COUNTRY PERSPECTIVES ON PRE-ARRANGED FINANCING

KENYA, MALAWI, NIGERIA, SENEGAL AND ZAMBIA

CENTRE FOR DISASTER PROTECTION

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
IFPRI

REPORT

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ACRONYMS

ARC	African Risk Capacity
Cat DDO	Catastrophe Deferred Drawdown Option
CCASA	Changement Climatique en Agriculture et Sécurité Alimentaire
CEGA	Centre for Effective Global Action
COVID-19	Coronavirus Disease 2019
DoDMA	Department of Disaster Management Affairs
DRF	Disaster Risk Financing
FSN	Fonds de Solidarité Nationale
IFPRI	International Food Policy Research Institute
KIIs	Key Informant Interviews
LMICs	Low- and Middle-Income Countries
NEMA	National Emergency Management Authority
ODA	Official Development Assistance
PAF	Pre-Arranged Financing
UNDP	United Nations Development Programme
UNDRR	United Nations Office for Disaster Risk Reduction
USD	United States Dollar
WTP	Willingness to Pay

EXECUTIVE SUMMARY

Governments increasingly face large and sudden fiscal pressures from climate-related and geophysical shocks. Pre-arranged financing (PAF) instruments, such as earmarked emergency funds, contingent credit lines and parametric insurance, are designed to provide rapid and predictable liquidity following disasters. When combined with sound contingency plans and strong implementation, a PAF-financed response system can deliver a rapid and effective response to a disaster. However, despite growing international focus on these instruments, their uptake and sustained use remain limited in many low- and middle-income countries (LMICs).

This study examines policymakers' preferences for key characteristics of PAF-financed response systems. Rather than focusing on specific instruments, the study analyses key attributes of PAF systems, including the speed of disbursement, and subsequent response and flexibility in the conditions that trigger payouts and use of funds. By exploring policymakers' reservation price (willingness to pay) for different types of PAF instruments, we also provide insights into how the (opportunity) cost of financing shapes demand.

To elicit policymakers' preferences, the study implemented an interactive disaster risk financing (DRF) simulation with approximately 190 government officials in Kenya, Malawi, Nigeria, Senegal and Zambia. Participants made repeated financing decisions under realistic fiscal and disaster risk scenarios, in which ex-post financing tends to be less effective than PAF. However, when obtaining PAF, the country incurs an opportunity cost and participants express their reservation price for PAF. This allows us to observe willingness to pay for different attributes of PAF-financed response systems.

Our first contribution is to show that this method can help surface participants' preferences over PAF-financed response systems. The simulation findings are closely aligned with participant responses to a complementary survey undertaken after the simulation, suggesting that the simulation was well understood and elicited credible preferences. In the simulation, willingness to pay for PAF-financed response varied as expected. Participants revealed a stronger willingness to pay for PAF for larger, infrequent disasters than for smaller, more frequent ones. In addition, willingness to pay increased with the fiscal budget on hand, but only up to a point. When the fiscal budget was sufficiently large, a further increase in fiscal space did not result in higher willingness to pay.

As a key conceptual innovation, the simulation distinguishes between disasters anticipated at the time of scenario planning and those not. Unanticipated disasters include events that were not on the planning horizon as well as events where needs differed from those planned. In the simulation, PAF-financed responses were most effective for anticipated disasters, where instruments and response arrangements can be tailored in advance. The effectiveness for anticipated disasters could be increased by increasing the *speed* of disbursement and execution. The effectiveness for unanticipated disasters could be increased by increasing the *flexibility* in triggers and the use of funds.

The results show that policymakers value both speed and flexibility and do not perceive any trade-off or interaction between these attributes. Although speed and flexibility increased effectiveness by the same amount, the gains from speed were realised in more common *anticipated* disasters, while gains from flexibility were realised only during less common *unanticipated* disasters. Although they benefited from greater flexibility less often, participants were, on average, willing to pay nearly as much for flexibility as for speed. This highlights the value policymakers place on reducing the risk of non-performance when a disaster strikes. Flexibility was particularly valued for large, infrequent disasters, whereas speed was more valued for smaller, more frequent events.

These findings provide new empirical evidence on how governments evaluate DRF and highlight the importance of designing PAF mechanisms that align with country priorities, fiscal space, and institutional realities.

Survey responses also point to a third, non-financial attribute of PAF-financed response systems: support for mobilising internal and external expertise for scenario planning, risk profiling and instrument design. By improving anticipation, such support may reduce the proportion of disasters that are unanticipated and, in turn, the reliance on flexibility to manage such events.

In terms of policy implications, improving PAF effectiveness and uptake requires shifting attention from individual instruments to the design of PAF-financed response systems that match country risk profiles and institutional capacity. Governments and providers should avoid one-size-fits-all solutions: systems that emphasise rapid execution are most valued for responses to small, more frequent disasters, while flexibility in disbursement conditions and the use of funds becomes increasingly important for large, infrequent disasters, where the consequences of mismatches between plans and realised needs are greatest. This points to portfolio-based approaches that combine instruments with different attributes, rather than reliance on a single product.

Moreover, fiscal constraints play a central role in shaping these choices. Because demand for flexibility falls sharply when budgets are tight, concessional or grant-based financing is likely to be necessary to make flexible PAF arrangements viable in low-income and debt-constrained settings. At the same time, investments in risk profiling, scenario planning, and institutional coordination should be treated as core components of PAF policy rather than ancillary support: by strengthening anticipation and reducing the likelihood that disasters fall outside planned scenarios, they can reduce reliance on flexibility ex post and increase the effectiveness of high-speed financing within PAF-financed response systems.

1

INTRODUCTION

Climate-related and geophysical shocks are becoming more frequent and costly, generating large and sudden financing needs among governments that can destabilise public budgets and disrupt development priorities. In many low- and middle-income countries, disaster response has remained largely reactive, relying on ex post budget reallocation, emergency borrowing, or ad hoc donor assistance. Such approaches often delay response and raise long-term economic and humanitarian costs. Evidence from disaster response and humanitarian operations shows that acting within the first response window after a shock can significantly reduce losses and improve the effectiveness of assistance by limiting reliance on costly coping strategies and mitigating longer-term welfare impacts (Ghesquiere and Mahul, 2010; Hill et al., 2019).

Pre-arranged financing (PAF) of disaster risks seeks to address this weakness by ensuring that financing will be available for disaster response when needed – before disasters occur.[1] Instruments such as contingent credit lines, parametric insurance, and catastrophe bonds make funds available when disasters strike, thereby providing timely and predictable liquidity for disaster response. When this financing is combined with well-implemented contingency plans, a PAF-financed response system can significantly improve welfare outcomes. For example, a cost-benefit analysis of the African Risk Capacity (ARC) finds that sovereign drought insurance combined with contingency planning, if designed to rapidly scale up social safety nets in the event of a disaster, could generate up to USD1.90 in benefits for each dollar invested by improving the speed, targeting and costs of a disaster response (Clarke and Hill, 2013; Kramer et al., 2020).

Despite growing global investment, uptake and sustained use of PAF remain limited, particularly in low- and middle-income countries (LMICs) and debt-constrained contexts. Between 2017 and 2021, low-income countries received only USD0.3 per capita in international development financing for PAF, and ODA-recipient countries only USD0.7 per capita, while high-income countries received USD12.4 per capita (Plichta and Poole, 2023). Although international PAF reached an all-time high of USD9.4 billion in 2024, this expansion has not translated into more equitable access: recent growth in PAF in LMICs and debt-constrained contexts has been driven primarily by non-concessional contingent loans that are less accessible to these countries. Low-income countries and fragile contexts each received less than 7% of total international PAF, reflecting persistent inequities in access to and affordability of available instruments (Plichta et al., 2025).

1 The Centre for Disaster Protection defines PAF as financing approved in advance of a crisis and guaranteed to be released to a specific implementer when a specific pre-identified trigger condition is met. The trigger may be based on data or models related to impact, forecasts, or projections of need, or on a declaration of emergency (or similar) by the specified respondent. The funding may be used for anticipatory action or in response to a crisis, either linked to a clear plan for a very specific purpose or as general budget support.

Existing analyses of PAF adoption focus primarily on fiscal risk quantification, instrument design, and macroeconomic stability (Mustapha and Benson, 2024; Plichta and Poole, 2023; Ghesquiere and Mahul, 2010). While this literature has improved understanding of the technical and fiscal benefits of PAF, it offers less insight into the factors that shape whether and how governments adopt these instruments in practice. In practice, limited uptake may be driven by a complex set of factors.

First, adoption of PAF may depend on both the availability of instruments and their perceived effectiveness. Some countries may not have access to certain instruments in the first place, either because they do not meet eligibility requirements or because instruments are offered only to a limited set of countries. Where instruments are available, concerns about effectiveness may also influence adoption. For example, basis risk in parametric insurance can lead to situations in which severe impacts occur without triggering payouts, as experienced by a number of countries with ARC policies, including Malawi in 2015/16 and Kenya in 2017 (Kramer et al., 2020).

Second, political economy considerations may also shape how governments perceive the value of PAF-financed response systems. Pre-arranged instruments require committing scarce resources in advance of uncertain events, and past experiences with basis risk in parametric insurance have shown that technically justified non-payouts can erode political support for these instruments (World Bank and Global Facility for Disaster Reduction and Recovery, 2014; Plichta and Poole, 2023). These considerations may increase the appeal of instruments that make frequent payouts and visibly demonstrate value, particularly for non-catastrophic events (Annex A). Yet such events are often more manageable using existing government budgets than infrequent but catastrophic shocks (World Bank and Global Facility for Disaster Reduction and Recovery, 2014). If preferences or perceptions favour frequent payouts, this could reduce countries less well protected against rare but high-impact events.

Third, PAF does not automatically result in value and requires a number of different implementation aspects to work well together to deliver welfare gains. Institutional capacity thus shapes the value of PAF. Rapid payouts only translate into rapid spending when public financial management and coordination are strong, allowing early liquidity in a crisis to be utilised quickly. Delays in transferring resources from central treasury accounts to implementing agencies can slow response times. The complex value proposition posed by PAF also means that when institutional capacity is weaker, it is harder for governments to know which financial instruments to select. Developing a clear understanding of a country's risk profile and potential financing needs is essential for designing effective DRF strategies and integrating PAF within broader fiscal planning.

These challenges raise questions about whether existing PAF instruments and the associated PAF-financed response systems, including contingency planning, public financial management, and coordination arrangements, adequately meet governments' operational and institutional needs. PAF response systems are often designed by providers and may not fully reflect government priorities, which can constrain the adoption and effective use of PAF in LMICs.

PAF-financed response systems can be characterised by multiple attributes, including their cost, the speed of disbursement and execution, flexibility in disbursement conditions and use of funds, and payout frequency. The PAF on offer combines different attributes, so policymakers do not face choices over individual attributes in isolation. As a result, little is known about country governments' preferences for these attributes and how these preferences shape choices over the PAF on offer. We also know little about how countries' preferences align with governments' fiscal, operational, and political constraints (Plichta and Poole, 2023; World Bank and Global Facility for Disaster Reduction and Recovery, 2014).

To address this gap, we develop and implement a structured simulation to elicit policymaker preferences over key attributes of PAF response systems. We focus on speed and flexibility and collect data on willingness to pay for these attributes for small, frequent shocks and large, less frequent shocks. Comparable evidence is collected through these simulations from nearly 200 participants from Kenya, Senegal, Malawi, Nigeria and Zambia. The results from this study yield insights into preferences for key attributes that can help provide an empirical foundation for designing PAF systems that are better aligned with country priorities and institutional realities.

As a key conceptual innovation, we characterise PAF-financed response systems as more effective for disasters anticipated at the time of scenario planning than for those that are unanticipated. Unanticipated disasters include events that were not on the planning horizon, for example, the COVID-19 pandemic or floods in areas where flooding would not normally be expected. Unanticipated disasters also include events that where needs were different from planned. For example, a drought may prove more severe than modelled, or needs may diverge from expectations – such as when PAF provides financing for cash transfers to households, but instead a critical bridge collapse requires funds for a different purpose. All of these events require funds to be spent on something unplanned, thereby reducing the effectiveness of pre-planning.

We then characterise PAF-financed response systems as more effective for *anticipated* disasters when they are faster (that is, they have high speed). Speed increases the likelihood that funds reach recipients when needed; for example, a high-speed response system may use parametric triggers combined with contingency planning to get triggered payouts to beneficiaries quickly. At the same time, we model flexible PAF-financed response systems to be more effective in the event of *unanticipated* disasters. For example, an instrument that disburses funding following a policy declaration of a disaster, and is not tied to a specific implementation plan, provides the ability to finance a wider variety of disaster responses. Speed and flexibility of PAF systems often require a trade-off. Features of high-speed PAF systems, such as parametric triggers and contingency planning, can hamper flexibility, making high-speed response systems less effective for an unanticipated disaster.

The remainder of the report is structured as follows. We start by motivating our conceptual framework for how speed, flexibility, payout frequency and fiscal space, and political incentives affect the value of PAF, based on a desk review and Key Informant Interviews (KIIs) with PAF specialists. Using this framework, we then develop a DRF simulation to elicit policymakers' preferences over PAF. Section 4 presents the results from implementing these DRF simulations in workshops organised with policymakers in Kenya, Malawi, Nigeria, Senegal and Zambia. The final section provides policy recommendations and areas for future research.

2

CONCEPTUAL FRAMEWORK

2.1 Context

The literature on PAF has largely focused on technical aspects: estimating governments' fiscal exposure to disasters, designing financial instruments to cover these risks, assessing how disaster-related shocks affect public finances and macroeconomic stability, and highlighting how ex ante instruments can reduce reliance on disruptive and slow budget reallocation (Clarke and Hill, 2013; Kramer et al., 2020). This includes modelling potential losses from different hazards, evaluating the cost-effectiveness of instruments such as insurance or contingent credit, and analysing how disasters can disrupt budgets, increase debt or reduce economic growth (Mustapha and Benson, 2024; Plichta and Poole, 2023; Ghesquiere and Mahul, 2010; World Bank and Global Facility for Disaster Reduction and Recovery, 2014). Sovereign DRF frameworks emphasise risk layering, cost-efficiency, and the optimisation of financial instruments across different return periods, typically abstracting from how these instruments are executed in practice and how system-level features shape response effectiveness and policy choice.

At the same time, despite uneven uptake of PAF, most studies evaluate PAF from a macro-fiscal or aggregate planning perspective. Far less attention has been paid to how policymakers evaluate system-level attributes of PAF-financed response arrangements when facing political, fiscal and institutional constraints. Existing approaches typically quantify risk exposure and fiscal gaps and recommend an optimal mix of instruments, but there is little understanding of how decision-makers weigh trade-offs between attributes such as speed of disbursement and the subsequent disaster response, flexibility in the use of funds and in conditions triggering disbursement, (opportunity) costs of financing, and the scale and frequency at which covered disasters occur.

Annex A summarises insights from Key Informant Interviews with practitioners involved in the design and implementation of PAF response systems, including interviewees working with multilateral development banks, regional risk pools, bilateral donors, private insurers and implementing agencies working on DRF. These interviews highlight additional, practice-driven considerations that shape how governments evaluate PAF-financed response arrangements in real-world policy environments.

First, respondents frequently observed a divergence between provider incentives and government priorities. Providers tend to emphasise actuarial soundness and market sustainability, whereas governments often prioritise affordability, political visibility, simplicity and alignment with existing public financial management systems. This divergence shapes how governments assess the practical value of PAF-financed response arrangements, beyond the technical properties of individual instruments.

Second, speed of disbursement is widely viewed by PAF providers as a defining feature of PAF systems. Interviewees consistently emphasised the importance of rapid payout following a disaster. At the same time, they stressed that rapid disbursement does not automatically translate into a rapid or effective response on the ground. Administrative bottlenecks, delays in reallocating funds from central treasury accounts, and fragmented or underdeveloped contingency and coordination systems can slow the use of funds, reducing the practical benefits of a fast payout. In this study, we therefore treat speed as a system-level attribute: the extent to which PAF enables resources to reach affected communities quickly, which depends jointly on the speed of disbursement emphasised by providers and the capacity to execute pre-planned responses.

Third, flexibility in the conditions under which funds are disbursed and in their subsequent use is frequently highlighted as critical for managing unforeseen events. Predefined triggers, especially when parametric, may not perfectly match realised disaster impacts. When disasters occur outside the scenarios anticipated at the time of planning, restrictions on when funds are disbursed or how they can be used may limit governments' ability to respond effectively. Greater flexibility can mitigate the consequences of basis risk and improve the practical usefulness of PAF-financed response systems.

Fourth, experiences with basis risk have had lasting political consequences. Non-payout events, even when consistent with model specifications, have undermined trust in parametric insurance mechanisms in some contexts (Clarke and Dercon, 2016; World Bank and Global Facility for Disaster Reduction and Recovery, 2014; Cummins and Mahul, 2009). This underscores the importance of perceived fairness and transparency in trigger design, as well as the broader design of PAF-financed response systems that governments view as credible and politically viable.

Finally, contextual constraints such as fiscal space, debt sustainability, exposure profiles and institutional maturity shape preferences over PAF arrangements. Highly indebted countries may be reluctant to assume contingent liabilities, while countries facing frequent lower-intensity shocks may favour arrangements with more regular payouts despite higher cost (for more detail, see Annex A).

Together, these findings shape our conceptual framework and methodology. Governments evaluate bundles of system attributes under uncertainty and constraints, rather than selecting instruments in isolation, and preferences are shaped not only by technical performance but also by political feasibility, institutional capacity, and perceived and observed effectiveness. The effectiveness of PAF-financed response systems depends crucially on whether policymakers and other stakeholders involved in disaster scenario planning anticipated the realised disaster, making it important to distinguish between anticipated and unanticipated disasters.

To reflect this, the analysis focuses on key attributes that capture the different dimensions along which PAF-financed response systems differ.

1. Speed of disbursement and response, which improves the effectiveness of PAF-financed response systems when disasters occur as *anticipated* at the time of planning.
2. Flexibility in the conditions under which funds are disbursed, and in how a government can use these funds, which improves the effectiveness of PAF-financed response systems when disasters do not occur as *anticipated*, for instance, when there is basis risk.
3. Cost of financing, referring to the fiscal resources required to maintain pre-arranged arrangements, such as premiums, opportunity costs or commitment fees.
4. Payout frequency and disaster scale, referring to how often resources are expected to be disbursed under typical disaster conditions, with frequent disasters having less severe consequences and smaller response needs than infrequent disasters.

