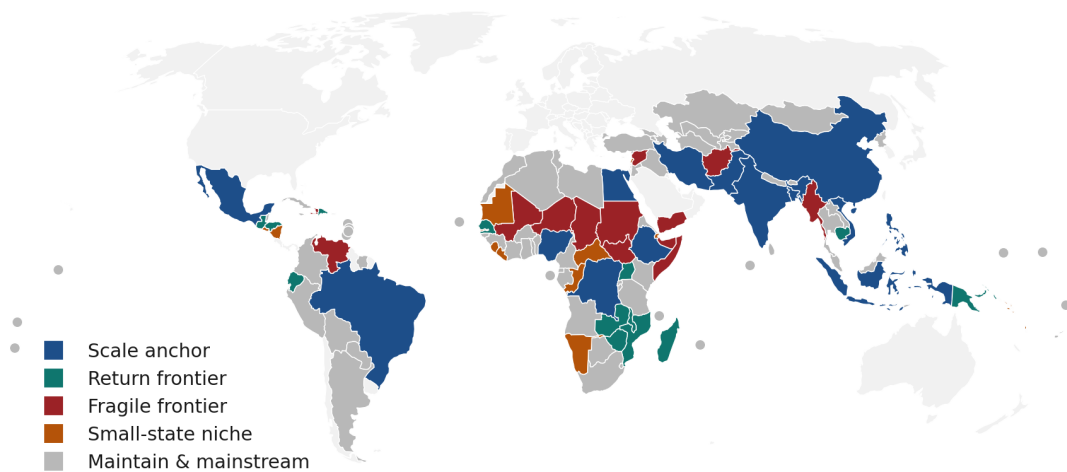


The Geography of Resilience in the Global South

Where Investments Could Most Reduce Future Risk



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Research Report · October 2026

Abstract

Resilience finance is scarce, and where it lands matters. UNEP estimates that developing countries need US\$310 to 365 billion a year for adaptation by 2035, against about US\$26 billion of international public flows in 2023, and independent analysis finds almost no correlation between adaptation finance per head and vulnerability. This report asks where resilience investments in the Global South could most reduce future risk.

Using the open INFORM Risk Index (mid-2026 release) and World Bank data, it scores 122 low- and middle-income economies, home to about 6.8 billion people, on three measures: risk intensity (the geometric mean of natural-hazard exposure, vulnerability and lack of coping capacity), risk mass (intensity times population) and deliverability (a discount for weak governance and conflict). The measures define two lenses, where the prize is and where each dollar works hardest, and five tiers: scale anchors, a return frontier, a fragile frontier, a small-state niche, and a group to maintain and mainstream.

Fourteen scale anchors hold 70 per cent of delivery-adjusted risk mass and 72 per cent of the people; India and China alone hold 39 per cent. Return intensity per person is highest in smaller, poorer and more exposed countries, including Madagascar, Papua New Guinea, the Solomon Islands, Haiti, Vanuatu and Honduras. Vulnerability, not hazard exposure, separates countries by risk, and 60 per cent of the risk-weighted population lives in thirteen countries facing compound hazards. The mass ranking is almost immune to reweighting, while the return ranking depends on how heavily fragility is discounted.

A review of the evidence supports sequencing investment from risk knowledge, warning and cushioning through to protective infrastructure: disaster mortality is nearly six times lower where early warning is comprehensive, and reported benefit-cost ratios run from 2:1 to 10:1. Enabling conditions are weakest where risk is highest, with social-protection coverage of 13 per cent in the fragile frontier against 54 per cent in the anchors. The report closes with allocation guardrails, ten recommendations, a three-horizon roadmap to 2040 and a monitoring scorecard.

Keywords: resilience; climate adaptation; disaster risk; Global South; investment prioritisation; early warning; social protection; adaptation finance

JEL classification: Q54, Q56, O12, O19, H54; climate and natural disasters; environment and development; economic development; infrastructures and other public investment

Data and method: The analysis uses the INFORM Risk Index mid-2026 release (European Commission Joint Research Centre, CC BY 4.0), World Bank Open Data and published institutional research available to October 2026. The country scores, tiers and archetypes are H Heuristics calculations; they are a prioritisation heuristic, not a cost-benefit analysis. Statistics from other organisations are attributed and hyperlinked in the text and in Appendix C.

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Key Findings

Resilience investment in the Global South should follow two maps at once: the map of where the most risk can be reduced, which follows people, and the map of where each dollar works hardest, which follows intensity. They overlap less than most allocation rules assume.

- **The prize is concentrated.** Fourteen scale anchors (India, China, Pakistan, Indonesia, Nigeria, Bangladesh, Brazil, the Philippines, Ethiopia, Egypt, the Democratic Republic of the Congo, Mexico, Vietnam and Iran) hold 70 per cent of delivery-adjusted risk mass and 72 per cent of the people in 122 low- and middle-income economies. India and China alone hold 39 per cent.
- **Return per dollar points elsewhere.** Risk intensity per person, adjusted for deliverability, is highest in Madagascar, Papua New Guinea, the Solomon Islands, Haiti, Vanuatu, Mauritania, Honduras, Somalia, Mozambique and Afghanistan. Three frontier tiers hold 293, 367 and 60 million people.
- **Vulnerability, not hazard, separates the countries.** Across the 122 economies, risk intensity correlates with vulnerability at 0.86 and with lack of coping capacity at 0.67, but with natural-hazard exposure at only 0.46.
- **Most of the risk is compound.** Thirteen countries facing two or more severe climate hazards hold 60 per cent of the risk-weighted population. Forecasting, social protection, standards and risk finance work across hazards.
- **The evidence favours the first layers.** Disaster mortality is nearly six times lower where multi-hazard early warning is comprehensive; Bangladesh cut cyclone deaths from about 139,000 (1991) to 26 (2020); reported benefit-cost ratios run from 2:1 to 10:1.
- **Enabling conditions are weakest where risk is highest.** Median social-protection coverage is 54 per cent in the anchors, 32 per cent in the return frontier and 13 per cent in the fragile frontier; electricity access is 100, 62 and 60 per cent.
- **Money does not follow risk.** UNEP puts developing-country adaptation needs at US\$310 to 365 billion a year by 2035 against about US\$26 billion in international public flows in 2023, and independent analysis finds virtually no link between adaptation finance per head and vulnerability.
- **The rankings differ in how robust they are.** The risk-mass ranking is nearly immune to reweighting (rank correlations of at least 0.988). The return-intensity ranking depends on how heavily fragility is discounted (correlations of 0.51 to 0.98), which is a value judgement the framework makes visible.
- **Allocation rules matter less than delivery models.** Anchors take 67 to 72 per cent of any allocation that follows people or risk; the three frontier tiers (10.6 per cent of people) would take 19 per cent of a concessional window. A mass-based key would send 39 per cent to India alone, so caps are needed.

