MAPPING FINANCIAL FLOWS FOR DISASTERS

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STRENGTHENING RESILIENCE AND RESPONSE TO CRISES

Abstract

A variety of financial flows are mobilised to help prepare for, mitigate and cope with disaster impacts. How much, from whom, and through which channels, however, is often not well understood, and remains difficult to track. This paper aims to identify available data and methodologies, explore whether these could support a global database to track disaster-related financial flows, and map financial flows to three events in order to outline the scope and limitations of available information: Typhoon Haiyan in the Philippines; the 2015/2016 El Niño-induced drought in Malawi; and Hurricane Maria in Dominica.

The paper finds that major gaps remain in publicly accessible databases and methodologies, particularly around government budget (re)allocations and public and private domestic flows, but also in international aid and remittances. The extent to which losses and damage from disasters are being recovered—and nationally identified post-disaster needs are being met through the types of financial flows assessed in this paper— varies greatly between the three events studied. If well managed and frequently updated, national information management systems could support better financial tracking.

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CENTRE FOR DISASTER PROTECTION

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EXECUTIVE SUMMARY

Purpose of the report

Disasters related to floods, droughts, hurricanes or other natural hazards threaten lives and livelihoods of affected populations and impact national economies. Emergency response, recovery and reconstruction from disasters are costly and ex post financial flows such as international humanitarian aid that aim to help address financial needs are often unpredictable and late. Under current disaster financing systems, relatively little money is made available to reduce or mitigate expected impacts and prepare in advance, even when forecasts indicate that an event is likely to occur.

Before, during and after a disaster, there can be a great variety of financial flows directed towards different actors to help them prepare for, mitigate and address disaster impacts. This includes flows from various international, regional or domestic public and private sources, which are delivered through a diversity of channels. Often, flows pass through several institutions from origin to destination, for instance when funds from multiple donors are pooled.

This diversity and complexity of financial flows makes tracking them at global level or for specific events and countries challenging. Recent advancements such as the International Aid Transparency Initiative (IATI) launched to increase transparency of aid spending have started to enhance reporting in the humanitarian sector. Yet, the picture presented in global databases remains patchy and biased towards traditional donors of bilateral aid, while comprehensive information on other flows, particularly private and domestic, is scarce.

In an effort to contribute towards a better understanding of financial flows for disasters, this report aims to:

(1) identify available data and methodologies and explore whether these could support a global database to track disaster-related financial flows, and
(2) map financial flows for three recent case studies to outline the scope and limitations of available information.

The case studies presented in this report include Typhoon Haiyan / Yolanda in the Philippines, the 2015/2016 El Niño-induced drought in Malawi and Hurricane Maria in Dominica in 2017.

Main findings

While official international financial flows linked to natural hazard-related disasters are fairly well documented through existing global databases and donor reporting, information on domestic budget (re) allocations and domestic public and private flows is less readily available and much more difficult to capture without in depth research on the ground.

At global level, a range of previous studies have assessed surges in different types of flows, mainly including international aid, migrant's remittances and private equity flows. However, some of these approaches are only applicable to larger samples and not suited for analysing individual country or event case studies because of their underlying assumptions. Furthermore, existing global data on international aid flows is not without its challenges: databases such as UN OCHA's Financial Tracking Service (FTS) or the OECD's Creditor Reporting System (CRS) only capture a share of international humanitarian financial flows for disasters and linking flows to specific events or types of events based on currently available data is time consuming in some instances and impossible in others.

The main reasons for under- or misestimation of flows encountered in this study were incomplete, non-standardised reporting of varying quality and a lack of attribution of flows to specific emergency events.

Case studies show that a more comprehensive picture of disaster-related financial flows can be obtained by combining a range of different sources of information.

The methodology proposed for that purpose in this report

consists of three steps:

(1) **Presenting an overview of disaster impacts.** This step serves to set financial flows into context and can build on global databases (such as EM-DAT, NatCAT Service, Sigma, Desinventar), post-disaster needs assessments, government or humanitarian reporting, among other sources of information.

(2) **Extracting data on financial aid flows from global databases.** The UN OCHA's Financial Tracking Service (FTS) provides data on some public and private humanitarian aid flows that can, with limitations, be linked to natural hazard-related disasters at country or regional level and provide a starting point for further detailed analysis.

(3) **Complementing global databases with information on other flows.** This includes, for example, reporting against national or regional appeals, post disaster needs assessments, press releases of donors and multilateral financial institutions, government plans, reports, and budgets.

While this approach is well suited for individual case studies, aggregating data from individual events and countries in this way is time and resource intensive for the purpose of mapping flows globally. This is especially the case in the absence of standardised reporting of financial flows for disasters by countries.

If well-managed and frequently updated, national information management systems could help to track financial flows for disasters more comprehensively than it is possible based on the existing international databases. However, the case studies in this report indicate that these are not always maintained beyond one or a few events. In Malawi, where a continuous system exists, the information it contains about flows for specific disasters such as the 2015/2016 El Niño is less comprehensive than the FTS database.

Though not all flows could be uniquely linked to a specific point in time for the global snapshot and country case studies, the general picture emerging from the study is that the **vast majority of funds is spent on relief, recovery and reconstruction, while only minor shares are allocated to disaster prevention, mitigation and preparedness.** Globally, this share is at 7 percent over the period 2000 to 2016.

The extent to which losses and damage from disaster are being recovered and nationally identified post-disaster needs are being met through the types of financial flows assessed in this report varies greatly between case studies. This may in part be because other important flows, for instance from private donors or through informal networks, are not captured in the methodology and vary between countries; because initial impact and needs assessments are over- or underestimated in some cases; or because some disasters attract greater donor response than others, for instance due to a country's income level, political circumstances or media coverage of disasters.

Recommendations

Several options exist to enhance mapping of disaster-related financial flows. They include entry points at national and global level that build on the methodology used in this report and are not mutually exclusive. Irrespective of which option(s) are pursued, there should be a clear strategy for informing or changing policy and practice around disaster-related financial flows behind it to ensure the way in which data is captured, processed and presented can be driven by purpose. Options include:

(1) Enhancing the database for global financial flows towards natural hazard-related disasters: The FTS database currently provides the most frequently updated, openly accessible and detailed information about international humanitarian aid flows that can be disaggregated for natural hazard-related disasters.

Because of the details on individual pledges, commitments and disbursements it entails, FTS is the most suitable starting point available to map international aid flows towards natural hazard-related disasters. Importantly, for this purpose, the database already links some flows to specific emergency events. Relevant flow records that are not yet linked to an emergency could be identified through a text search by emergency type (for example 'flood', 'hurricane', and 'drought') or names of larger events within these descriptions. Inventories of past disasters could further refine a text search. This would greatly increase the comprehensiveness of what can already be identified as flows towards natural hazard-related disasters based on the existing FTS emergency categories. As such, it is the 'lowest-hanging fruit' for enhancing the mapping of

financial flows for natural hazard-related disasters at global level.

(2) Mapping financial flows for country or event case studies: For specific countries or events of interest, the methodology suggested in this report could be applied to generate additional case studies. Depending on the time and resources available for the exercise, more detail and additional flows to those included in this study may be captured. In any mapping and aggregation exercise, issues of potential double counting; the difference between pledges, commitments and paid contributions or disbursements; definitions and attribution of flows to specific markers or categories; and timelines for flows and reporting need to be considered. For comparison over time and across countries and over time, inflation also needs to be accounted for.

(3) Enhancing tracking of financial flows for disasters at national level: As evident from the case studies in this report, limited information is publicly available and readily accessible about financial flows for disasters at national level. Some countries have worked towards building or strengthening national Aid Information Management Systems (AIMS) and started incorporating data from budgets and information on other flows. However, tracking disaster-related financing remains challenging for Governments. A next step in this regard would be to produce more detailed guidance for tracking at national level, accompanied by training and promotion to support Governments in undertaking more systematic accounting of disaster-related financial flows. To the extent possible, this should build on existing national systems and guidance for related processes already in operation. An online platform or data repository would be useful to compile data from across countries and would help to establish good practice in disaster risk financing accounting. Continuity and maintenance of such a platform would need to be ensured.

(4) Clarifying classifications for financing early action ahead of anticipated disasters in global databases Increasingly, global funds, donors and international multilateral, as well as non-governmental, organisations are using a variety of forecasting systems to trigger the release of resources before an extreme event occurs or before a critical situation that is being monitored develops into a full-fledged disaster. This is usually referred to as anticipatory humanitarian action, Forecast-based Early Action (FbA), rising commitment to make financial flows available earlier in order to prevent, mitigate and better manage anticipated disaster impacts has been shifting timelines for disaster-related financing. This is not currently well reflected in any of the global reporting platforms. It is important, however, to generate an enhanced understanding of flows that are released pre-disaster based on forecasts or early warnings in order to better assess the scale and effectiveness of forecast-based release of financial resources. Tracking this information could also help increase accountability for financing and acting early. Such an approach could be facilitated through more explicit definitions and/or additional (sub) categories in classifications of databases such as CRS.

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LIST OF ABBREVIATIONS

AIADB	Asian Development Bank
AIMS	Aid Information Management System
ARC	African Risk Capacity
CAAP	Civil Aviation Authority of the Philippines
Cat DDO	Catastrophe Deferred Drawdown Option
CCRIF	Caribbean Catastrophe Risk Insurance Facility
CDB	Caribbean Development Bank
CDEMA	Caribbean Disaster Emergency Management Agency
CERF	Central Emergency Response Fund
CRED	Centre for Research on the Epidemiology of Disasters
CRS	Creditor Reporting System
CRW	Crisis Response Window
DAC	Development Assistance Committee
DAT	Disaster Aid Tracking
DCCMS	Department of Climate Change and Meteorological Services
DILG	Department of the Interior and Local Government
DOMLEC	Dominica Electricity Services Limited
DPWH	Department of Public Works and Highways
DTI	Department of Trade and Industry
ECF	Extended Credit Facility
FAiTH	Foreign Aid Transparency Hub
FAM	Famine Action Mechanism
FbA	Forecast-based Early Action
FbF	Forecast-based Financing
FONDEN	Fondo de Desastres Naturales (Natural Disaster Fund)
FTS	Financial Tracking Service
GCD	Government of the Commonwealth of Dominica
GRiF	Global Risk Financing Facility
GSIS	Government Service Insurance System
IATI	International Aid Transparency Initiative
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IMF	International Monetary Fund
MWK	Malawian Kwacha
NDRRMF	National Disaster Risk Reduction Management Fund
ODA	Official Development Assistance
PCRAFI	Pacific Catastrophe Risk Assessment and Financing Initiative
PDNA	Post Disaster Needs Assessment
PHP	Philippine Peso
QRF	Quick Response Fund
RAY	Reconstruction Assistance on Yolanda
RCF	Rapid Credit Facility
RFI	Rapid Financing Instrument
SADC	Southern African Development Community
UNHCR	United Nations High Commissioner for Refugees
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
XCD	East Caribbean Dollar

CHAPTER 1

INTRODUCTION

The recent 2017 Atlantic Hurricane Season was recorded as the costliest in history. A series of hurricanes, including Harvey, Irma, Maria and Nate, caused unprecedented destruction across the United States and the Caribbean and resulted in an immense strain on populations and national economies. Hurricane Maria, for instance, was estimated to have resulted in loss and damage amounting to 226 percent of Dominica's Gross Domestic Product. Even in cases where direct macroeconomic impacts are relatively less pronounced, natural hazard-related disasters such as the El Niño induced drought in Malawi in 2015/2016 leave people 'struggling to survive'[1]. Emergency response, recovery and reconstruction from disasters are costly and ex post financial flows such as international humanitarian aid are often unpredictable and late. It also appears that under current disaster financing systems, little aid is made available to reduce or mitigate expected impacts and prepare in advance, even when forecasts indicate that an event is likely to occur.

The disaster financing landscape reaches beyond the humanitarian sector, including various international, regional or domestic public and private sources and a diversity of channels through which resources are delivered. Often, flows pass through several institutions from origin to destination, for instance when funds from multiple donors are pooled. Disaster-related financial flows can be spent or arranged ex ante, i.e. before a disaster occurs, for instance through investing in measures to reduce disaster risks, by sharing out funds based on a forecast, or by putting in place instruments to retain and transfer risks that release resources once a disaster occurs. Ex post financing is arranged after a disaster. This includes instruments such as post-disaster aid, tax increases or budget reallocation[2]. This diversity and complexity of financial flows makes tracking them at global level or for specific events and countries challenging. Recent advancements such as the International Aid Transparency Initiative (IATI) launched to increase transparency of aid spending have started to enhance reporting in the sector. Yet, the picture presented in global databases remains patchy and biased towards traditional donors of bilateral aid.

In an effort to contribute towards a better understanding of financial flows for disasters, the purpose of this report is twofold. Firstly, it aims to identify available data and methodologies and explore whether these could support a global database to track

1 https://malawi.savethechildren.net/news/struggling-survive-effects-el-ni%C3%B1o-malawi.

2 For a more detailed overview of disaster risk financing instruments and definitions see Table 7.1 in Clarke and Dercon (2016).

disaster-related financial flows. Secondly, it intends to map financial flows for three recent case studies - Typhoon Haiyan / Yolanda in the Philippines, the 2015/2016 El Niño in Malawi and Hurricane Maria in Dominica - to outline the scope and limitations of available information.

The report concentrates on assessing flows that are publicly reported. This includes official international humanitarian assistance captured through platforms such as the OECD's Creditor Reporting System or UN OCHA's Financial Tracking Service. For the three selected case studies, this is complemented with further information on additional financial flows, for example on private flows, support from multilateral development banks or domestic government budget allocations, where data is readily available and accessible. The main emphasis of the proposed methodology is on capturing the magnitude and timing of different financial flows for specific disasters or country case studies. This report does not analyse the costs related to securing or delivering different types of flows, it merely aims to show what was made available for previous events and when. It also needs to be noted that the report focuses on flows disbursed for addressing natural-hazard related disasters. These include disasters which are directly linked to geophysical, hydrological, meteorological and climatological events[3]. While other shocks such as conflicts, epidemics or financial crises are not explicitly considered, these can coincide with natural-hazard related disasters, exacerbating disaster impacts and making it difficult to disentangle financial flows according to destination and purpose.

The following Chapter 2 presents a typology of financial flows for disasters. Chapter 3 goes on to outline the different available sources and methodologies for mapping various types of flows. Building on this overview, Chapter 4 presents the methodology used for the three case studies in this report. Results are presented with a snapshot of financial aid flows for disasters in chapter 5 and case studies of the Philippines, Malawi and Dominica in Chapter 6. The report concludes with a summary of findings and options for further enhancing mapping of financial flows at global and case study level.

3 For more details on definitions used, see Annex 1.

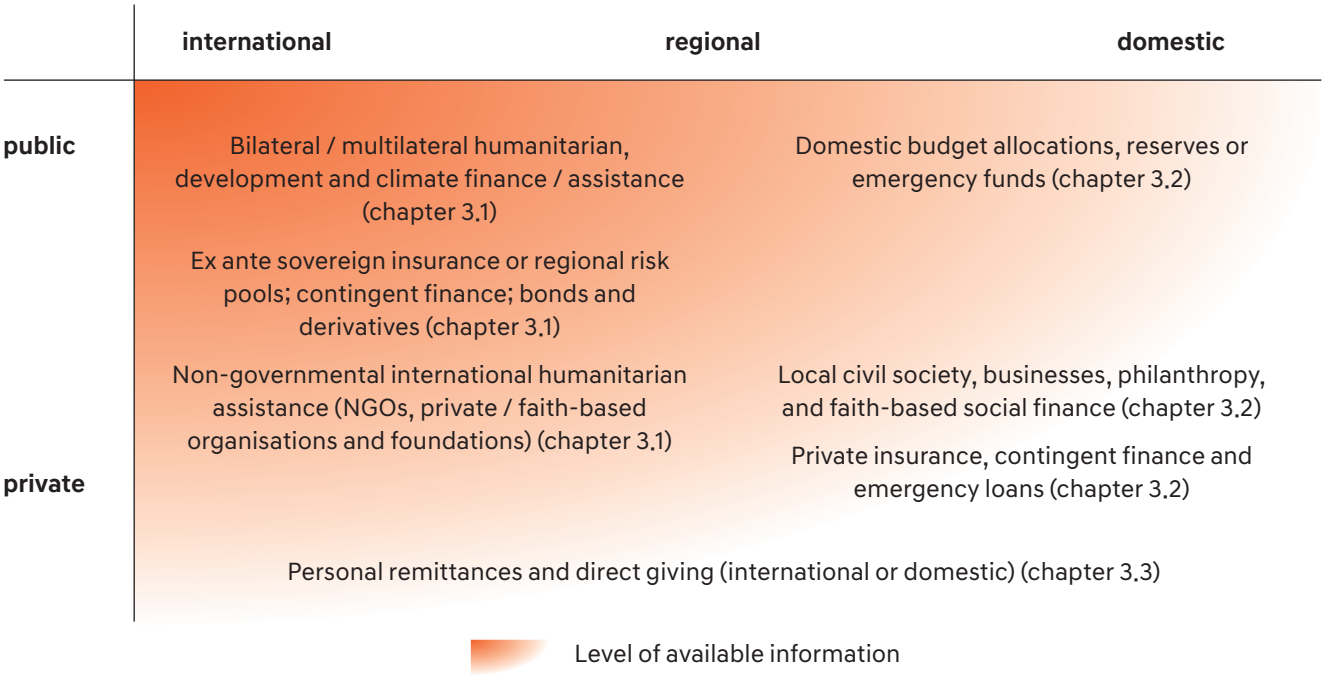
CHAPTER 2

TYPES OF FINANCIAL FLOWS FOR DISASTERS

Types and sources of financial flows for disasters are diverse and complex. They also encompass a variety of purposes, ranging from risk reduction investments across emergency preparedness to rapid response, recovery and reconstruction (Watson et al., 2015). Financial aid for natural-hazard related disasters can come through public international or domestic flows, such as those provided by donor governments directly or through international organisations; and those from national government budgets in countries affected by disasters. Furthermore, it can be provided by a variety of private or unofficial sources, for instance through non-governmental organisations or private foundations, as well as in the form of direct giving and remittances.[4]

In comparison to other types of flows, there is relatively good open access to data on public international flows for disasters through various initiatives and databases invested in tracking them (though each of these have their own challenges or blind spots as outlined in chapter 3.1). The picture for official domestic and non-official global flows is not as clear and readily available data is less comprehensive. Very little data is publicly available on domestic unofficial flows for disasters (Figure 1) and what exists varies greatly in quality (Willits-King et al., 2018)

Figure 1: Types of financial flows for disasters considered in this report

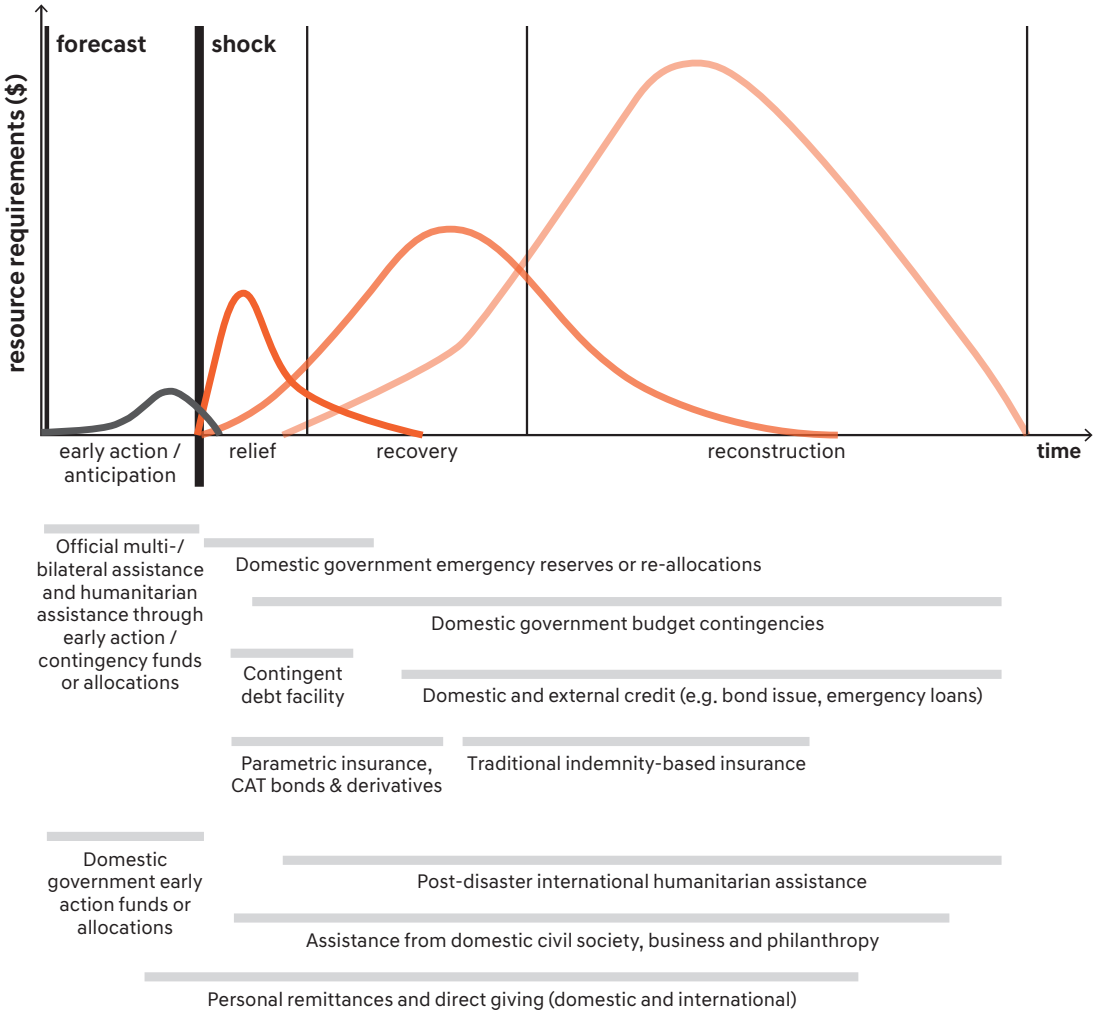


4 For a more detailed typology of crisis resource flows in a humanitarian context, see Willits-King et al., (2018).

Financial flows in relation to a disaster might be released before, during or after the event. Flows can include resources made available through ex ante financial instruments such as contingent budgets, reserve funds, contingent credit or risk transfer. In addition, governments, organisations and households may rely on ex post, ad hoc financial flows, for instance through budget reallocations, tax increases (in the case of governments), post-disaster borrowing or donor assistance (Clarke and Dercon, 2016).

