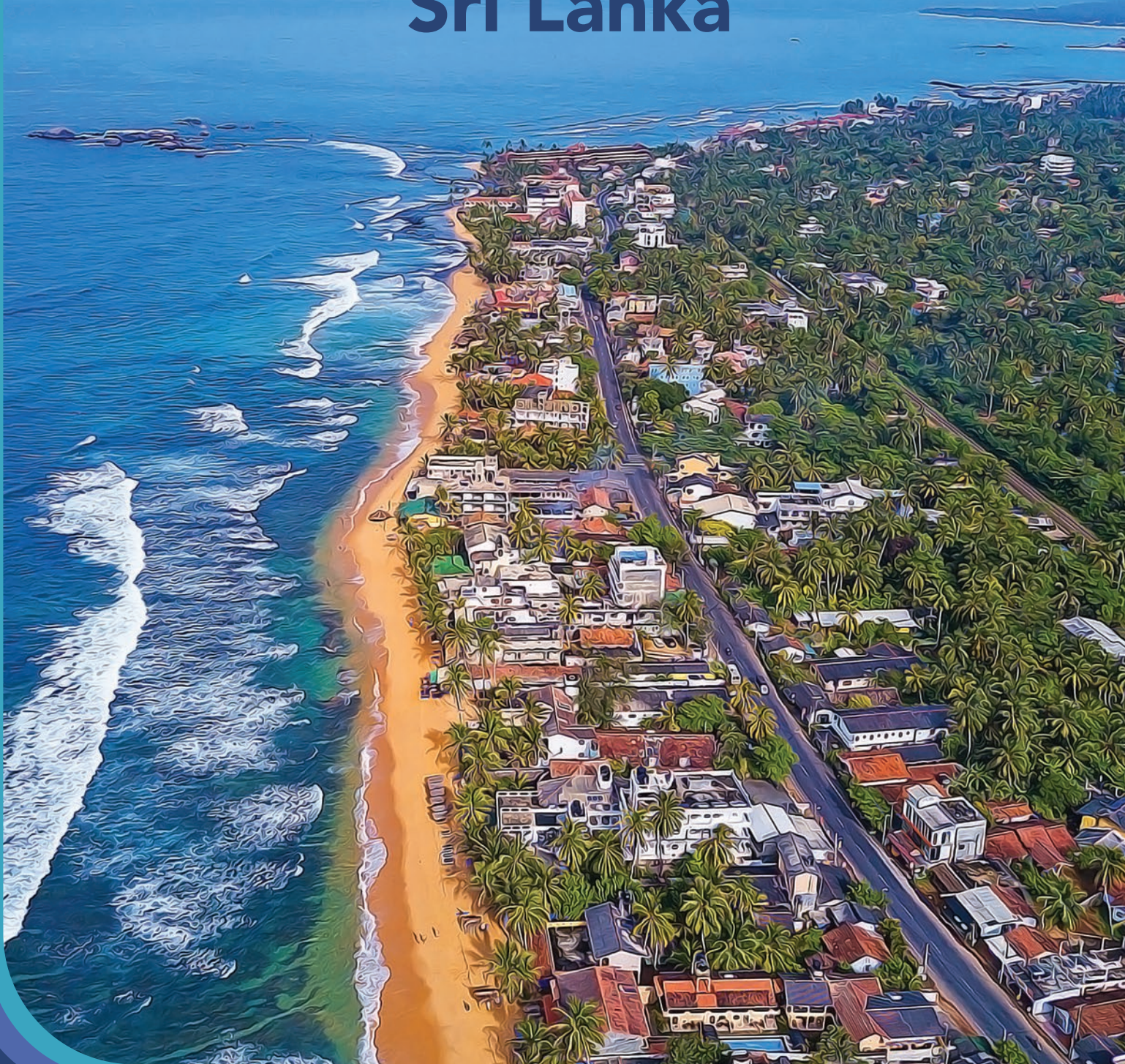


Contingent Liabilities from Natural Disasters: Sri Lanka



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Photo: Jacques Descloitres, MODIS Land Rapid Response Team, NASA/GSFC

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Contents

Acknowledgments	3
Abbreviations	8
Executive summary	9
1. Introduction	11
2. Background	13
Natural hazards	13
Exposure and vulnerability	14
Impact of recent disasters	15
3. Post-disaster governance	17
4. Contingent liabilities	19
Direct estimation of contingent liabilities	19
<i>Composition of disaster-related contingent liabilities</i>	22
1. Relief payments and supplies	24
2. Resettlement of affected communities	24
3. Relief and recovery efforts by the Sri Lanka armed forces	25
4. Support to stimulate economic recovery	25
5. Rehabilitation and reconstruction of damaged public infrastructure and assets	26
6. Risk transfers or premiums from Ministry of Finance to NNDIS	27
7. Transfers to Ceylon Electricity Board	28
<i>Refinements of direct estimation</i>	28
5. Options to manage or transfer contingent liabilities	32
Preventive measures	33
Option 1: Continue to invest in disaster risk reduction	33
Option 2: Improve coordination across ministries in the provision of relief	34

Financial measures	34
<i>Option 3: Enhance risk management capacity within the Ministry of Finance</i>	34
<i>Option 4: Maintain dedicated budget lines and use budget reallocations for low-frequency events</i>	34
<i>Option 5: Transfer risk through insurance of key public assets, NNDIS, and sector-specific insurance</i>	35
References and materials analyzed	36
Annexes	39
Annex 1: Methodology	40
Annex 2: List of people interviewed	41
Annex 3: Population vulnerability by location and hazard	42
Annex 4: Roles and responsibilities of government entities after a disaster	43
Annex 5: National Policy on Disaster Management, 2014	44
Section 21	44
Section 25	44
Section 26	44
Section 28	44
Annex 6: Ministry of Finance guidance on post-disaster expenditures	45
Annex 7: Post-disaster expenditure head and object codes	46
Annex 8: Government post-disaster expenditure	48

Annex 9: Government expenditure and natural events, 2012–2016	53
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Annex 10: Probabilistic loss estimate calculations: Methodology and assumptions	56
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Methodology.....	56
Key assumptions.....	56

LIST OF BOXES

Box 2.1: May 2018 flooding.....	14
Box 2.2: Drought-related fiscal risk.....	16
Government expenditures following disasters can include payments for the following costs:	40

LIST OF FIGURES

Figure 1: Total number of people affected by disasters, 2012–2016.....	13
Figure 2: Exposure to natural hazards.....	14
Figure 3: Total government expenditure, 2012–16.....	20
Figure 4: Government expenditure and number of natural events by month, 2016.....	21
Figure 5: Relief expenditure through NDRSC, 2007–2018.....	24
Figure 6: Ministry of Irrigation and Water Management expenditure for flood damage.....	27
Figure 7: Total economic losses as percentage of GDP at various return periods.....	29
Figure 8: Risk-layering approach.....	33

LIST OF TABLES

Table 1: Average annual loss by hazard.....	15
Table 2: Policies and guidelines supporting the Disaster Management Act.....	18
Table 3: Government contingent liability, 2012–2018 (calculated by direct estimation).....	21
Table 4: Development partners' financial assistance, 2016–2018.....	22
Table 5: Breakdown of post-disaster expenditure, 2017.....	23
Table 6: Disaster-related expenditure by Sri Lanka armed forces, May 2016.....	25
Table 7: Assistance provided to drought-affected farmers, 2013–2017.....	26
Table 8: Post-disaster expenditure by program name vs. object codes.....	28
Table 9: Total damages and number of affected people (2016–2017).....	29
Table 10: Indicative annual losses from flood, landslide, drought, and cyclone as share of GDP.....	30
Table 11: Indicative annual losses from flood, landslide, drought, and cyclone as share of GoSL budget.....	30
Table 12: Probabilistic explicit public contingent liabilities.....	31
Relief guidelines for disaster victims in an emergency.....	45

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Photo: Sreemangal / Shutterstock

Abbreviations

CEB	Ceylon Electricity Board
GDP	gross domestic product
GoSL	Government of Sri Lanka
LKR	Sri Lanka rupees
NBRO	National Building Research Organisation
NDRSC	National Disaster Relief Services Centre
NITF	National Investment Trust Fund
NNDIS	National Natural Disaster Insurance Scheme
PDNA	post-disaster needs assessment
PPP	public-private partnership
SLIC	Sri Lanka Insurance Corporation

Executive summary

This report identifies and estimates the contingent liabilities from natural disasters in Sri Lanka and presents options to manage them. Expenditures made in response to disasters are referred to as disaster-related contingent liabilities (OECD 2012). These expenses arise only if a contingent event, such as a disaster, happens. Two techniques are used in this report to estimate the value of contingent liabilities from natural disasters: direct estimation using historical expenditure data, and probabilistic modeling.

Using direct estimation, the disaster-related liabilities belonging to the Government of Sri Lanka (GoSL) are assessed, on average, at LKR 11 billion a year (US\$70 million). Analysis of historical expenditure data indicates that GoSL spent LKR 68 billion (US\$425 million) in 2012–2017 in response to natural disasters. In 2017, GoSL's contingent liability was LKR 23.8 billion (US\$149 million), or approximately 1 percent of total government expenditure. The reconstruction and rehabilitation of infrastructure and public assets are a major source of contingent liabilities for the government. Other areas of liability (of smaller magnitude) are relief payments, resettlement of affected communities, premiums for disaster-linked insurance schemes, and transfers to state-owned agencies.

Using probabilistic modeling, the annual average explicit contingent liability attributable to the GoSL from natural disasters is estimated at LKR 20.5 billion, or 21 percent of total associated loss. The average of 21 percent was derived from the average loss identified in the post-disaster needs assessments for 2016 and 2017, where the actual loss incurred by the public sector was 9.8 percent and 31.7 percent, respectively.

GoSL is currently managing its post-disaster liabilities through reallocations between budgeted lines of expenditure, dedicated budget lines, supplementary budgets, and use of the Miscellaneous Fund held by the Ministry of Finance. Budgeted lines of public spending are often reduced to release resources for unbudgeted post-disaster categories that need to be increased. In some instances, international assistance is also being used to fund or manage post-disaster liabilities.

Over the short to medium term, there are several options that GoSL could consider to manage its disaster-related liabilities. The options have been split into two categories: preventive measures, or those that can physically reduce the impact of disasters; and financial measures, or those that can help manage the cost from expected and unexpected contingent liabilities.

In the short term, GoSL should consider developing and implementing a national disaster risk financing strategy, which would help in the coordination and prioritization of options presented below:

Preventive measures

1. Continue to invest in disaster risk reduction

Building on work outlined in the Sri Lanka Comprehensive Disaster Management Plan, 2014-2018, the GoSL could do more to reduce the impact of disasters, and hence post-disaster expenditure. Key initiatives could include ensuring that the capital projects being funded have integrated disaster-mitigating measures in their design and are in secure locations. This is particularly important for state-owned enterprises that play an important role in infrastructure and core public services. The GoSL could also invest in climate-proof Public Investment Management processes, could investigate and implement measures to stimulate the domestic insurance market, and could provide tax incentives to encourage the uptake of disaster mitigation measures.

2. Improve coordination across ministries in the provision of relief

The amount of relief expenditure paid by the Ministry of Disaster Management has increased substantially in the past two years. In 2017, relief payments were also made by the Ministry of Women and Children. One way that GoSL could manage contingent liabilities is to ensure that there are clear relief guidelines in place across multiple ministries, that guidelines are strongly adhered to, and that there is good coordination across government. Moreover, given the recurring nature of weather-related events, and the fact that the poor and vulnerable are disproportionately affected by disasters, it may be prudent for Sri Lanka to investigate the feasibility of consolidating, scaling up, and amending existing social protection schemes. This step could reduce the administrative costs that arise when multiple agencies provide support to communities.

Financial measures

3. Enhance risk management capacity within the Ministry of Finance

With limited analysis of contingent liabilities and their potential quantity and impact, the GoSL is limited in its ability to devise an appropriate strategy to manage unexpected costs. An enhanced ability to analyze contingent liabilities would not reduce them, but it would help the Ministry of Finance devise the best strategy for managing the fiscal impact of disasters, direct or contingent. It is therefore recommended that the Ministry of Finance increase its capacity to identify, quantify, and use data on contingent liabilities. This effort could include taking a gender and poverty perspective in its work, possibly by establishing a fiscal risk unit or by ensuring that disaster risks are explicitly included in the mandate of existing teams that may be looking at fiscal risk issues.

4. Maintain dedicated budget lines and use budget reallocations for low-frequency events

The GoSL uses dedicated budget lines, financed through annual appropriations, to fund some contingent liabilities (e.g., item 1702—Flood and Drought Relief under the National Budget Department). This approach enables the GoSL to respond immediately to disaster without having to cut other spending programs or seek additional legislative authority. Given the high opportunity cost of maintaining a liquid reserve, these budget lines are useful for high-probability events. In addition to maintaining dedicated budget lines, the Ministry of Finance could also choose to earmark a certain percentage of the “other miscellaneous items” and/or “other contingency payments” budget lines toward post-disaster expenditure.

5. Transfer risk through insurance of key public assets, NNDIS (National Natural Disaster Insurance Scheme), and sector-specific insurance

To manage disaster-related liabilities, GoSL could transfer risk through insuring key public assets and strengthening existing insurance mechanisms—in particular NNDIS and sector-specific insurance such as agriculture insurance. The rehabilitation of infrastructure after a disaster is estimated to account for over 50 percent of total post-disaster expenditure. Standardizing insurance cover across key public assets would generate economies of scale, thereby potentially lowering premiums. At present, the state-owned Sri Lanka Insurance Corporation (SLIC) is the dedicated insurer for all state assets and insures public infrastructure construction such as roads and bridges, as well as some major hotels. Reviewing the current coverage and alternative private catastrophe risk insurance programs for public assets should be considered. Strengthening the National Natural Disaster Insurance Scheme, and the viability and cover of sector-specific insurance, would also help manage the liability arising from disasters.

1. Introduction

The objective of this report is to identify and quantify the liabilities that may arise when natural disasters occur in Sri Lanka, and to present options to manage them. Expenditures made in response to disasters are referred to as disaster-related contingent liabilities (OECD 2012). These expenses arise only if a contingent event, such as a disaster, happens. The quantity of contingent liabilities is determined by the frequency and severity of natural hazards, the exposure and vulnerability of people and assets, and the response of the government to events.

On average, Sri Lanka experiences LKR 50 billion (US\$313 million) in annual disaster losses related to housing, infrastructure, agriculture, and relief. Most of this figure—LKR 32 billion (US\$200 million)—is accounted for by losses from floods. Cyclones or high winds account for LKR 11 billion (US\$68 million), with droughts and landslides accounting for LKR 5.2 billion (US\$32 million) and LKR 1.8 billion (US\$11 million) respectively. This is equivalent to 0.4 percent of gross domestic product (GDP) or 2.1 percent of government expenditure. These losses place a large financial burden on the Government of Sri Lanka (GoSL). With a better understanding of the financial burden disasters pose for the GoSL, the Ministry of Finance will be further empowered to develop and implement suitable mitigation and management strategies.

