



Government Actuary's Department

A Disaster Risk Insurance Facility for the CERF

Discussion paper

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1 Executive Summary

1.1 This report has been prepared by the Government Actuary's Department (GAD) at the request of the Department for International Development (DFID) as a product of the Centre for Global Disaster Protection. The purpose of this report is to stimulate discussion within DFID and the United Nations (UN) Central Emergency Response Fund (CERF) on the proposal from the Innovative Finance Foundation (IFF) for a disaster risk insurance facility and an associated premium fund.

1.2 The report provides an independent actuarial analysis and assessment of the IFF's proposal from the perspective of:

- > Value for money relative to other potential options which could be taken to achieve the stated objectives; and
- > The CERF's contribution to reducing the impact of predictable natural hazards on vulnerable populations, as part of the wider humanitarian system.

It compares and contrasts the IFF proposal with three alternative options. The report builds on a growing evidence base that suggests that if designed well, risk finance linked to prearranged systems with clear decision processes can lead to faster, more cost-effective, and more reliable response to emergencies.¹ It is provided within the context of the role of the CERF in the broader humanitarian system, and in the context of the UK Government's Humanitarian Reform Policy,² but is based on limited information and may not be appropriate under different policy objectives.³

Analysis of the IFF proposal

1.3 This report reviews an IFF report⁴ and subsequent IFF update note⁵ which together propose the establishment of:

¹ Clarke, Daniel J.; Dercon, Stefan. (2016) *Dull Disasters? : How Planning Ahead Will Make a Difference*. Oxford University Press, New York, available at <https://www.gov.uk/dfid-research-outputs/dull-disasters-how-planning-ahead-will-make-a-difference>

² DFID (2017) *Saving lives, building resilience, reforming the system: the UK Government's Humanitarian Reform Policy*, available at <https://www.gov.uk/government/publications/uk-governments-humanitarian-reform-policy>.

³ For example, this report does not explicitly consider the implications of potential future changes to the nature or composition of humanitarian need, for example brought about by conflict, climate change, or economic development.

⁴ Innovative Finance Foundation (2016) *Innovative humanitarian financing: A risk insurance mechanism to scale-up UN-CERF*, October 2016, available at <https://docs.unocha.org/sites/dms/CERF/AG2016/CERF-IFF%20Report%2028.10.16.pdf>

⁵ Innovative Finance Foundation (2017) *Update – Disaster Risk Insurance Facility*, 9 May 2017, available at <http://www.unocha.org/cerf/sites/default/files/CERF/AG2017/Update%20-%20Disaster%20Risk%20Insurance%20Facility.pdf>



- > A disaster risk insurance facility (the 'Facility') which would issue disaster insurance policies to the CERF. This would be established as a commercially sustainable, regulated insurance company owned by the CERF, and would be capitalised by yet-to-be-identified government donors and private players; and
 - > An investment fund (the 'Fund') initially of \$120m, which would use returns to pay the Facility's annual insurance premium on behalf of the CERF. It would be capitalised by yet-to-be-identified government donors and private players, possible bilateral debt conversion,⁶ and possibly the Green Climate Fund.
- 1.4 So in summary, the Fund would invest and use returns to buy insurance from the Facility. The Facility would administer the insurance and pay any claim payments to the CERF, and the CERF would disburse any insurance claim payments to UN agencies through one of its existing funding windows.
- 1.5 The IFF report is underpinned by an assumption that government donors and private players would commit new funding to the Facility and the Fund, and that this would not divert core funding from the CERF or the wider UN humanitarian system. With this as the starting point the majority of the report analyses the operational practicalities for how the Facility and Fund could operate, and the mechanisms for how government donors or private players could contribute financially.
- 1.6 However, by restricting its focus to how 'more funding' could be implemented, the IFF report does not help the reader to understand whether a Facility and Fund could offer 'better financing' within the context of the CERF and wider humanitarian system. In particular the IFF report doesn't present evidence that investments in the Facility or Fund would provide value for money relative to other comparable options, such as direct investments in the CERF.
- 1.7 For the IFF proposal we estimate that the amount a donor would have to spend for each \$1 of funding ultimately received by the CERF (where all these figures are expressed as expected net present values) is:
- > For the IFF proposal: Between \$4 and \$15, with a central estimate of \$8.
 - > For direct funding to the CERF: \$1.

So under our central assumptions it is eight times more costly to put \$1 (in expected net present value terms) into the CERF through the proposed IFF Facility and Fund than through direct funding to the CERF. Most of this higher cost comes from the time delay between donor investments in the Fund and premium payments from the Fund to the Facility, with the remainder coming from the administrative and operational costs of the Facility.

⁶ Under bilateral debt conversion, a creditor would cancel a portion of bilateral debt to a developing country on the condition that the developing country contributed an agreed amount towards the Fund.



- 1.8 To motivate the IFF proposal it is therefore necessary to argue that it is doing more than just acting as a funding mechanism for the CERF. Disaster insurance initiatives for sovereigns are typically motivated as a way to increase the speed or targeting of specific kinds of response, or as a way to incentivise pre-disaster investments in preparedness. However, the IFF proposal doesn't provide any such motivation. It doesn't discuss the proposal in the context of the CERF's existing funding window, or whether the proposal could increase speed, targeting, or incentives of CERF-supported response.
- 1.9 Finally, whilst the IFF proposal does include discussion of many of the operational practicalities for how the Facility and Fund could operate, some aspects could benefit from further clarification. For example, it will be important to be clear about how conflicts of interest will be managed and how transparency and accountability concerns will be addressed in a context where experts may disagree over the likelihood of potential future disasters and therefore over the insurance premium that might be acceptable. Also, the assumption that funding to the Facility and Fund would be 'new funding' would benefit from further discussion and analysis in the context of sticky Overseas Development Assistance budgets.