By studying demand for PAF whilst varying these attributes, as well as fiscal and institutional constraints such as available budgets and political incentives, we examine how policymakers evaluate trade-offs among different features of PAF-financed response systems, and how these trade-offs depend on a country's decision-making environment.

2.2 Model for pre-arranged financing

Building on this context, we develop a conceptual framework in which governments face the challenge of financing their countries' disaster response under uncertainty about both the scale of disasters and the extent to which these disasters were anticipated at the time of planning. PAF for disaster response allows a country to intervene more effectively compared to when it relies on reactive ex-post financing, especially when disasters occur as anticipated, and when PAF increases speed. When disasters occur in ways that were not anticipated at the time of PAF design, PAF is more effective than ex-post financing only when the system offers flexibility.

In our model, PAF arrangements come at a fixed price or opportunity cost, both of which are paid from the country's annual DRF budget. A policymaker decides, for both small frequent and large infrequent disasters, on the maximum price at which the country will use PAF to finance a potential disaster response. If available PAF systems – whose price is exogenously determined – cost more than this reservation price, the country will rely on ex-post financing instead. Any budget not spent on PAF can be used for ex-post financing, and the policymaker aims to maximise social impact by funding as much of the required disaster response as possible, using resources as effectively and efficiently as possible, whilst maintaining political support.

At the start of each year, the government receives an annual DRF budget. During the year, the country may experience (i) no disaster, (ii) a small disaster with moderate response needs, or (iii) a large disaster with substantial response needs. Conditional on a disaster occurring, it may be either *anticipated* – corresponding to shocks aligned with prior risk mapping and contingency planning – or *unanticipated*, representing events outside the expected scenario. Any PAF will therefore be more effective for anticipated disasters than for unanticipated disasters.

PAF comes with an ex-ante non-reimbursable opportunity cost and disburses funding for a response automatically when a shock occurs. In contrast, ex-post financing does not come with ex-ante opportunity costs, but requires mobilising the required response costs after the realised shock. We assume that ex-post financing is less effective on average (for example, due to delays, administrative bottlenecks, or diversion of funds) than PAF, especially for anticipated disasters, where PAF is especially effective. For unanticipated disasters, some PAF systems may not be more effective than ex-post financing. Further, when PAF does not fully cover the required disaster response needs, it is possible to supplement the response using any remaining budget that was not spent on PAF, with the same effectiveness as other ex-post financing. This will help increase the share of disaster response needs covered.

A final building block in our conceptual framework is the political incentives that shape preferences over PAF attributes. The policymaker risks losing political support if the share of effective needs covered falls below a threshold, that is, if the shortfall in effective funding is too large. This reflects the idea that an ineffective disaster response can lead to reputational damage or loss of public support. Consequently, PAF may be valued not only for expected financial returns but also for its ability to reduce the probability of politically costly failures to respond effectively to disaster risks.

The effectiveness of PAF depends on two fundamental attributes: speed and flexibility. Speed refers to both the speed at which the instrument disburses funds in the event of a disaster and the speed at which the disaster response financed through PAF reaches affected communities. High-speed systems tend to rely on a combination of parametric triggers and ex ante approval of contingency plans. We propose that high speed improves the effectiveness of a disaster response, especially when the disaster has been *anticipated* at the time of planning, since only those scenarios would reflect the parametric triggers, and since governments can activate previously prepared contingency plans only in anticipated scenarios.

Flexibility, on the other hand, refers to the extent to which a government has flexibility around the types of disasters for which PAF instruments disburse payouts and the ability to adapt the ways in which the funding is used. This attribute is particularly important for *unanticipated* disasters, where realised needs differ from the scenarios considered at the time of planning, so that the government must adapt its response. Examples of systems with high flexibility use policy declarations of a disaster as a trigger and allow reallocation of funds where needed. We propose that flexibility improves effectiveness when real-world disaster response needs deviate from ex-ante anticipated events.

Combined, speed and flexibility determine the effectiveness of a disaster response funded using PAF in both anticipated and unanticipated disaster states. It is important to note that these attributes introduce a trade-off: high-speed systems with detailed pre-approved contingency plans, which are important for responding quickly, tend to require parametric triggers.[2] This combination of contingency planning and parametric triggers improves a response system's speed, but reduces its flexibility. Vice versa, having increased flexibility often comes with prolonged decision-making, ex post planning, and negotiation processes, which jeopardises the speed at which funding is disbursed and reaches affected communities.

We therefore proposed a third attribute, which is the extent to which a PAF arrangement helps a country mobilise internal and external expertise to improve risk profiling, modelling of future trends, and scenario planning. We think of this attribute as reducing the probability at which unanticipated events occur. This would be the primary way to reduce dependency on more flexible systems and allow countries to prioritise PAF with high speed. Examples include instrument providers facilitating capacity development, risk profiling and scenario planning workshops. These workshops bring together key stakeholders from government, civil society and communities at risk, as well as international experts, to improve risk modelling, instrument design, and contingency planning.

Summarising, given the annual budget and the menu of PAF attributes, the policymaker determines the maximum amount their country should pay for the PAF being offered. This willingness to pay, or reservation price, considers the trade-off between the reduction in expected uncovered needs across anticipated and unanticipated disasters and the value of avoiding political survival failures.

2 Note that there are high-speed instruments without parametric triggers, but these often do not require pre-approved contingency plans.

3

METHODS

3.1 Design

The study uses a structured DRF simulation to elicit policymakers' preferences for core attributes of PAF-financed response systems, building on the conceptual framework introduced above. The simulation was designed to mirror key features of real-world fiscal decision-making under uncertainty, including annual budget constraints, the possibility of both anticipated and unanticipated disasters, and political pressures associated with maintaining sufficient disaster response capacity (see Figure 1)[3].

Figure 1: Overview of the DRF simulation

3 Figures illustrating the simulation are directly drawn from the slide deck used to introduce it to participants.

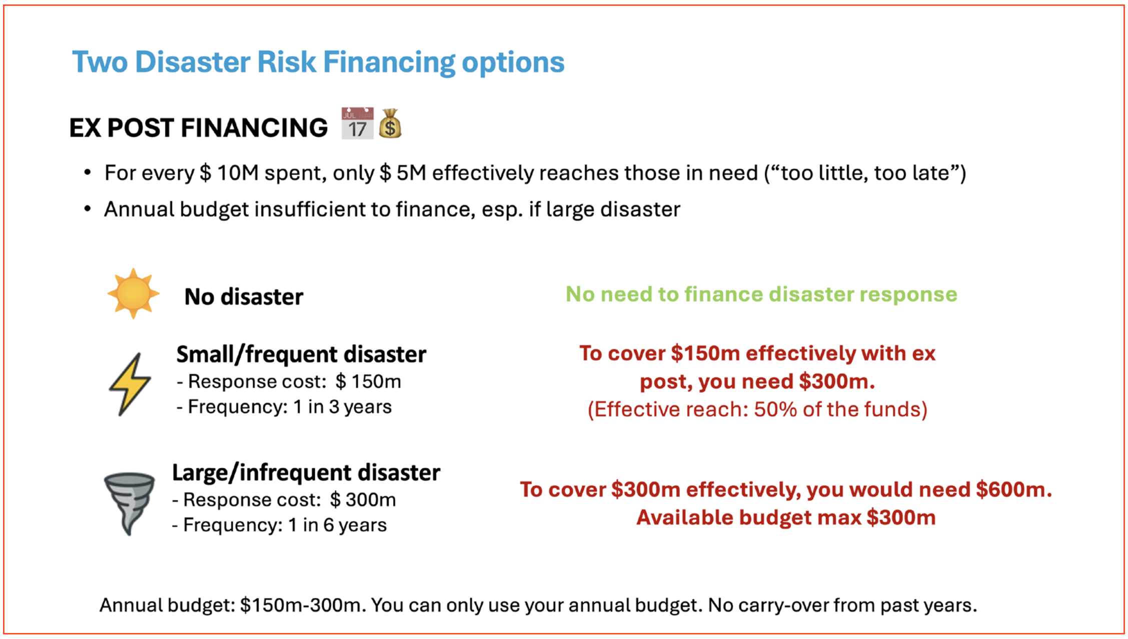
In the simulation, each participant assumes the role of a government decision-maker and manages a randomly drawn annual DRF budget, which can range from USD150–300 million. At the start of each simulated 'year', participants state their maximum willingness to pay (WTP) for the PAF system available that year. The simulation includes different levels, each offering a different type of PAF system and lasting several years. After participants record their WTP, the price of PAF is randomly drawn. If this price is less than or equal to the stated WTP, the participant obtains PAF at the randomly drawn price; otherwise, the participant must rely entirely on less effective ex-post financing that year.

After the financing decision, a disaster draw is realised. The simulation includes three possible states: a small disaster, which requires a response of USD150 million and occurs on average once every three years; a large disaster, which requires a response of USD300 million, and occurs on average once every six years; or no disaster, during which the policymaker does not need to finance any disaster response (see Figure 2)[4]. Conditional on a disaster occurring, the simulation further distinguishes between *anticipated* and *unanticipated* events. Anticipated disasters represent shocks that align with pre-existing risk assessments, and are the most common (with, on average, three out of four disasters being anticipated). By contrast, unanticipated disasters represent shocks in locations or forms not foreseen during planning. Although these are less common (with on average one out of four disasters being unanticipated), PAF is more effective for anticipated disasters. In case of unanticipated disasters, PAF can be as ineffective as ex-post financing.

This brings us to the final steps of the simulation. After the disaster is realised, the simulation determines the effective amount of disaster response financed through PAF (if obtained), together with any supplementary ex-post response funded from the remaining budget. For every dollar mobilised through ex-post financing, only half a dollar is used effectively. PAF is assumed to be more effective on average, particularly for anticipated disasters, and the country may need to mobilise funding for a supplemental response through ex-post financing.

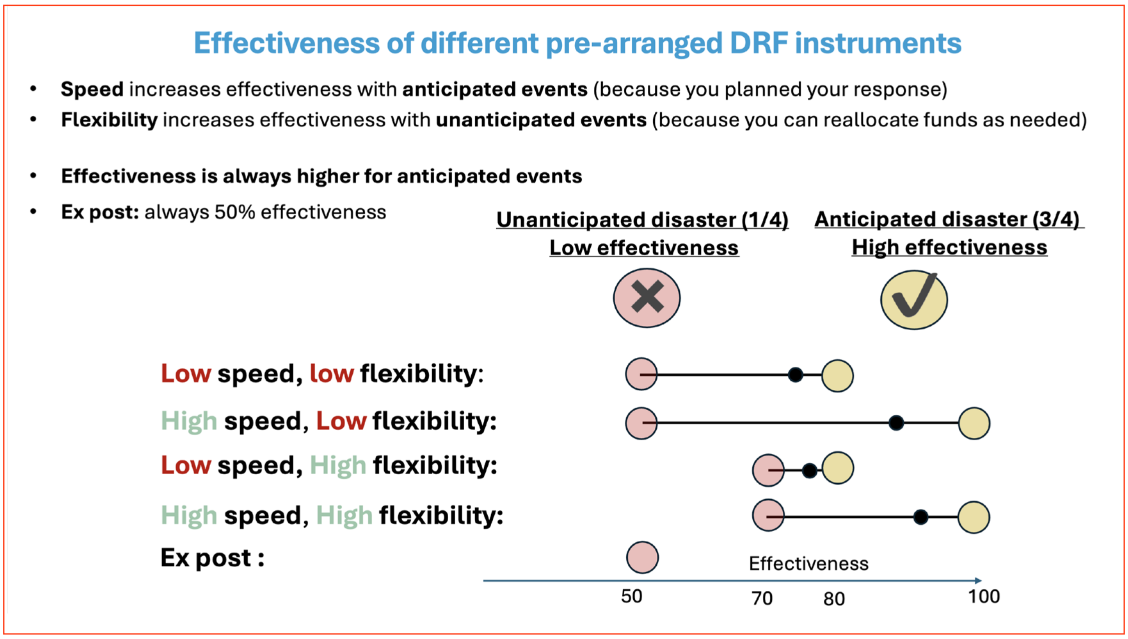
After participants are shown the resulting coverage and any shortfall in effective response, the simulation determines whether the policymaker maintains political support and, after a fixed four-year term, whether they can remain in office. From the fourth year onwards,

Figure 2: Different disaster scenarios and implications of ex-post financing



4 Figures illustrating the simulation are directly drawn from the slide deck used to introduce it to participants.

Figure 3: Effectiveness of ex-post and pre-arranged financing by instrument type



if the policymaker cannot mobilise sufficient funding for an effective response, and effective funding falls short by more than USD 60 million, they lose political support and do not continue for another year. They then move to the next level in the simulation (which presents a different type of PAF), until they reach the final level, where losing political support ends the simulation.

Participants accumulate *points* throughout the simulation equal to any annual budget left unspent at the end of the year, minus any livelihood losses that could not be avoided. Points were converted into a real monetary donation to a local charity. This incentive mechanism ensures that WTP decisions are meaningful and aligned with the participant's objective of maximising the country's welfare within the simulation.

Across simulation levels, participants encounter four different PAF arrangements (see Figure 3)[5]. Effectiveness within the simulation is defined by a 2 x 2 combination of:

1. **Speed:** the effectiveness of PAF in financing a response to *anticipated* disasters, representing the ability to plan and deliver a timely response. In the simulation, 80% of funds from low-speed systems reach affected communities in case of anticipated disasters, whilst this is 100% for high-speed systems.
2. **Flexibility:** the effectiveness of PAF in financing a response to *unanticipated* disasters, representing flexibility in disbursement conditions and the use of funds when shocks differ from expectations. In the event of an unanticipated disaster, systems with low flexibility can effectively cover only 50% of the required response costs. This increases to 70% when a system has high flexibility.

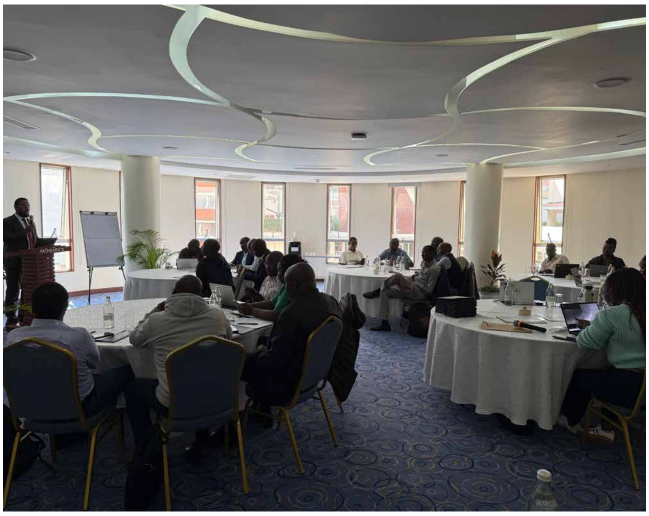
The simulation produces a panel dataset with repeated observations per participant at the PAF type-disaster-size level for every round of every level. For each participant *i*, level *l* and year *t*, the simulation records the stated willingness to pay for small- and large-disaster coverage, the realised budget draw, the random price at which PAF is offered, whether the participant obtained PAF, the realised type of disaster, the amount effectively spent on the disaster response, whether political support was maintained, points scored that year, and the type of PAF offered. In levels 1 to 4, participants are offered one PAF type per level. In level 5, to elicit a direct measure of willingness to pay for speed and flexibility, participants are asked to indicate their reservation price for small- and large-disaster coverage for each of these four PAF types. The simulation then randomly draws one of these to be offered that year.

5 Figures illustrating the simulation are directly drawn from the slide deck used to introduce it to participants.

3.2 Procedures

The study was implemented through half-day, in-person workshops organised in collaboration with government partners and supported by staff from local Food Policy Research Institute (IFPRI) offices in the project countries. The study protocol was reviewed and approved by the IFPRI. Workshops were held in five countries: Senegal, Zambia and Malawi, each hosting one workshop; Nigeria hosted three workshops – one at the federal level and two at the state or regional level; and Kenya hosted two workshops at the national and county levels. These workshops brought together policymakers involved in DRF, primarily from the Ministry of Finance and other relevant line ministries and government units engaged in disaster risk management and financing decisions.

The workshops combined three components: the interactive DRF simulation described above, a short survey, and a facilitated debrief discussion. Each workshop began with an introductory presentation to set the context for the simulation exercise. Participants were then provided with informed consent at the start of both the simulation and the survey. This was followed by a self-administered simulation exercise on individual tablets. After the simulation, participants completed a short survey, and the workshop concluded with a debrief session in which findings from the simulation were shared, and participants reflected on the simulation and related it to real-world DRF experiences. However, in Kenya, the sequence was adjusted due to initial



technical issues with the simulation programme, with the short survey administered first, followed by the simulation and a debrief session.

The simulation allowed participants to make decisions in realistic disaster risk scenarios, while the survey collected information on participants' knowledge, perceptions, and preferences related to PAF. The debrief discussion provided an opportunity for participants to reflect on their choices during the simulation, validate emerging findings, and discuss how the insights relate to real-world policy processes.

In each country, we invited over 30 government officials from different institutions involved in DRF to participate. The aim was to ensure representation from the range of government entities that contribute to DRF decisions, including the Ministry of Finance, disaster management authorities, and relevant sectoral ministries. Depending on the context, other stakeholders, for instance, from civil society or academia, were also invited, but formed a minority of participants.

Participants were recruited in collaboration with a focal government institution or platform in each country: the National Treasury in Kenya, the Department of Disaster Management Affairs (DoDMA) in Malawi, the National Emergency Management Authority (NEMA) in Nigeria, the Changement Climatique en Agriculture et Sécurité Alimentaire (CCASA) under the Ministry of Agriculture in Senegal, and the Ministry of Finance and National Planning in Zambia. The project team worked closely with these institutions to identify relevant ministries and agencies, draft invitation letters and coordinate the distribution of invitations. Follow-up communication with the focal institution helped ensure that invited policymakers and technical staff were available to attend the workshop.