Identifying and quantifying liabilities that may arise when natural disasters occur is important for Sri Lanka, which is subject to acute climate and financial vulnerability. Sri Lanka was ranked second among countries most affected by extreme weather events in the last 20 years by the Global Climate Risk Index 2019 (Eckstein, Hutflis, and Wings 2019). Moreover, Sri Lanka is also financially vulnerable with a high level of public debt (77 percent of GDP), substantial debt repayments in recent years, and large amounts of contingent liabilities held in state-owned enterprises (estimated to be 14 percent of GDP). With a better understanding of both disaster and financial vulnerability, the GoSL can develop appropriate strategies to manage these areas of risk.

In this context, the World Bank–Global Facility for Disaster Reduction and Recovery (GFDRR) Disaster Risk Financing and Insurance Program is collaborating with GoSL to define, assess, and quantify the costs affecting GoSL after a disaster happens. Increased understanding and accurate quantification of post-disaster liabilities will help GoSL make informed decisions about how to best to manage these liabilities. The expectation is that having assessed risks, the government will be better able to secure financing, use and monitor funding, and reduce financial risk. Securing financing may include integrating disaster risk into fiscal risk and public debt management, improving the post-disaster budget response capacity, and clarifying post-disaster financial assistance. Effectively managing disaster risk should also help reduce the negative impact of fiscal shocks to the economy.



UN Photo/Evan Schneider

If disaster-related liabilities are managed well and disaster risk financing reforms are adopted, the result could be a more stable macroeconomic environment, new business opportunities, better infrastructure, and a high standard of living. Conversely, the failure to manage disaster-related liabilities over the short to medium term could slow down reform momentum and growth, cause deterioration in the external position, increase vulnerability to shocks for households, and make Sri Lanka appear less favorable to investors and financial markets.

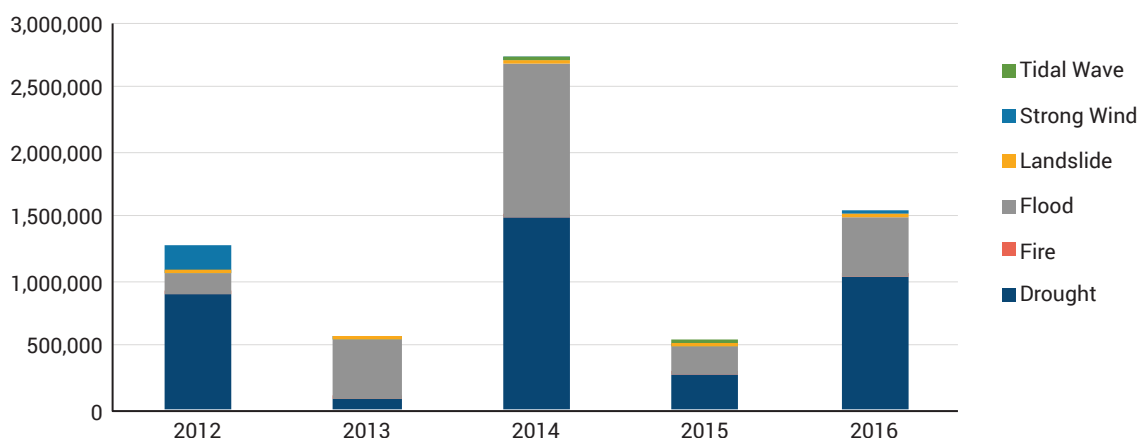
2. Background

Since the quantity of contingent liabilities is in part determined by the frequency and severity of natural hazards, and the exposure and vulnerability of people and assets, this chapter presents information on these topics. The impact of disasters is the result of the interaction of hazards, exposure, and vulnerability.

Natural hazards

Sri Lanka is vulnerable to low-frequency, high-impact events, such as the 2004 Indian Ocean tsunami, and to high-frequency weather-related hazards. Floods caused by monsoonal rains or low-pressure systems are the most common hazards, along with droughts caused by failure of monsoonal rain. Sri Lanka is also prone to landslides, lightning strikes, high winds/cyclones, and epidemics. The risk assessment platform INFORM ranks Sri Lanka's level of disaster risk as 56th among 191 countries. High-impact hazards over the past 15 years have included the Indian Ocean tsunami in 2004, as well as drought, floods, and landslides in 2014, 2016, and 2017. Figure 1 provides details on the number of people affected by disasters, mainly droughts and floods, from 2012 to 2016.

Figure 1: Total number of people affected by disasters, 2012–2016



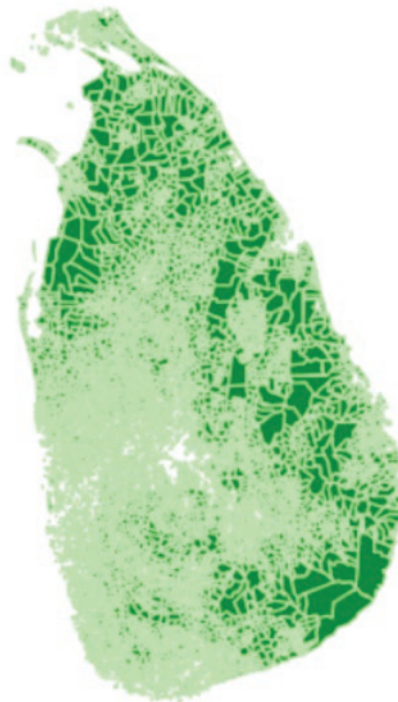
Source: Ministry of Disaster Management.

Different parts of the country are affected by different natural hazards. For instance, Batticaloa district was particularly badly affected by flooding in 2014; Kurunegala district suffered significant damage from drought in 2012. Floods and landslides in late May 2017 were more widespread, however, affecting 15 of the 25 districts; and at the time of writing (May 2018), pre-monsoon rains had brought severe flooding to 19 districts (box 2.1).

Box 2.1: May 2018 flooding

As of May 24, 2018, heavy pre-monsoon rains had killed at least 13 people, and more than 100,000 had been affected across 19 districts. Flooding and potential landslides led to the evacuation of people in low-lying areas, and four districts were placed on red alert for possible landslides. The National Disaster Relief Services Centre (NDRSC) provided LKR 24.9 million to 12 district secretaries to address the immediate needs of affected populations. Kalutara district received the largest allocation of funds. Forty-three houses were recorded as suffering full damage; 3,225 suffered partial damage. Personnel across the Sri Lanka armed forces and police were deployed to assist in relief and recovery efforts.

Source: Ministry of Disaster Management.

Figure 2: Exposure to natural hazards

Source: Risk Info, "Sri Lanka Disaster Risk Information Platform," <http://www.riskinfo.lk>.

Note: Darker shades denote more populous areas.

Exposure and vulnerability

Regardless of location, Sri Lankans are exposed to natural hazards. Figure 2 provides details on the location of people in areas prone to the hazards described above. The north and east of the country are particularly exposed to natural hazards (shaded dark green in the figure, denoting a higher population), while central Sri Lanka is slightly less exposed (white and/or light green shading, denoting a lower population). Further information on the exposure of the population to different hazards is provided in annex 3.

The wide geographical spread of natural hazards in Sri Lanka creates hazard exposure for both public and private assets. For instance, the national road network covers the entire country and hence crosses through hazard-prone areas.

The damaging effects of a hazard are disproportionately felt by the poor. For instance, approximately 12 percent of those affected by the 2017 floods and 2016–2017 drought were poor, nearly twice the national average of 6.7 percent (World Bank 2017).

In Sri Lanka, 77 percent of the population pursue agriculture-related livelihoods in drought- and flood-prone areas (UNDP 2013). Most farmers are smallholders with land holdings of less than 1 ha, and are therefore vulnerable to extreme climate change effects and other shocks. Moreover, most of the domestic food requirement, including rice (the staple grain of the nation and the basis of national food and nutritional security), is produced in drought-prone regions. Sri Lanka has a total land area of 65,600 km²—and droughts affect more than 75 percent of this (UNDP 2013). Both household livelihoods and many of the revenue-generating sectors of the economy are vulnerable to the effects of natural hazards. A substantial portion of agricultural export crops, including tea, rubber, and coconut, are grown in areas prone to both high rainfall and dry spells.

More than 2 million people were affected by the floods and drought in 2017; in August 2017, the number of food-insecure households was estimated at 277,000, 30 percent of them possibly consuming less than the daily minimum calorie intake (IMF 2017).

Impact of recent disasters

As noted in the introduction, on average, Sri Lanka experiences LKR 50 billion (US\$313 million) in annual disaster losses related to housing, infrastructure, agriculture, and relief. Table 1, which provides further information on annual losses by disaster, shows that the highest losses are associated with flooding and that Sri Lanka experienced significant flooding events in both 2016 and 2017. The 2017 floods are estimated to have caused 213 deaths, partial or full damage to 88,000 houses (1.5 percent of the total stock of housing), displacement of 100,000 people, and economic damages and losses of an estimated LKR 70 billion (US\$391 million). The total recovery needs were estimated to be LKR 116 billion.

Table 1: Average annual loss by hazard

Hazard	Earthquake	Wind	Storm surge	Tsunami	Flood	Multi-hazard
Average annual loss (million US\$)	0.77	1.70	18.57	1.75	143.75	166.54

Source: PreventionWeb, "Sri Lanka Disaster & Risk Profile," www.preventionweb.net/countries/lka/data/.

Floods and drought in 2016–2017 impacted economic growth, inflation, and the trade deficit. For instance, two rice cultivation cycles were disrupted in 2016–2017, and agriculture GDP contracted by 3.8 percent in 2016 and 0.8 percent in 2017 (IMF 2017). Of 612,224 ha of cultivated paddy, 50,615 ha were damaged by drought, and rice production for 2017 was expected to be the lowest paddy production in the last 10 years. The subsequent food shortage contributed to acceleration of food inflation to 14.4 percent year-on-year in December 2017, and to an increase in food imports by about US\$200 million in 2017 (0.2 percent of annual GDP). The drought also led to decreases in agricultural exports, mainly tea; it also forced a shift in power generation from hydro to more expensive thermal sources and thus increased imports of oil by about US\$560 million, or 0.7 percent of GDP (IMF 2017). Further details on the impact of drought in 2016–2017 are provided in box 2.2. Overall, recurring disasters result in constraints to economic growth, particularly in rural areas.

The GoSL's revenue was also impacted by floods and droughts in 2016–2017, placing pressure on the budget. As a result of the disasters, the Ministry of Finance removed or reduced duties on essential goods and certain commodities in 2016–2017; consumption fell over this period, impacting collection of the value added tax and national building tax. Business interruptions and loss of profitability for some state-owned enterprises also reduced revenue collection. Due to the May 2016 floods, Sri Lanka's third biggest taxpayer was out of business for five to six months; the floods also resulted in an estimated revenue loss of LKR 42.5 million by the Sri Lanka Transport Board (GoSL 2016). A similar situation occurred in 2017 after the May



Photo: UN Photo/Eskinder Debebe

floods, with several revenue-generating sectors affected (GoSL 2017s). The cost for higher thermal power generation, for instance, caused the Ceylon Electricity Board (CEB) to record a financial loss of LKR 34 billion.

Box 2.2: Drought-related fiscal risk

Drought in 2016–2017 impacted more than 1.2 million people across 19 of Sri Lanka's 25 districts. Northern, North Central, and Eastern Provinces reported low levels of water for agriculture, drinking, and household use, and the failure of two harvests in 2017 raised concern for the food security and livelihoods of affected communities. In response to the disaster, GoSL spent LKR 15,174 million to provide water and assistance to drought-affected farmers. This sum was 72 percent of total GoSL expenditure on disasters in 2017, with the remaining percentage spent on flood-related activities. Five separate government departments were involved in the provision of assistance. Of the LKR 15,174 billion spent on drought-related activities, LKR 6 billion was transferred to the CEB for thermal power generation.

Droughts pose a significant fiscal risk due to Sri Lanka's reliance on hydroelectricity generation and administered tariffs. Hydropower generation accounts for 30 percent of the total electricity generation capacity in Sri Lanka. Thus droughts result in low hydro utilization and boost the need for thermal generation (coal and oil), raising the cost of supplying electricity—the 2017 drought raised the average electricity cost to about LKR 20 per kWh (World Bank, forthcoming).

Source: World Bank forthcoming.

3. Post-disaster governance

The impact of disasters influences the quantity of contingent liabilities. Government policies and plans that guide the response during and after an event also influence the type and amount of expenditures. This chapter presents information on governance arrangements surrounding natural disasters in Sri Lanka.

Since the devastating 2004 tsunami, GoSL has paid increased attention to disaster management. In 2005, the Parliamentary Select Committee on Natural Disasters was appointed to identify ways to improve disaster management, and the Disaster Management Act was passed in May 2005 (amended in 2013). This act gives the National Council for Disaster Management (chaired by the president) and the Ministry of Disaster Management responsibility for implementing provisions under the act, namely declaration of a state of disaster, award of compensation, and preparation of disaster management plans.

Multiple stakeholders across different levels of government are involved in post-disaster relief, recovery, and rehabilitation activities. These include the National Disaster Relief Services Centre (NDRSC),¹ responsible for planning and implementing relief, rehabilitation, and reconstruction activities, and the Sri Lanka armed forces. Central agencies (Ministry of Finance, Ministry of National Policies and Economic Affairs) are responsible for preparing budgets in a timely fashion, establishing resources for disaster management, and authorizing the release of cash. Line ministries (e.g., Ministry of Irrigation and Water Resources Management, Ministry of City Planning and Water Supply) have annual budget allocations for relief and rehabilitation activities that they draw upon after a disaster. Other line ministries that lack a dedicated post-disaster budget line (e.g., Ministry of Education) will reallocate funds across budget lines to accommodate unplanned expenditure. Moreover, as service delivery is a function of subnational governments, key stakeholders in the planning, delivery, and monitoring of disaster management include provincial councils and district administrations. Further details on the roles and responsibilities of government agencies after a disaster are included in annex 4.



¹ NDRSC is one institution within the Ministry of Disaster Management. The other three institutions under the ministry are Department of Meteorology, Disaster Management Centre, and National Building Research Organisation.

One implication of having many agencies involved in post-disaster activities is that obtaining accurate information on the size and type of historical expenditures, as a means to estimate the level of contingent liabilities, is difficult. Another implication is that the Ministry of Finance must coordinate with and receive information from multiple players in managing liabilities.