Alternatives

- 1.10 This GAD report compares and contrasts the IFF proposal with three hypothetical alternatives:
- 1. Core funding to the CERF:** Instead of the IFF proposal, any funding that would be made available for the Fund and Facility to instead be channelled directly to the CERF as core funding;
 - 2. Embedded insurance purchased by the CERF:** As for the IFF proposal, but with no Fund, and with insurance finance explicitly linked to a new CERF window for early pre-committed response. In this option the insurance triggers would match the CERF window's triggers for early funding, and insurance claim payments would finance pre-agreed response plans; and
 - 3. Embedded pay as you go funding to the CERF:** As for the embedded insurance option, but without a Facility. Instead one or more donors would commit to make additional contributions to the CERF that precisely match what the insurance would pay out. In this alternative donors would take these contingent liability onto their balance sheets, rather than these being managed by the Facility. Some donors already do this to some extent—providing extra funding to the CERF after large disasters—but this option would formalise this further, and donors would need to pre-commit to provide funding in specific cases.
- 1.11 A subjective, qualitative comparison of options relative to core funding to the CERF is as follows:



Table 1. Subjective assessment of options, relative to providing core funding to the CERF

	IFF proposal	Embedded insurance	Embedded pay as you go
Cost to donors per \$1 of CERF funding (expected net present value)	xx	x	~
Provide additional finance for certain natural events	✓	✓	✓
Speed of response	~	✓	✓
Insurance payout rules targeted to humanitarian need	x	~	~
Embedded incentive for UN agencies to invest in preparedness	~	✓	✓

Table key: ✓ Better than core funding to the CERF
 ~ Similar to core funding to the CERF
 x Worse than core funding to the CERF
 xx Significantly worse than core funding to the CERF

- 1.12 Our analysis suggests that the embedded insurance option in particular could have some applications for the CERF, for example for faster response or for forecast-based financing. This may have higher average overheads than core CERF funding, but could bring additional benefits in terms of speed and improving incentives for preparedness within the UN system if designed well.
- 1.13 The embedded pay as you go option also has merits, but would require one or more donors to be willing agree to provide funding to the CERF based on objective data and pre-agreed rules, such as the occurrence of a sufficiently intense earthquake.
- 1.14 Our analysis also suggests that there may be value in the CERF exploring options to finance disaster preparedness to complement investments in pre-committed finance.

Conclusion

- 1.15 The IFF proposal raises a range of important questions about whether insurance principles and instruments might allow the CERF to achieve more. However, our analysis suggests that this specific proposal provides significantly lower value for money than some plausible alternatives. This low value is mostly due to the delay between donor investments in the Fund and premium payments from the Fund to the Facility.
- 1.16 We do find merit in exploring the potential for an embedded insurance approach, without a Fund, and with pre-committed finance designed to drive incentives for proactive risk management within the UN humanitarian system. Such an approach may offer the possibility of the benefits from an insurance system outweighing the administrative and operational costs of such a system.



2 Background

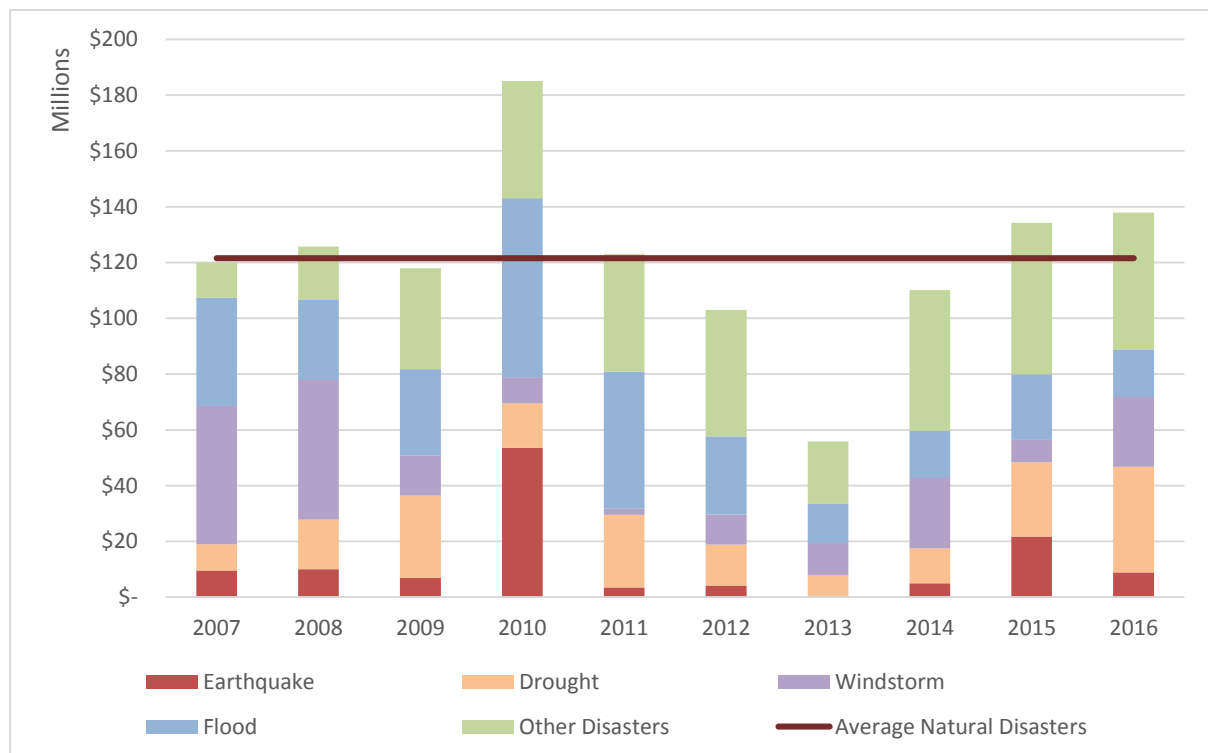
- 2.1 This report has been prepared by the Government Actuary's Department (GAD) at the request of the Department for International Development (DFID), as a product of the Centre for Global Disaster Protection. The purpose of this report is to stimulate discussion within DFID and the United Nations (UN) Central Emergency Response Fund (CERF) on the proposal from the Innovative Finance Foundation (IFF) for a disaster risk insurance facility and an associated premium fund.
- 2.2 The scope of this work is outlined in the Terms of Reference dated 17 August 2017. In particular, this report has been prepared for the use of DFID. Other than DFID, no person or third party is entitled to place any reliance on the contents of this report, except to any extent explicitly stated herein, and GAD has no liability to any person or third party for any act or omission taken, either in whole or part, on the basis of this report. As part of DFID's commitment to open research on disaster risk financing, parts of this analysis may be published by DFID in some form. This report is based solely on publicly available data and documentation as listed in Appendix 1.
- 2.3 The report provides analysis and assessment of the IFF proposal alongside three alternative options for innovative humanitarian finance that could be considered:
- > Core funding to the CERF
 - > Embedded insurance purchased by the CERF
 - > Embedded pay as you go funding to the CERF
- These options are described below.
- 2.4 The report provides analysis of these four options from the perspective of:
- > Value for money relative to other potential options which could be taken to achieve the stated objectives; and
 - > The CERF's contribution to reducing the impact of predictable natural hazards on vulnerable populations, as part of the wider humanitarian system.
- This analysis may not be appropriate under different policy objectives, and other stakeholders may have other views. For example, the analysis in this report may not be relevant for private companies, foundations, charities or individuals. Moreover, applying risk financing principles in a humanitarian context is a new area. There is a range of additional factors to consider when evaluating potential investments in this area that are not covered by this report.
- 2.5 The remainder of this report is structured as follows. The IFF proposal is described in Section 3 and analysed in Section 4, and the other options are described and analysed in section 5.



