World Bank Group Academy
Affordable Disaster Risk Insurance through Public-Private Partnerships

Day 1 - Overview and fundamentals of DRF

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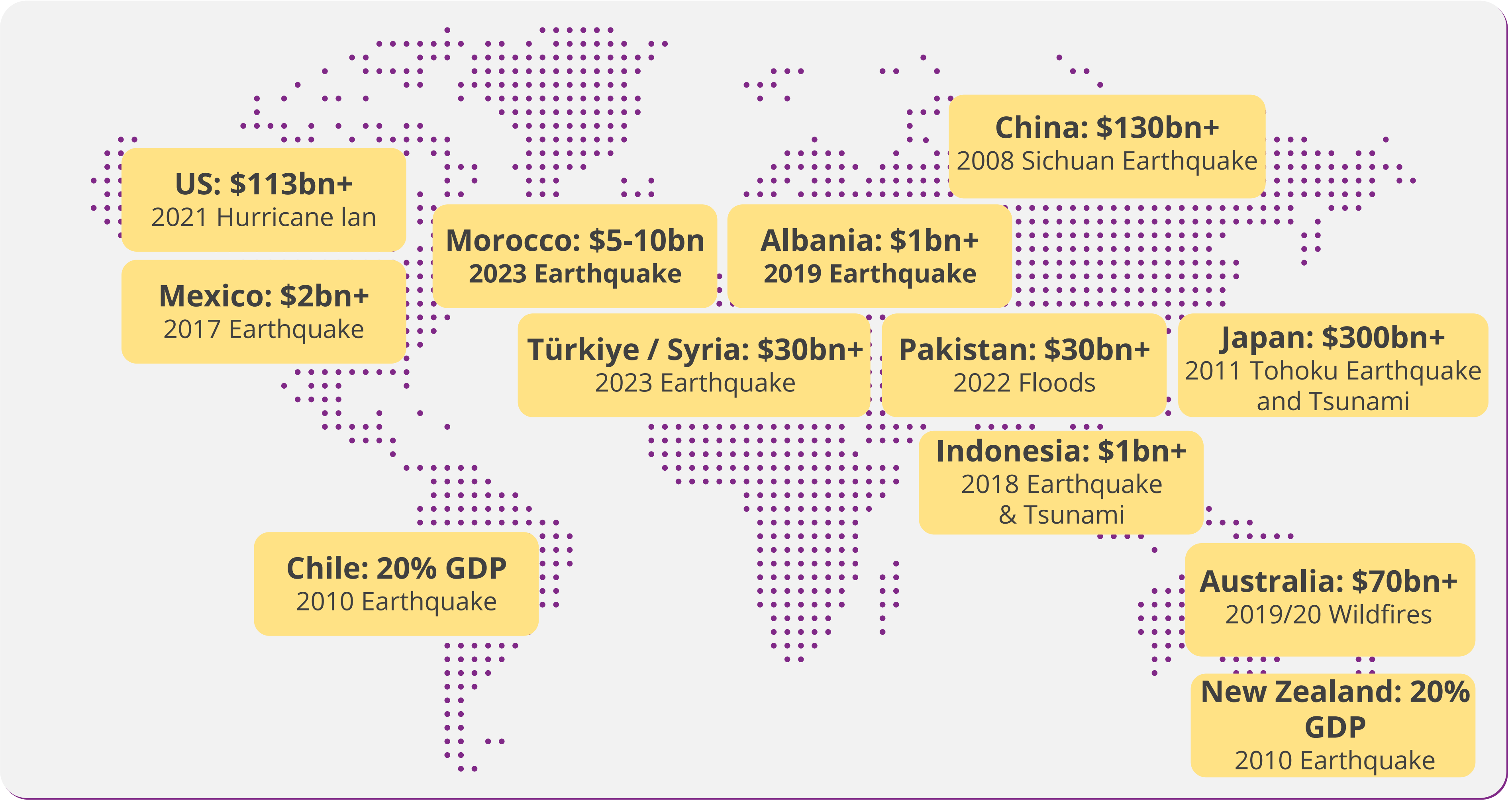
Disasters threaten development and poverty reduction

$300 B

$520 B

130 M



DRF's underlying question: disbursing efficiently under uncertainty

Type of risks	Acute risks
Targeted groups	Different "victims" require different "treatments"
Informational & Operational Constraints	Organizing after the occurrence of the disaster is inefficient
DRF conceptually	**Disbursing** efficiently with constraints **Trade-off:** uncertainty VS timing

Accuracy/information = analytics and modeling

Economics of risk and time = Finance

- **Savings, credit, insurance, capital markets**

DRF is about

- **addressing acute risks**
- **that may materialize and generate losses**
- **for specific entities**
- **by structuring pre-arranged/ ex-ante**
- **financial instruments/mechanisms**

With the ultimate goal of…

Increasing the financial resilience of governments, businesses, households, farmers against shocks and protecting livelihood and development

Photo credit : Graham Crouch / World Bank

Structure of this presentation

The DRF&I question

DRF&I guiding principles and intuitions

Fundamentals of DRF

- DRF Core Principles
- Contingent Liabilities
- Dividing (liabilities) to Conquer (risks)