This report focuses on the financial flows for specific disasters rather than on the instruments through which they are released[5]. Nonetheless, it needs to be noted that various types of financial flows for disasters are disbursed at different points in time. The instrument through which funds are released critically influences when financial resources typically become available and, consequently, when and how they can be tracked. Figure 2 exemplifies when various financial flows may be released for early action, disaster relief, recovery and reconstruction. As shown in the figure, early action, relief, recovery and reconstruction phases typically overlap and can be more long-term than depicted in the simplified graph.

Figure 2: Release of financial flows from along a disaster timeline



Source: Adjusted and expanded from Ghesquiere and Mahul (2010), based on input from Pablo Suarez.

5 This means, costs related to setting up and managing different types of instruments or systems through which money flows are not explicitly considered here. This may include investments in early warning systems and risk assessments, operational costs of running emergency funds, or premiums for insurance coverage, which need to be taken well in advance and are not necessarily linked to one particular disaster event. Other existing guidance notes can provide more detailed information on how to assess disaster risk financing instruments, for instance as part of a disaster risk finance diagnostic at national government level (see for example Alton et al., 2017; IMF, 2016).

CHAPTER 3

EXISTING DATA AND METHODOLOGY - OPPORTUNITIES AND CHALLENGES FOR TRACKING FINANCIAL FLOWS FOR DISASTERS

The following sub-chapters present and discuss available sources for tracking financial aid flows for disasters at global, regional and national level. Next to the presented approaches that focus at international and national scale, financial flows may be tracked bottom-up, taking households as a starting point to assess types and amounts of financial flows reaching local level. While this can present a much more detailed picture on the diversity and magnitude of flows people receive, and therefore provide valuable insights into the delivery and effectiveness of disaster aid, it is also very time and cost intensive to implement and maintain.

3.1 Data for tracking international financial flows

The share of global financial flows for disasters most aggregated and publicly accessible is official international aid. This includes humanitarian and development assistance and climate finance flows captured in a number of different databases.

3.1.1 Overview of databases for tracking international aid flows for disasters

The major globally available databases that contain information about financial aid flows for disasters are introduced below. These provide information on official multilateral and bilateral aid as well as on some other types of international humanitarian or development assistance. Most databases listed compile information primarily from 'traditional' humanitarian and development aid donors, i.e. governments and other organisations in countries such as the US, the UK, Germany and others. Non-Western donors, however, are underreported. This includes state and non-state actors from increasingly influential countries such as China, India, Turkey or the United Arab Emirates (AidData, 2018). Furthermore, some databases do not capture grants and loans provided through the Multilateral Development Banks' ex ante and ex post financing instruments for disasters.

OECD Creditor Reporting System (CRS)

The OECD's Creditor Reporting System (CRS) reports data on Official Development Assistance (ODA). It includes resource flows from donors under the Development Assistance Committee (DAC), multilateral organisations, some non-DAC countries such as China and some private donors. The CRS online database is updated four times a year and flows are reported in the form of commitments as well as in gross disbursements. The reporting framework used for CRS classifies aid into sectors, one of which is humanitarian aid. Within this category, flows are reported as emergency response; reconstruction relief and rehabilitation; or disaster prevention and preparedness[6]. This can facilitate a comparatively good understanding of availability of funds for different purposes at various points along a disaster timeline. An important disadvantage of the CRS, however, is that it does not allow for a disaggregation of flows by disaster type or to sub-national level. This means, data extracted for the purpose of mapping natural hazard-

6 For a detailed definition of each of these categories as used in the CRS, see Annex 2. The CRS also collects data on resources allocated to non-sector-specific disaster risk reduction (DRR), which is related to, but beyond the scope of this report. The category 'comprises risk assessments, structural prevention measures (e.g. flood prevention infrastructure), preparedness measures (e.g. early warning systems) normative prevention measures (e.g. building codes, land-use planning), and risk transfer systems (e.g. insurance schemes, risk funds). [It also] includes building local and national capacities and supporting the establishment of efficient and sustainable national structures able to promote disaster risk reduction' (OECD, 2018).

related disaster flows might instead be driven by spending on other types of disasters, such as conflict, epidemics or technological disasters that took place during the same period.

UNOCHA Financial Tracking System (FTS)

The Financial Tracking System (FTS) is a global platform for reporting humanitarian funding. FTS is managed by the UN Office for the Coordination of Humanitarian Affairs (UNOCHA). Data is voluntarily reported to FTS by donors and recipients, where it is then compiled, processed, quality controlled and published. The FTS is continuously updated; though not operating at real time, it can therefore be timelier than the CRS. FTS was established in 1992 and provides data on funding related to specific response plans, activities and some emergencies. This means, it is possible to distinguish flows for natural hazard-related disasters from other types of disasters such as conflict (Development Initiatives and OCHA, 2017). Because FTS includes not only bilateral government sources or funds from multilateral organisations, but also information from a wider range of NGOs, private organisations or foundations, the variety of donors listed is broader than that reported in the CRS. However, because the FTS relies on voluntary – though well-recognised – reporting, it underestimates actual flows (Becerra et al., 2012).

AidData Database

The AidData Database is operated at the College of William and Mary. It is mainly based on OECD DAC data and reporting standards, though it is complemented with data provided directly by donors to include a wider variety of information (AidData, 2018). Because of its partial reliance on CRS, many of the limitations, as well as advantages discussed above also apply to the AidData Database. The AidData Database is less frequently updated than the CRS or FTS, which can limit mapping of financial flows for more recent disasters.

GFDRR / UNISDR Disaster Aid Tracking (DAT) Initiative

The Disaster Aid Tracking (DAT) Initiative was operated by the AidData programme. It was initially set up to improve the information base on financial flows for disasters but has since been discontinued and only ever included data up until 2010. DAT combined and curated data from existing platforms such as CRS with data collected from public sources and through direct work with donors (Karelia, n.d.). Because it focused specifically on natural-hazard related disasters and used distinct markers for disaster risk reduction, emergency response and reconstruction and rehabilitation, it was the most useful source to map global financial flows for natural-hazard related disasters prior to 2010[7]. Currently, it is possible to achieve a similar level of disaggregation only through a combination of FTS and CRS data (see chapter 3.1.2), but not individually through either of these two platforms. Since the closure of the DAT database, both the CRS and the AidData dashboard have included specific markers for disaster-related resource flows, but they do not distinguish between natural hazard-related disasters and other types.

3.1.2 Methodology for extracting international financial aid flows for natural hazard-related disasters from existing databases

To differentiate financial aid flows for natural hazard-related disasters from other humanitarian disaster flows, for instance those related to conflict, a study by RMS and ODI (2017) presents a methodology combining both FTS and CRS databases. The study relies on FTS as the primary database, because this presents humanitarian aid flows in response to specific natural hazard-related disaster events[8]. Most flows in FTS are already recorded at country level, but in some cases, they are instead attributed to an entire region. In exceptional cases, such as the 2004 Indian Ocean Tsunami, the split of regional financial aid flows between countries is already established in existing reports. For all other cases, authors used the relative number of people affected by a disaster in every country of the region to estimate the share of financial flows to each country. Unlike CRS, which records flows by year and country, FTS therefore makes it possible to attribute flows to a specific event in years that experience multiple disasters or where flows are allocated to events that took place the previous year. One of the shortcomings of FTS, however, is that it does not record a split between emergency response; reconstruction relief and rehabilitation; and disaster prevention and preparedness, as is available for CRS. This means, it would not be possible to assess how much is spent in direct response to disasters versus in advance of disasters by only relying on FTS data. Therefore, the authors of the study use CRS to calculate the ratio of funding between these three categories. This ratio is then applied to the FTS figures to estimate the amount of financial flows that falls within each category.

7 For an overview of flows between 1991 and 2010, see Kellet and Caravani (2013).

8 This was especially the case in the previous version of the FTS data portal, which provided contributions towards natural disasters as a separate sub-set of data. An archived version of this can be found here: https://ftsarchive.unocha.org/pageloader.aspx?page=home. Since the update of the FTS site in 2017, the 'natural disaster' category is no longer available. Major natural hazard-related disasters and contributions towards them are still coded, but related flows need to be extracted individually by the user.

Meanwhile, the CRS database also includes flows for other types of disasters, for example money spent in response to conflict, which may bias the ratios between emergency response; reconstruction relief and rehabilitation; and disaster prevention and preparedness. To minimise the influence of conflict-related flows, the RMS and ODI (2017) study proposes to exclude countries which experienced conflict during the time of analysis. To determine a country in conflict, authors defined these as all countries where more than 3 percent of the population is internally displaced based on data from the UN High Commissioner for Refugees (UNHCR)[9].

This methodology proposed in RMS and ODI (2017) provides a snapshot of post disaster financing through official international assistance tracked in the FTS and CRS databases. However, it does not set these flows in relation to overall official assistance to a specific country. This means that post-disaster aid could consist of funds that may have been allocated to a country irrespective of a disaster happening and were then re-allocated to emergency response. If this were the case, allocations to disaster response could have negative impacts in other sectors where funds are drawn from. Becerra et al. (2012) set out to assess this by analysing surges in aid flows to affected countries post-disaster. Their methodology helps to better understand the difference in funding after a disaster in relation to regular aid flows, sets them in the context of the national economy, and presents them relative to the magnitude of the event and the economic damage it has caused. Because their methodology builds on a large sample of disaster events across almost four decades, the authors assume that any surge they capture is only due to the natural hazard-related disaster event of their interest and that potential influences on aid flows from other events such as conflict are negligible in a large enough sample. This allows them to use the CRS database, which is more comprehensive than FTS for official international aid flows. However, due to these assumptions, their approach is not suitable for providing a snapshot of flows over a shorter time period or for conducting case studies of individual disasters and countries.

3.1.3 Additional sources of data for international aid flows

Next to the databases outlined above, incoming financial flows may be reported through post-disaster needs assessments or appeals from international and regional organisations. Many countries also track their incoming flows through national Aid Information Management Systems (AIMS). However, these are not always well managed or maintained. Existing AIMS are mainly focused on ODA, though efforts are underway in some countries to incorporate data from domestic budgets and information on other flows such as those reported under the IATI framework[10]. Furthermore, international aid flows can be tracked by gathering direct information from individual donors or dedicated funds, e.g. emergency response funds such as the Central Emergency Response Fund (CERF) or common humanitarian funds[11]. Many of the commitments or disbursements reported there will already be captured through global databases such as CRS or FTS. Nonetheless, they may also contain flows from additional sources that are underrepresented in these databases and can help complement what is already aggregated and globally available.

Data on grants and loans from multilateral development banks, for instance, are not commonly reported in the FTS database. This includes flows released from emergency financing instruments such as the IDA Crisis Response Window (CRW) or the IMF's Rapid Financing Instrument (RFI) and Rapid Credit Facility (RCF). In addition, the Extended Credit Facility (ECF) of the IMF may be released or expanded in times of crisis. Information on such flows is commonly reported real time through institutional press releases or briefings. For IMF instruments, emergency flows and related activities can also be traced through the Financial Data Query Tool[12].

3.2 Flows through external sovereign disaster risk financing instruments

In addition to traditional bilateral and multilateral humanitarian or development aid, financial flows for disasters may be released through ex ante disaster risk financing instruments such as insurance or contingent credit. Next to the external ex ante instruments outlined in this sub chapter, disaster risk financing also includes ad

9 More details about the methodology and underlying assumptions can be found in the Technical Appendix of RMS and ODI (2017).

10 The International Aid Transparency Initiative (IATI) is a publishing framework to increase the transparency of humanitarian and development resource allocations. The IATI standard is used to publish open data in a comparable format. Data published under the IATI standard can be accessed from IATI's open data repository, curated and used by platforms such as FTS (Development Initiatives and UN OCHA, 2017).

11 For an overview of these different sources, approaches to tracking them, and application to country case studies specifically for disaster preparedness, see Kellett and Peters (2014).

12 https://www.imf.org/external/np/fin/tad/query.aspx.

hoc financing such as post-disaster humanitarian and development aid (captured in the previous sub chapter) or domestic sovereign risk financing instruments such as budget (re)allocations, budget reserves and government emergency funds discussed in chapter 3.3.

Release of financial resources through external disaster risk financing instruments is fairly well documented through individual institutional websites or reports by entities managing the respective instrument. Relevant instruments include contingent credit facilities, sovereign risk pools, (re)insurance and insurance-linked securities.

Contingent finance: Under a contingent credit line, interest rates, loan maturity and criteria for accessing the loan are agreed in advance. When a loan can be disbursed is dependent on specific criteria also pre-defined in the loan contract. This can be based on a 'hard trigger', such as rainfall measurements or a vegetation index, or a 'soft trigger', for instance an emergency declaration being issued by Government (Clarke and Mahul, 2011). Contingent loans to developing countries are issued mainly by international financial institutions and multilateral development banks, for instance through the World Bank International Bank for Reconstruction and Development (IBRD), the World Bank International Development Association (IDA), or the International Monetary Fund's (IMF) contingent finance instruments. Furthermore, regional development banks such as the Asian Development Bank or the Inter-American Development Bank, as well as some bilateral agreements offer contingent finance options to recipient governments. Reports and press releases of the multilateral financial institutions and national government budget speeches provide information about these flows.

Next to contingent credit, some countries have put in place arrangements for contingent debt relief. An example is Grenada, which negotiated 'hurricane clauses' with three creditors (Taiwan, private bondholders and Paris Club), allowing for a deferral of debt service payments in the event of a disaster (Robinson, 2016). In general, forums such as the Paris Club or the London Club may offer exceptional debt treatment countries experiencing a disaster, though this is option is not commonly used in practice.

(Re) insurance and insurance linked securities: Governments may pool natural hazard-related risks in regional risk pools such as the African Risk Capacity (ARC), the Caribbean Catastrophe Risk Insurance Facility (CCRIF) or the Pacific Catastrophe Risk Insurance Company (PCRIC). In these cases, governments or donors will pay a premium to the facility and a pay-out is triggered in the event that a pre-defined parametric threshold is reached. CCRIF provides a detailed list of all prior payouts of the facility and publishes detailed information about the volume and timing of flows. ARC and PCRIC payouts are documented through press releases and news coverage,
as well as through their own and third-party reports.

Next to pooling risks, sovereigns can take out parametric insurance or indemnity insurance, for instance covering public assets, through a third party. In a number of countries, e.g. Mexico and the Philippines, the government has put in place sub-national insurance mechanisms that it then re-insures against larger losses in the international market. While parametric insurance ideally pays out quickly after a disaster strikes, indemnity insurance can be slower to release funds and is thus more likely to be available for reconstruction rather than immediate response.

Catastrophe bonds can be another option for a country, or a group of countries, to transfer shares of their disaster risks to capital markets. Similar to the aforementioned insurance instruments, catastrophe bonds can be indemnity or parametric products. The World Bank supports the development of catastrophe bonds as an intermediary between states and capital markets and information on catastrophe bonds for specific countries can be typically found through the Bank's documentation.

3.3 Data on public domestic flows for disasters

Gathering comprehensive and comparable information about public domestic flows for disasters is challenging because reporting on disaster (re-)allocations is not standardised and data is often held within individual government agencies or Ministries of Finance. Limited public accessibility, as well as varying quality of information within and across countries are further issues for tracking financial flows.

Article IV reports by the IMF and other relevant documents such as government budgets obtained through Ministries of Finance can provide an overview of the **budget reserves** countries have set aside for disasters and the money released from these reserves in response to a specific event. Some governments have established dedicated **emergency funds** at national and / or sub-national level to which federal budget funds are allocated

on an annual basis. Examples are Mexico's Natural Disaster Fund (FONDEN) established in the late 1990s[13] and, more recently, Kenya's National Drought Emergency Fund. Historical data on **budget re-allocations**, especially within existing budget lines, is particularly difficult to obtain and flows are challenging to trace. A source of information for substantial re-allocations between ministries are supplemental budget statements or speeches where these are available (Alton et al., 2017).

Desk-based review of the abovementioned documents can provide a rough overview of public spending in anticipation of, or response to, a natural-hazard related disaster. A more detailed government historical expenditure analysis drawing on information about contingent liabilities[14] can complete this picture. Information for such an analysis can be drawn, for instance, from budget outcome reports, post-disaster needs assessments, IMF Article IV reports, World Bank / Asian Development Bank economic and fiscal updates. In this process, double counting should be controlled for where data is also accessed through international aid databases, or at the same time through institutions managing disaster risk financing mechanisms and government expenditure information. Otherwise inflows to and outflows from Government budgets might be accounted for more than once, for instance when funds are released from regional risk pools into Government budgets and these resources are then allocated to specific response measures.

Gaining a more complete understanding of domestic disaster-related spending requires in-depth analysis based on direct engagement with Ministries of Finance and line ministries with disaster risk management and response functions in country. Such an exercise can build on a detailed disaster risk finance diagnostic where this already exists. A disaster risk finance diagnostic, among other things, outlines existing instruments to finance economic and fiscal costs from disasters and estimates funding gaps.. The World Bank and the Asian Development Bank have already worked with this approach in over 50 countries and are providing a standardised diagnostic framework in their recent guidance note (Alton et al., 2017). For the purpose of tracking financial flows, a disaster risk finance diagnostic can reveal information about actual financing for past events and show which instruments are used in a given country. These can then be explored in more depth to track flows.

3.4 Understanding private global and domestic flows

Not only sovereigns, but also households and business can make use of **risk transfer, contingent finance or emergency lending** for natural hazard-related disasters, for instance insuring their houses against flooding and storms, or their agricultural production against harvest losses. Payouts from such **insurance** schemes can provide critical financial flows after a disaster. However, in low and middle-income countries, penetration is low and pay-outs, on aggregate, are negligible compared to those in high income countries[15] as well as compared to other flows such as humanitarian aid and remittances in low and middle-income contexts (see chapter 5).

