4

POVERTY, CLIMATE CHANGE AND DISASTER RISK REDUCTION

Too complex to evaluate?

Hazel Todd and David Todd

Climate change and poverty

This chapter explores the increasingly damaging effects of climate change on the global environment and observes that it is the poor, who are most severely challenged by this trend. “Weather-related events” are increasing in frequency and severity under Climate Change and in regions such as Asia-Pacific and the Caribbean disaster risk is outpacing resilience, posing severe limitations on poverty reduction. Many international interventions attempt to address the overlaps between climate change adaptation (CCA) and disaster risk reduction within a poverty reduction framework. Evaluation among international agencies has struggled to assess the progress and results of these efforts, given their exceptional complexity. While theory-based evaluation approaches have proved useful, they have often failed to find a suitable level of theory, which can provide clear findings and actionable lessons and recommendations. This chapter recommends an approach in which different levels of theory, from project through to the global environment, can be “nested” within each other, so that each addresses a specific aspect, while contributing towards evaluation of higher levels of social and environmental change.

Background

In the last two decades, substantial progress has been reported in addressing global poverty. This progress was catalysed by the Millennium Development Goals (MDGs), which were adopted by leaders of some 189 countries at the United Nations Millennium Summit in 2000.

By 2011, all developing regions, with the exception of sub-Saharan Africa, had achieved the target of halving the number of people living in extreme poverty.

The most populous countries in the world – China and India – played a major role in the worldwide reduction of poverty. The remarkable progress in China led to reduction in extreme poverty in Eastern Asia from 61 percent to 4 percent between 1990 and 2015. Southern Asia's progress has also been impressive, with a decline from 52 to 17 percent within the same time period, but with accelerated reduction since 2008.¹

According to the most recent estimates, in 2013, 10.7 percent of the world's population lived at or below \$1.90 a day. That's down from 35 percent in 1990 and 44 percent in 1981. This means that ending extreme poverty is within our reach. In April 2013, the World Bank set a new goal to end extreme poverty in a generation. The new target is to have no more than 3 percent of the world's population living on just \$1.90 a day by 2030.²

The MDGs were superseded by the Sustainable Development Goals (SDGs), which were adopted by all United Nations Member States in 2015. At the heart of the 2030 Agenda for Sustainable Development are 17 SDGs, which are an urgent call for action by all countries – developed and developing – in a global partnership. These recognise that ending poverty and other deprivations depends on implementation of strategies that improve health and education, reduce inequality, and spur economic growth – while tackling climate change and working to preserve oceans and forests.

Climate change was to some extent embedded in the MDGs, through MDG 7: “It is critical that the natural resources base and ecosystems are managed sustainably.” This focus was made more explicit and operational under the SDGs, with SDG 13 requiring countries to “Take urgent action to combat climate change and its impact.” Annual reporting on progress towards the goal is provided on the SDG website.³ However, this has largely focused on countries meeting process steps, such as communicating on Nationally Determined Contributions and on fund flows, rather than on progress towards the target of sustainable management. There is also some reporting on disasters and their potential relationship to climate change. However, this tends to be of a generic nature and does not permit exploration of the empirical interconnections between these phenomena, or between them and poverty. For example, it is reported that,⁴ “during the period 1998–2017, direct economic losses from disasters were estimated at almost \$3 trillion. Climate-related and geophysical disasters claimed an estimated 1.3 million lives”.

While there has been substantial progress globally with regard to poverty reduction (although with variable performance across regions), achievements with regard to climate change mitigation have been challenged by the apparently weak commitment of some major polluting countries to sign up to, still less meet, targets necessary to reduce greenhouse gas emissions. Although substantial and increasing funds have become available for adaptation efforts, the effects of these have been hampered by inadequate implementation capacity at country level and relatively slow release of committed resources by funding bodies.