DRF&I as financial optimization

Intuition & Analytics

- Risk Profile
- Opportunity Costs
- Risk Layering

Unrolling DRF best practices

Bringing in the policymaker

- Policy Decision Making

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Overview of the week

DRF core principles

Photo credit : Simone D. McCourtie / World Bank

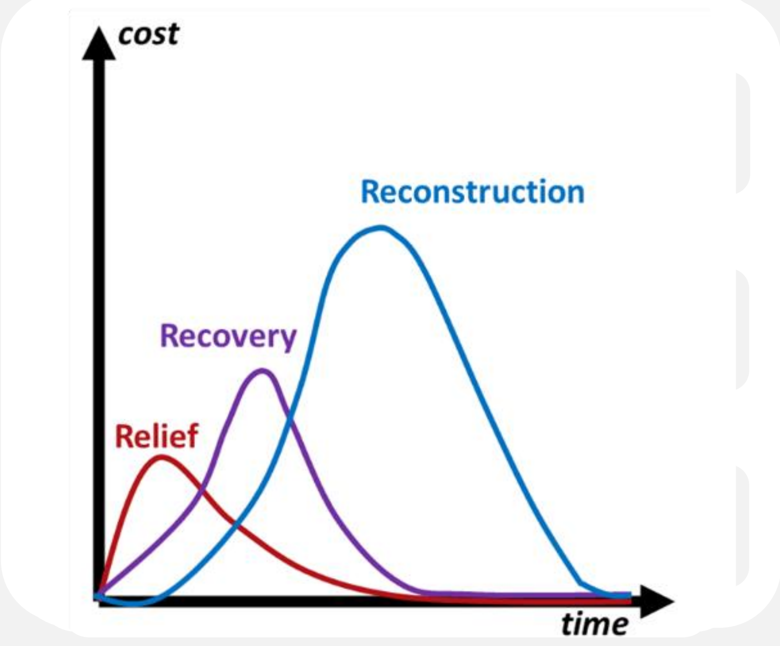
Timeliness of Funding

Disbursement of Funds

4 CORE PRINCIPLES

Data & Analytics

Disaster Risk Layering



Defining contingent liabilities and how to address them

Event Impact

Breaking down the impact of the Event

2023 Earthquake Morocco Al Haouz

Example of Losses

Direct financial aid for victims
USD 200 million

Direct physical damages
USD 3 billion

Regional development plan
USD 12 billion

Non-reduced risk

- Etc.
- Interruption of services
- Physical damages (destruction of buildings)
- Bodily injury
- Relief for disaster-stricken populations

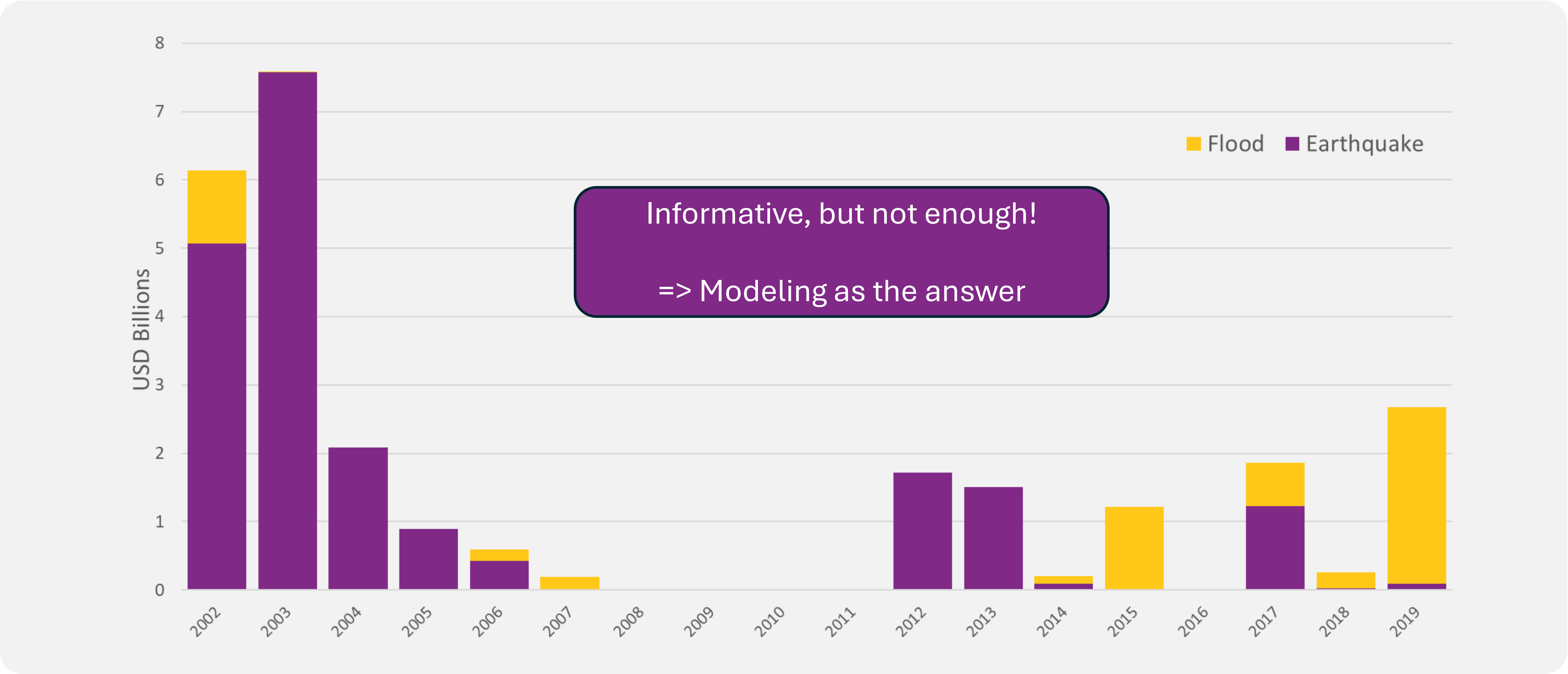
DRM / DRR

Residual risk

- Not financed
- Others (State guarantee, donations)
- State - Ministry of Finance, Public Fund
- Insurance sector