Data on insured losses from disasters can be accessed in aggregated form (groups of countries or globally) through databases of large re-insurance companies (Munich Re's NatCat Service and Swiss Re's Sigma service). However, this data may only be made available at national level on request and it is potentially less comprehensive for lower income countries than for high income countries, where insurance penetration is also higher and better documentation exists. The level of aggregation and multitude of sources underlying these databases make it difficult to trace which insured losses are captured and which are not.

International private capital flows such as bank lending and equity can be a further source of financial flows for disasters. However, negative economic impacts from disasters, along with rising public expenditure for emergency response and possible revisions of credit ratings after a large-scale disaster can limit an affected country's ability to borrow. The effect on creditworthiness is especially large for earthquakes and tropical storms. Furthermore, low-income countries are at higher risk of being impacted by reduced credit rating after a natural hazard-related disaster than countries with higher incomes (Standard and Poor's Rating Services, 2015). Relatively little is still known about the response of private capital flows to natural hazard-related disasters. David (2010) aims to address this gap through a multivariate dynamic panel analysis that estimates responses for a variety of different flows, including international aid, remittances and private capital flows. The author finds 'that bank lending flows in general do not attenuate the effects of disasters and in some specifications, net bank lending outflows typically occur

13 For more details on FONDEN's budget and financing instruments see Hofliger et al. (2012).

14 Contingent liabilities are 'obligations that do not arise unless particular discrete events occur in the future. As such, they differ from direct liabilities where the settlement date is fixed at the time when the nominal obligation is set' (Bova et al., 2016).

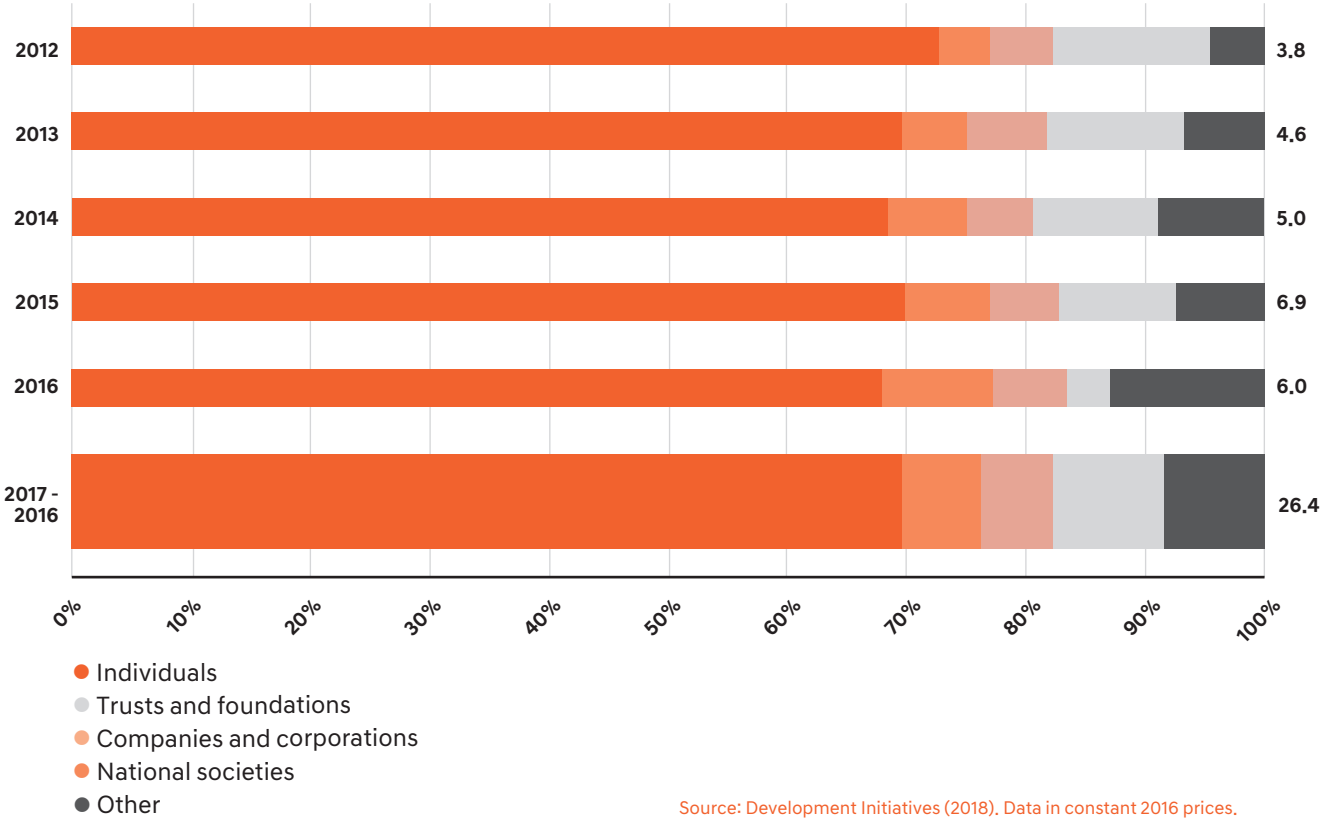
15 https://natcatservice.munichre.com/percentages/1?filter=eyJ5ZWFyRnJvbSI6MjAwOCwieWVhclRvIjoyMDE3fQ%3D%3D&type=2.

after the onset of disasters, therefore amplifying the negative economic effects of these events. Equity flows are not an important source of finance for disaster recovery in low income countries. Nevertheless, they respond positively to climatic disasters for the larger sample of developing countries, but not to geological disaster shocks. In addition, this effect is short-lived' (David, 2010). The study also concludes that aid only plays a relatively small role in mitigating disaster impacts, though it is admittedly more important in poorer countries. However, for aid flows the analysis relies solemnly on ODA data, thus potentially underestimating impacts expected from a larger volume and greater variety of aid.

To address countercyclical lending patterns, initiatives to increase the availability of **recovery lending** are underway, for instance to small businesses or smallholder farmers. This aims to increase access to finance at times where it is needed but lenders usually retreat. Examples include Vision Fund's recovery lending activities in the Philippines after Typhoon Haiyan or more recently in Malawi, Kenya and Zambia[16]. Many of these initiatives are still in their early stages or pilot phases and information on financial flows in the form of recovery loans needs to be collated from individual institutional homepages or reports. Some financial institutions back their recovery lending with insurance, in which case double counting can become an issue when the pay-outs are already captured elsewhere.

Globally, **humanitarian assistance flows from private donors** such as foundations, companies, individuals or national societies have continuously increased over the past years, reaching approximately USD 6.5 billion in 2017. Flows from private sources are difficult to track and to attribute to specific disasters, because donors are oftentimes not obliged to report to certain databases or according to common standards. However, some larger private donors are reporting through the IATI framework or in other ways to CRS and FTS. The most recent Global Humanitarian Assistance Report shows the large role individual donations play in humanitarian assistance as a whole (Figure 3). Though this captures overall humanitarian flows, there is no reason to assume that the pattern would be decisively different for natural hazard-related disasters.

Figure 3: Sources of private international humanitarian assistance, 2012-2016



Source: Development Initiatives (2018). Data in constant 2016 prices.

16 For a more detailed typology of crisis resource flows in a humanitarian context, see Willits-King et al., (2018).

Development Initiatives, who compile the data for the Global Humanitarian Assistance Report, provide detailed documentation of the methodology and definitions[17] used. However, the dataset as such is not publicly accessible and from the available figures it is not possible to differentiate flows for natural hazard-related disasters from other types of humanitarian flows. Furthermore, the database only includes flows channelled through the international humanitarian system, e.g. private donation to an NGO which then carries out emergency response. This does not capture direct remittances and giving, e.g. transfers between individuals.

Remittances have been found to provide critical resources for preparedness and emergency response after natural hazard-related disaster. In countries with a large diaspora relative to the home country population, flows increase post-disaster (Mohapatra, 2009; Attzs, 2008). In the hurricane-prone Caribbean, for example, a 1 percent decrease in GDP is estimated to be followed by a 3 percent increase in remittances from migrants two years down the line (Mishra, 2005 as cited in Mohapatra, 2009).

Data on global remittance flows is available through the World Bank's World Development Indicators database and approaches for capturing the flows specifically related to disasters are proposed by several studies. Most of these studies find a post-disaster increase in remittances by either conducting cross-country panel data analysis (Bettin and Zazzaro, 2018; Mbaye and Drabo, 2017; Mohapatra, 2009; Yang, 2006; Mishra, 2005) or by using household-level panel data to assess the change in remittances for every dollar of damage or lost income a household experienced due to a disaster (Yang and Choi, 2005; Clarke and Wallsten, 2003).

A challenge with using country-level remittance data is that it usually provides information on flows per year, but not per event. This means, an increase in remittances due to a natural hazard-related disaster cannot be differentiated from rising remittances for other reasons such as a conflict or an economic crisis (similar to challenges with using CRS data for humanitarian aid flows). Furthermore, it is difficult to attribute an increase in remittances to a shock versus a general trend or fluctuation in the total amount of remittance inflows. Taking a closer look at remittances and disasters, Bragg et al. (2017) for instance find an increase in remittances in the 3 months following a disaster but only few annual increases that were larger than the overall average annual increase in remittances during the 2000-2014 study period. The authors attribute this to the fact that the financial situations of the remittance senders does not change within such short time. The higher amounts of remittances sent immediately after a disaster are therefore later compensated by a decrease.

17 http://devinit.org/wp-content/uploads/2018/06/GHA-Report-2018-chapter-5.pdf.

CHAPTER 4

MAPPING FINANCIAL FLOWS FOR DISASTERS - CASE STUDY METHODOLOGY

The methodology for mapping financial flows on a case study basis proposed in this report builds on existing and for the most part publicly available data. It is designed as a desk-based exercise. This means, it can be implemented at relatively low cost and much shorter timelines in comparison with a more in-depth country level assessment that would include primary data collection. At the same time, it generates greater detail than would be available at a global level alone through existing databases such as CRS or FTS.

However, a desk-based exercise also implies that the methodology is limited in the variety of flows it captures. Due to the nature of reporting in global databases and by national or regional institutions, a bias towards official bilateral humanitarian flows is expected, while some domestic government allocations and flows from private organisations or companies, multilateral loan and grand disbursements, personal remittances and non-official domestic flows are likely to be underreported or remain uncaptured. Furthermore, the methodology is limited in the level of detail it can provide. Unlike studies that have tracked flows from source to end use (see for example Mowjee, 2017), or studies using a bottom-up approach to assessing financial flows at household level, the methodology proposed in this report does not offer a breakdown of where flows are channelled to and how they are used.

The unit of analysis are natural hazard-related disaster events at national level. In practice, of course, disasters are not confined to state borders and an assessment of financial flows for a specific event across a region might be preferred. While all case studies in chapter 6 of this report focus on specific countries, the same methodology through STEPS 1 to 3 (see below) could be applied to multiple countries to capture a regional situation. Disaster impact databases or post disaster needs assessments (STEP 1) often provide data on event basis, as do the global databases recommended for STEP 2. STEP 3 would require aggregation of country-level data on domestic flows to regional level.

Figure 4: Three steps for mapping financial flows for disasters

4.1 Step 1: overview of disaster impacts

To better understand the relevance and magnitude of financial flows for natural hazard-related disasters, these should be presented not only in absolute terms, but within the context of loss and damage from the disaster and the national or regional economy (Alton et al., 2017). Several databases provide openly accessible information about disaster impacts. One of the most commonly used and comprehensive sources is the EM-DAT database operated by the Centre for Research on the Epidemiology of Disasters (CRED) at the Université catholique de Louvain. For a smaller number of countries (currently around 80), the DesInventar database also presents disaster loss data and links this with monitoring of the Sendai Framework. These two databases emerged from the humanitarian and disaster risk management communities and draw data primarily from development and humanitarian agencies, which means information on human impacts is considered as fairly well documented. In addition, two databases managed by large Reinsurance companies – Munich Re's NatCat and Swiss Re's Sigma – collect and curate data on number of people affected, total losses and insured losses from disasters. While both provide information aggregated to global, regional, or income-group level, country-level information needs to be requested and data access will be assessed on a case by case basis. These two databases focus mostly on the financial consequences of disasters, with NatCat including a larger number of events, while Sigma only entails those of higher impact magnitude and therefore has a lower number of entries[18].

For the purpose of a global snapshot and the country case studies in this report, a combination of the EM-DAT and NatCat databases are used. Drawing on their respective strengths, data on the number of people adversely affected by disasters comes from EM-DAT, while NatCat is used as the primary source for asset and insured losses.

At national and regional level, Post Disaster Needs Assessments (PDNAs) and governments' recovery plans represent additional sources of information for outlining disaster impacts. For less recent events, additional post-disaster reports and studies may provide a more detailed and nuanced picture of impacts in the short and medium term.

Box 1: STEP 1 guiding questions for overview of disaster impacts

- What are the major natural-hazard related events in the country or region of interest?
- What were the types and magnitude of impact from the event (economic loss and damage, deaths, people affected, etc.)?

4.2 Step 2: extracting data on financial aid flows from global databases

For the purpose of this report – providing a global snapshot and analysing financial flows for case studies of specific natural hazard-related disasters in three countries – a methodology similar to that used in RMS and ODI (2017) is suggested to assess international aid flows. This relies primarily on FTS, which provides data by country and emergency. It is therefore possible to filter out natural hazard-related disasters only. However, not every natural hazard-related disaster is listed as an emergency in FTS and individual flows are not always tagged to a specific emergency event. This means, any global aggregation from FTS without additional data treatment will miss individual flows or entire events and is therefore expected to underestimate flows.

Next to FTS, CRS data is used to derive a ratio by which to split overall aid flows from FTS into emergency response; reconstruction relief and rehabilitation; and disaster prevention and preparedness. To do this without introducing a bias in relative allocations to these three categories due to other events such as conflict from the CRS database, however, a number of countries with high conflict prevalence are excluded in the global snapshot[19]. While this is a pragmatic approach to reducing conflict-induced bias in the financial aid flows data, it also excludes some countries with high occurrence and large impacts from natural-hazard related disasters such as Afghanistan, Somalia and Sudan (Peters, 2017). For the specific case studies selected in this report, there were no major conflicts in the periods when the event of interest

18 For a more detailed comparison of the different databases on disaster impacts see Guha-Sapir and Below (2002).

19 Afghanistan, Democratic Republic of the Congo, Somalia, South Sudan, Sudan, Syrian Arab Republic, Ukraine and Yemen.

took place, meaning that potential bias due to conflict is not a challenge and the split between different purpose categories can be carried out using CRS. In other cases where conflict has taken place, an overall sum of financial aid flows from FTS can still be used, but the split between the different categories (disaster prevention and preparedness; emergency response; reconstruction relief and rehabilitation) derived from CRS can be biased and needs to be treated with caution.

Finally, international aid flows may overall be mis-estimated due to the self-reporting nature of FTS. In the end, none of the currently available databases provide a complete picture to perfectly meet the purpose of this report, but primary reliance on FTS means that at least a greater diversity of flows from different sources are considered. Using FTS as the starting point also makes it is easier to control for double-counting when combining data with additional sources, because FTS provides more details on flows than CRS.

For the individual case studies, data on the emergencies of interest is downloaded and aggregated according to source, destination and timing of commitment or disbursement. The flow date used as indication for timing is defined in FTS as '[t]he date on which the funding flow was pledged, committed or paid. If this date is not available, FTS uses the decision date or, as last resort, the date the information was reported to FTS' . In practice, the date resources are pledged or committed does not usually reflect the actual time of payment. However, in absence of more detailed temporal information, the case studies follow the FTS specification. Furthermore, in line with FTS's standard practice, this report only accounts for flows that were committed or actually paid, but not those that were merely pledged.

Box 2: STEP 2 guiding questions

- What were the financial flows recorded in relation to the event through the publicly accessible databases identified above?
- What do we know about when the funding was committed and disbursed?
- What types of flows were recorded? What were their main sources, through which channels did they flow, for what purpose (anticipation / response / recovery)?

4.3 Step 3: complementing global databases with publicly available information on other financial flows

While some global databases are already tracking certain financial aid flows for disasters, they are far from comprehensive and only capture specific information from a limited number of international donors (see chapter 3.1). With the exception of the DAT, they were not set up specifically to track flows for natural hazard-related disasters. This means, it can be difficult to disentangle flows for a specific purpose.

Next to financial aid flows already aggregated in the major global databases, information on additional international and domestic flows linked to natural hazard-related disasters can be gathered from a variety of data sources. A non-comprehensive overview of these are listed in Table 1. In addition, secondary academic and grey literature can be a retrospective source of information on financial flows but is usually only available much later.

Within the scope of this study, the main focus is on international aid, ex ante sovereign disaster risk financing and public domestic flows. Though private flows represent an important share of all financial flows for disasters, they are not assessed in more detail as part of this report due to the limited information that is readily available. Nonetheless, Table 1 also outlines potential source of data as an entry point for further analysis with regards to these flows.

20 https://fts.unocha.org/glossary.

Table 1: Overview of additional data sources for different types of financial flows

Type of financial flow	Data source
Official international aid not captured in global aggregated databases	● Post Disaster Needs Assessments (PDNA) ● Appeals documents and reports ● Government budget statements ● NGO reports and statements ● National Aid Information Management Systems (AIMS) ● World Bank, IMF and regional development bank press releases, briefs and project reports
Ex ante sovereign insurance or regional risk pools; contingent finance; bonds and derivatives	● World Bank, IMF and regional development bank press releases, briefs and project reports ● IMF Financial Data Query Tool (https://www.imf.org/external/np/fin/tad/query.aspx) ● GFDRR country profiles (https://www.gfdrr.org/en/disaster-risk-profiles) ● Homepages and reports of regional risk pools: CCRIF (https://www.ccrif.org/category/faq-categories/ccrif-insurance-policies-and-payouts), PCRAFI, ARC (http://www.africanriskcapacity.org), etc. ● Private (re)insurers
Domestic budget allocations, reserves or emergency funds	● PDNAs ● Government response plans ● Government budgets and budget statements ● IMF Article IV Consultation reports (https://www.imf.org/external/np/sec/aiv/index.aspx) ● World Bank or regional development bank economic and fiscal updates
Private insurance, contingent finance and emergency lending	● (Re)insurer databases databases, e.g. Swiss Re's Sigma (http://www.sigma-explorer.com/) and Munich Re's NatCat Service (https://natcatservice.munichre.com/) ● Individual financial institutions ● World Bank Global Financial Development Database for bank and equity flows (https://www.worldbank.org/en/publication/gfdr/data/global-financial-development-database) ● NGO project documentation
Personal remittances and direct giving	● World Bank (http://www.worldbank.org/en/topic/migrationremittancesdiasporaissues/brief/migration-remittances-data) and IMF (https://www.imf.org/en/Data) databases on remittance flow

The main challenges in relation to extracting and using this information complementary to global databases are listed in the following paragraphs. These challenges should be considered and addressed where this is relevant in any attempt to aggregate and combine various types of information from different sources on financial flows for disasters.