The simulation included incentives to encourage active participation. Participants earned points during the game based on the outcomes of their decisions, including the resources remaining at the end of each round and the effectiveness of the disaster response. At the end of the workshop, accumulated points were converted into a monetary contribution to a local charity involved in disaster response. The charity was identified in consultation with government partners in various countries. Charity selections will be finalised by the end of March, with donations going out in early April.

Table 1 provides information on the total number of completed responses. We used a unique identifier for participants that they would enter themselves in both the simulation and the survey to merge responses across the two datasets. After accounting for duplicate observations, a total of 187 simulations and 190 surveys were completed across the five countries. Of these, 173 of the observations in the survey and simulation were successfully merged, while 31 observations could not be matched (17 surveys and 14 simulations). The number of observations is highest in Kenya and Nigeria because both countries can hold workshops at both national/federal and state/county levels.

Table 1: Summary of simulation and survey data used in the analysis

Variable	Total	Kenya	Malawi	Nigeria	Senegal	Zambia
Total number of completed simulations	187	46	30	64	22	25
Total number of surveys completed	190	46	27	69	17	31
Total number of observations merged	173	44	27	61	17	24
– Total number of surveys not merged	17	2	0	8	0	7
– Total number of simulations not merged	14	2	3	3	5	1

3.3 Empirical strategy

Our main empirical specification for exploring preferences over speed and flexibility is the following model for participant *i* in year *t* during level *l* for a disaster of scale *s*:

Equation 1

$$Y_{itls} = \alpha + \beta_1 Speed_{il} + \beta_2 Flex_{il} + \beta_3 Both_{il} + \beta_4 Large_s + \gamma x_{itl} + \eta_l + u_i + \varepsilon_{itls}$$

where Y_{itls}, our outcome variable, represents the willingness to pay for PAF for a disaster of scale *s*; $Speed_{il}$, $Flex_{il}$ and $Both_{il}$ are indicators for whether the PAF-financed response system that participant *i* is offered in level *l* has high speed, high flexibility, or a combination of the two; $Large_s$ a dummy variable that is equal to 1 if willingness to pay is recorded for an arrangement paying out in case of large infrequent disasters, and 0 in case of an arrangement that covers small frequent disasters; x_{itl} is a vector of controls, including the budget allocated to the policymaker in year *t* during level *l* and its square; η_l represents a level fixed effect; u_i is an individual random effect; and ε_{itls} is the residual, standard errors clustered at the participant level. Because sample sizes vary across countries, we use the inverse of the total sample size as a weight, so that model estimates are not biased towards the effects found in countries with a larger number of participants.

In this model, we can interpret the coefficient estimate $\hat{\beta}_1$ as the willingness to pay for speed; $\hat{\beta}_2$ as the willingness to pay for flexibility; and $\hat{\beta}_1 + \hat{\beta}_2 + \hat{\beta}_3$ as the willingness to pay for having both attributes available at the same time. We will test whether $\hat{\beta}_3$ is significantly different from zero; if negative, this would imply that speed and flexibility are seen as substitutes for one another, whereas positive values would imply that the two attributes are seen as complements.

Note that in each simulated year, participants state their willingness to pay for PAF for both small- and large-disaster coverage ex ante, since either type of disaster may occur in any given year. To allow for different attributes to be considered important for different layers of risk, we add interaction terms for the disaster scale, $Large_s$, and the three indicators for speed, flexibility, and their combination. In this way, we analyse whether preferences for attributes depend on the scale of disasters covered by the PAF arrangement, with PAF paying out more frequently if covering small disasters, and less frequently when covering large disasters:

Equation 2

$$Y_{itls} = \alpha + \beta_1 Speed_{il} + \beta_2 Flex_{il} + \beta_3 Both_{il} + (\beta_4 + \beta_5 Speed_{il} + \beta_6 Flex_{il} + \beta_7 Both_{il}) * Large_s + \gamma x_{itl} + \eta_l + u_i + \varepsilon_{itls}$$

Next, to estimate the effect of fiscal conditions on the willingness to pay for PAF, we estimate the following model for participant *i* in year *t* during level *l* for a disaster of scale *s*:

Equation 3

$$Y_{itls} = \alpha + \beta_1 B_{itl} + \beta_2 B^2_{itl} + \beta_3 Large_s + \beta_4 B_{itl} * Large + \beta_5 B^2_{itl} * Large_s + \eta_l + u_i + \varepsilon_{itls}$$

where Y_{itls} is defined as before, B_{itl} is the budget allocated to the policymaker in year *t* during level *l*, B^2_{itl} a quadratic term to capture potential nonlinear effects, $Large_s$ again defines the disaster scale, η_l is a level fixed effect, u_i an individual random effect, and ε_{itls} the residual, with standard errors clustered by participant *i*.

We first estimate this model without interaction terms for budget, its square, and the size of the disaster, to obtain the effect of fiscal conditions on aggregate demand for PAF. We then estimate this model with interaction terms to test whether budget constraints influence demand differently for PAF that pays out with high frequency for small disasters, versus PAF that pays out less frequently for large disasters.

Finally, we leverage the introduction of political incentives in the fourth year in every level to understand how demand for PAF in the simulation responds to a design-imposed increase in the risk of losing political support, which is introduced in the fourth year of each simulation level. To do so, we estimate a random effects model with interaction terms for PAF attributes (speed, flexibility, and the combination of the two), and the indicator for political incentives:

Equation (4)

$$Y_{itls} = \alpha + \beta_1 Speed_{il} + \beta_2 Flex_{il} + \beta_3 Both_{il} + (\beta_4 + \beta_5 Speed_{il} + \beta_6 Flex_{il} + \beta_7 Both_{il}) * PolRisk_t + \gamma \mathrm{x}_{itl} + \eta_l + u_i + \varepsilon_{itls}$$

whereby $PolRisk_t$ indicates rounds (years) four and above in the simulation, when political incentives were present, and a value of zero indicates observations in the first three years. The vector x_{itl} includes controls for disaster scale, budget, a quadratic budget term, and level fixed effects. Other variables are defined as before.

Appendix Table 6 also estimates these specifications separately by country to assess heterogeneity in preferences across contexts.

4

RESULTS

4.1 Participants' background information

Table 2 describes workshop participant characteristics. The sample reflects a relatively experienced and diverse group of government officials. Overall, 62% of participants held a master's degree or higher. About one third, or 33% of participants, were female, with the greatest gender balance in Senegal and Zambia, and the lowest representation of female participants in Malawi. Most respondents were aged 40 years or older (64%), with higher youth participation in Malawi.

Most participants (76%) reported that their countries have a DRF strategy in place, while 80% indicated that formal inter-ministerial coordination mechanisms exist and 61% reported access to risk modelling tools. This suggests that, from the perspective of participating officials, several key elements of DRF capacity are already in place, whilst also highlighting scope to further strengthen awareness and capacities within governments on their country's DRF approaches.

In terms of the types of DRF instruments used in their countries, 44% of participants reported that their country relies primarily on ex-post DRF, while 41% indicated a mix of ex-ante and ex-post mechanisms. Only 15% reported mostly pre-arranged or ex-ante approaches, suggesting limited use of proactive financing systems. Self-reported use of PAF is highest in Senegal, perhaps because the country has long participated in the African Risk Capacity.

Changes in leadership and political visibility appear to play a key role in DRF, with 59% of respondents reporting that a change in leadership strongly influences DRF decisions, such as budget allocations and financing PAF; and 51% rating political visibility, for instance through media coverage or public recognition, as highly important when considering the adoption of PAF. These variables showed strong heterogeneity across countries. Political visibility was considered more important in Nigeria and Kenya than in Malawi and Zambia.[6] A change in political leadership was thought to influence DRF choices more in Nigeria and Kenya as well, compared to Zambia and Malawi.

In terms of capacity development, 73% of participants reported that their countries have received external support for disaster modelling, while 58% indicated they have received DRF training. A majority of participants from Kenya (78%) reported having received training on DRF. Similarly, over half the respondents in Nigeria and Senegal reported having undergone such training, whereas in Zambia and Malawi, fewer than 50% reported receiving DRF training. Future robustness checks will use this data to disaggregate findings for participants with more versus less DRF experience.

6 In Senegal, participants skipped this question due to a technical issue with the survey form.

Table 2: Participant background Information and DRF knowledge bycountry (proportions)

Characteristic	Pooled	Nigeria	Kenya	Malawi	Senegal	Zambia
Demographics						
Education: Masters and above	0.62	0.56	0.57	0.56	0.80	0.81
Gender: Female	0.33	0.26	0.39	0.15	0.47	0.48
Age Distribution						
< 30	0.10	0.03	0.11	0.26	0.07	0.10
30–39	0.26	0.10	0.26	0.41	0.53	0.35
40–49	0.33	0.40	0.33	0.26	0.27	0.29
50–59	0.31	0.47	0.30	0.07	0.13	0.26
Country DRF Approach						
Primarily ex-post/reactive	0.44	0.56	0.54	0.23	0.21	0.37
Mix of ex-ante and ex-post	0.41	0.29	0.37	0.69	0.43	0.47
Mostly pre-arranged/ex-ante	0.15	0.16	0.10	0.08	0.36	0.17
Leadership Influence on DRF						
Strongly	0.59	0.62	0.78	0.41	0.29	0.58
Moderately	0.28	0.29	0.11	0.52	0.53	0.19
Weakly	0.09	0.04	0.11	0.07	0.12	0.16
Not at all	0.03	0.04	0.00	0.00	0.06	0.06
Importance of Political Visibility						
Not important	0.03	0.02	0.02	0.04	–	0.06
Low	0.15	0.04	0.09	0.22	–	0.35
Moderate	0.30	0.33	0.28	0.37	–	0.23
High importance	0.51	0.61	0.61	0.37	–	0.35
DRF Institutional Capacity						
Access to risk modeling tools	0.61	0.58	0.67	0.59	0.65	0.58
Has DRF strategy	0.76	0.59	0.93	0.96	0.82	0.65
Formal inter-ministerial coordination	0.80	0.77	0.85	0.89	0.53	0.87
External Support						
Received support from international partners for disaster modeling	0.73	0.72	0.70	0.74	0.76	0.77
Received training on DRF	0.58	0.56	0.78	0.44	0.53	0.45
Sample Size (n)	**190**	**69**	**46**	**27**	**18**	**31**

Note: For political visibility, the sample size is reduced by 40 observations because these questions were not administered in Senegal and in parts of Nigeria (Abuja). All values are proportions (0.00 to 1.00).

Figure 4: Awareness of DRF instruments

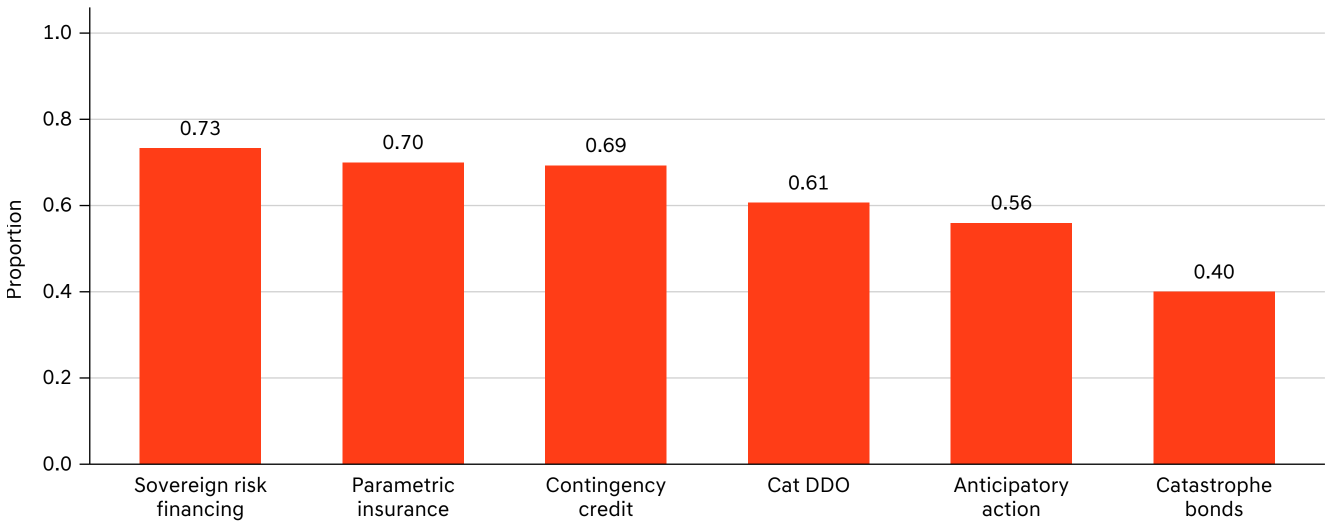


Figure 4 shows the extent to which participants are aware of various types of PAF.[7] Awareness varies across the different instruments listed in the survey. Most respondents are aware of sovereign contingency funds (73%), likely because these are embedded in national budgets and commonly used to respond to disasters. This is closely followed by parametric insurance (70%) and contingency credit (69%, with 61% familiar specifically with the World Bank's Cat DDO). Participants are less familiar with anticipatory action mechanisms (56%), and catastrophic bonds (40%), perhaps because some of these are not currently available in their countries.

We measure participants' understanding of how PAF works as a proxy for how well they understood the simulation. To that end, the survey included a set of multiple-choice knowledge questions related to PAF, including the benefits of speed versus flexibility and the conditions under which PAF pays out. Answer options for each question included three false statements and one correct statement. We constructed indicators for whether a participant provided the correct answer on each question and the proportion of questions answered correctly.

7 Except for the workshop with national policymakers in Kenya, the survey was administered after the simulation was completed. As a result, we had already sensitised participants on PAF, its benefits, its attributes and how it works. The statistics presented here are therefore an upper bound of knowledge and awareness.

Table 3: Knowledge on DRF attributes

Variable	Pooled	Nigeria	Kenya	Malawi	Zambia
Advantage of PAF with high speed	0.73	0.65	0.72	0.89	0.71
Advantage of PAF with high flexibility	0.68	0.59	0.65	0.96	0.61
Knowledge of pre-arranged payout amounts during a disaster	0.71	0.63	0.70	0.82	0.74
Knowledge of PAF in the absence of a disaster	0.62	0.35	0.65	0.82	0.81
Proportion of knowledge questions answered correctly	0.68	0.53	0.67	0.89	0.71
Observations	150	46	46	27	31

Note: The sample size is reduced by 40 observations relative to the total sample because the questionnaire was modified during data collection; as a result, this question was not administered in Senegal and in the first workshop in Nigeria (Abuja).

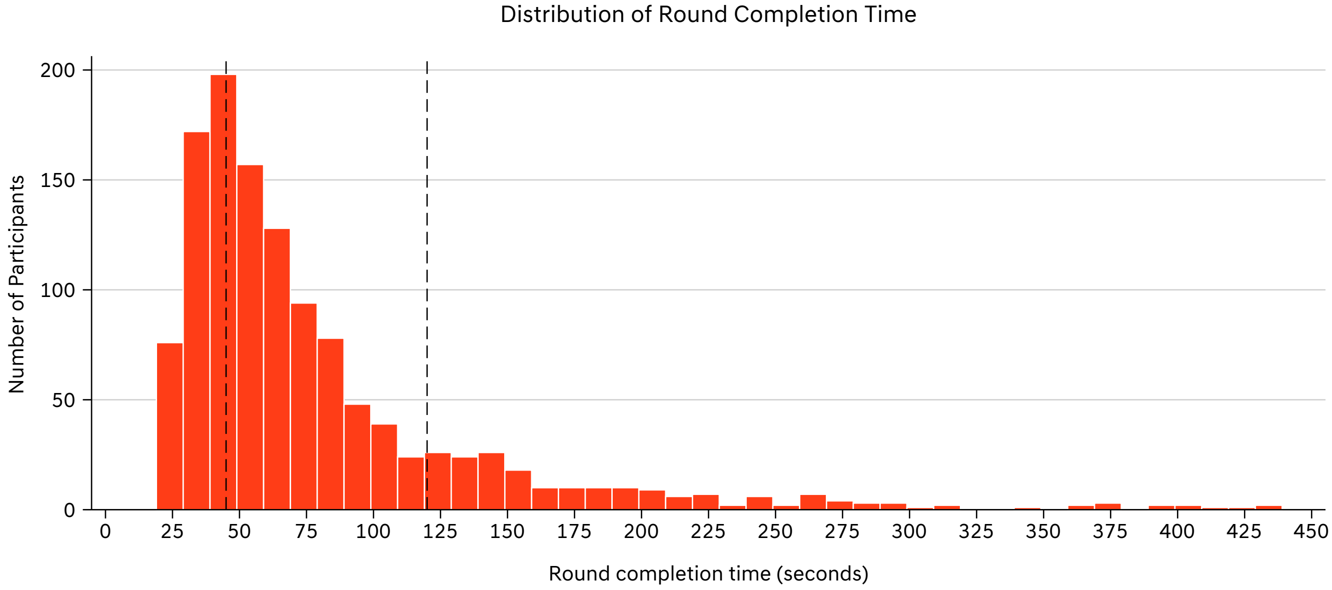
Table 3 shows that, overall, understanding was good. Whilst randomly selecting answer options would have yielded an average score of 25%, respondents answered on average 68% of items correctly, with the highest understanding in Malawi and Zambia.[8] In terms of specific attributes, 73% and 68% of respondents correctly identified the advantages of high speed and high flexibility in PAF, while 62% understood that PAF does not disburse payouts in the absence of a disaster, and 71% demonstrated understanding of how payouts are linked to the required size of the disaster response. Understanding was lower on average in Nigeria than in other countries, reflecting both the sequencing of workshops and the evolution of the simulation introduction over time. Subsequent robustness checks confirm that the main results are not driven by differences in participant understanding.

As an additional measure of understanding and data quality, we capture the average time it took participants to complete a round and how long they needed to complete the full simulation. For both variables, we distinguish three types of participants: fast respondents who completed a round and the simulation in less than 45 seconds and 40 minutes, respectively, who might have made more rushed decisions; respondents with medium durations, who completed a round in 45 to 120 seconds, and the simulation in 40 to 75 minutes, and who likely deliberated more on their choices; and respondents who took more than 120 seconds per round, and more than 75 minutes for the full simulation, which could signal that they were distracted or having difficulty understanding the instructions. We find that decisions in the simulation, including the willingness to pay for speed, flexibility, and the combination of these two attributes, do not vary across participant types, limiting concerns around data quality depending on how long participants took to finish the simulation.