3 Context and description of proposal

- 3.1 The CERF is the UN's global emergency response fund, providing immediate funding for life-saving humanitarian action at the onset of emergencies and for crises that have not attracted sufficient funding. Contributions are received year round, mainly from governments, but also from private companies, foundations, charities and individuals.
- 3.2 Since its creation in 2006 the CERF has disbursed an average of US \$402 million per year for humanitarian emergency assistance, of which the IFF estimate around a third was natural hazard-related, with the remainder related to other emergencies, such as armed conflict. Figure 1 below presents the CERF expenditure since 2006 by type of natural hazard; based on this analysis we estimate average annual disbursements of roughly \$122m per year for natural hazard-related assistance.

Figure 1. The CERF's annual expenditure by type of natural hazard

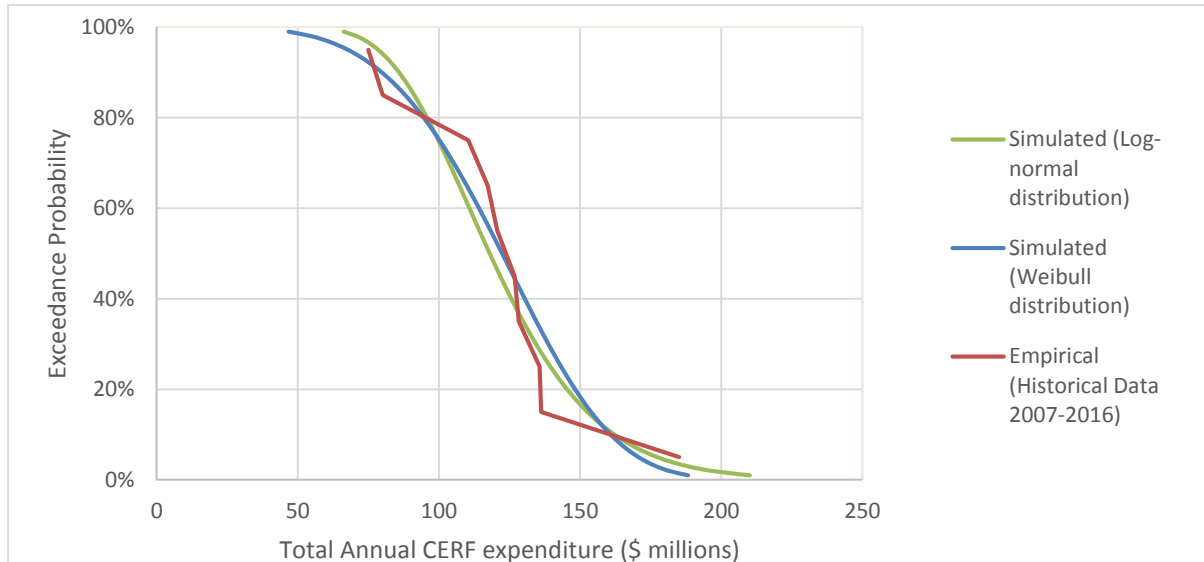


Source: GAD based on United Nations Financial Tracking Service

- 3.3 Figure 2 presents the estimated likelihood of different levels of the CERF's annual expenditure on natural hazards. It shows both the historical frequency of annual CERF expenditure on natural hazards as well as smoothed curves generated using maximum likelihood estimation. For example, under the smoothed curves, the 1-in-100 year annual CERF expenditure related to natural hazards is estimated to be between \$190 million and \$210 million.



Figure 2. Exceedance Probability curves showing the CERF's annual expenditure in respect of natural hazards.



Source: GAD based on United Nations Financial Tracking Service

- 3.4 The CERF is funded largely through voluntary grants from donors, and includes both regular funding and ad hoc replenishments.
- 3.5 In this context, the IFF published a report⁷ proposing a risk insurance mechanism for the CERF, initially focusing on natural hazards, and subsequently presented an update note⁸ to the CERF which refined the plan for preparation and implementation. Viewed together this proposal ('the IFF proposal') has two main components:
- > A disaster risk insurance facility (the 'Facility') which would issue disaster insurance policies to the CERF. This would be established as a commercially sustainable, regulated insurance company owned by the CERF, and would be capitalised by yet-to-be-identified government donors and private players; and
 - > An investment fund (the 'Fund') initially of \$120m, which would use returns to pay the Facility's annual insurance premium on behalf of the CERF. It would be capitalised by yet-to-be-identified government donors and private players, possible bilateral debt conversion,⁶ and possibly the Green Climate Fund.

