

Why should we apply a disruptive methodology and system thinking to assess the value of disaster-risk microinsurance?

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Abstract: In this article I approach the issues related to the value of disaster-risk microinsurance products that offer protection against extreme natural events. I also discuss the need to develop a new disruptive assessment methodology that considers a risk-layering approach and system thinking for the analysis of the microinsurance product, without separating it from “people” and “planet”. The article also explores the link between economic development, social protection and resilience. I review the international literature on the subject and expand the knowledge on the industry, based on more than 15 years of work experience with insurance and development projects focused on Latin America and the Caribbean.

Keywords: Climate change, evaluation tools, inclusive insurance, microinsurance, resilience.

Resumo: Neste artigo abordo as questões referentes ao valor dos microsseguros que oferecem proteção contra eventos naturais extremos. Discuto ainda a necessidade de elaboração de uma nova metodologia de avaliação disruptiva que considere uma análise a vários níveis e um pensamento sistêmico, e não desconecte o produto de seguro das “pessoas” e do “planeta”. O artigo também explora a ligação entre desenvolvimento econômico, proteção social e resiliência. Reviso a literatura internacional sobre a temática e, por outro lado, agrego conhecimento do terreno, decorrente de mais de 15 anos de trabalho com seguros e projetos de desenvolvimento focados na América Latina e no Caribe.

Palavras-chave: Instrumentos de avaliação, microsseguros, mudanças climáticas, resiliência, seguros inclusivos.

Nobody is an island.
We all are interconnected.
And our actions have consequences – for all of us.
(UNU-EHS, 2021: 7)

Introduction and background

There is increasing evidence that climate change poses financial risks to the global economy and is exacerbating the negative impacts of natural hazards (Cissé *et al.*,

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2021; Coronese *et al.*, 2019; Hoeppe, 2016; IAIS, 2018a; IPCC, 2018). It is already threatening people's food security, nutrition and livelihoods globally, especially for those disadvantaged by gender, age, race, class, caste, indigeneity and disability (Hallegatte *et al.*, 2016; Olsson *et al.*, 2014).

The interconnectivity of environmental and human-made hazards and their impacts on livelihoods is unmistakable (UNU-EHS, 2021), and continues to grow at an increasing rate (Sett *et al.*, 2021), particularly in the Global South. The number of publications that demonstrate the linkages between climate change, environmental change, biodiversity loss and human migration and mobility is also rising (Government Office for Science, 2011; Piguet *et al.*, 2011). The need to look beyond isolated cases to understand how and why such events are interconnected is thus a reality. The same rationale can be applied to assess and evaluate microinsurance products, which often disregard the complete system and its interconnectivities. We cannot look at disaster-risk microinsurance products without correspondingly looking at people and the planet.

The International Association of Insurance Supervisors defines “microinsurance” as risk-financing mechanisms targeted at low-income populations, provided by a variety of entities and run in accordance with generally accepted practices (IAIS, 2015). The term “inclusive insurance” has a broader sense and denotes all insurance products aimed at the excluded or underserved market. Yet, in this article, I use both terms interchangeably, hence covering all the products that fit within the latter definition, even if some of these falls outside the scope of microinsurance in particular contexts.

Emerging and developing countries, and especially smallholder farmers and women living in them, are often highly vulnerable to climate-related risks but have limited access to risk-financing tools and services (IAIS, 2018b). Thus, they are poorly equipped with the necessary coping capabilities to recover from recurrent losses, despite being some of the most affected by the increasing frequency and severity of extreme weather events.

Effectively managing climate-related risks requires a comprehensive set of methods and tools that should be applied in an iterative manner. Over the last 10 to 12 years, the approach to disaster-risk management (DRM) has moved away from

having disaster mitigation as its main component, by adding disaster-risk financing and ecosystem management to the equation (MCII, 2020: 8): “Disaster risk mitigation + ecosystem management + disaster-risk financing + social-protection strategies (including psychological impact of future disasters on our populations) = disaster preparedness”.²

For disaster preparedness to be implementable and cost effective, governments should include a climate and disaster-risk financing and insurance (CDRFI) strategy as an integral component of their DRM plan. Finance is necessary to effectively manage disaster risks, but is not sufficient. Thus DRM plans must also integrate (and resource) activities in different fronts: risk assessment, risk prevention, risk reduction and mitigation, emergency preparedness, institutional capacity building, and rebuilding and reconstructing (Cissé, 2021; Fernandez *et al.* 2019).