8 These knowledge questions were not yet included in the survey at the time of the Abuja, Nigeria and Senegal workshops, which is why the number of observations in Nigeria is lower than the total number of respondents and why data for Senegal are missing.

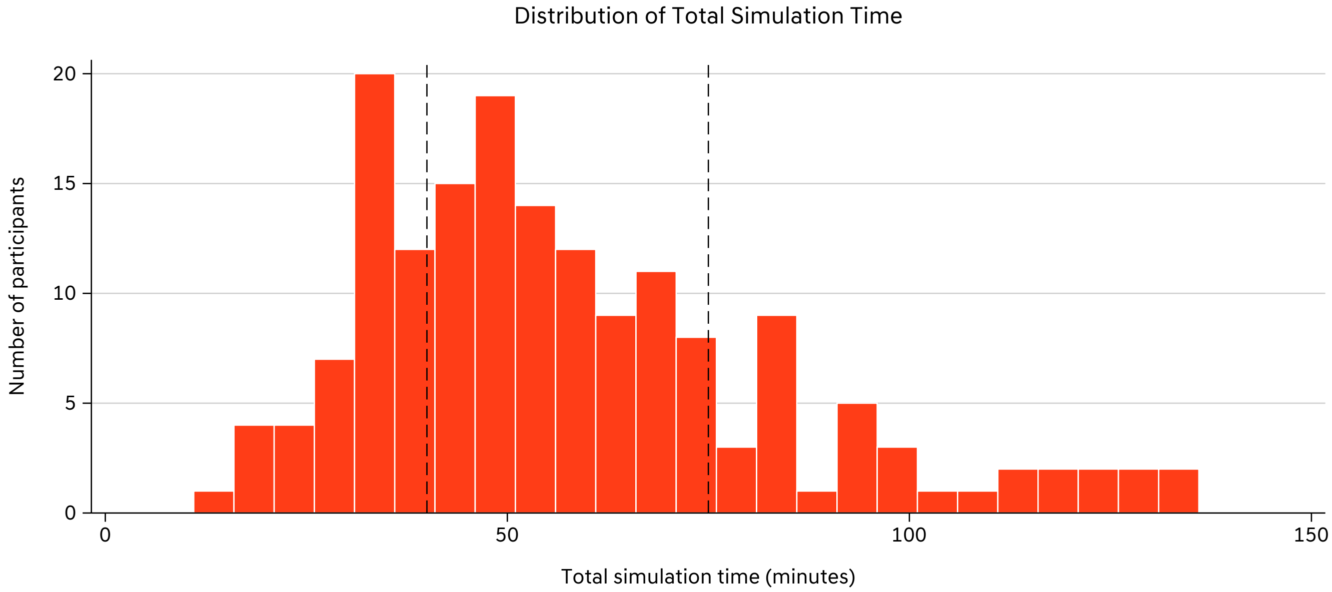
Figure 5: Simulation duration

a) By round duration



Cutoffs: Fast <45s, Medium 45–120s, Slow >120s

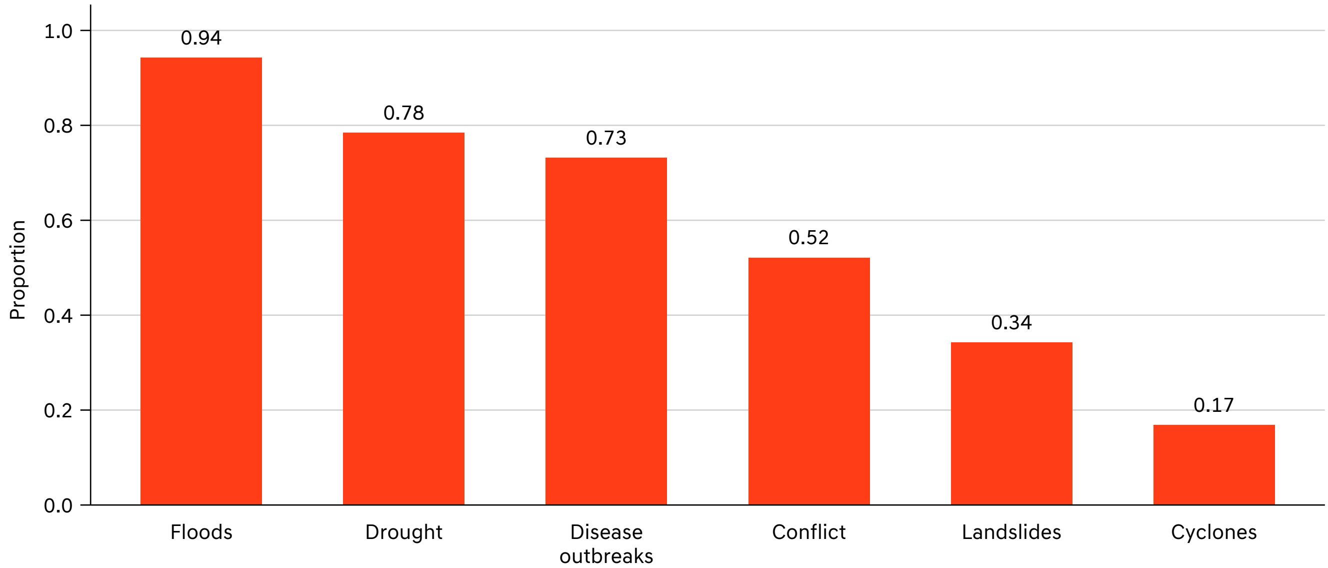
b) By total simulation duration



Cutoffs: Fast <40mins, Medium 40–75mins, Slow >75mins

Finally, the simulation was framed abstractly, without referring to specific types of hazards. It is nonetheless useful to understand which types of hazards participants may have had in mind when doing the simulation. A majority of participants identified floods as the most common disaster type (94%), followed by droughts (78%) and disease outbreaks (74%). Landslides (34%) and cyclones (17%) were the least commonly reported disaster types (see Figure 6).

Figure 6: Disaster risk profiling



4.2 Simulation: Demand for speed and flexibility by disaster scale

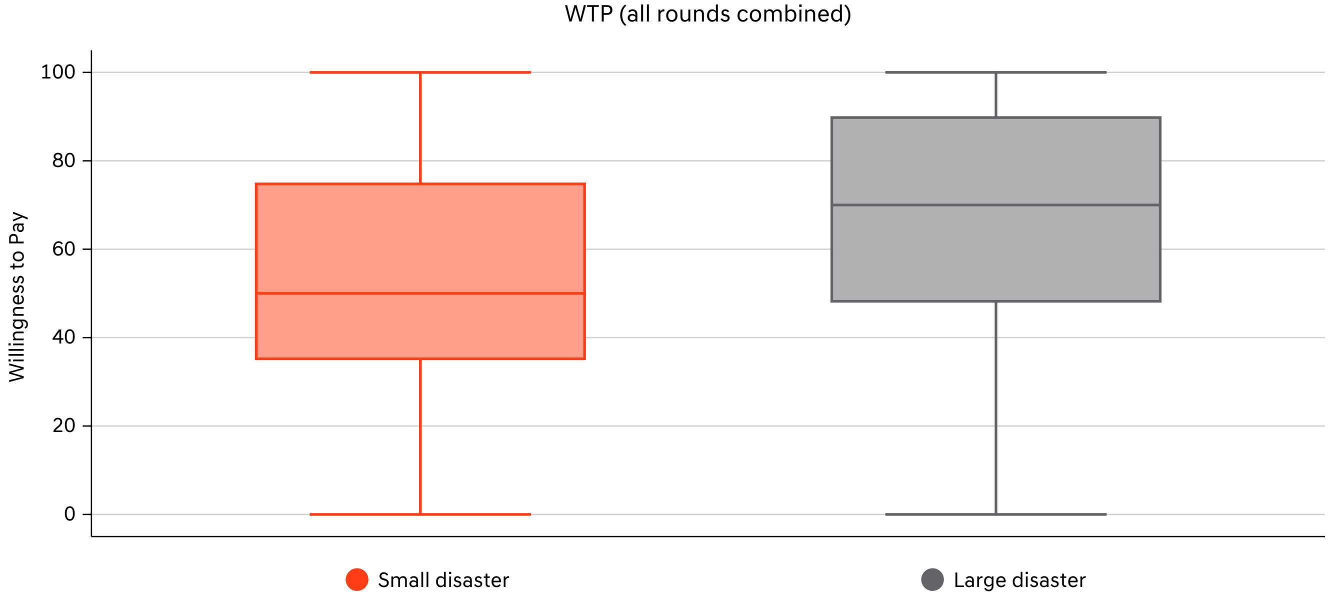
Next, we turn to the results of the simulation. Figure 7 Panel (a) presents a box plot of participants' observed willingness to pay for PAF by disaster scale, aggregating data across the initial four levels, as well as the data elicited for all four types of PAF in each round at the final level, and across all rounds. The average participant completed 7.12 rounds per level, yielding 21,304 observations in total across all 187 participants.

Although arrangements that provide coverage for small, frequent disasters versus large, infrequent disasters have the same actuarial cost of USD50 million, we observe a substantially higher willingness to pay for PAF that would apply in the event of a large disaster. The median participant is willing to pay about USD50 million – the actuarially fair cost from a provider's perspective – to pre-arrange financing for a response to small disasters, but is willing to pay an additional USD20 million (USD70 million in total) to secure coverage that would apply if a large disaster were to occur. Importantly, participants state willingness to pay for both small- and large-disaster coverage ex ante within the same decision environment, since either type of disaster may occur in any given year. Moreover, because effectiveness in the simulation reaches 100% only for high-speed arrangements and when disasters occur as anticipated, the expected value of PAF from a policymaker perspective is below USD50 million. The fact that participants are nonetheless willing to pay at or above this level suggests that demand reflects aversion to the risk of an ineffective disaster response, not only actuarial risk considerations.

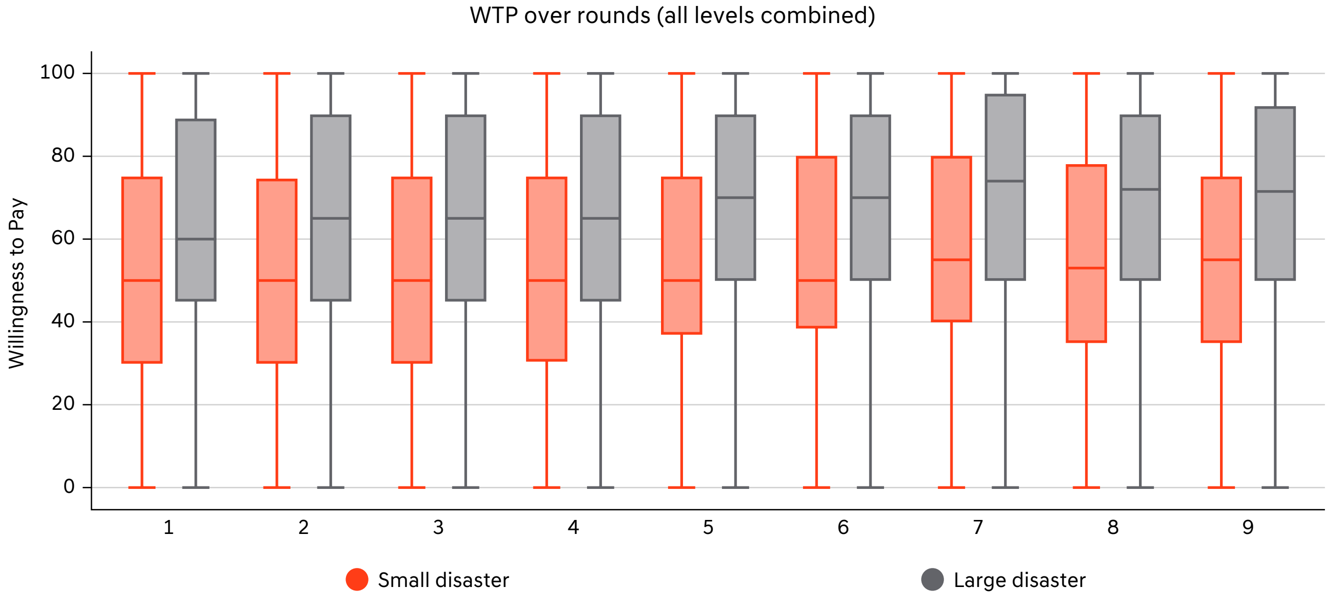
Figure 7 Panel (b) shows willingness to pay across rounds of the simulation, still pooling across all PAF types and levels. Willingness to pay for PAF, as well as the premium participants are willing to pay to finance large-disaster coverage, remains relatively constant across rounds. There is no strong upward or downward trend over time. This suggests that there is no systematic evidence of learning, fatigue, or strategic adjustment in stated willingness to pay over the course of the simulation, and that observed preferences are broadly stable within the simulation setting.

Figure 7: Willingness to pay for pre-arranged financing

a) By disaster scale



b) By disaster scale and round

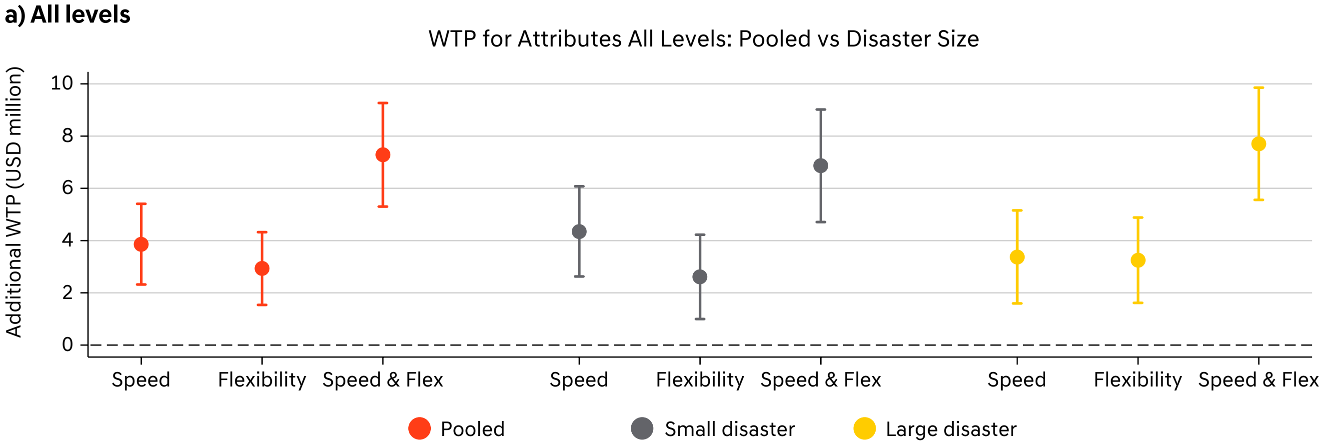


Notes: Box plots showing willingness to pay from all levels across all workshops and rounds in panel (a), and by round in panel (b). Total number of observations: N = 21,304 (for 187 participants).

Figure 8 presents the willingness to pay (WTP) for speed, for flexibility, and for both attributes combined. Panel (a) includes data from all levels, whereas Panel (b) includes data only from the final level, where WTP was elicited for all four types of PAF each round, increasing the salience of these attributes. Below, we discuss the results for Panel (a), noting that WTP for speed and flexibility is higher in the final level in Panel (b), where the comparison of different PAF types was more salient, given that WTP for these different systems was elicited simultaneously. In Panel (b), differences in WTP between speed and flexibility are therefore more clearly expressed, reflecting the elicitation design rather than a change in underlying preferences.

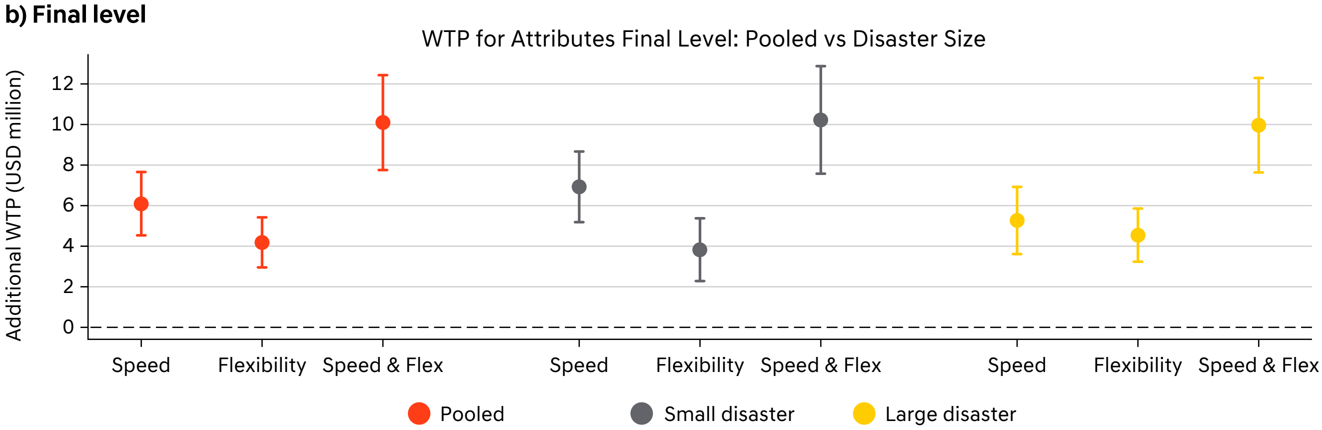
Figure 8: Predicted willingness to pay for speed and flexibility

a) All levels



Pooled: p–value (Speed = Flexibility) = 0.111; p–value (Speed × Flexibility = 0) = 0.556.
Small disasters: p–value (Speed = Flexibility) = 0.013; p–value (Speed × Flexibility = 0) = 0.923.
Large disasters: p–value (Speed = Flexibility) = 0.865; p–value (Speed × Flexibility = 0) = 0.303.
Bars represent 90% confidence intervals based on standard errors clustered at the participant level.

b) Final level



Pooled: p–value (Speed = Flexibility) = 0.001; p–value (Speed × Flexibility = 0) = 0.762.
Small disasters: p–value (Speed = Flexibility) = 0.000; p–value (Speed × Flexibility = 0) = 0.549.
Large disasters: p–value (Speed = Flexibility) = 0.338; p–value (Speed × Flexibility = 0) = 0.830.
Bars represent 90% confidence intervals based on standard errors clustered at the participant level.

