

Strengthening Financial Resilience in Agriculture Knowledge Exchange Series Part 2

Disaster Risk Financing Solutions for Climate-resilient Livelihoods in the Agricultural Sector

Session 3:

**Lessons learned and impact of
meso-level index based
insurance and credit solutions**

**Disaster Risk Financing
& Insurance Program**



USAID
FROM THE AMERICAN PEOPLE

Structure of Webinars



Total of 4 Factsheets & 90-minute Webinar for each Factsheet



Different guest speakers



Q&A: Please share your questions via chat



Participants will have an opportunity to obtain "Certificate of Informed Policymaker" from the World Bank on successful completion of following criteria:

Completion Certificate:

Participants need to attend 4 webinars and complete a short survey/quiz.

What will the four webinars cover?



1

A brief history of index-based livestock insurance, the state of global evidence on its impact and implications



2

Climate-responsive financial products and global evidence on strengthening climate resilience



3

Lessons learned and impact of meso-level index based insurance and credit solutions



4

The latest technology for agricultural and climate finance
















Introduction to meso-level index solution

Qhelile Ndlovu

Financial Sector Specialist,
World Bank Group

Definition of Macro- / Meso- / Micro- Level Index Insurance

Type of Insurance	Who is Policyholder	Needs met/ Objectives	Mechanisms of the solution
 Macro	National/regional government Developmental or humanitarian mandate	Protect national budget against climate shocks and disasters Social protection and food security Immediate liquidity to increase speed and reduce cost of emergency disaster response	 Farmer Government sets the payout rules to individual farmers  Government or development organization premium  payout  Insurer
 Meso	Financial institutions (MFIs, banks, cooperatives) Agricultural enterprises (agro-processors, administrators of contract farming schemes)	Protect loan portfolios against defaults Ensure business continuity Provide recovery lending to borrowers Improve risk management Protect business operations against yield shortfall May protect contract farmers (when part of payout shared with farmers)	May use payouts internally to mitigate portfolio risks, which supports farmers indirectly  Financial institutions premium  payout  Insurer
 Micro	Individual farmers May be grouped in farmer organizations	Immediate liquidity in event of climate shocks and disasters To increase investments in productivity	 Farmer premium  payout  Insurer

Micro vs Meso



Micro

Clear that farmers get payments

Lack of demand

Buyer may be less financially savvy

Difficult to scale

High delivery cost

Expensive

Basis risk remains an issue

B/C for smallholders may be an issue

Subsidies are likely to be unsustainable



Meso

Farmer is less likely to get the payment

Lack of demand

Buyer may be more financially savvy

Potential to scale

Reduced delivery cost

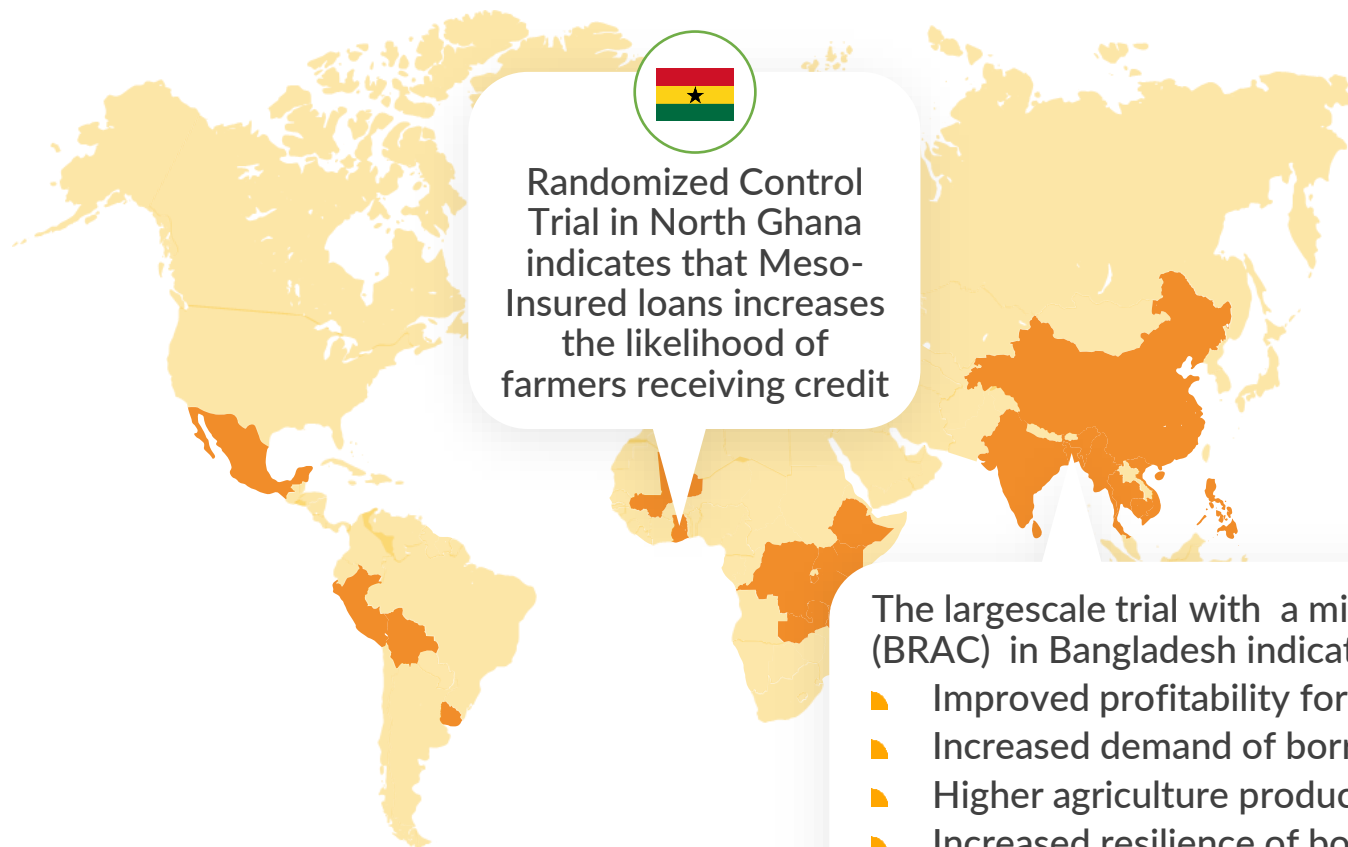
Potential to pool risk to get better pricing

Less basis risk (statistical aggregation)

Business rationale is stronger

Subsidies may not be needed or can be phased out

Emerging evidence of meso-level index solutions



Randomized Control Trial in North Ghana indicates that Meso-Insured loans increases the likelihood of farmers receiving credit



The largescale trial with a microfinance institution (BRAC) in Bangladesh indicates some impacts:

- ▶ Improved profitability for the MFI;
- ▶ Increased demand of borrowers;
- ▶ Higher agriculture productivity;
- ▶ Increased resilience of borrowers



**Theory of change of
meso-level index
solutions and the
case of VisionFund's
ARDIS**

Jerry Skees

Founder and Director
Global Parametrics



**Global
Parametrics**

- Understand Risk
- Own Risk
- Manage Risk

What is Meso-Level Parametric Insurance?



The parametric insurance is purchased by what we refer to as a 'risk-aggregator'.



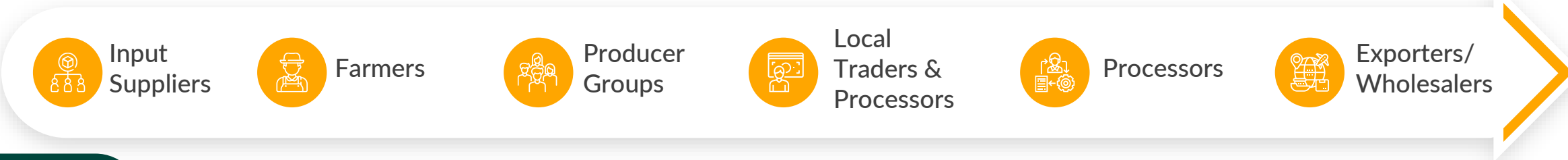
In the case of agriculture, consider the value chain that serves smallholder farmers

- Input suppliers (agrilender, seed, fertilizer, feed for animals, etc.)
- Output purchasers (warehouses, processors, exporters, etc.)
- Collective groups of farmers (cooperatives, water user associations, farmer unions, etc.)
- NGOs supporting famers (humanitarian organizations, collective actions groups, etc.)