⁷ Innovative Finance Foundation (2016) Innovative humanitarian financing: A risk insurance mechanism to scale-up UN-CERF, October 2016, available at <https://docs.unocha.org/sites/dms/CERF/AG2016/CERF-IFF%20Report%2028.10.16.pdf>

⁸ Innovative Finance Foundation (2017) Update – Disaster Risk Insurance Facility, 9 May 2017, available at <http://www.unocha.org/cerf/sites/default/files/CERF/AG2017/Update%20-%20Disaster%20Risk%20Insurance%20Facility.pdf>



So in summary, the Fund would invest and use returns to buy insurance from the Facility. The Facility would administer the insurance and pay any claim payments to the CERF, and the CERF would disburse any insurance claim payments to UN agencies through either its rapid response window or its underfunded emergencies window.

- 3.6 The IFF proposal also estimates some of the costs of implementing the Fund and Facility. It estimates that to be sustainable the Facility would need to charge insurance premiums with a multiple between 1.5 and 2.5.⁹ This means between \$1.50 and \$2.50 would be needed in insurance premium for every \$1 of annual average claim payment from the Facility to the CERF. It suggests that the Fund would adopt a low-to-moderate risk investment strategy. And it suggests that in addition to the premium payments, an additional cost of \$0.88m would be needed to establish the Facility and the Fund, with a further \$0.8m per year to cover Facility maintenance costs.

⁹ An insurance multiple is given by the cost of insurance per unit of expected claim payment. This compares with World Bank experience of multiples for sovereign disaster insurance of '1.3 and up' presented in Table 2 of World Bank Group (2017) Sovereign Catastrophe Risk Pools: World Bank Technical Contribution to the G20. World Bank, Washington, DC, available at <https://openknowledge.worldbank.org/handle/10986/28311>



4 Analysis of proposal

Comparison of IFF proposal with UK Government approach

- 4.1 Her Majesty's Government (HMG) has well-established processes for managing risks and purchasing insurance. One key principle is of particular relevance in this situation: HMG's public financial management handbook¹⁰ separates the approval processes that public sector organisations must follow for deciding whether to take a specific risk onto its balance sheet from decisions about whether to purchase insurance. There are good reasons for this.
- > **Defining contingent liabilities / contingent liability approval:** Contingent liabilities in this context mean potential future disbursements that may arise if certain events happen. Deciding which contingent liabilities a government or intergovernmental organisation will take on and which it won't needs to involve a range of stakeholders, and having a clear approval process in place can increase scrutiny, control and oversight. For example, the HMG process for contingent liability approval comprises policy formulation, Treasury approval, Parliamentary notification, and reporting; and involves public officials, boards, and Parliament.¹¹ Annex B reproduces HMG's checklist for approval of contingent liabilities.
 - > **Insurance purchase approval:** By comparison, the HMG process for deciding whether to buy insurance as part of a strategy for financing a contingent liability is largely a technical process, based on objective cost-benefit analysis as outlined in the Green Book.¹² Insurance purchase must be compared with other options which government could possibly take to achieve the identified objectives.
- 4.2 This principle is consistent with what the International Monetary Fund considers to be best practices for risk management in the public sector¹³, and with the operational processes for disaster risk finance being promoted by multilateral development banks.¹⁴

¹⁰ See Annexes 4.3 and 4.4 of HM Treasury (2017) Managing Public Money, 23 January 2017, available at <https://www.gov.uk/government/publications/managing-public-money>

¹¹ HM Treasury (2017) Contingent liability approval framework, 4 August 2017, available at <https://www.gov.uk/government/publications/contingent-liability-approval-framework>

¹² <https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government>

¹³ For example IMF (2016) Analyzing and managing fiscal risks – best practices, available at <https://www.imf.org/external/np/pp/eng/2016/050416.pdf>.

¹⁴ For example see Figure 12 of World Bank Group (2014) Financial Protection Against Natural Disasters: An Operational Framework for Disaster Risk Financing and Insurance. Washington, DC, available at <https://openknowledge.worldbank.org/handle/10986/21725>.



- 4.3 In the context of the IFF proposal, applying the above principles would have the following implications:
- > **Contingent liability approval:** The proposal does not distinguish between discussions about what contingent liability the CERF should take on (for example, should the CERF provide more or earlier funding after specific natural events) and discussions about how it should be financed (for example, should this be financed through a Facility and a Fund). Also, there is no discussion of how insurance claim payments would be channelled once they reached the CERF, how they would relate to core CERF funding, and whether they would be channelled through an existing CERF window or through a new window.
 - > By comparison, applying the HMG approach to the CERF would begin with a clear articulation of what contingent liabilities the CERF would like to take on and why, taking into account the existing humanitarian finance architecture. The CERF could construct this contingent liability by analysing previous disbursements, as well as thinking through what disbursements it would want to prioritise in potential future scenarios. A proposal for what contingent liability the CERF would take on would require a range of scrutiny, control and oversight by the CERF and its stakeholders.
 - > **Insurance purchase approval:** The IFF proposal is underpinned by an assumption that government donors and private players would commit new funding to the Facility and the Fund, and that this funding could not be provided for any other purpose. With this assumption taken as given, the proposal then approaches design of the Fund and the Facility as a technical exercise in how to establish a Fund and a Facility. It does not include any consideration of other potential options for meeting the proposed policy objectives. And it does not include any cost-benefit analysis, for example comparing investments in the Fund or the Facility with comparable direct investments in the CERF core funding.
 - > By comparison, applying the HMG approach to the CERF would require a cost-benefit analysis of the Fund and the Facility relative to potential alternatives.
- 4.4 Whilst a full cost benefit analysis of the IFF proposal following the methodology in HMG's Green Book is outside the scope of this analysis, we provide a semi-quantitative analysis of the value for money of the proposal, considering cost-efficiency, speed of response, targeting to humanitarian need and incentives for disaster preparedness.