Notes: Estimates of willingness to pay for speed, flexibility and the two attributes combined are based on Equations (1) for the pooled model and (2) for the model disaggregating by disaster scale, with standard errors clustered at the participant level and observations re-weighted at country level. The total number of observations is N = 21,304 in Panel (a) (with 10,652 observations for small-disaster coverage and 10,652 for large-disaster coverage), and N = 10,696 (5,348 observations for small-disaster coverage and 5,348 for large-disaster coverage) for the final level in Panel (b).

The WTP for speed, flexibility and their combination drawn in green on the left-hand side of Figure 8, represents pooled results aggregated across both small- and large-disaster coverage, estimated from Equation (1). We observe a positive WTP for both speed and flexibility, with participants willing to pay more for speed (an estimated USD3.9M) than for flexibility (an estimated USD3.0M); this difference is not statistically significant ($p = 0.111$), though it becomes more pronounced and statistically significant in the final level shown in Panel (b). However, recall that the high-speed PAF-financed response system provided greater efficiency gains than the flexible system. Speed raised effective response coverage by 20% of USD50M, with a 3/4 probability of a disaster being anticipated. The corresponding expected gain of USD7.5M is substantially larger than the 3.9M that participants are willing to pay for speed ($p < 0.01$). The flexible system increased effective coverage by a similar amount, but with a 1/4 probability of a disaster being unanticipated, corresponding to an expected gain of USD2.5M. This is not significantly different from the USD3.0M that participants are willing to pay for flexibility ($p = 0.543$). Finally, participants are willing to pay an estimated USD7.3M for both attributes combined, which is close to the sum of the separate WTPs, indicating that speed and flexibility are neither perceived as substitutes nor as generating additional value when bundled.

Moving to the right in Figure 8, we explore whether WTP for PAF attributes varies by disaster scale, using Equation (2) with interaction terms for disaster scale and attributes. Coefficients drawn in the middle in blue represent WTP for attributes for small-disaster coverage, whereas coefficients depicted in pink on the right represent WTP for attributes for large-scale coverage. Speed increases willingness to pay for both small- and large-disaster coverage. On average, participants are willing to pay an additional USD4.4M for higher speed when coverage applies to a small disaster, and an additional USD3.4M when coverage applies to a large disaster. This entails an increase in willingness to pay of 8.8% and 6.8% of the actuarially fair costs, respectively. In both cases, however, willingness to pay for speed is below the expected gain of USD7.5 million implied by the simulation design.

In absolute terms, flexibility is valued less for small-disaster coverage, with an average willingness to pay is USD2.7M. Although this is significantly lower than the 4.4M that participants are willing to pay for increased speed ($p < 0.01$), it is not significantly different from the expected gain of 2.5M implied by an increase in flexibility. Moreover, flexibility is valued relatively more in PAF that applies to large disasters. Participants are willing to pay an extra USD 3.3M for flexibility, which is statistically indistinguishable from the USD 3.4M that participants are willing to pay for speed ($p = 0.865$) and exceeds the expected gain from increased flexibility.

Finally, combining both attributes increases willingness to pay the most. Willingness to pay for both speed and flexibility is approximately equal to the sum of willingness to pay for each attribute separately (USD 6.8M for small-disaster coverage and USD 7.7M for large-disaster coverage), and the difference is statistically insignificant ($p = 0.303$). This indicates that participants do not view speed and flexibility as substitutes, but nor do they perceive additional value from combining the two beyond their individual contributions.

4.3 Simulation: Effects of fiscal conditions and political incentives

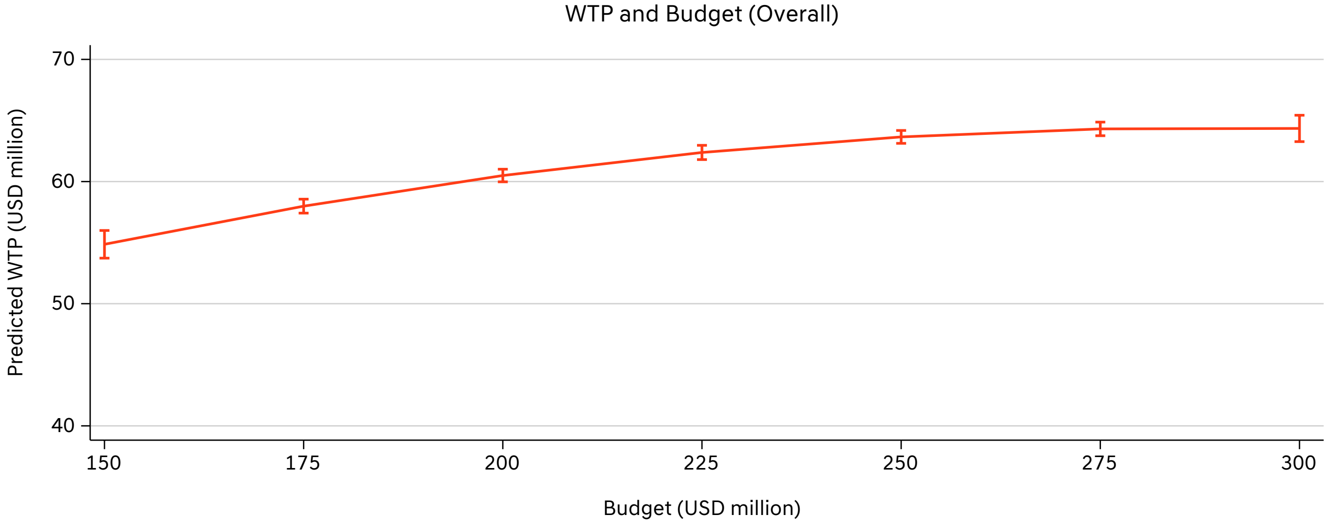
Next, we analyse to what extent fiscal constraints and political incentives shape policymakers' WTP for PAF. To that end, we first estimate the effect of the budget from Equation (3), which models WTP as a function of the annual budget, including a quadratic term to allow for nonlinear effects. Figure 9 shows predicted WTP for PAF by annual budget, which is randomly determined at the start of each year in the simulation and ranges from USD150M to USD300M.[9]

Panel (a) presents predicted WTP levels for the pooled data, without interaction terms for budget and disaster scale, whereas Panel (b) separates the data by coverage for small and large disasters. Fiscal space influences demand for PAF in a very similar way across disaster scales. WTP increases with budget at low and intermediate levels, with a USD1M increase in budget raising WTP by around USD0.3M ($p < 0.01$) when the allocated budget is USD150M. Income effects are nonlinear, however, as reflected in a significant quadratic budget term. As a result, once budgets exceed

9 Appendix Table 4 presents the full regression results.

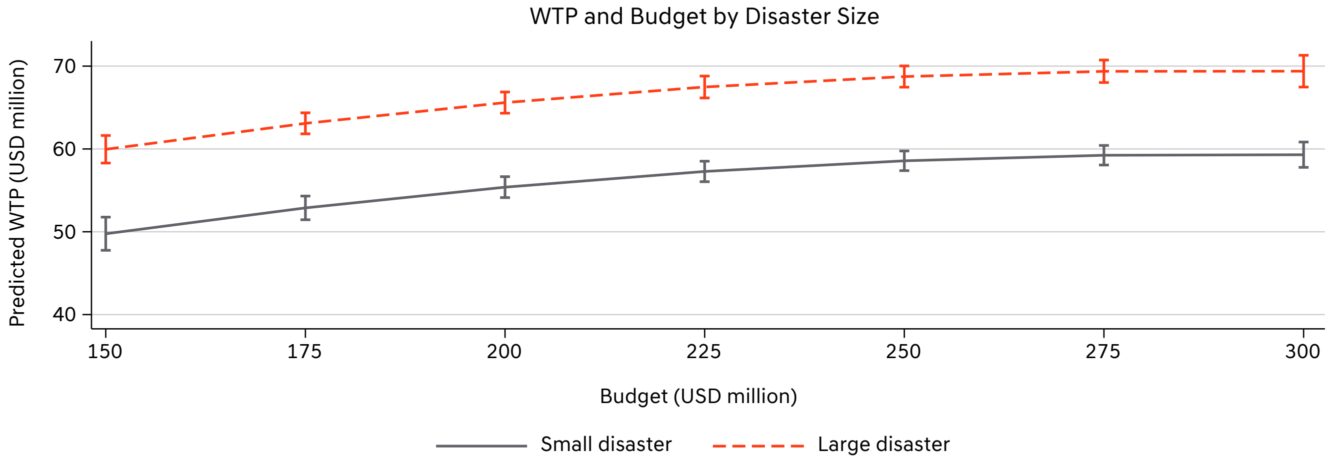
Figure 9: Demand for pre-arranged financing by fiscal conditions

a) Overall relationship



Estimated equation is WTP = 26.77 [7.22] + 0.285 [0.064] * Budget + −0.0005 [0.0001] * Budget^2.
All coefficients are statistically significant at the 1% level.
Bars represent 90% confidence intervals, based on standard errors clustered by participant, at observed budget levels.

b) Disaggregation by disaster size



Estimated equation (controlling for level indicators) is WTP = 21.84 [8.58] + 0.283 [0.074] * Budget + −0.0005 [0.0002] * Budget^2 for small disaster coverage,
and WTP = 31.69 [8.80] + 0.287 [0.080] * Budget + −0.0005 [0.0002] * Budget^2 for large disaster coverage.
Effect sizes for small vs large disaster coverage are not statistically different (joint p = 0.996).
Bars represent 90% confidence intervals, based on standard errors clustered by participant, at observed budget levels.

Notes: Figure plots predicted willingness to pay as a function of the allocated budget (which is a random draw $B \in \{150, 175, 200, 225, 250, 275, 300\}$ each year), based on estimates of Equation (3). Total number of observations is N = 21,304 (with 10,652 observations for small-disaster coverage and 10,652 for large-disaster coverage).

approximately USD250 million, further increases in budget no longer raise demand for PAF, presumably because participants perceive that they can retain more risk without relying on pre-arranged arrangements.

The observed income elasticity in more fiscally constrained environments reflects the higher opportunity cost of committing scarce resources to PAF. When resources are very limited, governments may be reluctant to commit funds ex ante even when disaster response needs are high, particularly given the risk of an ineffective response. As available budget expands, WTP rises; but once governments have sufficient fiscal space, the marginal value of PAF declines. This pattern suggests that governments facing the tightest fiscal constraints may be least able to commit to PAF, even though potential welfare gains from effective disaster response are high. We do not find significant interaction effects between budget and disaster scale, indicating that this relationship holds for both small- and large-disaster coverage.

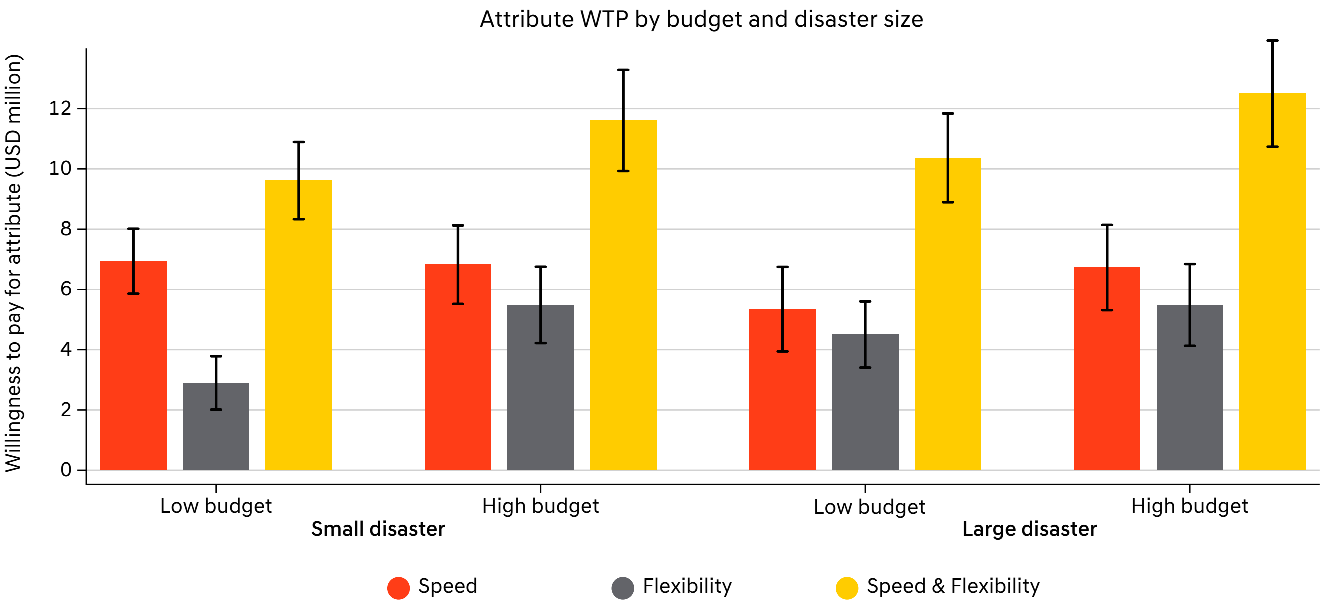
Next, Figure 10 explores the extent to which fiscal conditions influence WTP for speed, flexibility, and their combination in the final level, where comparisons across attributes are most salient because WTP is elicited for each arrangement in each year. The figure plots WTP for each attribute for rounds with high versus low budgets, and for coverage applicable to small disasters (left) versus large disasters (right).

We find that WTP for speed is fairly constant across fiscal conditions, for both small- and large-disaster coverage. For coverage applying to large disasters, demand for flexibility also does not vary strongly with the budget allocated in a given year. By contrast, WTP for flexibility for coverage applying to small disasters is significantly lower in years with a relatively low budget than in years when fiscal constraints are relaxed. In other words, demand for flexibility for small-disaster coverage is income elastic.

This pattern is consistent with theoretical results showing that demand for insurance can be depressed at low levels of wealth when there is a risk of contractual or system nonperformance, as the downside risk of paying for coverage that may not deliver looms large (Doherty and Schlesinger, 1990). As fiscal space expands, willingness to pay for flexibility increases, consistent with governments becoming more willing to insure against the risk of an ineffective response and system nonperformance once the opportunity cost of committing scarce resources ex ante declines.

Finally, we use the simulation data to analyse the effects of political incentives on willingness to pay for PAF. Figure 11 Panel (a) shows the effect of introducing political incentives on willingness to pay for the low-speed, low-flexibility arrangement, which serves as the benchmark in Equation (4). During the first three years, in any given

Figure 10: Willingness to pay for speed and flexibility – by fiscal space and disaster size

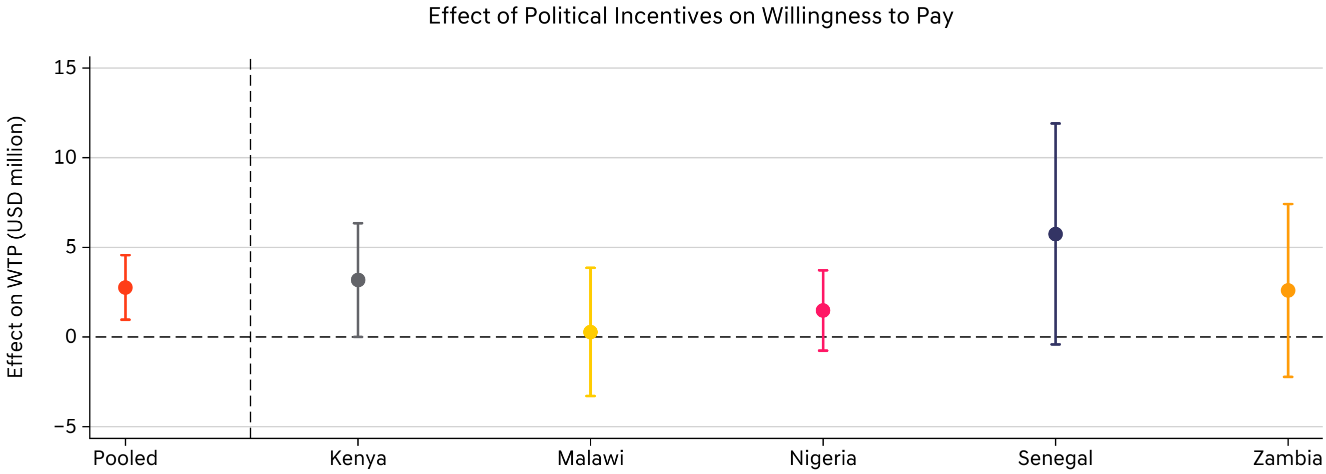


level, participants were on a fixed four-year term and could not lose political support. From the fourth year onwards, participants needed to maintain political support in order to continue in that level. We observe a small increase in WTP – of approximately USD3M – following the introduction of this design-imposed political risk. Estimated effects vary across countries, with larger effects in Senegal and smaller effects in Malawi and Nigeria, highlighting that the salience of political incentives within the simulation is context-specific.

Panel (b) presents WTP for speed, flexibility and their combination, separately for years with and without political incentives. As before, results pool observations across small- and large-disaster coverage. We find small and insignificant changes in willingness to pay for speed, flexibility and their combination following the introduction of political incentives. Taken together, these changes do not systematically alter how policymakers value core response-system attributes such as speed and flexibility.