Climate-risk insurance (CRI) is one of the many tools available to policymakers in the field of CDRFI and can play a role in different risk-management areas. The appropriate use of insurance requires an innovative approach, combining risk assessments, risk layering,³ and complementary actions to address the underlying risk causes (Hallegatte *et al.*, 2017). Risk layering can be more cost-effective than implementing a standalone instrument. For instance, an empirical study in Mozambique found that a DRM strategy of improving irrigation could reduce insurance costs by at least 30% (Biffis and Chavez, 2017).

In my opinion, it is important to start applying an integrated disruptive methodology and system thinking to assess the value of microinsurance products worldwide. At the same time, it is important to consider how these specific products (bundled⁴ or not) fit within the DRM arena and add value to the complete stakeholder chain. Responding to the climate crisis requires concerted efforts from all countries, cities, financial actors, the insurance industry, businesses and, most importantly, each citizen. This is the only way to move the conversation forward when applying systemic solutions.

² This equation is proposed by the Caribbean Catastrophe Risk Insurance Facility (CCRIF-SPC) to its members in terms of the elements that disaster preparedness should incorporate (MCII, 2020).

³ Risk layering involves implementing a set of tools that collectively address multiple risk layers, from high-frequency/low-impact hazards to low-frequency/high-impact hazards, across all the population.

⁴ Bundled refers to a product that is either sold in combination with another insurance product or in combination with any other non-insurance product or service.

Microinsurance, resilience and evidence generation

Disaster-risk microinsurance is seen as a way to break the vicious cycle of vulnerability and poverty (Cohen and Sebstad, 2005; Collins *et al.*, 2009; Dercon, 2005). But can this promise be fulfilled? Insurance is not a silver bullet; it is one piece of the resilience “package”, which should always integrate a risk-layered approach and a mix of strategies. As an example, the World Food Programme (WFP) R4 Rural Resilience Initiative combines four risk-management strategies: asset creation and improved agricultural practices (risk reduction); insurance (risk transfer); increased investment, livelihood diversification and microcredit (prudent risk taking); and savings (risk reserves) (WFP, 2021).

There is a growing understanding among different stakeholders that countries, communities and people can have their long-term resilience improved by the development and delivery of integrated insurance, risk-financing and investment solutions, from products, tools and services (Hillier, 2018). One of the cross-cutting topics mentioned by the new UNDP Insurance and Risk Finance Facility is “advocacy, research and evidence” (UNDP, 2021). Similar approaches have been already initiated by different donors and implementers, such as the International Labour Organization (ILO) Impact Insurance Facility, WFP, the Swiss Agency for Development and Cooperation, the European Union and KfW Development Bank.

Low-income and underserved populations can benefit directly (e.g. through reduced out-of-the-pocket expenditures in case of a shock, smooth cash flows or access to health providers) (Ekman, 2004; Hamid *et al.*, 2010) or indirectly (through “peace of mind”) from insurance protection. In microinsurance, the need for providing customer value is particularly relevant, as this can often be the first contact that the person has with insurance and/or formal financial services (IAIS, 2015). Uninsured risk changes how households make decisions that affect their livelihoods today and in the future (Carter and Chiu, 2020).

According to the insurance theory, microinsurance — like “traditional” insurance — is replacing “the uncertain prospect of losses with the certainty of making small, regular premium payments” (Deblon and Loewe, 2012: 21). Households can thus

invest in profitable opportunities and, when a disaster strikes, they can reduce the use of costly or negative coping strategies. This is because individuals, institutions and governments want to “soften” or balance their consumption across different “states of nature” or possible real-world outcomes such as health, disease, bountiful harvests and extreme weather events.