Several policies and plans in line with the Disaster Management Act help guide agencies in post-disaster expenditure (table 2). For instance, the National Policy on Disaster Management states that “affected communities should have assistance for speedy recovery of disrupted livelihoods and market systems” (NCDM 2010). There are no details, however, on what “assistance” communities should have or on how it will be financed. These details may be defined after an event or held within additional policies within the Ministry of Disaster Management. In the past, financial limits after a disaster have sometimes been set by the Ministry of Finance. For instance, in 2016 the National Budget Department released budget circulars to inform agencies of what would be funded in relation to relief payments.²

Table 2: Policies and guidelines supporting the Disaster Management Act

Name of policy/guideline	Responsible agency
Comprehensive Disaster Management Programme (2014–2018)	Ministry of Disaster Management
National Policy on Disaster Management (2010, 2013, 2014) ^a	Ministry of Disaster Management
National Adaptation Plan for Climate Change Impacts 2016–2025	Ministry of Disaster Management
National Disaster Management Plan (2018–2022). The plan follows the guidelines for the Disaster Management Act and related policy; it details the institutional relationships involved in disaster risk management and mechanisms to establish the disaster risk framework and implement related programs.	Ministry of Disaster Management
National Emergency Operations Plan	Ministry of Disaster Management
Disaster Management Plans for every ministry, government department, district, and public corporation	All ministries, government departments, districts, and public corporations
National Policy on Local Government (2009). The policy calls for local authorities to incorporate hazard parameters in their planning processes. Further refinements are required to ensure that government entities divert adequate resources to disaster mitigation and preparedness.	Ministry of Local Government, provincial councils
Annual budget circulars from the Budget Department ^b	National Budget Department
Guidance contained in the Appropriation Act(s). For instance, clause 6(1) of the 2015 Appropriation Act states that “supplementary allocations will be strictly provided for . . . contingency provisions for security related or natural disaster related risks.” Supplementary allocation provisions are shown under Head 240 (National Budget Department).	Parliament with the National Budget Department drafting the Appropriation Act(s)
Vision 2025. The document asserts that GoSL will take steps to improve disaster management. It specifically cites the disaster insurance scheme under the National Insurance Trust Fund (NITF) to enable “quick claims for those affected by disasters without burdening the Government budget”; a National Disaster Reserve Fund to finance post-disaster reconstruction; resettlement of high-risk communities living in landslide-prone areas; and the introduction of insurance schemes for economically important sectors (GoSL 2017b).	Prime Minister’s Office

a. Provisions of the policy that may affect expenditure decisions are in annex 5.

b. Key details from recent circulars guiding expenditure decisions are included in annex 6.

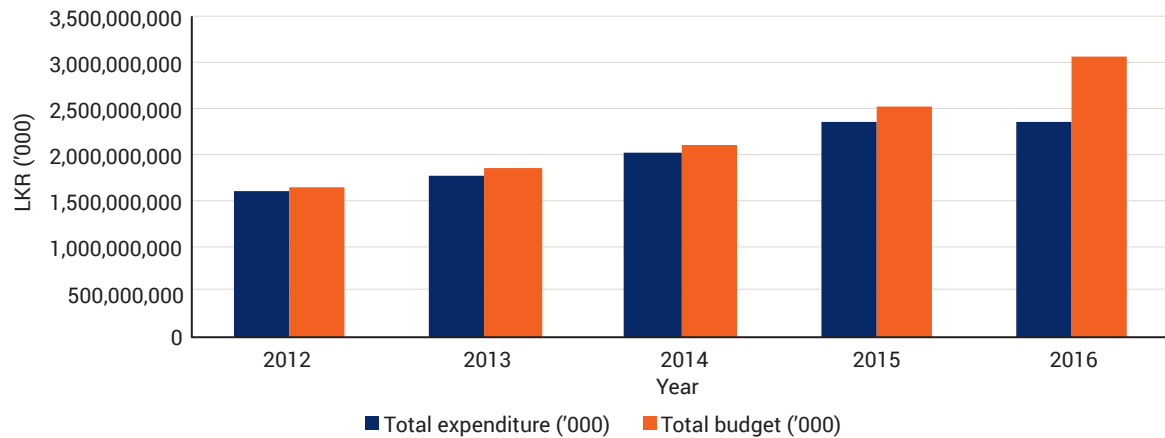
4. Contingent liabilities

Contingent liabilities are obligations that are triggered when a potential but uncertain event occurs. They may be explicit—arising from a prearranged explicit commitment made (for example) in a contract or policy, or through law; or they may be implicit—arising from a perceived moral obligation without any prior commitment, due to public expectations or political pressure on the government.

There are two methods that can be used to estimate the value of liabilities (both explicit and implicit) from natural disasters: (i) direct estimation, and (ii) probabilistic modeling. Direct estimation requires analysis of historical data on government expenditures in response to past disasters. This provides an estimate of the probability of future costs, and hence liabilities, after a disaster happens. The second method, probabilistic modeling, can be used in the absence of historical data on disaster expenditure, or where the available data are insufficient to estimate the probable occurrence and related fiscal costs of a disaster. Probabilistic modeling is a good complementary method to estimate the government's potential exposure to disaster-related contingent liabilities. This chapter first presents figures from direct estimation, and then data from probabilistic modeling, to generate a figure for GoSL's liabilities from natural disasters.

Direct estimation of contingent liabilities

Total government expenditure has increased by 49 percent from 2012 to 2016 (from LKR 1.5 trillion to LKR 2.3 trillion). Recurrent spending has remained broadly unchanged over this period. As shown in figure 3, total government spending increased by 14 percent between 2014 and 2015 and remained constant between 2015 and 2016. An increase in expenditure has taken place in the context of growth over the past five years (4.6 percent in 2017). A proportion of total expenditure is used by GoSL to fund relief, recovery, and rehabilitation activities after a disaster.

Figure 3: Total government expenditure, 2012–16

Source: Ministry of Finance, budget books for relevant years.

The materialized liability from disasters is estimated to be LKR 68 billion (US\$425 million) over the past six years (2012–2017), or on average LKR 11 billion (US\$70 million) annually. In 2017 the estimated post-disaster liability was LKR 23.8 billion (US\$149 million). This equates to approximately 1 percent of total government expenditure. The estimates included in table 3 have been calculated using the following data:

- Expenditure data provided by the Budget Department (2017 actuals and 2018 estimates).
- Expenditure data provided by the Road Development Authority.
- Proxy estimates of expenditure by provinces, compiled with the Finance Commission. There is no vote for post-disaster expenditure within the provinces, so proxies have been used. Rehabilitation and reconstruction work is paid for using provincial allocations for capital expenditure and is estimated to be 5–10 percent of the capital budget each year.³
- Expenditure extracted from the budget books (2014–2016).

The estimate of post disaster liabilities provided below may under-estimate expenditure by government as 2017 and 2018 data provided by the Budget Department relates only to floods and drought events and expenditure under the Budget Department's contingency fund has not been included. A 2017 IMF report indicates expenditure in 2017 to have been LKR 53.5 billion; officials reports from the National Budget Department indicates LKR 23 billion. A GDP deflator was applied to the analysis below to determine if there has been a significant increase in prices from 2012–2017, which may in turn account for increased expenditure. Overall, prices have not increased significantly over the period; prices increased by 6% from 2010 to 2017. Further detail on the calculations are contained in Annex 8 and 9.

Post-disaster expenditure has primarily been financed through reallocations between budget lines within government entities, dedicated budget lines, supplementary budgets, and use of the Ministry of Finance's Miscellaneous Fund. Budgeted lines of public spending are reduced to release resources for unbudgeted post-disaster categories that need to be increased. For instance, there is no dedicated object code, or appropriation, at the provincial level to be used for post-disaster expenditure. In the event of a disaster, provinces reallocate funds held under 23 budget lines for capital expenditure toward rehabilitation and reconstruction efforts. Several supplementary budgets have also been passed in recent years, assumed to be financed by increased borrowing or increased taxation, which provide government entities with additional

3 The estimate of 5–10 percent of the capital budget being used for post-disaster expenditure was put forward by the secretary of the Finance Commission and further verified by the financial officer in the Western Provincial Council. In 2016 the amount spent for reconstruction and rehabilitation by Western Province was 3–4 percent of the capital budget.

resources. For instance, following flooding in 2017, the Ministry of Disaster Management requested and received LKR 9 billion (US\$56 million) in additional resources through a supplementary budget.

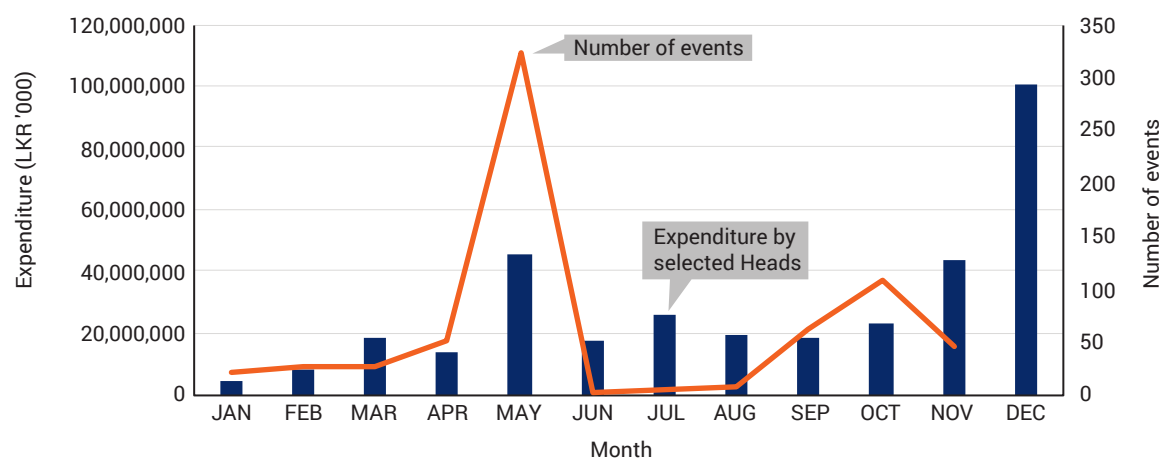
Table 3: Government contingent liability, 2012–2018 (calculated by direct estimation)

	2012	2013	2014	2015	2016	2017	2018
Total post-disaster expenditure (LKR million)	5,068	6,383	9,076	6,045	17,461	23,821	25,093
Post-disaster expenditure as % of total government expenditure	0.32	0.36	0.45	0.26	0.74	0.62	0.63
Post-disaster expenditure per capita	248	310	437	288	824	1,111	1,157
Post-disaster expenditure as % of GDP	0.06	0.07	0.09	0.06	0.15	0.18	0.18

Source: World Bank calculations

Analysis of government expenditure by month and by entity involved in post-disaster expenditure reveals spikes in spending patterns.⁴ These spikes may be related to post-disaster expenditure, financed by reallocations between budget lines within entities. Due to data limitations and the absence of disaster-specific object codes, it is not possible to see a commensurate fall in non-disaster-related expenditure. Analysis of the 2016 peaks in expenditure indicates that expenditure exceeds the disaster allocation, meaning that funds have been reallocated from other activities. As shown in figure 4, in 2016, peaks in expenditure occurred in July and December, two months after a high number of events. High rainfall usually occurs in April/May and October/November. Peaks in expenditure at these times of year are particularly acute in the Ministry of Higher Education and Highways and Ministry of Disaster Management. It should be noted, however, that there is also a spike in expenditure in December each year, which is likely a result of expenditure by ministries before the end of the financial year. Annex 9 contains further analysis for the years 2012–2016.

Figure 4: Government expenditure and number of natural events by month, 2016



Source: State Accounts Department and Desinventar.

In some instances, international assistance is being used to fund or reduce post-disaster liabilities. For instance, JICA (Japan International Cooperation Agency) provided a concessional loan to protect national roads from landslides. In 2016, US\$118.74 million was reportedly disbursed as foreign official development assistance (loan and grants) toward disaster management (Ministry of Finance 2016). GoSL also had access to a World Bank Development Policy Loan with a Catastrophe Deferred Drawdown Option (Cat-DDO) (US\$102 million) to strengthen the country's fiscal resilience to disaster from 2014 to 2017. In the aftermath

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⁴ Figure 4 includes expenditure by 70 government entities who may be involved in post-disaster expenditure. Expenditure has been included only for certain object codes that may be used to reflect post-disaster expenditure, e.g., 1501 is used to reflect welfare programs.

of the May 2016 disaster, GoSL withdrew the full amount—US\$101.49 million. The amount of funding committed by development partners toward disaster management (2016–2018) is shown in table 4. While some international assistance is provided to GoSL, development partners' financial assistance is minimal in comparison to GoSL's direct expenditure. For example, in 2016 finance from development partners is estimated to have been LKR 227 million (US\$1.4 million), while GoSL provided LKR 17.5 billion (US\$109 million) toward financing post-disaster relief and recovery efforts.

Table 4: Development partners' financial assistance, 2016–2018

Donor	Program/purpose	2016 Actuals (LKR thousands)	2017 Budget (LKR thousands)	2018 Estimate (LKR thousands)
UNDP/World Bank	Disaster risk management program	9,989	7,300	-
UNDP	Strengthening the resilience of post-conflict recovery and development to climate change risks in Sri Lanka	8,615	88,160	-
UNDP	Ensuring global environmental concerns and best practices are mainstreamed in Sri Lanka's sustainable development process through an improved information management system	-	42,330	42,000
ADB	Program for flood and landslide disaster response	196,080	100,000	-
World Bank	Landslide mitigation program	-	2,000	-
WMO	Development of meteorological observation, weather forecasting, and dissemination of weather information	12,620	10,000	-
Total		227,304	249,790	42,000

Source: Ministry of Finance 2018.

Note: UNDP = United Nations Development Programme; ADB = Asian Development Bank; WMO = World Meteorological Organization; - no estimated expenditure

Composition of disaster-related contingent liabilities

Broadly speaking, the GoSL's post-disaster liabilities can be categorized into seven areas:

- 1. Relief payments and supplies** provided to affected communities, primarily managed by the National Disaster Relief Services Centre under the Ministry of Disaster Management. Relief payments to affected communities are also made by some line ministries, e.g., Ministry of Women and Child Affairs. This liability is primarily financed through dedicated budget lines, alongside the allocation of additional funds by the Ministry of Finance through supplementary budgets and/or use of the Miscellaneous Fund.
- 2. Resettlement of affected communities post-disaster**, including the purchase of land. The resettlement program is managed by the Ministry of Disaster Management. This liability is financed through a dedicated budget line.
- 3. Response efforts provided by the Sri Lanka armed forces.** After a disaster, the Sri Lanka armed forces (army, navy, and air force) are actively involved in relief and recovery efforts. This liability is financed by using funds already budgeted for, reducing budgeted lines of public spending for unbudgeted post-disaster categories, and/or reallocating additional funds from the Ministry of Finance.
- 4. Support to stimulate economic recovery through sector-specific insurance schemes**, such as relief support for plantation industries, fishermen, and farmers. This is financed through dedicated budget lines to pay the premium and/or through allocation of additional funds from the Ministry of Finance.