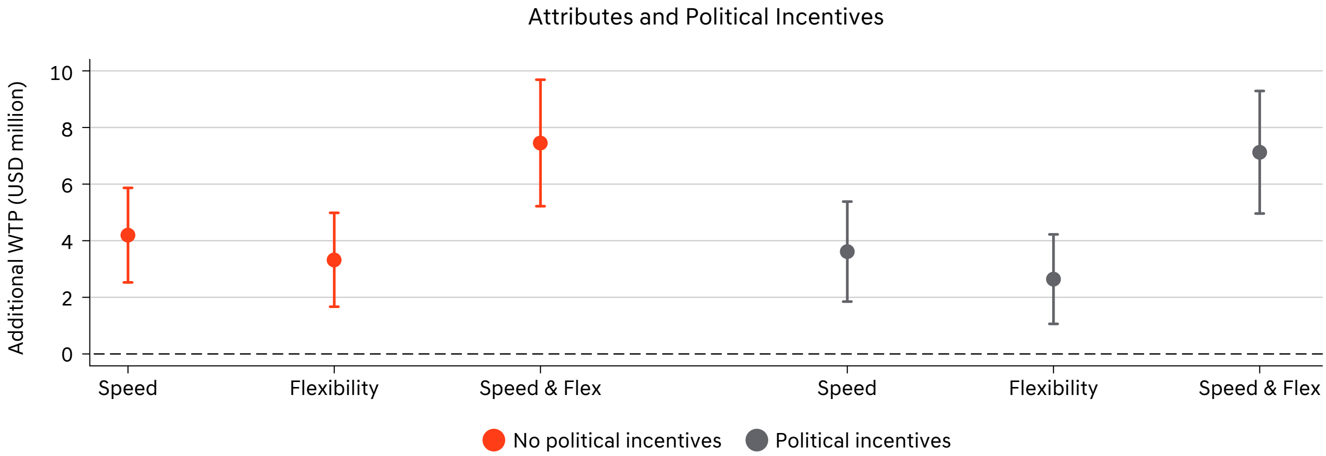
Figure 11: Willingness to pay for speed and flexibility – by political incentives

a) Disaggregation by country



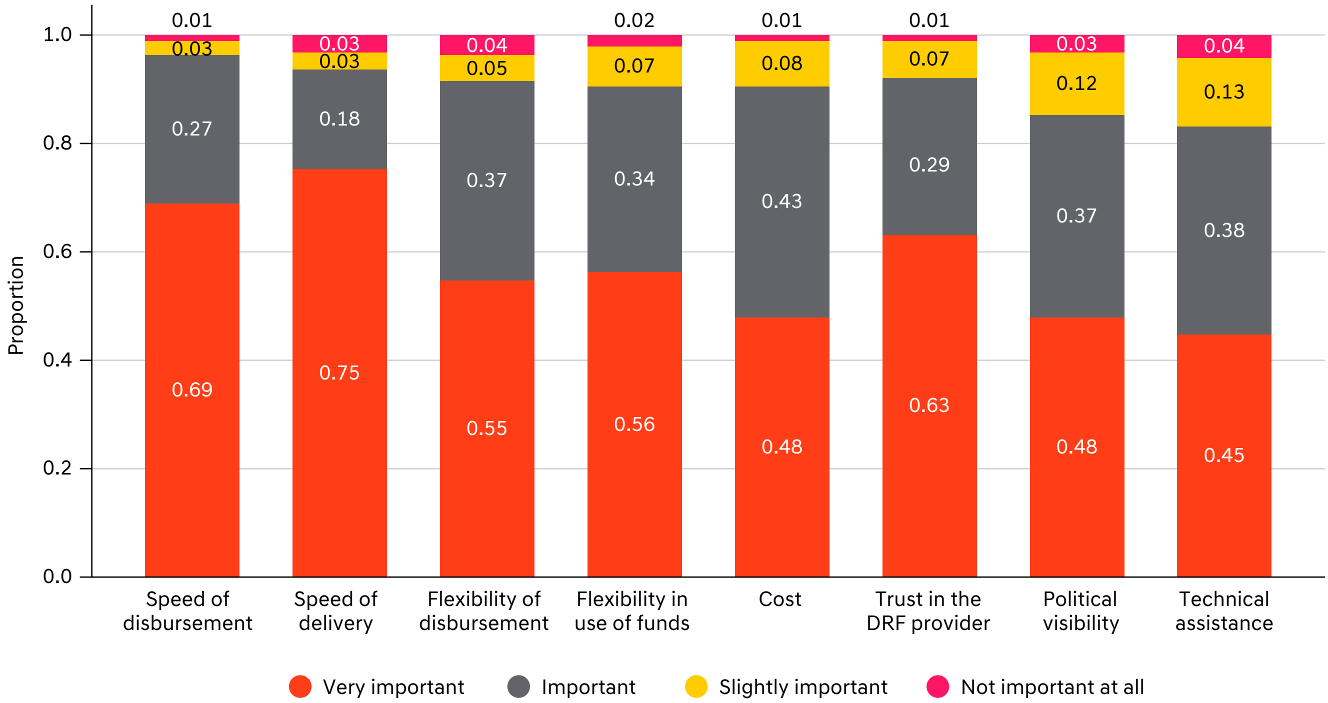
Points show estimated effect of political incentives (Years 4+ vs Years 1–3) on willingness to pay.
Bars represent 90% confidence intervals based on standard errors clustered at the participant level.

b) Disaggregation by attribute



P–values test whether political incentives change the effects of Speed, Flexibility, and their combination:
Speed (0.478), Flexibility (0.424), Speed & Flexibility (0.383); joint test = 0.835.
Bars represent 90% confidence intervals based on standard errors clustered at the participant level.

Figure 12: Survey-reported rankings of various PAF attributes

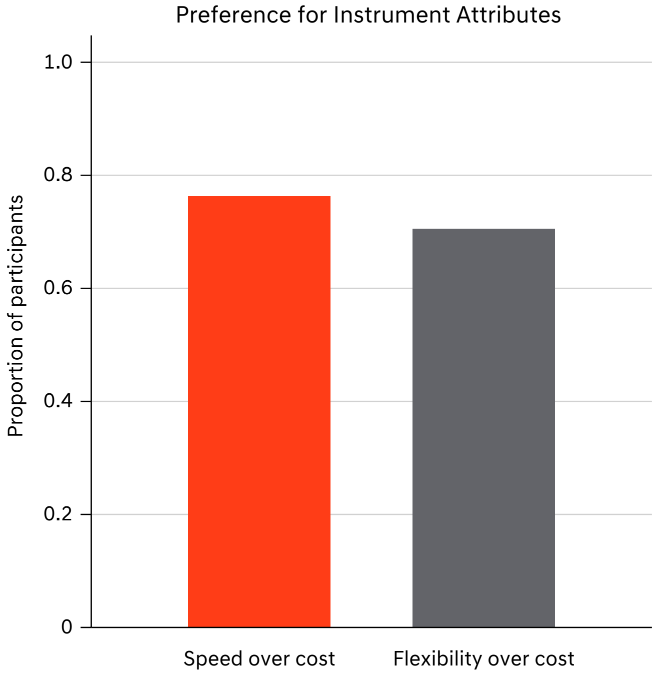


4.4 Linking simulation results with survey evidence

Survey results are consistent with these findings. Figure 12 summarises how important participants consider various PAF attributes in the survey. Leading the rankings, the speed of delivery is considered very important by 75.4% of respondents, followed by speed of disbursement (69.1%). Trustworthiness of instrument providers (63.4%) also ranked highly. Flexibility was considered the next-most important attribute, reported to be 'very important' by 56.5% of participants in case of flexibility in the use of funds, and by 55.0% in case of flexibility in disbursement conditions. Political visibility (48.2%), cost (48.2%) and technical assistance (45.0%) were less frequently rated as very important.

As further evidence that the simulation captured real preferences, Figure 13 presents participants' self-reported preferences in the survey for a PAF system offering high speed (flexibility) but at a high cost, versus a system with low speed (flexibility) offered at a much lower cost. Most participants preferred a high-speed or high-flexibility system: consistent with our results above, close to 80% preferred speed over a cost reduction, and about 70% preferred an increase in flexibility over a lower cost.

Figure 13: Survey-reported preferences for increased speed and flexibility over a cost reduction in PAF



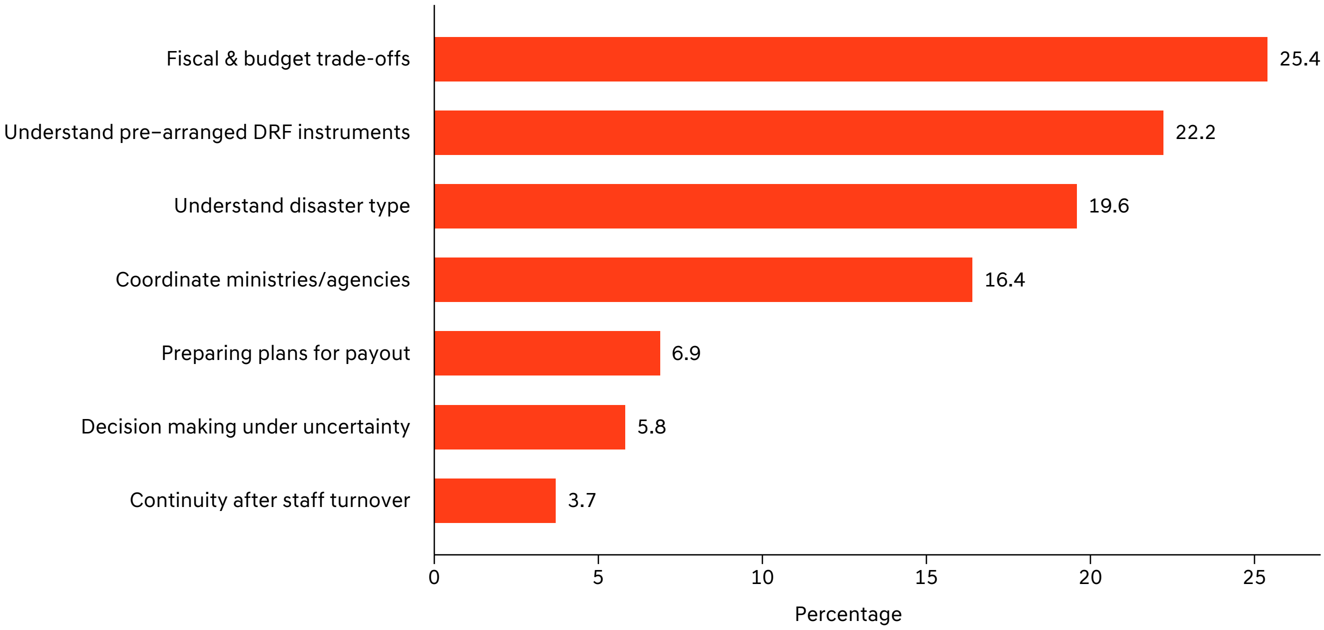
One attribute that we propose in our conceptual framework, but which we did not vary in the simulation, was the ability to mobilise internal and external expertise in the design process of PAF decisions, for instance, at the time of risk profiling and contingency planning. To understand the value of such an attribute, and the extent to which it would help reduce the frequency at which unanticipated disasters occur (as proposed in our conceptual framework), we included survey questions on the main challenges that governments face in DRF processes, and on how they value internal and external expertise in addressing these challenges.

Participants identified assessing fiscal implications and managing budget trade-offs (25.4%) as the main challenge, highlighting pressure on limited public resources, as shown in Figure 14. This is followed by key knowledge gaps, particularly in understanding pre-arranged DRF systems and their triggers (22.2%) and disaster types and their implications (19.6%). These suggest that technical capacity gaps may constrain the effective design, uptake and use of DRF, but are perhaps not always the binding constraint.

We then asked participants to rate the importance of internal and external expertise in addressing technical capacity gaps for frequent and infrequent disasters, as well as predictable (anticipated) and less predictable (unanticipated) disasters. Participants consistently rated internal expertise as highly important across all disaster types, whether frequent or infrequent, and predictable or unpredictable, highlighting the central role of internal capacity in planning and implementing PAF. Participants also viewed external expertise as important across all disaster types, though less so than internal expertise. Its role becomes more prominent in infrequent disasters (47% rated it very important) and less predictable events (41%), compared to frequent disasters (30%). This suggests that external support is especially valued in more complex or uncertain situations, where additional specialised expertise may be needed to complement domestic capacity.

Taken together, these findings suggest ways to shape such a third attribute. Internal and external expertise could help reduce the probability of unanticipated events occurring, for example, in the form of PAF providers' facilitation of capacity development, risk profiling and scenario planning workshops. These workshops bring together key stakeholders from government, civil society and communities at risk, as well as international experts, to improve risk modelling, instrument design, and contingency planning. In such workshops, participants' survey responses indicate that these two types of expertise would play different roles, but mobilising both types of expertise could help reduce dependency on more flexible systems and allow countries to prioritise systems that have high speed.

Figure 14: Government challenges in disaster risk financing



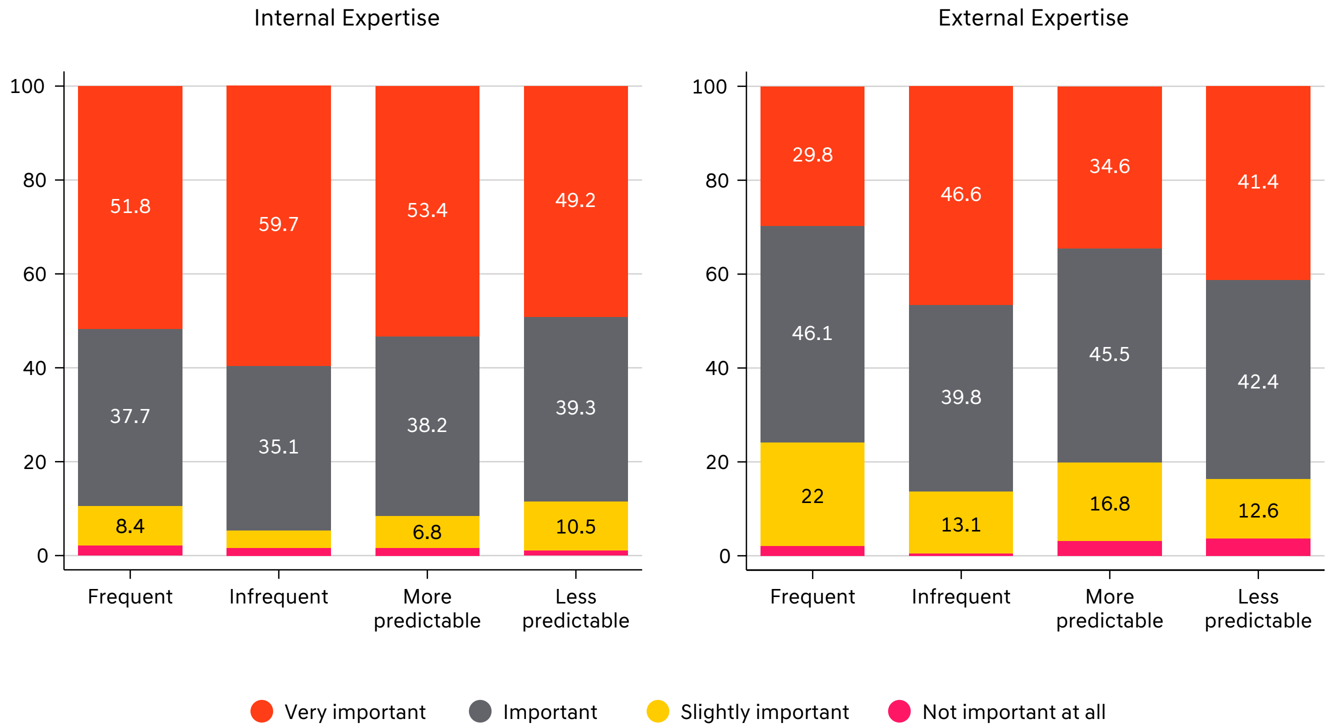
4.5 Debrief findings and next steps

Across countries, the debrief sessions at the end of the workshop provided an opportunity to check the validity of findings from the simulation; gather qualitative insights complementary to the simulation results on how policy makers interpret trade-offs between different attributes of PAF; and discuss how these insights may translate into policy and practice. Participants reported that the simulation reflected real-world DRF decisions, including the co-existence of rewards for social impact and political incentives. Only one participant in Zambia questioned the use of political incentives, indicating that achieving impact should be the main priority for policymakers.

Participants consistently emphasised the importance of speed and flexibility in ways that reflected practical implementation challenges. There was strong interest in more flexible PAF response systems, particularly insurance products that can better adapt to unanticipated needs during disaster response. This reflects broader concerns that rigid systems may not align well with how disasters unfold in practice. In Zambia, participants emphasised that speed is particularly valuable for managing recurrent shocks where rapid response is essential, while flexibility becomes more important when disasters deviate from expected scenarios. Participants also expressed interest in better understanding how these attributes relate to existing PAF options, and whether current products adequately combine them to reflect their preferences.

They also nuanced the attributes we studied. In Malawi, a respondent emphasised the value of timeliness, which is different from speed. For instance, food aid should be distributed during the lean season rather than during harvest periods, when food prices and the need for aid are highest. In addition, participants in Malawi noted that their limited recovery from small, frequent disasters was eroding communities' ability to manage subsequent disasters, even if small, and suggested that future simulations should include a recovery component. In Kenya, participants noted that frequent yet severe disasters were not included in the simulation and agreed that this type of event required disaster risk reduction efforts to turn these into small frequent, or large infrequent disasters. An extension of the simulation could include such a disaster risk reduction component.

Figure 15: Role of internal and external expertise



Across all settings, participants highlighted the value of the simulation as a learning and decision-support tool. They noted that it helped them better understand the trade-offs between different financing options and the constraints they faced when making real-time budget decisions. The simulation was seen as strengthening their ability to think through DRF choices under uncertainty and limited fiscal space. Participants also emphasised the importance of adopting a layered approach to DRF, combining PAF instruments and associated response systems to address both frequent, smaller shocks and less frequent but more severe events.

In Nigeria, where relatively few participants were aware of any disaster risk financing strategies being in place in their country, participants emphasised the relevance of PAF for strengthening disaster risk management and indicated that lessons from the simulation should be translated into policy and practice. There was a clear signal that adopting PAF approaches should be a priority going forward. At the same time, participants noted that PAF remains a relatively new area; and highlighted significant knowledge gaps, with strong demand for additional training and capacity building. UNDP is supporting the National Emergency Management Authority (NEMA) in drafting a DRF strategy, and there was strong interest in collaboration.

This is consistent with feedback from Senegal, where the government (under the leadership of the Ministry of Finance) is actively engaged in the Global Shield in-country process to refine its DRF strategy. This simulation was seen as a complementary step to better understand trade-offs between attributes when selecting and designing new PAF instruments and associated response systems, with growing cross-government interest and engagement on DRF. Following the workshop, representatives from the Fonds de Solidarité Nationale (FSN) contacted IFPRI to express interest in the approach and to explore next steps, further illustrating the relevance of the exercise for ongoing policy processes.