Increasing the offer of and access to insurance coverage could therefore help to put emerging countries (and their populations) in a better position to cope with the economic shocks that follow extreme natural events. Four decades ago, only about 25% of losses resulting from such events were insured, even in highly developed countries (Munich Re, 2021). Today, still less than half of all losses are covered. The situation in developing and emerging countries has not improved over time: the proportion of insured losses is still well below 10% and often almost zero (Munich Re, 2021).

Evidence suggests a causal relationship between insurance, market activity and economic growth (Arena, 2006; Haiss and Sümegi, 2008; Lester, 2014; Outreville, 2011; Ward and Zurbrugg, 2000). When hit by an extreme event, countries with a robust insurance industry recover faster than countries with low insurance penetration. However, many microinsurance products available today are not adequate for addressing climate risks faced by the low-income and underserved populations. Also, these often do not expand over pilot phases (due to the funding cycles, programme requirements and donor accountability). Such products end up experiencing low uptake, not reaching the adequate scale for their sustainability, which leads to their discontinuation long before payouts can occur.

Over the last 15 to 20 years, there has been a considerable amount of innovation in the CDRFI arena, as governments and communities have become more aware of and increased their demand for financial planning in preparation for extreme events and other emergencies. Growing advances in data management, technology and modelling have enabled the integration of financial planning and DRM programming, leading to the development of innovative CRI instruments, mainly with the support of donors and international organizations. However, insurance uptake at all levels

(micro, meso and macro) remains limited.⁵ According to the *2021 Landscape of Microinsurance*, the number of people covered globally by microinsurance (considering all product types) in 2020 represented between 6% and 14% of the target population — that is, the number of people earning between USD2 and USD20 per day on a purchasing-power-parity basis (Merry, 2021). Disaster-risk products still have few schemes reported worldwide.

Since the launch of the InsuResilience Initiative on Climate Risk Insurance,⁶ in 2017, the speed of innovation has increased. However, investments have often not been accompanied by adequate endeavours in monitoring, evaluation, evidence generation and learning (Scott, 2020). Increasing efforts have been developed and tested worldwide in this regard (Cissé *et al.*, 2021; GRFF, 2021). Nevertheless, in some cases, organizations and donors end up financing the design of new solutions without having full access to evidence from existing microinsurance or pilots that could be adapted to a different region/context.

There is a lack of rigorous evidence on CDRFI and most empirical research consists of case studies and success stories (GRFF, 2021). The World Bank's Global Risk Financing Facility recently conducted a study to better understand the evidence behind disaster-risk financing instruments and performed a literature review of nearly 250 documents. According to the report, less than half of the documents provided a stated methodology and only 16% followed a qualitative, quantitative or mixed-methods approach (GRFF, 2021). The evidence base for macro-level products consisted mostly of cost-effectiveness studies, scenario analysis, loss modelling and qualitative approaches drawing on key-informant interviews, for example.

It is critical to understand that efficiently assessing microinsurance requires a thorough understanding of not only the costs of natural hazards but also the product's value to the end beneficiaries, communities, implementers, governments and, why

⁵ Micro-level products directly insure low-income, vulnerable and underserved populations (they are targeted at individual policyholders or groups). Meso-level solutions insure organizations working with vulnerable communities (MFIs, cooperatives, NGOs, humanitarian organizations, etc.). Macro-level solutions aim to directly protect national or local governments and reduce the burden after an extreme event. Examples of sovereign-level facilities at the national scale are the African Risk Capacity (ARC) and CCRIF-SPC.

⁶ Launched at COP23 in Bonn as a joint G7, G20 and V20 initiative, the InsuResilience Global Partnership has as its vision strengthening the resilience of developing countries and protecting the lives and livelihoods of poor and vulnerable people against the impacts of disasters and other climate risks.

not, to our planet. Unfortunately, the current methods used to assess the value and impact of microinsurance products often employ a variety of methodologies and approaches for different impacted sectors, which hinders the efforts to establish comprehensive and comparable figures.

Data and evidence are key but there are significant gaps in the existing literature on microinsurance. The lack of reliable, consistent, standardized and up-to-date data is often mentioned as a central challenge for scaling up CDRFI solutions (GRFF, 2021). Even for the *Landscape of Microinsurance* reports developed by the Munich Re Foundation and the Microinsurance Network since 2011, the lack of reliable data has always been a challenge. For the 2021 edition, out of the 705 insurers targeted to respond to the survey, only 224 completed the questionnaire.