What to do

- Screen on both lenses and publish annual country priority ledgers.
- Treat the 14 anchors as system-change targets (standards, national warning and shock-responsive protection), not project sites.
- Open a grant-heavy window for the return frontier and a protected, state-light portfolio for the fragile frontier; pool risk for small states.
- Close early warning and observation gaps first, build adaptive social protection and package both with energy and connectivity.
- Build subnational priority ledgers and align finance architecture with risk.

1. Introduction: Resilience Has an Address

Most resilience debates ask how much to spend. This report asks where. Risk is not spread evenly across the developing world, and neither is the capacity to reduce it. A dollar placed in a coastal delta, a drought-prone farming belt or a fast-growing river city does a different amount of work from the same dollar placed somewhere else. Locating that difference is the first step in spending resilience money well.

The case for resilience investment is by now well rehearsed. The Intergovernmental Panel on Climate Change (IPCC) reports with high confidence that [approximately 3.3 to 3.6 billion people live in contexts that are highly vulnerable to climate change](#), with hotspots in West, Central and East Africa, South Asia, Central and South America and the small island developing States. The World Bank's *Unbreakable* estimated that natural disasters cost the world about US\$520 billion a year in lost consumption and push some 26 million people into poverty annually. The United Nations Office for Disaster Risk Reduction (UNDRR) now argues, in its *Global Assessment Report 2025*, that once cascading and ecosystem costs are counted, disasters cost more than US\$2.3 trillion a year, about ten times the direct losses recorded in official statistics.

The financing response has not kept pace. The United Nations Environment Programme (UNEP) [puts the adaptation finance needs of developing countries at US\\$310 to 365 billion a year by 2035](#), against international public flows of about US\$26 billion in 2023. When needs run at twelve to fourteen times flows, allocation is no longer a secondary matter. Every project that goes to the wrong place is a project that did not go to the right one, and the wrong place is easy to choose because the places that attract finance are rarely the places where risk is highest. A recent [Center for Global Development analysis of climate finance allocations](#) found virtually no correlation between adaptation finance per person and either vulnerability or income across country groups.

1.1 The question

This report asks one question: **across the Global South, where could resilience investments most reduce future risk?** It is a question about geography in three senses. It is about countries, because national governments and development banks allocate by country. It is about hazards, because a drought belt and a cyclone coast need different assets. And it is about places inside countries, because risk is lumpy, concentrated in deltas, drylands, informal settlements and floodplains that national averages hide.

The question has two honest answers, and they do not coincide. If the goal is to reduce the largest total amount of risk, the answer follows people: a handful of very large countries hold most of what can be reduced. If the goal is to get the most risk reduction from each dollar, the answer follows intensity: smaller, poorer, more exposed and more fragile places, where a given programme protects a larger share of the population. A sound allocation needs both lenses, plus a realistic view of whether money can be absorbed and delivered where it is sent.

1.2 What this report does

The report makes five contributions.

- **It builds a transparent, reproducible country screen.** Using the open [INFORM Risk Index 2026](#) (the mid-year 2026 release, v0.7.3, published by the European Commission's Joint Research Centre under a CC BY 4.0 licence) and World Bank data, it scores 122 low- and middle-income economies, home to about 6.8 billion people, on risk intensity, risk mass and deliverability.
- **It sorts countries into five investment tiers:** scale anchors, a return frontier, a fragile frontier, a small-state niche, and a group to maintain and mainstream. Each tier calls for different instruments.

- **It tests whether the answer survives disagreement.** Nine alternative specifications change the weights, the aggregation and the deliverability discount. The top of the mass ranking is stable; the return-intensity ranking is more sensitive, and the report says which parts to trust.
- **It matches hazard archetypes to interventions,** drawing on published evidence about what has worked and what it returned, from Bangladesh's cyclone preparedness to Ethiopia's safety net.
- **It translates the findings into allocation rules, a roadmap and a monitoring scorecard** that a finance ministry, development bank or philanthropic funder could adopt.

1.3 What it does not do

The screen is a prioritisation heuristic, not a cost-benefit analysis. INFORM scores describe national conditions on a 0 to 10 scale; they do not measure the cost of a specific project or the exact number of lives it would save. Where the report states a benefit-cost ratio, it attributes it to the study that estimated it. Subnational patterns are drawn from the published literature and case evidence, not from the national index. Section 14 returns to these limits.

1.4 Scope and definitions

'Global South' here means the 122 economies that the World Bank income classification, as carried in the INFORM dataset, places in the low-, lower-middle- or upper-middle-income groups, excluding European countries other than Türkiye, the Caucasus and Central Asia. That set includes China and India. It covers 25 low-income, 47 lower-middle-income and 50 upper-middle-income economies, and sums to about 6.8 billion people on INFORM's 2026 population figures. High-income countries are excluded, not because their risks are small, but because the allocation question is different where domestic finance and institutions are deep.