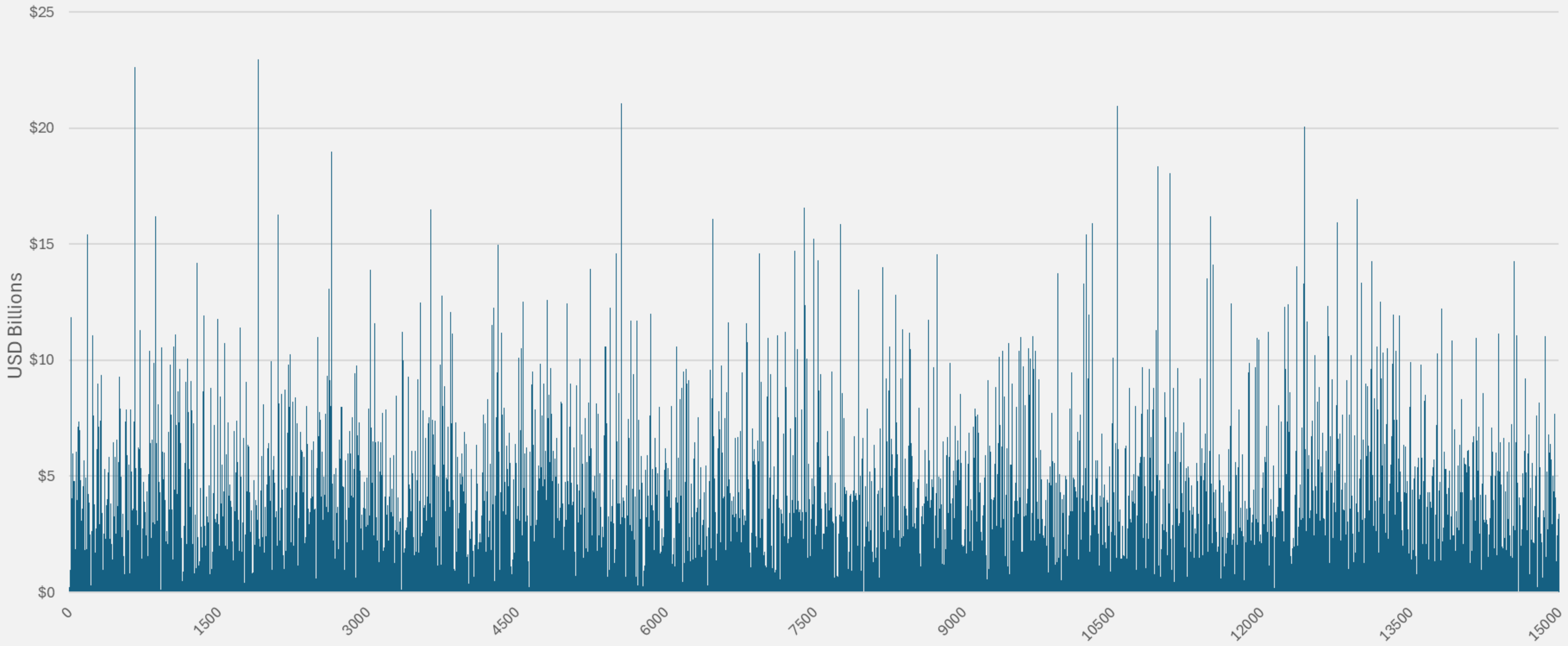
What are the State's **contingent financial** responsibilities (direct and indirect) **after a disaster**?
How can pre-planned financial instruments (funds, private and sovereign insurance, etc.) help respond?

From observed historic data to modeled risk



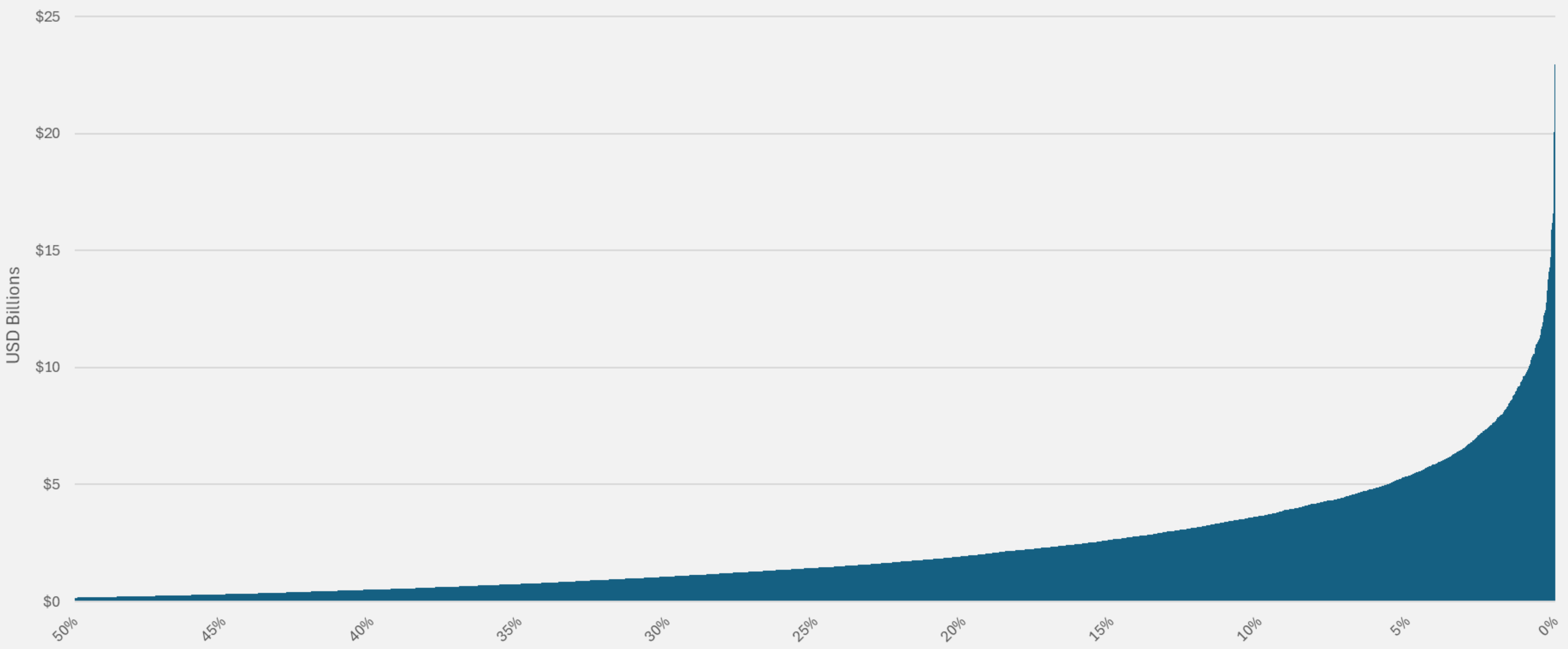
From observed historic data to modeled risk

Simulated Earthquake Losses for a Chosen Country



From observed historic data to modeled risk

Simulated Earthquake Losses for a Chosen Country (Ranked)



Opportunity costs - An intuitive stylized example

Can you match the risk layer and the instrument?