Financial Services



Value chain suppliers



What Problem are we trying to solve?

Core challenge with correlated risk – many are impacted by the same event

Firms in the value chain know extreme events impacting large numbers of farmer impact their finances

- Understand Risk
- Own Risk
- Manage Risk

Use of Funds

Pass through to farmers (underlying risk and price can remain relatively high)

- ▶ Tobacco company in Africa supported their farmers with a maize drought product
- ▶ Financial institution ties payments to loan forgiveness,
- ▶ GP has worked with One Acre Fund and Climbs (Wendy will cover)
- ▶ Peru MFI purchase of ENSO Insurance (used to expand lending into risky areas)
- ▶ World Bank DRC project to support climate smart agriculture

Protection of their own financial exposure (opportunity to gain more efficiency in pricing)

- ▶ Cotton processor in Texas to protect their revenue ($\text{rev} = \text{margin} * \text{volume}$) – 2001
- ▶ South African grain elevator to protect their revenue ($\text{rev} = \text{margin} * \text{volume}$)
- ▶ Financial institution to protect their balance sheet
- ▶ GP has worked with VisionFund International and Enabling Capital



Who Pays?

Event-based (Parametric) DRF Solutions

- Understand Risk
- Own Risk
- Manage Risk

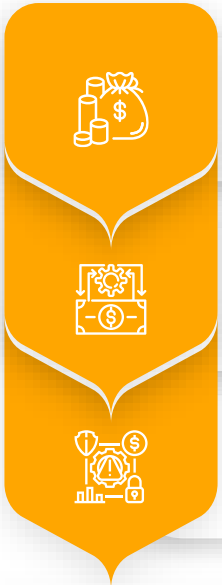


Event-based structures trigger payments based on statistical rank of geophysical events



Higher ranked (less frequent) and more severe events require greater financing

The same statistical ranking processes can be use for

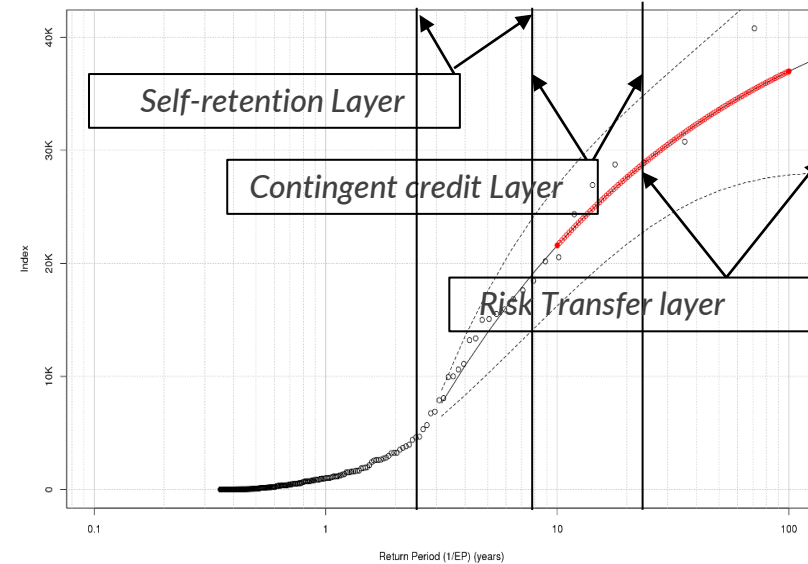


Financing triggers for self-retention reserves

Financing triggers for contingent credit for liquidity

Financing triggers for risk transfer for capital

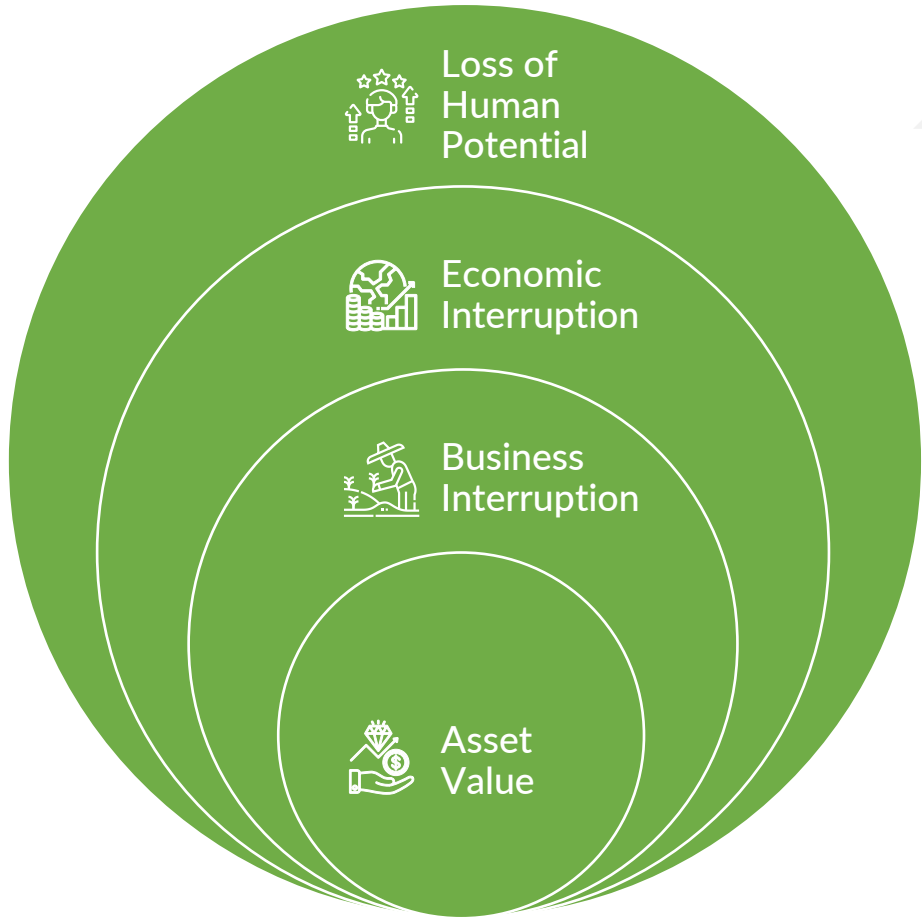
- ✓ Fast payments
- ✓ Balance Sheet Protection (BI Insurance)
- ✓ No loss assessment costs
- ✓ Limits moral hazard & adverse selection







Risk Layering is used to build efficient Disaster Risk Financing

Why use parametric risk transfer?

- Understand Risk
- Own Risk
- Manage Risk



 <p>Parametric products can cover much larger risk base even serving as a form of Business Interruption Insurance</p>	 <p>Parametric products can be reliably priced & settled</p>	 <p>Automation enables rapid scaling and low admin costs</p>	 <p>More customer centric</p>
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 <p>Indemnity insurance covers the asset loss</p>	 <p>Assets are becoming harder to value 'intangible assets'</p>	 <p>Loss is becoming more difficult to assess Inflation has added liabilities</p>
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Parametric products pay pre-agreed amounts which are settled based on an objective measurement

- Understand Risk
- Own Risk
- Manage Risk

Access to and Cost of Capital



Extreme weather events are correlated impacting a large geography at the same time



The dynamics of business interruption created by geophysical shocks have serious negative implications for **access to and cost of capital.**

Climate risks alone **added 68 to 117 basis points (BPS)** to the cost of capital in low-income countries



We estimated that the cost of capital in N Peru was likely **200bps more** due to extreme El Niño