Cost of the IFF proposal as a fundraising mechanism for the CERF

- 4.5 In terms of cost-efficiency, a natural question would be to ask how much a donor has to spend to get \$1 of funding to the CERF. Asking this question is slightly complicated because under the IFF proposal both donor spending and funding to the CERF happen over a period of time and depend on when disasters occur. As such, to ask this question we have to account for discounting and risk:
- > **Discounting:** Most humanitarian donors prefer to allocate today's budget to save lives today, rather than allocating today's budget to save lives a long way in the future. There are various reasons for this. In financial terms, this can be captured by using a discount rate to convert cashflows into the CERF occurring in the future to 'present values'. For example, in the current context, a humanitarian donor might be indifferent between \$110 paid into the CERF in one year's time and \$100 paid into the CERF today. This is equivalent to assuming a discount rate of 10%, since \$110 discounted by one year at a discount rate of 10% is equivalent to \$100 today.
 - > **Risk:** Future claim payments from insurance into the CERF will depend on when eligible disasters occur. For example, if no eligible disasters occur in the first ten years of operation, the total funding to the CERF over this period from the Facility would be zero. However, if there was a series of very large disasters the total funding over this period could be very large. It may therefore be useful to consider the expected cashflows into the CERF, taking into account all the potential future disasters and their respective likelihoods.
- 4.6 Taken together we may compare the expected net present value (hereafter 'value') of donor spending with the value of funding to the CERF. Or more precisely we ask:
- > 'How much does a donor have to spend to achieve funding with value of \$1 into the CERF.'
- 4.7 To answer this question we use a simple actuarial model which is based on the five parameters listed in Table 2. For all parameters we propose a central assumption. For the average Fund investment return and Facility insurance multiple we also propose low and high sensitivity assumptions which we use to illustrate how the findings may change if one or both of these assumptions differ to what is expected.

Table 2. Assumptions for central estimates and sensitivity analysis

Assumptions	Low	Central	High	Assumption from
Average Fund investment return	1.9%	2.9%	3.9%	GAD
Facility insurance multiple	1.5	2.0	2.5	IFF proposal
Donor discount rate		10%		GAD
Donor contribution to Fund		\$120m		IFF proposal
Donor contribution to Facility administrative cost		\$0.88m in year one Plus \$0.8m per year thereafter		IFF proposal



- 4.8 Three of the assumptions in Table 2 are proposed in the IFF proposal and we do not discuss them here. The discount rate assumption of 10% has been chosen in consultation with DFID to reflect current practice for some humanitarian donors. We assume that the Facility is self-financing and does not need donor funding. For simplicity's sake we have done all calculations in sterling, and converted all figures to US dollars at today's exchange rates for presentational purposes.
- 4.9 The average Fund investment returns have been estimated by applying assumed average investment returns to an assumed investment portfolio as follows.
- > **Assumed investment portfolio:** The IFF report proposes that the Fund will invest to offer low-to-moderate risk, and we have chosen what we consider to be a typical asset portfolio for this level of risk within a UK context. In practice, a wide range of portfolios and strategies may be invested in. Our example portfolio composition is described in the 'Asset Weighting' column of Table 3.
 - > **Assumed average investment returns:** Views on future investment returns, including views of expected returns, inflation and correlations are uncertain and subject to a wide degree of judgement and so other views and assumptions are plausible. The assumptions in this report are provided in Table 3 and are derived from the outputs of a third-party Economic Scenario Generator. We believe that the assumptions are within a range that could be considered reasonable and are broadly reflective of current market conditions. However, alternative views that cover both higher and lower simulations of returns and inflation do exist. We assume that the Fund would not be subject to taxation on investment returns.

Table 3. Assumed average investment returns by asset class

Asset Class	Asset Weighting (%)	Low Return (%)	Central Return (%)	High Return (%)
Investment Grade Corporate Bonds	40	2.05	2.75	3.55
Index Linked Bonds	40	1.20	1.70	2.20
Equities	20	3.00	5.75	8.20
Average		1.9	2.9	3.9

- 4.10 Table 4 then presents how much a donor has to spend to put a funding with value of \$1 into the CERF, under these assumptions.

Table 4. Average cost to a donor of putting \$1 in value of funding into the CERF (\$)

		Insurance multiple		
		Low Scenario (1.5)	Central Assumption (2.0)	High Scenario (2.5)
Investment return	Low Scenario (1.9%)	9	12	15
	Central Assumption (2.9%)	6	8	10
	High Scenario (3.9%)	4	6	7



- 4.11 We explain this table by talking through the calculation for our central assumptions:
- > In this example the donors put \$120m into the Fund immediately. They would also contribute \$0.88m to the Facility in year one, and \$0.8m per year thereafter to cover maintenance costs. Assuming that these payments are all due at the start of each year, this adds up to a donor contribution of \$129m in value.¹⁵
 - > The Fund earns expected investment income of \$3.52m at the end of each year for every future year.¹⁶
 - > This \$3.52m investment income per year is used to purchase insurance with a multiple of 2. Therefore, the \$3.52m of premium corresponds to \$1.76m¹⁷ of annual average claim payment from the Facility to the CERF, starting from year 2.
 - > In order to calculate the value of funding to the CERF we discount the value of payouts (\$1.76m each year) to calculate their total worth in today's money. Assuming the cashflows occur on average in the middle of each year, the value of the funding from the Facility to the CERF is \$16.8m.¹⁸
 - > Consequently this shows a donor needs to spend around \$8 to get a value of \$1 into the CERF.¹⁹
- 4.12 As we can see in Table 4 above, depending on which set of assumptions applied, the cost to a donor of putting funding with value of \$1 into the CERF ranges from \$4 to \$15. Most of this higher cost comes from the time delay between donor investments in the Fund and premium payments from the Fund to the Facility. For example, under our central assumptions it would take 34 years before the total insurance premiums financed by the Fund reached \$120m. Humanitarian donors tend to have discount rates greater than expected investment returns, and therefore prefer to focus on need now rather than need in the distant future. The numbers would be substantially lower if the entire Fund was spent on immediate insurance premiums. The remainder of the higher cost comes from the administrative and operational costs of the Facility.
- 4.13 The range of \$4 to \$15 quoted above and in Table 4 is based on a discount rate of 10%. However, it may also be informative to investigate the sensitivity of results to the discount rate, holding all other assumptions constant. Under our central assumptions for investment returns and insurance multiple, as we increase the assumed donor discount rate from 5% to 10%, and then 15%, the average cost to a donor of putting \$1 in value of funding into the CERF increases from \$4 to \$8, and then \$12, respectively.