Health risk

Common cold

- It's the winter
- Probability of illness = 90%
- It costs $10 to treat a cold

Heart Attack

- Probability of heart attack = 1%
- It costs $100,000 to pay for needed surgery + hospitalization

Financing Instruments

Purchasing insurance

- Premium proportional to frequency of occurrence
- Subscribing insurance for cold is burdensome, maybe more expensive
- Subscribing insurance for heart attack has relatively low premium

Setting funds aside

- Setting funds aside without using them has an opportunity cost of not investing them
- Cold is likely (high frequency), and cheap to treat (low severity) => reserves are rational
- Heart attack is unlikely (low frequency) and costly to treat (high severity)

DRF is a trade-off balancing exercise through risk layering

Funding choices involve balancing the trade-offs to align the policymaker's objectives and their risk appetite.

Instruments can be structured in different ways offering varying cost and protection levels.

Trade-offs

Cost vs. level of protection

Timeliness of funding vs. accuracy

Agreeing co-financing across parties

Complexity vs. simplicity

Layer	Instruments	Indicative Cost (multiplier)	Disbursement (months)	Amount of funds available
	Donor support (relief)	0-1	1-6	Uncertain
	Donor support (recovery & reconstruction)	0-2	4-9	Uncertain
Risk Retention	Budget contingencies	1-2	0-9	Small
Risk Retention	Reserves	1-2	0-1	Small
Risk Retention	Budget reallocations	1-2	0-1	Small
Risk Retention	Contingent debt facility (e.g., CAT DDO)	1-2	0-1	Medium
Risk Retention	Domestic credit (bond issue)	1-2	3-9	Medium
Risk Retention	External credit (e.g. emergency loans, bond issue)	1-2	3-6	Large
Risk Transfer	Parametric insurance	2 & up	1-2	Large
Risk Transfer	ART (e.g., CAT bonds, weather derivatives)	2 & up	1-2	Large
Risk Transfer	Traditional (indemnity based) insurance	2 & up	2-6	Large

Benefits of risk layering: a more diverse portfolio of funding instruments

Overcoming budgetary constraints

the use of diversified funding sources can effectively overcome budgetary limitations, enabling governments to respond promptly and decisively to disasters without compromising fiscal sustainability

Balancing immediate financing needs with long-term considerations

Different DRF instruments can combine to address different costs that emerge at different times from disaster events.

Political kudos

Transparent, ex-ante DRF instruments can align directly with political objectives to show a commitment to fiscal responsibility.

Risk Layering is an approach that guides policy makers on how best to combine different financial instruments, to maximize their cost-effectiveness.

Layering of different sources of funding

Large and rare

How large are these events?
How often do they occur?

LAYER 3

Instruments which can disburse very large amounts, relatively infrequently, at minimal cost, and without undermining fiscal sustainability

LAYER 2

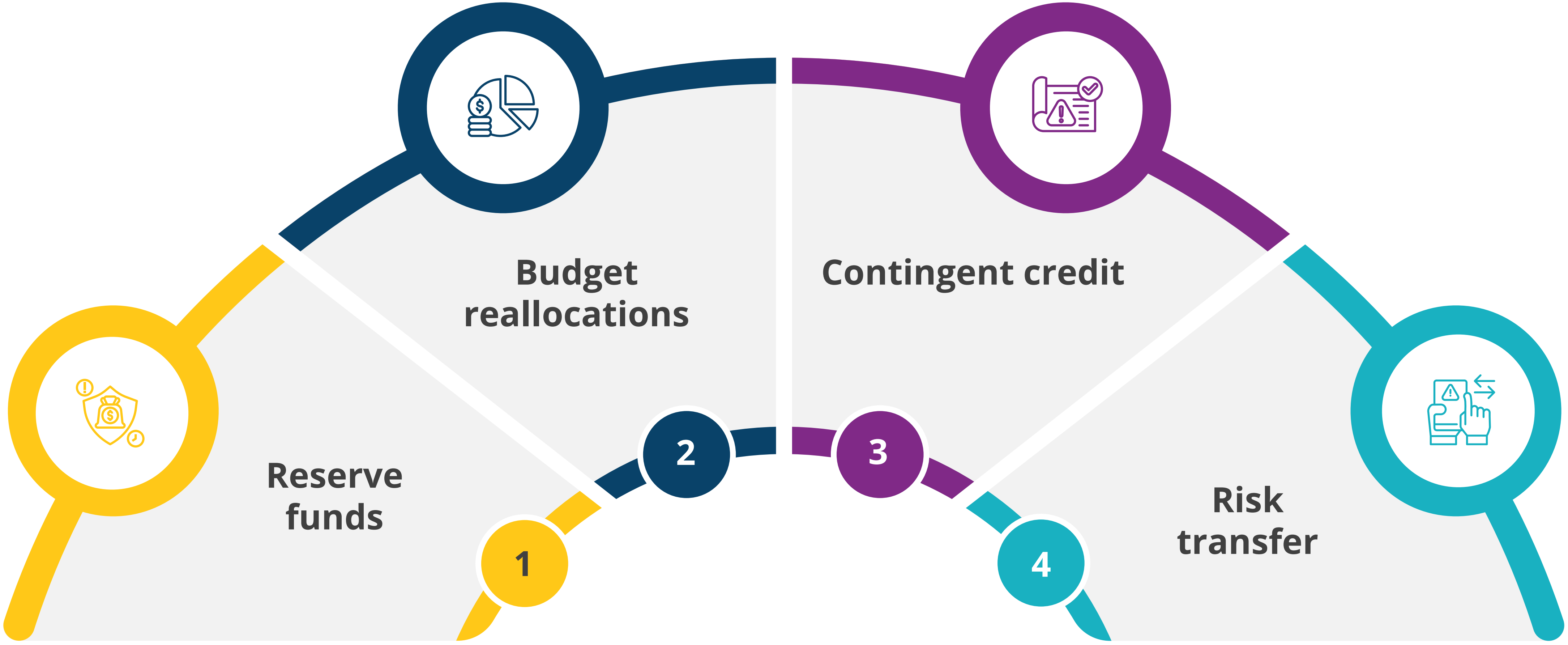
Instruments which can disburse larger amounts (more than is possible under layer 1), less frequently, at minimal cost