As the field of CDRFI is new, the scarcity of historical data on triggering events can explain the lack of rigorous evidence. However, most disaster-risk microinsurance products are often designed considering low-frequency high-impact hazards. Thus, assessment tools should not rely mainly on triggered events — “ex post” impacts of insurance (i.e. its impact after a disaster strikes) — to produce evidence on the value of such solutions.

There are clear indications that subjective components of resilience, such as self-efficacy, perceived adaptive capacity and risk perception, have an impact on adaptation behaviours (Burnham and Ma, 2017). These could be qualified as “ex ante” effects. Furthermore, there is a growing recognition that people have a strong understanding of their resilience capacities and abilities (Cissé *et al.*, 2021). As a result, subjective resilience measures (both qualitative and quantitative) are increasingly being included in climate-resilience measurements guidelines (Maxwell, 2015) and resilience studies (Béné *et al.*, 2015). Therefore, to design a comprehensive and valid methodology to assess disaster-risk microinsurance, I propose also considering resilience indicators in the context of insurance.

In fact, insurance as a risk-transfer mechanism is seen as having a critical role to play in directly delivering nine of the SDGs (A2ii, 2021), by reducing vulnerabilities to socioeconomic, climate, health and disaster risks. Yet, SDG indicators largely do not capture insurance metrics, even when the SDG target implies that insurance is included (Chiew, 2021). There is a need for consistent and long-term metrics to assess

progress and success (Carter and Chiu, 2020). How can the insurance industry, implementers, donors and governments make informed decisions regarding piloted interventions to scale up without reliable evidence from existing products and solutions in the long term? What benefits/value can microinsurance bring to the affected communities and policyholders? What are the attributes of an effective, inclusive, sustainable and successful microinsurance programme? How can microinsurance support governments to meet the SDGs?

In a recent report, Hui Lin Chiew summarized the systemic challenges caused by the lack of robust and reliable data, evidence and consistent metrics:

Data and evidence are the key missing pieces in a vicious cycle: the less insurance data is made available, the smaller the pool of evidence, the less decision-makers are able to grasp the impact of insurance on development goals, thus the more insurance will continue to be underused as a development tool. Insurance supervisors, policymakers and the insurance industry can join forces to take the first step towards breaking the cycle by collecting the necessary data (Chiew, 2021: 6).

To help strengthen the resilience of low-income and climate-vulnerable people globally, the CDRFI community must focus on the evidence-based scaling of solutions, but also on an organized strategy for evidence building. The InsuResilience initiative proposed a roadmap that has different paths: one being by influencing laws, policies and the global disaster-risk finance infrastructure; another one by scaling up products to reach more people through the replication and contextualization of successful solutions (going beyond pilots); and, in the long term, by promoting behavioural change through the understanding of local needs and values (Cissé, 2020; Cissé *et al.*, 2021; Moore *et al.*, 2015).

Evidence-generation and product-assessment frameworks — why to apply a disruptive and system-thinking approach?

Why disruptive? The word disruptive, understood as “making things that turn the old things obsolete” (Acaroglu, 2017: 8), has been used countless times in different fields, along with the word “innovative”. Most disaster-risk microinsurance schemes are coined as “innovative”. Yet, as a concept, innovation does not embed any social and ecological value sets. This is why I suggest using an adapted version of the Disruptive Design Method coined by Leyla Acaroglu (2017) to challenge the available

methodologies. This unique multidisciplinary approach is highly efficient to activate positive change by combining knowledge covering disciplines such as design thinking, sociology, environmental sciences, behavioural economics and system thinking.

This rationale can be explained as follows: nearly everything around us can be defined as a system.⁷ Thinking in systems enables exploring the world in more manageable ways without disregarding the larger complex “whole”. As problems are connected to many other elements within dynamic systems, if we only treat a symptom or piece, we will not see the cause-and-effect relationships. Problem solvers and insurance practitioners must catalyse creative changes and avoid reductionist thinking to uncover all the dynamics that might be influencing a problem, such as low uptake, lack of insurance awareness or index reliability. Thus, by using the disruptive approach to develop a new methodology, it is possible to seek out the parts that make up the whole, by looking for the connections between “people, product and planet” (Acaroglu, 2017).