- **Double counting:** Appeals, post-disaster needs assessments or institutional reporting can present information that may already be captured in international, quality-controlled databases. In attempting to aggregate data from these different sources, double counting can thus become an issue. This is because the complexity of the humanitarian system means that financial flows can pass through many different institutions from source to end-beneficiary. If building on the FTS, double counting can be reviewed on a case-by-case basis because detailed information on individual projects is available through the FTS database. The CRS, while less diverse in the range of donors, contains more complete aggregated flows for those donors it includes. The potential for double-counting is therefore reduced when CRS information is complemented with data on financial flows from additional donors, but it is more difficult to control for when there is further information on flows from the same same donors, or when flows are channeled through multiple institutions.
- **Appeals, commitments and paid contributions:** Generally, international humanitarian appeals for disasters are relatively well documented and published during or immediately after the event. However, such appeals often remain underfunded. Over the 20 years prior to 2015, the gap between humanitarian funding requests and what was actually provided increased by over 800 percent (UNISDR, 2015). Therefore, it would be preferable to track actual disbursements. However, these usually come in much later and more fragemented than the initial appeal or the funding commitment. FTS and CRS report appeals, commitments and paid contributions, but this may not always be the case through other sources and flows may be counted up differently. The FTS, for example, includes commitments and paid contributions, but not pledges, in its total funding figures. As a result, comprehensive and timely reporting of actual flows can be challenging.
- **Inflation:** If compared over time and across countries, data on financial flows and disaster losses needs to be adjusted to price and exposure inflation (though this is less relevant for individual case studies as these depict a specific snapshot rather than a comparison over time and space). The major global databases on disaster-related economic losses and financial flows provide information about the adjustments made to their data or offer a choice between current and constant figures to the user. CRS data, for example, is available in current or in 2016 value, while FTS data are only available in value of the year recorded. This makes it relatively easy to provide a snapshot overview based on data from one specific database. When combining different data sources, however, these need to be inflation adjusted to the same base value to ensure coherence.
- **Definitions and attribution of flows to specific markers or sector categories:** Various institutions and tracking platforms differ in the language and definitions used to describe financial flows for disasters at different points of a disaster timeline. This can determine how funding is marked or coded and can present a challenge to combining information from different sources. Furthermore, the boundary between preparedness, anticipation, emergency response, recovery and reconstruction can be blurry and funding from one project may span across multiple funding streams, which complicates categorisation and increases the risk of double counting (Kellett and Peters, 2014).
- **Reporting timelines:** Both FTS and CRS databases for global financial aid flows are relatively frequently updated; on a report-by-report basis for FTS and on a quarterly basis for CRS. However, whether the information available online – on these platforms as well as through organisational homepages or reports – is up to date will also depend on how quickly funds are committed and disbursed before, during or after a disaster and when this information is reported by individual organisations. This means there may be a significant time lag between a specific event and when information on financial flows related to the event is available. This becomes evident in the case of Dominica, where the latest financial flows recorded in FTS were counted towards January 2018, even though alternative sources revealed that additional commitments were still being made to support reconstruction at the time of writing in late 2018.

Box 3: STEP 3 guiding questions

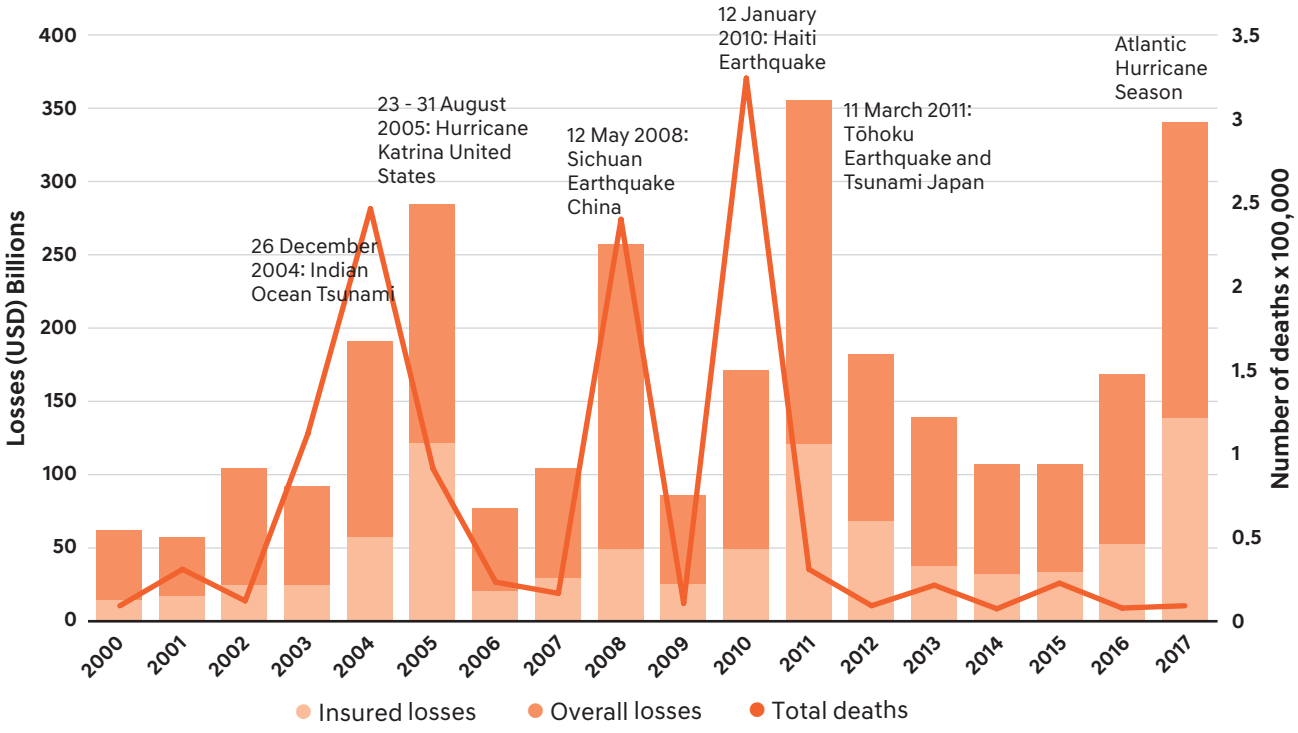
- What were the financial flows recorded in relation to the event through the publicly accessible databases identified above?
- What do we know about when the funding was committed and disbursed?
- What types of flows were recorded? What were their main sources, through which channels did they flow, for what purpose (anticipation / response / recovery)?

CHAPTER 5

A GLOBAL SNAPSHOT OF FINANCIAL FLOWS FOR DISASTERS

Figure 5 presents total losses and number of deaths from natural hazard-related disaster events for the period 2000 to 2017. Most recently, the 2017 Atlantic hurricane season has become the costliest season on record. Hurricanes Harvey, Irma and Maria alone are estimated at around 215 billion USD overall losses in the Caribbean and the United States. Insurance has helped recover parts of these losses. On average, close to 30 percent of globally recorded losses between 2000 and 2016 were insured. However, most of these fall into high income countries, while lower middle income and low-income countries only have an average annual insurance recovery of about 3 percent of total asset losses (RMS and ODI, 2016).

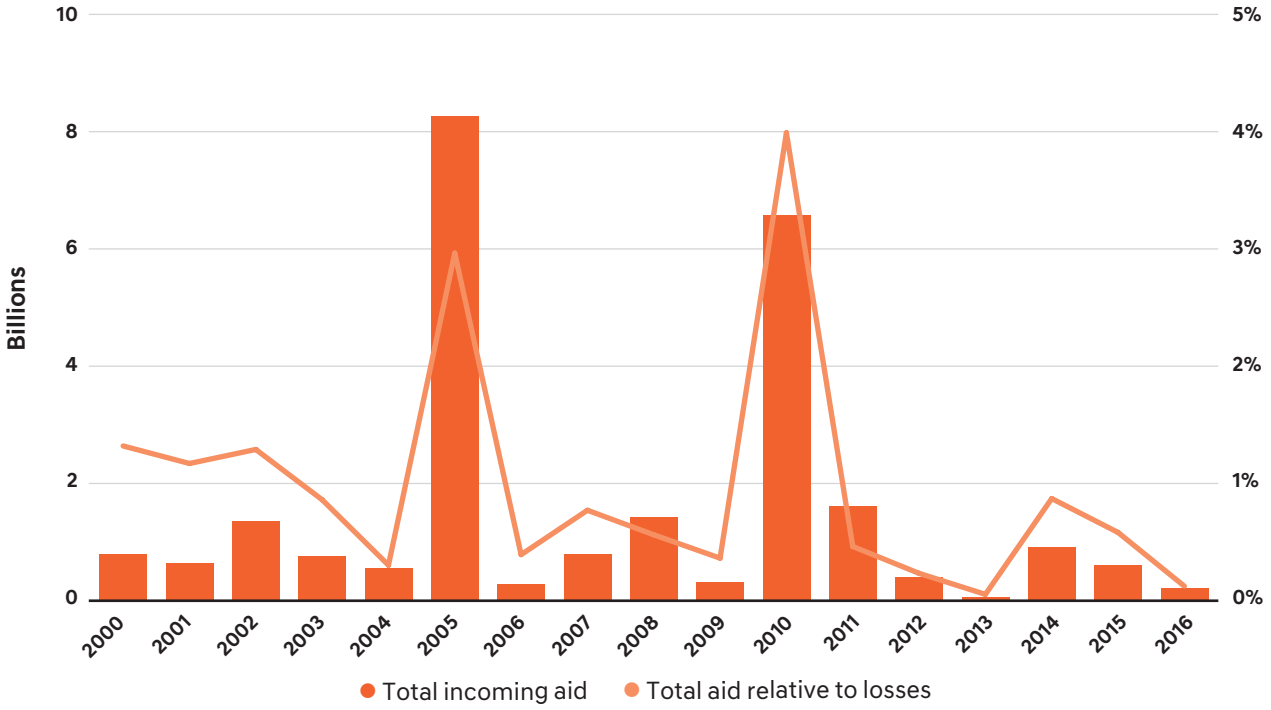
Figure 5: Total insured and uninsured losses and number of deaths



Source: Author based on data from CRED (2018) and Munich Re (2018). Total and insured loss values normalised and adjusted for inflation to 2016 prices.

Globally, an annual average of USD 1.2 billion of international humanitarian flows has been recorded for natural hazard-related emergency between 2000 and 2017 in the FTS database[21]. An annual breakdown of assistance is shown in Figure 6. In low and lower-middle income countries, international humanitarian aid flows have contributed with about 8 percent of asset losses to emergency response, reconstruction relief and rehabilitation from natural hazard-related disasters (RMS and ODI, 2016). Globally, this figure is just over 1 percent, with spikes in 2005 and 2010 where flows were driven by the Indian Ocean Tsunami and the Haiti Earthquake[22]. Though high income and upper middle-income countries also benefit from international emergency assistance, these flows are much smaller relative to the share of losses covered by insurance. In Japan, for example, insured losses from the 2011 Earthquake and Tsunami were estimated at around USD 21 – 35 billion across property and life insurance (RMS 2011), while FTS recorded around USD 1.1 billion in international humanitarian assistance towards the event.

Figure 6: Total incoming humanitarian aid flows for natural hazard-related emergencies and flows as percentage of total losses 2000-2016



Source: Author based on data from UN OCHA FTS (2018). Aid flow values adjusted for inflation to 2016 prices. Total and insured loss values normalised and adjusted for inflation to 2016 prices.

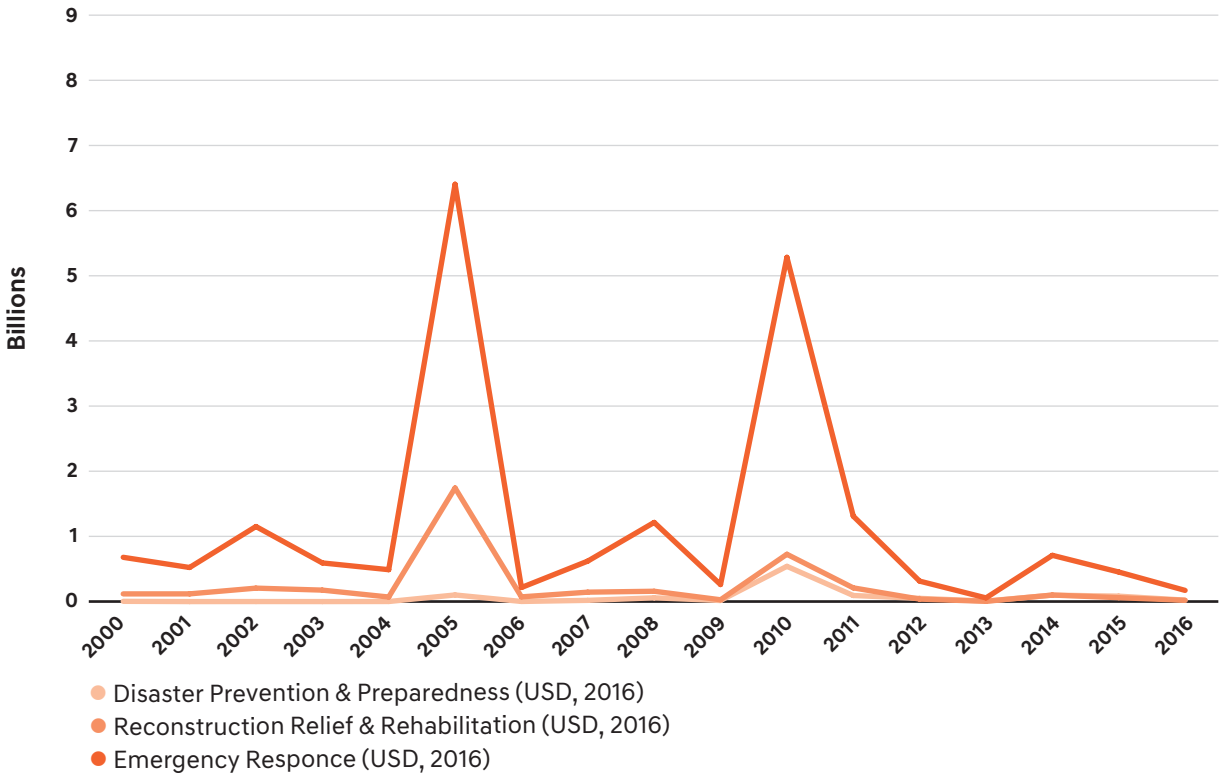
The vast majority of this funding – close to 80 percent on average – are spent on emergency response, while smaller shares go to reconstruction relief and rehabilitation or disaster prevention and preparedness (Figure 7)[23]. It needs to be noted that CRS humanitarian aid data focuses on immediate reconstruction relief and rehabilitation, while longer-term reconstruction and activities towards building back better are reported against the relevant sectors and not included here. Therefore, emergency response captures a much larger share than might be otherwise expected, especially in cases where there is major damage to infrastructure and rebuilding is costly.

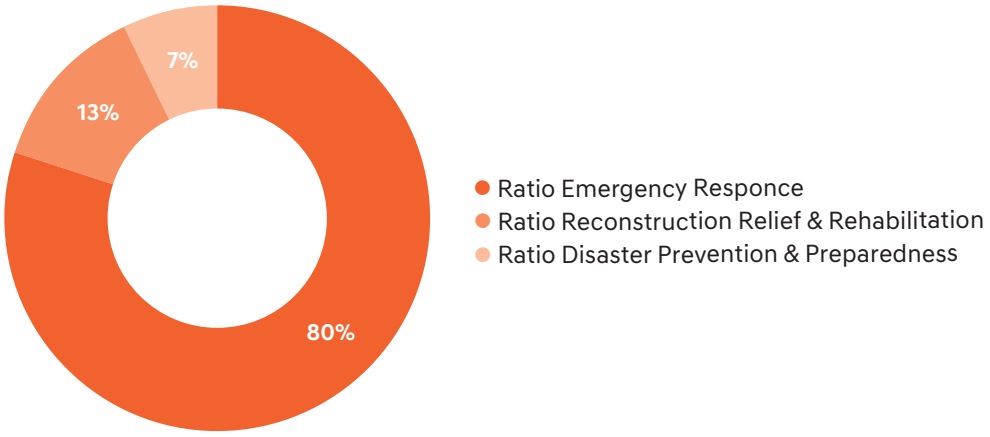
21 Note that this figure is assumed to be a substantial under-estimate of actual flows because of the voluntary nature of FTS recording. It is also expected to underestimate flows directed towards natural hazard-related disasters that are recorded in FTS, as not all flows are tagged to a specific emergency in the database.

22 As the Tsunami happened in the last days of 2004, almost all incoming flows towards this event are recorded in 2005.

23 For detailed definitions of each of these categories, see Annex 2.

Figure 7: Incoming humanitarian aid flows for natural hazard-related emergencies 2000-2017





Source: Author based on data from UN OCHA FTS (2018) for annual totals and OECD (2018) to calculate split between disaster prevention and preparedness; emergency response; and reconstruction relief and rehabilitation. Values adjusted for inflation to 2016 prices.

CHAPTER 6

6 CASE STUDIES

The following sub-chapters present case studies aimed at mapping financial flows towards three recent natural hazard-related disasters: Typhoon Haiyan / Yolanda in the Philippines in 2013, the El Niño induced drought in Malawi in 2015/2016 and Hurricane Maria in Dominica in 2017. The case studies trace actual flows while also serving as test cases for the methodology proposed in previous chapters. Therefore, they include methodological notes next to findings on financial flows. Each case study entails an overview of the event and impacts in the respective country, a visual representation of overall flows and a breakdown with more detailed information for different categories of flows as introduced in chapter 3. Due to restrictions of data availability and access, the focus for all case studies is on international humanitarian flows, flows released through sovereign risk financing and public domestic (re-)allocations.

6.1 Philippines: Typhoon Haiyan/Yolanda 2013

6.1.1 Overview of disaster impacts

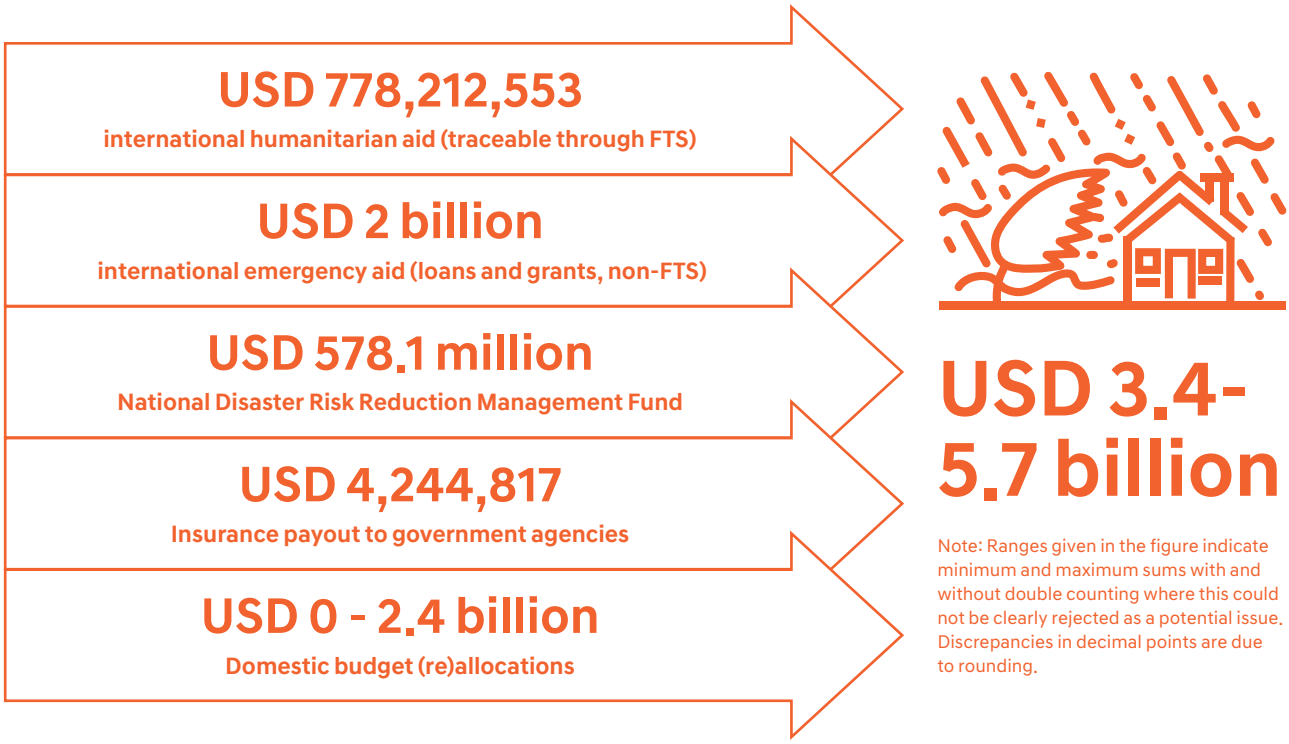
On 8 November 2013, Typhoon Haiyan, or Yolanda as it was locally named, made landfall in the Philippines and caused severe destruction particularly across 9 regions located in the central part of the country. With wind speeds over 300 kilometres per hour, Typhoon Haiyan / Yolanda was one of the strongest ever recorded. According to Government records, it killed over 6,200 people and caused an estimated USD 12.9 billion in damage and economic losses. This represents almost 5 percent of Philippine GDP that year. In 2013, economic growth was slowed down by 0.9 percentage points and a further 0.3 percentage points in 2014 (World Bank, 2018; Republic of the Philippines, 2013).