¹⁵ = $\$120.88m + \$0.8m/10\%$

¹⁶ = $\$120m \times 2.93\%$

¹⁷ = $\$3.52m/2$

¹⁸ = $\$1.76m \times 1.1^{-0.5}/0.1$

¹⁹ = $\$129m/\$16.8m$



Qualitative discussion of benefits

- 4.14 It is common for the cost of insurance to outweigh the average expected claim payments. For example HM Treasury's Managing Public Money explains:
- > 'In the private sector risk is often managed by taking out insurance. In central government it is generally not good value for money to do so. This is because the public sector has a wide and diverse asset portfolio; a reliable income through its ability to raise revenue through taxation; and access to borrowed funds more cheaply than any in the private sector. In addition commercial providers of insurance also have to meet their own costs and profit margins. Hence the public purse is uniquely able to finance restitution of damaged assets or deal with other risks, even very large ones. If the government insured risk, public services would cost more.'
- 4.15 Nevertheless any analysis of insurance should recognise the benefits, and compare it with realistic alternative options. The above analysis seems to suggest that if the sole goal of the Fund and the Facility are to provide additional funding to the CERF, then they seem to be quite an expensive way to do this on average. However, it is possible to argue that insurance can have a role beyond this.
- 4.16 One obvious potential benefit of disaster insurance is that it can provide large amounts of funding after large disasters. Even if this is costly on average, this ability to help the CERF ensure it has funding available when it is needed could be valuable. This argument has merit, but would be strongest if the insurance was to cover events that are costly for the CERF as a whole, thereby better matching funding availability to needs. Given that earthquakes and windstorms have only accounted for 8% of the CERF's expenditure over the last decade, it is not clear to what degree the IFF proposal would actually provide funding in years in which the CERF experiences the largest funding shortfalls.
- 4.17 In addition to providing additional funding after disasters, disaster insurance initiatives for sovereigns are often motivated as a way to increase the speed or targeting of specific kinds of response, or as a way to incentivise pre-disaster investments in preparedness.²⁰

²⁰ World Bank Group (2016) Disaster Risk Finance as a Tool for Development : A Summary of Findings from the Disaster Risk Finance Impact Analytics Project, available at <https://openknowledge.worldbank.org/handle/10986/24374>



- > **Speed:** Based on the information available to GAD at the time of this review (as listed in Appendix A) it is unclear whether the Fund and Facility would increase the speed of the CERF's funding for windstorms and earthquakes relative to the CERF's existing Rapid Response Window. For example, in the aftermath of Typhoon Haiyan in 2013 the CERF authorised a \$25 million rapid response grant for use by UN agencies within 48 hours. This is faster than typical insurance. However, not all CERF disbursements seem to be this fast—Cyclone Mora made landfall on 30 May 2017, but the CERF disbursements for Bangladesh and Burma were not until 22 June and 3 July respectively. It may also be that the CERF's funding is slower than this for slow-onset events, in which case it may be possible that insurance could improve the speed of funding. However, slow-onset events are excluded from the IFF proposal.
- > **Targeting:** Although GAD does not have expertise in this area, based on discussions with humanitarian experts it seems possible that the existing CERF decision processes may target need more accurately than the sort of crude insurance payout rules proposed by the IFF for windstorm and earthquake.
- > **Preparedness:** There is no discussion in the IFF proposal about whether the CERF would pre-commit insurance-based funding to specific UN agencies for specific purposes. Provision of a more reliable income stream to UN agencies might increase their incentives to invest in preparedness.²¹ However, this is not part of the proposal.

Potential for fundraising

- 4.18 GAD does not have any special expertise in humanitarian fundraising. However, recent experience for sovereign disaster insurance and pandemic insurance suggests that donor financing is easier to mobilise for start-up costs and capitalisation of insurance captives than to pay for ongoing response costs through insurance premiums, even where there is encouraging cost benefit analyses.²² Without an encouraging cost benefit analysis the Fund may find it even harder to obtain funding. And even if the Facility were established, without a Fund or other sustainable source of premium funding it would be challenging for the Facility to thrive.

²¹ Clarke, Daniel J.; Dercon, Stefan. (2016) Dull Disasters? : How Planning Ahead Will Make a Difference. Oxford University Press, New York, available at <https://www.gov.uk/dfid-research-outputs/dull-disasters-how-planning-ahead-will-make-a-difference>

²² World Bank Group (2017) Sovereign Catastrophe Risk Pools: World Bank Technical Contribution to the G20. World Bank, Washington, DC, available at <https://openknowledge.worldbank.org/handle/10986/28311>



Conflicts, transparency, and accountability

- 4.19 Finally, whilst the IFF proposal does include discussion of many of the operational practicalities for how the Facility and Fund could operate, some aspects could benefit from further clarification.
- > The executive summary states that ‘the private sector partners have been identified and stand ready to work out the details in collaboration with the CERF’ but there is no discussion of how real or perceived conflicts of interest would be managed.
 - > There is no discussion of whether the Fund may need to select an investment strategy consistent with generally established humanitarian principles, and what effect this might have on investment returns.
 - > There is no discussion of how the Facility would approach transparency over claim payment rules and risk information in a context where experts may disagree over the likelihood of potential future disasters and therefore over the insurance premium that might be acceptable.
 - > There is a lack of clarity over the role of the CERF and its Advisory Group in approving insurance cover.



