

Not a silver bullet

Why the focus on insurance to address loss and damage is a distraction from real solutions

By Julie-Anne Richards and Liane Schalatek



ABOUT THE AUTHORS

Julie-Anne Richards has worked in climate change for more than a decade, driven by the injustice of the fossil fuel industry profiting whilst causing climate impacts on the poorest and most vulnerable. She is well known for her work on finance for loss and damage, including developing and campaigning on the [Climate Damages Tax](#), to force the fossil fuel industry to pay for its' climate damage. She has worked with civil society around the world, including coordinating strategy and policy for Climate Action Network International; working to establish a coalition to campaign on the Climate Damages Tax in the UK; capacity building with Pacific civil society; and as Executive Officer for Climate Action Network Australia. For Oxfam Great Britain and Oxfam Australia she worked on climate justice advocacy, and she has written extensively including co-authoring a number of reports on climate finance for loss and damage; displacement from climate change; climate risk insurance; climate litigation; coal and energy intensive industry.

Liane Schalatek is the Associate Director of the Heinrich Böll Stiftung North America. She has worked on climate change with a focus on climate finance and a human rights/gender rights framing since 2008. Currently the CSO active observer for developed countries in the Green Climate Fund (GCF), she has helped shape the GCF through [advocacy and analysis](#) from the first meeting of the Transitional Committee throughout all GCF Board meetings. She has written widely on the GCF and climate finance more broadly, including on the [gender dimensions of climate finance](#), working with several multilateral climate funds, international agencies, governments and the UNFCCC Secretariat to improve gender integration into climate finance. Together with ODI, she co-founded and co-leads the website [Climate Funds Update \(CFU\)](#), which tracks and provides transparency on dedicated public climate funding mechanisms and is co-author of CFU's [Climate Finance Fundamentals \(CFF\)](#) briefing series.

ACKNOWLEDGEMENTS

Acknowledgements and thanks for valuable input and feedback are owed to Debbie Hillier, Olivia Serdeczny, Rosemary Forest, Marie-Lena Hutfils, and Avinash Persaud

Published by the Heinrich Böll Stiftung North America
Washington, DC, August 2018



[Creative Commons Attribution NonCommercial
NoDerivs 3.0 Unported License](#)

Heinrich Böll Stiftung North America

1432 K Street, NW, Suite 500
Washington, DC 20005/ United States
T +1-202-462-7512
E info@us.boell.org
W <http://us.boell.org/>

Authors: Julie-Anne Richards (lead author) and Liane Schalatek

Cover photo accessed under creative commons license.

Available: <https://www.flickr.com/photos/climatecentre/36531181963/>

Picture taken in St Maarten on 11 September 2017 by Netherlands Red Cross (NLRC) photographer Arie Kievit after Hurricane Irma damaged or destroyed more than 90 percent of the territory's homes and buildings as it crossed near peak intensity.

TABLE OF CONTENTS

Executive summary	1
Introduction	3
Insurance & loss and damage	5
The front line of climate change	6
2017 hurricane season: two responses.....	6
Hurricane Maria, Dominica	6
Hurricane Harvey, Texas.....	10
Malawi drought.....	12
Other instances of sovereign insurance in the face of climate related disasters	16
Insurance driven by ideology, not facts.....	17
If insurance is not the whole solution, what is?	20
Where should the real focus be?	22
Conclusions & recommendations.....	23
Endnotes.....	25

FIGURES & TABLES

Figure 1: Number of weather-related catastrophes, 1900-2017	3
Figure 2: Overall and insured losses, 1980-2017	4
Figure 3: Dominica loss and damage from Hurricane Maria	8
Figure 4: Caribbean Catastrophe Risk Insurance Facility (CCRIF) payouts over time..	9
Figure 5: US Hurricane rainfall estimate.....	10
Figure 6: US federal government role in covering disaster losses.....	11
Figure 7: Malawi recovery needs from 2015-2016 drought.....	14
Figure 8: Word Cloud on 2016 SCF Forum report.....	18
Table 1: Summary of loss and damage from Hurricane Maria in Dominica	7
Table 2: Summary of damages, losses and needs across all sectors from Malawi drought.....	13
Table 3: Comparison of humanitarian costs and insurance payouts.....	16

EXECUTIVE SUMMARY

The countries most vulnerable to climate change are those that did the least to cause it. Developing countries are being increasingly hammered by the direct impacts of a growing number of climate change charged weather extremes—super-sized storms, worsening floods, and more devastating droughts—as well as the insidious, slow onset of rising sea levels. These climate events often overwhelm economies, costing poor countries, by some estimates, US\$500 billion annually and forcing 26 million people into poverty each year.

Yet in an egregious injustice, developing countries are paying not just the majority of direct costs, but also for the “solution” in the form of premiums for insurance schemes, which rich countries champion as the main response to climate catastrophes. This is contrary to the responsibility, enshrined in UN agreements, of rich countries and polluting industries to pay for the costs of action to address climate change under the “polluter pays” principle. In effect, insurance schemes, which are zealously promoted by developed countries have garnered the vast majority of finance committed by all rich countries to loss and damage thus far. Insurance also remains the main focus under the work program of the Warsaw Mechanism for Loss and Damage (WIM) to advance its mandate for progress on loss and damage finance provision.

This study argues that the focus on insurance by developed countries is too narrow and comes at the expense of a serious consideration of other options. Insurance is only one tool in a much larger toolbox. The emphasis on insurance is also self-serving and diverts the focus from the failure of developed countries to provide adequate and predictable public climate finance in order to fulfill their obligations under the climate regime to one of blaming developing countries for a lack of effort to manage their growing climate risk. This is an unfair and unreasonable expectation, as developing countries did not cause climate change.

The narrow focus on insurance is also ideologically motivated, looking to the private sector and public-private partnerships as a financing solution. This analysis finds that the evidence on whether climate insurance is the most appropriate or most sustainable risk management mechanism for poorer countries is lacking, particularly in comparison with other approaches, such as investing in informal savings schemes, social safety nets, or cash transfer programs. The evidence points to such alternative public approaches, for which affected citizens when consulted about their preferences have voiced strong support, providing better value for money than the cost of insurance premiums.

In order to illustrate some of these points, this study considers three case studies: two comparison cases of climate impacts in the developing and developed world during the 2017 hurricane season and one case of climate exacerbated drought in Malawi. First, this paper contrasts the role of insurance in response to hurricane impacts in Dominica and the United States. In Dominica, which suffered catastrophic loss and damage from Hurricane Maria estimated at US\$1.37 billion (or 226 percent of its GDP), sovereign insurance under the Caribbean Catastrophe Risk Insurance Facility (CCRIF) provided just US\$19.3 million or 1.5 percent of the cost of loss and damage incurred, adding insult to injury to the injustice of Dominica having to fund their own solution to climate impacts by paying an insurance premium. In the United States, as damage from climate related events increases, loss is more and more being shifted from the private to the public sector. Despite a political emphasis on insurance provided by public-private partnerships, the exposure of the US federal government grew more than four times the rate of private sector insurance exposure. Nevertheless, even with a growing number of at-risk households paying for insurance, too many were left inadequately covered.

This study also analyses the experience of Malawi with sovereign-level drought insurance from the African Risk Capacity (ARC). ARC served as Malawi’s primary source of risk financing to address the devastating impacts from extreme weather events, such as the extended drought that followed a once-in-500-years flood in 2015, causing US\$365.9 million in loss and damage. ARC, initially challenging that an insurance

claim payout had been triggered, ultimately paid out US\$8.1 million nine months after Malawi declared an emergency; this was not only “too little too late”, but also undermined the chief advantage of climate insurance—an immediate payout to address urgent needs post-disaster.

Even a doubling or tripling of insurance coverage for poor countries would have only scratched the surface of the loss and damage associated with the major climate events analyzed. This study finds that insurance cannot be scaled up to the point where it would provide a viable disaster response. In each case, the bulk of support came from other sources of public finance. For developing countries future support will continue to have to rely on international finance. Selling insurance as a panacea, when it is at best only capable of playing a small supporting role, is not helpful.

This paper highlights a number of approaches to loss and damage that should receive more attention and international finance, such as national contingency funds with dedicated loss and damage savings pools or social protection programs, social safety nets, and direct cash transfers to increase the underlying resilience of communities. Alternative livelihood programs, to retrain communities confronted by the loss of resources, such as fish stock declines or desertification, are also cost-effective alternatives to insurance coverage, including by ensuring that the poorest people (who often cannot pay the premium for micro-insurance schemes) are fully benefiting. Contingent emergency credits, released only following an extreme event, or increased concessionality and flexibility of green credit lines provided under climate financing mechanisms, such as the Green Climate Fund (GCF), to adapt to situations of disaster with automatic maturity extensions or loan forgiveness such as in cases of extreme weather impacts, are other options worth broader consideration and financial support.

We argue that a global solidarity fund should be at the center of such a package of non-insurance solutions to provide financial support for loss and damage to vulnerable countries and populations. This fund could be financed in substantial part by a Climate Damages Tax, imposed on the fossil fuel industry, thus operationalizing the polluter-pays principle. Such a tax placed on the extraction of coal, oil, and gas, if well designed, could generate most of the estimated US\$300 billion a year by 2030 needed in international loss and damage finance. With the WIM up for review in 2019, climate negotiators should give it a clear mandate to consider the Climate Damages Tax, as well as other fair and equitable sources of financing (including financial transaction taxes or international levies on maritime or air transport) for loss and damage finance.

While country ownership is often emphasized in the international climate finance discourse, this ownership, and concomitant ability to determine priorities in response to climate disasters, in developing countries is undermined when developed countries push solutions to address severe climate impacts via earmarked funding for climate insurance. This approach requires developing countries to literally “buy into” these schemes by utilizing their own scarce public resources to pay for insurance premiums. Ultimately, developing countries should be able to opt for the right financial support measures to address severe climate impacts by bringing direct and immediate benefits to people, households, and local businesses. Enhanced Direct Access (EDA) approaches, currently the exception in multilateral climate funds, are more supportive of such choices. Such EDA approaches could result in transferring more international climate funding directly into existing national funds or national climate savings vehicles. In the GCF as the main multilateral fund tasked with the implementation of the Paris Agreement, EDA should be operationalized as the main access modality. In this context, the GCF should be further considered for its ability to serve as an international funding mechanism for loss and damage.

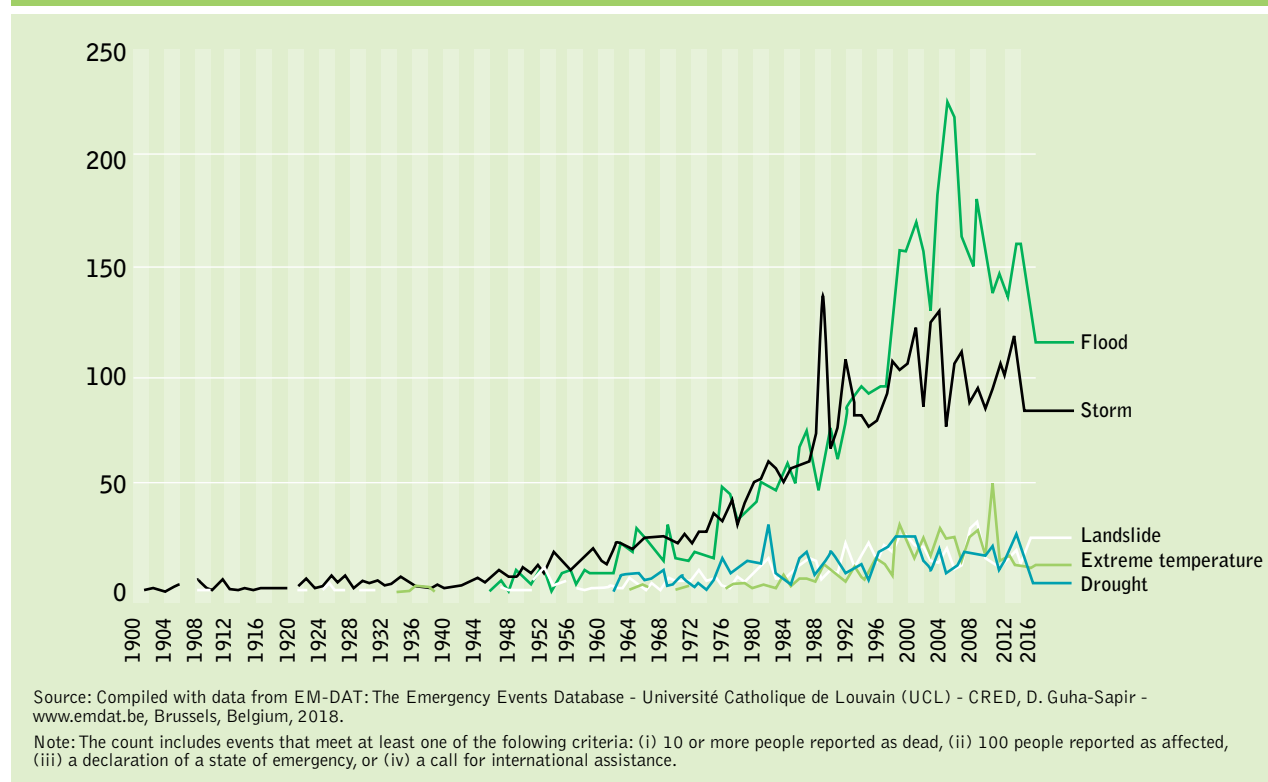
Insurance is not a silver bullet to address loss and damage, and rich countries and institutions such as the World Bank must stop pushing it above other, more appropriate, efficient, equitable, and country-owned responses to climate catastrophes.

INTRODUCTION

Developing countries are being increasingly hammered by the direct impacts of a growing number of climate change charged weather extremes—super-sized storms, worsening floods, and more devastating droughts—as well as the insidious slow onset of rising sea levels. These climate events are at a scale that can overwhelm economies; disasters already cost poor countries US\$500 billion a year and force 26 million people into poverty each year.¹

The countries most vulnerable to climate change are those that did the least to cause it. It is rich countries' historic pollution that has caused the climate change being experienced today. That is why UN agreements enshrine the responsibility of rich countries and polluting industries to pay for the costs of actions to address climate change in developing countries.² Yet, in an egregious injustice, developing countries are paying not just the majority of direct costs, but are also being forced to pay for the "solution" as rich countries champion insurance as the main response to climate catastrophes, with vulnerable countries expected to pay the premiums.