A National State of Calamity was proclaimed by then President Benigno S. Aquino III on 11 November 2013. In December 2013, the UN launched a Strategic Response Plan for Typhoon Haiyan / Yolanda, requesting a total of USD 788 million to meet people's immediate humanitarian needs (UN OCHA, 2013). According to the Government's plan for Reconstruction Assistance on Yolanda (RAY), donors had pledged over PHP 23 billion (USD 513 million) foreign aid as of 12 December (Republic of the Philippines, 2013). The RAY set out a framework for public sector action and outlined funding requirements for recovery and reconstruction.

6.1.2 Mapping financial flows

Total flows from international humanitarian aid, ex ante sovereign risk financing and public domestic (re) allocation of funds towards Typhoon Haiyan / Yolanda in the Philippines are estimated at between USD **3.4 and 5.7** billion over a period from 2013 to 2016 (Figure 8). This adds up to between around 25 and 45 percent of total loss and damage from the event.

Figure 8: Estimated financial flows 2013 Typhoon Haiyan / Yolanda, Philippines

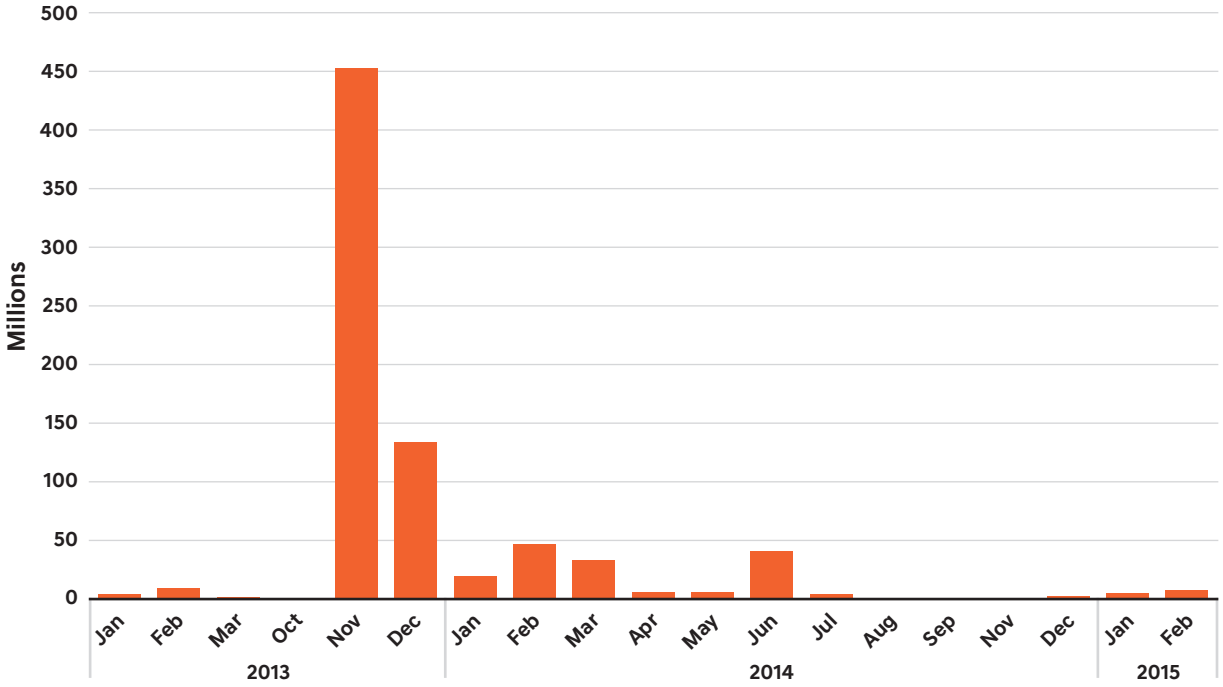


Note: Ranges given in the figure indicate minimum and maximum sums with and without double counting where this could not be clearly rejected as a potential issue. Discrepancies in decimal points are due to rounding.

International aid flows and emergency funding

A total of **USD 778 million** were recorded for the Philippines Typhoon Haiyan / Yolanda emergency in the FTS database. The majority of these incoming commitments and paid contributions fall into November and December 2013 (Figure 9). Close to 10 percent of total flows (USD 77,077,164) were directed towards the Government of the Philippines, while most of the remaining 90 percent went to non-governmental and multilateral organisations.

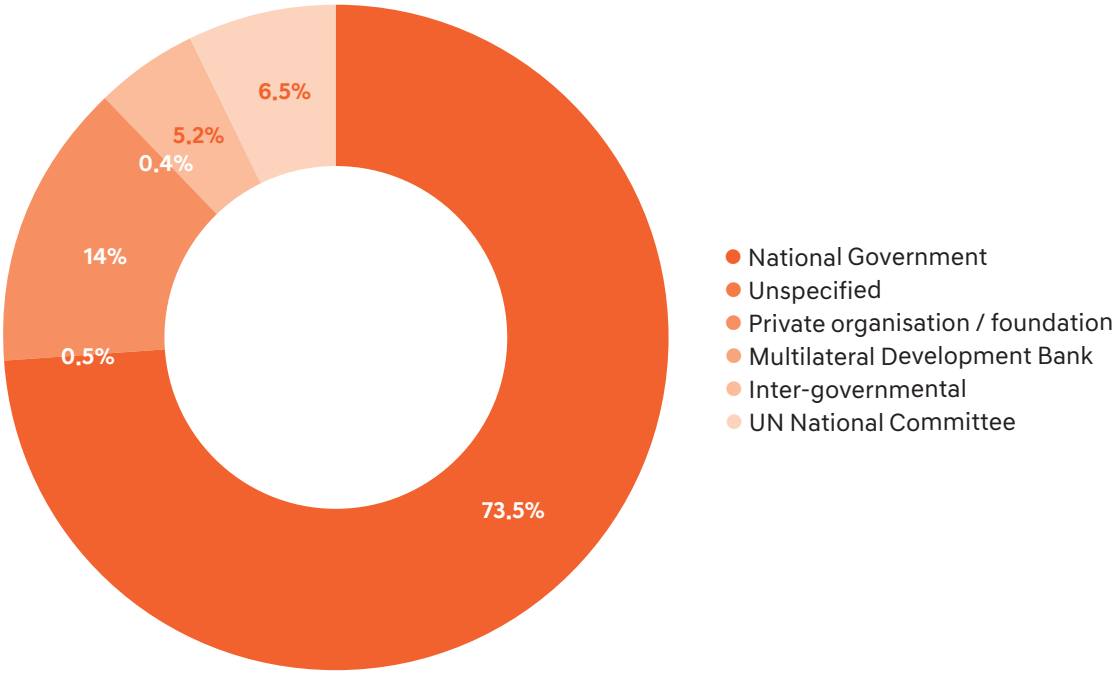
Figure 9: Incoming commitments and paid contributions recorded in FTS per month to the Philippines for Typhoon Haiyan / Yolanda



Source: Author based on data from UN OCHA FTS (2018). Values in current USD. Flows identified based on classification of record as 'PHILIPPINES' in the FTS Destination Emergency indicator.

The donor base for Typhoon Haiyan / Yolanda was relatively broad, with over 100 different organisations listed in FTS alone. These include national governments, private organisations or foundations, multilateral development banks, inter-governmental organisations and UNICEF national committees (Figure 10).

Figure 10: Source of financial flows to the Philippines recorded in FTS for Typhoon Haiyan / Yolanda



Source: Author based on data from UN OCHA FTS (2018).

Out of the 6 largest donors named, five are bilateral governments, with the United Kingdom enlisting the biggest amount at over USD 122 million. An aggregate of unspecified individuals and organisations contributes a further USD 98.6 million[24].

24 While this aggregates several undisclosed private individuals and organisations into one group, further private entities providing additional large contributions are listed separately in FTS.

Table 2: Commitments and paid contributions from the six largest donors recorded in FTS[25]

Source of incoming flows	Total amount (USD)
European Commission's Humanitarian Aid and Civil Protection Department	40,470,717
Japan, Government of	63,328,022
Canada, Government of	63,645,009
United States of America, Government of	90,585,530
Private (individuals & organizations)	98,589,169
United Kingdom, Government of	122,743,593

Source: UN OCHA FTS (2018).

Following Typhoon Haiyan / Yolanda, major improvements were made towards enhancing disaster aid and budget information management systems in the Philippines through the launch of the Foreign Aid Transparency Hub (FAiTH) (Ramachandran, 2013; Sakumoto, 2013). This aimed at increasing transparency and accountability of aid by tracking funds that are channelled through the Philippine Government. FAiTH could have provided more detailed information on financial flows towards the Typhoon at national level. However, at the time of writing the FAiTH homepage was no longer active and could therefore not be used as a source of information on financial flows[26]. The same applies to the eMPATHY platform initially set up to track expenditures and progress towards rehabilitation and recovery project implementation across agencies and stakeholders (GFDRR, 2015).

From press releases and donor reports, additional financial flows not recorded in FTS could be identified. These include a **USD 500 million** emergency loan for immediate budget support provided by the World Bank in response to Typhoon Haiyan / Yolanda (World Bank, 2014a). At the end of November 2013, an additional **USD 480 million** financial assistance were offered in support of a national community-driven project to help rebuild critical services and infrastructure (World Bank, 2013). The Asian Development Bank (ADB) availed a **USD 372 million** loan as support for the Philippine Government's Kalahi-CIDDS programme, which focuses on community development and the restoration of basic social services. The ADB also provided **USD 500 million** budget support towards rehabilitation and reconstruction and reallocated up to **USD 150 million** from ongoing projects after the Typhoon[27] (Asian Development Bank, 2014).

Ex ante external sovereign disaster risk financing

The Philippines Government has taken a pro-active approach to disaster risk financing[28]. It has put in place several measures to enhance its financial resilience, including local and national disaster risk management funds (introduced in Box 4), contingent finance and parametric insurance of national government assets and 25 provinces launched in 2017 (World Bank, 2018; World Bank, 2017a). Further instruments are under development. After Tropical Storm Sendong / Washi in 2011, the Government of the Philippines for the first time drew on a World Bank USD 500 million Disaster Risk Management Development Policy Loan with a Catastrophe Deferred Drawdown Option (Cat DDO), a contingent credit line aiming to provide immediate liquidity in the event of a disaster. Because the Cat DDO had been fully depleted for Washi, the Government of the Philippines needed to mobilise alternative resources for its response to the more devastating Typhoon Haiyan / Yolanda. According to a World Bank review of the Cat DDO instrument, this was much slower than the two days

25 A full list of donors and their contributions recorded in FTS can be found in Annex 3.

26 https://www.gov.ph/faith.

27 These flows are in addition to a USD 3 million and a USD 20 million grant flowing from / through the Asian Development Bank that are listed in the FTS database and therefore already included in the international humanitarian aid figure.

28 For an overview of current and prospective disaster risk financing instruments in the Philippines see Annex 4.

it took to release Cat DDO funds in the case of Washi. A second USD 500 million Cat DDO was not approved until after Typhoon Haiyan / Yolanda in 2015 (GFDRR, 2018; World Bank, 2017b).

Box 4: Philippines national disaster funds

National Disaster Risk Reduction and Management Fund (NDRRMF) — a special purpose, lump sum fund intended to cover aid relief and rehabilitation services to communities/ areas affected by man-made and natural calamities, and repair and reconstruction of permanent structures, including capital expenditures for disaster operation, and rehabilitation services.[18] DBM administers the fund and releases monies directly to the implementing agencies (including LGUs) upon the approval of the President of the Philippines with the endorsement of the NDRRMC (in the case of local disasters) or the appropriate agency (for internal crisis).

Quick Response Fund (QFR) — are built-in budgetary allocations that represent pre-disaster or standby funds for agencies to immediately assist areas stricken by catastrophes and crisis.[19] Agencies that have built-in QRFs include DPWH, DSWD, the Department of National Defence (Office of the Secretary and the OCD), the Department of education, and the Department of Agriculture. The release and use of these funds are not subject to the President's approval and recommendation of the NDRRMC. Also, agencies may request the replenishment of their QRF to DMB subject to the approval of the Office of the President. QRFs wee previously programmed as part of the NDRRMF, but have been decentralized among eligible national agencies since 2012.

Source: Direct citation from GFDRR (2015).

Prior to the development of parametric insurance policies for national and sub-national governments, public agencies in the Philippines already had the option of insuring property and any other insurable interest against catastrophes such as typhoons, floods and earthquakes. This has been possible through the Government Service Insurance System (GSIS), which can provide premium rates favourable to private insurers due to the tax exemptions it is granted on insurance products (Villacin, 2017). In late 2014, GSIS paid out to three government agencies – the Civil Aviation Authority of the Philippines (CAAP), the Department of Trade and Industry's (DTI) Regional Office in Tacloban and the Provincial Office of the National Food Authority in Leyte – a total of PHP 190.18 million (**USD 4,244,817**) for property damages from Typhoon Haiyan / Yolanda (GSIS 2014).

Domestic budget (re)allocations, reserves or emergency funds

The Philippines have two national disaster funds: The Philippines National Disaster Risk Reduction Management Fund (NDRRMF) and the Quick Response Fund (QRF) described in Box 4. The NDRRMF released PHP 14.6 billion in 2014 (**USD 325.9 million** at 1 January 2015 exchange rate) and 11.3 billion in 2015 (**USD 252.2 million**)[29]. Flows from the NDRRMF are almost entirely allocated to emergency response, relief operations and rehabilitation of infrastructure. Over the entire period of 2011 to 2016, 49 percent of released funds were used for relief and response, 49 percent for reconstruction and rehabilitation and only 2 percent for disaster prevention, mitigation and preparedness. Of the total funds, 98 percent went towards national government agencies and 2 percent to local governments (The Australian Embassy – The Asia Foundation Partnership in the Philippines, 2017). Quick Response Funds are also available to several Government Agencies, though no comprehensive source of information about actual disbursements from these funds in relation to Typhoon Haiyan / Yolanda could be identified in this study. The same applies to reserves of at least 5 percent of estimated revenue local government units are mandated to set aside for emergency purposes (GFDRR, 2015).

The Government of the Philippines committed to funding the bulk of recovery requirements for Typhoon Haiyan / Yolanda through its own budget (GFDRR, 2015). To track taxpayer money spent on reconstruction, the Philippine Government launched the Open Reconstruction[30] website as a complement to the FAiTH platform (which focused

29 Though not all of this can be uniquely attributed towards Typhoon Haiyan / Yolanda from the available data, it is assumed that a majority of funds supported emergency response, recovery and reconstruction for the event because of its magnitude.

30 http://openreconstruction.gov.ph/home.

on donor flows). Specifically, Open Reconstruction focuses on project proposals, budget releases and implementation related to the Philippine Department of Public Works and Highways (DPWH) and the Department of the Interior and Local Government (DILG). Despite wider potential application, Open Reconstruction currently only includes information for two events that both took place in 2013: Typhoon Haiyan / Yolanda and the Bohol Earthquake.

In response to Typhoon Haiyan / Yolanda, a total of PHP 36.38 billion (USD 812 million) were requested for reconstruction from national government budget, according to the homepage. Out of all requests, 539 are listed as having been assigned to an executor for implementation. These amount to a total of PHP 3.9 billion (USD 87 million). The Open Reconstruction platform only considers national funds and does not include tracking of donor contributions or spending through local calamity funds in its scope, thus reducing double counts. However, a risk of double counting remains when aggregating information available on the Open Reconstruction website with above-listed flows because budget released towards DPWH proposals could be backed by the national calamity fund or direct budget support from donors.

Project data from the DPWH provides more detailed information of funding sources and timing (Figure 12). The total of around PHP 4.7 billion across funding years reflects funding requirements for the public works and roads sector set out in the Yolanda Comprehensive Rehabilitation and Recovery Plan. The total PHP 4.3 billion (USD 96.5 million) cumulative obligations captured towards this requirement by October 2016, close to 50 percent were sourced through the NDRRM fund. This leaves PHP 2.17745 billion (USD 48.6 million) of (re) allocations from agency budget and alternative sources towards DPWH.

The Philippines Department of Budget and Management compiles domestic flows for Typhoon Haiyan / Yolanda across public implementing agencies (Figure 12). These amount to a total of over PHP 105.4 billion (USD 2,353,003,884). Part of the funds stem from a supplemental allocation to the annual budget, which was based on the RAY and could be implemented because Typhoon Haiyan / Yolanda occurred at the end of the budget cycle in 2013. At the end of 2014, the General Appropriations Act for 2015 was signed. This allocated PHP 21.7 billion (about USD 500 million) for rehabilitation. A 2014 supplemental budget entailed PHP 22.4 billion (USD 516 million) mainly for reconstruction projects (GFDRR, 2015).

Again, as the source of the funding is unknown, double counting is a potential issue for any of these domestic flows listed.

Table 3: Public domestic flows for Typhoon Haiyan / Yolanda 2013 - 2016 (PHP)

Implementing agency	Funding year				
	2013	2014	2015	2016	TOTAL
National Government agencies	15,371,041,891	25,724,423,763	19,353,527,017	55,386,342	60,504,379,013
Government owned and controlled operations	11,328,471,784	11,000,000,000	22,551,638,264	0	44,880,110,048
Local government units	36,831,947	0	0	0	36,831,947
Total	**26,736,345,622**	**36,724,423,763**	**41,905,165,281**	**55,386,342**	**105,421,321,008**

Source: Philippines Department of Budget and Management (2016); Villacin (2017).

Adding a further layer of detail, Jose (2012) suggests a methodology for tracking disaster-related budget allocations at government agency level in the Philippines. Building on existing tracking systems and drawing on enacted budget documentation (General Appropriations Act), this includes items on preparedness, disaster response, sustainable recovery and risk financing. While beyond the scope of this research, the budget allocation tracking system proposed by Jose (2012) could provide a starting point for further in-depth analysis on budget allocations towards disasters[31].

6.2 Malawi: El Niño-induced drought 2015/2016

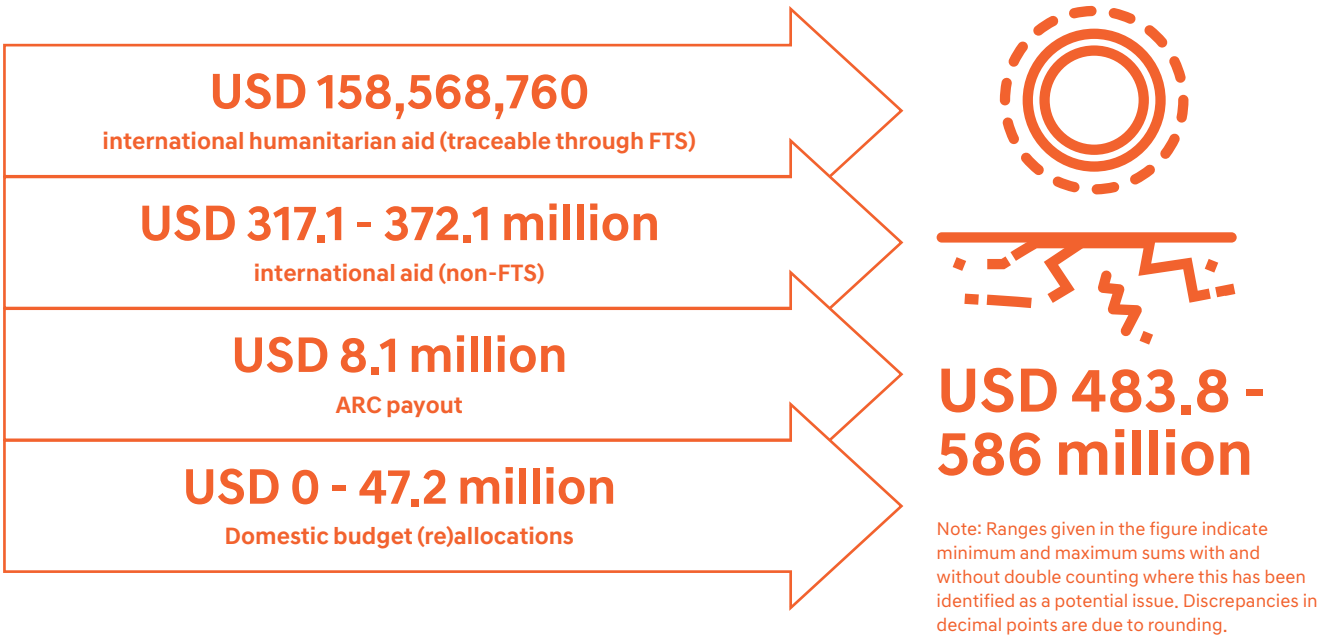
6.2.1 Overview of disaster impacts

Across South Africa, the El Niño conditions in 2015/2016 resulted in the worst drought in 35 years and the second failed harvest in a row (RIASCO, 2016). In Malawi, the 2015/2016 agricultural season was marked by erratic and below average rainfalls with prolonged dry spells, particularly in central and southern regions of the country. Severe crop failure meant that an estimated 6.5 million people were at risk of not meeting their food requirements in 2016/2017. This prompted the President of Malawi to declare a State of Natural Disaster on 12 April 2016 (Republic of Malawi, 2017b). Total damage and losses from the drought were estimated at USD 365.9 million, about 6.7 percent of Malawi's GDP in 2016, in the Post-Disaster Needs Assessment (PDNA) (Republic of Malawi, 2016a). The drought followed a severe flood event that had taken place earlier in 2015 and many districts throughout the country were heavily affected by both events (Republic of Malawi, 2017b). Though the September 2015 seasonal forecast from the Malawi Department of Climate Change and Meteorological Services (DCCMS) indicated a high probably for below-average rainfall in the upcoming season, El Niño preparations appear to have been overshadowed by continuing response to the previous flood and drought events (Tozier de la Poterie, 2018).