These estimates are from looking back **excluding seismic risks and pandemics**

Looking forward – UN’s World Meteorological Organization

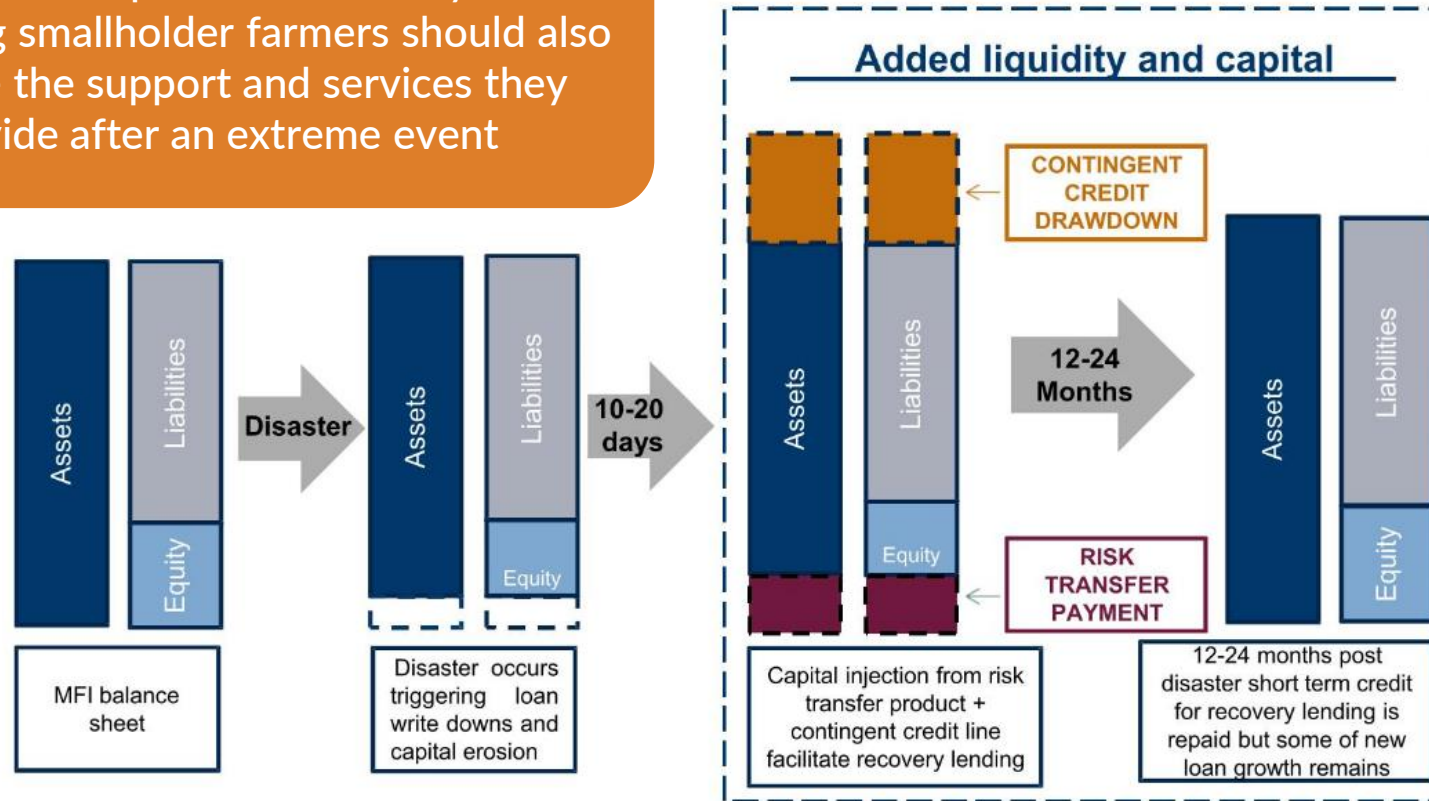
“Extreme weather disasters have increased fivefold in the past 50 years”

Indirect losses are almost always higher for the poor and vulnerable who have limited asset but have livelihood strategies that can push them into poverty traps when there is a geophysical shock

- Understand Risk
- Own Risk
- Manage Risk

Business Continuity – Balance Sheet Protection

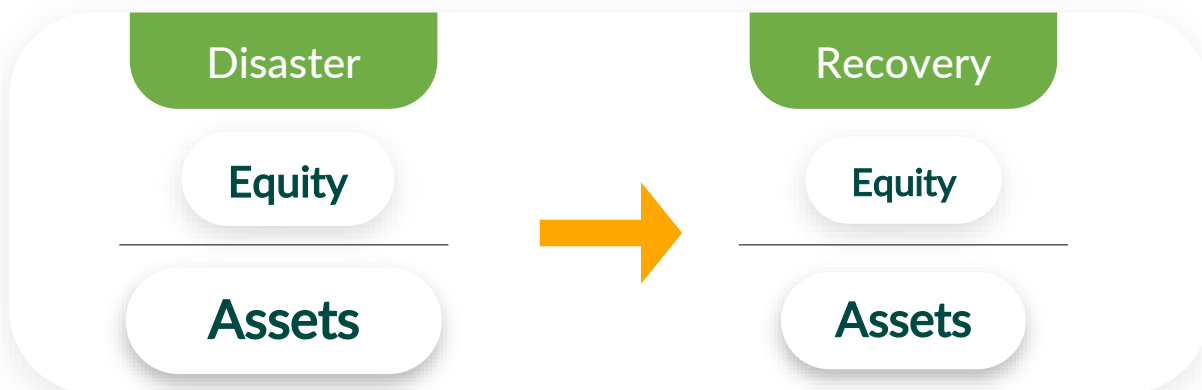
Balance sheet protection for any firm supporting smallholder farmers should also increase the support and services they provide after an extreme event



Theory of Change:

Efficient risk transfer can **open access** and **lower cost** of services offered

DRF Solutions Protect Capital and Improve Performance



DRF provides liquidity and capital

- ✓ Avoiding capital crunch → allows bank to continue profitable lending practices
- ✓ Allowing bank to operate closer to minimum capital ratio, become more leveraged (Allen & Carletti, 2006; Chiesa, 2008)

After disaster, must shrink asset base (Peek and Rosengren, 1995)

- ▀ Reduce loan origination
- ▀ As current loans mature, asset base falls

Main cost of under-capitalization is **foregone profitable lending** (Van den Heuval, 2006)

Protection only part of the capital adequacy is needed reducing the premium needed.

MFI needs a 10% CA ration- Let's protect 5%. Thus, an index priced at 10% RoL x 5% of the loan portfolio will cost 50 bps

For 50 bps, the MFI can protect their portfolio of loans

Impacts on growth of a firm



DRF solutions to protect the balance sheet of businesses slammed by geophysical shocks



DRF solutions allow business continuity by having financing immediately after an event



DRF gives more opportunity 'to build back better' using experience of the recent shock



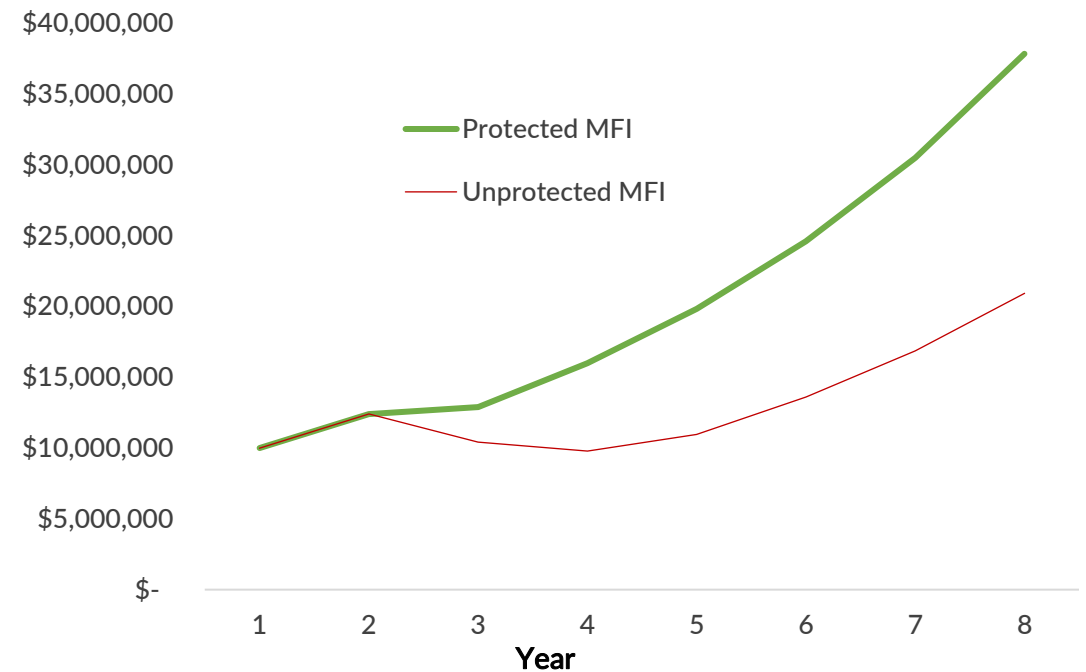
Properly developed DRF solutions reinforce building resiliency