FIGURE 4.1 Potential Effects of Climate Change on Poverty Reduction

In the light of these complex phenomena and interactions between them at all levels, from global to local, a critical emerging question is: Will climate change be a “killer blow” for poverty reduction? It is evident that, if mitigation measures are not effective, climate change will have major damaging effects on the global environment. These will be cumulative and probably irreversible. At national level, environmental damage will affect all aspects of society. The poor will be most severely impacted, since they are often directly dependent on natural resources for livelihood or live in the most fragile locations. Attempts to strengthen resilience through adaptation measures will have varying levels of effectiveness and are likely to be geographically dispersed, with many communities unsupported; while major challenges will be posed for the sustainability of adaptation gains, since these will often require continuing resource support, which will overstretch the resources of countries and international partners.

Given these factors, there is high potential for the progress, which has been made against poverty to be reduced or even reversed. If poverty reduction continues in a “business as usual” mode, the impacts of climate change are highly likely to increase, with particularly strong effects on the poor. The costs of delivering intended development pathways will substantially increase. This is illustrated in Figure 4.1.

Poverty–climate interactions

Climate effects, although ubiquitous and continuous, are most directly experienced through “weather-related events”, such as hurricanes, tropical storms and typhoons.

In urban areas, low-income communities are most affected by these events, because of such factors as inappropriate location (for example through susceptibility

to such forces as flooding and strong winds, poor drainage, sloping land), fragile housing quality and poor roads. In such areas houses and small-scale businesses are frequently damaged or destroyed, roads are washed away and schools and clinics closed down as extreme events strike. When this occurs, the poor have no income reserves and low access to credit to enable them to renovate or rebuild their homes and/or to recommence small-scale income generation activities.

In contrast, although affected by adverse events, non-poor households have more resilient houses, better access to services, insurance coverage and credit worthiness to recover. This being so, weather-related events increase inequalities in urban areas, including through effects on housing, income, education, employment and health-care; and often have disproportionate effects on women and children.

Poverty effects of weather-related events in rural areas are often even more severe than in urban centres. Overall, rural housing stock is often less robust than that of urban areas and is prone to severe damage or destruction, while possessions, animals and crops are all likely to be lost. Increased rural poverty promotes migration to urban areas, which weakens rural communities and economies, as well as contributing to urban inequality and challenging the provision of infrastructure and services in these areas.

Whether in urban or rural locations, two types of settlement are particularly affected by extreme weather events:

- Coastal communities, which are subject to sea surges, winds and heavy rain on often inadequately drained surfaces.
- Hillside/mountain communities, built on unstable land are subject to landslides and flash floods (which often cause fatalities), road collapse and resultant inaccessibility, which may last for some time. Such areas often cannot be reached by vehicles bringing rehabilitation equipment and supplies for some time and are also cut off from markets to obtain necessary supplies or sell products to restore their income.

Responding to climate change

Climate change mitigation activities are intended to protect the global environment by slowing down or eliminating negative climate change effects. While environmental benefits gained from reduced GHG emissions are often envisaged at the macro level and in the long term, interventions have been targeted at all levels, ranging from global agreements and funds, through national policies and strategies to local level activities.

Although climate change mitigation efforts may reduce aggregate climate change effects (assuming they are at a consistently high level and well-targeted), disasters will continue to occur, so disaster risk reduction must play a critical role, particularly for the poor.

Disaster risk reduction

Disaster risk reduction and the SDGs

Disaster risk reduction (DRR) must take account of the shifting risks associated with climate change and ensure that its measures do not accidentally increase vulnerability towards them. For example, hazard analysis has traditionally been based on historical data. This approach is no longer sufficient, since hazard characteristics are worsening as a result of climate change.

The principle of disaster resilience is central to the SDGs of the 2030 Agenda. As indicated under Goal 1, during the period 1998–2017, direct economic losses from disasters were estimated at almost \$3 trillion. Climate-related and geophysical disasters claimed an estimated 1.3 million lives. The Sustainable Development Goals are to be achieved through a comprehensive global framework of six separate but interrelated agreements, one of which is The Sendai Framework for Disaster Risk Reduction 2015–2030.

The Sendai Framework for disaster risk reduction 2015–2030

The stated outcome of the Sendai Framework is: “The substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries”. A major Goal contributing to attainment of this outcome is as follows:

Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience.