Figure 1: Number of weather-related catastrophes, 1900-2017

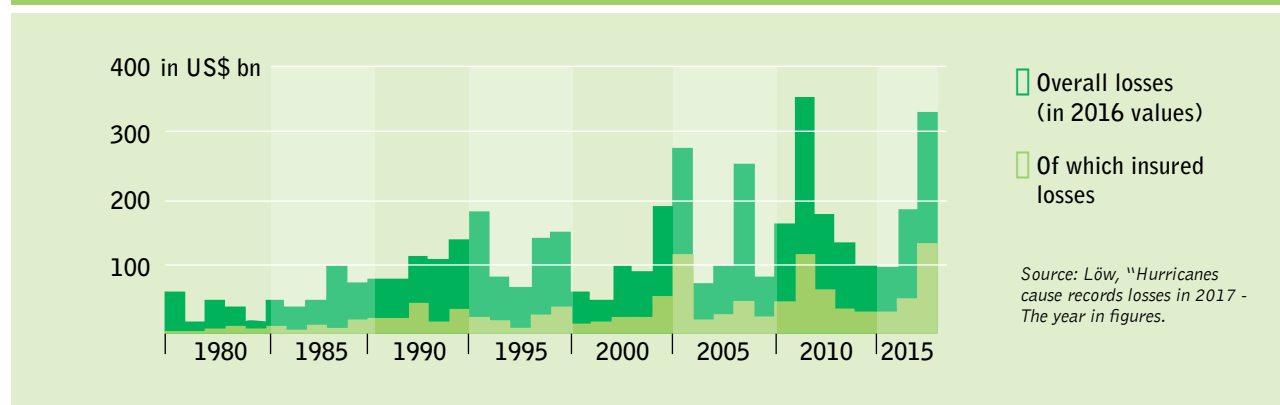


Source: Bob Buhr, Ulrich Volz, Charles Donovan, Gerhard King, Yuen Lo, Victor Murinde, and Natalie Pullin. "Climate Change and the Cost of Capital in Developing Countries," UN Environment, Imperial College Business School, Centre for Climate Finance & Investment, SOAS University of London, July 2018, <http://eprints.soas.ac.uk/26038/>.

Following on from steadily mounting climate-related catastrophes, 2017 was a weather bomb that broke all previous extreme weather event records with losses of over US\$300 billion and 710 large scale loss events, compared with a decadal average of 605 and a 30-year average of 490 events.³ Insured losses

were also record breaking, due to the particularly costly 2017 hurricane season impacting the United States, a country with high levels of insurance. Even so, insured losses only came to US\$135 billion, or 41 percent of total losses.⁴ The difference between total losses and insured losses is often referred to as the “insurance gap,” and is typically framed as a shortcoming or problem, and seen as a business opportunity for the insurance industry. Whilst in the short-term this “gap” might be used as a boost for the insurance industry, in the long-term the very scale of disasters brought about by climate change threaten the foundation of the insurance industry itself, as losses become too frequent, too costly, or too unpredictable to insure.⁵

Figure 2: Overall and insured losses, 1980-2017



The framing of insurance as the answer to loss and damage from climate change ignores, or dismisses out of hand, alternatives to private sector insurance as well as questions of fairness, culpability, and responsibility around who should be required to pay for losses and damages from events that have been supercharged by climate change.

This report will demonstrate not only that commercial insurance is an inadequate tool in the face of the scale of the devastation climate change is already wreaking, but that it is a deliberate distraction by the rich countries, accountable for the bulk of climate change causing emissions, from their responsibility to pay for the loss and damage occurring in vulnerable countries. Instead of a single-minded focus on insurance, the international community should be concentrating on how and where to raise the funds, which must include significant public finance, necessary to support vulnerable countries in the face of growing climate disasters. Substantial funds for loss and damage could be generated through a Climate Damages Tax—an equitable fossil fuel extraction charge—levied on producers of oil, gas, and coal to pay for the damages and costs caused by climate change when these products are burnt.⁶

INSURANCE & LOSS AND DAMAGE

While insurance is a prominent tool in the US and Europe, in most other regions of the world it is a less familiar concept (rates of insurance are very low in Asia, South America, and Africa).⁷ Insurance is a way of managing risk by transferring it, for a fee, from the insurance holder to an insurance company, which then spreads that risk over many policyholders, and distributes it even further by engaging reinsurers. The insurance we are most familiar with is indemnity insurance, where a specific loss event is insured against (such as flood, fire, theft, or medical expense) and the insurance company makes a payout if the event occurs, typically matched precisely to an assessment of the loss. This process can be quite time consuming and litigious.⁸

In the case of loss and damage from climate change index insurance, also called parametric insurance, is mostly used. Index insurance pays out when specific conditions – such as the amount of rainfall, wind speed, or the greenness of vegetation in a specific geographic area – fall outside of pre-defined parameters. This kind of insurance was designed to provide faster payouts in the case of disasters, with lower administrative costs. In this report we largely deal with macro-level insurance, meaning insurance taken out by governments to provide emergency funding. Climate insurance can also be micro, at the level of individuals such as farmers, or meso-level where cooperatives, NGOs, financial institutions, or similar take out policies.⁹

Micro-insurance has been growing, not just in response to climate change (where according to some global estimates around 55 million of the poorest and most vulnerable people received direct coverage against climate risks in 2015),¹⁰ but also in other areas such as health insurance. There has been an emphasis on providing micro-insurance for the very poor. According to a Munich Re Foundation/ILO 2012 report, the number of micro-insurance schemes worldwide increased substantially over a five-year period from 2008 to 2012 reaching an estimated 500 million people worldwide¹¹ and significant further growth is expected. This privatization of social safety nets places the onus to pay premiums on the most vulnerable individuals (who may not be able to afford them), provides a much less effective safety net than one provided by government, and can act to increase inequality.¹²

Climate insurance is applied to loss and damage, which is when the impacts of climate change go beyond what it is possible to adapt to, including extreme events like tropical storms (typhoons, hurricanes, cyclones), extreme flooding, landslides caused by too much rain, or severe droughts (e.g., droughts experienced in East Africa in recent years, where decades of a drying trend eroded the coping capacity of communities who then suffered multiple years of extreme drought). For insurance to be viable it needs to cover events that occur infrequently – a rule of thumb is events occurring less often than roughly every seven years.¹³ As climate impacts become more frequent and more severe, insurance will become less and less viable as premiums will become too expensive, while payouts might be reduced.

There are two elements of loss and damage from climate change that insurance is not relevant to: slow onset events and non-economic loss. Slow onset events such as sea level rise, glacial melt, and desertification are already occurring around the world (e.g., rising sea levels are causing people from Pacific Islands and from low-lying vulnerable countries like Bangladesh to flee from their homes). Such slowly unfolding, yet certain disasters offer challenges¹⁴ to which insurance is not the best response. Instead, dedicated international funding to help communities who will be displaced is likely to be a better option.¹⁵ Likewise, non-economic losses, such as the loss of language and traditions when communities are fractured by climate impacts, are not best served by monetizing and insuring them.

The front line of climate change

Three case studies of climate-fuelled extreme events follow, exploring the role that insurance (parametric sovereign-level risk pools and private insurance) played in dealing with the loss and damage faced in two vulnerable countries and in the United States. In each case conclusions are drawn as to the role insurance has played, its changing role over time, and its capability of being scaled up to the levels discussed by advocates of insurance to address widespread loss and damage from climate change in developing countries. These are followed by an overview of insurance across a broad swathe of recent climate-related catastrophes.

2017 hurricane season: two responses

2017 was a year that demonstrated the ferocity of climate impacts. It broke many records and also broke through the apathy on loss and damage from climate change. It was the most expensive hurricane season on record, with total estimated economic losses of over US\$200 billion, mostly due to Hurricanes Harvey, Irma, and Maria.¹⁶ Here we contrast two experiences of the climate-charged 2017 hurricane season. First, we examine Hurricane Maria's devastation of Dominica, a low-income country whose emissions contribution to climate change is miniscule. Second, we consider Hurricane Harvey's impact on Texas, United States, one of the richest, most carbon polluting countries of the world, and a strong advocate of private insurance as the solution to loss and damage from extreme weather events (even if the link between climate change and these events is often denied in national political discourse).

Hurricane Maria, Dominica

Dominica has branded itself the "nature island." According to its prime minister, sixty percent of the country is protected rainforest, and the marine environment is similarly protected, although World Bank data rates levels of protection much lower.¹⁷ A country of 73,543 people, before Hurricane Maria, Dominica had a gross domestic product (GDP) of US\$581 million¹⁸ and CO₂ emissions per capita of 1.9 tons in 2014 (for comparison US CO₂ emissions per capita were 16.5 tons in the same year).¹⁹

One of the most rapidly intensifying hurricanes on record, Hurricane Maria transformed into a category 5 hurricane in roughly 24 hours.²⁰ It made landfall in Dominica at 9 p.m. on Monday September 18. Striking Dominica as a category 5 hurricane with maximum winds of 145 knots (270 km/h), Maria is the strongest hurricane on record to make landfall on the island. In addition to wind damage, there was considerable damage caused by storm surge, wave action, and torrential rains, with a maximum observed total rainfall of 22.8 inches. These rains caused serious flooding and mudslides across the island.²¹



Source: <https://www.facebook.com/SupportRooseveltSkerrit/posts/999579703517217>

Maria caused "utter devastation." The once-lush tropical island was effectively reduced to an immense field of debris. Thirty-one people died directly as a result of Hurricane Maria, with 34 people still missing in April 2018. Most structures were seriously damaged or destroyed. Trees and vegetation were downed or defoliated. The agricultural sector was essentially eliminated. The roofs of the majority of buildings and homes were either damaged or blown off, including that of the Prime Minister, Roosevelt



Source: <https://www.facebook.com/SupportRooseveltSkerrit/posts/my-roof-is-gone-i/999465053528682/>

Skerritt. There was extensive damage to roads. Power, phone, and internet services were cut off, leaving the country almost incommunicado with the outside world.²²

Maria wiped out 70 percent of livelihoods in the island,²³ leaving a significant proportion of the labor force unemployed. Projections show that the decline in the production of goods and services may continue for one to two years and the number of people living in poverty may double.²⁴

Total damages and losses were estimated at US\$1.37 billion or 226 percent of GDP.²⁵ Identified recovery needs for reconstruction and resilience interventions amounted to US\$1.37 billion, as can be seen in the table below.

Dominica is a member country of the Caribbean Catastrophe Risk Insurance Facility (CCRIF), which was set up in 2007 as a multi-country risk pool, offering an insurance-based regional catastrophe fund for Caribbean governments to limit the financial impact of devastating hurricanes and earthquakes by quickly providing financial liquidity when a policy is triggered.²⁷

Table 1: Summary of loss and damage from Hurricane Maria in Dominica (in millions (M))

	DAMAGES (M)		LOSSES (M)		NEEDS (M)	
	US\$	EC\$	US\$	EC\$	US\$	EC\$
PRODUCTIVE SECTOR	177.95	480.47	202.49	546.73	188.52	509.03
Agriculture	55.37	149.23	124.37	335.80	88.46	238.83
Fisheries	2.41	6.52	0.50	1.35	2.54	6.87
Forestry ¹	29.72	80.24			14.87	40.15
Commerce & Micro Business	70.40	190.08	6.85	18/50	73/01	197.14
Tourism	20.15	54.40	70.77	191.08	26.19	70.72
SOCIAL SECTOR	444	1199	42	112	638	1724
Housing	353.96	955.70	28.50	76.94	519.75	1403.34
Education	73.98	199.74	3.21	8.66	94.20	254.33
Health	10.90	29.50	6.95	18.80	22.14	59.75
Culture	5.07	13.68	2.91	7.85	4.67	12.63
INFRASTRUCTURE SECTOR	306	826	135	365	509	1375
Transport	182.15	491.82	52.62	142.09	302.00	815.00
Electricity	33.18	89.59	32.94	88.94	80.68	217.84
Water and Sanitation	24.00	64.79	39.73	107.27	56.26	151.90
Telecommunication	47.74	128.88	8.31	22.43	47.84	129.17
Airports and Port	18.89	51.00	3.26	8.79	22.67	61.20
CROSS-CUTTING	3	8	1	2	13	34
Disaster Risk Management	3.00	8.11	0.80	2.17	10.22	27.60
Environment ²					1.78	4.80
Gender ³					0.79	2.12

Source: Government of the Commonwealth of Dominica, "Post-Disaster Needs Assessment Hurricane Maria".

On September 22, the Caribbean Catastrophe Risk Insurance Facility announced that Dominica would receive a payout on its insurance policy of US\$19.3 million within 14 days of Hurricane Maria's landfall;²⁸ it also received an additional US\$1 million, bringing the total to US\$20.3 million. While an extremely small contribution in the face of the loss and damage sustained by Dominica, this money did have the advantage of arriving (almost) immediately.

On September 29, 2017, a Flash Appeal was launched seeking US\$31.1 million for life-saving assistance and early recovery activities for the months through the end of 2017. As of January 30, 2018, the Appeal was 63.3 percent covered with contributions amounting to US\$19.7 million. Contributions outside the appeal, many of which were for the Red Cross, amounted to US\$8.8 million. Total emergency humanitarian funding for Dominica, including contributions to the Flash Appeal and outside, amounted to US\$28.5 million.²⁹ Additionally, financing for Dominica's reconstruction included US\$115 million from the World Bank (\$50 million as grant financing and \$65 million as concessional loans),³⁰ £65 million (US\$90 million) pledged over a number of years from the United Kingdom,³¹ US\$16 million provided as a loan from the Caribbean Development Bank,³² US\$15 million pledged by China,³³ US\$13 million pledged by the European Union for recovery and reconstruction,³⁴ US\$2 million committed by Japan for disaster response and reduction,³⁵ and US\$150,000 provided by Kuwait.³⁶ Other contributions were promised to the Caribbean community of nations at the pledging conference *CARICOM-UN High Level Pledging Conference: 'Building a more Climate Resilient Community'*, but the authors were unable to find specific amounts promised to Dominica.

While this amounts to an impressive fundraising drive, as can be seen in Figure 3, the vast majority of the loss and damage that Dominica suffered from Hurricane Maria was borne by the people of Dominica. Insurance provided just 1.5 percent of the cost, with a further 2 percent coming from humanitarian aid and 19 percent of longer-term reconstruction costs coming from grants and loans from other countries and development banks.