- Understand Risk
- Own Risk
- Manage Risk



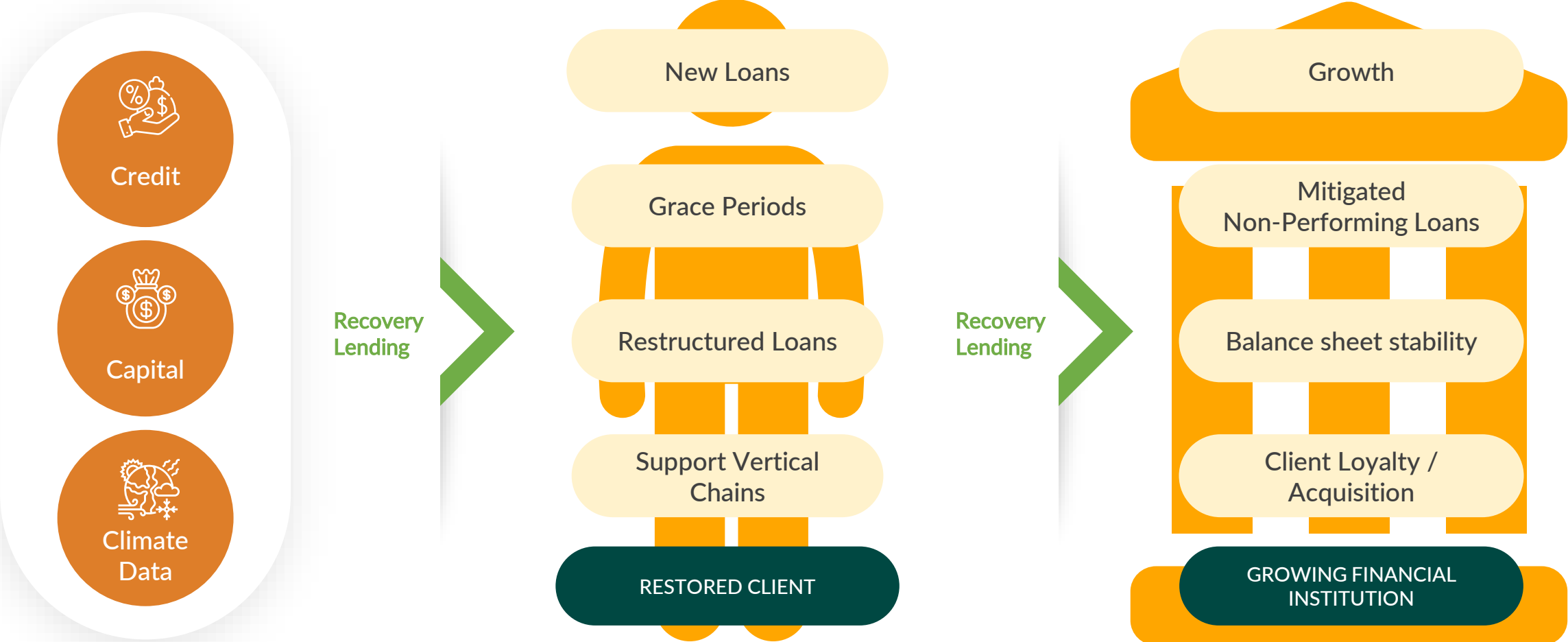
The 'hidden cost': Slows business growth

Unprotected Financial Institution (FI) vs Protected FI post Shock Loan Portfolio Growth



A Specific Case: Supporting VisionFund for Recovery Lending

With the right financial tools in place, **recovery lending** (i.e. post disaster lending programs) can offer highly impactful mechanisms to build client resilience, strengthen client loyalty and provide financial stability



- Understand Risk
- Own Risk
- Manage Risk

Global Parametric solution: VisionFund ARDIS

Watching how VFI changed their practices as they understood the risk was instructive



Contingent credit line

Loan repayment



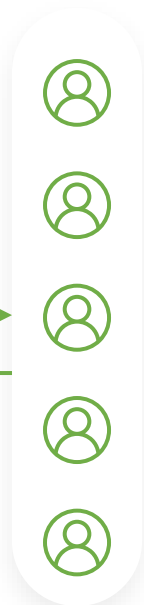
Climate/natural disaster risk protection per tailored index

Fee for protection



Recovery lending or contingent credit from MFI within VFI network

Fee for package of services and financing



In 2020, the ARDIS program was activated four times, providing a direct payments GP's NDF and access to up to \$3,950,000 of contingent credit ~675,000 active borrowers

Global Parametrics solution: VisionFund ARDIS

- Understand Risk
- Own Risk
- Manage Risk



GP is protecting 27 MFIs for VisionFund International against five hazards using event-based structures that reflect the location of VFI's assets at the branch locations and loan portfolio data supplied by VFI.



Pooling risk adds significant efficiencies (VFI gets >\$10M of cover with ~\$2.5M of protection) – lower pricing.



The event-based structure was used to trigger both contingent credit and contingent capital in a single debt instrument; funds are used for recovery lending.



We need to improve the message



As micro-level index insurance provides a clear payment to smallholder farmers, the point of reference in assessing meso-level products has been to consider the direct benefit to farmer

- ▶ Meso-level products that work to pass payments directly to farmers are viewed more favorably
- ▶ This reference point misses the dynamics of how even the prospect of an extreme event that is highly correlated impacts the meso-level firms that are providing services to smallholder farmers
- ▶ Almost always passing the direct payments to farmers will be more costly than protecting the firm's balance sheet

ACCESS



An unprotected firm will offer far more services to farmers who are in less risky regions than those who are exposed to more frequent and highly correlated events

COSTS



When the unprotected firm offers services in higher risk regions, they are likely to charge more for those services

- ▶ Only a small percentage of the asset base needs to be protected reducing the premium needed
- ▶ For example, protecting 5% of the asset base with an index priced at 10% RoL x 5% means that
- ▶ for 50 bps on asset base, a firm should be able to protect their balance sheet

Our community needs better data



Given the infrequent occurrence of extreme events, we are also working with limited data to understand how extreme events impact firms serving the poor and vulnerable.



Scenario analysis and stress testing are needed to create deeper understanding of the risk



Stress testing must build on what we know about the dynamics of extreme events in terms of how the impact on firms occurs after but also before they do business with smallholder farmers



This leaves me concerned about what we don't know regarding how extreme events impact the growth of firms serving exposed farmers and for how many years these impacts last



It should not be difficult to understand why firms are reluctant to provide their services to smallholder farmers who are in risky regions and why they charge more when they do

Using mix market and EM-DAT data, Collier (2015) demonstrated that an average disaster would reduce the growth of an MFI by 12 percent in the first year / 10 percent in the second / and still negative in the 3rd year

This study begs the question of what happens to growth after an extreme event.

Lesson Learned: A single debt instrument can be used



A single debt instrument can be wrapped with:

- Senior debt that is protected by
- Contingent debt triggered by parametric product
- Subordinated debt triggered by parametric product
 - (Enabling Qapital is doing this with Global Parametrics)



Contingent debt is used to manage liquidity needs and to also manage the uncertainty of estimating financial needs when the event occurs (i.e., as a call option on credit, the client does not need to take all the credit)



Lesson learned – it is difficult to tie up capital for an infrequent event



Subordinated debt can quickly convert to capital

Lessons learned

Key is finding good partners



Protecting a firm's balance sheet can be more efficient

- Protecting farmers by passing the payments through a firm to farmers remains relatively expensive
- Protecting a portion of a firm's balance sheet is significantly less costly
 - Where is the largest value for money given what we know about the importance of business continuity?