The Sendai Framework lists climate change as “one of the drivers of disaster risk”. Accordingly, in order to reduce disaster risk, it will be necessary to reduce the effects of climate change. While mitigation will play a critical long-term role in this process, for many communities around the world and particularly in the Asia-Pacific region adaptation measures will be essential in the short to medium term.

Climate change and disaster risk reduction across regions

The first section of this chapter has outlined the interconnections between climate change and poverty to date and how these may be expected to evolve in future. The connections are complex and operate at various social and economic levels. The poor are particularly vulnerable to climate change effects. Many of these effects are experienced as disasters; although others are long-term changes adversely affecting livelihoods of the poor over time, through such trends as increasing land aridity or salinity, which reduces the crop yields of marginal farmers on poor quality or vulnerable land. (These are sometimes brought into the disaster arena as “slow onset

disasters”). This section takes a brief look at some interactions between climate change and disasters in different regions and sub-regions and shows that, although each has its specific characteristics and may be affected by specific types of weather-related events, there are also common factors emerging across them.

Disasters in the Asia-Pacific region

Recent events such as floods across South Asia and typhoons in East Asia continued a series of catastrophes in the region, which is one of the most vulnerable in the world to natural disasters. According to the Asia-Pacific Disaster Report 2017, disaster risk is outpacing resilience in the region. It estimates that an average national disaster in the region leads to a 0.13 increase in the country’s Gini coefficient.⁵ Figure 4.2 illustrates some of the major events in the region in the last 50 years. Although earthquakes have had a major destructive impact, weather-related events, such as cyclones, typhoons and floods have also played a major part in reducing the economic and social potential of the region. Some estimates of the possible cost and numbers affected by such events are shown in Table 4.1.⁶

FIGURE 4.2 Some Major Disasters in Asia-Pacific 1970–2016⁷

TABLE 4.1 Some Estimated Impacts of Disasters in the Region

<i>Disaster impacts in Asia and the Pacific, 2016</i>			
	<i>Lives lost</i>	<i>People affected</i>	<i>Cost of estimated damage (\$ million current)</i>
Floods	3,250	13,787,307	35,846
Storms	880	6,345,793	11,409
Droughts	–	13,381,000	3,000
Extreme Temperature	336	158,100	1,727
Earthquakes	198	613,022	24,407
Other	323	240,480	835
Total	4,987	34,523,702	77,223

The Asia-Pacific Disaster Report (2017) suggests that in future the region could account for 40% of global economic losses resulting from disasters. Average annual GDP losses may be 4% for its Small Island Developing States and 2.5% for its Least Developed Countries.

Climate change has magnified the risk of disasters and increased their costs. As the climate system has warmed, the number of weather-related hazards globally has tripled, while the number of people living in flood-prone areas and cyclone-exposed coastlines has doubled – and these trends will increase. The impact of climate change will be felt particularly through periodic weather events such as monsoon rainfall and El Niño – as well as through heat waves, sandstorms, floods, cyclones and droughts.

South Asia

In South Asia, weather-related disasters present a major challenge, which is exacerbated both by climate change and by rapid population growth. “The entire population is vulnerable to change in climate and extreme events because of the low level of institutional capabilities, economic vulnerability, and great dependence on climate sensitive resources.”⁸ A broad range of DRR activities may substantially overlap with CCA measures, including “those related to hydrometeorological events such as drought-proofing, flood protection, cyclone warning and shelters, malaria eradication, resistant agriculture, mangrove conservation, saline embankment, and alternative livelihood development”.⁹

As with the East Asia and Pacific region discussed in Section “Disasters in the Asia-Pacific region” above, losses incurred from weather-related events are devastating: between 2005 and 2014, disasters were calculated to be responsible for 1.2 million deaths in southwestern and southern Asia, accounting for over 20% of all global deaths and led to economic losses of some \$80 billion in 2005 value.¹⁰