6.2.2 Mapping financial flows

Total flows from international humanitarian aid, ex ante sovereign risk financing mechanisms and domestic (re) allocation of funds towards the El Niño induced drought in Malawi are estimated at between **USD 483.8 - 586 million** over a period from 2015 to 2017 (Figure 13). This comes to about 130-160 percent of total loss and damage estimated in the PDNA and around 8-9 percent of 2015 GDP.

Figure 13: Estimated financial flows 2015/2016 El Niño, Malawi



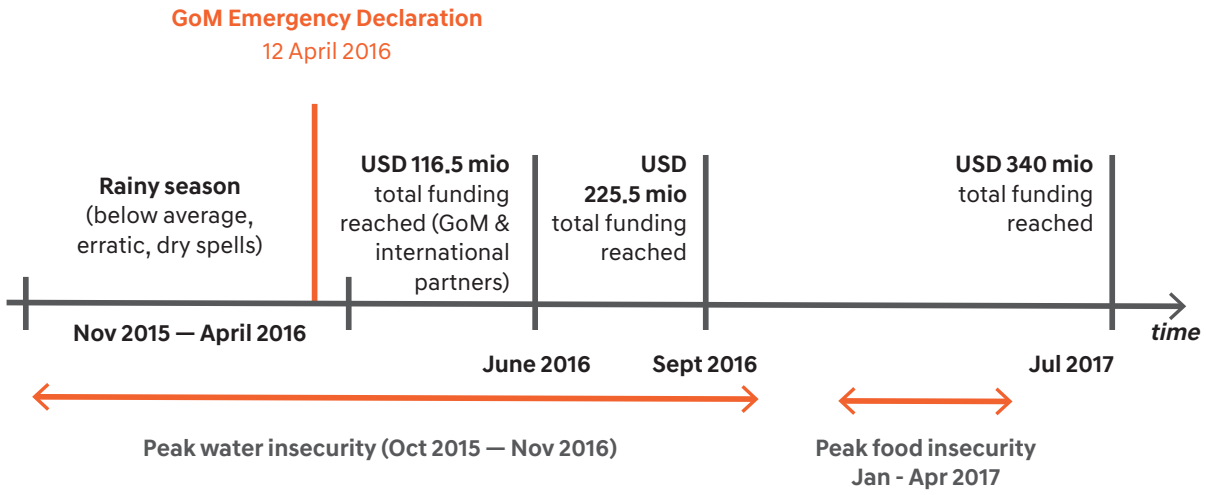
31 Jose (2012) provides an overview of the individual items in the tracking system that relate to disaster preparedness, response, recovery and risk financing, as well as the relevant government agencies for each of the items.

International aid flows

Unlike for the other two case studies, the FTS does not list the El Niño induced drought in Malawi in 2015 / 2016 as a specific emergency event (though there is a 'Malawi Floods 2015' emergency and a 'Malawi 2015' tag with a small number of entries). While some international humanitarian flows directed towards the drought event might still be recorded in FTS, it is more challenging to disentangle them from flows for other purposes. Appeals documents, action or response plans and reporting on these plans are a useful source of information on international flows in this case and also give an indication of when funds were committed.

In reaction to the drought situation, the Southern African Development Community (SADC) issued a regional appeal that was supported and reported on by the Southern Africa Regional Inter-Agency Standing Committee (RIASCO). For Malawi, the appeal indicated a funding requirement of USD 380 million, with USD 50 million available from the Government of Malawi and USD 66.5 million available through partners, leaving a funding gap of USD 263.5 million as of June 2016 (SADC, 2016a). By the time of the SADC appeal update in September 2016, this gap had reduced to USD 127.5 million due to additional partner contributions (SADC, 2016b) and by July 2017, the remaining gap amounted to USD 40 million (RIASCO, 2017) (Figure 14).

Figure 14: Funding progress towards SADC regional appeal in Malawi and peak humanitarian needs



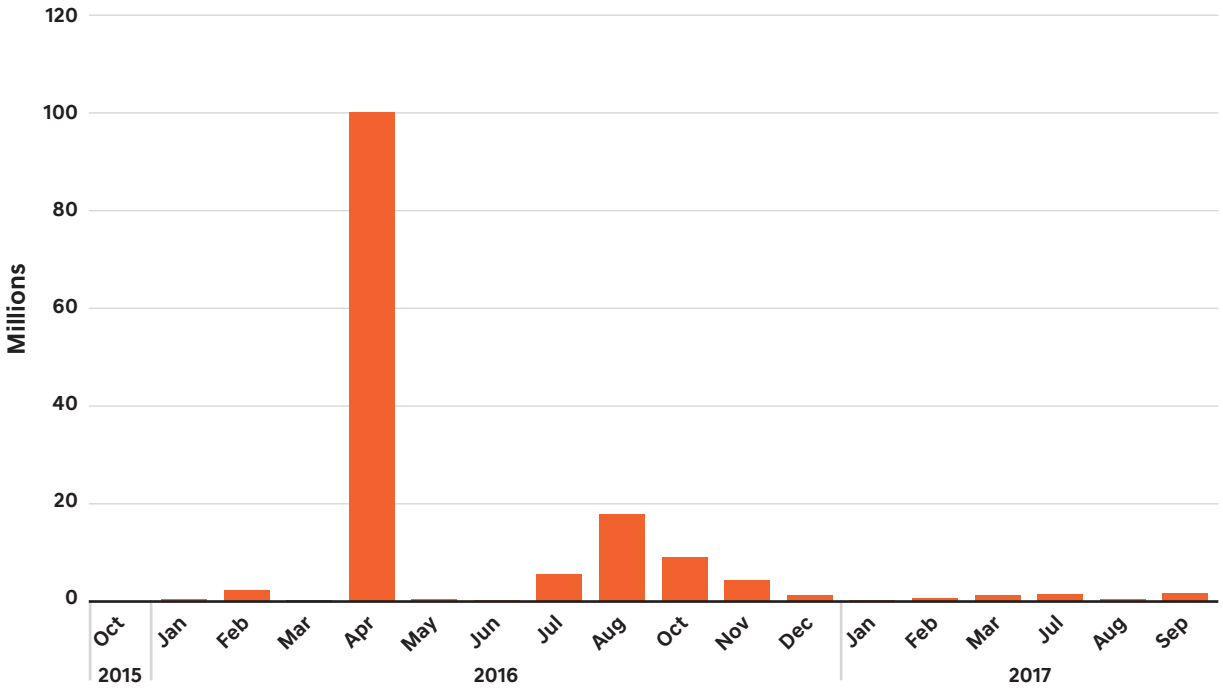
Source: Author based on SADC (2016a), SADC (2016b) and RIASCO (2017).

Note: Funding figures represent total amounts reached by a certain point in time, not additional allocations in that month.

Overall, the donor base for the El Niño appeal was relatively narrow, with the five major sources of funding for the region being USAID, DFID, the Government of Malawi in a joint response plan, ECHO and the World Bank. Some of the direct support by the World Bank and the International Monetary Fund (IMF) was provided in the form of emergency loans (RIASCO, 2017).

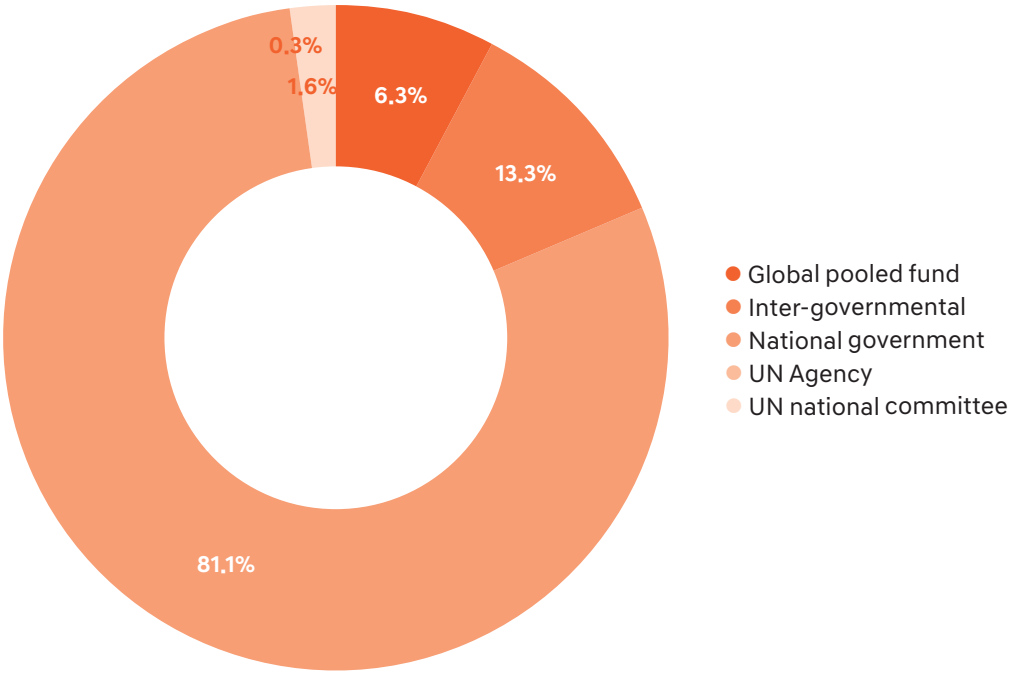
Based on the timeline in Figure 14 and the appeal and response plan documents, more detailed information can be extracted from FTS by screening the description text for each individual flow recorded in the database. For the years 2015 – 2017 a total of 241 entries are available, 128 of which are specifically allocated towards the flood emergency. Out of the remaining entries, 58 can be equivocally attributed to the El Niño-induced drought based on the project descriptions available in FTS.

Figure 15: Incoming commitments and paid contributions recorded in FTS per month to Malawi for El Niño induced drought



Source: Author based on data from UN OCHA FTS (2018). Values in current USD. Flows identified based on search for 'drought' and 'El Niño' in FTS description text.

Figure 16: Source of financial flows to Malawi recorded in FTS for 2015/2016 El Niño



Source: Author based on data from UN OCHA FTS (2018).

Aggregated flows per month over the period 2015 – 2017 are displayed in Figure 15. The sum of incoming financial flows recorded in FTS amount to about **USD 158.6 million**, so less than half of what has been recorded for Malawi against the regional appeal in action plan reports. Without the USD 50 million budget allocation by the Government of Malawi – which is included in the appeal reporting but would not be recorded in FTS – information from the global database captures about 55 percent of funding tracked by RIASCO and SADC through the appeal process. Part of the shortfall in the FTS data appears to be missing reporting of flows from some of the main donors. The World Bank and China, for instance, are named as main contributors towards the SADC regional appear in action plan reporting but are not among the sources of incoming flows listed in the FTS database (Table 4). Unfortunately, no detailed breakdown of donors per country is available in the action plan reporting, so a full comparison is not possible.

Table 4: Incoming aid flows for El Niño in Malawi per source according to FTS

Source of incoming flows	Total amount (USD)
Lithuania, Government of	20,920
Luxembourg, Government of	56,288
United Nations Development Programme	510,000
Denmark, Government of	665,193
UNICEF National Committee/Japan	907,640
Sweden, Government of	1,272,646
UNICEF National Committee/Germany	1,559,441
United Kingdom, Government of	2,611,183
Italy, Government of	2,877,740
Canada, Government of	7,380,654
Germany, Government of	9,223,537
Central Emergency Response Fund	9,963,628
European Commission's Humanitarian Aid and Civil Protection Department	17,048,592
United States of America, Government of	104,471,298
Total	**158,568,760**

Source: Author based on data from UN OCHA FTS (2018).

Next to the absence of some donors in FTS records, missing information on existing entries also contributes to the underestimation of flows. For example, not all project descriptions make explicit reference to 'drought' or 'El Niño', so in a number of cases it is impossible to determine whether links exist between the flow record and a specific event. In the case of Malawi, 33 records amounting to around USD 60 million could neither be clearly attributed to, nor disassociated from the El Niño situation. Nonetheless, FTS allows for a more detailed mapping of international humanitarian aid flows towards the event than CRS would, because if provides additional information on each flow rather than an aggregate and allows for a separation of flows towards the drought versus a flood event also taking place in Malawi during the same year (2015).

Though Malawi's Aid Management Platform[32] has been deemed relatively active in a comparison of Aid Information Management Systems (AIMS) across developing countries, (Park, 2017) it only records a fraction of flows captured in the FTS[33]. Instead, institutional reports, for example from the World Bank, the IMF and other main donors indicated through the appeals document better complement FTS information and complete the more detailed picture of international financial aid flows in the case of Malawi.

In June 2016, The International Monetary Fund (IMF) enabled immediate disbursement of **USD 76.8 million** from the Extended Credit Facility (ECF) arranged in 2012 and increased the existing ECF by USD 49.2 million for response to the El Niño induced drought. Furthermore, the World Bank provided a **USD 104 million** International Development Association (IDA) grant for drought recovery and resilience to Malawi in November 2016, including USD 9 million from the Crisis Response Window (CRW) of the IDA (GFDRR and World Bank, n.d.; International Monetary Fund, 2016a). Under the project, which became active in January 2017, USD 50 million were used for the purpose of procuring maize internationally and locally (World Bank, 2016). Additional funding from the World Bank in response to the drought included: a grant of **USD 47.68 million** and a credit of **USD 22.32 million** towards cash transfers and public works, **USD 10 million** additional finance towards nutrition, **USD 30 million** budget support for policy reform on drought and agriculture and **USD 300,000** of analytical work to enhance El Niño preparedness and response (RIASCO, 2016; World Bank, 2016). The African Development Bank approved **USD 16 million** to a budgetary support programme for response to the drought-related food crisis (International Monetary Fund, 2018a). Furthermore, the Government of China contributed in kind rice donations of **USD 10 million** value. The Government of Malawi's 2016/2017 food insecurity response plan also lists a carryover of funds from a previous humanitarian emergency amounting to **USD 55 million**, although the original source of funds is unclear from the document (Republic of Malawi, 2016). This means there might be some double counting. Technically, FTS should capture carry over from prior emergencies through its 'source emergency indicator' and therefore allow for verification of any suspected double-counting. In practice, however, there is no mention of a 'source emergency' for any of the El Niño-related flows recorded in FTS. Furthermore, the overall low number of flows related to any specific emergency in Malawi put in question the reliability of this indicator.

Ex ante external sovereign disaster risk financing

Malawi has a limited disaster risk financing portfolio. In 2015/2016, the only instruments in place to finance early response were sovereign-level drought insurance and budget re-allocations (discussed below under domestic flows) (Republic of Malawi, 2017a). Malawi was part of the second round of the Africa Risk Capacity risk pool in 2015/2016 and received a payout of **USD 8.1 million** from the pool in 2017. Funds were used to scale up cash transfers and replenish strategic grain reserves (African Risk Capacity, 2017a). Though the rainy season ended in April / May 2016, payouts were not made until much later after completion of a technical review process. This became necessary because ARC's underlying software, Africa Risk View, had not triggered a release of payment despite evident devastating drought impacts on the ground (African Risk Capacity, 2017b).

Domestic budget (re)allocations, reserves or emergency funds

Through fiscal programme revisions in 2015/2016 and 2016/2017, the Government of Malawi spent MWK 13 billion (about **USD 19.2 million** at 30 April exchange rate[34]) and MWK 20 billion (about **USD 28 million** at 31 October 2016 exchange rate) respectively on additional

32 http://malawiaid.finance.gov.mw/portal/.

33 Specifically, only two relevant projects with a total disbursement volume of just over USD 3.9 million funded by Italy and the UK Department for International Development could be identified through the database key word search for 'El Niño' and 'drought'. Both flows were also recorded in the FTS database.

34 Though the actual date of (re-)allocation is not clear from the IMF report, end of April was chosen as this was the time when an official emergency was declared by the Government.

maize purchases. However, from the IMF's consultation report it is unclear whether this was sourced trough re-allocations in the domestic budget or external budget support (International Monetary Fund, 2016a). In the latter case, double-counting with international financial flows might be an issue. At the time of writing, the homepage of the Malawian Ministry of Finance, Economic Planning & Development was inaccessible and potential re-allocations could not be verified through budget statements or speeches.

6.3 Dominica: hurricane Maria 2017

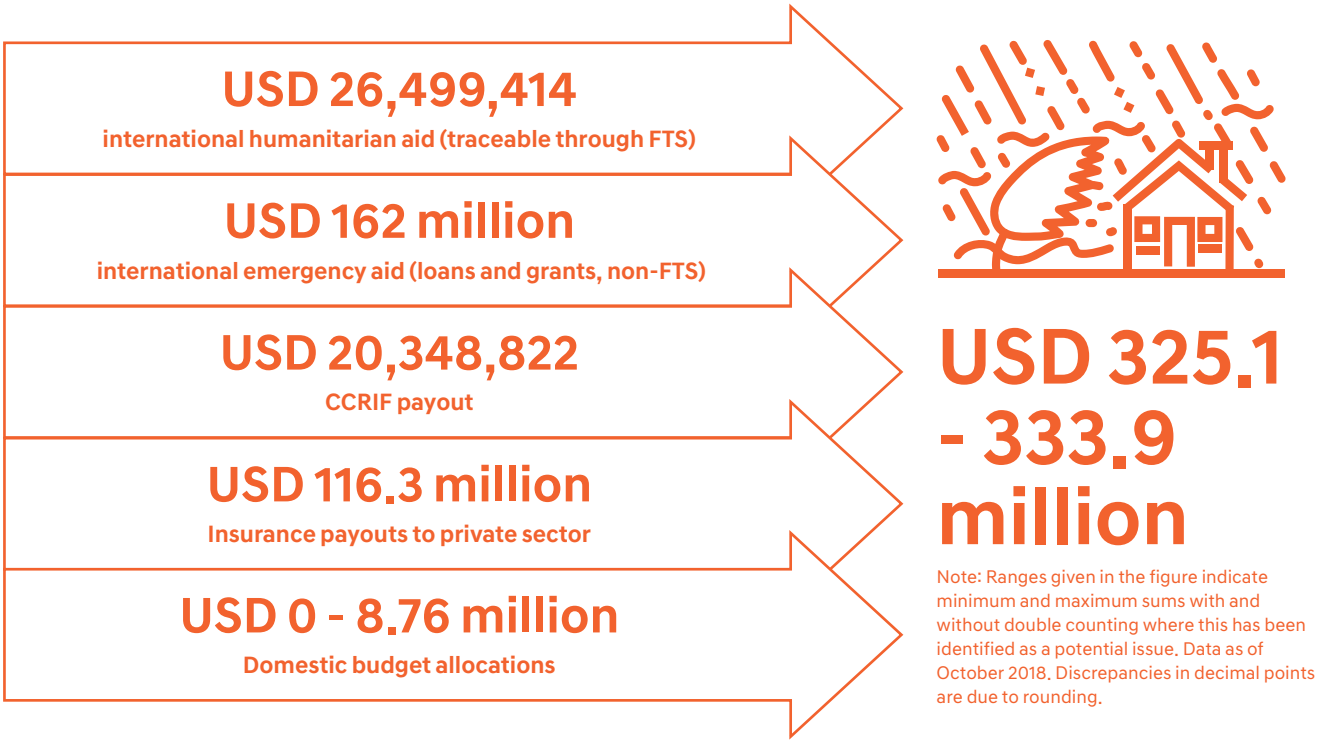
6.3.1 Overview of disaster impacts

Hurricane Maria reached the Commonwealth of Dominica as a Category 5 hurricane with winds over 274 kilometres per hour on 18 September 2017. The storm was accompanied by heavy rainfalls that resulted in flashfloods and landslides. Its total death toll is estimated at 64, making Hurricane Maria Dominica's deadliest natural hazard-related disaster in almost 90 years (CRED, 2018). Dominica's entire population of 71,000 was affected by the event and more than 17,000 people, or 24 percent of the population, were assumed to have left the country within just over a month afterwards (ACAPS, OCHA and UNDP, 2017). Combined damages and losses from the Hurricane amounted to XCD 3.54 billion (USD 1.3 billion) according to the national PDNA. This represents 226 percent of Dominica's 2016 GDP. The Government of Dominica identified financial needs for reconstruction and resilience activities of XCD 3.69 billion (USD 1.7 billion) (Government of the Commonwealth of Dominica, 2017). In Response to Hurricane Maria, the Caribbean Disaster Emergency Management Agency (CDEMA) convened the Regional Response mechanism on 19 September and the Government of the Commonwealth of Dominica (GCD) officially requested a PDNA, as well as the establishment of UN-led Crisis Management Unit (Government of the Commonwealth of Dominica, 2017). However, response to, and recover from Hurricane Maria were complicated by the fact that the recovery process from Tropical Storm Erika in 2015 were still ongoing (ACAPS, OCHA and UNDP, 2017).