Figure 3: Dominica loss and damage from Hurricane Maria (in US\$ millions)

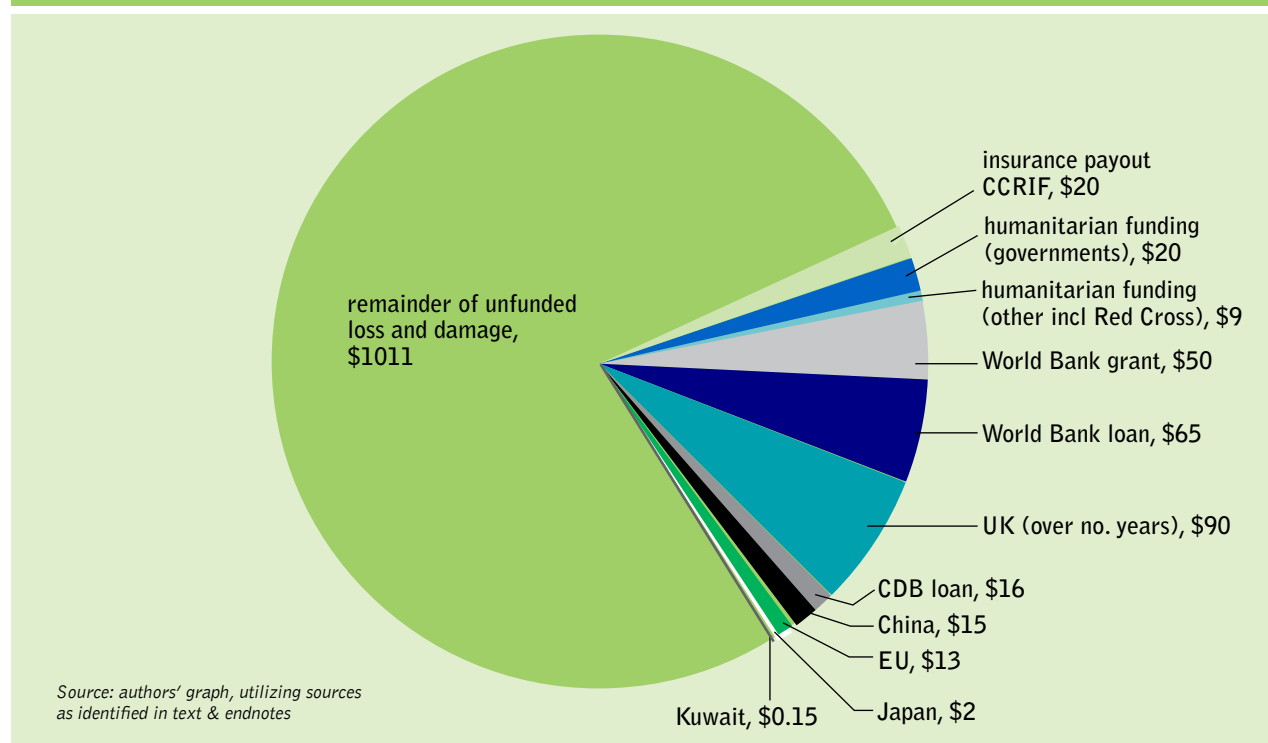
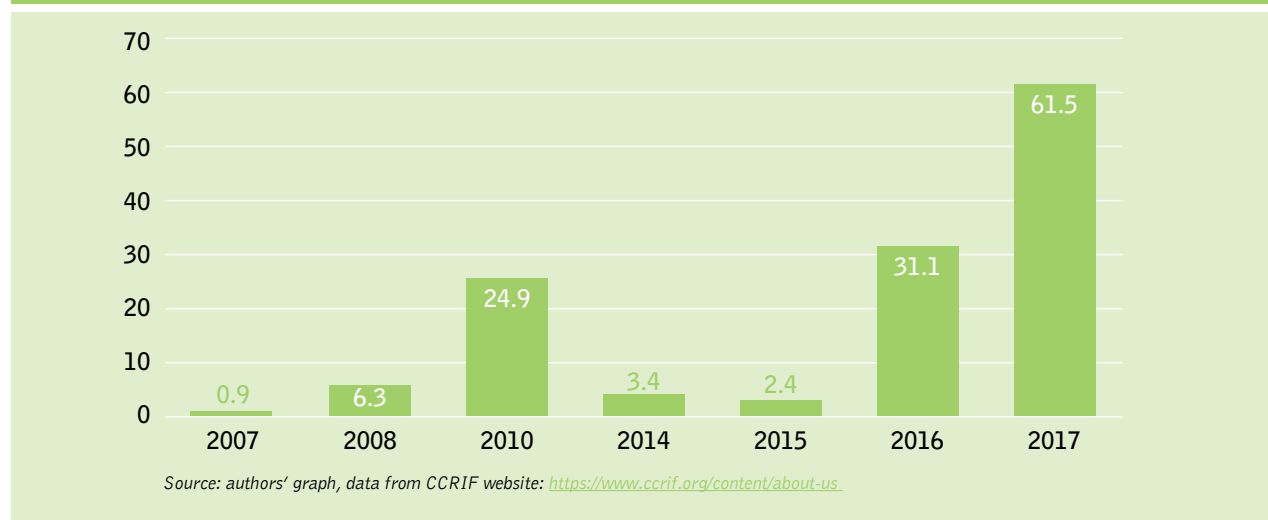


Figure 4: Caribbean Catastrophe Risk Insurance Facility (CCRIF) payouts over time

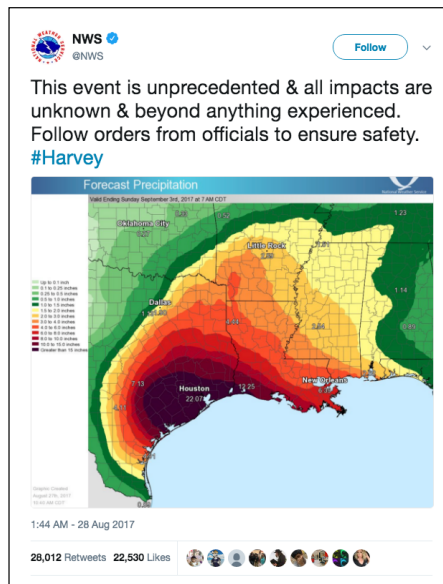


The damage to the economy of Dominica will have a significant impact on the ability by the government to collect taxes and therefore will have a negative impact on Dominica's ability to pay future insurance premiums. This is in the context of a potential increase in insurance premiums, as the CCRIF paid out twice as much in 2017 as in any other year, with its next biggest record being in 2016 (see graph below) and as global insurance payouts and reinsurance costs, in 2017 were huge.³⁷ Traditionally, such a set of circumstances would mean reinsurance and insurance costs would rise,³⁸ with such a significant set of disasters providing stress on the insurance industry.³⁹

In response to the difference between the scale of loss and damage from supercharged hurricanes and insurance payouts, head of CCRIF, Isaac Anthony, stated, "We need to get the countries to scale up their coverage, some countries are only scratching the surface."⁴⁰ Yet, as the example of Dominica demonstrates, a doubling or even tripling of insurance coverage would still only scratch the surface of the loss and damage associated with climate change. Indeed, the World Bank acknowledges that to scale up CCRIF insurance to adequately cover, for example, Haiti's risk, would make annual premiums prohibitive.⁴¹ Insurance cannot be scaled up to the point where it would provide a viable response to a disaster like Maria, therefore other sources of public finance are urgently needed.

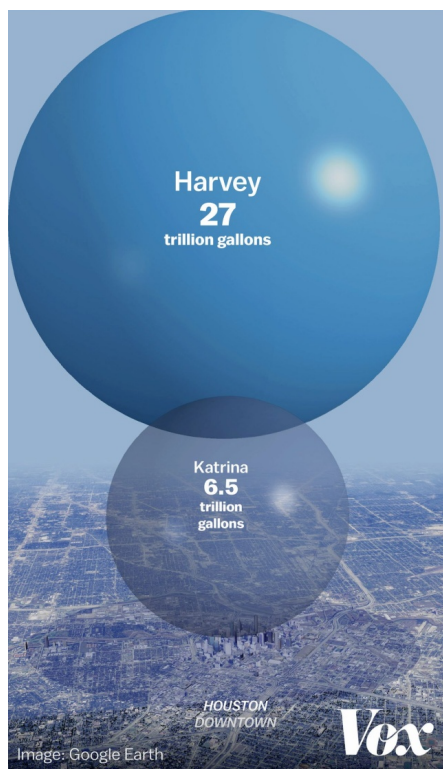
"Some people say we should use more public private partnerships. More insurance, more blended finance. But climate change cannot be addressed by private insurance. Insurance works best when the risk is uncorrelated, diversified, random, and you can spread the risk over time and across disasters. But what does climate change tell us? That disasters are at an increasing intensity and rising correlation. By definition you cannot privately insure against that."

Avinash Persaud, Head of Economic Reconstruction of Dominica post-Hurricane Maria, 16 April, 2018.



Source: National Weather Service. Twitter. August 28, 2017. Available: <https://twitter.com/nws/sta-tus/901832717070983169>

Figure 5: US Hurricane rainfall estimate



Source: Javier Zarracina and Brian Resnick, "All the rain that Hurricane Harvey dumped on Texas and Louisiana," Vox, September 1, 2017, <https://www.vox.com/science-and-health/2017/8/28/16217626/harvey-houston-flood-water-visualized>

Hurricane Harvey, Texas

Hurricane Harvey crossed into Texas on August 26, 2017. Its extremely strong winds (115 knots, or 213 km/h) were surpassed in destructive capacity by the vast volume of water that Harvey dumped on Houston. Harvey was the most significant tropical cyclone rainfall event in United States' history, both in scope and peak rainfall amounts. Equipment was unable to measure the unprecedented rain in many areas; estimates of 65-70 inches (1.65-1.8m) of rain were made by the National Hurricane Center,⁴² resulting in more than 24-34 trillion gallons of water being dumped on Houston.⁴³ The rain combined with a storm surge to produce flooding of 6 to 10 ft (1.8-3m) above ground level across wide areas.⁴⁴

The damage caused by flooding was catastrophic over a large area of southeastern Texas. At least 68 people died as a direct result of Harvey, 30,000 water rescues were conducted, and 40,000 flood victims were forced into shelters. Over 300,000 structures in the region were flooded, with up to 500,000 cars reported flooded as well. Approximately 336,000 customers lost power during the hurricane.⁴⁵

The latest National Ocean and Atmospheric Administration (NOAA) damage estimate from Harvey is US\$125 billion, which makes it the 2nd most costly US tropical cyclone after Hurricane Katrina.⁴⁶

Recent decades have seen disasters become more frequent and more expensive within the US. From 1980 to 1990, the United States averaged fewer than three annual disasters that cost more than US\$1 billion; since 2010, the average has risen to ten per year. In the 1980s, disasters cost one-tenth of a percentage point of GDP. In the 1990s and 2000s this tripled and almost quadrupled from 2010 to 2017.

The amount of rain falling due to heavy rainstorms has increased 10 percent since 1900 due to climate change, with nine of the top 10 years for extreme one-day precipitation events occurring since 1990.⁴⁷

Despite the relatively high rates of insurance coverage in the US and increasing flood risks noted above, it is noteworthy that fewer than 20 percent of Texas residents have indemnity flood insurance⁴⁸ and the vast majority of Hurricane Harvey losses were uninsured.⁴⁹ Small businesses have even lower rates of coverage. For Superstorm Sandy, 90 percent of small businesses did not have flood insurance.⁵⁰

Where people do hold flood insurance policies, it is likely to be via the federal government's National Flood Insurance Program (NFIP).⁵¹ Established in 1968, the program has 5.2 million policies, covering more than US\$1.2 trillion in assets nationally. The NFIP is managed by the Federal Emergency Management Agency (FEMA) and its objectives are to provide flood insurance, improve

floodplain management, and develop maps of flood hazard zones.⁵²

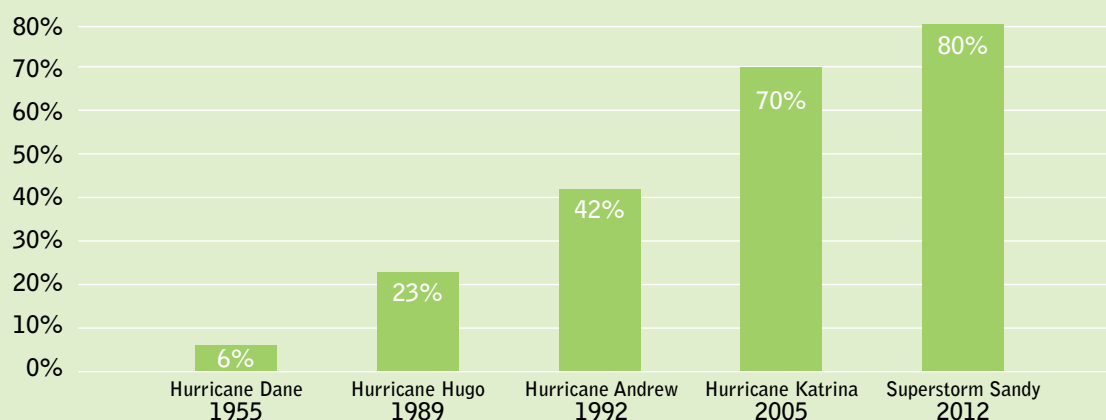
The NFIP was intended to be self-funded via premium payments. However, as flood disasters have become progressively worse the NFIP has been operating at a deficit, and has been subsidized by the government since Hurricane Katrina ravaged New Orleans and the southern coast of the US in 2005.⁵³

The NFIP was also intended to be part of an overall shift to improve resilience—specifically to discourage people from building in areas at high risk of flooding.⁵⁴ However, this hasn't been the case, rather thousands and thousands of new homes have been built in flood zones and homes have been renovated in ways that make them more, not less, likely to flood.⁵⁵

Despite not reducing the harm to average Americans, this system has worked very well for insurance companies, which act as agents to sell NFIP policies and process claims. In the years 2011 through 2014 (which includes Superstorm Sandy), insurers had a 29 percent profit margin (total annual profits ranging from US\$240 - US\$406 million). This is money not available to home owners, or governments, to deal with these new extreme storms. Meanwhile, insurance companies systematically underpaid claims.⁵⁶ In fact, many affected households waited for more than a year after initial losses were incurred for payment of claims, as the process is so burdensome.⁵⁷ It is typically federal aid, via FEMA, that provides initial assistance to many people.

As loss and damage from climate events is growing in the US, the loss is increasingly being shifted from the private to the public sector. While the private sector insurance exposure grew 8 to 10 percent between 2007 and 2013, the federal government exposure to uninsured loss increased by more than four times as much, 46 percent, over the same period, with inflation-adjusted disaster relief appropriations increasing from US\$6.2 billion between 2000 and 2006, to US\$9.1 billion between 2007 and 2013.⁵⁸ The graph on the following page illustrates the US federal government role in funding disaster losses increasing over time.⁵⁹

Figure 6: US federal government role in covering disaster losses



Source: Michel-Kerjan and Taglioni, "Insuring hurricanes: Perspectives, gaps, and opportunities after 2017."

The conclusion to be drawn is that despite the US being one of the most heavily insured regions of the world, private sector insurance plays quite a small role in covering loss and damage from climate events. It is rather the public sector's underwriting of the insurance scheme and provision of emergency assistance, that plays a greater role in dealing with catastrophe. The emphasis on insurance provided via a public-private partnership has worked to increase the profits of the insurance sector, but provided an expensive and inadequate solution for Americans, in the context of lower resilience and increased vulnerability of the population to the growing impacts of climate change. It must be acknowledged that the federal govern-

ment, as well as public sector actors more generally, have been the main financial responders paying for the increasing impacts of climate change in the US and that a professed enthusiasm for insurance as providing a “solution” to loss and damage from climate change flies in the face of actual facts on the ground. It is the public sector that is coming to the rescue of Americans in the face of climate extremes—and so the US and other developed countries, should acknowledge that the same will be necessary for developing countries and therefore the bulk of financial support to address the impacts of climate extremes will need to come from public transfers, mostly international ones.