In the region, although climate change and disasters are clearly interlinked and overlapping, the institutional structures, legislative provisions and national and regional policies dealing with them have largely developed as independent strands. The implication of this trend has been well explored by Mall et al.¹¹ Their analysis shows that there is a lack of coordination and awareness among the nodal

agencies, which critically limits their proper functioning. In most cases, stand-alone adaptation and disaster reduction policies were found to exist and DRR including climate change adaptation policies seemed extremely challenging due to the involvement of multiple institutions within similar kinds of projects. In certain cases, duplication or even triplication in the execution of similar projects was identified, which often hindered the pace of effective execution in terms of both economy and benefit to the people. A lack of coordination also implies an excessive budgetary burden in executing similar types of projects and plans by different institutions and agencies.¹²

The Caribbean region

The Caribbean Development Bank (CDB) plays a major role in advising and supporting its Borrowing Member Countries (BMCs) in their efforts to combat poverty. Disasters, often in the form of weather-related events, are increasing in intensity and frequency in the region and often challenge these efforts. There are no agreed estimates of the economic impact of climate change on Caribbean countries¹³ in a “no adaptation scenario”. Such estimates are difficult because of rapid changes in global climate change projections as well as because of the limited climate model projections at suitable spatial scales available for the Caribbean, and the limited inventory of the Region’s environmental resources and assets. Various studies have estimated annual impact at anywhere between 5% and 30% of GDP. Even taken at the low end of this range, the impact of climate change on CDB’s BMCs is expected to be devastating to their long-term growth and development.¹⁴

As far back as 1998, CDB implemented a Natural Disaster Management Strategy and Operational Guidelines (NDMSOG), under which some 11.37% of the Bank’s total lending and technical assistance was expended in the period up to 2008. This was replaced by an updated Disaster Management Strategy and Operational Guidelines (DiMSOG) in 2009. The DiMSOG is intended to support and inform the following areas of CDB intervention¹⁵:

- a) Proactive assistance to BMCs to reduce risk through institutional strengthening, knowledge management, risk reduction measures and enhanced community resilience
- b) Post-disaster response
- c) Mainstreaming Disaster Risk Management into CDB’s grants and loans
- d) Effective collaboration by CDB with regional and national DRM partners.

The CDB Climate Resilience Strategy¹⁶ was approved in 2012. It seeks to develop and operationalise a robust environmental sustainability risk framework that explicitly considers climate resilience in CDB’s operations and assists BMCs and regional institutions to mobilise financing, and design and implement policies, strategies and investment programmes to address climate resilience and deliver on their sustainable development objectives. It notes that Disaster Risk Reduction is a priority for

the Bank and is acknowledged as a critical short-term response to climate change adaptation. The Bank will continue to provide assistance for post disaster rehabilitation and for mitigation interventions (under its DiMSOG); but will place greater emphasis on identifying/developing innovative risk transfer instruments and initiatives and building community resilience. Under the CRS, CDB intends to support BMCs to design and mainstream climate risk management strategies in regional, national and sectoral policies.

Although funding under the DiMSOG has intended to support countries to develop disaster risk reduction approaches, take up of funds for this purpose has been slight. To a limited extent, post disaster-response funding has incorporated an element of “building back better”, which may contribute to future DRR, but overall, countries have proved reluctant to borrow money to reduce disaster risks. Furthermore, in most of the countries concerned, active approaches to DRR are not strongly incorporated in national policies and strategies, so there is little impetus to borrow money in this area.

To some extent, the growing fundability of climate resilience and adaptation interventions appears to offer potential support to effective disaster resilience programmes. Many CDB activities funded under climate resilience are expected to raise the resilience and preparedness of countries for disasters, thereby reducing the need for separate disaster-specific funding. However, an evaluation by the Bank’s Independent Evaluation Office (IEO) found no evidence that the theoretical connections between the two strategies have yet been systematically realised. Projects in one area rarely specify the effects they will produce in the other, so that overall benefits are not maximised and the potential for duplication remains. Given the increasing intention to mainstream DRM, including on infrastructure projects, the use of Climate Risk Assessment as an input into project design will be an essential aspect of “building back better”, although the cost implications of responding to such assessments will need to be monitored. Such Assessment is one potential method to specify the overlap between climate and disaster related effects of investments.¹⁷

The IEO evaluation of the DiMSOG developed (retrospectively) a theory of change to help analyse the extent to which the strategy (in association with CCA approaches) has assisted Borrowing Member Countries to move towards poverty reduction. This is presented as Figure 4.3.