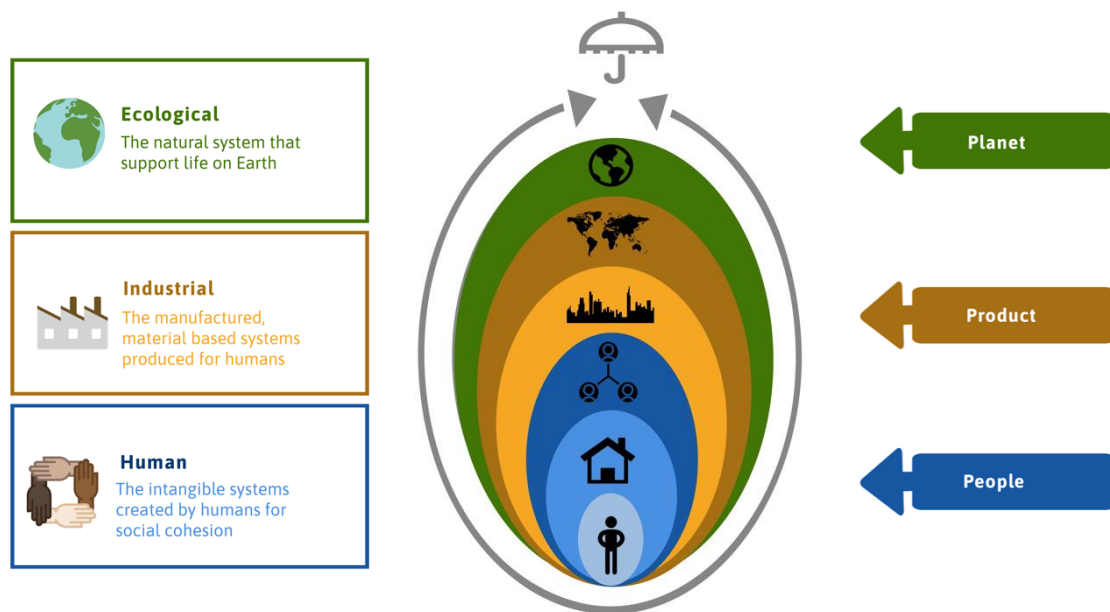


Figure 1: Interconnected systems at play.

Source: Author’s version adapted from “Three interconnected systems at play” (Acaroglu, 2017) and the “Holistic ecosystem approach to resilience-building” being developed by WFP Guatemala (draft document consulted by the author).

⁷ According to Donella Meadows (2008: 11): “A system isn’t just any old collection of things. A system is an interconnected set of elements that is coherently organized in a way that achieves something. If you look at that definition closely for a minute, you can see that a system must consist of three kinds of things: elements, interconnections, and a function or purpose”.

I propose that CDRFI solutions be seen as sets of related components that are part of the DRM system, which is also a component of a broader and more complex system. Relationships cause feedback loops and create flows between different elements of a system. One can then identify, observe, understand and intervene in these relationships to create different dynamics (e.g. microinsurance product design).









When discussing assessment tools and methodologies for microinsurance programmes, it is essential to understand “the problem we are trying to solve” and define the goal we are trying to achieve with a specific product or set of interventions by acknowledging what exactly is happening at the different levels. All things are connected, and therefore a system-thinking approach is needed to explore and identify the fundamental parts of the complex arena of disaster-risk microinsurance. The insurance industry can design interventions that catalyse positive, structural and lasting changes but, up to now, most of the evidence is generated in a fragmented way (GRFF, 2021).

There are a few manuals and methodologies that help in preparing and conducting impact studies and performance evaluations of insurance products and programs, such as the *PACE tool*, *Client Math* and the *3D Tool*. The latter has been created by the ILO Impact Insurance Facility and the Assets and Market Access (AMA) Innovation Lab by merging the Facility’s *PACE tool* with AMA’s calculations for *Minimum Quality Standards* for index insurance. This tool allows insurance practitioners or donors to measure the value of their agricultural index insurance.