LAYER 1

Instruments which can disburse relatively small amounts, relatively frequently, at minimal cost

Small and frequent

Some financing options to fund against disasters



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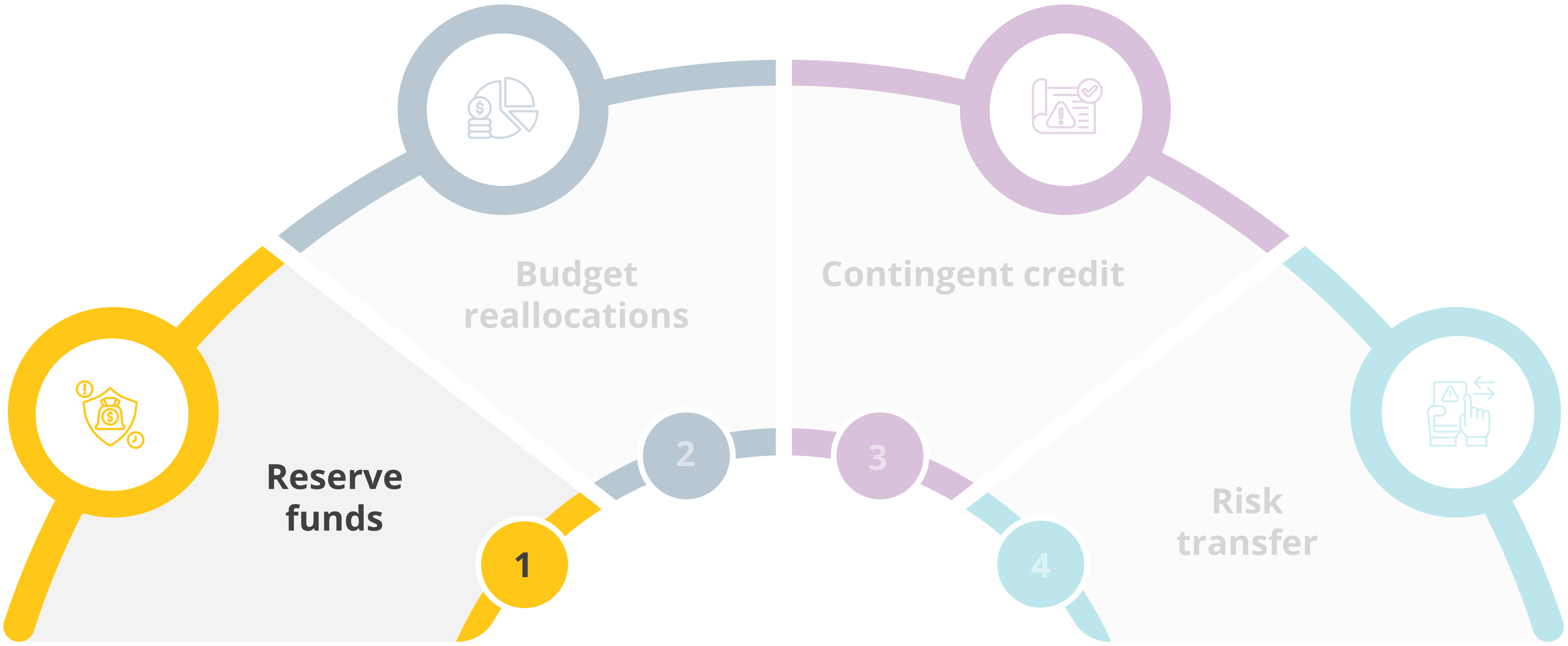

What are disaster reserve funds?

Funds that are set aside as reserve within the budget with specific rules for use or established as a dedicated purpose.

Financial management:

fulfill key policy objectives to strengthen financial resilience and to improve the financial management of disasters, increases discipline;

Disaster response:

provide the government with readily available resources to be used for post disaster expenditure to enable emergency relief and response after a disaster, and long-term recovery including rehabilitation and reconstruction;

Coordination:

alignment to key processes and systems that enable the flow of funds to ensure they get to the point of need for effective recovery long-term

Photo credit : Simone D. McCourtie / World Bank

How do reserve funds work?

Photo credit : Image by Amnicrckr/Worldbank

Act early.
Governments' resources are depleted day by day and an absence of reserves may worsen the crisis. Setting money aside will help governments to have the means to act early.

Be prepared.
Considerations such as how much money we will need immediately or how we will spend it, and on what, make regular budget planning a challenge. Saving for the worst case can help manage this uncertainty.

Save. A reactive approach is more expensive.
Preparing in advance requires thinking about how to manage financial costs before those costs materialize.

Where do Reserve Funds fit in our risk layering?

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How often do they occur?