'Resilience investment' is used broadly: anything that reduces the vulnerability of people and assets, or raises their capacity to cope, before a hazard strikes. That includes early warning systems, climate-resilient infrastructure, social protection that can scale up in a crisis, drought-adapted agriculture, coastal and ecosystem protection, building codes, health-system preparedness and risk-transfer instruments. It excludes post-disaster relief, except where the report discusses how pre-arranged finance can change its speed.

1.5 How to read the report

Sections 2 and 3 set out the risk landscape and the method. Sections 4 to 6 give the results: where the prize is, where each dollar works hardest, and how robust the answer is. Sections 7 and 8 turn from places to portfolios, matching hazard archetypes to interventions and reviewing the evidence on returns. Section 9 examines the enabling conditions of money, social protection and infrastructure. Sections 10 and 11 move down to subnational hotspots and up to regional playbooks. Sections 12 to 14 draw out allocation rules, recommendations and limits. Appendix B lists every country's scores. Every external statistic carries a hyperlink to its source, and Appendix C collects them.

2. The Risk Geography of the Global South

Climate and disaster risk is concentrated on three overlapping geographies: the places where hazards are intense, the places where people and assets are exposed, and the places where poverty, weak services and fragile institutions leave people unable to cope. Their overlap, not any one of them, defines where resilience investment is most needed.

2.1 The scale of what is at stake

The headline numbers are large enough that it is easy to lose sight of their different meanings. Figure 1 sets seven of them side by side. Some describe exposure to hazards (people on flood plains), some describe vulnerability (people in poverty or hunger) and some describe the capacity to respond (people without social protection, countries whose interest bills crowd out health and education). They overlap heavily, but they are not the same people, and a resilience programme aimed at one will miss part of another.

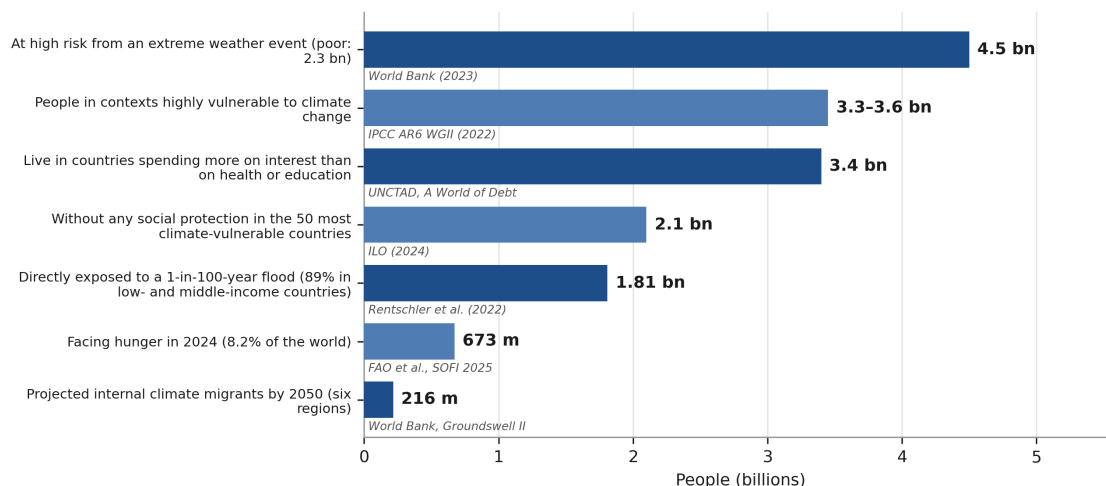


Figure 1. The stakes in numbers: exposure, vulnerability and weak coping capacity.

Sources: IPCC AR6 WGII (2022); World Bank (2023) on people at high risk from weather shocks; UNCTAD, A World of Debt; Rentschler et al. (2022); ILO, World Social Protection Report 2024–26; FAO et al., SOFI 2025; World Bank, Groundswell Part II (2021). Figures are not additive.

Several of these figures deserve a closer look. A World Bank study of 2023 [estimated that about 4.5 billion people, more than half the world, are at high risk of an extreme weather event](#), of whom about 2.3 billion live on less than US\$6.85 a day. In a global flood analysis, [Rentschler, Salhab and Jafino found that 1.81 billion people, 23 per cent of the world, are directly exposed to a once-in-a-hundred-year flood](#); 89 per cent of them live in low- and middle-income countries, 1.24 billion in South and East Asia, and about 780 million of them live on less than US\$5.50 a day. The [International Labour Organization \(ILO\)](#) reports that in the 20 countries most vulnerable to the climate crisis, 91.3 per cent of people lack any social protection, and across the 50 most vulnerable countries 75 per cent (2.1 billion people) do.

The costs of heat and hunger add a human dimension to the exposure data. The [2025 Lancet Countdown](#) reports an average of about 546,000 heat-related deaths a year in 2012–2021 and US\$1.09 trillion of potential income lost to heat-related labour productivity decline in 2024, with the heaviest impacts on low- and middle-income countries. The [FAO's 2025 State of Food Security and Nutrition](#) estimates 8.2 per cent of the world's population, about 673 million people, faced hunger in 2024, with Africa's share around 20 per cent.

2.2 Where risk concentrates

To locate risk by country, this report uses the INFORM Risk Index, an open, peer-reviewed composite that combines three dimensions: hazard and exposure, vulnerability, and lack of coping capacity. Each runs from 0 to 10, and INFORM aggregates them with equal weight using a geometric mean, so that a high score on one dimension cannot fully offset a low one. INFORM's [methodology](#) is documented in full, and its authors caution that it is a simplified view of reality that should be used with other sources.