Malawi drought

Malawi is a country of 18 million people, with a GDP of US\$5.4 billion and approximately 0.075 tons of CO₂ emissions per capita.⁶⁰ Malawi is one of the poorest countries in the world; it is the 16th least developed country according to the 2015 UNDP Human Development Report. A largely agricultural country, about 85 percent of the population of Malawi live in rural areas and are engaged in agricultural activities. Over 70 percent of the population lives below the poverty line and 29.8 percent are considered to be living in severe poverty.⁶¹

The impact, frequency, and spread of drought in Malawi have intensified in the past four decades and are likely to worsen with climate change, compounded by other factors, such as population growth and environmental degradation.⁶²

In 2015, Malawi suffered from a once-in-500-years flood, which impacted more than 1.1 million people. Fast on the heels of this tragedy was a devastating drought, including a delayed start to the 2015-16 agriculture season, with delayed and erratic rains and prolonged dry spells across most parts of the country, resulting in severe crop failure.⁶³ In April 2016, the Government of Malawi declared a state of emergency and in May 2016 (in consultation with the UN’s Food and Agriculture Organization and the World Food Program) assessed at least 6.5 million people, 39 percent of the population in Malawi’s 24 drought-affected districts, as not being able to meet their food requirements between April 2016 and March 2017.⁶⁴ This added 14 percent of Malawians to the country’s food insecure population, meaning that in the first quarter of 2017, 28 percent of its population would not have access to the minimum food and non-food requirements.⁶⁵

This placed the communities affected under enormous strain. Community members rationed food for long periods of time, with many families eating one meal a day (women often less than men). Men migrated to find work, leaving their families behind, and children had their education affected, as families couldn’t afford school fees or food.⁶⁶

*Coping with the Consequences of the Drought. A 17-year-old head of household in Balaka District attending school while caring for her three younger siblings explained that food shortages have put an unprecedented amount of pressure on herself and her family: “Every time I reach out for help in my community to help feed my brothers and sisters, I am told I should drop out of school and use the money I receive for my fees to feed my family – What kind of future will my family and I have if I do that? But every day when I see them with no food to eat, my heart breaks and I consider doing anything possible to feed them, including selling my body since that’s the only thing I have left.” An 11-year-old girl added: “...We rarely attend school these days; my siblings and I leave the house in the morning with an empty stomach and go search for food. Sometimes we can manage to steal from neighbors’ gardens and eat a little but most of the time we just go to the stagecoach – We beg from passengers or carry their loads. Some give us money and others just chase us or want to have sex with us for food...”*⁶⁷

Source: World Bank, “Malawi drought 2015-2016: post-disaster needs assesment (PDNA) (English)”

With damages amounting to US\$36.6 million and losses amounting to US\$329.4 million, the total effect of the drought was estimated at US\$365.9 million. The cost of the immediate Food Insecurity Response Plan was US\$380 million and recovery needs across all sectors, including food security, were estimated at US\$500 million (see table below).

Table 2: Summary of damages, losses and needs across all sectors from Malawi drought

	COST (USD)		
	Damages	Losses	Recovery Needs
PRODUCTIVE SECTORS			
Crops	—	198,758,638	40,545,252
Livestock	15,722,527	31,186,832	10,067,379
Fisheries	—	10,783,990	537,571
Irrigation	—	31,876,168	14,101,063
Trade & Industries	—	8,768,583	4,997,417
PRODUCTIVE SECTORS TOTAL	15,772,527	281,374,212	70,238,682
PHYSICAL SECTORS			
Energy	—	5,888,561	2,893,521
Environment & Forestry	4,245,524	1,501,786	6,560,350
Transport	—	—	15,331,000
Water Resources	1,400,000	—	10,707,143
Water Supply & Sanitation	11,803,071	7,377,773	20,991,643
PHYSICAL SECTORS TOTAL	17,448,596	14,768,119	56,483,656
SOCIAL SECTORS			
Food Security	—	—	268,459,014
Education	3,358,929	6,946,445	12,285,922
Health	—	14,303,878	13,524,120
Nutrition	—	11,970,568	33,425,537
Social Protection	—	—	42,908,343
Human & Social Impact	—	—	—
SOCIAL SECTORS TOTAL	3,358,929	33,220,892	370,592,937
CROSS-CUTTING ISSUES			
DRR	—	—	2,926,609
Contingency Financing	—	—	—
CROSS-CUTTING ISSUES TOTAL	—	—	2,926,609
TOTAL WITH FOOD SECURITY	36,580,052	329,363,222	500,241,884
TOTAL WITHOUT FOOD SECURITY	36,580,052	329,363,222	231,782,

Source: World Bank, "Malawi drought 2015-2016 : post-disaster needs assessment (PDNA) (English)."

The Malawi Government had purchased sovereign-level drought insurance from the African Risk Capacity (ARC), for a premium of US\$4.7 million, as its primary risk financing. Apart from ARC and some budget re-allocation, the Government had no other instruments in place to finance early response.⁶⁸

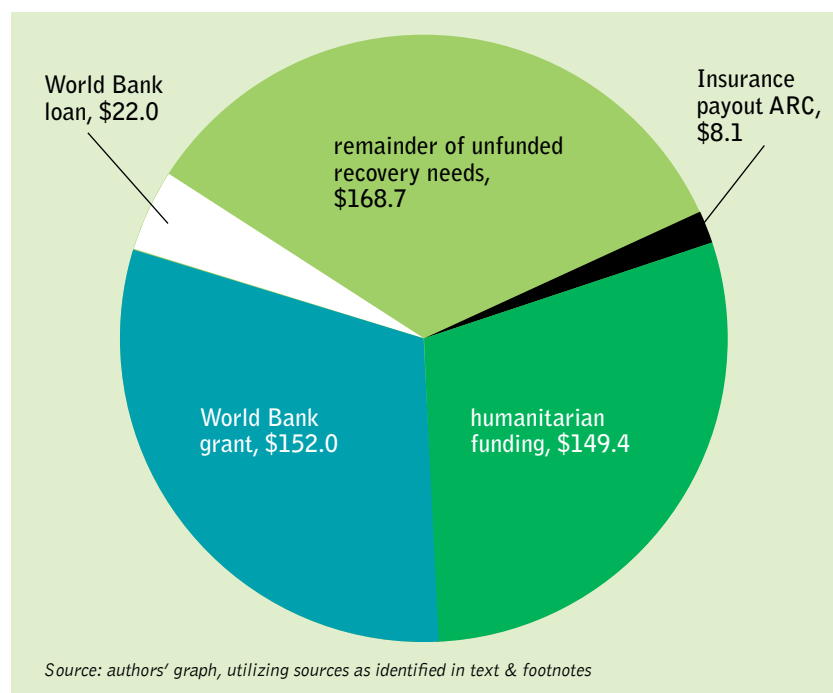
The African Risk Capacity was established in 2012 for just such a situation. It was set up to help African Union (AU) countries improve their capacities to plan, prepare for, and respond to weather-related

disasters. The objective of ARC is to assist AU Member States to reduce the risk of loss and damage caused by extreme weather events by providing, through sovereign risk insurance, targeted responses to natural disasters in a more timely, cost-effective, objective, and transparent manner.⁶⁹ ARC has issued policies to eight governments over four drought risk pools. These countries have paid US \$54 million in premiums (95 percent of which has come directly from national budgets). ARC has paid out US\$37 million in total to Malawi, Mauritania, Niger, and Senegal.⁷⁰ Premiums are priced to cover reinsurance as well as the costs of paying back the returnable capital provided primarily by the United Kingdom and Germany through what are effectively twenty-year interest-free loans.⁷¹

Yet, ARC assessed Malawi as not suffering from a drought affecting sufficient people to trigger a payout, and therefore (initially) failed to pay an insurance claim to Malawi.

Payout decisions are made on the basis of ARC's model, Africa RiskView, which uses satellite-based rainfall data to estimate whether sufficient rain has fallen to grow crops.⁷² The ARC modeling had assumed Malawian farmers were growing maize with a growing period of 120-140 days, whereas farmers had actually planted maize with a 90-day growing period. The different maize meant that rain was needed at different times and the 2015-16 rainfall pattern was particularly unfavorable to the shorter cycle maize.⁷³ It took a lengthy period, and a great deal of fieldwork and re-examination, before ARC was willing to reassess its model. Once it did so, using the shorter period maize, it calculated that a payout of US\$8.1 million should be made. ActionAid undertook detailed fieldwork and analysis, concluding there were "major defects in the model, data and process used to determine a pay-out"⁷⁴—a conclusion with which it is hard to argue.

Figure 7: Malawi recovery needs from 2015-2016 drought (in USD millions)



The situation that Malawi was faced with under the ARC is an example of basis risk (e.g., when the wrong risk is insured for or when damages occur that are different to the risk that is insured for). Basis risk is particularly a problem with index insurance, where the risk is defined very specifically⁷⁵ and which is used as the core insurance approach for extreme weather related risks, including for agricultural food production. It is also a problem that will be exacerbated by climate change – as risks become more frequent, more random, and harder to predict.

The eventual payout by ARC was announced in November 2016 and made in January 2017. The additional few months delay resulted from ARC insisting that the Government of Malawi

submit a plan for how it would spend the money before it paid it out.⁷⁶ This delay occurred despite an emergency having been declared in April 2016 and Malawi having made public a detailed disaster needs

assessment in conjunction with international partners early in the crisis.⁷⁷ It is worth noting that ARC refused to recognize that they were in the wrong, despite the fact that the ARC model is so complex as to be inaccessible by anyone other than ARC technical experts⁷⁸ and thus only ARC experts were in a position to judge the suitability of the model beforehand. The UK Government in their report blamed Malawi for making the mistake and recorded the timing of the payment as having met the indicator of being received 21 days from it being triggered, despite the fact that Malawi did not receive it until nine months after the emergency was declared.⁷⁹

One of the theoretical advantages of insurance coverage, such as that offered by the ARC, is that it can provide a quick injection of finance – early funding can help prevent difficult situations from developing into bigger emergencies. In providing the payout nine months after the emergency was declared, in Malawi's case, the ARC payout was "too little, too late" and effectively meant the discounted value of the payout was less than the value of the initial premium according to ActionAid's analysis.⁸⁰

The Malawi Government sought international humanitarian financing. The total amount of financial assistance mobilized by the government and international partners was US\$149 million.⁸¹ The World Bank went on to provide US\$174 million – via grants of \$152 million and loans of \$22 million.⁸²

Risk financing strategies should recognize the interaction between drought and flood and the contingency planning that is needed to manage the risk of one following the other (potentially in a constant cycle).⁸³ The expected frequency of droughts and floods in Malawi, given the intensification with climate change, makes insurance a far less viable option.

In fact, in the Post-Disaster Needs Assessment, the Malawi Government, and international partners identify a multi-pronged approach to strengthening the Disaster Risk Reduction (DRR) system including improving early warning systems, risk identification, and assessments, revising emergency preparedness procedures, and increasing institutional capacity, while mainstreaming risk reduction and diversifying risk financing. The budget for this improvement in the DRR system was calculated at US\$2.9 million.⁸⁴ In contrast: Malawi's US\$4.7 million insurance premium is 160 percent of this budget.

Another effective option, for instance, would be to increase the social protection provided to Malawians, which is currently low by international standards and would include things like cash payments for the very poor or school meal programs (see following sections for further discussion). The annual budget for social protection programs was US\$53.2 million in 2014–15. This spending accounted for only 2.9 percent of total government expenditure and represented approximately 0.8 percent of GDP. Based on international standards, Malawi's social protection budget is less than one-third of the African Region's average and one-sixth of the world average.⁸⁵ Increasing spending on social protection would increase resilience against many risks—not only that of drought as covered by ARC insurance.⁸⁶

This example demonstrates the scale of the challenge that Malawi faces when it comes to climate change, with damaging floods followed by devastating droughts. Malawi requires international funding to deal with the impacts of climate change as it is currently left to pay for a third of the drought recovery costs out of its extremely constrained budget, which will only exacerbate its development challenges. The example also demonstrates the danger of an over-reliance on insurance as a response to loss and damage from climate change. In this case the model used for insurance was wrongly calculated. Rather, Malawi needs to undertake a clear assessment of value for money, within the context of an extremely constrained budget, and choose options that can offer a buffer to multiple shocks. It is far from clear that insurance, and especially narrowly calculated index insurance, is the best option. Finally, the Malawi experience of ARC during the 2015–16 drought demonstrates the injustice of expecting Malawi, a developing country with low historic CO2 emissions, to self-fund insurance premiums to address climate impacts that are becoming more and more severe due to massive, accumulated emissions caused by industrialized countries for which the latter have reaped lasting economic benefits.

Other instances of sovereign insurance in the face of climate related disasters

These three case studies are some of the most recent examples of extreme events where insurance played a role. Taking a broader look (as per further examples offered in Table 3) supports the observation that, at best, insurance can only play a small part in the increasing loss and damage being experienced as a result of climate change. Further, there is an imperative to increase international support to deal with the incredible economic impact that climate fueled extreme events are having on vulnerable countries.

Table 3: Comparison of humanitarian costs and insurance payouts

RISK POOL	COUNTRY	DISASTER	UN HUMANITARIAN APPEAL FOR EMERGENCY NEEDS (\$M)	PAYOUT AMOUNT (\$M)	PAYOUT AS PERCENTAGE OF HUMANITAR- IAN NEEDS
ARC	Mauritania	Sahel drought, 2015	94.6	6.3	6.7%
ARC	Niger	Sahel drought, 2015	375.5	3.5	0.93%
ARC	Senegal	Sahel drought, 2015	59.5	16.5	28%
ARC	Malawi	El Niño drought, 2015-16	366	8.1	2.2%
CCRIF	Haiti	Tropical Cyclone Matthew, 2016	139	23.4	16.8%
PCRAFI	Tonga	Tropical Cyclone Ian, 2014	13	1.9	9.8%
PCRAFI	Vanuatu	Tropical Cyclone Pam, 2015	95	1.9	2%

Source: adapted from Hillier, "Facing Risk: Options and challenges in ensuring that climate/disaster risk finance and insurance deliver for poor people."