Risk education has positive benefits



- When structuring an index product for a firm, GP focuses on the exposure units at a high resolution and overlays the hazard to give a portfolio view of the risk – this intensifies the internal discussion about how to reduce the risk (geographic diversification, risk retention with reserves, risk transfer, etc.)
- I like programs that protect farmers while they adopt improved farming systems that will make them more resilient to climate change




Impediments to scale

- Geographically concentrated and small firms that serve agriculture need these protections the most
- Yet, because they are small, the scale of the transaction(s) remains small, and a sustainable index insurance program remains a daunting challenge
- Working with a network of firms is significantly more scalable (VFI, One Acre, Climbs) and passing the benefits of risk pooling to the network also means that subsidies may not be needed

Contingent credit has significant value



- A call option on credit eases the concern that the firm can't possibly know their needs ex ante
- The Development community can play a big role in increasing the use of contingent credit – **for example [Asia-Pacific Climate Finance Facility \(ACLIFF\)](#)**
- Future work – How might a Global Liquidity Facility work to use repo transactions based on extreme events?



Global Parametrics' experience and the case of CLIMBS and One Acre Fund

Wendy Smith

Impact and ESG Manager
Global Parametrics



Global
Parametrics

Global Parametrics



Global Parametrics was founded to build the tools needed to understand, manage and mitigate the risks of extreme weather and catastrophic events anywhere in the world. We aim to drive impact through innovation, driving global leadership in parametric product design and distribution.



Solutions are backed by our Natural Disaster Fund (NDF); a public-private partnership designed to mitigate the challenges in natural disaster resilience for ODA-eligible countries.



We manage the NDF Technical Assistance Facility; dedicated pot of TA created to pilot and scale innovative and impact-driven NDF transactions.

Key Supporters:



2022 by numbers

23 million

covered by risk transfer

55

countries of operation

6

perils

Portfolio of programs

In 2022, the NDF was deployed in 16 transactions in 55 geographies, across agriculture, business continuity and public sector.

NDF transactions are designed to:



Enable scale

(% increase in risk transfer, policies sold by partner, geographies and perils covered, replication)



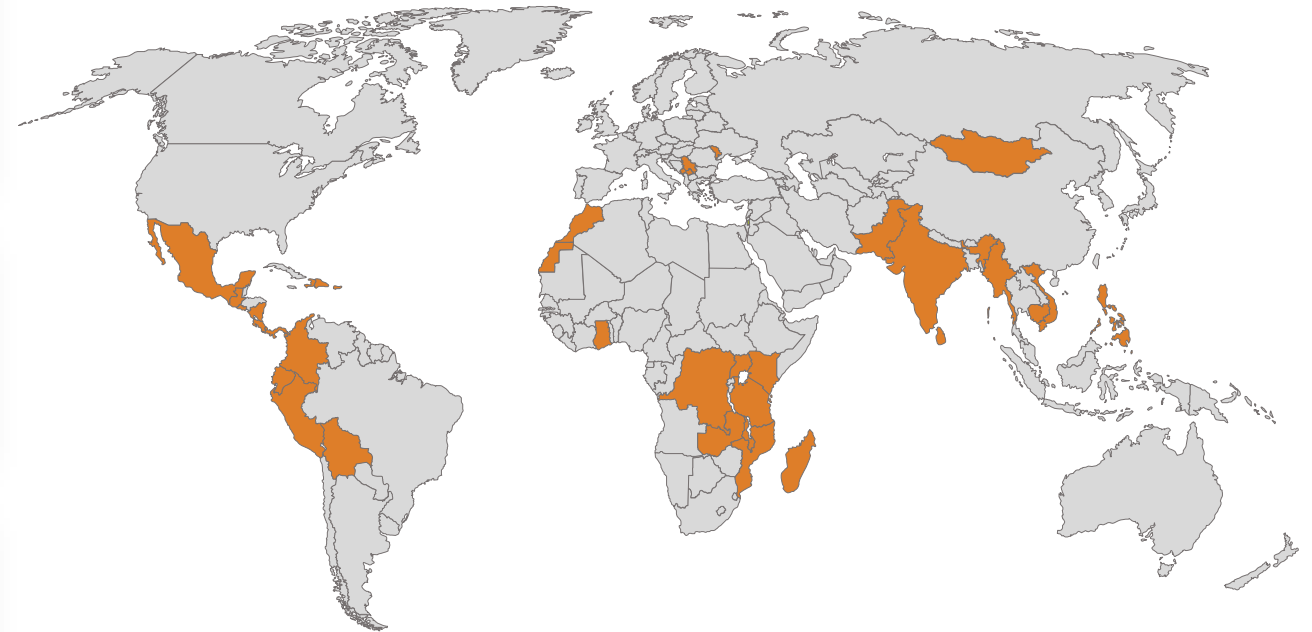
Ensure continuity of transactions

(% private capital crowded in; renewal)



Address the most vulnerable

(% of beneficiaries directly and indirectly impacted by risk transfer)



Key factors for sustainable growth



Accurate risk assessment



Enabling environment
regulatory,
policy,
government
buy-in



Understanding throughout the value chain
coverage objective,
data accuracy &
limitations,
conditions of policy



Stakeholder alignment
both short-
and long-term
strategic
objectives



Focus on holistic risk management
services outside
of risk transfer,
particularly to
mitigate/ adapt
to risks outside
of risk transfer.

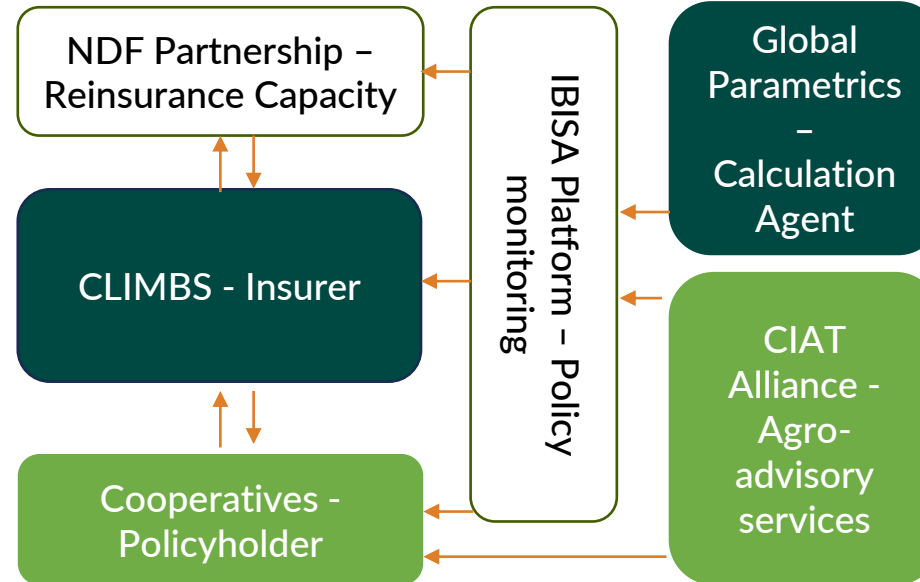
Case study 1: CLIMBS Weather Protect Insurance

In the Philippines, floods and tropical cyclones regularly cause losses and damage to the agricultural and food value chain. When a tropical cyclone impacts harvests, farmers can lose income and often struggle to pay back loans.

Solution: a parametric protection covering excess rain and tropical cyclone windspeed events, distributed via local carrier CLIMBS General and Life Insurer to agricultural lending cooperatives.

Components of cover:

- Protection is offered on an annual basis to cooperatives, designed to protect loan portfolio against excess rainfall and wind.
- Protection is subdivided with separate index parameters per province and per peril.
- Payouts are structured over three triggers (yellow, orange, red) for excess rainfall and windspeed.
- Reinsurance protection provided to CLIMBS via the Natural Disaster Fund partnership.



Key partners

Insured: Cooperatives in CLIMBS portfolio
Insurance: CLIMBS General and Life Insurer
(Re)insurance: Natural Disaster Fund partnership (via Hannover Re)
Product development: Global Parametrics and IBISA Network
Policy monitoring platform: IBISA Network
Agri-services: CIAT Biodiversity Alliance

Case study 1: CLIMBS Weather Protect Insurance – cont.