For this report the hazard dimension is restricted to natural and health hazards (earthquake, river flood, tsunami, tropical cyclone, coastal flood, drought and epidemic), so that conflict, which INFORM also scores, is treated separately as a factor in deliverability rather than as a hazard that resilience investment reduces directly. The result, which this report calls **risk intensity (R)**, is the geometric mean of the natural-hazard exposure, vulnerability and lack-of-coping-capacity scores. Figure 2 maps it.

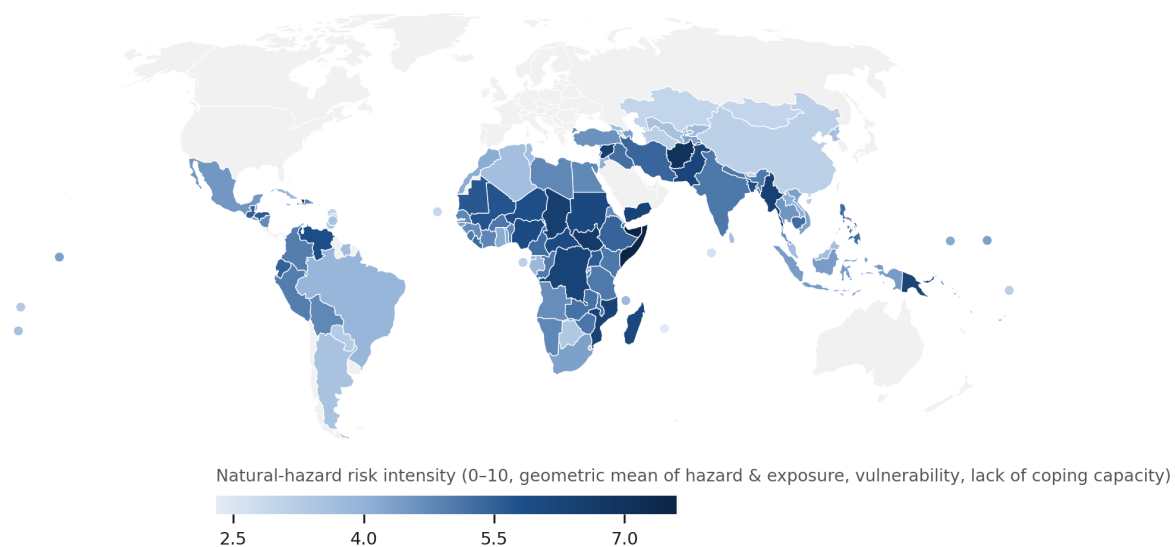


Figure 2. Natural-hazard risk intensity (R) across 122 low- and middle-income economies.

Source: H Heuristics analysis of INFORM Risk Index mid-2026 (European Commission JRC, CC BY 4.0). Country boundaries: Natural Earth. Small island States shown as points. High-income and excluded countries in grey.

Three features stand out. First, intensity is highest in a band of fragile and low-income countries running from the Horn of Africa through the Sahel and Central Africa, where high vulnerability and weak coping capacity combine with moderate natural-hazard exposure: Somalia (7.6), Haiti (7.2), Afghanistan (7.0), South Sudan (6.7), Chad (6.5), Myanmar (6.4), Mozambique (6.3) and the Democratic Republic of the Congo (6.3) lead the list. Second, a second belt of high intensity runs through the Asian deltas and archipelagos: Pakistan (6.2), Bangladesh (5.8) and Papua New Guinea (6.3). Third, the two most populous countries, China and India, score very differently (3.1 and 5.1), because China's vulnerability and coping scores are far lower than India's even though both face intense flood and cyclone hazards.

The regional picture follows in Figure 3. South Asia holds 29.5 per cent of the Global South's population but 33.5 per cent of its risk-weighted population (population multiplied by intensity), and Sub-Saharan Africa 19.7 per cent of people but 23.2 per cent of risk-weighted population. East Asia and the Pacific is the mirror image: 31.9 per cent of people but only 24.9 per cent of risk, because its large economies have built more coping capacity.

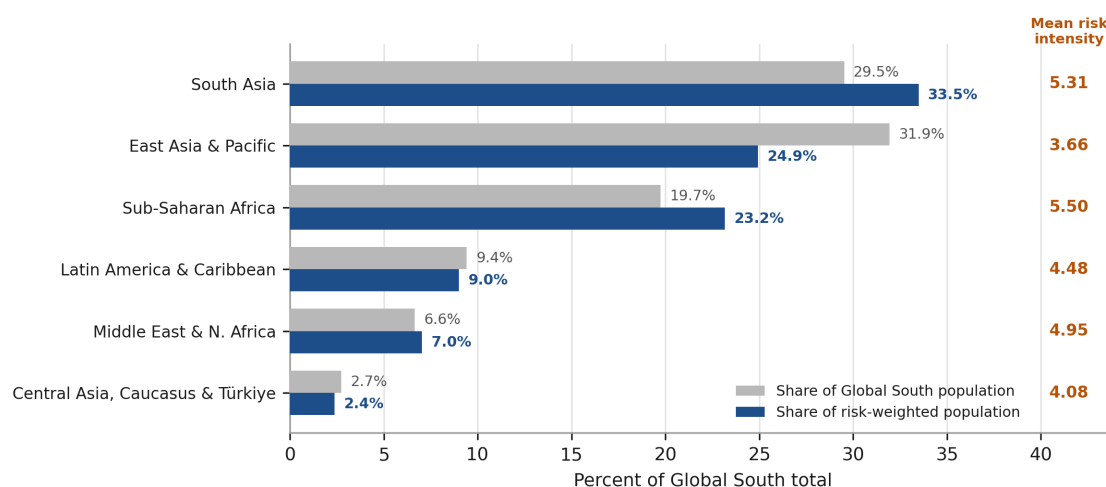


Figure 3. Regional shares of population and of risk-weighted population, Global South.