5 Alternatives

Description of alternative options considered

- 5.1 In this section we compare the IFF proposal with three plausible alternatives.
- > **Core funding to the CERF:** Instead of the IFF proposal, any funding that would be made available for the Fund and Facility to instead be channelled directly to the CERF as additional core funding;
 - > **Embedded insurance purchased by the CERF:** As for the IFF proposal, but with no Fund, and with insurance finance explicitly linked to a new CERF window for early pre-committed response. In this option the insurance triggers would match the CERF window's triggers for no-regrets early funding, and insurance claim payments would finance pre-agreed response plans; and
 - > **Embedded pay as you go funding to the CERF:** As for the embedded insurance option, but without a Facility. Instead one or more donors would commit to make additional contributions to the CERF that precisely matched what the insurance would pay out. In this alternative donors would take these contingent liability onto their balance sheets, rather than these being managed by the Facility. Some donors already do this to some extent—providing extra funding to the CERF after large disasters—but this option would formalise this further, and donors would need to pre-commit to provide funding in specific cases.

Qualitative comparison of options

- 5.2 Comparing the IFF proposal to CERF core funding is quite a high bar because the CERF has an established track record in providing value for money in reducing the impact of predictable natural hazards on vulnerable populations.²³ Regardless, Table 5 provides a qualitative comparison of these three options relative to providing core funding to the CERF, and the remainder of this section provides discussion of these assessments.

²³ DFID (2016) Raising the standard: the Multilateral Development Review 2016, available at <https://www.gov.uk/government/publications/raising-the-standard-the-multilateral-development-review-2016>



Table 5. Subjective assessment of options, relative to providing core funding to the CERF

	IFF proposal	Embedded insurance	Embedded pay as you go
Cost to donors per \$1 of CERF funding (expected net present value)	xx	x	~
Provide additional finance for certain natural events	✓	✓	✓
Speed of response	~	✓	✓
Insurance payout rules targeted to humanitarian need	x	~	~
Embedded incentive for UN agencies to invest in preparedness	~	✓	✓

Table key: ✓ Better than core funding to the CERF
 ~ Similar to core funding to the CERF
 x Worse than core funding to the CERF
 xx Significantly worse than core funding to the CERF

Cost per \$1 of CERF funding

5.3 Under the same assumptions as the corresponding analysis in Section 4, we can calculate the average costs of all four options, namely:

Table 6. Comparative analysis of cost per \$1 of CERF funding

Option	Cost to a donor of putting funding with value of \$1 into the CERF (\$)
Core funding to the CERF	1
IFF Proposal	4-15
Embedded insurance	1.5-2.5
Embedded pay as you go	1

5.4 As can be seen from the above table the IFF proposal is the highest cost, per unit of value funding to the CERF. Core funding to the CERF and the pay as you go options both offer the lowest cost per unit of funding to the CERF since every \$1 of donor expenditure is paid directly into the CERF.

5.5 In this context, to be able to motivate either the IFF proposal or the Embedded insurance option it is necessary to argue that they are doing more than just acting as a funding mechanism for the CERF.



Provide additional finance for certain natural events

- 5.6 The IFF proposal, embedded insurance, and embedded pay as you go options are all designed to provide additional finance for certain natural events. This funding could potentially crowd out other CERF or other humanitarian funding (since for some donors, seeing a large insurance payout may make them less willing to contribute after the disaster than they would have otherwise been.) And the embedded pay as you go option brings additional risks to the CERF in respect of donors not fulfilling their commitments. However, even allowing for this it seems reasonable to assume that these proposals would all provide additional finance for certain natural events relative to core funding to the CERF.

Speed of response

- 5.7 As discussed in Section 4 it may be possible to argue that the IFF proposal could increase the speed of response for some windstorms and earthquakes relative to core funding to the CERF. However, there does seem to be an even stronger rationale for speed improvements for slow-onset events.
- 5.8 For example, over the past few years there has been increased discussion of the extent to which weather forecasts could be used to trigger some actions even earlier, several days or many weeks in advance of a humanitarian crisis, saving more lives and reducing the impact and costs of disasters, as well as taking advantage of any opportunities that might be presented (e.g. water harvesting and increased crop yields). The use of forecasts inevitably brings additional challenges. Nevertheless, research suggests that, for some types of early action and some hazards, the potential benefits may outweigh the risks.²⁴
- 5.9 Weather and climate information is increasingly being used to trigger earlier responses to droughts and floods. Examples include within shock-responsive social safety net systems, such as the Kenya Hunger Safety Net Programme, the Productive Safety Net Programme (PSNP) in Ethiopia, and the Sahel Adaptive Social Protection Programme. And there is evidence that forecast-based financing approaches can work in practice from the pioneering work by the Red Cross Red Crescent Climate Centre. Early responses to the 2015/16 El Nino event by DFID and others was informed in large part by the evolving forecasts and further demonstrates how forecasts have been used to effectively inform early action at a more macro-level. A number of other actors, such as the START network, are also now building systems for NGOs to act in advance of an emergency based on weather forecasts.