5. **Rehabilitation and reconstruction of damaged public infrastructure and assets.** This expenditure is budgeted and paid for by line ministries, provincial councils, and the President's Office through the reallocation of funds between budget lines. Rehabilitation of infrastructure may also be paid for by state-owned enterprises' own funds (grants provided by central government or own revenue), such as Road Development Authority funds, or through additional funds allocated by the Ministry of Finance.
6. **Premiums for disaster-linked insurance schemes such as the National Natural Disaster Insurance Scheme (NNDIS).** NNDIS is managed by the National Insurance Trust Fund (NITF), a state-owned enterprise that addresses claims obligations. These premiums are financed through a dedicated budget line from Ministry of Finance to NITF.
7. **Transfers to Ceylon Electricity Board** for the use of thermal energy for electricity production, in periods of drought. In the past this need has been financed through a transfer from the Ministry of Finance.

As noted earlier, contingent liabilities may be explicit (those underpinned by some form of legal obligation) or implicit (those resting on the social expectation that the government will act as insurer of last resort). This distinction is important, as explicit contingent liabilities are usually easier to identify and manage, but often represent a small proportion of total contingent liabilities. In Sri Lanka, the main source of implicit liabilities arising from the 2017 drought and flood was relief and resettlement payments (25 percent of total post-disaster expenditure). Expenditure relating to the rehabilitation and reconstruction of public assets may be classified as explicit or implicit depending on the funding source used. In this instance, given that most reconstruction has been financed by government, the contingent liability is assumed to be explicit. This explicit liability accounted for 42 percent of total post-disaster expenditure in 2017, and the obligation to underwrite state-owned enterprises and corporations (NNDIS and CEB) accounted for 33 percent. GoSL's explicit contingent liabilities, which consist predominately of government financing of post-disaster infrastructure rehabilitation, are larger than its implicit liabilities.

For each expenditure, a breakdown and (where possible) analysis of trends over time are provided in the following section. A summary of estimated expenditure and percentage share for each area in 2017 is provided in table 5.

Table 5: Breakdown of post-disaster expenditure, 2017

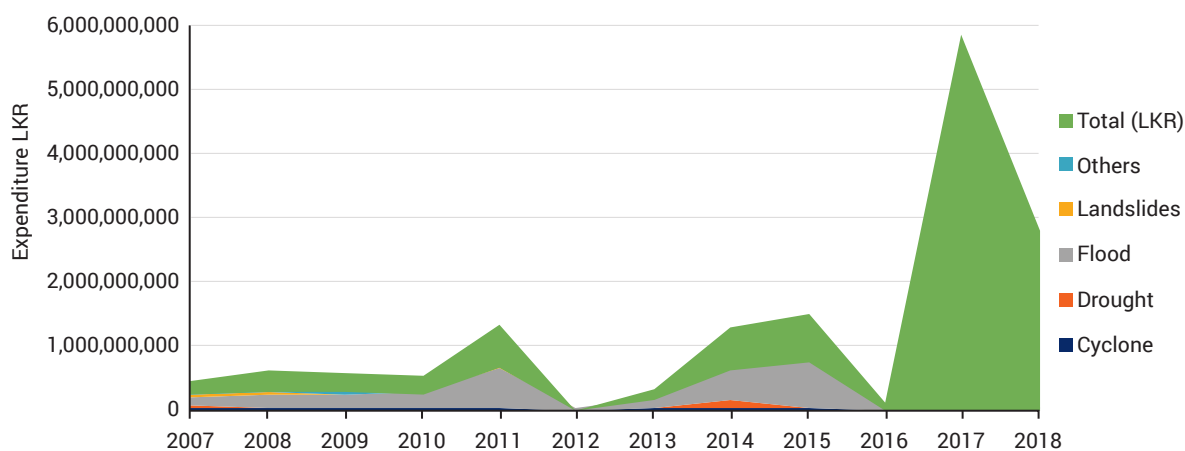
Expenditure area	Amount (LKR millions)	%
1. Relief payments and supplies	5,771	24
2. Resettlement of affected communities	887	4
3. Response efforts by the Sri Lankan armed forces	Unknown	--
4. Support to stimulate economic recovery	1,405	6
5. Rehabilitation and reconstruction of damaged public infrastructure & assets	9,258	39
6. Premiums for disaster-related insurance schemes such as the NNDIS	500	2
7. Transfers to CEB	6,000	25
Total	23,821	100

Source: World Bank calculations

1. Relief payments and supplies

Through the NDRSC, GoSL provides immediate relief to disaster victims. Funds are transferred from NDRSC to district administrations, which in turn procure relief supplies in line with NDRSC guidelines. NDRSC further procures and holds relief supplies if supplies purchased at the district level are insufficient. Figure 5 details total government expenditure for food aid and incidental expenses incurred due to disasters (2007–2018). It shows an increase in relief payments made in 2017 and the first three months 2018, predominately due to floods. Over 50 percent of relief expenditure over the period was provided in the aftermath of a flood. The amount provided to affected communities is detailed in a Ministry of Finance circular, an example of which is provided in annex 6. Depending on the size of the disaster, payments can change from a one-month payment per family (at LKR 5,000; US\$31) to a three-month payment. Relief payments to affected communities are also provided by the Ministry of Women and Children (LKR 64 million in 2017).

Figure 5: Relief expenditure through NDRSC, 2007–2018



Source: Ministry of Disaster Management.

Note: Data for 2018 are for January through March.

2. Resettlement of affected communities

Communities affected by a landslide are eligible for funding from GoSL—provided through the National Building Research Organisation (NBRO)—to support housing reconstruction. The process and amount due to communities is articulated in draft guidelines. Following a landslide, an Action Committee is established and tasked with identification of beneficiaries and the identification and acquisition of land.⁵ The district secretary is responsible for registering beneficiaries under the scheme, with three options available:

- LKR 1.6 million to purchase and house with land
- LKR 0.4 million to purchase land and LKR 1.2 million to construct a house
- LKR 1.2 million to construct a house on state land

Payment is typically made in four installments (for those building on state land): LKR 0.2 million for land preparation and foundation; LKR 0.3 million for construction of one room and toilet; LKR 0.4 million for wall construction; and LKR 0.3 million for plastering, electricity, and other needs.

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⁵ The Action Committee comprises the district secretary, divisional secretary, and officers representing the NDRSC, NBRO, Department of Irrigation, Urban Development Authority, Ministry of Local Government, and the relevant Provincial Council.

The current resettlement program started in 2016, and since then 2,808 houses have been constructed. Of these, 682 were constructed on state-owned land, 72 were constructed on purchased land, and 2,054 were constructed on privately owned land. In 2016, LKR 90.5 million was spent on the program; LKR 1,667 million was spent in 2017, and LKR 800 million was allocated in 2018. According to discussions with the Ministry of Disaster Management, 15,000 people are estimated to benefit from this program.

3. Relief and recovery efforts by the Sri Lanka armed forces

The Sri Lanka armed forces play a vital role in relief and recovery efforts after a disaster. Following the May 2016 flooding, the Sri Lanka Army deployed more than 1,500 personnel for immediate search, rescue, and relief operations, including medical support. The Sri Lanka Air Force dispatched helicopters for rescue operations and provided aid to victims, and the Navy dispatched 81 flood relief teams. An estimated LKR 60 million (US\$376,206) was spent after the May 2016 floods (table 6), and GoSL has provided an allocation to the armed forces for search and rescue operations.

Table 6: Disaster-related expenditure by Sri Lanka armed forces, May 2016

Branch	Expenditure (LKR)
Army	16,982,251
Navy	26,875,174
Air force	17,032,238
Total	60,889,664

Source: Government of Sri Lanka 2017a.

4. Support to stimulate economic recovery

GoSL provides support under different ministries to help businesses and smallholders recover after a disaster. Support may be through grant assistance (e.g., rehabilitation assistance for tea smallholders through the Ministry of Plantation Industries⁶) or through funding for insurance premiums (e.g., crop insurance under the National Investment Trust Fund).

Table 7 provides an overview of support to drought-affected farmers through both NITF and the Agriculture and Agrarian Insurance Board (AAIB), under the Ministry of Agriculture. NITF's crop insurance scheme is available to paddy farmers to cover them against the loss of their crops due either to natural perils such as drought and floods or to the peril of wild elephants destroying their paddy fields. The Agriculture Insurance Board provides insurance schemes for paddy, maize, and vegetable crops as well as livestock in identified areas of Sri Lanka. However, uptake of this product is low, with less than 5 percent of Sri Lanka's farming community opting in to the program (World Bank 2016). In the case of paddy farming, for instance, farmers favor the NITF because its coverage is free (in contrast to the AAIB, which charges a nominal premium) (World Bank 2016).

As a percentage of total post-disaster expenditures, support to stimulate economic recovery is low; in 2017 it accounted for 9 percent of the total. This is due, in part, to low uptake of insurance and small grant

6 In 2017, LKR 505 million was provided as relief assistance for tea smallholders.

payments. As a percentage of GDP, total insurance premiums (life and non-life) were just 1.2 percent in 2011 (World Bank 2014b).

Table 7: Assistance provided to drought-affected farmers, 2013–2017

Year	NITF (LKR millions)	Ministry of Agriculture (LKR millions)	Total (LKR millions)
2013	10.44	0	10.44
2014	369.30	0	369.30
2015	685.98	913.24	1,599.22
2016	68.65	163.35	232
2017	1,593.3	2,640.04	5,233.34

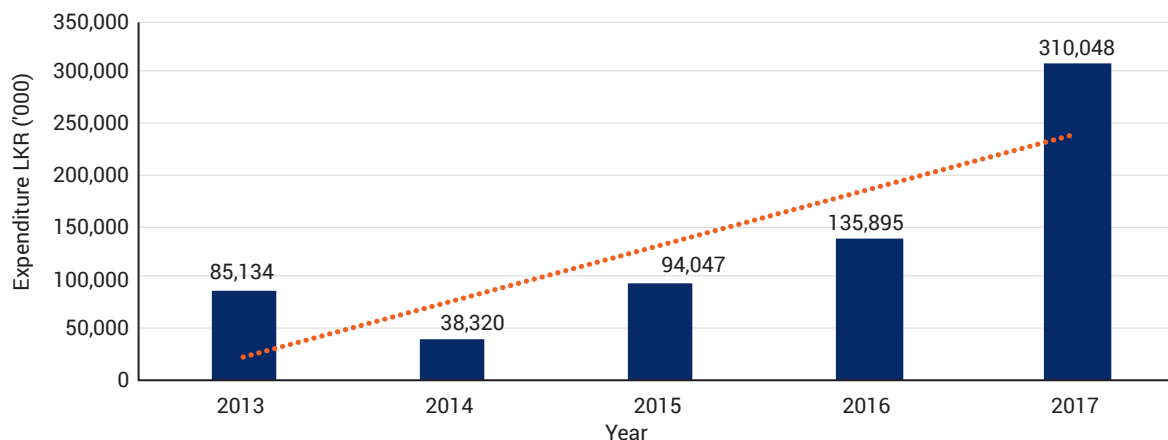
Source: Ministry of Agriculture.

5. Rehabilitation and reconstruction of damaged public infrastructure and assets

The rehabilitation and reconstruction of damaged public infrastructure and assets is paid for by line ministries and district secretaries. The National Budget Circular No. 3/2016 states that small-scale reconstruction activities (e.g., small-scale rural roads, small tanks, bridges) are the responsibility of relevant district secretaries; additional funds for this work can be received from the Treasury. Large-scale reconstruction activities are the responsibility of different line ministries. The circular also states that “after estimation of the cost for the reconstruction of damaged infrastructure facilities in each district, the relevant line ministry should use existing provisions or additional provisions obtained from the Treasury” (Ministry of Finance 2016b).

In 2017, GoSL spent LKR 950 million (US\$5.9million) on improvements to transport infrastructure through the Road Development Authority; LKR 310 million (US\$1.9 million) was spent through the Ministry of Irrigation and Water Management. Analysis of the amount spent on flood damage repairs by the Ministry of Irrigation and Water Management further indicates that the cost of repairing damage is increasing year-on-year (figure 6). Other line ministries have reallocated funds toward rehabilitation work; for example, the Ministry of Education spent LKR 800 million (US\$5 million) in 2017 toward the rehabilitation and reconstruction of damaged infrastructure.

Most post-disaster expenditure by GoSL is estimated to be for the rehabilitation and reconstruction of damaged public infrastructure.

Figure 6: Ministry of Irrigation and Water Management expenditure for flood damage

Source: Ministry of Irrigation and Water Management.

6. Risk transfers or premiums from Ministry of Finance to NNDIS

In April 2016, the National Natural Disaster Insurance Scheme was launched by the National Insurance Trust Fund, an insurance institution fully owned by GoSL. The insurance scheme offers nationwide financial protection against property damage and accidental death arising from natural events (excluding droughts). The Ministry of Finance allocated NNDIS LKR 300 million (US\$1.8 million) in 2016, LKR 500 million (US\$3.1 million) in 2017, and LKR 500 million in 2018. Under the scheme, beneficiaries are entitled to the following:

- LKR 100,000 compensation for loss of life due to a natural disaster
- LKR 100,000 compensation for persons who have become totally and permanently inactive and disabled due to natural disasters
- LKR 2.5 million (maximum) compensation to a family whose home and property have been damaged due to natural disaster. Businesses with annual turnover of less than LKR 10 million are also eligible for this compensation.

Major floods in 2016 and 2017 resulted in 164,049 claims to NNDIS, and payouts totaling LKR 3.6 billion. Because of two successive bad years, the NNDIS balance sheet is deteriorating, and NITF was forced to supplement the insurance premium paid by Ministry to Finance from its own funds. The deteriorating balance sheet has come about through there being a gap between the premium received and reinsurance paid (LKR 300million). For NNDIS to continue as a financing mechanism for disaster-related contingent liabilities, its governance, operations, and financial structure must be strengthened. Key actions to achieve this goal include encouraging top-up insurance coverage from the private sector, considering a scalable social protection mechanism for “uninsurable” households, and streamlining the claims process using new technologies. NITF must receive the full cost of the reinsurance premium, or its capital will be eroded and its financial viability endangered.

7. Transfers to Ceylon Electricity Board

Hydropower generation accounts for 30 percent of Sri Lanka's total electricity generation capacity. However, droughts reduce the use of hydropower and increase electricity production through alternative means. In 2017, CEB required financial support to purchase oil and generate electricity through thermal generation.

Refinements of direct estimation

Analysis of historical data on direct government expenditures in response to past disasters has identified areas of liability and an estimate of the expected size of future fiscal costs. As detailed in table 3, GoSL has spent an estimated LKR 68 billion on disasters from 2012 to 2017. The annual figures were calculated through analysis of budget books and, as mentioned previously, are likely to underestimate the true cost of post-disaster expenditure. Two actions have therefore been taken to refine the initial direct estimate:

1. Given the lack of a singular post-disaster object code, figures have been collated from the budget books and discussions with stakeholders and compared against total expenditure data provided by the State Accounts Department for potential disaster-related object and head codes used in the Chart of Accounts. A comparison makes it possible to see the difference between expenditure by program name and expenditure by object codes.
2. Estimates of damage to government-owned buildings and infrastructure and estimates of the potential damage to privately owned assets have been collected from two years of major events. The number of affected people has also been collected. From this information, an estimate of the potential costs of compensation and financial assistance to government, individuals, and businesses has been derived.