Source: H Heuristics analysis of INFORM Risk Index mid-2026 and INFORM population estimates for 2026. Risk-weighted population = population × R / 10. Mean intensity is population-weighted.

2.3 Different hazards, different places

Hazard profiles differ sharply by region, and the differences matter for what to build. Figure 4 shows the population-weighted INFORM hazard scores for each region. South Asia is exposed across the board, with river flood (9.1), earthquake (8.4), tropical cyclone (7.3) and coastal flood (7.1) all scoring high. East Asia and the Pacific shares the flood and coastal exposure (8.9 and 8.6). Sub-Saharan Africa's defining exposures are epidemic (7.1) and, on a more local scale, drought; its cyclone and earthquake scores are low on average but conceal very high values in the Indian Ocean coast and the Rift Valley. Central Asia, the Caucasus and Türkiye are dominated by earthquake risk (7.9).

	River flood	Tropical cyclone	Coastal flood	Drought	Earthquake	Epidemic
South Asia	9.1	7.3	7.1	5.3	8.4	6.7
East Asia & Pacific	8.9	6.4	8.6	4.2	6.7	5.7
Sub-Saharan Africa	5.9	0.4	2.7	4.5	1.9	7.1
Middle East & N. Africa	6.9	0.6	5.7	4.8	5.9	4.6
Latin America & Caribbean	6.9	2.9	5.0	3.8	5.4	5.8
Central Asia, Caucasus & Türkiye	6.7	0.0	2.4	4.3	7.9	5.0

Figure 4. Population-weighted hazard exposure by region (INFORM scores, 0–10).

Source: H Heuristics analysis of INFORM Risk Index mid-2026, hazard and exposure sub-indicators, weighted by 2026 population. Scores are exposure-based, not annual-probability-based.

2.4 Vulnerability, not hazard, separates the countries

A notable result is how little natural-hazard exposure explains about the ranking of risk across countries. Among the 122 economies, the rank correlation (Spearman) between risk intensity and vulnerability is 0.86 and with lack of coping capacity 0.67, but with natural-hazard exposure only 0.46. Hazard exposure and coping capacity are, if anything, mildly inversely related (−0.17): countries with more intense hazards are not systematically worse prepared. In plain terms, nearly every large country in the Global South faces serious hazards; what differs

is how many people are poor, hungry, displaced or uninsured when the hazard arrives, and how much the state can do about it.

This has a direct implication for investment. Hazard cannot be moved by policy. Vulnerability and coping capacity can. The resilience investments in this report therefore target the two levers that determine how much damage a given hazard does: the exposure and susceptibility of people and assets, and the capacity of households, firms and governments to anticipate, absorb and recover.

2.5 How this compares with other risk rankings

Other global indices rank countries differently, and the differences are informative. Table 1 summarises three of them. The [WorldRiskReport 2025](#), published by Bündnis Entwicklung Hilft and Ruhr University Bochum, ranks the Philippines first, followed by India and Indonesia, and finds that Africa shows the highest levels of vulnerability. Germanwatch’s [Climate Risk Index 2026](#) looks backward, ranking countries by the realised impacts of extreme weather in 1995–2024 (more than 832,000 deaths and direct losses of almost US\$4.5 trillion across 9,700 events); Dominica, Myanmar and Honduras lead. INFORM looks forward at the conditions that make a humanitarian crisis likely.

Table 1. Three views of risk and what each is best used for

Index	What it measures	Top of the ranking	Best used for
INFORM Risk 2026	Likelihood of a crisis needing international help: hazard & exposure, vulnerability, lack of coping capacity (191 countries)	South Sudan, Somalia, DR Congo, Chad and the Central African Republic rank highest overall (conflict included)	Screening for where capacity to cope is thin
WorldRiskIndex 2025	Geometric mean of exposure and vulnerability (193 countries), with a focus on floods	Philippines, India, Indonesia, Colombia, Mexico, Myanmar, Mozambique	Comparing exposure to natural hazards
Climate Risk Index 2026	Realised human and economic losses from extreme weather, 1995–2024	Dominica, Myanmar, Honduras; recurring: Haiti, Philippines, Nicaragua, India	Looking back at who has been hit

Sources: *INFORM* (European Commission JRC); *WorldRiskReport 2025* (Bündnis Entwicklung Hilft / Ruhr University Bochum); *Germanwatch CRI 2026*. Rankings are reported as published and are not directly comparable.

The three indices overlap on Myanmar, the Philippines and India, and disagree at the margins. They disagree most about small island States, which score extremely on realised losses (a single storm can erase a large fraction of national income) but are small in population terms and so barely move any measure of total risk. That tension runs through this report. It is why the framework in the next section separates **risk mass**, which follows people, from **risk intensity**, which follows exposure per person.

3. A Framework for Locating Resilience Investment

A country should attract resilience investment when three things hold: its risk is high, it contains many people, and money placed there can actually be delivered. The framework turns those three conditions into transparent scores, then sorts countries into five tiers that call for different instruments.

3.1 Three scores

Risk intensity (R). As defined in Section 2, R is the geometric mean of three INFORM dimensions: natural-hazard exposure, vulnerability and lack of coping capacity, each on a 0 to 10 scale. It measures how large the risk is for a typical person in the country.

Risk mass (M). Risk mass is population (P) multiplied by risk intensity, divided by ten: $M = P \times R / 10$. It is measured in million person-equivalents. It answers: how much total risk is there, scaled by the number of people exposed to it? A country with 100 million people and R of 5 has M of 50 million person-equivalents.

Deliverability (D). Resilience investment fails if it cannot be absorbed. Weak governance and active conflict slow procurement, deter private partners, destroy assets and make long-lived infrastructure risky. Deliverability is $D = 1 - \frac{1}{2} \times (\frac{1}{2} G + \frac{1}{2} C) / 10$, where G is INFORM's governance lack-of-coping score and C is its current conflict intensity score, both on 0 to 10. D ranges from 0.53 (Sudan) to 0.90 (Fiji), and has a median of 0.76. The discount is deliberately moderate: it halves the effect of the worst governance and conflict conditions, because humanitarian and development needs are greatest in precisely those places and a purely mechanical discount would abandon them.