A review of methodologies and approaches commonly applied in the microinsurance domain is shown in Table 1. The list was adapted and expanded from a previous publication of the MicroInsurance Centre (Matul *et al.*, 2011).

The listed methodologies have been tested and applied in several countries by different stakeholders; nevertheless, in my opinion there is a need for a methodology that considers a multilayer approach. A combination of the current methodologies could be created to incorporate new technologies applied in the field of CRI to design and monitor products such as earth-observation data supplemented with ground-referenced data (Benami *et al.* 2021), picture-based insurance (Ceballos *et al.*, 2020), blockchain technology, artificial intelligence and Internet of things. Such a composed methodology should also duly consider each country’s context and advancements in achieving the SDGs.

Table 1: Available tools to assess the client value of microinsurance.

Tool	Year	Rationale	Type	Stage	Data source	Complexity / costs
<u>Key Performance Indicators for Microinsurance</u>	2010	Raise red flags about current client-value performance	Ongoing monitoring	After product launch	Management Information Systems (MIS)	 Low
<u>Social Performance Indicators for Microinsurance</u>	2013	Raise red flags about current social performance of products	Ongoing monitoring	After product launch	MIS	 Low
<u>PACE</u>	2011	Identify value-creation opportunities; explore strengths and weaknesses of current design in relation to alternatives	Ad hoc audit	Product development or later	Secondary data on current design and policyholders	 Low to medium
<u>3D Tool</u>	2018	Allow insurance providers to measure the value of their agricultural index insurance products	Ad hoc audit	Product development or later	Primary and secondary data on policyholders, management and sales staff, MIS	 Medium
<u>Client Math</u>	2011	Understand the financial value at the time of a claim of products in comparison to alternative risk-coping mechanisms	Ad hoc study	For more mature products	Primary client interviews and MIS	 Medium
<u>Client Satisfaction Study</u>	NA	Understand client satisfaction, renewal behaviours and policyholder loyalty	Ad hoc study, ongoing monitoring	Product refinement	Primary and secondary data on current policyholders, MIS	 Medium
<u>Market Study</u>	NA	Understand the needs and preferences of the target population	Ad hoc study	Product development	Primary and secondary data on current and prospective policyholders	 Medium to high
<u>Academic Impact Study</u>	NA	Assess impacts on indicators related to the wellbeing of households and communities	Ad hoc, longitudinal study	For more mature products	Primary and secondary data, at least two rounds of data collection	 High

Source: Adapted from Matul *et al.* (2011).

Most methodologies to date apply different approaches, usually a mix of quantitative and qualitative methods at the “micro level”, with interviews with policyholders, implementers and enablers, such as insurers and donors. A comprehensive analysis of the product design and features is often conducted by independent evaluators. However, these often do not consider possible connections to incorporate other layers, or the impacts of such products at the macro and meso levels (communities, cities, countries, regions, the planet, food systems, biodiversity loss, environmental degradation, local economies etc.) and their linkages with the individuals (people).

Conclusion and way forward

Designing a risk-layered and concise tool to assess the value of disaster-risk microinsurance is challenging, but there is an emergent need, as pilots and programmes start to grow. At the same time, there is a window of opportunity, with technology and an enabling political environment playing an important role.

By creating a repository of comparable and reliable data, the insurance industry can start monitoring and evaluating programmes, considering not only the successes and good practices, as often done at the end of a programme at its final evaluation. Getting data from all levels is also extremely important to construct the entire system, meaning that we should use technology to create this articulated repository of data and assessment tools. By providing evidence of good and not-so-good practices linked to a broader context, one could support the industry to move in the right direction towards a sustainable future for CDRFI.

The use of a disruptive methodology and system thinking to assess disaster-risk microinsurance products can contribute to the creation of compared and reliable metrics and evidence regarding CDRFI, to guide practitioners, donors, governments and individuals. As demonstrated above, there is a growing number of emergent methodologies and metrics, and the literature reviewed suggests that the insurance industry could benefit from a standardized and risk-layered approach that would connect products not only to people but also to the planet.

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