2021/2022



Year 1

- 5 cooperatives targeted, 14 registered
- 41 provinces
- Excess rainfall peril
- Payouts
- ~1M USD capital mobilized

2022/2023



Year 2

- 105 cooperatives
- 81 provinces covered
- Excess rainfall and tropical cyclone windspeed perils (drought cover in development)
- Payouts
- ~4M USD capital mobilize

Current lessons learned



Impact of cover on behavioral change of cooperatives/ farmers key to product sustainability (study Wharton School and University of Chicago).



Use of monitoring platform as an additional educational tool to explain product.



Basis risk still a key challenge.

Holistic approach

Steps between offering the insurance and the end-beneficiaries benefitting from insurance

The Farmer takes out a loan from the savings and credit cooperative

Automatic notification of triggers thru digital platform and computation of payment and release within 10 working days to affected cooperatives



The loan is insured 8 to protect farmer from climate-related risks.

Continuous Smart farming advisories during the insured period



Smart farming advisories

Based on soil temperature, season forecast, and data on flood risk



Crops suitable to area



Livelihood Mapping



Crop Calendar



Seasonal Agriculture

Case Study 2: One Acre Fund Meso-Scale Cover

One Acre Fund is a social enterprise providing smallholder farmers in 9 countries across Africa with financing and agriculture inputs to combat poverty and hunger. 1AF and Global Parametrics developed a meso-scale cover to protect a portfolio of 1AF's farmers against key perils.

Components of cover:



Protection is offered on an annual basis to One Acre Fund, designed to protect key agricultural economic zones (AEZs) against drought and excess rain perils



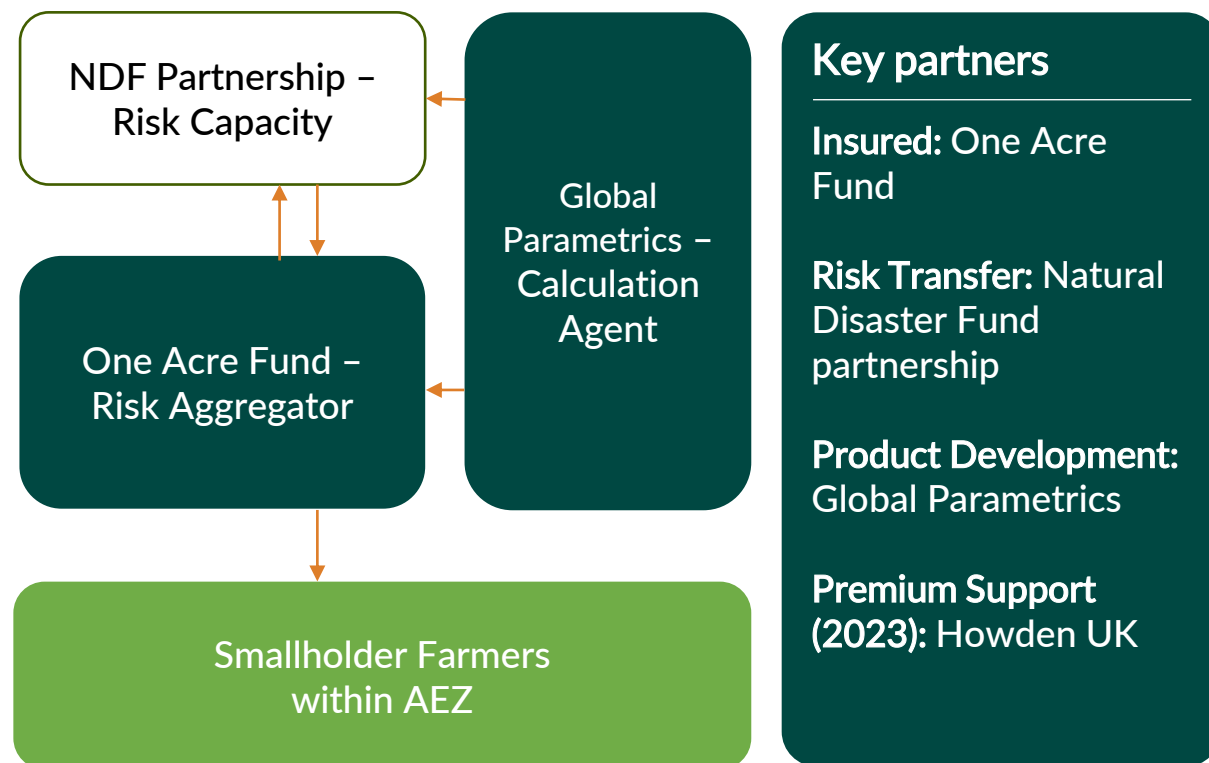
Protection is mapped to key crop phenology to minimise price and maximise cover.



Payouts are distributed directly to One Acre Fund, who distribute benefits to farmers as loan forgiveness, agri-inputs and direct payouts (following assessment).



Risk transfer provided to One Acre Fund via the Natural Disaster Fund partnership.



Case Study 2: One Acre Fund Meso-Scale Cover



Current lessons learned:



Allows aggregator to cover beneficiary in whichever manner is most appropriate for context.



Meso scale protection limits need for distribution costs, challenges related to policy education and uptake



Cover cannot be used as a perfect substitute for shocks to yield at the household level.



Premium support allowing the aggregator to purchase more cover/ adapt payout structure.

**Enabling Qapital's
experience and the
case of EMF
Microfinance Fund**

Chuck Olson

Managing Partner
Enabling Qapital

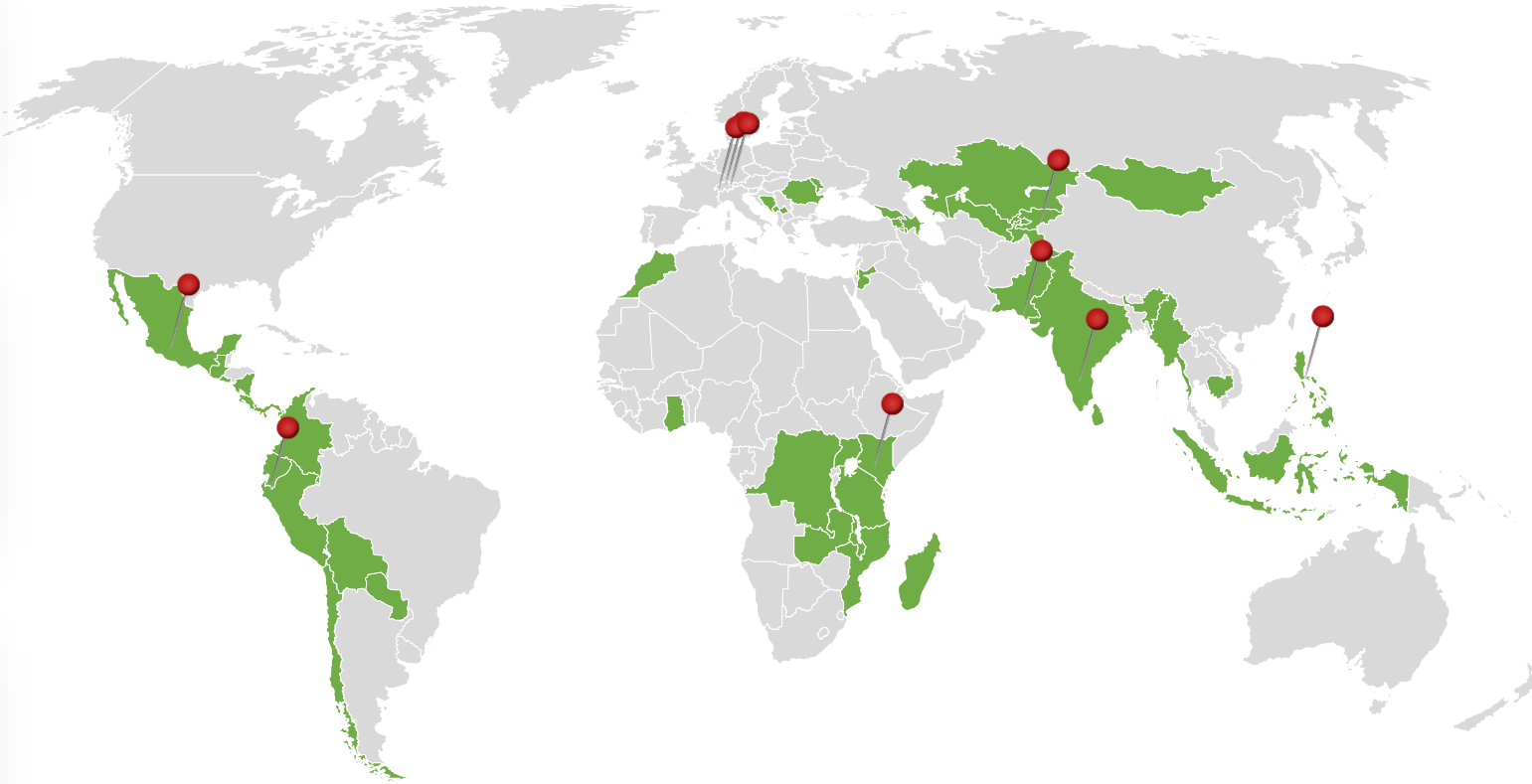


Enabling Qapital (EQ) Ltd.