3.2 Two delivery-adjusted lenses

Combining the three scores gives two lenses, shown in Figure 5. **$M \times D$, delivery-adjusted risk mass**, is the lens for 'where is the prize?'. It measures the total amount of risk that investment could plausibly reduce, scaled by feasibility. **$R \times D$, return intensity**, is the lens for 'where does each dollar work hardest?'. It is independent of population, so it identifies places where a given per-person programme addresses more risk. If the cost of a standard resilience package scales roughly with the number of people covered, return intensity is a rough proxy for risk reduced per dollar.

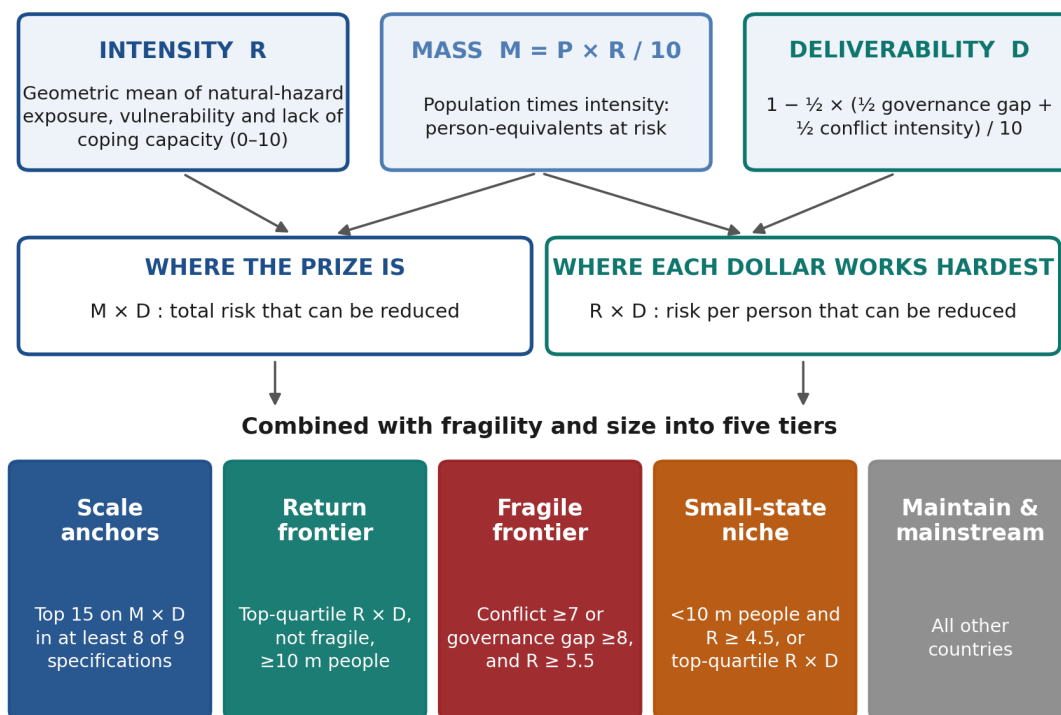


Figure 5. The framework: three scores, two lenses and five investment tiers.

Source: H Heuristics. Thresholds are defined in Table 2.

3.3 Five tiers

The tiers sort countries by what they need, not by how deserving they are. They are mutually exclusive and are assigned in the following order.

- **Scale anchors** are the 14 countries that rank in the top 15 on delivery-adjusted risk mass in at least eight of nine alternative specifications (Section 6). They hold most of the prize because they hold most of the people.
- **Fragile frontier** countries (not anchors) have conflict intensity of 7 or more, or a governance lack-of-coping score of 8 or more, and risk intensity of at least 5.5. Their risk is high and their capacity to absorb conventional projects is low.
- **Return frontier** countries (not anchors, not fragile, at least 10 million people) are in the top quartile of return intensity among non-anchor, non-fragile countries. Money works hard here, and deliverability is adequate.
- **Small-state niche** countries have fewer than 10 million people and either risk intensity of at least 4.5 or a top-quartile return intensity. Their total risk mass is small, but single events can be catastrophic relative to their economies.
- **Maintain and mainstream** countries are all the rest. Risk is lower or already being managed; the task is to maintain gains, embed resilience in routine investment and watch for change.

Table 2. Framework parameters and data sources

Element	Definition	Source
Risk intensity R	Geometric mean of Natural hazard & exposure, Vulnerability and Lack of coping capacity (0–10)	INFORM Risk 2026
Population P	2026 population estimate	INFORM population sheet
Risk mass M	$P \times R / 10$, million person-equivalents	H Heuristics calculation
Deliverability D	$1 - \frac{1}{2} \times (\frac{1}{2} \text{ governance gap} + \frac{1}{2} \text{ conflict intensity}) / 10$	INFORM Governance and Conflict indicators
Delivery-adjusted mass	$M \times D$	H Heuristics calculation
Return intensity	$R \times D$	H Heuristics calculation
Fragile flag	Conflict ≥ 7 or governance gap ≥ 8	INFORM
Enabling conditions	Electricity access, internet use, social protection coverage, external debt service, poverty headcount	World Bank Open Data

INFORM indicators use the mid-2026 release (v0.7.3). World Bank indicators are the most recent available value for each country. Governance and conflict values come from INFORM's 'Governance' and 'Current Conflict Intensity' indicators.