6.3.2 Mapping financial flows

Total flows from international humanitarian aid, ex ante sovereign risk financing, the insurance sector and domestic allocation of funds towards Hurricane Maria in Dominica are estimated at between **USD 325.1 and 333.9 million** over a period from 2017 to November 2018. This amounts to around 25 percent of the total damage and losses from the event and around 60 percent of GDP in 2016. As the Hurricane happened only about a year before this report was written, and considering timelines for the previous case studies, figures might further increase due to ongoing and additional future flows.

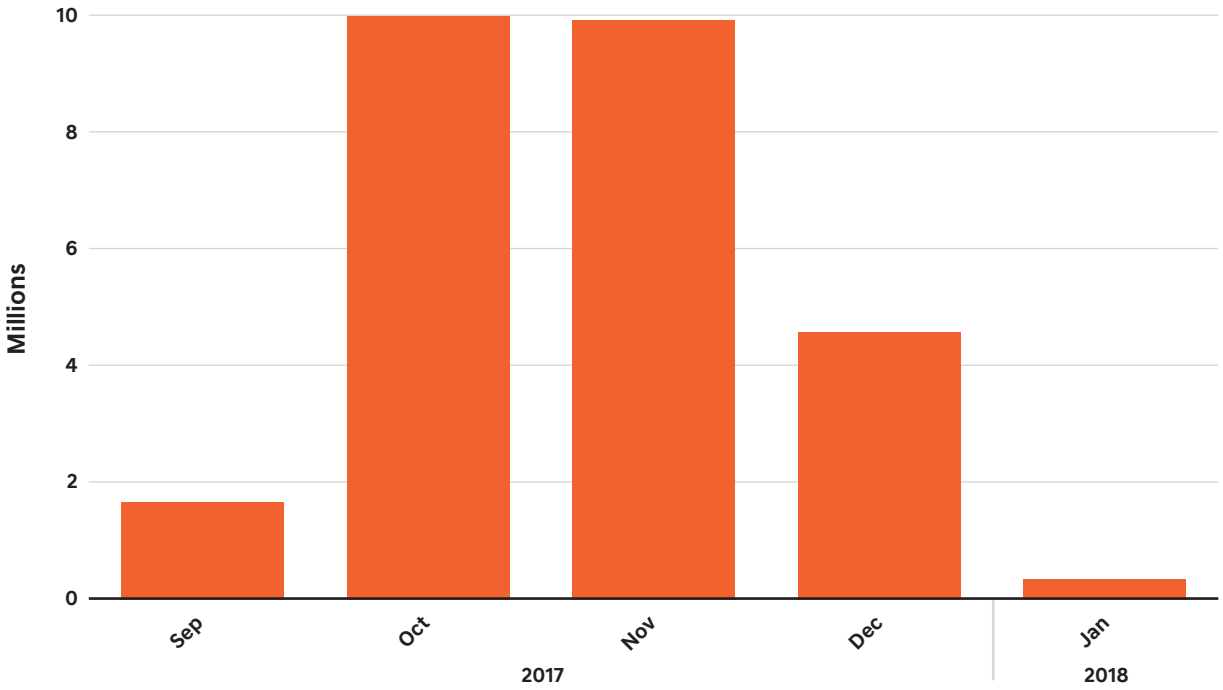
Figure 17: Estimated financial flows Hurricane Maria, Dominica



International aid flows

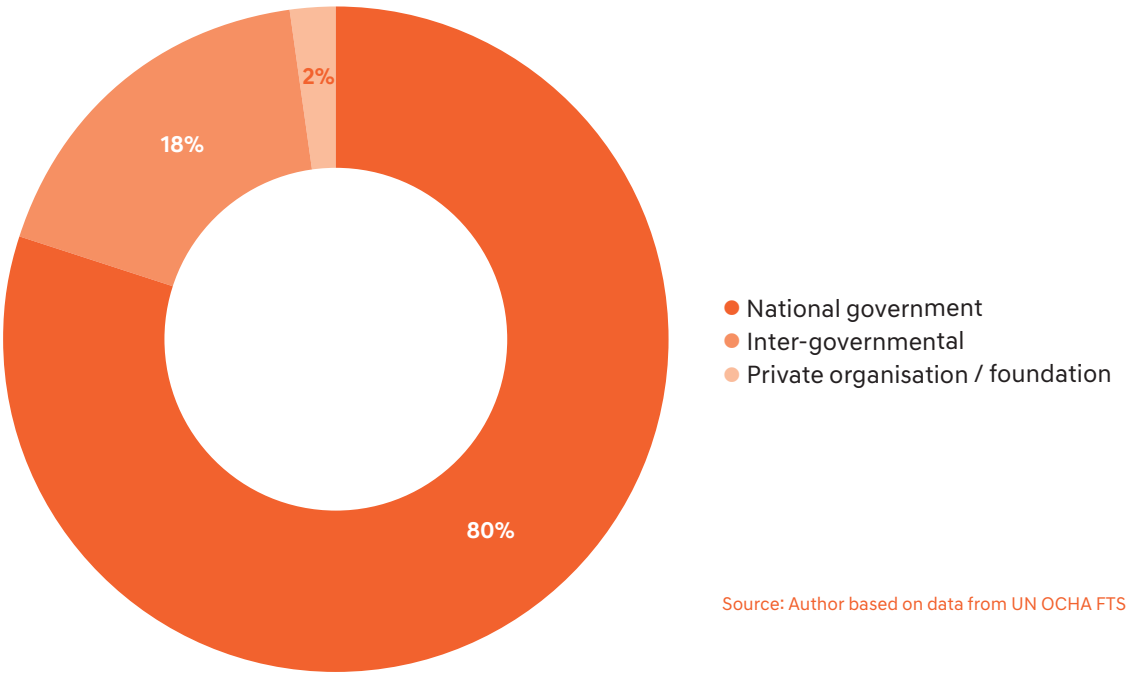
To date, the FTS database has recorded a total of USD 26.5 million in financial flows towards the Hurricane Maria emergency marker. The majority of these flows were committed or paid in the last quarter of 2017. No incoming flows are recorded to have taken place after January 2018 (Figure 18). This is despite the fact that investigation into flows from additional donors indicates that contributions, for instance from the World Bank, are still being made into the fourth quarter of 2018. This discrepancy may in part be related to the general underreporting expected in FTS and in part to the fact that the event happened fairly recently so that flows may not yet have been submitted by source organisations or updated by the database.

Figure 18: Incoming commitments and paid contributions recorded in FTS per month to Dominica for Hurricane Maria



Source: Author based on data from UN OCHA FTS (2018). Values in current USD. Flows identified based on classification of record as 'DOMINICA - Hurricane Maria - September 2017' in the FTS Destination Emergency indicator.

Figure 19: Source of financial flows to Dominica recorded in FTS for Hurricane Maria



Source: Author based on data from UN OCHA FTS (2018).

As for the previous two case studies, the majority of incoming flows into Dominica that were recorded in FTS were committed or paid by national Governments (Figure 19). This includes contributions of around USD 3 million that were channelled through the Central Emergency Response Fund (CERF) in mid-October 2017. The three largest donors in late 2017 and January 2018 consisted of the European Commission, the United States Government and the Government of the United Kingdom (Table 5).

Table 5: Commitments and paid contributions recorded in FTS

Source of incoming flows	Total amount (USD)
Malta, Government of	17,422
Luxembourg, Government of	46,740
Germany, Government of	60,096
Belgium, Government of	100,000
Italy, Government of	120,192
Norway, Government of	125,992
Private (individuals & organizations)	127,394
Sweden, Government of	145,690
Ireland, Government of	174,216
Switzerland, Government of	205,761
United Arab Emirates, Government of	350,000
Canada, Government of	400,962
Qatar, Government of	425,000
Facebook	500,000
Australia, Government of	1,174,628
China, Government of	3,000,000
European Commission's Humanitarian Aid and Civil Protection Department	4,730,965
United States of America, Government of	6,349,998
United Kingdom, Government of	8,444,358
Total	**26,499,414**

Source: UN OCHA FTS (2018)

In addition to flows reported in FTS, the World Bank approved emergency assistance to Dominica to rebuild housing, restore agricultural livelihoods and strengthen resilience in response to Hurricane Maria. The **USD 115 million** total support include USD 65 million concessional financing and a USD 50 million grant from the International Development Association's (IDA) Crisis Response Window (World Bank, 2018c). In October 2018, the World Bank stocked up an existing project with an additional USD 31 million to support building back better from Hurricane Maria (World Bank, 2018b).

The Caribbean Development Bank (CDB) supported the restoration of the severely affected electricity sector through a **USD 200,000 grant and a USD 15.8 million loan** to Dominica Electricity Services Limited (DOMLEC) (Caribbean Development Bank, 2018a)[35]. A multi-country CDB road transport sector project was expanded to Dominica later in 2018 as a reaction to damage caused by Hurricane Maria (Caribbean Development Bank, 2018b), but no information about the volume of financial support could be traced for this study. Dominica is not a member of the Inter-American Development Bank and was therefore not eligible to access the USD 1 billion in loans pledged by the IADB in response to the 2017 Hurricane season.

Ex ante external sovereign disaster risk financing

Dominica has a relatively narrow ex ante disaster risk financing portfolio, focused mainly on risk transfer (The Commonwealth, 2018)[36]. The country has been part of the Caribbean Catastrophe Risk Insurance Facility (CCRIF), a risk pool offering parametric policies to countries in the region. Four days after Hurricane Maria made landfall in Dominica, CCRIF confirmed that the country would receive a payout of **USD 19,294,800** within 14 days of the event through its tropical cyclone policy (CCRIF SPC, 2017). Shortly after, an additional payout of **USD 1,054,022** was made under Dominica's excess rainfall policy in relation to Hurricane Maria (CCRIF SPC, 2018). Little is known about additional insurance of public assets by individual Government agencies and no information on this could be centrally accessed. It was estimated that insurance payouts to the Dominican private sector since Hurricane Maria had added up to roughly 20 percent of GDP, about **USD 116.3 million**, as of August 2018. Claims amounting to 15 percent of GDP were still outstanding at the time (International Monetary Fund, 2018b).

Domestic budget (re)allocations, reserves or emergency funds

In 2018, post Maria, it was announced that the GCD would establish a Disaster Management and Preparedness Fund to help mobilise resources for future events. However, such a fund did not exist in 2017 and public domestic flows were largely reallocations in the existing budget or new allocations under the 2018/19 budget. Many of the additional allocations towards recovery and reconstruction from Hurricane Maria in the 2018/19 budget are built into wider projects. This means, budget directed towards disaster-related activities in some cases cannot be disentangled without more detailed analysis of Government budget and individual projects that is beyond the scope of this report. For some areas, however, the 2018 budget address highlights direct links to Maria. This includes XCD 1.24 million **(about USD 460,000 at 1 July 2018 exchange rate)** additional allocations in the tourism sector for rehabilitation of coastal areas and the yachting sector affected by Maria. It also entails XCD 5.6 million **(USD 2 million)** to dispose of metals and bulky waste the Hurricane left behind. Furthermore, the GCD imported building materials at a value of XCD 17 million **(USD 6.3 million)** (Government of the Commonwealth of Dominica, 2018). Whether or not these are allocations sourced through domestic revenues or backed by some of the international budget support and loans provided to the GCD after Hurricane Maria is not clear from the data. Potential budget reallocations in 2017 could not be traced in information publicly available through the Dominican Ministry of Finance. While further in-depth country analysis might clarify the volume of reallocations that were made by the GCD, it remains beyond the scope of this report.

35 Earlier reporting from September 2017 mentioned that the Caribbean Development Bank (CDB) had offered a USD 200,000 grant to Dominica shortly after Hurricane Maria hit the country. In addition, Dominica was eligible for a USD 750,000 Immediate Response Loan from the CDB to clear areas damaged by the Hurricane and support restoration of services (Caribbean Development Bank, 2017). At the time of writing, it was unclear whether any or all of this amount has been drawn on by the GCD and whether the USD 200,000 grant was the same as, or additional to, the joint IDB/CDB grant or the CBD grant to DOMLEC.

36 For a full overview of disaster risk financing instruments used in Dominica, see Annex 5.

CHAPTER 7

7 CONCLUSIONS AND WAYS FORWARD

7.1 Summary of findings

This report presented an overview of available data and methodologies for mapping financial flows towards natural hazard-related disasters at global and case study level. **While official international flows are fairly well documented through existing global databases and donor reporting, domestic budget reallocations and domestic public and private flows are much more difficult to capture** without in depth research on the ground.

At global level, a range of previous studies have assessed surges in different types of flows, mainly including international aid, migrant's remittances and private equity flows. However, some of these approaches are only applicable to larger samples and not suited for analysing individual country or event case studies because of their underlying assumptions. Furthermore, existing global data on international aid flows is not without its challenges: databases such as FTS or CRS only capture a share of international humanitarian financial flows for disasters and linking flows to specific events or types of events based on currently available data is time consuming in some instances and impossible in others.

The main reasons for under- or misestimation of flows encountered in this study were the voluntary nature of reporting in FTS, meaning some flows go unrecorded by the database, along with incomplete, non-standardised reporting of varying quality and a lack of attribution of flows to specific emergency events.

Case studies showed that more complete mapping of flows can be re-created by combining a range of different sources of information. This includes, for example, reporting against national or regional appeals, post disaster needs assessments, press releases of donors and multilateral financial institutions, government plans, reports, and budgets. However, for the purpose of global mapping of flows, aggregating data from individual events and countries in this way is time and resource intensive. This is especially the case in the absence of standardised reporting of financial flows for disasters by countries.

If well-managed and frequently updated, national information management systems could help to track financial flows for disasters more comprehensively than it is possible based on the existing international databases. However, the case studies in this report indicate that these are not always maintained beyond one or a few events. In Malawi, where a continuous system exists, the information it contains about flows for specific disasters such as the 2015/2016 El Niño is less comprehensive than the FTS database.

Though not all flows could be uniquely linked to a specific point in time for the global snapshot and country case studies, the general picture emerging from the study is that the **vast majority of funds is spent on relief, recovery and reconstruction, while only minor shares are allocated to disaster prevention, mitigation and preparedness.** Globally, this share is at 7 percent over the period 2000 to 2016.

The extent to which losses and damage from disaster are being recovered and nationally identified post-disaster needs are being met through the types of financial flows assessed in this report varies greatly between case studies. This may in part be because other important flows, for instance from private donors or through informal networks, are not captured in the methodology and vary between countries; because initial impact and needs assessments are over- or underestimated in some cases; or because some disasters attract greater donor response than others, for instance due to a country's income level, political circumstances or media attention.

7.2 Outlining options for enhanced mapping of finanical flows for disasters

Based on the current state of data and methodology introduced in this report, several options exist for enhancing global mapping of financial flows through further treatment of existing data and tracking of additional flows not currently captured in FTS. They include several entry points at national and global level that build on the methodology used in this report and are not mutually exclusive. Irrespective of which option(s) are pursued, there should be a clear strategy for informing or changing policy and practice around disaster-related financial flows behind it to ensure the way in which data is captured, processed and presented can be driven by purpose. Options are detailed in the following:

(1) Enhancing the database for global financial flows towards natural hazard-related disasters

The FTS database currently provides the most frequently updated, openly accessible and detailed information about international humanitarian aid flows that can be disaggregated for natural hazard-related disasters. Following the Grand Bargain commitment for increased transparency in humanitarian financing, closer integration of IATI and FTS is expected to enhance reporting, though recent reviews indicate that there is still a long way to go for donors and aid organisations in this area (Metcalfe-Hough et al., 2018).

Because of the details on individual pledges, commitments and disbursements it entails, FTS is the most suitable starting point available to map international aid flows towards natural hazard-related disasters. Importantly, for this purpose, the database already links some flows to specific emergency events. It also entails more detailed descriptions for each pledge, commitment and paid contribution than CRS and those descriptions often refer to specific events or types of events. Relevant flow records that are not already linked to an emergency could be identified through a text search by emergency type (for example 'flood', 'hurricane', and 'drought') or names of larger events within these descriptions. Inventories of past disasters, such as kept by the Dartmouth Flood Inventory or the NOAA National Hurricane Centre could further refine a text search.

Such an approach can enable a differentiation of additional flows towards natural hazard-related disasters from flows towards other purposes, for instance response to technological disasters, conflicts or epidemics. This would greatly increase the comprehensiveness of what can already be identified as flows towards natural hazard-related disasters based on the existing FTS emergency categories. As such, it is the 'lowest-hanging fruit' for enhancing the mapping of financial flows for natural hazard-related disasters at global level.

Nonetheless, limited capacity of the FTS website for accessing and downloading larger sub-sets of the data and attribution of flows to specific events or types of events beyond individual case studies remain challenging due to the large number of records and events that would need to be coded. If the aim is a global database for financial aid flows towards natural hazard-related disasters, additional resources would need to be invested towards extracting and processing FTS data as described and continuity in updating the resulting database would need to be ensured by a dedicated institution.

(2) Mapping financial flows for country or event case studies

As the global snapshot and the case studies in this report demonstrate, FTS can be useful to provide a broader overview of flows. It also presents detailed information on a range of indicators (including source and destination organisations, timing of decision and flow, etc.) for each record it enlists, but presents a less complete picture of total amounts for individual events. Specifically, private flows, financing from multilateral development banks and non-traditional donors of aid are underrepresented, while other types of flows such as remittances, domestic budget (re)allocations or resources released through ex ante disaster risk financing instruments are not within the realms of what the database captures.

Piecing together a more comprehensive picture of financial flows is more feasible at case study level for individual events or countries than at global level, because it requires screening of a variety of different sources of information. The methodology and table presented in Chapter 4 of this report can be used as guidance for further case studies. Depending on the time and resources available for the exercise, more detail and additional flows to those included in Chapter 6 may be captured[37]. In any mapping and aggregation exercise, issues of potential double counting; the difference between pledges, commitments and paid contributions or disbursements; definitions and attribution of flows to specific markers or categories; and timelines for flows and reporting need to be considered. For comparison over time and across countries, inflation also needs to be accounted for.

37 As guidance, the case studies presented in this report were compiled with about 4 days of research and writing per disaster event.