Two Funds:
EMF Microfinance
Fund
Spark+ Africa

With
650M AUM
we reach roughly
400'000
Micro borrowers &
Clean Cooking Users

> 130
Microfinance
Institutions & Clean
Cooking Companies



With **> 50** Team
Members
in **5** Continents

Active in
> 45
Countries

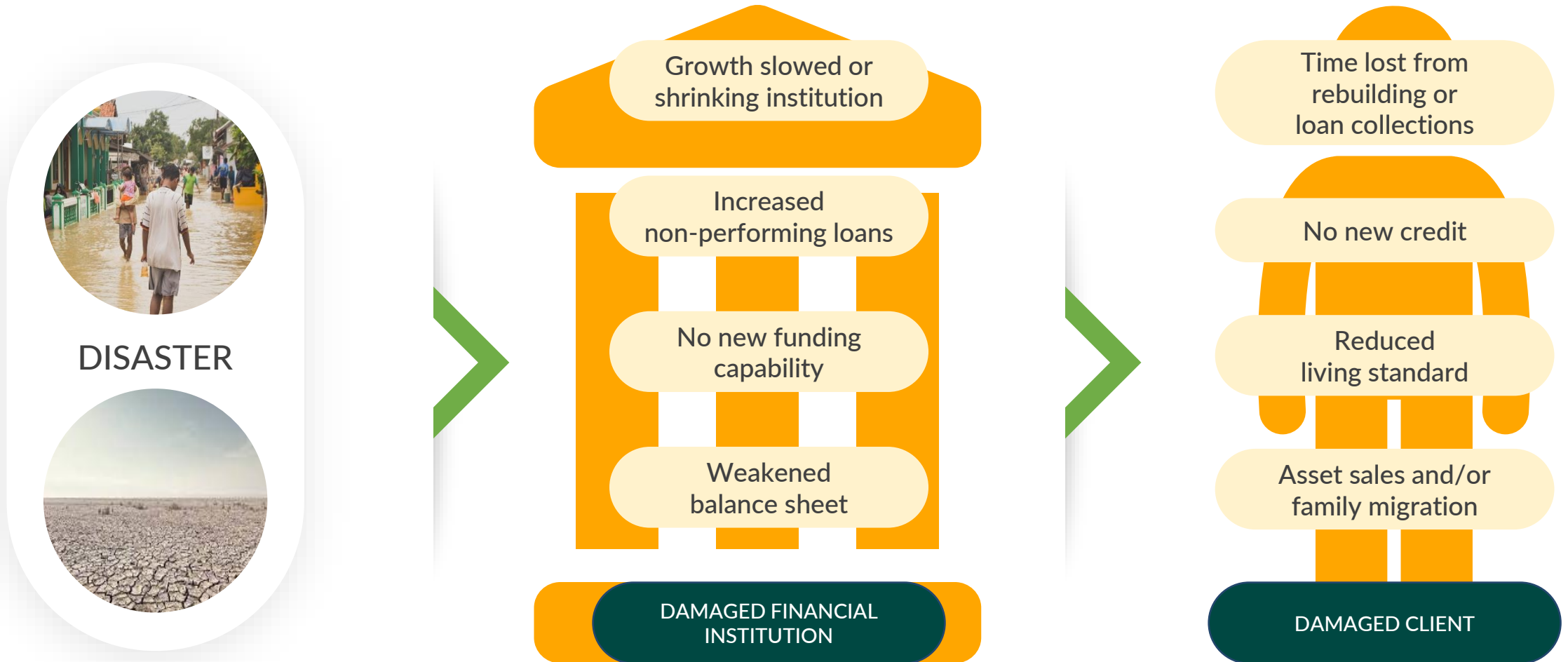
>100
Years combined
Experience in Impact
Investing

>12 Million
Microborrowers
71% Female



Disaster Impacts on Financial Institutions & Their Clients

Severe or even moderate natural disasters often leave both borrowers and the financial institution that serves them in a significantly weakened position that can slow growth capacity, create liquidity stress or in an extreme situation, lead to a bankruptcy situation.



Needs Vary Depending on Severity



Broken Shutter

VS.

Roof
Blown Off



VS.