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Budgetary Instruments

Small reserves set aside as contingency

Small and frequent

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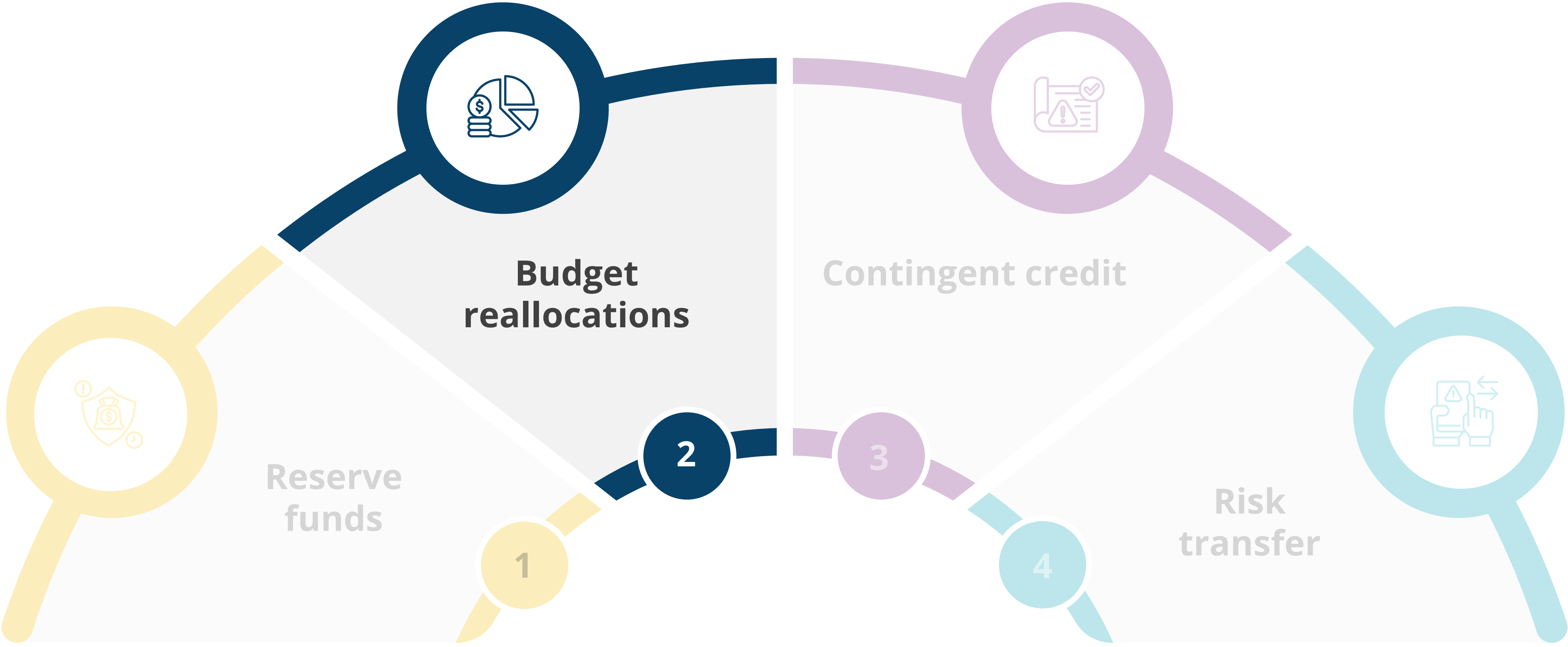

What are budget reallocations?

Moving money between budget lines allows countries to rapidly meet financing requirements but with significant potential costs

At a Glance

A country's PFM regulations will specify what is allowed in terms of virements and supplementary budgets

Sometimes these restrictions will be loosened in an emergency

Diverting funding away from its intended purpose usually manifests in an opportunity cost from returns delayed/forgone (est. between $1.20-$1.60 for every dollar mobilized) (World Bank 2021)

Useful stop gap while other funding sources funds are being mobilized.

Fully within a government's control.

Effective as part of a broader risk management strategy which seeks to limit the use of more costly reallocations and avoid indiscriminate cross-budget cuts.

Where do Budget Reallocations fit in our risk layering?

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Budgetary Instruments

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Some financing options to fund against disasters