Enthusiasm for insurance is self-serving on the part of developed countries and unsupported by the evidence on whether climate insurance provides benefits and is cost effective.⁸⁷ This support exists in spite of insurance not always being the most appropriate and most sustainable risk management mechanism in comparison with other approaches, such as investing in informal savings schemes, social safety nets, or cash transfer programs.⁸⁸

In a meta-review for the UK Department for International Development (DFID) which assessed the cost effectiveness of climate adaptation and risk reduction strategies, insurance was found to have the lowest cost-benefit-ratio (although there were relatively few insurance cost-benefit analyses to draw from, two were included in the assessment). The review found a lack of robust evidence to support the arguments in favor of insurance,⁸⁹ indicating that with limited funds available alternatives such as early warning systems, enhanced hydrological and meteorological information, livelihood and social protection, public goods (such as flood defense), training, and contingency planning, offered better value for money. Further, in an early analysis of ARC it was assessed that for one-in-five-year events, ARC would represent worse value for money than a regular budget allocation (e.g., a national contingency fund).⁹⁰ In addition, when Munich Climate Insurance Initiative (MCII) undertook a review of climate insurance, it reported a positive result for only one to two of the eight categories of assessment for the macro insurance schemes it reviewed (i.e., ARC, CCRIF, and two others, namely PCRAFI in the Pacific and FONDEN in Mexico). It is notable that the study only assessed potential positive impacts and did not consider potential negative impacts of insurance, indicating a pro-insurance bias.⁹¹

There has been one study by the World Bank that found that countries with high insurance penetration recover more quickly economically after disasters. However, this study was limited in scope, dealing only with countries with high private sector insurance penetration (rather than sovereign level insurance).⁹² Further, this study tells us nothing about the costs of the insurance policies and whether alternative uses of that money would have had more impact.⁹³

Insurance driven by ideology, not facts

As the facts don't support the current zeal for insurance – what is driving the enthusiasm? The answer, it seems, is ideological, made up of a number of elements. First is the long-standing mantra, perpetuated by international financial institutions and the governments who are their main share holders, to look to the private sector for solutions and to portray public sector service or infrastructure provision as too costly and inefficient—“an assertion, regardless of evidence and repeated often enough that it became accepted as a truism, that the public service is inherently incompetent, indolent and unresponsive by its very nature.”⁹⁴ Government policy action and public finance in this narrative is then primarily seen as facilitator to “leverage” or bring in the private sector as the purportedly more efficient and less costly alternative, including via public-private partnership (PPP) approaches. This is irrespective of broad evidence suggesting that privatization is not intrinsically better or more efficient than public ownership. The efficiency of service provision under all ownership models (public, private or mixed) depends on a multitude of factors such as competition, regulation, and wider financial and legal institutional development.⁹⁵ PPPs, for example, often leave the public sector carrying the long-term debt burden whilst the private sector makes a relatively risk-free return-on-investment, thanks to public sector guarantees.⁹⁶

Secondly, insurance shifts the focus from climate change—with its pesky emphasis on who caused the problem and should therefore pay to address its fallout—to risk management, thereby effectively shifting the responsibility away from the richer countries that caused climate change, and onto poorer countries that are feeling its impacts. Focusing on climate insurance is a way to make it the “fault” of vulnerable countries for not being prepared enough and to shift responsibility to vulnerable countries to pay for premiums. In effect, this is doubling down on the climate injustice of poor and vulnerable countries being forced to deal with the impacts of climate change, to which they did not contribute.

The unjustified enthusiasm for insurance is a distraction, or diversion, from the failure of developed countries to provide sufficient and predictable public climate finance to fulfill their obligations under the climate regime, including the full implementation of the Paris Climate Agreement.

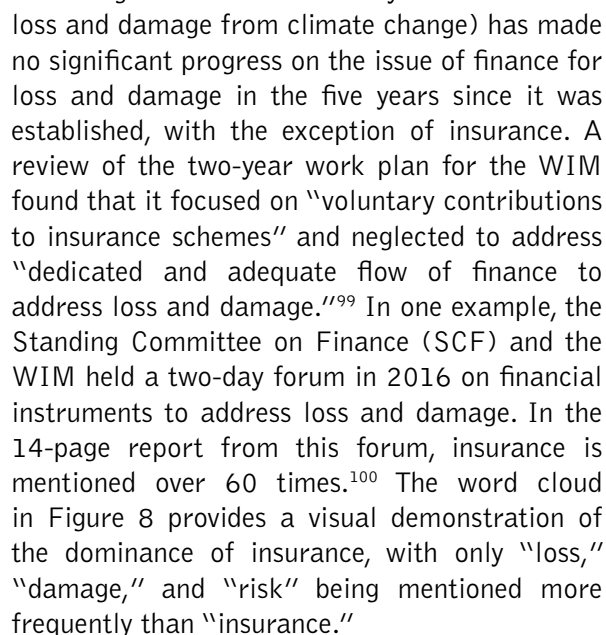
This perspective is discernible in the following quote from Simon Young, then CEO of ARC Insurance Company Ltd, from a 2015 interview:

“[T]he states are largely paying their own premium (only about 20% of 2014/15 premium is donor-funded, and then only indirectly)... If one considers that drought response in sub-Saharan Africa has traditionally been funded almost entirely by donors, it is actually quite remarkable that countries are willing to both meet our contingency planning and other requirements and pay a premium from their own budgets – but that is what is happening and it really demonstrates the commitment of African nations to step up to the plate in building resilience against climate hazards, in the face of increasing uncertainty due to global climate change, a phenomenon in which they have played almost no role in causing.”⁹⁷

An oft-repeated statement about insurance is that it provides an incentive for risk reduction (e.g., your insurer might give you a discount for putting locks on your windows and reducing your risk of being burgled). However, for climate insurance (i.e., index or parametric insurance), there is a disconnect between payout and losses. Payout is made based on how much rain fell and not whether farmers were taking steps to reduce the impacts of drought. Thus there is no incentive for an insurer to work to reduce risk.

The Warsaw International Mechanism for Loss and Damage (WIM) (the UN body which deals with

Word Cloud representation of the report from the 2016 SCF Forum on loss and damage finance



Further, at the climate summit held in November 2017, (COP23) the WIM hosted a side event, with the title "Risk Financing for Slow

More recently the Suva Expert Dialogue was held in May 2018 in order to address finance for loss and damage from climate change. Rich countries emphasized insurance to such an extent that developing countries and civil society felt the need to remonstrate and point out that options other than insurance were necessary.¹⁰² One delegate from Germany went as far as to describe insurance as a “magic instrument.”¹⁰³

18

damage from climate change. Both the CCRIF and ARC have a one-size-fits-all supply-driven approach, with insurance offered as the only financial solution, rather than a broader, demand-driven approach.¹⁰⁴

The initial cost-benefit analysis that was undertaken for ARC identified that supporting countries to retain risk at the national level (which can be done, for example, through budget allocation or through country created emergency funds) has significant benefits, with gains more than twice those that could be expected from the ARC model. The report also noted that the very act of pooling risk between countries and spreading response costs over a three-year horizon would reduce costs dramatically (essentially a public, non-market based, insurance model), and also that adopting a reinsurance model is not critical to the value proposition of ARC.¹⁰⁵ Despite this, the insurance/reinsurance model was adopted by ARC and is the only option it offers to its member countries. All these counterfactuals lead one to conclude that an ideological attachment to insurance from the World Bank and donor countries drove the design of ARC, rather than a balanced examination of best outcomes.

In 2015, under German presidency, the G7 launched InsuResilience, which later evolved into the G20 Global Partnership, which has the objective of increasing the number of the global poor and vulnerable covered by insurance by 400 million people (300 million by macro, sovereign level insurance and the remaining 100 million by micro insurance).¹⁰⁶ Thus far, rich countries (primarily Germany and the UK) have contributed US\$715m to InsuResilience. This is the vast majority of finance committed by all rich countries to loss and damage¹⁰⁷ and roughly the same amount contributed to disaster risk reduction in developing countries each year.¹⁰⁸

The InsuResilience initiative focuses on the extremely poor (people living on less than US\$1.90 per day), the moderately poor (living on US\$1.90 to US\$3.10 per day), and the vulnerable (living on US\$3.10 to US\$15.00 per day). The program claims that climate insurance can “help people to reduce their vulnerability and better manage their resources, as they can focus on useful activities rather than having to engage in risk-minimizing activities.”¹⁰⁹ However, experience shows that insurance is unlikely to be the best option for very poor people who face multiple risks. An increasingly erratic climate poses multiple risks from drought, flooding, new pests and pests with increasing impacts, diseases, and tropical storms, etc. Climate (i.e., index) insurance is typically aimed at one, or perhaps two, risks and thus is a very narrow approach which disregards the fact that climate change exacerbates multiple kinds of risk, in increasingly unpredictable ways. Poor people also face risks to their health and livelihood, which might severely impact or threaten their overall well-being, but is not covered by climate insurance. Other options, such as savings and/or social safety nets, are likely to better address this situation of multiple interlinked risks. In addition, poor people and many developing countries face severe budget constraints and insurance premium payments are likely to be diverted from other projects that might have otherwise been allocated funding, such as, national DRR funding, adaptation measures or alternative social safety nets.¹¹⁰ A narrow focus on insurance is dangerous and can lead to the kind of outcomes identified in the Malawi case study above.

In addition, the World Bank’s Disaster Risk Financing and Insurance Program has provided assistance in more than 50 countries, and pilot insurance schemes at all levels have proliferated, funded by donors including the UK, Germany, the US, Switzerland and Japan.¹¹¹

All of which is not to say that insurance is never a relevant response to loss and damage from climate change. If it is subsidized by polluting countries and industries, rather than funded by premiums paid by vulnerable countries, it may be judged by developing countries to be appropriate alongside a suite of other options. However, as has been demonstrated in this report, the international discourse on loss and damage has an uncritical and unjustifiably narrow focus on insurance at the expense of other options, driven by an ideological belief in profit-based, private sector response as well as, self-interest on the part of richer countries to distract from their own obligation to pay for climate change.

If insurance is not the whole solution, what is?

It should go without saying that reducing climate emissions is absolutely essential and is the best way to reduce the impact of climate change. While we have passed the point where we can prevent all loss and damage from climate change, it nonetheless remains true that the more, and faster, mitigation is undertaken, the less loss and damage will be suffered.

Likewise ensuring sufficient adaptation finance from rich countries to vulnerable countries is essential to keep loss and damage to a minimum, as well as to increasing adaptive capacity through improved drought resistance, the ability to cope with extreme rainfall, and water management, amongst other activities. At present climate change adaptation is extremely under-funded. Oxfam estimates that there was US\$9.5 billion of public climate finance dedicated to adaptation in 2015-16¹¹² —only a small portion of the US\$140-300 billion needed each year by 2025-30.¹¹³ Relatedly, risk reduction efforts, such as improving forecasting of droughts and storms or planning for how the community will cope with extreme events, including evacuation plans and centers, are short-changed by international climate-related assistance, despite evidence of efficiency and effectiveness. One analysis found that 102 out of 117 disaster risk reduction (DRR) programs were cost-effective, with higher impacts for those in less developed countries. Another found that early warning systems could yield benefits 4 to 36 times greater than the cost.¹¹⁴ Self-evidently these types of activities should be undertaken, yet they don't receive anywhere near enough funding. It has been estimated that for every dollar spent on disaster risk reduction the benefit is 4 times in terms of avoided loss or prevented damage.¹¹⁵ Yet less than 40 cents in every US\$100 of aid is spent on disaster risk reduction, roughly US\$700 million a year from 1991-2010.¹¹⁶

However, as emissions have not been reduced enough and rich countries are failing to provide sufficient adaptation finance, vulnerable countries in urgent need of scaled-up climate funding today are already facing loss and damage—which we know will get worse.¹¹⁷ A clear lesson from the preceding sections is that options other than insurance should be considered, some of which have been mentioned already in this report. Such options could include, for example, the establishment of new or expanded national climate funds, with a dedicated loss and damage savings pool, which would allow developing countries to make a budget allocation each year against future climate-related disasters, in conjunction with international climate funding resources.

A very brief summary of non-insurance approaches to loss and damage that should receive more attention and international finance includes:¹¹⁹

- A global solidarity fund able to pay out to countries facing climate impacts, which could be designed to pay out for both extreme and slow onset events;
- Social protection programs including social safety nets that can increase the underlying resilience of communities (ensuring that one extreme climate event doesn't push them into poverty) that can be designed to be scaled up in the case of extreme droughts, flooding, and storms, etc. These might take the form of, or be supplemented by, payments of money to individuals or households. Social safety net programs are proven ways to support poor people through the shock of disasters. In 2017, a meta-evaluation covering 27 safety net programs in 14 African countries found strong evidence of increases in food and other consumption, livestock and productive assets, and in incomes and earnings.¹²⁰ Safety nets offer value for money, but unfortunately, there are still many gaps. In many countries, social programs cover less than half of the poorest quintile.¹²¹ In addition, social protection schemes as a way to increase climate resilience and address disasters have to overcome an ideological bias in international climate funding contexts. For example, in the Green Climate Fund (GCF) in December 2016, several developed country board members rejected a funding scheme proposing social safety net expansion to increase the resilience of the

poorest population quintile of coastal communities in Bangladesh¹²² as not adaptation/climate-relevant, claiming it was “too much development.” A reformulated and significantly scaled down proposal ultimately approved by the GCF Board in March 2018 now excludes funding support for social protection.¹²³ A change in discourse is needed to overcome the politically charged, narrow, and counterproductive juxtaposition of development versus adaptation, especially with respect to protecting the poorest population groups (which generally do not profit from insurance approaches) from climate disasters, as many civil society groups have argued.¹²⁴

- One interesting innovation in Bangladesh is contingent emergency credit, released following an extreme event such as flooding or drought. With a 25 percent interest charge, it is cheaper than existing index insurance contracts. These emergency lump sum loans can provide a cushion for a wide range of risks, rather than formal insurance which requires each risk to be separately insured and the payment of multiple policies;¹²⁵
- Alternative livelihood programs, where communities facing the loss of resources, such as fish stock declines, or desertification of traditionally fertile land, are retrained to a new livelihood;
- Relocation funds for communities forced to move by, for example, rising sea levels and other slow onset events;
- National contingency funds, or emergency reserves, such as the Bangladesh National Climate Funds,¹²⁶ that can, amongst other things, provide an immediate source of funds in the case of an extreme event and can be used for a range of activities including, for example, reconstruction costs in reaction to supercharged storms and other climate impacts;
- Mexico’s Natural Disaster Fund FONDEN is an example of a country-based approach to extreme events. Mexico created a nationally owned trust, funded by a dedicated budget, and built a national risk model that includes rapid rehabilitation of public infrastructure, low-income housing, and the natural environment. It incorporates market-based risk transfer mechanisms, including insurance and catastrophe bonds, a revolving fund, dedicated subaccounts for emergency relief and recovery actions, as well as priority reconstruction activities.¹²⁷ Of course, for vulnerable countries facing climate impacts, these efforts should be entirely funded, or significantly subsidized, on a polluter pays basis;
- While being careful to ensure these options serve communities and offer good value for money, other, non-insurance, financial market options could be considered such as catastrophe bonds, where if a catastrophe exceeding the trigger point occurs, then the bond defaults and the obligation to pay interest and/or repay the principal is either deferred or completely forgiven.
- Increasing the concessionality of green credit lines to flexibly respond to situations of disasters could also be an option applied more comprehensively by existing climate funds. For example, the Green Climate Fund under its Enhanced Direct Access pilot approach has provided support for a program in the Eastern Caribbean and has been implemented by an Antigua and Barbuda government entity, which provides subsidized credit lines for households and micro- and small-sized businesses for resilience measures, which include options for loan forgiveness and automatic maturity extensions in cases of extreme weather impacts.¹²⁸

In deciding how best to spend precious budget dollars in the face of the ever-increasing threat of climate disasters, it is *crucially* important for governments to consult widely, including with their own citizens and civil society. When ActionAid conducted consultations in Malawi regarding the role of ARC insurance in drought recovery, many responses to how to spend US\$5 million came back, none favoring insurance.¹²⁹

There are other reasons for considering alternatives. While climate change is, in the short-term, a boost for the insurance industry, in the long run, climate change may make insurance a less viable option.