Overview of climate change adaptation and disaster risk reduction

As shown by a brief overview of these issues in three regions, the overlaps between disaster risk reduction and climate change adaptation have not been well recognised or incorporated into international, regional and national approaches to either of the two phenomena. Attempts to address both issues simultaneously are also rare. This partly reflects a “silo” approach emanating from the different institutional and funding streams through which climate change and disasters are addressed. The silo approach is ineffective since there are substantial issues, which could be more effectively addressed through collaboration, as shown in Figure 4.4.

FIGURE 4.3 Initial Theory of Change for DiMSOG

FIGURE 4.4 Overlaps Between Disaster Risk Reduction and Climate Change Adaptation

In terms of national and international development funding, common types of intervention, which call for effective collaboration between planners and implementers in the fields of CCA and DRR, include:

- Improved design, construction and maintenance of roads and bridges
- Housing standards and quality

- Quality of buildings and systems for continuous service provision: especially schools and clinics
- Design resilience of electricity, water supply, drainage and communications systems.

In terms of poverty reduction, it can be seen that most activities, which are currently addressed within approaches to DRR or CCA would previously have been funded as poverty-focused development interventions.

Evaluation challenges of interventions in overlapping areas

The evaluation repertoire

It has been demonstrated above that poverty, climate change and disaster risks are inextricably bound in complex and dynamic ways. These linkages operate at all institutional levels:

- global development and environment institutions
- regional environment and development institutions
- national policies and institutions
- governments, NGOs, CBOs, traditional institutions
- communities.

International development and environment support are provided by numerous agencies, many of which focus largely on one of the three elements – poverty, climate or disasters. Evaluation follows funding and largely targets individual elements rather than their interconnections. Most evaluations commissioned by international or national agencies draw on a set of relatively standard methods, which are combined differently according to the type and level of intervention, as shown in Table 4.2.

TABLE 4.2 Common Types and Methods of Evaluation at Various Levels of Intervention

<i>Level</i>	<i>Types of Evaluation</i>	<i>Predominant Methods</i>
Global/Cross-cutting	Overall Performance	Meta analysis, statistical analysis, big data, secondary data, case studies
Sectoral/Cross-cutting	Thematic Programme	Meta analysis, statistical analysis, secondary data, big data, field missions, case studies
Annual Cross-cutting	Annual Performance Report	Meta analysis, statistical analysis, secondary data
Country Portfolios	Country Office Country Portfolio	Field missions, case studies, document review, surveys, secondary data

Evaluation among international agencies

Can evaluation adequately address the increasing complexity posed by climate change and disasters?

The common types and methods of evaluation presented in Table 4.2 are conventionally framed under the umbrella of the “DAC Criteria” of relevance, efficiency, effectiveness and sustainability. A fifth DAC criterion, impact, is often left out of Terms of Reference for evaluations in view of its perceived complexity and long duration; or else it is intended to be addressed under sustainability, with which it is assumed to be related. The DAC criteria are in the process of review by the OECD.

While the DAC Criteria have played an important role in bringing a level of consistency across evaluations in the context of international development, they have not been found ideal for interventions targeting complex, multi-layered changes with a medium to long time-span: which characteristics include most interventions targeting poverty reduction, climate change mitigation and adaptation and disaster risk reduction.

In the extremely challenging global development context, those commissioning evaluations are increasingly focused on the urgent need to learn lessons, which can be applied to future interventions; rather than dwelling too much on accountability issues, which have traditionally been central to evaluations conducted within the framework of the DAC criteria. Since even the largest development interventions are in themselves a small contribution to the challenges facing the global environment and the societies, which depend upon it, the most important evaluation lessons for future interventions revolve around the issues of sustainability and impact. Given that an activity has been evaluated as (more or less) relevant, efficient and effective how will its approaches and results be sustained over time and scaled up to a more significant level?