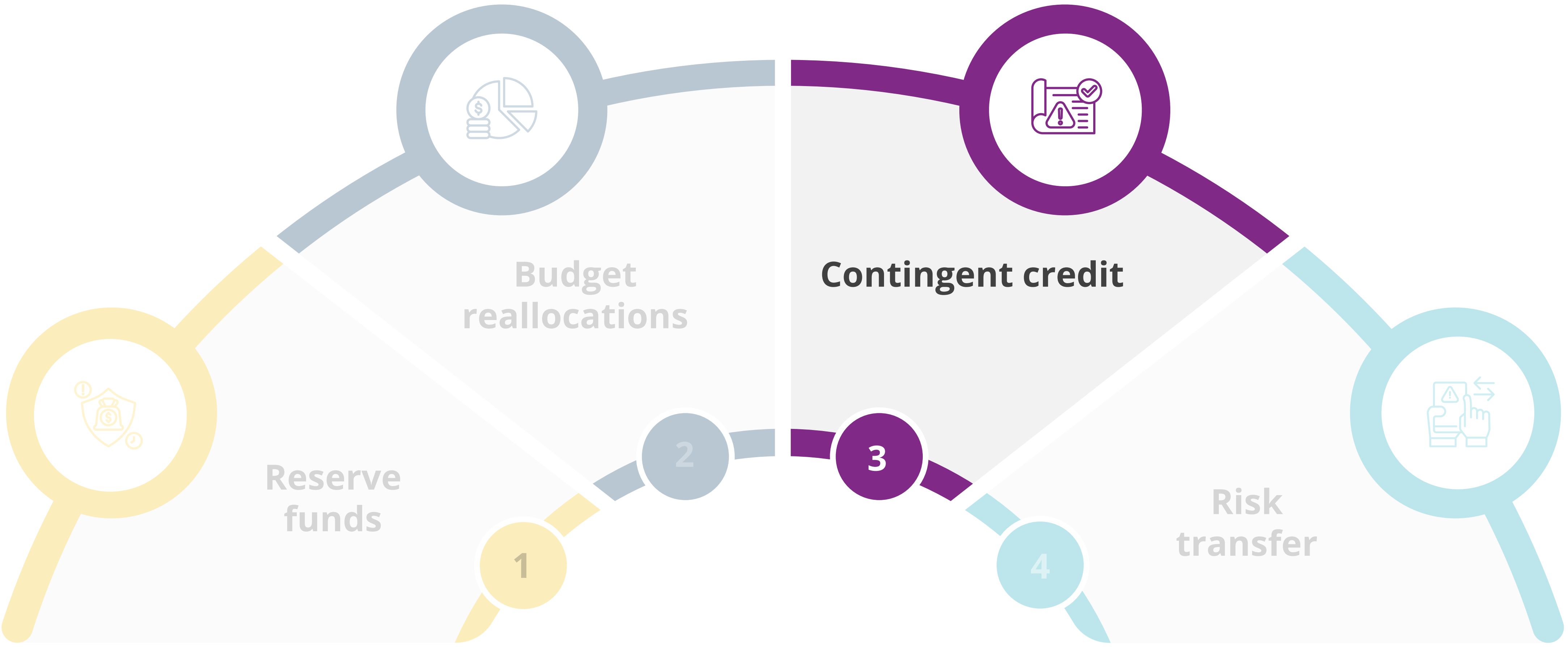

Photo credit : Simone D. McCourtie / World Bank

What is contingent credit?

Contingent credit lines allow countries to rapidly meet financing requirements following a shortfall in resources due to adverse economic events or disaster.

At a Glance

- Immediate liquidity following a natural disaster
- Funds become available for disbursement after the drawdown trigger – typically the member country's declaration of a state of emergency

- Early financing while other funding sources funds (e.g. insurance aid, loans) are being mobilized.
- Enhance countries' capacity to plan for and manage crises by securing access to financing before disaster strikes.
- Effective as part of a broader risk management strategy in countries highly exposed to natural disasters.

How does contingent credit work?

Pre-approved credit or loan facilities accessible in the event of a declaration of an emergency.

Example: **Catastrophe Deferred Drawdown (CAT-DDO).**

Enhancing financial resilience by retaining a portion of the risk and reducing reliance on external assistance.

Balancing act to ensure adequate funds are available while maintaining affordable interest rates and repayment terms, and the potential impact on fiscal sustainability and debt management.

Quick access

Governments' can source funds for emergency response, early recovery, and reconstruction activities depending on the size of the loan.

Complement to reserve funds

lower opportunity costs when compared to reserve funds, allowing the governments to retain the risk but maintain flexible use of existing budgets

Flexible

Flexibility allows governments to rapidly secure funding for emergency response and recovery efforts, avoiding delays

Where does Contingent Credit fit in our risk layering?

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Contingent Financing

Pre-arranged lines of finance that can be triggered immediately based on pre-agreed policy or data driven triggers

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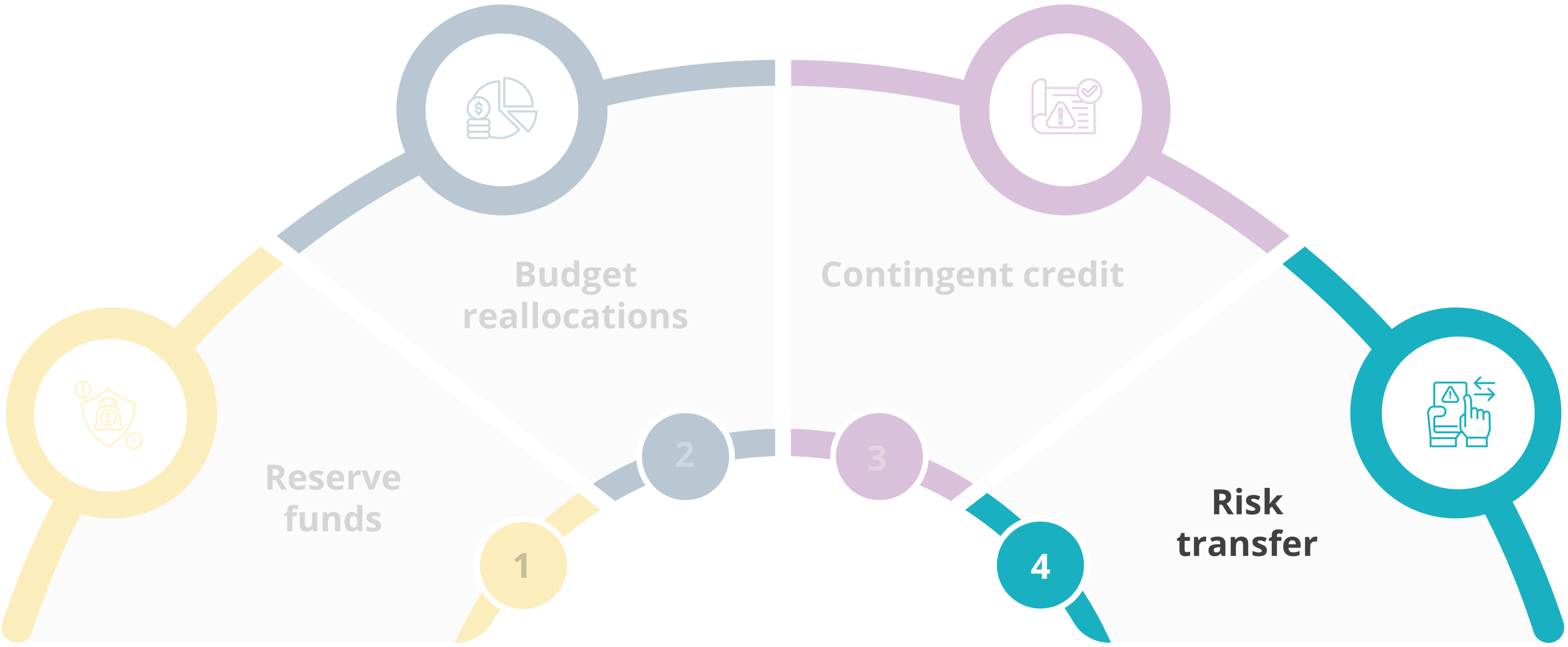
Small and frequent

Some financing options to fund against disasters



What is risk transfer?