Completely
Destroyed

Credit and Risk Transfer Fusion



Senior /
Subordinated
Loan
Packaged as
Credit Line

CRED

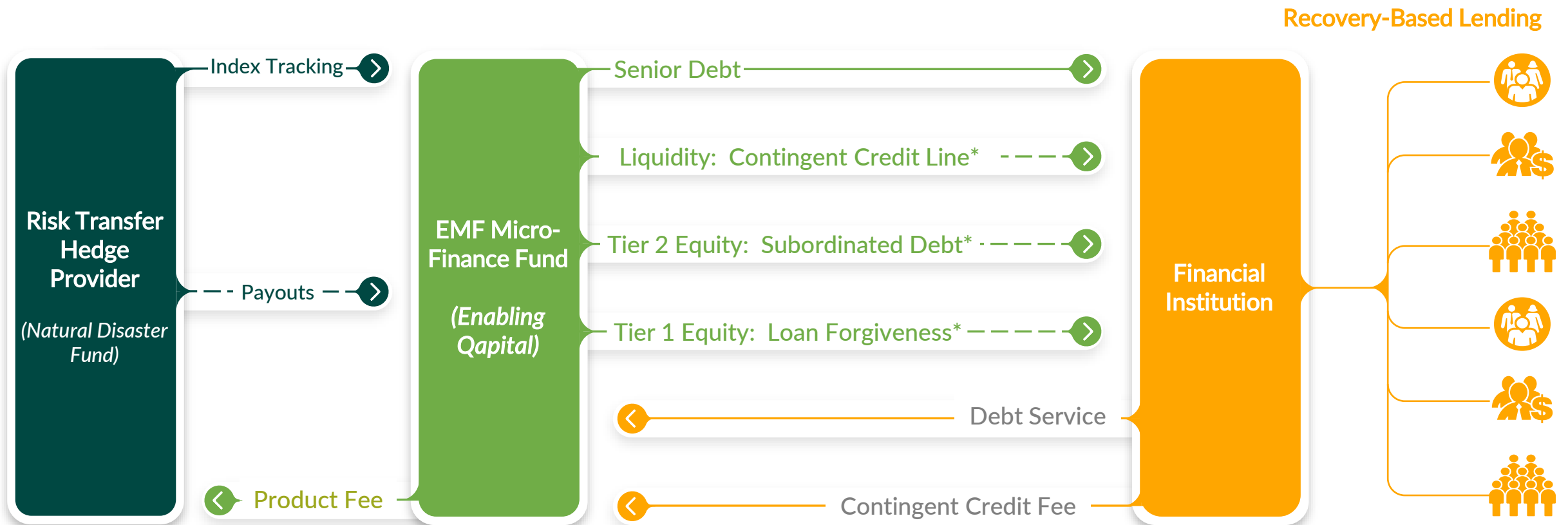
Climate Resilient
Enhanced Debt



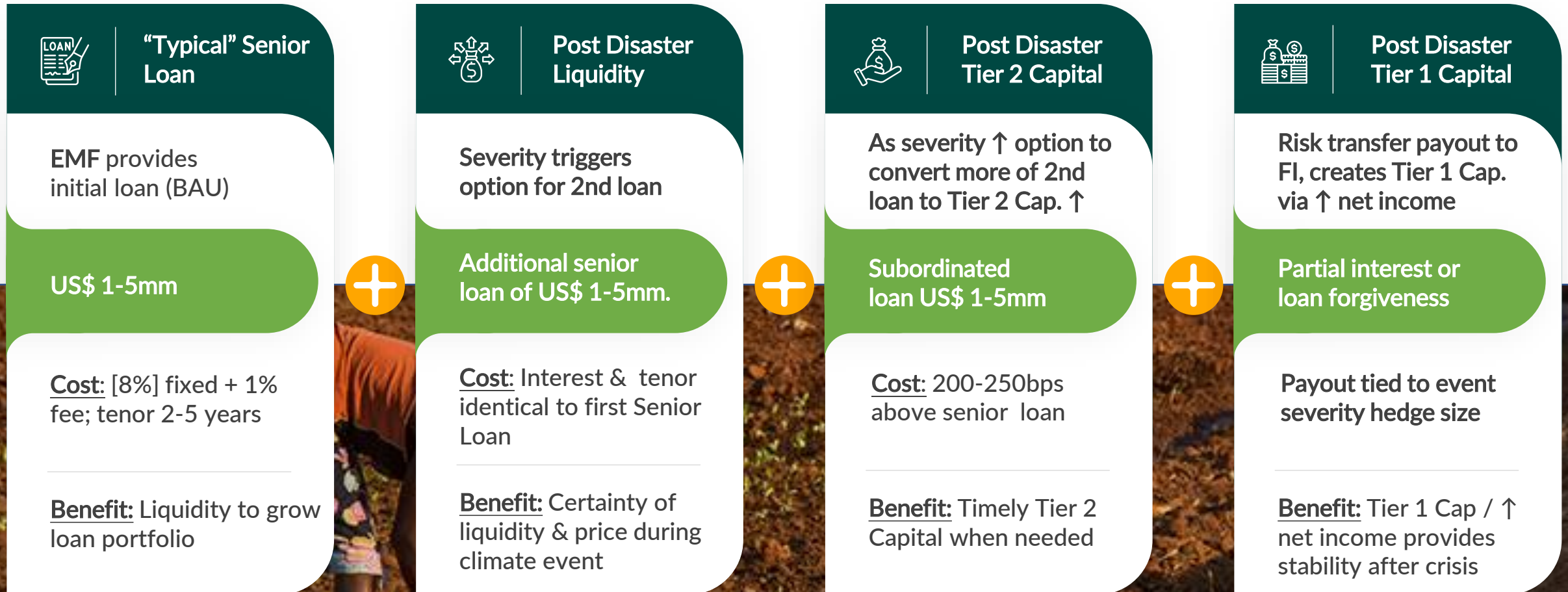
Parametric Risk
Transfer /
Climate Hedge

CRED Flows / Layering

CRED offers layered disaster risk financing (liquidity and capital) after a climate disaster. Loans and payouts are linked to severity of event as measured by climate data and pre-defined thresholds.



Example of CRED Layering Components



What Makes CRED Special?



Tailored Risk Transfer Solution

Risk transfer solution is tailored to the needs / perils relevant for the financial institution and its clients.



Financial Layering

Combining debt with climate risk hedge makes overall package more attractive, allowing Financial Institutions access to “layered” capital – liquidity at low severity / trigger levels, and more capital (Tier 1 & 2) as severity increases (situation deteriorates).



Structure

Fund contracts with risk-transfer counterparty. CRED structured with borrower as liquidity line and capital injection comes via commercially simple and often used practices such as subordinated debt (Tier 2) or debt forgiveness (Tier 1).

- Regulatory issues are with the banking authority where these practices are more common rather than the insurance regulator where index insurance may be untested.
- No subjectivity around access to liquidity. Parametric index used and transparency provided.



Option

Borrower has no obligation to take additional debt (senior or subordinated). This is important in managing uncertainty about financial needs when event occurs.



“Commercial” Response to Climate Resiliency

No subsidies in the structure. No Development Finance Institution (DFI) money. Pool of capital exists for credit dimension and product fits within the overall impact mandate of the fund.

Lesson Learned



CRED is complex

Regular and consistent reporting of the index helps build trust in product.

Requires more simplified / clearer marketing material & internal training



Cost matters to all parties involved.



Closing requires internal champion and board / management buy in.



Regulation / Controls matter: Tier 2 capital and currency controls.



For recovery-based lending to be affective, initial underwriting needs to be done well. Financial institution needs to critically analyze underwriting processes & strive for improvements. EQ can help in review, but openness by FI required.



Technical assistance can help.



Recovery-based lending is not an oxymoron or soft-hearted response to a crisis



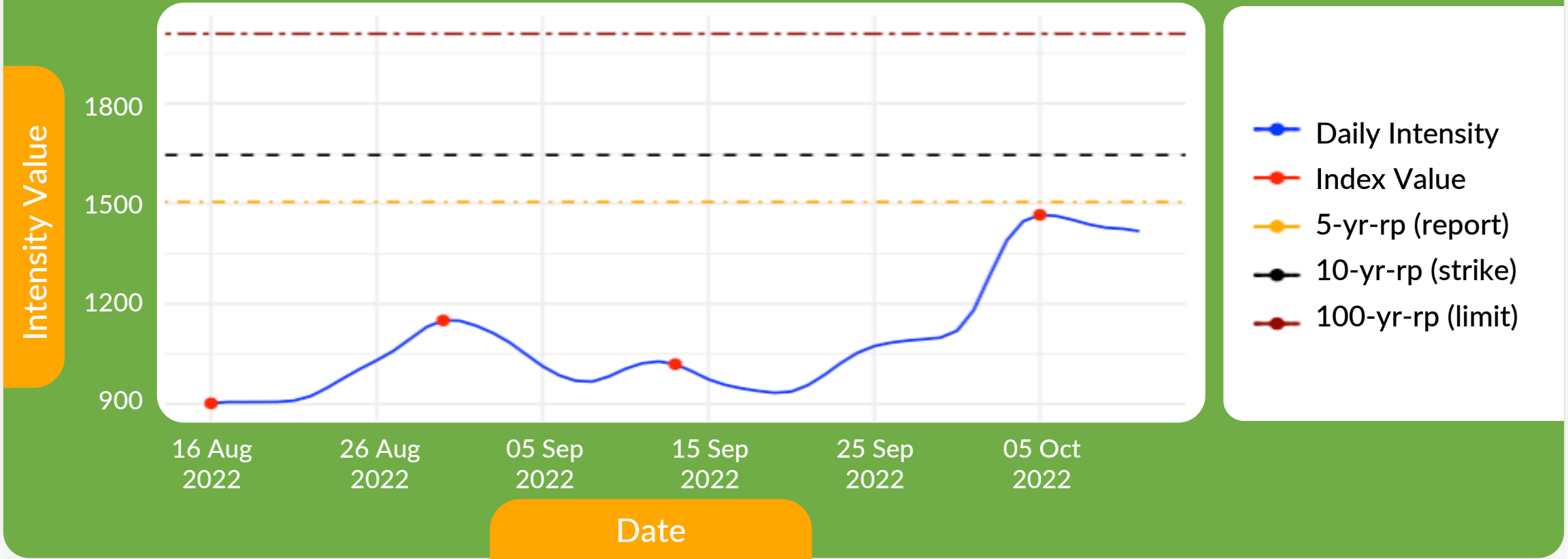
Rapid onset perils may require slow response. Legal documentation needs to follow.



Basis risk exists, but because of unique structure of CRED, we can overcome some of it...

River Flow Intensity Index Status: Cambodia October 2022

Status date ending: 2022-10-11



Challenges and Opportunities



How to scale?


Reengineer process - start with portfolio cover: "Build it and they will come"



Liquidity Backstop Challenge



TA Facility to facilitate delivery of recovery-lending product to end-client



Time for Questions

DRF Community of Practice & Resources



Join our Community
of Practice



Join our Disaster Risk
Finance and Insurance
LinkedIn Group



Check out DRF
resources @ Financial
Protection Forum



Thank you!

Session 3:

Lessons learned and impact of meso-level index based insurance and credit solutions

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& Insurance Program



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