Indirect losses, such as loss in tax revenues, have not been captured in this analysis due to insufficient data. However, they should be captured if possible, as they create an additional fiscal burden.

Table 8 compares post-disaster expenditures identified in two different ways: through program names or through disaster-related object and head codes.⁷ Certain head and object codes that are likely associated with post-disaster activities were selected, and expenditures were collated month by month over five years. There is a significant difference between the two sets of numbers; this is driven largely by the fact that there is no one object code for post-disaster expenditure, and that the chosen object codes (e.g., 1501–welfare payments) could be used for post-disaster activities or non-disaster-related activities.

Efforts could be made to estimate how much of each code is disaster-related; however, such analysis would be crude. What the analysis does point to is certain high-expenditure object codes by entities conducting post-disaster activities: 2104–buildings and structures; 1501–welfare payments; and 2201–transfers to public institutions. This finding correlates with earlier analysis showing that most post-disaster expenditure is toward the rehabilitation and reconstruction of public infrastructure and assets.

Table 8: Post-disaster expenditure by program name vs. object codes

Data set	2012	2013	2014	2015	2016
State accounts data set (object codes)	250,737,991	249,152,589	326,504,864	445,801,590	337,795,485
Budget books data set (program name)	5,068,072	6,383,207	9,076,355	6,045,801	17,461,250
Budget data as % of state accounts data set	2%	3%	3%	1%	5%

Source: Calculated from state accounts data and budget book data.



⁷ The latter data set was provided by the State Accounts Department; the former data set was compiled through analysis of budget books and discussion with stakeholders.

Table 9 provides an alternative calculation of liabilities from disasters using total damages from the past two years and the number of affected people. From these figures, the damage to public assets and potential relief expenditure (assuming LKR 5,000 per person) have been calculated. While damages do not equal the cost of rehabilitation and reconstruction, they do suggest the effect of major disasters and the scale of work required.

Table 9: Total damages and number of affected people (2016–2017)

Year	Total damages (LKR millions)	% of Total damages, public vs. private		Estimated total public damages (LKR millions)	Number of affected people	Estimated expenditure on affected people (LKR millions)	Total damage to public infrastructure and relief expenditure (LKR millions)
		Public	Private				
2016	87,027.88	9.8%	90.2%	8,528.73	493,319	2,467	10,995
2017	59,740.44	32%	68%	19,116.94	879,778	4,399	23,516

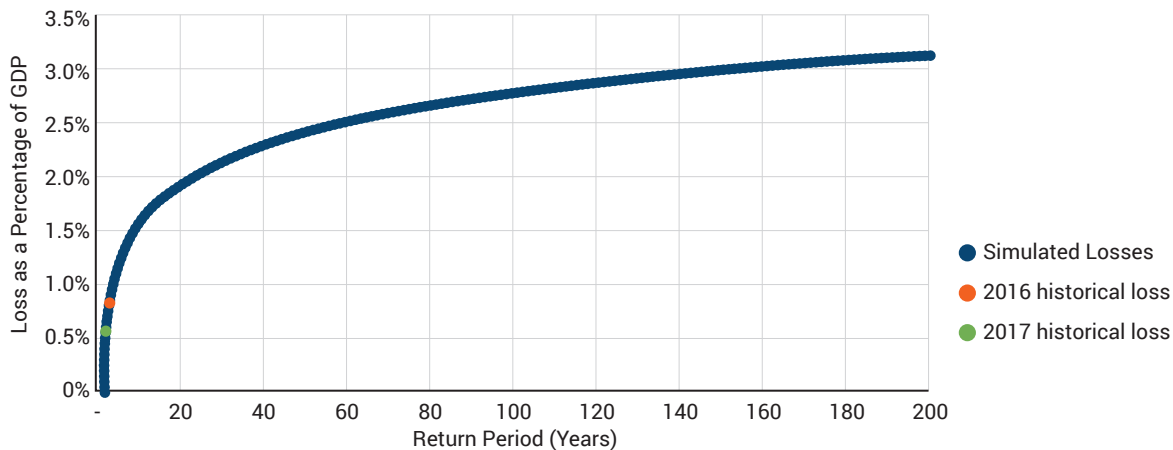
Source: GoSL 2016, 2017a; World Bank calculations

Probabilistic calculation of contingent liabilities from natural disasters

Contingent liabilities can also be estimated using probabilistic modeling. To build a greater understanding of contingent liabilities from natural disasters, it is important to consider the potential future losses that could feasibly be expected to materialize with different frequencies or return periods. This type of information can support financial planning for disasters, as it enables the government to develop risk-informed budgeting practices, such as establishing an optimal amount for a reserve fund to finance disaster response.

This section presents the results of a high-level analysis carried out by the World Bank, which focuses on the total economic loss—that is, the total direct and indirect financial impact of disasters to the private and public sector—from four key perils in Sri Lanka: flood, landslide, tropical cyclone, and drought. Sri Lanka is also exposed to earthquake and tsunami, but these have been excluded from the analysis due to lack of historical loss data. These perils could be considered in future but would require the development of a catastrophe risk model that quantifies the impact of such events.

Figure 7: Total economic losses as percentage of GDP at various return periods



Using the available information on historical losses from disasters in Sri Lanka since 1998 to inform the projection of potential future losses, figure 7 shows that the severity of losses varies between an estimated 0 percent and 2 percent of GDP in most years. The two years of 2016 and 2017 represent the worst annual losses that would be expected to occur every three and two years, respectively.

Table 10 provides estimates of the total economic loss that might be expected for events of increasing severity. For example, the losses corresponding to a return period of 10 years present the largest annual loss that one would expect to occur in a 10-year period.

Table 10: Indicative annual losses from flood, landslide, drought, and cyclone as share of GDP

Return period (years)	Proportion of GDP (%)
Mean	0.77
2	0.62
5	1.17
10	1.56
20	1.93
50	2.41
200	3.13

On average, total economic losses are 0.77 percent of GDP, although losses can increase to above 2 percent in more extreme years. For an event with a return period of 200 years, the associated economic loss would be equivalent to 3.13 percent of GDP.⁸ A 1-in-200-year return period is often considered to be a maximum probable loss by insurance companies setting their reserve levels, particularly by those regulated under Solvency II in Europe—widely considered as the gold standard in solvency regulation. Thus this approach represents a robust level of prudence.

When expressed as a proportion of the 2017 GoSL budget (table 11), the values show that the cost of addressing the total economic loss would be 2.85 percent of budget on average, but would represent a significant proportion of the budget in more extreme years.

Table 11: Indicative annual losses from flood, landslide, drought, and cyclone as share of GoSL budget

Return period (years)	Proportion of annual GoSL budget (%)
Mean	2.85
2	2.30
5	4.37
10	5.81
20	7.20
50	9.00
11.64	11.64

The annual average explicit contingent liability attributable to the GoSL from natural disasters is estimated to be LKR 20.5 billion, or 21 percent of total associated loss. The average of 21 percent was derived from the average loss identified in the 2016 and 2017 post-disaster needs assessments (GoSL 2016, 2017a), which found the actual loss incurred by the public sector to be 9.8 percent in 2016 and 31.7 percent in 2017. To estimate the contingent liabilities of events of different magnitudes (return periods), 21 percent of total economic loss is used as a proxy for explicit contingent liabilities.⁹ This analysis demonstrates that much of the contingent liability from natural disaster is attributable to the private sector. The absence of an appropriate platform for the private sector to manage these losses can result in the government acting as insurer of last resort.

It should be noted that the figures in table 12 present the actual loss incurred to the public sector in 2016 and 2017, which accounts for 9.8 percent and 31.7 percent, respectively, of total loss. This serves to demonstrate the explicit contingent liability to the GoSL from natural disasters.

Table 12: Probabilistic explicit public contingent liabilities

Return period	Total economic loss (LKR billions)	Total explicit public sector loss (LKR billions)	Total explicit public sector loss (% of GDP)
Mean	102.7	21.3	0.16
2017 event ^a	75.0	23.8	0.18
2016 event	100.8	9.9	0.08
5	157.3	32.6	0.24
10	209.2	43.3	0.32
20	259.3	53.7	0.40
50	323.9	67.0	0.50
200	419.1	86.8	0.65

a. The 2016 and 2017 estimates were not calculated using probabilistic modeling; they are historical estimates of loss used here for reference.

This analysis is indicative only, and the contingent liability faced by the GoSL may differ from the results presented here. The output is aimed at developing an understanding of the contingent liability but should not be used to design precise financial strategies. The analysis is subject to a range of assumptions, which along with the methodology used are summarized in annex 10.

5. Options to manage or transfer contingent liabilities

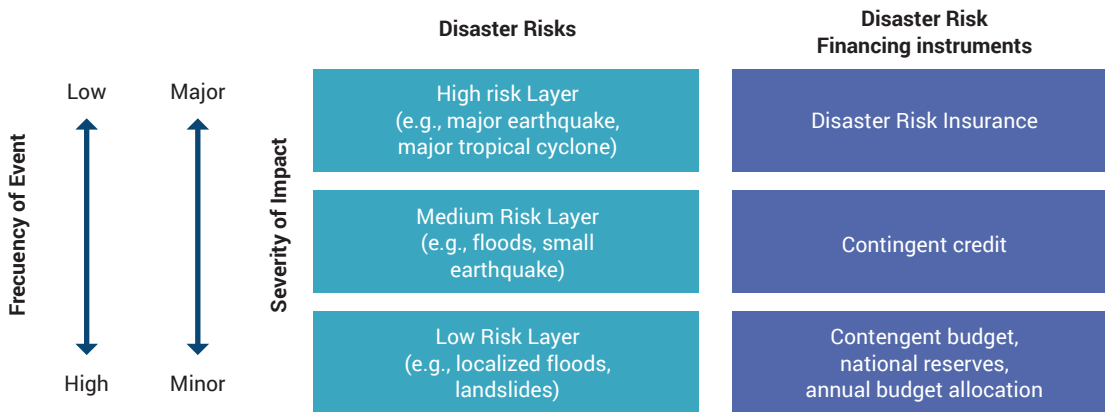
The identification and quantification of liabilities from disasters, as outlined in chapter 4, creates the basis for GoSL to control the size of disaster-related expenditures, implement strategies to manage potential shocks to public finances, and avoid costly ad hoc budget shifts. Several financial instruments and approaches can be used to control the size of contingent liabilities and remaining fiscal risk. This chapter presents options for GoSL to consider in managing its disaster-related liabilities.

GoSL currently manages its contingent liabilities through *ex ante* interventions (e.g., dedicated budget lines under the Ministry of Disaster Management) and *ex post* interventions (e.g., budget reallocations). A review of existing and new options is warranted, as both the choice of interventions and the risk environment have evolved over time. Vision 2025 advocates improvements in disaster management, including financing reforms, and the frequency and impact of disasters has increased in recent years. For instance, the cost of damage caused by the 2016 and 2017 floods and landslides was more than twice as high in U.S. dollar terms as that of the worst flood disasters between 1992 and 2011 (World Bank 2017).

The GoSL has been proactive in implementing financial solutions such as the NNDIS to help it meet post-disaster financial needs. However, solutions should be sought in a more coordinated way across government, with the Ministry of Finance leading the effort. For instance, cash payments to affected communities are currently being paid by multiple agencies. But given the recurring nature of weather-related events in Sri Lanka, and the fact that the poor and vulnerable are disproportionately affected by disasters, it may be prudent to investigate the feasibility of consolidating, scaling up, and amending existing social protection schemes. This step could reduce the administrative costs that arise when multiple agencies provide support to communities.

The selection of instruments to manage contingent liabilities must be informed by the country context, and the frequency and severity of disaster impacts. For high-risk contexts, certain products are more appropriate (e.g., disaster risk insurance); for lower-risk settings, other approaches will be more suitable (e.g., contingency budget lines). In some cases, multiple instruments may be used at the same time to manage financial risk. In selecting and developing approaches to manage disaster-related contingent liabilities, GoSL could apply a bottom-up, risk-layering approach, as outlined in figure 8. The low-risk layer is typically applied for disasters with a return period of about five years or less. The medium-risk layer is used for disasters with return periods of about 5–20 years, and the high-risk layer is used for disasters with return periods greater than 20 years. The preceding discussion of options that considers the frequency and cost of disasters is a starting point, but further in-depth analysis of the comparative merit of options is required.

Figure 8: Risk-layering approach



Source: World Bank 2012.

Taking into account the level of disaster-related liabilities and the risk profile of Sri Lanka, the list below provides several options for GoSL to consider as a way to minimize the cost and scale of post-disaster expenditure. The options have been split into two categories: preventive measures, which can physically reduce the impact of disasters, and financial measures, which can help manage the cost from expected and unexpected contingent liabilities.

Preventive measures

Option 1: Continue to invest in disaster risk reduction

To limit its disaster-related liabilities, GoSL should invest in ways to prevent and mitigate the effects of disasters in addition to relying on disaster risk financing and transfer instruments. It is encouraging that GoSL has made significant investments in disaster management in recent years, as outlined in the Comprehensive Disaster Management Plan. However, more can be done. For instance, the Ministry of Finance could ensure that GoSL funds only those capital projects that have integrated disaster-mitigating measures in their design and are in secure locations; it could also ask government entities as part of the annual budget preparation process to explicitly state what their expected disaster-related liabilities are and how they will be managed. This is particularly important for state-owned enterprises in Sri Lanka that play an important role in infrastructure and core public services. The ministry could also invest in climate-proof Public Investment Management to ensure that projects are screened at the concept and appraisal stages to consider climate resilience matters. Moreover, the ministry could investigate and implement measures to stimulate the domestic insurance market and/or provide tax incentives to encourage the uptake of disaster mitigation measures. Ultimately, investing in disaster management will reduce the level of impact of disasters and therefore post-disaster expenditure.

Option 2: Improve coordination across ministries in the provision of relief

The amount of relief expenditure paid by the Ministry of Disaster Management has increased substantially in the past two years. Relief payments were also made by the Ministry of Women and Children in 2017. To better manage contingent liabilities, GoSL could ensure that there are clear relief guidelines in place across multiple ministries, that there is strong adherence to the guidelines, and that there is good coordination across government. Moreover, given the recurring nature of weather-related events in Sri Lanka, and the fact that the poor and vulnerable are disproportionately affected by disasters, it may be prudent to investigate the feasibility of consolidating, scaling up, and amending existing social protection schemes. This step could reduce the administrative costs that arise when multiple agencies provide support to communities. Vision 2025 (GoSL 2017b) notes that the government will establish an integrated, efficient social protection system to minimize program duplication and beneficiary overlaps and reduce administrative costs.¹⁰ Thus a timely discussion could be held about post-disaster relief payments as part of reforms to the social protection system.