The workshops also generated follow-up engagement from government counterparts and development partners, including interest in further collaboration by UNDP and NEMA in Nigeria, DoDMA and the Ministry of Finance in Malawi, the Ministry of Finance and National Planning in Zambia (they have also requested the simulation code to be able to use the simulation themselves), and UNDRR and the National Treasury in Kenya. This response suggests that the methodology developed in this study has practical relevance for governments and institutions seeking to understand better country preferences over pre-arranged risk financing.

Finally, the study has generated strong interest within the academic community. The research has attracted interest from researchers working on DRF and climate risk management, and the team has been invited to speak on this work during a keynote plenary session at the Centre for Effective Global Action (CEGA)'s Africa Evidence Summit in Addis Ababa on July 23–24, 2026. It is hoped that this encourages more action-oriented research and innovation in this area.

5

CONCLUSION

This study provides new empirical evidence on how policymakers in five African countries evaluate the core attributes of PAF systems and the trade-offs these attributes entail under realistic fiscal and political constraints. By embedding participants in a decision environment that mirrors real-world DRF challenges – including annual budget constraints, differences between anticipated and unanticipated disaster states, and the political risks associated with inadequate disaster response – the simulation generated systematic evidence on the demand for speed, flexibility, and PAF more broadly.

Five key takeaways emerge.

First, policymakers value PAF for both small, frequent and large, infrequent disasters, despite its opportunity costs. Across contexts, the average participant was willing to pay actuarially fair costs to secure PAF, with demand consistently higher for coverage that would apply in the event of large disasters. This reflects recognition that reactive DRF is often insufficient to manage high-impact shocks, and that PAF can mitigate the political and welfare losses associated with delayed or ineffective response.

Second, speed and flexibility are valued as distinct attributes that address different dimensions of disaster response performance. In the simulation, speed was characterised as improving response effectiveness in anticipated disaster states, while flexibility was characterised as reducing the risk of an ineffective response when disasters occur in unanticipated ways or deviate from planned scenarios. Although willingness to pay for speed is higher in absolute terms, benchmarking these values against expected efficiency gains reveals that policymakers are willing to pay less than the expected gain from increased speed, whilst being willing to pay at least the expected gain from increased flexibility. This pattern suggests that governments are not only concerned with improving average response performance, but also place particular value on reducing the risk of PAF-financed response system nonperformance. Consistent with this interpretation, policymakers do not view speed and flexibility as substitutes or complements, implying that well-designed PAF-financed response systems – combining money-in and money-out arrangements – may need to integrate mechanisms that deliver both attributes.

Third, willingness to pay for PAF varies nonlinearly with fiscal space, suggesting that countries can be too fiscally constrained to commit to PAF but sufficiently resourced to rely less on it once budgets expand. Willingness to pay increases as budgets rise from low to intermediate levels, indicating that fiscal space enables governments to commit resources ex ante. However, once budgets exceed key thresholds, additional fiscal space does not further increase demand, as policymakers perceive a greater ability to retain risk. Importantly, this pattern is consistent with theoretical results showing that demand for insurance can be depressed at low levels of wealth when there is a risk of contractual or system nonperformance, as the downside risk of paying for protection that may not deliver looms large (Doherty and Schlesinger, 1990; Clarke, 2016). In this sense, limited uptake of PAF among fiscally constrained countries reflects not only affordability constraints, but also aversion to the risk of an ineffective response.

Fourth, political incentives influence overall demand for PAF, though the effects are modest and context-specific. Introducing a design-imposed risk of losing political support slightly increases willingness to pay for PAF on average, with substantial heterogeneity across countries. However, political incentives do not systematically alter how policymakers value speed and flexibility, underscoring that core preferences over PAF-financed response system attributes are shaped more by operational and fiscal considerations than by short-term political pressures.

Fifth, survey results and debrief discussions highlight the importance of internal expertise and external support for strengthening disaster preparedness and response systems. Participants emphasised the value of improved risk profiling, scenario planning, and institutional coordination, particularly for managing infrequent or unpredictable and unanticipated disasters. Strengthening these capabilities can reduce the likelihood that disasters fall outside planned scenarios, thereby reducing reliance on flexibility ex post and enabling countries to extract greater value from high-speed arrangements.

The simulation method has a number of limitations. First, although designed to reflect fiscal decision-making under uncertainty, it cannot capture all factors influencing preferences over PAF-financed response systems . Second, PAF decisions are typically made by politicians and senior officials, whereas participants were primarily technocrats; although asked to adopt a decision-maker perspective, their responses may not fully reflect actual decision processes and may vary with expertise. Third, to ensure comparability across countries of different sizes, we did not scale budgets or response needs to country-specific levels. As a result, absolute willingness-to-pay estimates should not be interpreted as country-level reservation prices; instead, the analysis focuses on how demand for PAF varies with system attributes and fiscal constraints.

In terms of robustness, several findings support the internal validity of the results. First, preferences elicited through the simulation are broadly consistent with stated preferences in the post-simulation survey, suggesting that results are not driven by artefacts of the simulation design. Second, results are robust to variation in participant understanding and engagement, with no systematic differences in willingness to pay by knowledge scores or by time taken to complete the simulation. Third, preferences remain stable across rounds, providing no evidence of learning or fatigue effects. Finally, while there is some cross-country heterogeneity in magnitudes, the main qualitative findings are consistent across the five study countries.

The limitations of the simulation and analysis point to several areas for future work. Extending the simulation to incorporate recovery dynamics, disaster risk reduction, and alternative forms of non-performance risk would enable a richer exploration of policy-relevant trade-offs. Linking elicited preferences to administrative and fiscal data would provide an important test of how closely the simulation's behaviour maps to real-world decision-making. More broadly, as climate- and geophysical risks intensify, aligning PAF design and accompanying capacity investments with governments' preferences over system performance will be essential to strengthening financial protection. In particular, accounting for governments' aversion to response failure remains critical to ensuring that disaster response systems are timely, effective, and politically viable.

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ANNEX A: DESK REVIEW AND KEY INFORMANT INTERVIEWS

This annex summarises the desk review and key informant interviews that informed the development of the conceptual framework and research design presented in the main report.

A.1 Desk review

A desk review was conducted to assess the current state of knowledge on PAF for disaster risk management and to identify the main factors that may influence country preferences over PAF instruments. The objective of the review was to inform the conceptual framework and research design used in this study and to provide background on the design features, use cases, and limitations of existing PAF instruments.

The review covered a wide range of sources, including national DRF strategies, government reports, evaluations of PAF implementation, provider-led assessments and surveys, and outputs from international policy initiatives such as the V20, G20, and the Bridgetown Initiative. It also drew on analytical work produced by multilateral development banks, regional risk pools, and research institutions.

The desk review confirmed that the literature on DRF has largely focused on fiscal risk quantification, instrument design, and macroeconomic stability. Existing frameworks typically emphasise risk layering, cost-efficiency, and the optimisation of financial instruments across different return periods. This body of work has been important in clarifying the technical case for PAF and in highlighting the potential benefits of ex ante instruments in reducing reliance on disruptive budget reallocations and in smoothing fiscal shocks after disasters.

At the same time, the review also highlighted an important gap. While there is considerable analysis of the comparative design and performance of different PAF instruments, there is much more limited evidence on how governments value the attributes embedded in those instruments. Most studies focus on identifying technically optimal financing strategies rather than examining how policymakers weigh trade-offs among characteristics such as speed of disbursement, flexibility in the use of funds, cost of financing and payout frequency.

The desk review further highlighted that PAF instruments differ substantially in structure, governance arrangements, trigger mechanisms, financing modality and intended use. The main categories of instruments identified through the review include sovereign contingency funds, contingent credit lines, contingent emergency response mechanisms, climate-resilient debt clauses, regional risk pool insurance, catastrophe bonds, and other rapid response or readiness mechanisms. Across these instruments, the main benefits discussed in the literature include improved timeliness and predictability of financing, while the most frequently cited constraints include affordability, basis risk, limited fiscal space, technical complexity, and the need for stronger institutional systems to ensure effective us of funds.

These findings helped identify the key dimensions most relevant to understanding country preferences over PAF and provided the initial basis for structuring the subsequent inquiry.

A.2 Findings from key informant interviews

To complement the desk review, the study drew on key informant interviews with practitioners involved in the design, implementation, financing, or advisory support for PAF instruments. Interviewees included representatives from multilateral development banks, regional risk pools, bilateral and multilateral initiatives, private sector actors, and international organisations involved in DRF.

Several recurring themes emerged from these interviews.

First, interviewees frequently pointed to a divergence between provider and government priorities. Providers often emphasise actuarial soundness, financial sustainability, and internal product logic, whereas governments may place greater value on affordability, simplicity, political visibility, and compatibility with existing public financial management systems. This may create misalignment between how instruments are designed and how governments assess their usefulness in practice.

Second, speed of disbursement was widely viewed as one of the defining benefits of PAF. Rapid access to resources was consistently cited as a major advantage of ex ante instruments relative to ex post financing. At the same time, interviewees stressed that rapid payout does not automatically translate into a rapid response on the ground. In a number of cases, disbursed funds may remain in central treasury accounts or be delayed by coordination and approval bottlenecks before reaching implementing agencies or affected populations. This means that the practical value of speed depends not only on the financing instrument itself but also on the country systems through which the funds are ultimately deployed.

Third, flexibility in the use of funds emerged as an important consideration. Interviewees noted that disasters often do not unfold exactly as anticipated when instruments are designed. When financing is tightly linked to predefined uses or highly specific contingency plans, governments may struggle to respond to unexpected needs. For example, funding may be available for relief delivery to a particular area, but if access routes are damaged and funds cannot be redirected to restore critical infrastructure, the response may still be delayed or ineffective. In this sense, flexibility in the use of funds was seen as an important factor shaping the real-world value of PAF.

Fourth, experiences of basis risk were repeatedly cited as shaping government perceptions of parametric instruments. Interviewees described situations in which severe impacts occurred without triggering payouts, which can erode trust in the instrument even when the non-payout is consistent with the model specifications. These experiences were described as having lasting implications not only for the credibility of a specific product but also for broader political support for similar instruments.

Fifth, affordability was consistently identified as a central driver of uptake, especially in low-income and fiscally constrained settings. Interviewees emphasised that premium subsidies, grant funding, and concessional terms often play a significant role in making instruments politically and fiscally viable. At the same time, they also noted that subsidies and donor preferences may shape uptake in ways that do not always reflect countries' underlying preferences.

Sixth, political incentives were frequently described as influencing preferences over instrument design. Interviewees noted that visible payouts can help demonstrate value to policymakers and the public, potentially increasing the appeal of instruments associated with more frequent disbursements. However, this can create tension with the risk-layering logic often recommended in the literature, under which lower-severity events may be managed more efficiently through existing budget mechanisms while pre-arranged financial instruments are reserved for less frequent but more severe shocks.

Finally, institutional and analytical capacity emerged as a major factor shaping how countries engage with PAF. Interviewees highlighted the importance of governments' ability to understand their own risk profile, assess potential financing gaps, and evaluate the trade-offs associated with different instruments. Limited technical literacy, weak coordination across ministries, and fragmented decision-making processes were all described as barriers to more strategic and demand-driven use of PAF.

ANNEX B: APPENDIX TABLES

Table 4: Effect of fiscal space on willingness to pay for PAF

	All levels (1)	All levels (2)	Initial levels (3)	Final levels (4)
Budget (USD million)	0.285*** (0.0637)	0.283*** (0.0738)	0.421*** (0.0771)	0.170 (0.105)
Budget^2	−0.0005*** (0.0001)	−0.0005*** (0.0002)	−0.0007*** (0.0002)	−0.000287 (0.0002)
Large disaster	9.855 (9.660)	14.69 (12.64)	6.413 (15.50)	
Large disaster × Budget		0.00379 (0.0861)	−0.0211 (0.114)	0.0174 (0.137)
Large disaster × Budget^2		−0.00001 (0.0002)	−0.00004 (0.0002)	−0.00003 (0.0003)
Observations	20,182	20,182	9,486	10,696
Within R^2	0.0641	0.116	0.141	0.0603
p-value: budget effect (joint)	2.27e−17	5.58e−12	2.48e−18	0.00127
p-value: differential effect of budget by disaster size		0.996	0.954	0.985

Notes: Dependent variable is WTP in USD million. All models are estimated using fixed effects with standard errors clustered at the participant level and re-weighted at the country level. Budget enters quadratically in all specifications. Column (1) uses all levels and pooled disasters, while Column (2) adds interactions with disaster size. Column (3) restricts the sample to the initial simulation levels (Levels 1–4), while Column (4) uses only the final level (Level 5). The reported *p*-value for the quadratic term tests for nonlinearity; the reported joint *p*-value tests whether the budget terms are jointly significant; and the differential-effect *p*-value tests whether the budget relationship differs between small and large disasters. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Effect of PAF attributes on willingness to pay

	Pooled (1)	Small vs. Large (2)
Budget (USD million)	0.287*** (0.0635)	0.287*** (0.0635)
Budget^2	−0.0005*** (0.0001)	−0.0005*** (0.0001)
Speed	3.863*** (0.783)	4.352*** (0.875)
Flexibility	2.930*** (0.706)	2.611*** (0.819)
Speed × Flexibility	0.492 (0.834)	−0.0993 (1.026)
Large disaster		10.04*** (1.445)
Large disaster × Speed		−0.978 (0.843)
Large disaster × Flexibility		0.638 (0.848)
Large disaster × Speed × Flexibility		1.183 (1.235)
Observations	20,182	20,182
Within R^2	0.0775	0.129

Notes: Dependent variable is WTP, measured in USD million. All models are estimated using fixed effects with standard errors clustered at the participant level and re-weighted at the country level. Budget enters quadratically in all specifications. Column (2) allows the effects of PAF attributes to differ between small and large disasters. In Column (2), we report how those effects differ for large disasters relative to small disasters by attributes. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Effect of PAF attributes on WTP by country

	(1) KEN (1)	(2) KEN (2)	(3) MWI (1)	(4) MWI (2)	(5) NGA (1)	(6) NGA (2)	(7) SEN (1)	(8) SEN (2)	(9) ZMB (1)	(10) ZMB (2)
Speed	1.455 (1.049)	1.621 (1.299)	9.977*** (1.900)	9.814*** (2.061)	3.392*** (0.956)	3.828*** (1.144)	3.458* (1.862)	4.500* (2.438)	0.977 (2.282)	1.884 (2.357)
Flexibility	2.555** (0.979)	1.680 (1.259)	6.630*** (1.952)	5.892*** (1.997)	1.399* (0.819)	0.710 (1.025)	1.100 (1.608)	3.746 (2.334)	1.636 (1.603)	0.0234 (1.822)
Speed × Flexibility	−0.453 (1.444)	−0.403 (1.615)	−2.122 (2.182)	−1.797 (2.499)	−0.543 (1.030)	−0.558 (1.295)	1.540 (1.901)	−2.250 (3.243)	4.348* (2.190)	4.415* (2.201)
Large disaster	10.63*** (2.409)	9.955*** (2.337)	6.562* (3.411)	5.810 (3.537)	11.14*** (1.965)	10.87*** (2.066)	8.455** (3.371)	10.23*** (3.127)	13.83*** (3.680)	13.16*** (4.430)
Political incentives	0.816 (1.161)	0.816 (1.161)	1.339 (1.020)	1.339 (1.021)	1.703* (0.936)	1.703* (0.936)	5.734** (2.502)	5.734** (2.504)	2.371* (1.303)	2.371* (1.304)
Budget (USD million)	0.446*** (0.112)	0.446*** (0.112)	0.395*** (0.113)	0.395*** (0.113)	0.354*** (0.0975)	0.354*** (0.0975)	−0.363* (0.202)	−0.363* (0.203)	0.473*** (0.102)	0.473*** (0.102)
Budget^2	−0.0009*** (0.0002)	−0.0009*** (0.0002)	−0.0007*** (0.0003)	−0.0007*** (0.0003)	−0.0007*** (0.0002)	−0.0007*** (0.0002)	0.001** (0.0004)	0.001** (0.0004)	−0.0009*** (0.0002)	−0.0009*** (0.0002)
Large disaster × Speed		−0.332 (1.247)		0.326 (1.884)		−0.874 (1.078)		−2.085 (1.884)		−1.813 (2.765)
Large disaster × Flexibility		1.751 (1.319)		1.477 (1.989)		1.380 (0.988)		−5.290** (2.447)		3.225 (2.167)
Large disaster × Speed × Flexibility		0.099 (1.447)		−0.650 (2.690)		0.0305 (1.370)		7.578** (3.572)		−0.134 (3.853)
Observations	5,342	5,342	3,326	3,326	6,608	6,608	2,102	2,102	2,804	2,804
Within R^2	0.122	0.123	0.136	0.136	0.180	0.181	0.208	0.210	0.150	0.152

Notes: Dependent variable is WTP in USD million. All models are estimated using fixed effects with standard errors clustered at the participant level and re-weighted at the country level. Budget enters quadratically. Specifications (2), (4), (6), (8) and (10) include interactions with disaster size. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