The answer to this fundamental question is often the weakest link in completed evaluations for all levels of intervention. Indeed, it is common for evaluations to simply state that it is “too early” to make any assessment on these dimensions or to give speculative scenarios based on largely unsupported assertions of increased government resources and commitment. Intrinsic to this weakness is the possibility and temptation to treat each of the DAC criteria as an isolated box for evidence and interpretation, without considering the inter-relationships between them and, more specifically, the contribution the activity under evaluation is likely to make in the future. This critical gap in analysis often rests on the failure to answer a simple question during the evaluation inception phase, namely, how was this intervention intended to generate a lasting and scalable contribution to the issue it addresses? In fact, in many (possibly most) original project documents presented to evaluators, this is not at all clear.

The nearest most project document sets get to such a consideration provided by a Logical Framework document, which could potentially provide key inputs to understanding how the activity is expected to “work” in the long run. Unfortunately,

over time Log Frames became primarily a progress tracking tool, focused almost entirely on what could be counted with inadequate attention to where these “deliverables” were leading. Most of the essential information on how the intervention might contribute to intended long-term change was “parked” in a peripheral column of assumptions/risks, subjected to only the most cursory analysis.

Partly in response to the challenges and frustrations of evaluating the cumulative contribution of development interventions (including those related to environment and disasters) based on analysis using the DAC Criteria and information organised around a Log Frame approach, theory-based approaches emerged as a new platform for complex evaluations. These attempt to outline and assess the interconnections among the activities of an intervention and its environment, which will be necessary to generate the desired contribution to change, taking into account such factors as timescales and sequencing.

Refining theory-based approaches

Although theory-based approaches rapidly gained traction across the evaluation community, they also soon ran into practical challenges and often appeared to promote confusion among different types and levels of development practitioners. Some symptoms of these challenges included:

- Theories generated at institution-wide or portfolio-wide level proved too all-encompassing to be evaluated
- Decision-makers became frustrated at the failure of theories to deliver concrete performance information
- Different levels and types of theory are needed for use by policy makers and for portfolio, programme and project managers
- Evaluators need the most detailed theories of all, to enable them to explore cause and effect of progress along intended “impact pathways”.

Responding to such challenges, evaluators and practitioners moved towards an approach in which different levels of theory could be developed for empirical investigation and placed within an (eventually) over-arching theory of change for an intervention or set of interventions. This approach became identified as the use of “nested theories of change”, as illustrated in Table 4.3.

When approaching the evaluation of any complex intervention, whether at policy, strategy, programme or project level it is therefore critical to first focus on one main “level” of theory of change, appropriate to the key issues being addressed. For example, the evaluation may be of a programmatic intervention, with the theory of change primarily addressing this level. However, the “environment” surrounding the programme is also likely to influence the achievement of its objectives. Such “environmental” influences on the programme may come from a “higher” level, (such as the Global Development Architecture), from a thematic level (such as

TABLE 4.3 The Use of “Nested Theories of Change” to Help Evaluate Different Types of Issue

<i>Level for “nested ToC”</i>	<i>Type of Issues Covered</i>
Global ToC	Linkages poverty, CC and disasters in Global Development Architecture
Institutional/Corporate ToC	Policies, objectives, strategies, resource allocation, overall performance
Thematic ToC	Gender mainstreaming, social safeguards, capacity development
Sectoral/Focal Area ToC	Disaster Risk Reduction, Climate Mitigation, Climate Change Adaptation
Programme/Portfolio ToC	Specific Funds (e.g. Special Climate Change Fund), Country Programmes
Project ToC	Individual projects within or across countries

gender mainstreaming) or from a “lower” level, such as individual projects, which derive from or are supported by the programme. In addition to its detailed examination of progress along expected development pathways of its main theory of change, in this case for the programme, the evaluation should therefore also consider at a less detailed level the inputs and influences on it from other levels of the nested TOCs. For example, was an expected piece of legislation delayed or abandoned, with adverse effects on the programme? It should also consider the outcomes and influences from the focus programme into other levels of the nested theories. For example, has the programme influenced gender mainstreaming in the area targeted; such as CCA, DRR or poverty reduction? Has it enabled new projects to be conceived and implemented, based on its achievements?

