 and 2003 in line with drought shocks in those years.

In addition, the government has to spend large sums of money in managing natural disasters, in terms of mitigation, preparedness, response and recovery. Centrally compiled statistics are not available at present to denote cost of disaster management in Sri Lanka. However, available information shows that about 0.04 per cent of government expenditure is incurred annually towards relief for disaster victims (Table 13.1). Over the last decade, the highest cost of relief has been incurred on floods and droughts.

The economic costs of natural disasters are likely to rise with the impacts of global climate change. Sri Lanka, as a small economy having an insignificant contribution to global CO₂ emissions, will have to focus on adaptation strategies in facing up to impacts of climate change. It is estimated that around Rs. 47.7 billion of additional financing will be required for the period of 2011-16 to implement the climate change adaptation strategies. The estimated additional financing is expected to be used for mainstreaming climate change adaptation into national planning and development, enabling climate resilient and healthy human settlements, minimizing climate change impacts on food security, improving climate resilience of key economic drivers, and safeguarding natural resources and biodiversity from climate change impacts.

³ Hettiarachchi, S.S.L and S.P. Samarawickrama, 2009, "A Strategic Approach towards Planning and Management of Impacts of Sea Level Rise in Sri Lanka", a paper presented at the workshop on "Mainstreaming Climate Change for Sustainable Development in Sri Lanka", organized by the IPS, 19-21 August 2009, Sri Lanka. Available at http://www.ips.lk/events/workshops/19_8_09_climate_change/more_detail.html.

⁴ Wickramasinghe, K., A. Senaratne, 2009, "Climate Impacts on Performance of Agricultural Exports of Sri Lanka: Analysis Based on the Tea Sector", a paper presented at the "Third Annual Research Forum of the Sri Lanka Agricultural Economics Association (SAEA)", 2 October, 2009, Colombo.

Table 13.1
Cost of Relief for Selected Disasters (Rs. mn.)

	Animal Attack	Drought	Flood	Landslide	Rains	Total	Relief Expenditure as % of Government Expenditure
2001	3	245	9	-	0	257	0.089
2002	3	121	10	3	1	138	0.042
2003	5	48	941	152	0	1,147	0.347
2004	7	221	6	1	0	235	0.062
2005	3	14	56	1	1	75	0.017
2006	3	25	53	10	7	97	0.018
2007	1	51	30	3	4	90	0.015
2008	1	1	70	3	4	80	0.011
2009	1	18	5	1	3	27	0.003
2010	-	0	11	-	-	12	0.001
Total	31	753	1,228	174	19	2,206	0.040

Source: Compiled using data from data www.desinventar.lk.

13.4.2 Distributional Impacts of Natural Disasters and Climate Change

Natural disasters and climate change can cause distributional impacts owing to two key reasons. First, due to the fact that physical vulnerability to natural disasters and climate change vary across regions, the occurrences and the impacts of natural disasters are heterogeneously distributed within the country. Second, natural disasters can lead to worsening regional disparities due to the differences in the ability to manage disaster risks effectively among different endowment classes.

The Dry Zone, coastal areas and certain parts of the Wet Zone are experiencing most of the natural disasters in Sri Lanka. Most of the Dry Zone districts are based on agriculture for livelihoods, whereby droughts and floods have significant adverse effects on

output. Agricultural households constitute around 45 per cent of total poor households in Sri Lanka, with the poverty headcount index at 21.6 per cent - significantly higher than the national figure of 15.2 per cent in 2006/07.⁵ Water scarcity in Dry Zone agriculture can further exacerbate existing inequities in poverty outcomes. Moreover, adverse impacts on sectors where many tea/rubber plantations exist - with the highest incidence of poverty in comparison to urban and rural sectors of the country - may also see a worsening of equity gaps.

Climate-induced water scarcity has implications on energy security of the country as well. During 2000-08, for instance, hydroelectricity is estimated to have contributed 43 per cent on average to national electricity supply.⁶ Lack of adequate water in the country's major reservoirs thus leads to a

⁵ Department of Census and Statistics, *Poverty in Sri Lanka*, available online: www.statistics.gov.lk.

⁶ Department of Census and Statistics, *Statistical Abstract 2008*, available online: www.statistics.gov.lk.

reduction in hydro power generation. If appropriate mitigation and adaptive strategies are not implemented, natural disasters and climate change can have considerable implications on poverty and inequality.