Risk transfer is an option to offset the financial costs associated with potential losses from the government to another party, typically through mechanisms such as insurance or capital market instruments.

Financial management:

Enhances financial capacity to cover losses beyond the level that the government can hold reserves for in a cost-effective way.

Disaster response and recovery:

Different risk transfer options are available to provide additional financial resources for immediate post-disaster expenditures and long-term recovery.

Terms and conditions:

Risk transfer products are contractual agreements that specify the premium payments, coverage limits, and policy duration.

Photo credit : Simone D. McCourtie / World Bank

Risk transfer basics

Policyholder / insured ❯ **Pays upfront premium** ❯ Risk taker (e.g. insurer)

If event occurs…

Policyholder / insured ❮ **Pays out claim (as per policy coverage)** ❮ Risk taker

Note: the premium is paid by the insured upfront, whether an event occurs or not

How does risk transfer work?

An arrangement where the insured provides relevant risk information, and the insurer covers losses based on agreed terms.

Pricing based on assessments considering historical losses and the uncertainty of future losses.

Wide range of options available, with two main types: **Indemnity insurance and parametric insurance.**

Claims processes vary by product, usually involving a trade-off between prompt payment and precise assessment of actual losses.

Risk pooling creates diversification benefits, as it spreads the financial burden of losses across a pool of policyholders and reduces costs for an individual participant of the pool.

Risk capacity.

Transfer of catastrophic risks to a third party in excess of amounts that can be budgeted for.

Flexible and comprehensive coverage.

financial reimbursement for a wide range of risks with policies designed to specific needs.

Access to risk management expertise.

Risk takers can provide insights on risks and advice on loss prevention advice.

Where does risk transfer fit in our risk layering?

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Where does risk transfer fit in our risk layering?

How large are these events?
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Market-Based Instruments

Risk transfer for assets such as property insurance or agricultural insurance and risk transfer for budget management like parametric insurance, cat bonds/swaps.

Contingent Financing

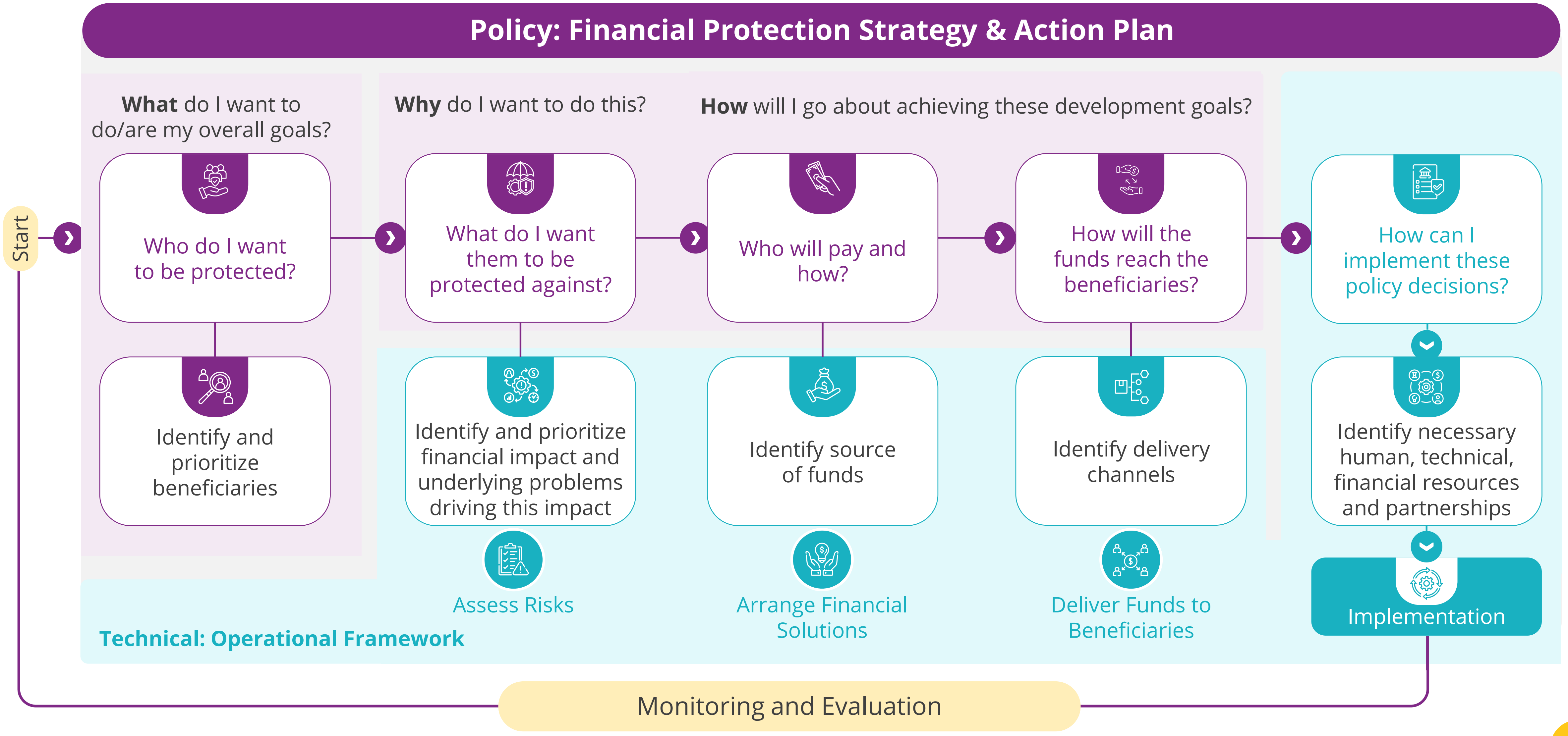
Pre-arranged lines of finance that can be triggered immediately based on pre-agreed policy or data driven triggers

Budgetary Instruments

Small reserves set aside as contingency, or measures in place of reallocating or diverting budget

Small and frequent

From the policy decision to the operational implementation



Thank You

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Annexes

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