Financial measures

Option 3: Enhance risk management capacity within the Ministry of Finance

The National Budget Department has recently completed analysis of GoSL's 2017 and estimated 2018 post-disaster expenditure. Post-disaster expenditure analysis *before* 2017 has not been conducted, and the impact of disasters on revenue and macroeconomic indicators is not consistently considered in fiscal forecasting and reporting. With limited analysis of contingent liabilities' potential quantity and impact, GoSL is limited in its ability to devise an appropriate strategy to manage unexpected costs. An enhanced ability to analyze contingent liabilities would not reduce them, but it would help the Ministry of Finance devise the best strategy for managing the fiscal impact of disasters, direct or contingent. It is therefore recommended that the Ministry of Finance increase its capacity to identify, quantify, and use data on contingent liabilities. This effort could include taking a gender and poverty perspective in its work, possibly by establishing a fiscal risk unit or ensuring that disaster risks are explicitly included in the mandate of existing teams that may be looking at fiscal risk issues. In Colombia, Panama, and Peru, for instance, risks from disasters are explicitly included in the mandate of the Fiscal Risk Management Unit within the Ministry of Finance (OECD 2017). The Ministry of Finance should also consider development of a national disaster risk financing strategy. This strategy could contain a cost-benefit analysis of possible risk financing options and enable GoSL to implement a layered approach to risk management (figure 8).

Option 4: Maintain dedicated budget lines and use budget reallocations for low-frequency events

GoSL uses dedicated budget lines, financed through annual appropriations, to fund some contingent liabilities (e.g., item 1702—Flood and Drought Relief under the National Budget Department). This enables GoSL to respond immediately to disaster without having to cut other spending programs or seek additional legislative authority. Given the high opportunity cost of maintaining a liquid reserve, these budget lines are useful for high-probability events. In addition to maintaining dedicated budget lines, the Ministry of Finance could also choose to earmark a certain percentage of the “other miscellaneous items” and/or “other contingency payments” budget lines toward post-disaster expenditure. This would help ensure that funds are available for high-probability annual events such as flooding. For low-frequency, low-impact events such as fires or rock falls, reallocating underutilized funds to meet unplanned expenditure is likely to be more cost-effective than maintaining a liquid reserve or dedicated budget lines.

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¹⁰ For instance, one issue highlighted in the latest Household Income and Expenditure Survey (HIES) is that 16 percent of households received Samurdhi cash transfers in 2013, when only 5.3 percent of households were classified as poor.



Photo: Carstenbrandt / iStock

Option 5: Transfer risk through insurance of key public assets, NNDIS, and sector-specific insurance

To manage disaster-related liabilities, GoSL could transfer risk through insuring key public assets and strengthening existing insurance mechanisms—in particular NNDIS and sector-specific insurance such as agriculture insurance. The rehabilitation of infrastructure after a disaster is estimated to account for over 50 percent of total post-disaster expenditure. Standardizing insurance cover across key public assets would generate economies of scale, thereby potentially lowering premiums. At present, the state-owned Sri Lanka Insurance Corporation (SLIC) is the dedicated insurer for all state assets and insures public infrastructure construction such as roads and bridges, as well as some major hotels. Reviewing the current coverage and alternative private catastrophe risk insurance programs for public assets should be considered. Strengthening NNDIS, as outlined in chapter 4, and improving the viability and cover of sector-specific insurance will also help manage the liability arising from disasters. Weather index and crop insurance products, for instance, could act as risk transfer mechanisms for farmers facing recurring floods and droughts. Sri Lanka already has an insurance system in place for paddy crops under NITF and the Agriculture Insurance Board, but the uptake is currently low.¹¹ The Central Bank estimates that less than 4 percent of the paddy area is insured at present (Central Bank of Sri Lanka 2017). Understanding why the uptake is low, and how sector-specific insurance could help manage the fiscal impact of disasters, could be a useful step.

Finally, development and implementation of a national disaster risk financing strategy will help the coordination and prioritization of the options presented above.

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11 Note that GoSL has announced an index-based crop insurance program targeting paddy, maize, soybean, potatoes, and onions in the 2018 budget.

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Annexes

Annex 1: Methodology

To define and quantify expenditures made in response to disasters, several documents and data sets from GoSL and development partners were analyzed (see “References and materials analyzed” above). In addition, semi-structured interviews were held with government staff and other stakeholders who have or are currently engaged in disaster risk management (see annex 2).

Consultations and document analysis were informed by the methodology outlined in the OECD (2017) paper “Managing Disaster Risk Related Contingent Liabilities in Public Finance Frameworks.” Six steps were followed to define, quantify, and assess options to manage contingent liabilities arising from natural disasters:

3. Collect, collate, and assemble available data on post-disaster expenditures (at the national and—where appropriate—subnational level) and on any budget reallocations.
4. Analyze the composition of post-disaster spending by entity, program, and line item, as appropriate and relevant (see box below).
5. Analyze the distribution of both dedicated and embedded funds across budget programs.
6. Identify any critical gaps in accounting, classification, and reporting.
7. Quantify contingent liabilities through direct estimation using historical expenditure data, and conduct basic probabilistic modeling using probable occurrence and related fiscal costs of a disaster.
8. Identify options for managing the identified contingent liabilities.

Having presented findings from these areas of enquiry, the report provides recommendations on options for managing contingent liabilities (chapter 5).

Government expenditures following disasters can include payments for the following costs:

1. Relief payments to affected populations.
2. Spending for the reconstruction of damaged public infrastructure and assets, particularly in case of damage to uninsured public corporation assets.
3. Cash transfers to public health facilities and to publicly owned, or guaranteed, insurance companies to address claims obligations.
4. An increase in short-term social transfers, such as health and medical support, temporary mortgage, and debt or tax relief, due to an economic slowdown that follows a disaster.
5. Expenditure to stimulate the economy following a disaster, e.g., support to key industries or businesses and providers of critical infrastructure, capital injections or loans to public or private corporations, or financial incentives for housing (re)construction.
6. Expenditures due to guarantees issued to public or private entities suffering disaster losses. The government may for example face pressure to finance the restoration of public services provided under a public-private partnership (PPP) contract if the PPP operator’s assets were not covered by disaster insurance.
7. Payments to subnational levels of government faced with fiscal constraints in the aftermath of a disaster.

Source: OECD 2017.

Annex 2: List of people interviewed

Interviews were conducted with the following people:

- Mr. Manjula de Silva, Chairman, National Insurance Trust Fund
- Mr. Sanath C. de Silva, Chief Executive Officer, National Insurance Trust Fund
- Mr. Jad Siriwardena, Assistant General Manager, National Insurance Trust Fund
- Ms. Nimali Pathirana, Assistant General Manager, National Insurance Trust Fund
- Mr. I. C. Pathiraja, Director, National Disaster Relief Services Centre
- Mr. S. G. Senarathna, Director General, Department of State Accounts, Ministry of Finance
- Mr. A. P. Kuvumbalapiriyel, Director, Department of State Accounts, Ministry of Finance
- Mr. L. P. Wewanlage, Assistant Director, Department of State Accounts, Ministry of Finance
- Mr. P. Algama, Director General, Department of Public Finance, Ministry of Finance
- Mr. T. Malean Ossen, Assistant Director General, Department of Public Finance, Ministry of Finance
- Ms. Nalani Amardunga, Director, Department of National Budget, Ministry of Finance
- Ms. Niroscha Narandeniya, Budget Assistant, Department of National Budget, Ministry of Finance
- Mr. Fonseka, Chief Accountant, Ministry of Disaster Management
- Mr. Ralph Van Doorn, Senior Economist, Global Practice for Macroeconomics, Investment and Trade, World Bank
- Ms. Tatiana Nenova, Program Leader for Equitable Growth, Finance and Institutions, World Bank
- Ms. Priyanka Dissanayake, Disaster Risk Management Specialist, World Bank
- Mr. Kishan Abeygunawardana, Country Economist, World Bank

Data were also collected and discussed with the following stakeholders:

- Mr. A. K. Seneviratne, Director General, Department of National Budget
- Ms. G. Wimalaweera, Additional Director General, Department of National Budget
- Ms. S. Yapa, Director, Department of National Budget
- Ms. A. Batagoda, Director, Department of National Budget
- Ms. N. Amratunge, Director, Department of National Budget
- Ms. S. Rupasinghe, Additional Director, Department of National Planning
- Ms. K. D. S. R. Perera, Additional Director, Department of National Planning
- Ms. S. Jayasinghe, Assistant Director, Disaster Management Centre
- Mr. N. Cooray, Assistant Director, Planning Division, Ministry of Disaster Management
- Ms. C. Fernando, Additional Secretary, Ministry of Disaster Management
- Ms. N. Dayanade, Legal Officer, Ministry of Disaster Management
- Mr. U. Chandradasa, Consultant, Ministry of Disaster Management
- Ms. M. Gunasekara, IT Officer, Disaster Management Centre
- Mr. D. Ariyaratna, Additional Secretary, Ministry of Irrigation
- Mr. S. Mohanraja, Director General, Department of Irrigation
- Ms. U. Priyantha, Chief Financial Officer, Department of Irrigation
- Mr. R. Kumarasiri, Chief Accountant, Ministry of Agriculture
- Mr. S. Ekanayaka, Assistant Director, Ministry of Agriculture
- Mr. D. Mathararachchi, Senior Program Director, Ministry of Roads and Highways
- Mr. P. Rathnayaka, Senior Program Director, Ministry of Roads and Highways
- Mr. D. Kumara, Chief Accountant, Ministry of Education
- Ms. D Kumari, Accountant, Ministry of Health
- Mr. U. Tennakoon, Secretary, Finance Commission

Annex 3: Population vulnerability by location and hazard

Distric	Vulnerability by hazard			Population (thousands)
Colombo	Flood			2,419
Gampa ha	Flood			2,391
Ka l uta ra	Flood			1,271
Kandy		Landslide		1,452
Mata le	Flood	Landslide		514
Nuwara-eliya		Landslide		756
Ga lle	Flood			1,113
Matara				851
Ha mba ntota			Drought	647
Jaffna			Drought	608
Mannar			Drought	107
Vavuniya			Drought	184
Mullaitivu			Drought	96
Kilinochchi			Drought	124
Battica loa			Drought	560
Am pa ra			Drought	705
Trincomalee			Drought	412
Kurunega la			Drought	1,694
Putta la m			Drought	814
Anuradhapura			Drought	918
Polonnaruwa	Flood		Drought	431
Badulla	Flood	Landslide		864
Mona raga la	Flood		Drought	485
Ratnapura	Flood	Landslide		1,151
Kega lle	Flood	Landslide		877
			Total	21,444

2017 population at risk (thousands)	
Flood	13,193
Landslide	5,614
Drought	7,785

Source: Compiled from the South Asian Disaster Knowledge Network (SADKN) portal, www.saarc-sadkn.org/countries/srilanka/hazard_profile.asp; and Department of Census and Statistics data.

Annex 4: Roles and responsibilities of government entities after a disaster

Post-disaster intervention	Government entity responsible
Provision of relief payments and supplies	Ministry of Disaster Management District Secretariats
Support for immediate relief and recovery efforts	Sri Lanka Armed Forces District Secretariats
Resettlement of affected communities and compensation payments	Ministry of Disaster Management (in conjunction with a cross-government Action Committee)
Rehabilitation of public assets and infrastructure	Line ministries State-owned enterprises (e.g., CEB) Provincial councils Office of the President
Expenditure to stimulate the economy—e.g., support to key industries and businesses	Ministry of Agriculture Ministry of Plantation Industries
Disaster-linked insurance payout	National Insurance Trust Fund Agriculture Insurance Board
Miscellaneous expenditure	Ministry of Finance Office of the President

Annex 5: National Policy on Disaster Management, 2014

The provisions of the policy that may affect expenditure decisions are included here exactly as they appear in the policy text (NCDM 2010).

Section 21

- Children affected by disasters should have access to continuous education where necessary;
- Affected persons should have documentation services for during early recovery period;
- Affected communities should have assistance for speedy recovery of disrupted livelihoods and market systems;
- Displaced persons and their properties, and people with special needs should have search and rescue services, care and protection;
- If individuals at relief centers need an extended stay, district administration should arrange additional services;
- In the event of re-settlement, houses should be adapted to beneficiary needs and respect accessibility standards as per national law. Houses should be provided only in locations suitable for human settlement and the housing should be designed and constructed with beneficiary participation;
- Counselling services should be available to address post-disaster trauma and other psychological needs of affected persons including into the long-term;
- Disaster management policies, legislations and regulations should respond to emerging needs, and minimize the impacts of disasters on society, economy, infrastructure and the environment.

Section 25

- Disaster-affected houses and settlements should be rebuilt with disaster-resilient features;
- Government should partner with non-government and civil society organisations to rehabilitate public and private infrastructures and properties damaged due to disasters as per agreed building codes and guidelines.
- In rehabilitation and reconstruction of houses affected by disaster, proposed housing policies and strategies in the National Housing Policy should be followed. In order to optimize the land utilization priority should be given to condominium property development.

Section 26

- Mechanisms should be in place to transfer or share risk among parties best-placed to manage it. A mechanism should be in place to obtain financial assistance on concessionary terms from international institutions, state and private sector financial institutions, civil society organisations and risk transfer schemes to reconstruct/repair and rehabilitate damaged properties, and for other recovery needs.

Section 28

- Fiscal resilience to disasters will be improved with efficient budgetary mechanisms, access to contingent credit and sovereign and private catastrophe insurance products. Development of such programmes will be confirmed by a Fiscal Disaster Risk Assessment.
- The fiscal disaster risk management program would be put in place with due consideration to the availability of post-disaster funds and the rapid execution of those funds. Fiscal and risk transfer mechanisms will be designed and implemented to ensure the availability of sufficient funds for recovery and reconstruction.

Annex 6: Ministry of Finance guidance on post-disaster expenditures

The Ministry of Finance has issued several circulars in recent years to guide post-disaster expenditures. Details of expenditure items and amounts in the National Budget Department Circular No. 03/2016(i) (Ministry of Finance 2017b) are provided below.

Relief guidelines for disaster victims in an emergency

Item	Existing upper limits of Circular No. 3/2016	LKR	Amended upper limits (Rs)
Emergency disaster relief/cooked meals (per day)	Cooked meal (per person per day)	225	300
Provision of dry rations (per week)	For single person	700	900
	Family with 2 persons	900	1,200
	Family with 3 persons	1,100	1,400
	Family with 4 persons	1,300	1,600
	Family with 5 persons	1,500	1,800

National Budget Circular No. 3/2016 (Ministry of Finance 2016b) provides further details on the provision of relief and restoration of damaged areas, as follows:

- Divisional secretaries and district secretaries should take necessary actions to provide relief in a disaster emergency, in coordination with any payment from NNDIS.
- Small-scale reconstruction activities (e.g., small-scale rural roads, small tanks, bridges) are the responsibility of relevant district secretaries. Additional funds for this work can be received from the Treasury.
- Large-scale reconstruction activities are the responsibility of different line ministries. “After estimation of the cost for the reconstruction of damaged infrastructure facilities in each district, the relevant line ministry should use existing provisions or additional provisions obtained from the Treasury.”