Natural disasters can also have broader consequences on development processes. For instance, floods in certain districts in the N&E in late 2010/early 2011, hampered ongoing post-conflict development activities, including delays and damage to reconstruction of infrastructure, resettlement, etc. Revival of livelihoods of conflict-affected communities also suffered a set-back due to destruction of agriculture and other livelihoods. Such impacts tend to worsen existing conditions. Poor infrastructure and less developed institutional mechanisms in some of the flood-affected regions in the N&E made them inaccessible for relief services.⁷

Recurrent floods also hold implications for urban poverty. It has been found that most of the shanty and slum settlements within the Colombo Municipal Council are located in the flood-prone areas. If natural calamities continue to occur at higher frequencies, they will undeniably worsen prevailing socio-economic disparities.

Given that the impacts of natural disasters depend on a host of varying factors - segments of the society, income groups, livelihood categories, geographical regions, etc. - and that the impacts are becoming more significant for vulnerable groups with the increased intensity and frequency of disasters, adopting an inclusive strategy for managing disasters is critical.

13.5 Disaster Management System in Sri Lanka

Given the varying types of natural disasters, there cannot be a uniform approach to manage disasters, but rather strategies have to be location and cause-specific.⁸ Disaster management processes usually comprise four basic elements: namely, disaster mitigation, preparedness, response, and recovery. In terms of facing the impacts of global climate change, Sri Lanka will have to take adaptive measures, which might fall into all four elements of disaster management. However, in broad terms, disaster management and climate adaptation strategies fall into the two categories of (i) physical measures, and (ii) socio-economic measures.

13.5.1 Measures to Reduce Physical Vulnerability

Disasters are not entirely natural phenomena. Natural disasters are also caused due to anthropogenic factors. Unplanned deforestation and unsustainable land utilization practices lead to landslides, where climate related factors aggravate the occurrences and intensities. Therefore, as a preventive measure, it is important to adopt sustainable strategies for the utilization of natural resources. However, all natural calamities are not always preventable. Mitigation actions can help to lessen the impacts of certain natural disasters, including droughts and floods. Commendably, a number of disaster mitigation projects are ongoing aimed at droughts and floods. They are mainly concerned with rehabilitation of tanks, canals, construction of culverts, etc. In 2011, 39 such projects are expected to be conducted in vulnerable districts across Sri Lanka. Sustainable natural resource utilization and disaster mitigation

⁷ Based on field discussions in N&E regions in early 2011.

⁸ Steele, P., M. Knight-John, A. Rajapakse, K. Senanayake, and K. Wickramasinghe, 2007, "Disaster Management Policy and Practice: Sharing Lessons among Government, Civil Society and Private Sector", IPS, mimeo.

measures should be incorporated into sectoral development activities to make them viable in the long run.

13.5.2 Measures to Reduce Socio-economic Vulnerability

Social protection also has an important complementary role in disaster management. There is ample evidence of instances where social protection has been used as an important component in overall disaster management,⁹ although the results have tended to be mixed. The presence of effective social safety nets is vital to minimize impacts of natural disasters on the poor. In the absence of effective coping mechanisms, vulnerable groups tend to adopt sub-optimal or inefficient coping strategies. At present, existing social protection mechanisms in Sri Lanka do not play an effective role in disaster risk management.¹⁰ They are found to be highly biased towards relief, while schemes such as agricultural insurance cover only small proportions of the cultivated area of the country. Agriculture insurance is primarily used by farmers as a prerequisite for obtaining agricultural loans and insurance is not taken as a direct risk management strategy in most of the cases. It is timely to revisit socio-

economic security systems in Sri Lanka and enhance their ability to cover against negative impacts of climate change.

13.6 Implications for Policy

There is a need to mainstream disaster management into national development strategies, as it cuts across a number of sectors including agriculture, infrastructure, poverty, etc. Given the wide spectrum of issues in relation to disaster management and climate change adaptation, a number of measures have to be taken to mitigate the disaster impacts on inclusive growth in Sri Lanka. The measures should address the differential impacts of natural disasters, and aim to minimize the consequent implications on poverty and equality. First, reduction of physical vulnerability should receive high attention in order to lessen the impacts. In line with the physical measures, the socio-economic system in terms of coping and adaptation strategies has to be strengthened to enable vulnerable groups to better manage risks. It is only with the adoption of both types of measures that efforts to reduce impacts of natural disasters and climate change will successfully support inclusive growth strategies.

⁹ Vakis, R., 2006, "Complementing Natural Disasters Management: The Role of Social Protection", Social Protection Discussion Paper No. 0543, The World Bank.

¹⁰ Wickramasinghe, K., 2008, "Natural Disasters and Socio-economic Security in Sri Lanka", a paper presented at the International Conference on "Universalizing Socio-economic Security in South Asia", New Delhi, India, 18-21 January, 2008.