Climate change may make predicting when and how losses will manifest even more challenging—thus making insurance more difficult to design to correctly target risks faced by communities. In addition, climate change may drive losses to a level where they become too frequent, too costly, or too unpredictable to insure.¹³⁰ In fact, some within the industry have foreseen that climate change could pose such huge losses that it could bankrupt the insurance industry as we know it today.¹³¹

Where should the real focus be?

It is time to shrug off the distraction of climate insurance and pivot back to the fundamental issue at stake: who is going to pay for the loss and damage from climate change? How will we urgently raise this money? The answer lies squarely in the international agreements already made, at Paris and elsewhere: the polluters have a responsibility to pay for the damage they have caused.¹³²

We are at a point where the injustice of climate change impacting those on its front line, whilst polluting industries make trillions in profits¹³³ and rich countries do not live up to their promises, can no longer be ignored. It is clear that the “magic bullet” of insurance provides an inadequate consolation prize. A solution at the scale required, estimated as US\$50 billion a year by 2022 and US\$300 billion a year by 2030,¹³⁴ and paid for by the polluters not the victims, must be implemented. Such a solution would be a Climate Damages Tax, to equitably tax the extraction of coal, oil and gas, and thereby provide funds to a global loss and damage solidarity fund for vulnerable countries and communities.

“What mechanism is there for us to be able to access emergency funds when facing a disaster like that caused by Maria?”

We have been put on the front line by others. We were the guardians of nature. We have not contributed to global warming. ...

We are on the front line and this is not a metaphorical war....it is one in which we bury the dead, console the grieving, nurse our wounds and call out for reinforcements.

And we grow weary ... waiting for the world to hear our cry. We hear that now is the time to act. We read headlines of funds set aside. We smell the sweet fragrance of agreements promises and commitments. But we grow weary waiting.”

Roosevelt Skerrit, Prime Minister of the Commonwealth of Dominica. 16 November 2017.

https://unfccc.int/sites/default/files/dominica_cop23cmp13cma1-2_hls.pdf

A Climate Damages Tax has been proposed since 2014¹³⁵ and has gained wide support. It was widely called for at the Suva Expert Dialogue in Bonn in May,¹³⁶ has been demanded by vulnerable countries,¹³⁷ and is a key demand of global civil society.¹³⁸

A tax would be placed on the extraction of each barrel of oil, ton of coal, and cubic liter of gas. The tax would be calculated on the basis of the CO₂ estimated to be emitted by each product and applied at the same rate wherever fossil fuels are extracted. The tax would add to an international loss and damage fund. Poor countries would be able to use 100 percent of the tax collected from fossil fuels extracted in their countries for climate purposes. Rich countries could use 50 percent of the tax collected from fossil fuels extracted in their countries to help communities to transition to renewable options and 50 percent of the tax would go to the global loss and damage solidarity fund.

The global loss and damage solidarity fund could then be used to fund the kind of activities laid out in the preceding section, as managed by the relevant UNFCCC body.¹³⁹

Why should the fossil fuel industry be the target of such a tax? Not only are they responsible for 70 percent of emissions, they have known about climate change since the 1980s and have chosen to ignore the dangers and continue to pollute whilst actively denying and obfuscating the science of climate change in order to stymie real action.¹⁴⁰ Whereas the people facing the most dramatic impacts to their way of life are largely poor countries and poor people. It is a basic principle of justice, enshrined in the UN Framework Convention on Climate Change and the Paris Agreement, that those responsible for causing climate change pay the costs, not vulnerable people and countries on the front line of the impacts who did little to cause it.

The Climate Damages Tax, if well designed, could raise a substantial portion of the US\$50 billion a year by 2022 and US\$300 billion a year by 2030 that is indicative of the scale necessary in international loss and damage finance.¹⁴¹ Other alternative sources of finance should also be considered including carbon pricing, financial transaction taxes, international aviation, and maritime charges. These must all meet the standards of fairness and equity, ensuring they don't add to the burden of climate change faced by poor countries and poor people. Such levies and taxes, including the Climate Damages Tax, would contribute to raising the predictability of climate finance—as currently largely voluntary public sector contributions or philanthropic funding, the latter at the whims of individual or organizational philanthropies, are unpredictable. New sources of finance must be just that—new and in addition to current climate and humanitarian finance. Perhaps most importantly, they must follow the polluter pays principle. For the time of big business privatizing profits from continued fossil fuel use whilst the rest of society suffers must end!

CONCLUSIONS & RECOMMENDATIONS

Climate change creates mammoth new challenges for developing countries, hitting them again and again with climate-fueled disasters. Meanwhile climate change is a problem that vulnerable countries did not contribute to, rather rich countries and polluting industries must take responsibility for the damage that their actions, policies, and products have caused over time.

Those involved in the global discussion on climate change must be aware of the politics underlying the seemingly neutral discourse on the best solutions to address climate disasters and long-term loss and damage. Advocating for insurance is favoring a private sector, victim-pays approach to a problem that requires a justice and human rights-based solution, grounded in the application of the polluter-pays principle. We must focus on the why of the problem, in order to reach an effective and equitable solution.

Vulnerable countries need help to deal with loss and damage from climate change and they deserve climate justice. This will require the establishment of a global solidarity fund, with financial inputs from new and additional sources on top of promised development and climate assistance. The core of the financial resources for such a fund should come from implementing a Climate Damages Tax on extraction of coal, oil, and gas, as well as other alternative and predictable sources of finance, such as other taxes and levies, that can be introduced equitably, incorporating the polluter-pays principle.

The Warsaw International Mechanism for Loss and Damage (WIM) has a responsibility to generate the kind of finance that vulnerable countries will need and they must do the work required to make it a reality by the end of 2019, when the WIM is due to be reviewed. At the climate talks in 2018, countries need to set the WIM on the right track, agreeing on terms of reference for the review of the WIM that make it clear that a focus on insurance and an attempt to shift responsibility to developing countries, is not sufficient and that clear plans will be drawn up for approval in 2019 for predictable and adequate financial support, such as a global solidarity fund, and the sources that will fill it.

A global solidarity fund can provide the center of a solutions package to provide financial support for loss and damage to vulnerable countries and populations, but must be complemented by a renewed ap-

preciation of the role of social support systems to address climate vulnerability in an equitable and efficient way while protecting human rights, dignity, and livelihoods. As highlighted in this paper, in many instances, improvements to publicly-funded social protection schemes could provide a more cost-effective and comprehensive alternative to climate insurance. This might start with recognition of the political motivation behind efforts by many developed country climate negotiators to prevent support for such measures. Developed countries are driven by their motivation not to acknowledge their responsibility for climate change, not to pay for necessary climate actions and climate damages, and not to recognize that climate change is increasing the costs and efforts of development. This is the background of why they argue that these programs are not-climate-related, but are rather development investments and thus do not fall within the remit of climate funding mechanisms or under the obligation of developed countries to finance under the polluter-pays mandate applied by the UNFCCC framework. This political motivation is also evident in the perpetuation of a false dichotomy between development and adaptation approaches.

While country-ownership is often emphasized in international climate finance discourse, this ownership and the concomitant ability to make choices and determine priorities in response to climate disasters in developing countries, is frequently undermined by the provision of earmarked climate funding by developed countries in support of a broader political or ideological agenda, such as a preference for private-sector backed insurance schemes. By making funding available only for specific initiatives or approaches preferred by developed contributor countries, instead of the needs or preferences of recipient countries, the long-term sustainability of such efforts is weakened.

Developing countries should be able to set their own agendas, without having the ideology of “donors” forced upon them. Instead of utilizing scarce climate finance resources for insurance premiums, developing countries and their citizens could opt for financial support measures that bring direct and immediate benefits to people, households and local micro- and small-scale businesses to build resilience and allow for further contingencies in response to climate disasters. Given the option, developing country governments might favor direct access to highly concessional climate finance that is passed on to local farmers or fisherfolk in the form of small support grants or as subsidized small loans with lower interest rates to build resilience and livelihood alternatives. These programs could allow for an extension of maturity and some loan forgiveness in the case of climate-related disasters. In example, the Government of Antigua and Barbuda requested such funding from the Green Climate Fund (GCF) for efforts in the Eastern Caribbean.¹⁴² Such Enhanced Direct Access (EDA) approaches, currently the exception in multilateral climate funds, should become more widespread. In the GCF, EDA should become, over time, the preferred direct access modality. Such EDA approaches could ultimately result in transferring more international climate funding directly into existing national climate funds or national climate savings vehicles, including for future climate disasters and loss and damage investments.

In this context, the international community should also consider the ability of the GCF, as the main multilateral climate fund tasked with the implementation of the Paris Agreement, to serve as an international funding mechanism for loss and damage, as recommended by a recent study, which analyzed the structures of existing multilateral climate funds for their suitability for loss and damage finance provision.¹⁴³

Rich countries and institutions such as the World Bank, must stop zealously and ideologically prioritizing insurance above other, more appropriate, efficient, equitable, and country-owned responses to climate catastrophes. Rather they need to empower developing countries and communities to weigh the options, make informed decisions based on impartial analyses, and decide how they want to deal with the risk of climate-related catastrophes of storms, droughts, and floods. Selling insurance as a panacea, when it is at best only capable of playing a small supporting role, is not helpful.

ENDNOTES

¹Climate change is adding to the intensity of disasters and making intense disasters more frequent. While not every one of these disasters is related to climate change and some of the impact is due to more people living in more vulnerable (often coastal) areas, the overall influence of climate change can be seen in the growing number of increasingly severe disasters. World Bank, "Breaking the Link Between Extreme Weather and Extreme Poverty," November 14, 2016, <http://www.worldbank.org/en/news/feature/2016/11/14/breaking-the-link-between-extreme-weather-and-extreme-poverty>.

²These principles date back to the 1972 Stockholm Declaration and were strengthened and expanded upon in the 1992 Rio Declaration, and UN Framework Convention on Climate Change (UNFCCC), and its treaties, including the 2015 Paris Agreement, as well as in the Draft Principles on Allocation of Loss in the Case of Transboundary Harm Arising out of Hazardous Activities. For further discussion see Julie-Anne Richards and Keely Boom, "Big Oil, Coal and Gas Producers Paying for their Climate Damage: A discussion paper," In the *Publication Series Ecology*, Vol. 39, edited by the Heinrich Böll Foundation (2nd, revised edition) (Berlin: Heinrich Böll Foundation, 2014), pp-pp. https://www.boell.de/sites/default/files/2015-06-big_oil_coal_and_gas_producers_must_pay_for_their_climate_damage.pdf.

³The event statistics include all relevant loss events, based on different threshold values for property losses according to a country's level of development. The statistics also include all loss events with fatalities. Petra Löw, "Hurricanes cause record losses in 2017 - The year in figures," Munich RE, January 4, 2018, <https://www.munichre.com/topics-online/en/2018/01/2017-year-in-figures>

⁴Löw, "Hurricanes cause record losses in 2017 - The year in figures"

⁵Lena Weingartner, Catherine Simonet and Alice Caravani, "Disaster risk insurance and the triple dividend of resilience" Working Paper 515, Overseas Development Institute, September, 2017, <https://www.odi.org/publications/10926-disaster-risk-insurance-and-triple-dividend-resilience>.

⁶An international advocacy campaign for such a Climate Damages Tax was launched in 2017; see: Stamp Out Poverty, "Climate Damages Tax," last accessed August 20, 2018, <https://www.stampoutpoverty.org/cdt/climate-damages-tax/>.

⁷Löw, "Hurricanes cause record losses in 2017 - The year in figures."

⁸In the US insurance and health care industries have litigation costs at between two to four times that of other industries. Lawyers for Civil Justice, Civil Justice Reform Group, and U.S. Chamber Institute for Legal Reform, "Litigation Cost Survey of Major Companies," prepared for presentation to Committee on Rules of Practice and Procedure, Judicial Conference of the United States, May 10-11, 2010, 2010 Conference on Civil Litigation, Duke University, http://www.uscourts.gov/sites/default/files/litigation_cost_survey_of_major_companies_0.pdf.

⁹For a more in depth definition, see: Catherine Blampied, Aaron Oxley, Amy Whalley, Ben Sadek and Tom Maguire, "Weathering a risky climate: The role of insurance in reducing vulnerability to extreme weather," UK RESULTS, April 21, 2016, <https://www.results.org.uk/sites/default/files/files/Weathering%20a%20Risky%20Climate.pdf>.

¹⁰The G7 InsuResilience Climate Risk Insurance Initiative proposes to extend direct climate risk coverage from 55 million poor people in 2015 to 100 million by 2020; a further 300 million vulnerable poor people would receive indirect coverage (through macro-level insurance schemes) by 2020, up from 45 million in 2015. See: Federal Ministry of Economic Cooperation and Development, "G7 Initiative on Climate Risk Insurance

¹¹"InsuResilience': Reducing Risks – Insuring Losses - Increasing Resilience," October 28, 2015, https://www.gfdrr.org/sites/default/files/1c_InsuResilience.pdf.

ILO/MunichRe, "Microinsurance Compendium: Protecting the poor," <http://www.munichre-foundation.org/home/Microinsurance/MicroinsuranceCompendium.html>.

See also: Craig Churchill, "Microinsurance: Much progress, but challenges remain," *International Labour Organization*, March 21, 2014, http://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_237793/lang-en/index.htm; UN Non-Governmental Liaison Service, "Microinsurance reaches nearly 500 million people worldwide," 2012, https://unngls.org/index.php/un-ngls_news_archives/2012/2146-microinsurance-reaches-nearly-500-million-people-worldwide.

¹²For further discussion see Debbie Hiller "Facing Risk: Options and challenges in ensuring that climate/disaster risk finance and insurance deliver for poor people," *Oxfam*, April 16, 2018, <https://policy-practice.oxfam.org.uk/publications/facing-risk-options-and-challenges-in-ensuring-that-climatedisaster-risk-financ-620457> and Ceri Averill and Anna Marriott, "Universal Health Coverage: Why health insurance schemes are leaving the poor behind," *Oxfam*, *Oxfam Briefing Paper*, October 9, 2013, <https://www.oxfam.org/en/research/universal-health-coverage>.