²⁴ Coughlan de Perez, Erin & Hurk, Bart & Aalst, Maarten & Jongman, Brenden & Klose, T & Suarez, Pablo. (2014). Forecast-based financing: an approach for catalyzing humanitarian action based on extreme weather and climate forecasts. Natural Hazards and Earth System Sciences, available at <https://www.nat-hazards-earth-syst-sci.net/15/895/2015/nhess-15-895-2015.pdf>



Insurance payout rules targeted to humanitarian need

- 5.10 As discussed in Section 4 it is challenging to assess the targeting accuracy of the IFF proposal, but it seems unlikely that this will be better targeted to humanitarian need for easily observable fast-onset windstorms and earthquakes than core CERF funding. There are also still ambiguities over the role of the CERF and its Advisory Group in designing and approving the insurance (particularly if the CERF is not to pay the premium).
- 5.11 However, it does seem possible, at least in theory, that embedded insurance for extremely early action or forecast-based action could be well-targeted, and fill a gap that is currently missing both within the CERF and within the wider humanitarian system. Decisions over targeting of such funding would need to be guided carefully by the CERF and its Advisory Group, and there would no doubt be challenges with this approach. A no-regrets, data-driven financing window could be open to criticism for example over allocating funding to humanitarian need that may or may not materialise, rather than allocating funding to humanitarian need that is already pressing, even if the former is expected to have greater impact. However, the balance of evidence does seem to be in favour of investigating such approaches.

Strengthens incentive for UN agencies to invest in preparedness

- 5.12 One important feature of the embedded insurance options is that specific UN agencies would receive pre-committed finance from the CERF to finance pre-agreed minimal response plans. Providing reliable funding to UN agencies for specific disaster scenarios provides incentives for them to invest in preparedness to be able to respond when funding would arrive. Indeed, such a funding window could be tied to loans or other financial instruments for preparedness investments.
- 5.13 Estimates of the potential benefit from investments by UN agencies in preparedness are high. A recent multi-year study of 83 emergency preparedness investments, conducted by Pricewaterhouse Coopers in partnership with UNICEF, WFP, UNHCR and OCHA, estimated that \$1 invested in emergency preparedness by UN agencies resulted in median outcomes reported in Table 7 below, including:
- > a 14 day reduction in the gap between the occurrence of a crisis and the initial response;
 - > \$1.50 saved over the entire lifecycle of the investment;
 - > 0.24 kg of CO2 emissions saved.

If embedded insurance linked to more reliable contingent funding for UN agencies is able to stimulate well-targeted investments by UN agencies in preparedness, this could significantly improve the value proposition of insurance for the CERF.



Table 7. Comparative analysis of cost per \$1 of CERF funding

Type of investment	Time savings (days)	For every \$1 invested ...			
		Net savings after the first emergency to occur	Net savings over investment lifecycle	Kgs of CO2 equivalents emissions saved	Affected person-days receiving better assistance
Data systems	18	\$0.9	\$3.5	0.03	603
Infrastructure / process pre-positioning	3	\$0.5	\$3.4	19.62	7
Long term agreements / Programme Cooperation Agreements	16	\$1.2	\$12.3	-	204
Skills	9	\$6.6	\$21.6	0.77	-
Supply pre-positioning	14	\$0.2	\$0.2	0.27	12
All	14	\$0.5	\$1.5	0.24	15

Source: Pricewaterhouse Coopers (2017) Emergency Preparedness: Return on Investment Model, Return trend analysis.



Appendix A: Documents reviewed in this report

- A.1 CERF (2017) Background: CERF and Innovative Financing, 4th May 2017, available at
<http://www.unocha.org/cerf/sites/default/files/CERF/AG2017/Background%20CERF%20and%20Innovative%20Finance.pdf>
- A.2 Innovative Finance Foundation (2016) *Innovative humanitarian financing: A risk insurance mechanism to scale-up UN-CERF*, October 2016, available at
<https://docs.unocha.org/sites/dms/CERF/AG2016/CERF-IFF%20Report%2028.10.16.pdf>
- A.3 Innovative Finance Foundation (2017) *Update – Disaster Risk Insurance Facility*, 9 May 2017, available at
<http://www.unocha.org/cerf/sites/default/files/CERF/AG2017/Update%20-%20Disaster%20Risk%20Insurance%20Facility.pdf>



Appendix B: HM Treasury Contingent Liabilities Checklist

1. Rationale

- A. What is the problem that needs to be solved (the market failure) and why is government intervention necessary?
- B. Why is incurring / modifying a contingent liability necessary to address the market failure?
- C. What other alternatives have been explored? For example, direct spending such as subsidies. Why were these rejected?

2. Exposure

- A. What is the maximum size of the contingent liability, if any?
- B. Why is this size necessary? If there is no explicit maximum, please explain why.
- C. What is the maturity of the contingent liability, if any? Specifically, when does it cease to exist?
- D. Why is this maturity necessary? If there is no explicit maturity, please explain why.
- E. If, prior to maturity, the contingent liability no longer proves to be value for money, is there an exit strategy? If yes, how would it work? If no, why not?

3. Risk and return

- A. What are the triggers for potential crystallisation of the contingent liability?
- B. What is the likelihood of complete crystallisation over what timeframe? For example, time $t = X\%$, time $t+1 = Y\%$, time $t+2 = Z\%$, etc
- C. What is the distribution of possible losses over the life of the contingent liability? For example, loss of A with likelihood of B, loss of C with likelihood of D, etc
- D. What is the expected loss associated with the contingent liability?
- E. How do the risks compare to the returns on the contingent liability?

4. Risk management and mitigation

- A. Who will manage the risks associated with the contingent liability and what is the governance process around the management of these risks?
- B. What risk mitigation tools have been explored? For example, partial guarantees, collateral, controls on risk-taking behaviour, reinsurance, etc
- C. Is the Exchequer being adequately compensated for bearing the risk associated with the contingent liability? For example, guarantee fees, contingent claims, profit-sharing, etc
- D. How should the Exchequer guard against the residual risk? For example, contingency fund, setting aside financial assets, hedging, etc

5. Affordability

- A. If the contingent liability crystallised, to what extent would it be possible to meet the required payment out of the department's existing budget?
- B. What is the ratio of the contingent liability's expected loss to the department's available resource?
- C. If the contingent liability crystallised, how would it affect public sector net borrowing (PSNB) and public sector net debt (PSND)?