(3) Enhancing tracking of financial flows for disasters at national level

As evident from the case studies in this report, limited information is publicly available and readily accessible about financial flows for disasters at national level. In some cases, Aid Information Management Systems (AIMS) contribute to a better understanding of incoming flows in addition to global databases such as CRS and FTS. However, these AIMS are of variable quality, not always maintained beyond individual disaster events, and they are not necessarily compatible with platforms to account for other types of flows such as domestic Government budget (re)allocations. Some countries have worked towards incorporating data from budgets and information on other flows such as those reported under the IATI framework, but tracking disaster-related financing remains challenging for Governments. This is exemplified in the Philippines, where the World Bank and GFDRR have supported the Office of Civil Defence (OCD) in developing a system for this purpose. Initially, constant changes in staffing and budget resulted in limited capacity to operate. Furthermore, the 'overwhelming effect' of Typhoon Haiyan / Yolanda revealed the inadequacy of the system to generate relevant information and highlighted the importance of basing such systems in the most relevant agency (World Bank, 2017). Finally, tracking of disaster-related flows is not currently standardised or interoperable across countries.

A next step in this regard would be to produce more detailed guidance for tracking at national level, accompanied by training and promotion to support Governments in undertaking more systematic accounting of disaster-related financial flows. To the extent possible, this should build on existing national systems and guidance for related processes already in operation such as that for disaster risk finance diagnostics suggested by the World Bank and the Asian Development Bank (Alton et al., 2017). An online platform or data repository would be useful to compile data from across countries and would help to establish good practice in disaster risk financing accounting. Continuity, maintenance, and relevance for policy and practice of such a platform would need to be ensured.

(4) Clarifying classifications for financing early action ahead of anticipated disasters in global databases

For now, global databases on financial aid flows for disasters such as the CRS make a distinction between disaster prevention and preparedness; emergency response; and reconstruction relief and rehabilitation. However, there is no (sub-)category to distinguish financial flows released in anticipation of a specific event from funding for strengthening 'multi-hazard response preparedness' more generally. The latter includes a broader range of interventions such as institutional capacity building, risk analysis and assessment or preparedness for 'potential, imminent and current' emergencies (OECD, 2018). Increasingly, global funds, donors and international multilateral, as well as non-governmental, organisations are using a variety of forecasting systems to trigger the release of resources before an extreme event occurs or before a critical situation that is being monitored develops into a full-fledged disaster. This is usually referred to as Forecast-based Early Action (FbA), Forecast based Financing (FbF) or Early-Warning Early-Action (EW/EA). Current examples include the recently launched Famine Action Mechanism (FAM), ongoing pilot programmes by the IFRC, WFP, FAO, the START Network and others, as well as considerations to introduce capacity for forecast-based financing through the CERF.

Rising commitment to make financial flows available earlier in order to increase early action or preparedness and reduce disaster impacts has shifted timelines for disaster-related financing. This is not currently reflected in any of the global reporting platforms. While such flows would fall under the current 'disaster prevention and preparedness' classification of the CRS, for instance, they are aggregated with wider activities to build the capability, capacity and responsiveness to disasters in the database. It is important, however, to generate an enhanced understanding of flows that are released pre-disaster based on forecasts or early warnings in order to better assess the scale and effectiveness of forecast-based release of financial resources. Tracking this information could also help increase accountability for financing and acting early to prevent, mitigate, or better manage anticipated disaster impacts. Such an approach could be facilitated through more explicit definitions and/or additional (sub)categories in classifications of databases such as CRS.

CHAPTER 8

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ANNEX 1

DEFINITION AND CATEGORIES OF TYPES OF EVENTS

In this report, the focus is on natural hazard-related disasters. To distinguish these from other types of events, classifications from the major available disaster impact databases are used and applied to select relevant flows from the FTS database.

1) EM-DAT

EM-DAT distinguishes natural disasters from technological disasters such as industrial and transport accidents. Within the natural disasters group, six categories are defined: geophysical, meteorological, hydrological, climatological, biological and extra-terrestrial. For the purpose of this report, only the first four categories are included in the analysis to ensure consistency across the databases.

Table 6: Disaster subgroups, definitions and types in the natural disaster group as classified in EM-DAT

Disaster subgroup		Disaster main type
Geophysical	A hazard originating from solid earth. This term is used interchangeably with the term geological hazard.	Earthquake, mass movement (dry), volcanic activity
Meteorological	A hazard caused by short-lived, micro- to meso-scale extreme weather and atmospheric conditions that last from minutes to days.	Extreme temperature, fog, storm
Hydrological	A hazard caused by the occurrence, movement, and distribution of surface and subsurface freshwater and saltwater.	Flood, landslide, wave action
Climatological	A hazard caused by long-lived, meso- to macro-scale atmospheric processes ranging from intra-seasonal to multi-decadal climate variability.	Drought, glacial lake outburst, wildfire
Biological	A hazard caused by the exposure to living organisms and their toxic substances (e.g. venom, mold) or vector-borne diseases that they may carry. Examples are venomous wildlife and insects, poisonous plants, and mosquitoes carrying disease-causing agents such as parasites, bacteria, or viruses (e.g. malaria).	Epidemic, insect infestation, animal accident
Extra-terrestrial	A hazard caused by asteroids, meteoroids, and comets as they pass near-earth, enter the Earth's atmosphere, and/or strike the Earth, and by changes in interplanetary conditions that effect the Earth's magnetosphere, ionosphere, and thermosphere.	Impact, space weather

Source: CRED (2018) EM-DAT, https://www.emdat.be/classification.

2) Sigma

Swiss Re's Sigma explorer database distinguishes between natural catastrophes and man-made disasters, subdivided into the following categories:

Type of disaster	Sub-category
Natural catastrophes *'A natural catastrophe is caused by natural forces.'*	Floods, storms, earthquakes, droughts/forest fires/heat waves, cold waves/frost, hail, tsunamis, and other natural catastrophes.
Man-made disasters *'A man-made or technical disaster is triggered by human activities.'*	Major fires and explosions, aviation and space disasters, shipping disasters, rail disasters, mining accidents, collapse of buildings/ bridges, and miscellaneous (including terrorism).

Source: Swiss Re Sigma Explorer, http://www.sigma-explorer.com/documentation/Methodology_sigma-explorer.com.pdf.

3) NatCat

The Munich Re NatCat Service includes data on geophysical, meteorological, hydrological and climatological events worldwide, including the following sub-types:

Table 7: Event types and sub-types as classified in NatCat SERVICE

Type of event	Sub-type
Geophysical events	Earthquake, tsunami, volcanic activity
Meteorological events	Tropical cyclone, extratropical storm, convective storm, local storm
Hydrological events	Flood, mass movement
Climatological events	Extreme temperature, drought, forest fire

Source: Munich Re (2018) NatCat SERVICE, https://natcatservice.munichre.com/.

4) FTS

Financial flows attributed to specific emergencies in FTS were classified into five different categories for the purpose of further analysis:

- Conflict or civil unrest
- Refugee crisis
- Natural hazard-related disasters
- Technological disasters
- Biological disasters

In line with the use of EM-DAT and NatCat data and classifications, only the natural hazard-related disasters category was used in this paper. Though biological disasters, according to EM-DAT, generally fall into the 'natural' disasters group, they were not included in the analysis in this report to ensure coherence, because these are not included in the NatCat database.

ANNEX 2

SECTOR CLASSIFICATIONS AND DEFINITIONS RELEVANT TO FINANCIAL FLOWS FOR DISASTERS IN THE OECD CRS

Emergency Response	
Material relief assistance and services	'Shelter, water, sanitation, education, health services including supply of medicines and malnutrition management, and other non-food relief items (including cash and voucher delivery modalities) for the benefit of crisis affected people, including refugees and internally displaced people in developing countries, Includes assistance delivered by or coordinated by international civil protection units in the immediate aftermath of a disaster (in-kind assistance, deployment of specially-equipped teams, logistics and transportation, or assessment and coordination by experts sent to the field). Also includes measures to promote and protect the safety, well-being, dignity and integrity of crisis-affected people including refugees and internally displaced persons in developing countries. (Activities designed to protect the security of persons or properties through the use or display of force are not reportable as ODA.)'
Emergency food assistance	'Provision and distribution of food; cash and vouchers for the purchase of food; non-medical nutritional interventions for the benefit of crisis-affected people, including refugees and internally displaced people in developing countries in emergency situations. Includes logistical costs. Excludes non-emergency food assistance (52010), food security policy and administrative management (43071), household food programmes (43072) and medical nutrition interventions (therapeutic feeding) (72010).'
Relief co-ordination and support services	'Measures to co-ordinate the assessment and safe delivery of humanitarian aid, including logistic, transport and communication systems; direct financial or technical support to national governments of affected countries to manage a disaster situation; activities to build an evidence base for humanitarian financing and operations, sharing this information and developing standards and guidelines for more effective response; funding for identifying and sharing innovative and scalable solutions to deliver effective humanitarian assistance.'

Reconstruction Relief & Rehabilitation	
Immediate post-emergency reconstruction and rehabilitation	'Social and economic rehabilitation in the aftermath of emergencies to facilitate recovery and resilience building and enable populations to restore their livelihoods in the wake of an emergency situation (e.g. trauma counselling and treatment, employment programmes). Includes infrastructure necessary for the delivery of humanitarian aid; restoring pre-existing essential infrastructure and facilities (e.g. water and sanitation, shelter, health care services, education); rehabilitation of basic agricultural inputs and livestock. Excludes longer-term reconstruction ("build back better") which is reportable against relevant sectors.'

Disaster Prevention & Preparedness	
Multi-hazard response preparedness	'Building the responsiveness, capability and capacity of international, regional and national humanitarian actors to disasters. Support to the institutional capacities of national and local government, specialised humanitarian bodies, and civil society organisations to anticipate, respond and recover from the impact of potential, imminent and current hazardous events and emergency situations that pose humanitarian threats and could call for a humanitarian response. This includes risk analysis and assessment, mitigation, preparedness, such as stockpiling of emergency items and training and capacity building aimed to increase the speed and effectiveness of lifesaving assistance delivered in the occurrence of crisis.'

Source: OECD (2018).

ANNEX 3

LIST OF DONORS AND CONTRIBUTIONS TOWARDS TYPHOON HAIYAN / YOLANDA IN THE PHILIPPINES

Table 8: Total contributions per donor attributed to the Typhoon Haiyan / Yolanda Emergency in FTS

Donor	Total amount (USD)
UNICEF National Committee/Andorra	13,111.00
Andorra, Government of	13,405.00
UNICEF National Committee/Slovakia	14,334.00
Friends of UNFPA	20,390.00
Cyprus, Government of	25,221.00
Virgin Unite	30,000.00
Portugal, Government of	33,967.00
Greece, Government of	40,761.00
Guyana, Government of	50,243.00
UNICEF National Committee/Iceland	50,703.00
Malta, Government of	53,619.00
UNICEF National Committee/Indonesia	60,749.00
Croatia, Government of	68,691.00
Deutsche Telekom	68,871.00

continued →

Donor	Total amount (USD)
Eli Lilly	75,000.00
Slovenia, Government of	81,522.00
Arab Gulf Programme for United Nations Development Organizations	100,000.00
Iceland, Government of	100,000.00
Kazakhstan, Government of	100,000.00
Target	100,000.00
UNICEF National Committee/Poland	100,000.00
Holy See, Government of	150,000.00
Roddick Foundation	160,772.00
UNICEF National Committee/Luxembourg	163,043.00
Liechtenstein, Government of	164,959.00
Azerbaijan, Government of	200,000.00
Taiwan International Cooperation and Development Fund	200,000.00
Hungary, Government of	207,177.00
National Basketball Association	250,000.00
UNICEF National Committee/Hong Kong	257,948.00
Monaco, Government of	271,740.00
Kuwait, Government of	275,000.00
UNICEF National Committee/Slovenia	275,983.00
Singapore, Government of	292,103.00
Brazil, Government of	300,000.00
Ford Foundation	300,000.00

Donor	Total amount (USD)
Samsung Group	348,087.00
South Africa, Government of	400,000.00
OPEC Fund for International Development	406,176.00
Turkey, Government of	470,135.00
UNICEF National Committee/New Zealand	494,234.00
Ecuador, Government of	500,000.00
UNICEF National Committee/France	550,964.00
Czech Republic, Government of	575,289.00
UNICEF National Committee/Ireland	603,217.00
Estonia, Government of	647,633.00
UNICEF National Committee/Denmark	721,103.00
UNICEF National Committee/Norway	807,600.00
Samenwerkende Hulporganisaties	817,021.00
UNICEF National Committee/Finland	887,831.00
Hong Kong Special Administrative Region of the People's Republic of China, Government of	899,743.00
UNICEF National Committee/Switzerland	926,442.00
Community Chest Korea	1,000,000.00
Malaysia, Government of	1,000,000.00
Mexico, Government of	1,000,000.00
UNICEF National Committee/Japan	1,018,434.00
UNICEF National Committee/Italy	1,349,589.00
Accenture	1,600,000.00

continued →

Donor	Total amount (USD)
Bahrain, Government of	1,600,000.00
UNICEF National Committee/Korea (Republic of)	1,626,477.00
UNICEF National Committee/Belgium	1,675,603.00
China, Government of	1,800,000.00
Indonesia, Government of	2,000,000.00
Belgium, Government of	2,038,705.00
France, Government of	2,041,760.00
Bill and Melinda Gates Foundation	2,600,000.00
Austria, Government of	2,622,020.00
Thailand, Government of	2,630,000.00
IKEA Foundation	2,754,821.00
Korea, Republic of, Government of	2,800,000.00
Luxembourg, Government of	2,992,435.00
Asian Development Bank	3,000,000.00
Unspecified	3,510,848.00
UNICEF National Committee/Sweden	3,688,428.00
UNICEF National Committee/United Kingdom	3,963,451.00
UNICEF National Committee/Spain	4,132,707.00
Spain, Government of	4,171,931.00
UNICEF National Committee/Australia	4,253,507.00
Switzerland, Government of	4,579,654.00
UNICEF National Committee/Canada	5,004,766.00

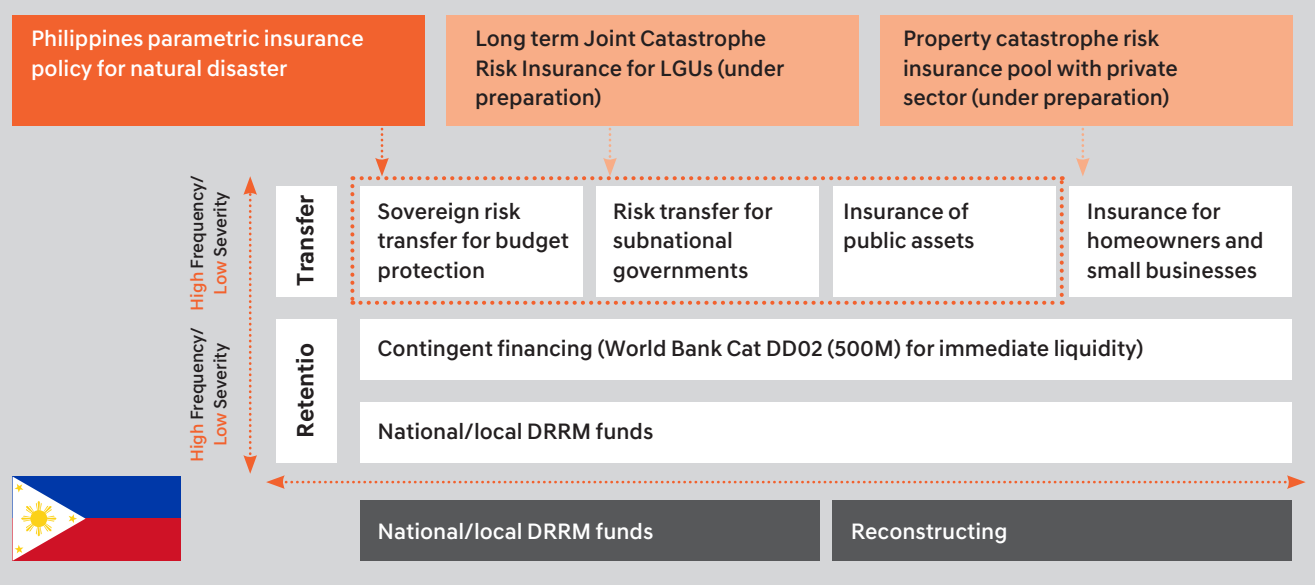
Donor	Total amount (USD)
Russian Federation, Government of	5,738,871.00
Italy, Government of	5,859,192.00
Finland, Government of	6,432,284.00
Denmark, Government of	7,998,747.00
UNICEF National Committee/Netherlands	8,135,148.00
New Zealand, Government of	8,625,588.00
Ireland, Government of	8,971,234.00
UNICEF National Committee/Germany	9,596,567.00
Saudi Arabia (Kingdom of), Government of	10,000,000.00
Netherlands, Government of	13,690,879.00
Germany, Government of	17,208,111.00
Sweden, Government of	18,511,521.00
United Arab Emirates, Government of	20,622,870.00
Norway, Government of	31,579,414.00
Australia, Government of	38,700,164.00
European Commission's Humanitarian Aid and Civil Protection Department	40,470,717.00
Japan, Government of	63,328,022.00
Canada, Government of	63,645,009.00
United States of America, Government of	90,585,530.00
Private (individuals & organizations)	98,589,169.00
United Kingdom, Government of	122,743,593.00
Total	**778,212,553.00**

Source: FTS (2018)

ANNEX 4

DISASTER RISK FINANCING IN THE PHILIPPINES

Figure 20: Layering of current and prospective disaster risk financing instruments in the Philippines



Source: World Bank (2018)

ANNEX 5

DISASTER RISK FINANCING IN DOMINICA

Table 9: Ex ante and ex post disaster risk financing instruments in Dominica

Financing instruments	Availability in Dominica
Ex-ante disaster financing	
Budget contingencies	X
Reserve fund	X
Contingent debt facility	X
Parametric insurance	✓
Alternative risk transfer	X
Traditional insurance	✓
Ex-post disaster financing	
Budget reallocation	✓
Donor assistance (relief)	✓
Donor assistance (recovery and reconstruction)	✓
Domestic credit (bond issue)	✓
External credit (such as emergency loans, bond issue)	✓
Special taxes	X

Source: The Commonwealth (2018) based on International Monetary Fund (2016b), International Monetary Fund (2016c), Benson et al. (2001), Government of the Commonwealth of Dominica (1978), Government of the Commonwealth of Dominica (1994).

Table 10: Eligibility for international financial institutions' ex post disaster response facilities

International Financial Institution	Facility	Features	Eligibility
IMF	Rapid Credit Facility	Access 18.75 - 37.5 percent of member's quota per year or 75 percent cumulative. Zero interest rate. 5.5 years grace period, final maturity of 10 years.	✓ PRGT eligible
	Rapid Financing Instrument	Access 37.5 percent of member's quota per year or 75 percent cumulative. Up to 60 percent of quota per year if natural disaster causes assessed damage of 20 percent of GDP or more. Repaid within 3 ¼ to 5 years. Cost includes commitment fee (depending on quota), lending rate (Special Drawing Rights interest rate + Surcharge) and service charge of 50 basis points.	✓ All member countries
	Catastrophe Containment and Relief Trust	Conditional on a catastrophic disaster, debt flow relief for two years following disaster or full cancellation of debt where disaster has created long-lasting balance of payment needs	X Upper middle income PRGT eligible
World Bank	IDA Crisis Response Window (CRW)	Allocation conditional on parametric data, impact assessment and availability of CRW resources. Concessional terms identical under IDA	✓ IDA eligible
Caribbean Development Bank	Emergency Relief Grant	Amount not exceeding USD 200,000 for damage assessments, provision of emergency relief supplies and transportation costs	✓ Borrowing member country
	Immediate Response Loan	Amount not exceeding ISD 750,000 provided at a concessionary rate for clearing and cleaning of affected areas and emergency restoration of critical infrastructure and essential public services.	✓ Borrowing member country
	Rehabilitation and Reconstruction Loan	Member country to request within six months of the disaster. Offered at concessional rates.	✓ Borrowing member country

Source: The Commonwealth (2018) based on Caribbean Development Bank (2009), International Monetary Fund (2017a), International Monetary Fund (2017b), International Monetary Fund (2017c), World Bank (2017c)

Notes: IDA, International Development Association; PRGT, Poverty Reduction and Growth Trust.

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