¹³Hillier, "Facing Risk: Options and challenges in ensuring that climate/disaster risk finance and insurance deliver for poor people."

¹⁴For examples see Elisa Jiménez Alonso, "Slow Onset Disasters," *Acclimatize*, May 9, 2017, <http://www.acclimatise.uk.com/2017/05/09/slow-onset-disasters-where-climate-change-adaptation-and-disaster-risk-reduction-meet/>.

¹⁵Swenja Surminski, "Loss and damage of climate change: from managing risks to the politics of compensation," *Acclimatize*, April 24, 2017, <http://www.acclimatise.uk.com/2017/04/24/loss-and-damage-of-climate-change-from-managing-risks-to-the-politics-of-compensation/>.

¹⁶Erwann Michel-Kerjan & Giambattista Taglioni, "Insuring hurricanes: Perspectives, gaps, and opportunities after 2017," *McKinsey & Company*, December, 2017, <https://www.mckinsey.com/~media/McKinsey/Industries/Financial%20Services/Our%20Insights/Insuring%20hurricanes%20Perspectives%20gaps%20and%20opportunities%20after%202017/Insuring-hurricanes-Perspectives-gaps-and-opportunities-after-2017.ashx>.

¹⁷Commonwealth of Dominica, "Address by Hon. Roosevelt Skerrit Prime Minister of the Commonwealth of Dominica," November 16, 2017, https://unfccc.int/sites/default/files/dominica_cop23cmp13cma1-2_hls.pdf. According to World Bank data, only 22.1 percent of terrestrial Dominica and none of its territorial waters were officially protected. See <https://data.worldbank.org/indicator/ER.LND.PTLD.ZS> for terrestrial protection and <https://data.worldbank.org/indicator/ER.MRN.PTMR.ZS> for marine protection .

¹⁸World Bank. *Dominica*. (Washington, D.C.: The World Bank, accessed June 29, 2018), <https://data.worldbank.org/country/Dominica>.

¹⁹World Bank. *CO2 Emissions*. (Washington, D.C.: The World Bank, accessed June 29, 2018), <https://data.worldbank.org/indicator/EN.ATM.CO2E.PC?view=map>.

- ²⁰Government of the Commonwealth of Dominica, "Post-Disaster Needs Assessment Hurricane Maria," November 15, 2017, <https://reliefweb.int/report/dominica/post-disaster-needs-assessment-hurricane-maria-september-18-2017>.
- ²¹Richard J. Pasch, Andrew B. Penny, and Robbie Berg, "National Hurricane Center Tropical Cyclone Report: Hurricane Maria," National Hurricane Center, April 10, 2018, https://www.nhc.noaa.gov/data/tcr/AL152017_Maria.pdf.
- ²²Ibid.
- ²³United Nations Development Programme, "Dominica: Hurricane Maria Overview of the Humanitarian Response in 2017 (September-December 2017)," February 8, 2018, <https://reliefweb.int/report/dominica/dominica-hurricane-maria-overview-humanitarian-response-2017-september-december-2017>.
- ²⁴Government of the Commonwealth of Dominica, "Post-Disaster Needs Assessment Hurricane Maria."
- ²⁵World Bank, "World Bank Provides US\$65 million for Dominica's Post-Maria Reconstruction," April 13, 2018, <http://www.worldbank.org/en/news/press-release/2018/04/13/world-bank-provides-us65-million-for-dominicas-post-maria-reconstruction>
- ²⁶United Nations Development Programme, "Dominica: Hurricane Maria Overview of the Humanitarian Response in 2017 (September-December 2017)."
- ²⁷Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company (CCRIF SPC), "About us," Accessed July 9, 2018, <https://www.ccrif.org/content/about-us>.
- ²⁸Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company (CCRIF SPC), "CCRIF to make payout to Dominica of US\$19 million following the passage of Hurricane Maria," September 22, 2017, <https://www.ccrif.org/news/ccrif-make-payout-dominica-us19-million-following-passage-hurricane-maria>.
- ²⁹United Nations Development Programme, "Dominica: Hurricane Maria Overview of the Humanitarian Response in 2017 (September-December 2017)."
- ³⁰World Bank, "World Bank Provides US\$65 million for Dominica's Post-Maria Reconstruction."
- ³¹Dominica News Online, "UK to provide £65 million for Dominica's climate resilience bid," March 11, 2018, <http://dominicanewsonline.com/news/homepage/news/the-uk-to-provide-65-for-dominicas-climate-resilient-bid/>.
- ³²Caribbean Development Bank, "CDB funds project to assist with restoration of electricity in Dominica," March 22, 2018, <http://www.caribank.org/news/cdb-funds-project-assist-restoration-electricity-dominica>.
- ³³CARICOM-UN High Level Pledging Conference, "Update on Pledges as of 7 December," November 21, 2017, <http://resilientcaribbean.caricom.org/wp-content/uploads/2017/12/Update-on-Pledges.docx>.
- ³⁴Caribbean360, "European Union Steps up Support for Hurricane-Hit Caribbean Countries," July 18, 2018, <http://www.caribbean360.com/news/european-union-steps-up-support-for-three-hurricane-hit-caribbean-countries#ixzz50ArPDjnd>.
- ³⁵Dominica News Online, "Dominica receives grant aid from Japan for disaster response," March 1, 2018, <http://dominicanewsonline.com/news/homepage/news/economy-development/dominica-receives-grant-aid-from-japan-for-disaster-response/>.
- ³⁶Dominica News Online, "Dominica receives grant aid from Japan for disaster response."
- ³⁷Oliver Ralph, "Munich Re's warning on hurricane damage set to be first of many," Financial Times, September 14, 2018, <https://www.ft.com/content/5aad868a-993c-11e7-b83c-9588e51488a0>.
- ³⁸Lloyd's, "After the storms Harvey, Irma and Maria: lessons learned," Market Insight Report, 2018, <https://www.lloyds.com/~media/files/news-and-insight/risk-insight/2018/him/after-the-storms.pdf>.
- ³⁹Michel-Kerjan and Taglioni, "Insuring hurricanes: Perspectives, gaps, and opportunities after 2017."
- ⁴⁰The comment was made in relation to Hurricanes Harvey and Irma, and before Maria hit. Ralph, "Munich Re's warning on hurricane damage set to be first of many."
- ⁴¹Hillier, "Facing Risk: Options and challenges in ensuring that climate/disaster risk finance and insurance deliver for poor people."
- ⁴²Eric S. Blake and David A. Zelinsky, "National Hurricane Center tropical cyclone report: Hurricane Harvey," *National Hurricane Center, National Oceanographic and Atmospheric Association*, May 9, 2018, https://www.nhc.noaa.gov/data/tcr/AL092017_Harvey.pdf.
- ⁴³Umair Irfan and Brian Resnick, "Megadisasters devastated America in 2017. And they're only going to get worse: Storms, fires, floods, and heat caused at least \$306 billion in destruction last year," Vox, Updated Mar 26, 2018, <https://www.vox.com/energy-and-environment/2017/12/28/16795490/natural-disasters-2017-hurricanes-wildfires-heat-climate-change-cost-deaths>.
- ⁴⁴Blake and Zelinsky. "National Hurricane Center tropical cyclone report: Hurricane Harvey."
- ⁴⁵Ibid.
- ⁴⁶Ibid. However, other estimates of damage were higher.
- ⁴⁷Umair and Resnick, "Megadisasters devastated America in 2017. And they're only going to get worse. Storms, fires, floods, and heat caused at least \$306 billion in destruction last year."
- ⁴⁸Umair Irfan, "The stunning price tags for Hurricanes Harvey and Irma, explained" Vox, September 18, 2017, <https://www.vox.com/explainers/2017/9/18/16314440/disasters-are-getting-more-expensive-harvey-irma-insurance-climate>.
- ⁴⁹Michel-Kerjan & Taglioni, "Insuring hurricanes: Perspectives, gaps, and opportunities after 2017."
- ⁵⁰Ibid.
- ⁵¹Ibid.
- ⁵²Joe Resendiz, "Is the Rest of America Footing Flood Insurance Costs in Louisiana and Mississippi?" *ValuePenguin*, May 8, 2018, <https://www.valuepenguin.com/are-states-footing-flood-insurance-costs-mississippi-louisiana>.
- ⁵³Ibid.

- ⁵⁴Ella Nilsen, "The National Flood Insurance Program was already \$24 billion in debt before Harvey and Irma," *Vox*, September 11, 2017, <https://www.vox.com/2017/8/26/16208230/hurricane-harvey-flood-damage>.
- ⁵⁵Benjamin Lesser and Ryan McNeill, "Unfettered building, scant oversight add to cost of hurricanes in U.S.," *Reuters*, December 12, 2017, <https://www.reuters.com/investigates/special-report/usa-flooding-insurance/>.
- ⁵⁶Laura Sullivan, "Business of Disaster: Insurance firms profited \$400 million after Sandy," *NPR*, May 24, 2016, <https://www.npr.org/2016/05/24/478868270/business-of-disaster-insurance-firms-profited-400-million-after-sandy?t=1529507361646>.
- ⁵⁷Dante Disparte, "Insurance - A Great Form Of Protection, A Terrible Form Of Liquidity," *Forbes*, April 29, 2018, <https://www.forbes.com/sites/dantedisparte/2018/04/29/insurance-a-great-form-of-protection-a-terrible-form-of-liquidity/#23fff07f564f>.
- ⁵⁸Umair Irfan, "The stunning price tags for Hurricanes Harvey and Irma, explained."
- ⁵⁹Michel-Kerjan & Taglioni, "Insuring hurricanes: Perspectives, gaps, and opportunities after 2017," graph.
- ⁶⁰World Bank. *Malawi*. (Washington, D.C.: The World Bank, Accessed July 4, 2018). <https://data.worldbank.org/country/malawi>.
- ⁶¹Government of Malawi/World Bank, "Malawi drought 2015-2016 : post-disaster needs assessment (PDNA) (English)," (Washington, D.C.: World Bank Group, 2016), <http://documents.worldbank.org/curated/en/640011479881661626/Malawi-drought-2015-2016-post-disaster-needs-assessment-PDNA>.
- ⁶²Ibid.
- ⁶³Ibid.
- ⁶⁴This assessment was later increased to 6.7 million people. Jonathan Reeves, "The wrong model for resilience: How G7-backed drought insurance failed Malawi, and what we must learn from it," *ActionAid UK*, May 24, 2017, <http://www.actionaid.org/publications/wrong-model-resilience-how-g7-backed-drought-insurance-failed-malawi-and-what-we-must-l>.
- ⁶⁵World Bank, "Malawi drought 2015-2016 : post-disaster needs assessment (PDNA) (English)."
- ⁶⁶Ibid.
- ⁶⁷Ibid.
- ⁶⁸Ibid.
- ⁶⁹African Risk Capacity, "Malawi to receive USD 8M insurance payout to support drought-affected families," November 14, 2016, <http://www.africanriskcapacity.org/2016/11/14/press-release-malawi-to-receive-usd-8m-insurance-payout-to-support-drought-affected-families/>.
- ⁷⁰African Risk Capacity, "Climate and disaster risk financing get fresh boost from African Development Bank," May 23, 2018, <http://www.africanriskcapacity.org/2018/05/23/press-release-climate-and-disaster-risk-financing-get-fresh-boost-from-african-development-bank/>.
- ⁷¹Reeves, "The wrong model for resilience: How G7-backed drought insurance failed Malawi, and what we must learn from it."
- ⁷²Ibid.
- ⁷³African Risk Capacity, "Malawi to receive USD 8M insurance payout to support drought-affected families."
- ⁷⁴Reeves, "The wrong model for resilience: How G7-backed drought insurance failed Malawi, and what we must learn from it."
- ⁷⁵Hillier, "Facing Risk: Options and challenges in ensuring that climate/disaster risk finance and insurance deliver for poor people."
- ⁷⁶African Risk Capacity, "Malawi to receive USD 8M insurance payout to support drought-affected families."
- ⁷⁷Government of Malawi/World Bank, "Malawi drought 2015-2016 : post-disaster needs assessment (PDNA) (English)," (Washington, D.C.: World Bank Group, 2016), pp-pp, <http://documents.worldbank.org/curated/en/640011479881661626/Malawi-drought-2015-2016-post-disaster-needs-assessment-PDNA>.
- ⁷⁸e-Pact, "Independent Evaluation of the African Risk Capacity (ARC) Annex C: Case Studies," e-Pact, UKAID, *Oxford Policy Management*, itad., October 27, 2017, <https://www.opml.co.uk/files/Publications/a0603-independent-evaluation-african-risk-capacity/arc-evaluation-annex-c-case-study.pdf?noredirect=1>.
- ⁷⁹The report specifically stated that "A technical and field review revealed errors in customisation by Malawi which, when corrected, triggered a payout." In: UK Department for International Development, "Annual Review, African Risk Capacity," April 2017, <https://devtracker.dfid.gov.uk/projects/GB-1-203469/documents>.
- ⁸⁰Reeves, "The wrong model for resilience: How G7-backed drought insurance failed Malawi, and what we must learn from it."
- ⁸¹World Bank, "Malawi drought 2015-2016 : post-disaster needs assessment (PDNA) (English)."
- ⁸²World Bank, "World Bank Provides Hope to Drought Stricken Malawi," November 8, 2016, <http://www.worldbank.org/en/news/press-release/2016/11/08/world-bank-provides-hope-to-drought-stricken-malawi>.
- ⁸³World Bank, "Malawi drought 2015-2016 : post-disaster needs assessment (PDNA) (English)."
- ⁸⁴World Bank, "Malawi drought 2015-2016 : post-disaster needs assessment (PDNA) (English)."
- ⁸⁵World Bank, "Malawi drought 2015-2016 : post-disaster needs assessment (PDNA) (English)."
- ⁸⁶For a discussion of social protection to increase resilience across the multiple shocks that Malawi faces see, Rebecca Holmes and Cecilia Costella with Meghan Bailey, Andrew Kruczkiewicz, Richard Poulter, Kay Sharp and Lucy Scott, "Towards A Shock Sensitive Social Protection System for Malawi," (London: ODI and The Hague: Red Cross Climate Centre, 2017), http://socialprotection.org/sites/default/files/publications_files/Shock-Sensitive%20Social%20Protection%20in%20Malawi_FINAL.pdf
- ⁸⁷Hillier, "Facing Risk: Options and challenges in ensuring that climate/disaster risk finance and insurance deliver for poor people," and Roz Price, "Cost-effectiveness of disaster risk reduction and adaptation to climate change," *K4D, UK DFID Help Desk Report*, February 2, 2018, https://assets.publishing.service.gov.uk/media/5ab0debce5274a5e20ffe268/274_DRR_CAA_cost_effectiveness.pdf.
- ⁸⁸Weingartner, Simonet and Caravani, "Disaster risk insurance and the triple dividend of resilience."
- ⁸⁹Price, "Cost-effectiveness of disaster risk reduction and adaptation to climate change."
- ⁹⁰Hillier, "Facing Risk: Options and challenges in ensuring that climate/disaster risk finance and insurance deliver for poor people."