ANNEX C: COUNTRY-SPECIFIC RESULTS

Figure 16: Awareness of various DRF instruments by country

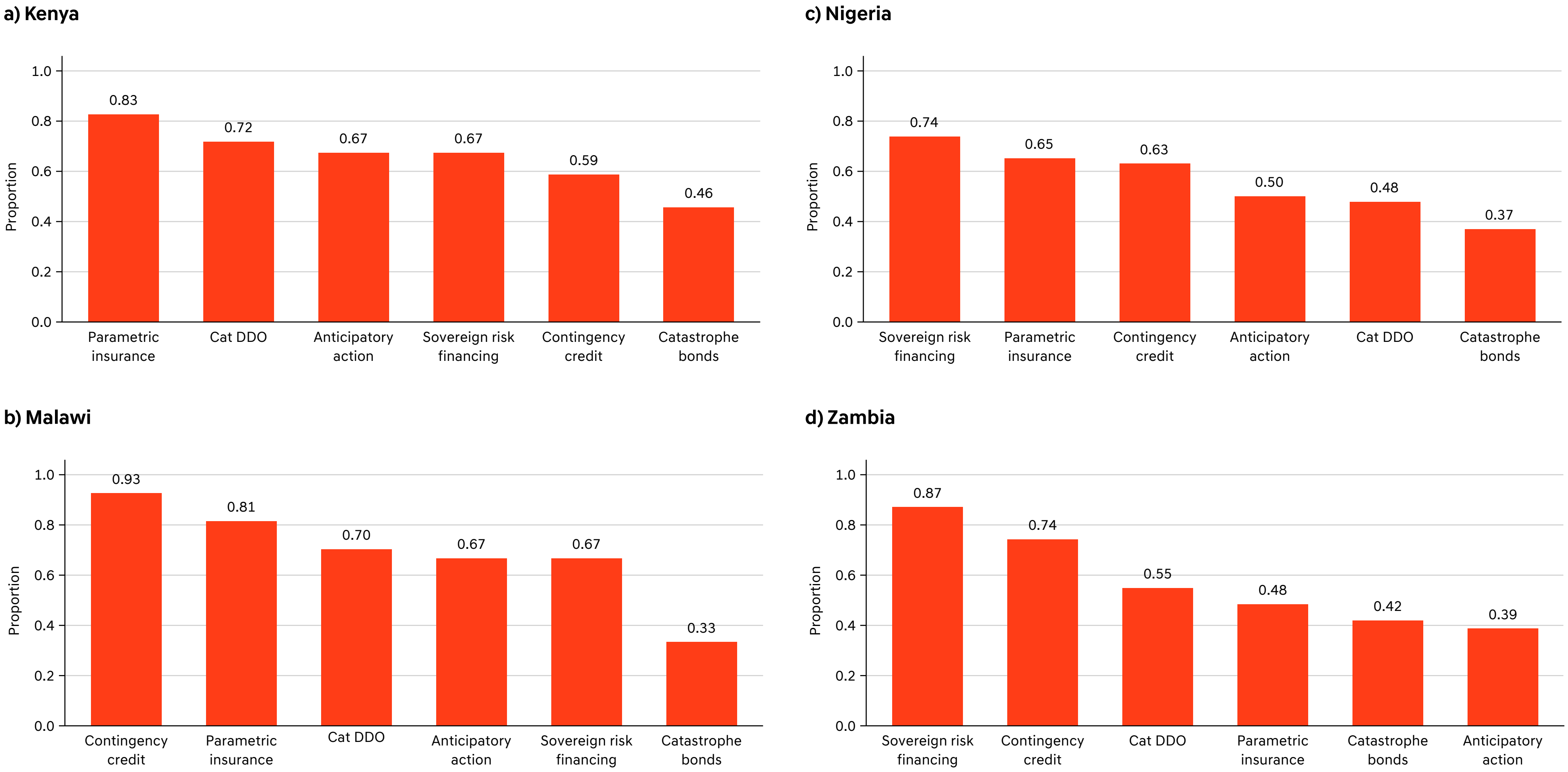


Figure 17: Ranking of various PAF attributes by country

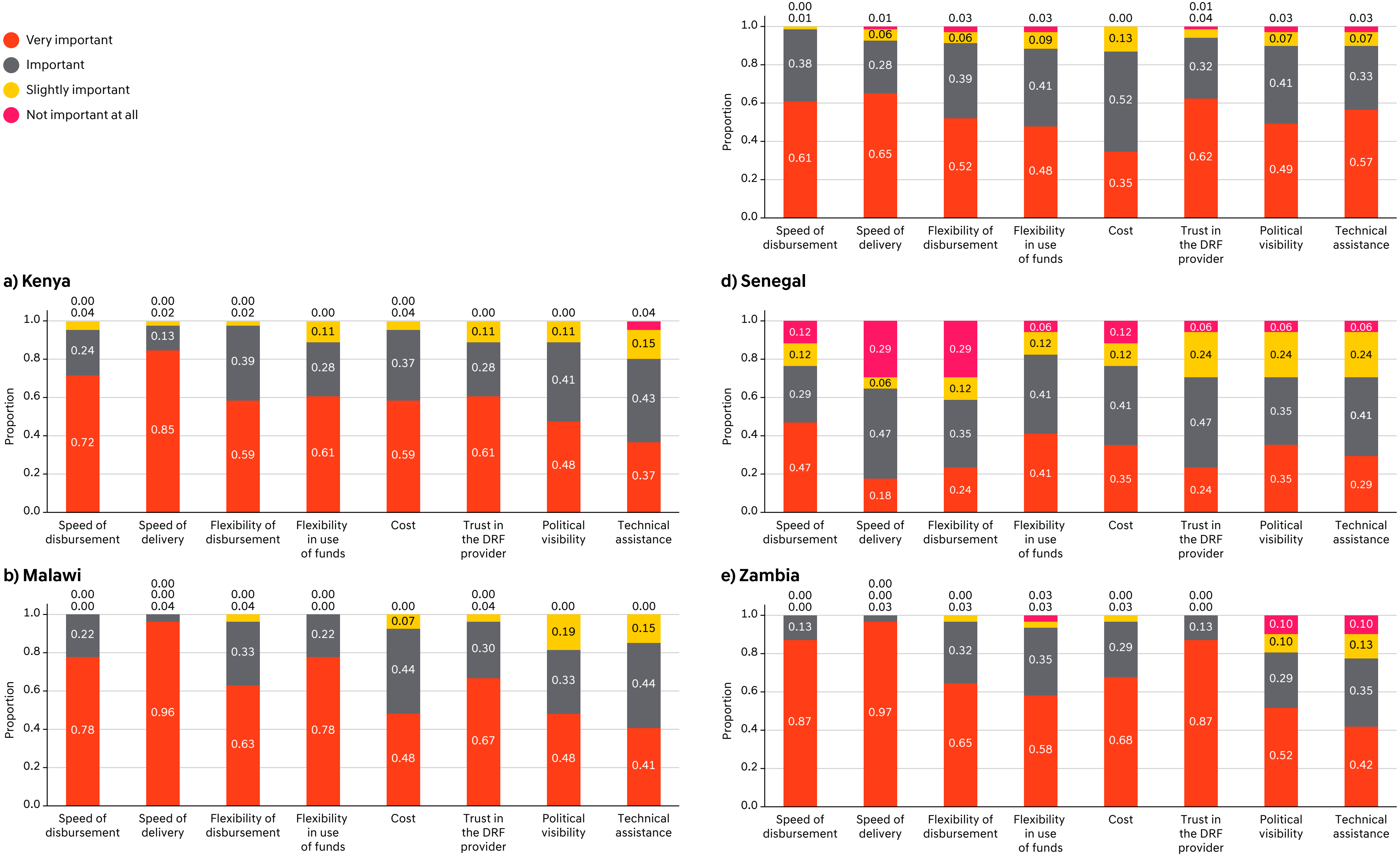


Figure 18: Role of internal and external expertise by country

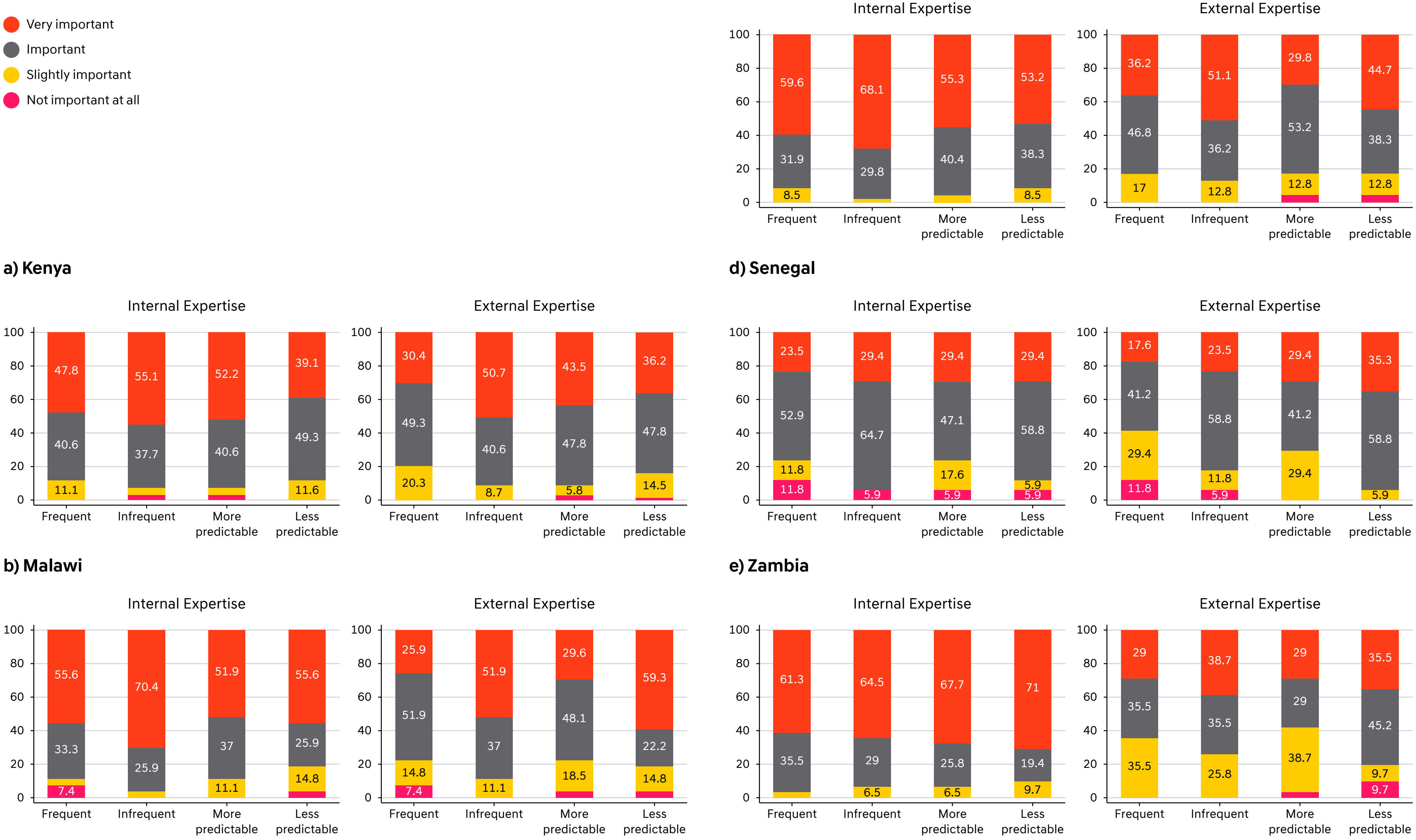


Figure 19: Main challenge for governments in DRF decisions by country

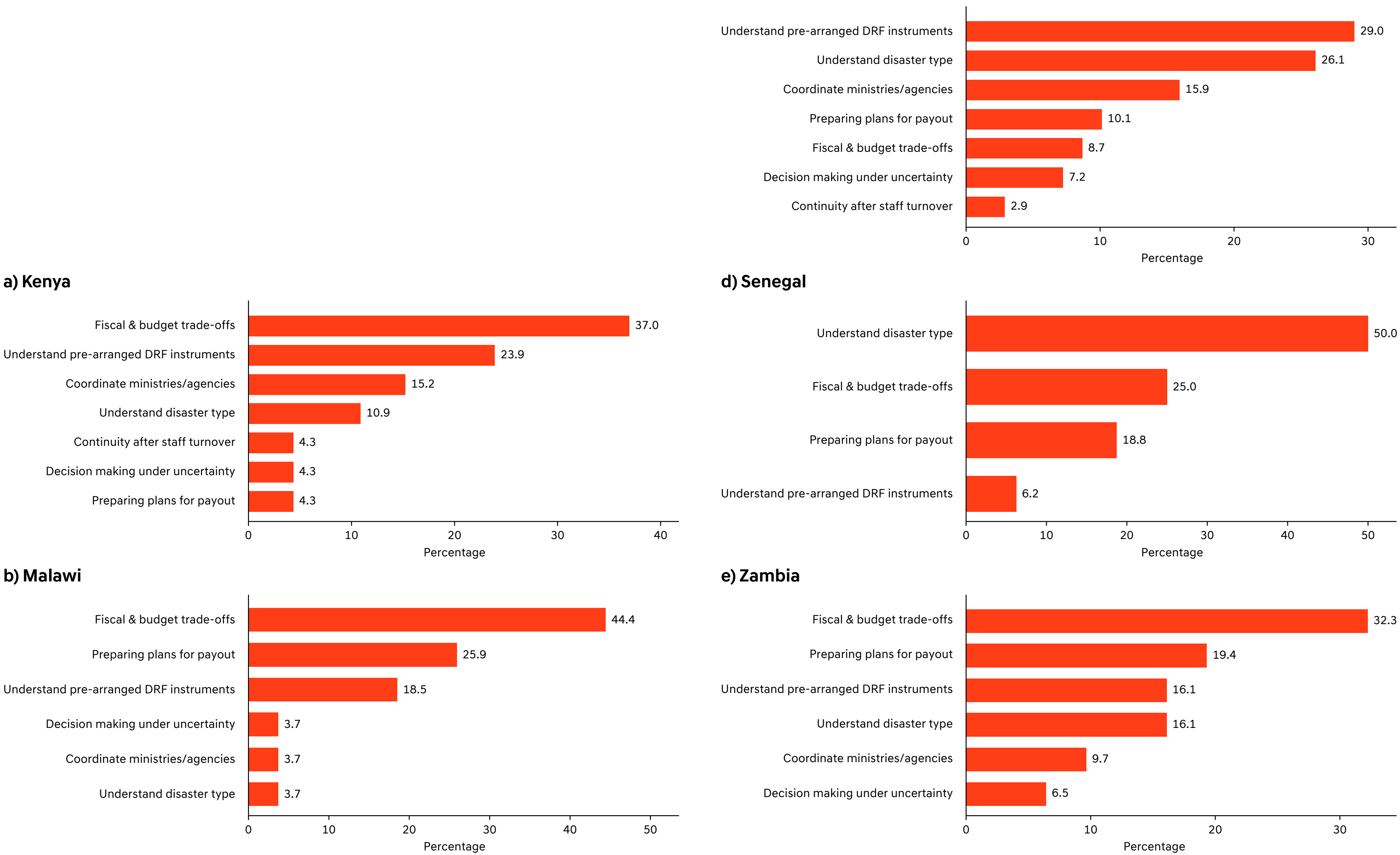
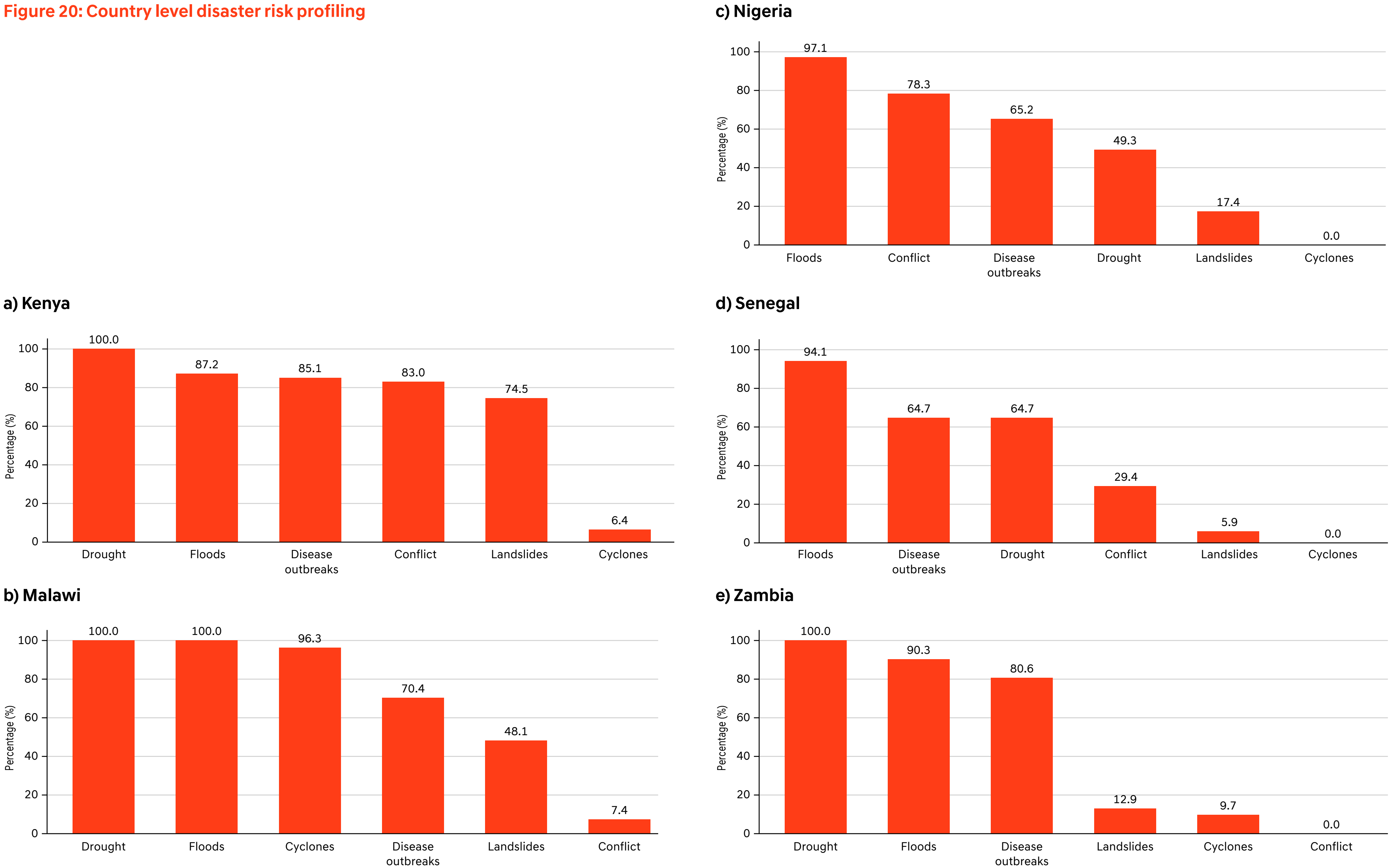


Figure 20: Country level disaster risk profiling



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Cover photo: Public mini buses, known as Danfos, travel through the streets of Lagos, Nigeria. (Benson Ibeabuchi / Bloomberg via Getty Images)