Annex 7: Post-disaster expenditure head and object codes

Head codes	Description	Head codes	Description
1	His Excellency the president	165	Ministry of National Integration and Reconciliation
8	Police	166	Ministry of City Planning and Water Supply
11	Office of the Finance Commission	176	Ministry of Ports and Shipping
24	National Procurement Commission	194	Ministry of Telecommunications and Digital Infrastructure
102	Ministry of Finance	198	Ministry of Irrigation and Water Resources Management
103	Defence	216	Department of Social Services
104	Ministry of National Policies and Economic Affairs	217	Department of Probation and Child Care Services
106	Ministry of Disaster Management	222	Sri Lanka Army
111	Ministry of Health, Nutrition and Indigenous Medicine	223	Sri Lanka Navy
114	Ministry of Transport and Civil Aviation	224	Sri Lanka Air Force
117	Ministry of Higher Education and Highways	225	Department of Police
118	Ministry of Agriculture	255-279	District secretariats
119	Ministry of Power and Renewable Energy	281	Department of Agrarian Development
120	Ministry of Women and Child Affairs	282	Department of Irrigation
121	Ministry of Home Affairs	283	Department of Forests
123	Ministry of Housing and Construction	285	Department of Agriculture
124	Ministry of Social Empowerment and Welfare	291	Department of Coast Conservation and Coastal Resource Management
126	Ministry of Education	304	Department of Meteorology
135	Ministry of Plantation Industries	306	Department of Sri Lanka Railways
140	Ministry of Hill Country New Villages, Infrastructure and Community Development	308	Department of Postals
151	Ministry of Fisheries and Aquatic Resources Development	312-319	Provincial councils
154	Ministry of Rural Economic Affairs	321	Eastern Provincial Council
155	Ministry of Provincial Councils and Local Government	325	Coast guard
161	Ministry of Sustainable Development and Wildlife	332	Department of National Community Water Supply



Photo: UN Photo / Evan Schneider

Object codes	Description
1501	Welfare programs
1504	Development subsidies
1509	Contribution to contingencies fund
1701	Losses and write off
1702	Contingency services
2001	Buildings and structures
2002	Plant, machinery, and equipment
2103	Plant, machinery, and equipment
2104	Buildings and structures
2203	Grants to provincial councils

Object codes	Description
2503	Contingency services
2504	Contribution to provincial councils
2509	Other
1508	Other
2202	Development assistance
2507	Research and development
2506	Infrastructure development
2105	Land and land improvement
2201	Public institutions

Annex 8: Government post-disaster expenditure

	2012	2013	2014
Total post-disaster expenditure (LKR)	5,068,071,800	6,383,206,800	9,076,354,500
National post-disaster expenditure (LKR)	4,231,178,000	5,606,640,000	7,517,034,000
Expenditure by MDM (LKR)	227,000,000	512,000,000	2,320,000,000
Expenditure by other departments & ministries (LKR)	3,947,558,000	5,025,030,000	5,165,084,000
Expenditure by RDA (LKR)	56,620,000	69,610,000	31,950,000
Provincial expenditure (LKR)	836,893,800	776,566,800	1,559,320,500
Total government expenditure (LKR)	1,589,419,305,000	1,756,028,650,000	2,024,889,737,000
Total government budget (LKR)	1,620,000,001,000	1,819,943,280,000	2,084,138,000,000
Total post-disaster expenditure as % of total government expenditure	0.32%	0.36%	0.45%
Total population	20,425,000	20,585,000	20,771,000
Post-disaster expenditure per capita (LKR)	248	310	437
GDP in current prices (LKR)	8,732,000,000,000	9,592,000,000,000	10,361,000,000,000
Total post-disaster expenditure as % of GDP	0.06%	0.07%	0.09%

Source: Ministry of Finance budget books for relevant years; Department of Census and Statistics data; financial reports from Ministry of Disaster Management and Road Development Authority; and proxies for provincial expenditure developed in consultation with the Finance Commission.

Note: MDM = Ministry of Disaster Management; RDA = Road Development Authority. Expenditure by MDM and RDA was obtained directly from the agencies in question; expenditure by other departments and ministries was obtained through analysis of the budget books (further details are in the table below). Proxies have been used to estimate expenditure by provinces.

	2012	2013	2014
Total post-disaster expenditure (LKR)	5,068,071,800	6,383,206,800	9,076,354,500
Total post-disaster expenditure in 2017 prices (LKR)	5,260,081,981	6,307,727,506	8,816,228,388
Real terms growth rate		19.92.	39.77.

The table overleaf provides details on Sri-Lanka's post disaster expenditure in 2017 prices. From 2010 to 2017, cumulative inflation was 6%. Whilst prices increased over the period, this alone does not account for increased post-disaster expenditure. Interestingly, a significant increase in expenditure took place between 2015 to 2016 and 2017. This may be accounted for by better financial data, or it may be that expenditure was particularly high in these years due to significant flooding events, or changes in Government policies (e.g. new relief guidelines, additional expenditure on infrastructure).

	2015	2016	2017	2018 est.	Total
	6,045,800,500	17,461,249,664	23,821,352,000	25,093,333,100	92,949,368,364
	4,251,427,000	15,139,388,664	22,026,415,000	22,929,415,000	81,701,497,664
	730,000,000	2,353,500,000	"Already accounted for in fig. above"	"Already accounted for in fig. above"	
	3,449,707,000	12,555,429,000			
	71,720,000	169,570,000	950,415,000	950,415,000	
	1,794,373,500	2,321,861,000	1,794,937,000	2,163,918,100	11,247,870,700
	2,356,884,857,000	2,364,894,464,000	3,827,570,576,000	3,973,522,200,000	17,893,209,789,000
	2,498,000,000,000	3,050,742,085,000	3,628,110,436,000		14,700,933,802,000
	0.26%	0.74%	0.62%	0.63%	
	20,966,000	21,203,000	21,444,000	21,687,739	
	288	824	1,111	1,157	
	10,952,000,000,000	11,839,000,000,000	13,098,000,000,000	14,271,000,000,000	78,845,000,000,000
	0.06%	0.15%	0.18%	0.18%	0.12%

	2015	2016	2017	2018 est.	Total
	6,045,800,500	17,461,249,664	23,821,352,000	25,093,333,100	92,949,368,364
	6,071,157,128	18,053,035,362	23,821,352,000		
	31.14	197.36	31.95		

The table below provides a breakdown of post-disaster expenditure by ministry, object code, and program name from 2012–2017. It does not include expenditure by the Ministry of Disaster Management, as this is accounted for separately. Nor does it include expenditure from the contingency fund under the Ministry of Finance. A proportion of this vote may have been used for post-disaster expenditure, in line with the Appropriation Act. In 2017 this vote was LKR 129,266 million.

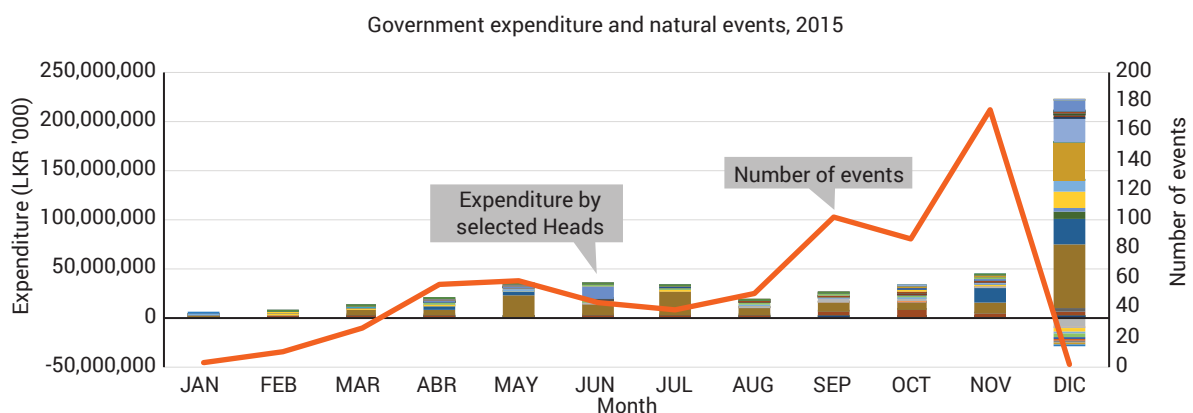
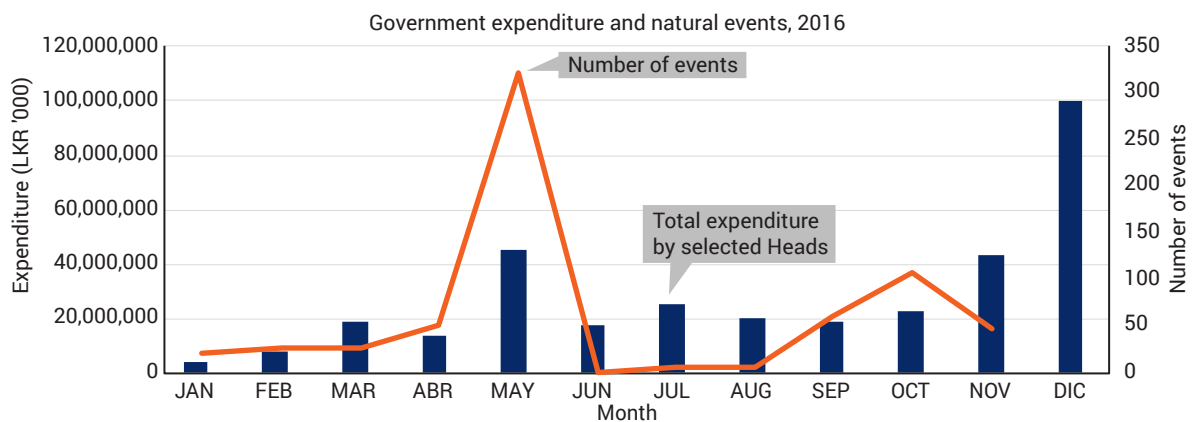
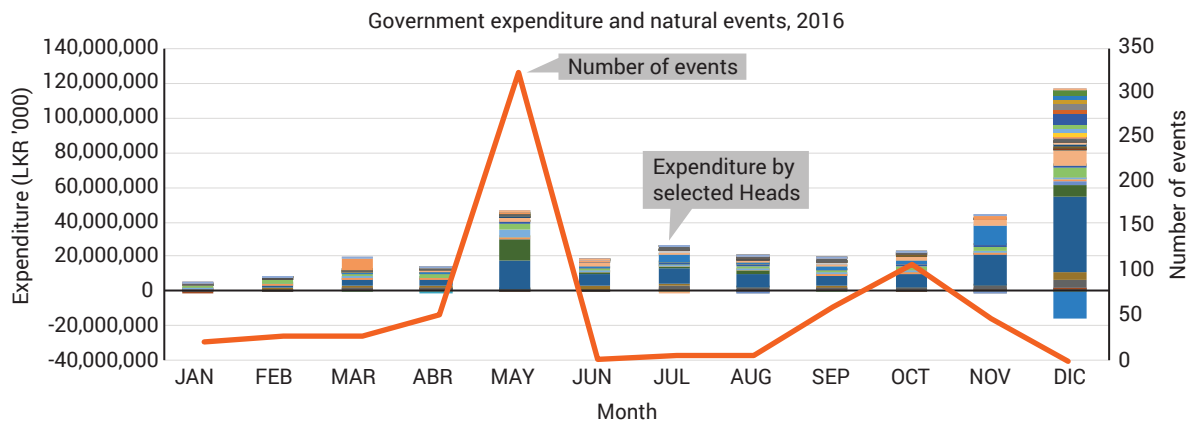
Head co Ministry	Object coy Description	2012	2013	2014	2015	2016	2017
	Total	3,947,	5,025,030	5,165,084	3,449,707	12,555,429	45,508,684
282 Department of irrigation	2001 Improvements to major irrigation works	23,558	55,000				
282 Department of irrigation	2001 Additions and improvements to existing irrigation works	17,547	47,000				
282 Department of irrigation	2105 Major irrigation schemes	3,808,840	4,152,760				
282 Department of irrigation	2105 Medium irrigation schemes	81,757	348,670				
111 Department of Health	2104 Tsunami emergency recovery - emergency health supply and rehabilitation	15,856	20,000	18,271			
119 Ministry of Power and Energy	1405 Emergency lighting programme	0	401,600				
240 Department of National Budget	1702 Other miscellaneous requirements					8,453,555	36,128,684
240 Department of National Budget	1702 Relief on farmer's loans						
240 Department of National Budget	1702 Insurance scheme for fishermen						
117 Ministry of Higher Education and Highways	2502 Rectification of slope failure project on southern expressway						
155 Ministry of provincial councils and local government	2504 Emergency response capacity project - contribution to provincial councils						
198 Ministry of irrigation and water resources management	2105 Schemes including emergency infrastructure - land and land improvements				557,067		
198 Ministry of irrigation and water resources management	2502 Schemes including emergency infrastructure - investments				791,878		
240 Department of National Budget	1702 Flood and drought relief						2,451,000