3.4 A note on what 'risk reduction' means here

Resilience investment acts on vulnerability and coping capacity, not on hazard. To give the scores a physical scale, suppose that a standard resilience package closes one-fifth of both the vulnerability and the coping-capacity gaps in a country. Because R is a geometric mean, that cuts natural-hazard risk intensity by about 14 per cent ($1 - (0.8 \times 0.8)^{(1/3)}$). Applied to the 3.18 billion person-equivalents of natural-hazard risk across the 122 economies, it would remove about 0.44 billion person-equivalents. This is an illustration of scale, not a forecast. It shows that even a modest, uniformly applied package changes the exposure of several hundred million people, and it makes clear that the ranking of countries by risk reduction potential is the same as their ranking by risk mass, since the percentage reduction is the same everywhere. What differentiates countries is deliverability and the cost per person, which is why the framework adds a second, intensity-based lens and a fragility screen.

Choosing a proportional rather than a fixed-point improvement is deliberate. Under a fixed-point improvement, a geometric mean pays the largest returns to countries that already have low scores, an artefact of the mathematics rather than of reality. The proportional assumption better reflects the experience that moving from very weak to moderate capacity is cheaper per point than moving from good to excellent.

3.5 Why a country screen, and what it cannot see

National screens are blunt. A country is both a unit of policy and a region of very different conditions: Brazil's Amazon and its north-east drylands, India's Gujarat coast and its Himalayan foothills, Nigeria's Niger Delta and its Sahelian north. The screen locates where to look and how to approach it; Section 10 then looks inside countries. It also uses INFORM's inputs as given. INFORM's hazard indicators reflect exposure rather than climate projections, so they do not capture how risk is changing; the ranking is a snapshot of the current risk landscape, not a forecast of 2050. And the INFORM index combines indicators measured in different years, with a median age of data of several years in many countries; Appendix A reports the reliability issues.

4. Where the Prize Is: Risk Mass and the Scale Anchors

Most of the risk that resilience investment could reduce sits in a small number of very large countries. Fourteen scale anchors hold 70 per cent of the delivery-adjusted risk mass and 72 per cent of the people. That concentration is mostly demographic, but it carries a lesson for allocation: the largest gains come from changing how large national systems are built, not from adding projects around the edges.

4.1 A highly concentrated prize

Ranking the 122 economies by delivery-adjusted risk mass ($M \times D$) produces one of the most skewed distributions in development finance. India and China alone account for 39 per cent of the total. The top five countries (India, China, Pakistan, Indonesia and Nigeria) hold 52 per cent, the top ten 64 per cent, the top 14 70 per cent and the top 30 84 per cent. The remaining 92 countries share 16 per cent between them. Figure 6 shows the concentration curve.

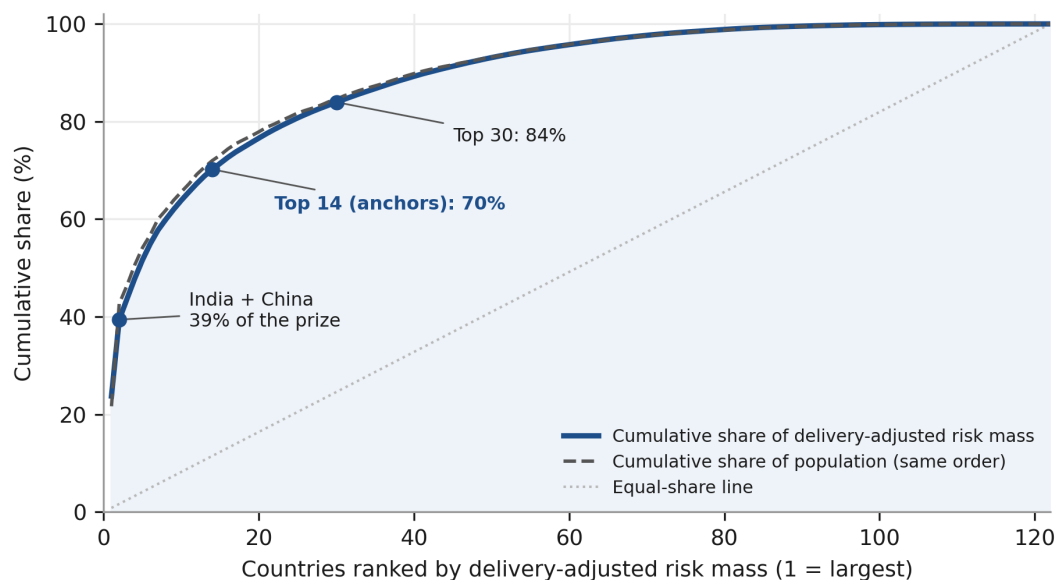


Figure 6. Cumulative share of delivery-adjusted risk mass, countries ranked from largest to smallest.

Source: H Heuristics analysis of INFORM Risk Index mid-2026. The population curve (same country order) is almost identical, showing that concentration of mass is mainly a population effect.

The population curve in Figure 6 is almost indistinguishable from the risk-mass curve. That tells us something important: **at the level of totals, the geography of the prize is mostly the geography of people.** Risk intensity varies across countries, but not enough to move the large countries out of the lead. The 14 anchors have a population-weighted intensity of 4.6, slightly below the 4.7 average for the whole group, because China, Brazil and Vietnam pull it down.