- ⁹¹: Laura Schaefer and Eleanor Waters, "Climate Risk Insurance for the Poor & Vulnerable," *MCII*, November, 2016, http://www.climate-insurance.org/fileadmin/mcii/documents/MCII_2016_CRI_for_the_Poor_and_Vulnerable_full_study_lo-res.pdf.
- ⁹²Martin Melecky and Claudio Raddatz, "How do Governments Respond after Catastrophes?" *Policy Research Working Paper Series 3503*, (Washington DC: World Bank, 2011), <http://documents.worldbank.org/curated/en/202541468026361854/pdf/WPS5564.pdf>.
- ⁹³Hillier, "Facing Risk: Options and challenges in ensuring that climate/disaster risk finance and insurance deliver for poor people."
- ⁹⁴UNDP/GCPSE, "Is the Private Sector More Efficient? A Cautionary Tale," (Singapore: UNDP/Global Centre for Public Service Excellence, 2015), http://www.undp.org/content/dam/undp/library/capacity-development/English/Singapore%20Centre/GCPSE_Efficiency.pdf.
- ⁹⁵Ibid.
- ⁹⁶Motoko Aizawa, "Key Messages for the World Bank Group's 2017 Guidance on PPP Contracts," *Heinrich Boell Stiftung North America*, <http://us.boell.org/2017/09/15/key-messages-world-bank-groups-2017-guidance-ppp-contracts>.
- ⁹⁷Artemis, "Interview: Where next for African Risk Capacity, Dr. Simon Young," February 20, 2015, <http://www.artemis.bm/blog/2015/02/20/interview-where-next-for-african-risk-capacity-dr-simon-young/>.
- ⁹⁸Reeves, "The wrong model for resilience: How G7-backed drought insurance failed Malawi, and what we must learn from it."
- ⁹⁹Jonathan Gewirtzman, Sujay Natson, Julie-Anne Richards, Victoria Hoffmeister, Alexis Durand, Romain Weikmans, Saleemul Huq, and J. Timmons Roberts, "Financing loss and damage: reviewing options under the Warsaw International Mechanism," *Climate Policy*, 18, no. 8 (2018): 1076-1086, <https://doi.org/10.1080/14693062.2018.1450724>.
- ¹⁰⁰Total number of mentions was actually closer to 70 times, but 60 is used here to take into account only positive (rather than negative) mentions of insurance. The report can be found at Appendix III here: UNFCCC, "Report of the Standing Committee on Finance to the Conference of the Parties," *UNFCCC*, FCCC/CP/2016/8 (November 7-11, 2016), <https://unfccc.int/resource/docs/2016/cop22/eng/08.pdf#page=29>.
- ¹⁰¹Including Lena Weingartner, "Looking beyond insurance: the UK's new disaster protection centre," *ODI*, July 15, 2017, <https://www.odi.org/comment/10531-looking-beyond-insurance-uk-s-new-disaster-protection-centre>. and Koko Warner, Kristina Yuzva, Michael Zissener, Susan Gille, Janina Voss, and Solveig Wanczek, "Innovative Insurance Solutions for Climate Change: How to integrate climate risk insurance into a comprehensive climate risk management approach," (Bonn: United Nations University Institute for Environment and Human Security (UNU-EHS), Report No. 12, 2013); <http://collections.unu.edu/eserv/UNU:1850/pdf11484.pdf>.
- ¹⁰²Harjeet Singh, "Expert Dialogue underscores finance gap to address climate induced 'Loss and Damage'," *Third World Network*, May 14, 2018, <https://twnetwork.org/climate-change/expert-dialogue-underscores-finance-gap-address-climate-induced-loss-and-damage>.
- ¹⁰³Soila Aparicio, "One-sided dialogue as rich countries sit out talks on climate loss" *Climate Home News*, May 4, 2018, <http://www.climatechangenews.com/2018/05/04/one-sided-dialogue-rich-countries-sit-talks-climate-loss/>.
- ¹⁰⁴CCRIF observation: World Bank Independent Evaluation Group (IEG) (2012) in Hillier, "Facing Risk: Options and challenges in ensuring that climate/disaster risk finance and insurance deliver for poor people."
- ¹⁰⁵Daniel J. Clarke and Ruth Vargas Hill. "Cost-Benefit Analysis of the African Risk Capacity Facility," *African Risk Capacity*, IFPRI Discussion Paper 01292 (September 2013), http://www.africanriskcapacity.org/wp-content/uploads/2016/11/ARC_CBA_and_Response.pdf.
- ¹⁰⁶Federal Ministry of Economic Cooperation and Development, "G7 Initiative on Climate Risk Insurance 'InsuResilience': Reducing Risks – Insuring Losses - Increasing Resilience."
- ¹⁰⁷It is difficult to calculate exactly how much finance had been committed to loss and damage as there are no agreed accounting rules to define loss and damage and the UNFCCC's Standing Committee on Finance does not include anything other than a cursory comment in their biennial reports.
- ¹⁰⁸Hillier, "Facing Risk: Options and challenges in ensuring that climate/disaster risk finance and insurance deliver for poor people."
- ¹⁰⁹InsuResilience, "About the InsuResilience Global Partnership," Accessed 10 July 2018: <https://www.insureilience.org/about/>.
- ¹¹⁰Weingartner, Simonet and Caravani, "Disaster risk insurance and the triple dividend of resilience."
- ¹¹¹Hillier, "Facing Risk: Options and challenges in ensuring that climate/disaster risk finance and insurance deliver for poor people."
- ¹¹²Tracy Carty and Armelle le Comte, "Climate Finance Shadow Report 2018," (Oxford: Oxfam International, May 2018), <https://www.oxfam.org/en/research/climate-finance-shadow-report-2018>.
- ¹¹³UNEP 2016, in Carty and le Comte, "Climate Finance Shadow Report 2018."
- ¹¹⁴Hillier, "Facing Risk: Options and challenges in ensuring that climate/disaster risk finance and insurance deliver for poor people."
- ¹¹⁵Price, "Cost-effectiveness of disaster risk reduction and adaptation to climate change."
- ¹¹⁶Jan Kellett and Alice Caravani, "Disaster Risk Reduction, a 20 year story of international aid," *GFDRR and ODI*, September 2013, <https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/8574.pdf>.
- ¹¹⁷For a discussion on the difference between adaptation and loss and damage, and for estimates on the scale of loss and damage see: Julie-Anne Richards and Liane Schalatek, "Financing Loss and Damage: A Look at Governance and Implementation Options," *Heinrich Böll Stiftung*, <https://www.boell.de/en/2017/05/10/financing-loss-and-damage-look-governance-and-implementation-options>.
- ¹¹⁸On options and considerations for establishing National Climate Funds, see: Cassie Flynn, "Blending Climate Finance through National Climate Funds: A guidebook for the design and establishment of national funds to achieve climate change priorities," (New York: United Nations Development Programme, September, 2011), http://www.undp.org/content/dam/undp/library/Environment%20and%20Energy/Climate%20Change/Capacity%20Development/Blending_Climate_Finance_Through_National_Climate_Funds.pdf.
- ¹¹⁹These options were drawn from the following sources, for more discussion and examples see: Climate Action Network. "Submission on the Scope of the Technical Paper Exploring Sources of Support for Loss and Damage and Modalities for Accessing Support," February 2018. https://unfccc.int/sites/default/files/resource/CAN%20Loss%20and%20Damage%20Submission_%20022018.pdf; UNFCCC, "Synopses Series: Approaches to Address Loss and Damage Associated with the Adverse Effects of Climate Change," 2012, https://unfccc.int/files/adaptation/groups_committees/loss_and_damage_executive_committee/application/pdf/synopsis_literature_review.pdf; and Hillier, "Facing Risk: Options and challenges in ensuring that climate/disaster risk finance and insurance deliver for poor people."

- ¹²⁰Ralston et al., 2017 in Hillier, "Facing Risk: Options and challenges in ensuring that climate/disaster risk finance and insurance deliver for poor people."
- ¹²¹Hillier, "Facing Risk: Options and challenges in ensuring that climate/disaster risk finance and insurance deliver for poor people."
- ¹²²GCF funding proposal FP032 was withdrawn at the 15th GCF Board meeting (December 2016) as it became clear that there was no consensus by the GCF Board to approve it, with several developed country Board members strictly opposed. FP32 is available at: Green Climate Fund, "Consideration of funding proposals – Addendum V Funding proposal package for FP032," GCF/B.15/13/Add.05, November 24, 2016, https://www.greenclimate.fund/documents/20182/490910/GCF_B.15_13_Add.05_-_Funding_proposal_package_for_FP032.pdf/28f71049-e8c5-40c5-ad96-c0a1500a7dfe.
- ¹²³GCF funding proposal FP069 was approved at the 19th GCF Board meeting. FP069 is available at: Green Climate Fund, "Consideration of funding proposals – Addendum XI Funding proposal package for FP069," GCF/B.19/22/Add.11, February 6, 2018, https://www.greenclimate.fund/documents/20182/953917/GCF_B.19_22_Add.11_-_Funding_proposal_package_for_FP069.pdf/ecbc0d18-46a9-4e39-ad00-e944bbc2997b.
- ¹²⁴CSO Letter to the GCF Board, July 2017, https://us.boell.org/sites/default/files/uploads/2012/10/2017-6-29_cso_letter_on_adaptation_versus_development_final.pdf
- ¹²⁵Hillier, "Facing Risk: Options and challenges in ensuring that climate/disaster risk finance and insurance deliver for poor people."
- ¹²⁶SM Munjurul Hannan Khan, Saleemul Huq and Md Shamsuddoha, "The Bangladesh National Climate Funds," International Institute for Environment and Development, LDC paper series, no date, <http://idccc.org/ldc/documents/bangladeshnationalfund.pdf>.
- ¹²⁷Salvador Perez, "The experience of Mexico's Fonden in catastrophe bonds, lessons for Asia," *Asian Development Blog*, November 9, 2015, <https://blogs.adb.org/blog/experience-mexico-s-fonden-catastrophe-bonds-lessons-asia> and World Bank, "FONDEN: Mexico's Natural Disaster Fund--A Review," (Washington D.C.: The World Bank, May 2012), <https://openknowledge.worldbank.org/handle/10986/26881>.
- ¹²⁸See the approved GCF funding proposal FP061, Green Climate Fund "Integrated physical adaptation and community resilience through an enhanced direct access pilot in the public, private, and civil society sectors of three Eastern Caribbean small island developing states," GCF/B.19/22/Add.03, February 6, 2018, https://www.greenclimate.fund/documents/20182/953917/GCF_B.19_22_Add.03_-_Funding_proposal_package_for_FP061.pdf/581cd2e2-262b-4a70-b225-8d9cf6e13c8e.
- ¹²⁹Reeves, "The wrong model for resilience: How G7-backed drought insurance failed Malawi, and what we must learn from it."
- ¹³⁰Weingartner, Simonet and Caravani, "Disaster risk insurance and the triple dividend of resilience."
- ¹³¹Damian Carrington, "Climate change threatens ability of insurers to manage risk," *The Guardian*, December 7, 2016, <https://www.theguardian.com/environment/2016/dec/07/climate-change-threatens-ability-insurers-manage-risk>.
- ¹³²For a discussion of the polluter pays and other equity principles in international laws and agreements, including the Paris Agreement, see: Keely Boom, Julie-Anne Richards, and Stephen Leonard, "Climate Justice: The international momentum towards climate litigation" *Heinrich Böll Stiftung and Climate Justice Programme*, November 15, 2016, <https://www.boell.de/en/2016/11/15/climate-justice-international-momentum-towards-climate-litigation>.
- ¹³³Julie-Anne Richards and Keely Boom, "Making a killing: who pays the real costs of Big Oil, Coal and Gas," *Climate Justice Programme*, <https://www.boell.de/sites/default/files/making-a-killing.pdf>.
- ¹³⁴Climate Action Network, "Submission on the Scope of the Technical Paper Exploring Sources of Support for Loss and Damage and Modalities for Accessing Support," February 2018, http://climatenetwork.org/sites/default/files/can_loss_and_damage_submission_022018.pdf.
- ¹³⁵Originally called the Carbon Levy. For the 2014 report and others since see: Heinrich-Böll-Stiftung, "The Carbon Levy," Last accessed August 20, 2018, <https://www.boell.de/en/carbon-levy-project>.
- ¹³⁶See the notes from each session: <https://unfccc.int/topics/adaptation-and-resilience/workstreams/loss-and-damage-ld/workshops-meetings/suva-expert-dialogue#eq-5>
- ¹³⁷Joseph Isaac, Ronny Jumeau, Anisul Islam Mahmud and Ralph Regenvanu, "When will the world's polluters start paying for the mess they made?" *Climate Home News*, May 2, 2018, <http://www.climatechangenews.com/2018/05/02/will-worlds-polluters-start-paying-mess-made/>.
- ¹³⁸Climate Action Network, "Submission on the Scope of the Technical Paper Exploring Sources of Support for Loss and Damage and Modalities for Accessing Support."
- ¹³⁹For more detail on how this would work, see Stamp Out Poverty, "Climate Damages Tax Briefing," last accessed August 20, 2018, https://www.stampoutpoverty.org/wp-content/uploads/2018/04/SoP_CDT_briefing-web2.pdf.
- ¹⁴⁰See Center for International Environmental Law (CIEL)' webpage (www.ciel.org/) and CIEL, "Smoke and Fumes: The Legal and Evidentiary Basis for Holding Big Oil Accountable," November 16, 2017, <https://www.ciel.org/news/smoke-and-fumes-2/>, as well as the Union of Concerned Scientists (UCS)'s webpage (www.ucsusa.org) and their series of report "Holding Major Fossil Fuel Companies Accountable for Nearly 40 Years of Climate Deception and Harm," last accessed August 20, 2018, <https://www.ucsusa.org/global-warming/fossil-fuel-companies-knew-about-global-warming#.Wz0zrRJKiV4>.
- ¹⁴¹Climate Action Network, "Submission on the Scope of the Technical Paper Exploring Sources of Support for Loss and Damage and Modalities for Accessing Support."
- ¹⁴²See the approved GCF funding proposal FP061, Green Climate Fund, "Integrated physical adaptation and community resilience through an enhanced direct access pilot in the public, private, and civil society sectors of three Eastern Caribbean small island developing states."
- ¹⁴³See a summary of options for an international funding mechanism for loss and damage in: Julie-Anne Richards and Liane Schalatek, "Financing Loss and Damage: A Look at Governance and Implementation Options,"