By using this “nested theory” approach, evaluators can avoid the temptation to develop “mega-theories” of such scope and complexity that they can scarcely be conceived, still less evaluated. Such approaches hinder the production of usable evaluation conclusions and recommendations and make the derivation of lessons for the future extremely difficult. In turn this can lower the perceived “value added” of evaluation for practitioners operating in complex development fields. Given the increasing understanding of the interactions between poverty, climate change and disasters, the use of a “nested theories” approach offers evaluators a valuable tool to explore the different levels and types of issues, which have contributed to achievements and progress.

Notes

- 1 <https://www.mdgmonitor.org/>, accessed 24th October 2019.
- 2 <https://www.un.org/en/sections/issues-depth/poverty/>, accessed 24th October 2019.
- 3 See, for example, <https://sustainabledevelopment.un.org/sdg13>, accessed 24th October 2019.
- 4 <https://sustainabledevelopment.un.org/sdg13>, accessed 24th October 2019.

- 5 “Leave no One Behind. Disaster Resilience for Sustainable Development”. Asia-Pacific Disaster Report 2017. P. v. United Nations ESCAP, Bangkok.
- 6 Source: Asia-Pacific Disaster Report 2017, Table 1-1, P3.
- 7 Source: Asia-Pacific Disaster Report 2017, Figure 1-1, P4.
- 8 “Disaster Risk Reduction Including Climate Change Adaptation Over South Asia: Challenges and Ways Forward”, in International Journal of Disaster Risk Science (2019) 10:14-27. Rajesh K. Mall, Ravindra K. Srivastava, Tirthankar Banerjee, Om Prakash Mishra, Diva Bhatt, Geetika Sonkar.
- 9 Mall et al, P15.
- 10 “Disasters without borders—Regional resilience for sustainable development”. Asia-Pacific disaster report 2015. UNESCAP Bangkok 2016.
- 11 Mall et al., op.cit.
- 12 Mall et al., P21.
- 13 *Climate Resilience Strategy*, P1, Caribbean Development Bank, 2012.
- 14 Evaluation of The Caribbean Development Bank’s 2009 Disaster Management Strategy and Operational Guidelines. Final Report. Office of Independent Evaluation, July 2018. P12.
- 15 CDB. Op.cit. P13.
- 16 *Climate Resilience Strategy*, 2012–2017. CDB. 2012.
- 17 CDB, op.cit. P42.

References

- Caribbean Development Bank. *Climate Resilience Strategy*, 2012–2017, Barbados, 2012.
- Gutierrez, Miren, McFarland, Will, Fonua, Lano. *Zero Poverty, Think Again*. Overseas Development Institute (ODI), London. 2014.
- Mall, Rajesh K, Srivastava, Ravindra K, Banerjee, Tirthankar, Mishra, Om Prakash, Bhatt, Diva, Sonkar, Geetika. “Disaster risk reduction including climate change adaptation over South Asia: Challenges and ways forward”, *International Journal of Disaster Risk Science* (2019) 10:14–27.
- Office of Independent Evaluation, Caribbean Development Bank. “Evaluation of the Caribbean Development Bank’s 2009 disaster management strategy and operational guidelines. Final Report.”, Barbados. July 2018.
- United Nations. “Disasters without borders—Regional resilience for sustainable development”. *Asia-Pacific disaster report 2015*. UNESCAP Bangkok, 2016.
- United Nations. “Leave no one behind: Disaster resilience for sustainable development”. *Asia-Pacific Disaster Report 2017*. UN ESCAP, Bangkok. 2017.
- United Nations. Sendai framework for disaster risk reduction 2015—2030. UNISDR, Geneva, 2015.

Websites

- <https://www.mdgmonitor.org/>, accessed 24 October 2019.
- <https://www.un.org/en/sections/issues-depth/poverty/>, accessed 24 October 2019.
- <https://sustainabledevelopment.un.org/sdg13>, accessed 24 October 2019.