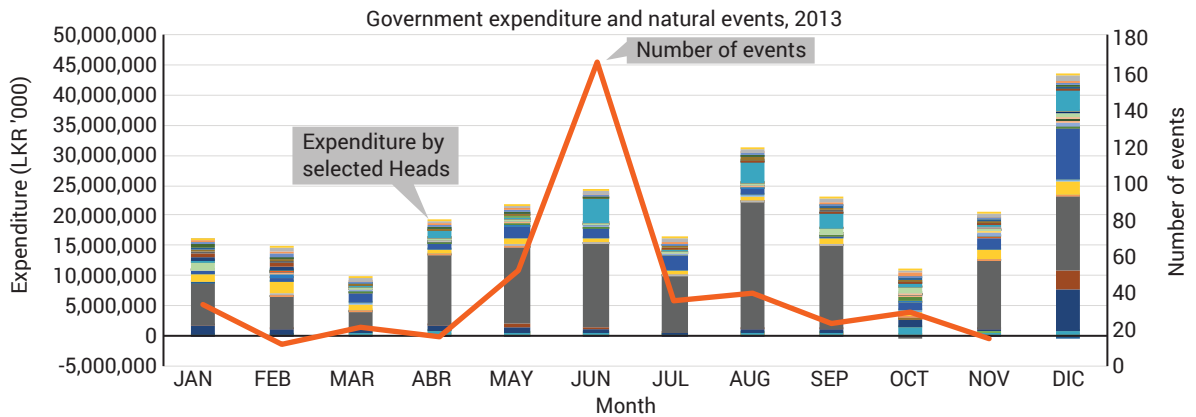
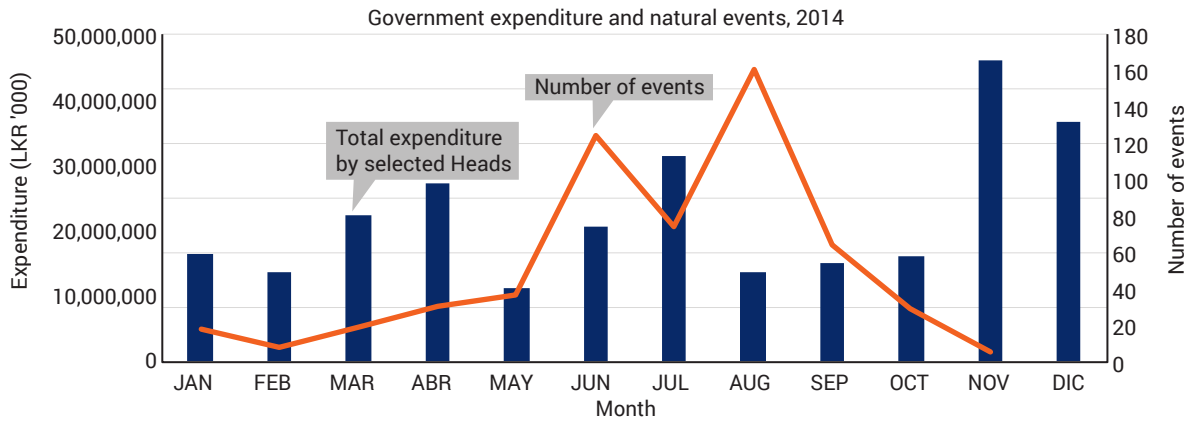
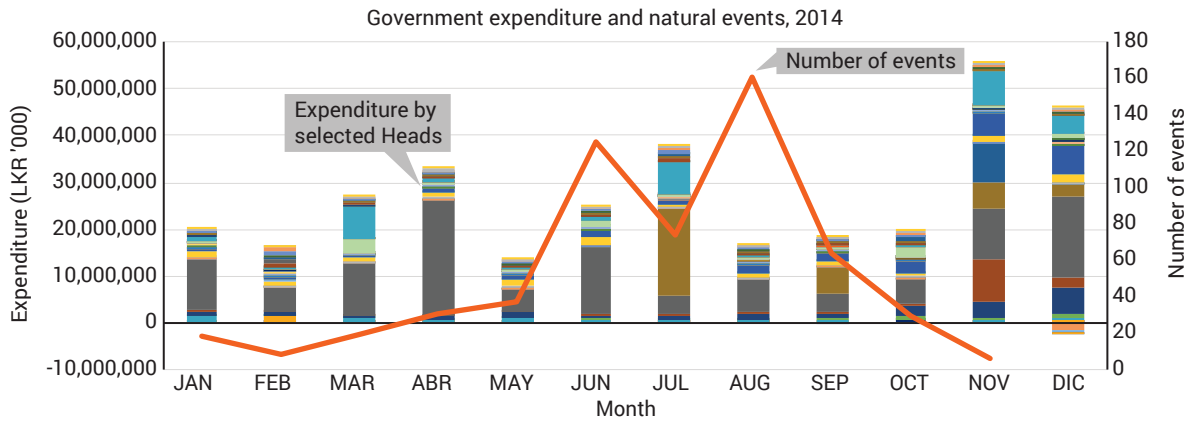
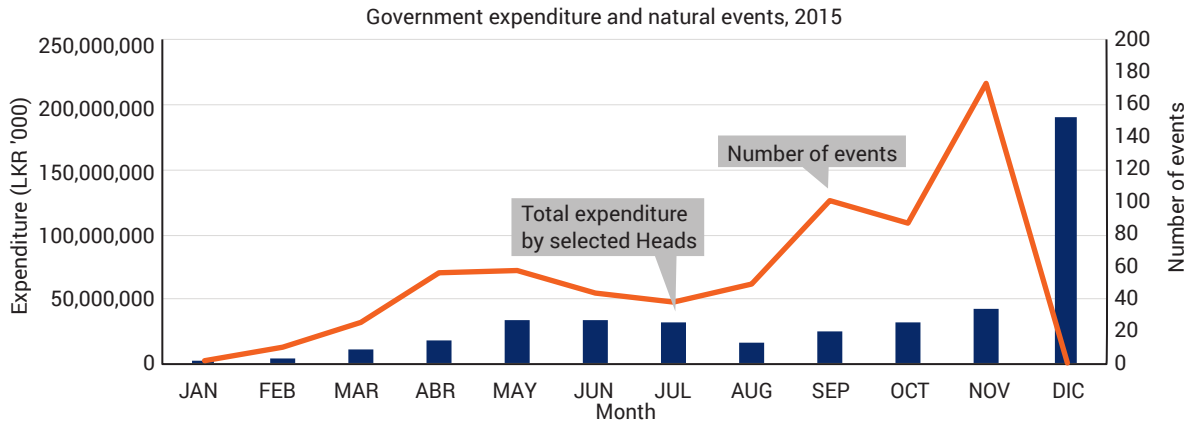
Head co Ministry	Object coy Description	2012	2013	2014	2015	2016	2017
240 Department of National Budget	2503 Rehabilitation of small tanks and channels						
240 Department of National Budget	2503 Assistance for constructing 1,000 rural houses in each electorate					v	
240 Department of National Budget	2503 Implementation of Natural Disaster Insurance Scheme providing insurance premium						
103 Ministry of defence	2502 Development of humanitarian search and rescue capacity						
104 Ministry of National Policies and Economic Affairs	2502 Food relief programme			383,166	770,857	632,874	
237 Department of National Planning	2502 Emergency natural disaster rehabilitation project			2,283			
117 Ministry of Higher Education and Highways	2104 Natural disaster rehabilitation project						
117 Ministry of Higher Education and Highways	2104 Landslide disaster protection project of national road network			19,400			
117 Ministry of Higher Education and Highways	2104 Rehabilitation and reconstruction of universities in the tsunami affected areas (GOSL/Kuwait)			10,000			
118 Ministry of Agriculture	1503 Agricultural and agrarian insurance board			2,100,300	2,276,000	2,690,000	2,700,000
118 Ministry of Agriculture	2201 Agricultural and agrarian insurance board			1,084,488	4,000	4,000	4,000
123 Ministry of Housing and Construction	2502 Urgent and essential repairs of government housing schemes			110,690			
151 Ministry of Fisheries and Aquatic resources development	2502 Post-tsunami coastal rehabilitation and resource management programme			2,293			

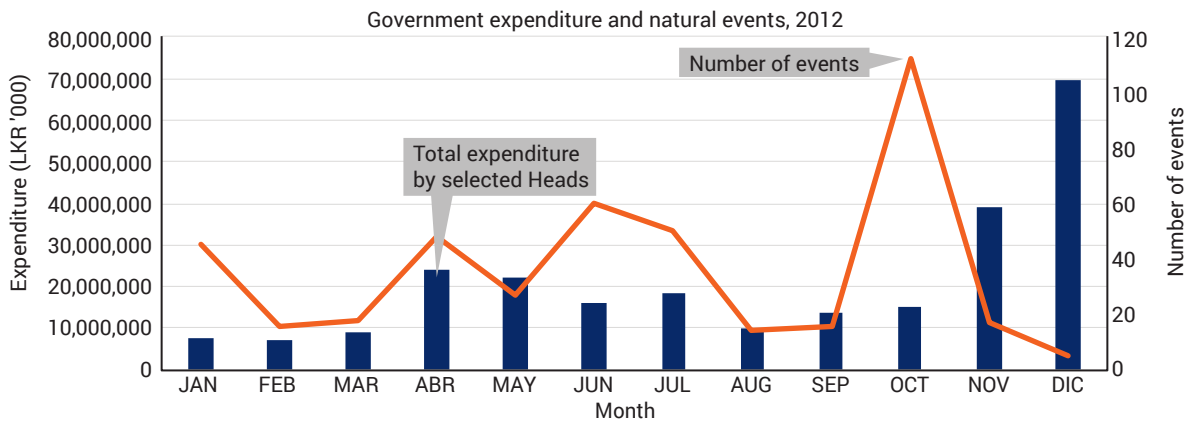
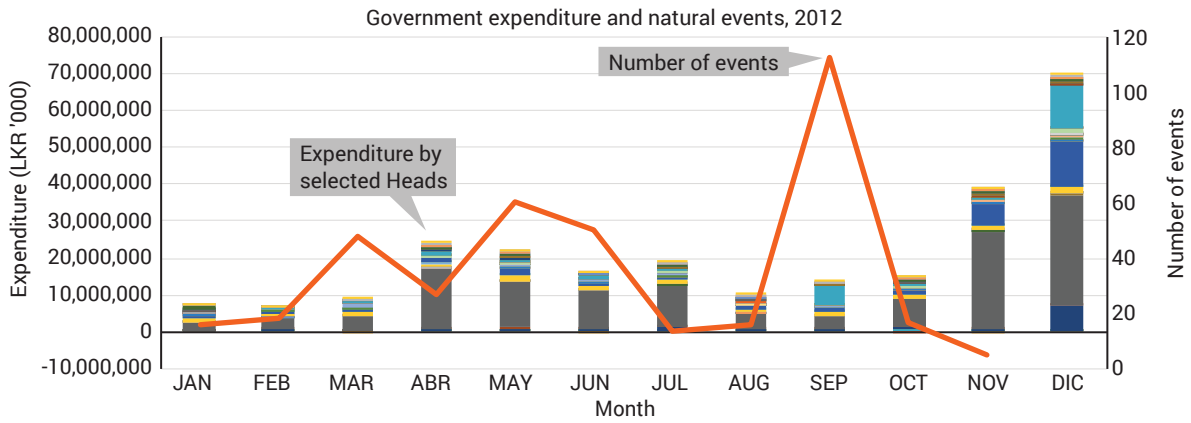
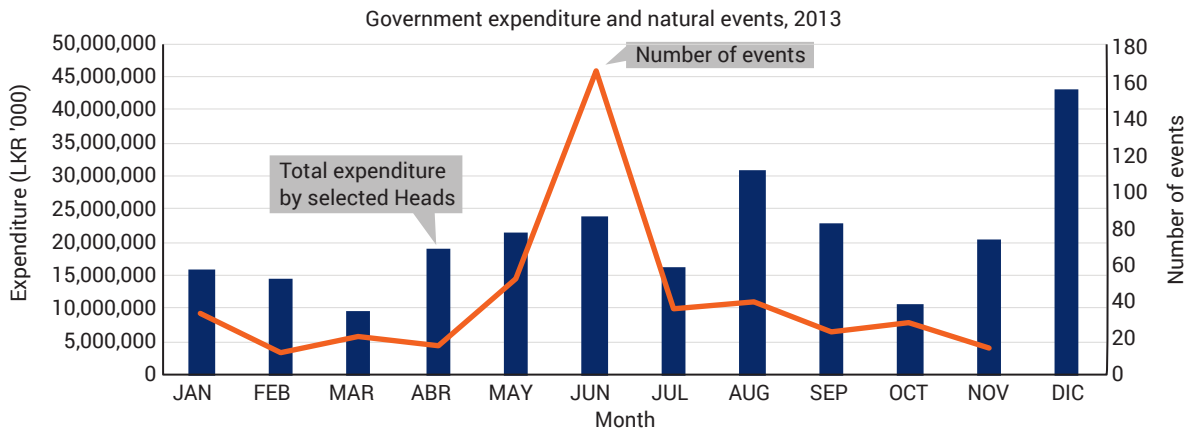
Head co Ministry	Object coy Description	2012	2013	2014	2015	2016	2017
151 Ministry of Fisheries and Aquatic resources development	2104 Coastal rehabilitation and resources management programme			39,222			
160 Ministry of Mahaweli Development and Environment	2502 Adaptation and mitigation of climate change impacts			1,225			
160 Ministry of Mahaweli Development and Environment	2502 Rehabilitation of major and medium irrigation scheme including emergency infrastructure					200,000	165,000
198 Ministry of irrigation and water resources management	2502 Emergency natural disaster rehabilitation project			34,283			
240 Department of National Budget	2503 Purchase 25 flat-bed boats for disaster management centre and fire brigade units of local authorities (B.P. no. 414)						250,000
240 Department of National Budget	2503 Increase the coverage of natural disaster and emergency relief scheme to Rs. 15 billion (B.P. No. 416)						200,000
240 Department of National Budget	2503 Restoration, rehabilitation and de-silting of 1,500 small tanks (B.P. No. 422)						3,000,000
111 Ministry of Health	2502 Disaster preparedness and response programme			10,518	2,574	10,000	10,000

Annex 9: Government expenditure and natural events, 2012–2016

The following graphs provide an overview of GoSL expenditure for certain head and object codes, month by month (the bars), charted alongside the number of natural events for a given year (the gold line) for the years 2012–2016. Each pair of graphs for the same year shows the same spending and same set of natural events, but the graphs on the left break down expenditure by entity, while the graphs on the right show total expenditure. The analysis indicates spikes in expenditure one to two months after a high number of natural events. A full breakdown of the codes used for the analysis is detailed in annex 7.







Annex 10: Probabilistic loss estimate calculations: Methodology and assumptions

Methodology

To aid in understanding of the analysis and results, the methodology followed is laid out below:

- Historical losses from property and roads were compiled, aggregated by event year. The data were sourced from a World Bank (2014b) paper—which took its data from the Desinventar database and a range of other sources, and followed a similar methodology to that carried out here—as well as PDNAs for 2016 and 2017 in Sri Lanka. Where loss data were unavailable, they were omitted.
- These historical losses were then expressed in historical U.S. dollars and Sri Lanka rupees, using historical inflation and exchange rate information. These were also expressed in terms of GDP using historical GDP figures.
- Historical losses may be subject to trends due to climate change, changes in resilience of the country, or other factors. The losses were tested and found not to be subject to a statistically significant trend.
- A range of statistical distributions were fitted to the loss data, and an appropriate distribution was selected to take forward based on tests of goodness of fit to the data as well as actuarial judgment.
- To identify losses according to the various return periods, 50,000 potential years of loss were then simulated from the distribution.

These losses were then scaled up to transform from property and road losses to total economic loss and scaled down to estimate the explicit public sector losses.

Key assumptions

- Losses to property and roads comprise 60 percent of the total economic loss. This assumption is based on the corresponding split of losses exhibited in the 2016 and 2017 Sri Lanka PDNAs. This is a simplifying assumption, as in practice this percentage may vary based on severity of loss and peril.
- Sri Lanka's exposure to risk is proportional to its GDP, and so adjusting losses for GDP growth is sufficient to allow comparison of losses from year to year.
- PDNAs and the Desinventar database contain accurate estimates of losses to property and roads in previous years.
- Historical losses are a reliable indicator of potential future losses.
- The chosen statistical distribution accurately represents the potential for losses in increasing extreme years.

The proportion of total losses made up of public sector losses is independent of the size of the total loss.



**Disaster Risk Financing
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