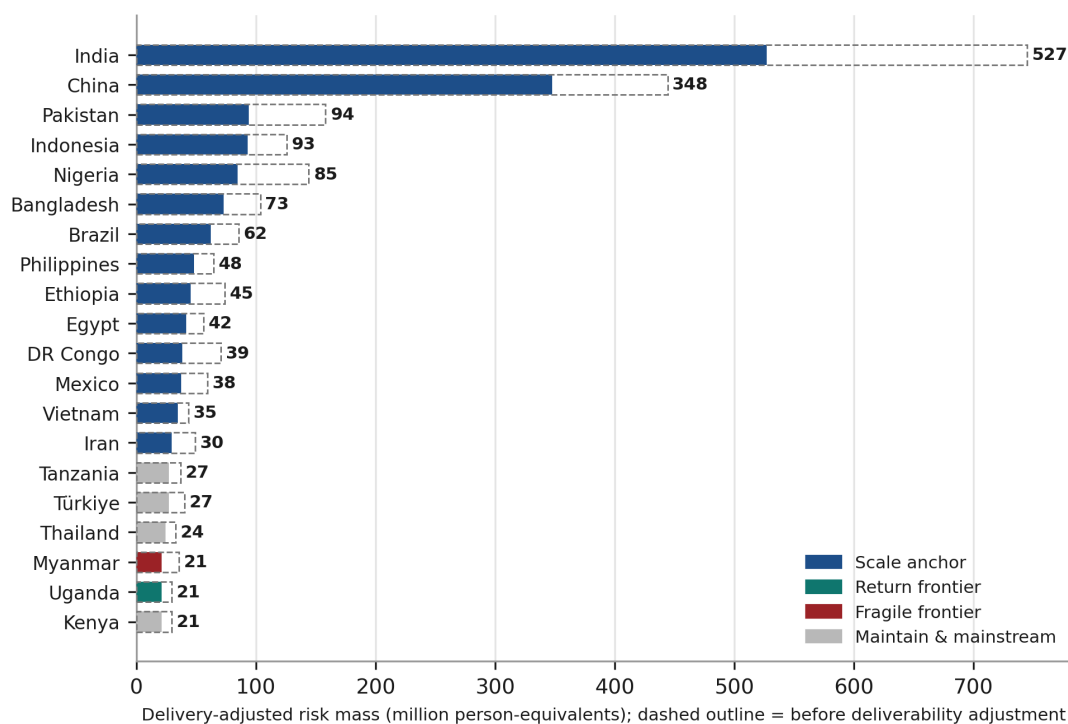


Figure 7. The 20 countries with the largest delivery-adjusted risk mass.

Source: H Heuristics analysis of INFORM Risk Index mid-2026. Dashed outlines show risk mass before the deliverability adjustment. Million person-equivalents = population $\times$ R / 10 $\times$ D.

4.2 The 14 scale anchors

The anchors are India, China, Pakistan, Indonesia, Nigeria, Bangladesh, Brazil, the Philippines, Ethiopia, Egypt, the Democratic Republic of the Congo, Mexico, Vietnam and Iran. Defined by robustness rather than a fixed cut-off (they rank in the top 15 in at least eight of nine specifications; see Section 6), they are listed in Table 3. Their combined population is 4.9 billion, 72 per cent of the Global South total, and they are spread across every region except Europe and Central Asia.

Table 3. The 14 scale anchors

Rank	Country	Pop. (m)	R	D	M × D	Archetype	Fragile flag
1	India	1467	5.1	0.71	527	Compound	No
2	China	1423	3.1	0.78	348	Compound	No
3	Pakistan	255	6.2	0.59	94	Compound	Yes
4	Indonesia	284	4.4	0.74	93	Compound	No
5	Nigeria	240	6.0	0.59	85	Flood	Yes
6	Bangladesh	178	5.8	0.70	73	Compound	No
7	Brazil	220	3.9	0.73	62	Flood	No
8	Philippines	123	5.3	0.75	48	Storm & coast	No
9	Ethiopia	136	5.4	0.61	45	Flood	Yes
10	Egypt	118	4.8	0.74	42	Compound	No
11	DR Congo	113	6.3	0.55	39	Flood	Yes
12	Mexico	131	4.5	0.63	38	Compound	Yes
13	Vietnam	101	4.3	0.80	35	Compound	No
14	Iran	91.0	5.4	0.60	30	Compound	Yes

Source: H Heuristics analysis of INFORM Risk Index mid-2026. Population in millions (2026). $M \times D$ in million person-equivalents. ‘Fragile flag’ = conflict intensity ≥ 7 or governance gap ≥ 8 on INFORM’s 0–10 scales. Archetype is defined in Section 7.

Three observations follow. **First**, the anchors are not a homogenous group. China, Brazil, Indonesia and Vietnam combine large populations with relatively strong coping capacity (their deliverability scores are 0.73 to 0.80) and, in general, more domestic fiscal capacity than the other tiers. For them the useful leverage is policy and standards: building codes, land-use rules, resilient-infrastructure requirements and the pipeline of public investment they already deploy. India is large enough to be a category of its own. It combines the largest risk mass in the sample with deliverability of 0.71 and a state-level federal structure in which delivery varies enormously, so the right unit of engagement is the state or the river basin rather than the nation.

Second, six of the 14 anchors carry the fragile flag: Pakistan, Nigeria, Ethiopia, the Democratic Republic of the Congo, Mexico and Iran. In Pakistan, Nigeria and Ethiopia the flag reflects internal conflict intensity of 9.3 to 9.5 out of 10. These are cases where the size of the prize and the difficulty of delivery coexist. Programmes there need sub-national design, flexible procurement and protection against disruption; abandoning them is not an option, because the people at risk are numerous. Pakistan’s 2022 floods, for which the [Post-Disaster Needs Assessment](#) found damages above US\$14.9 billion, economic losses of about US\$15.2 billion and reconstruction needs of about US\$16.3 billion (with close to 70 per cent of damages and losses in Sindh), show what is at stake. The assessment also estimated that the floods could push 8.4 to 9.1 million more people below the poverty line.

Third, the anchors are where one-off projects matter least and system design matters most. The Global Commission on Adaptation’s finding of benefit-cost ratios [between 2:1 and 10:1](#) in five priority areas applies most powerfully where programmes can be replicated at national scale: early warning networks, national social-protection registries, standards for new infrastructure, and the retrofitting of public buildings. A national early warning platform covering 250 million people is a different order of investment from a pilot in two districts.

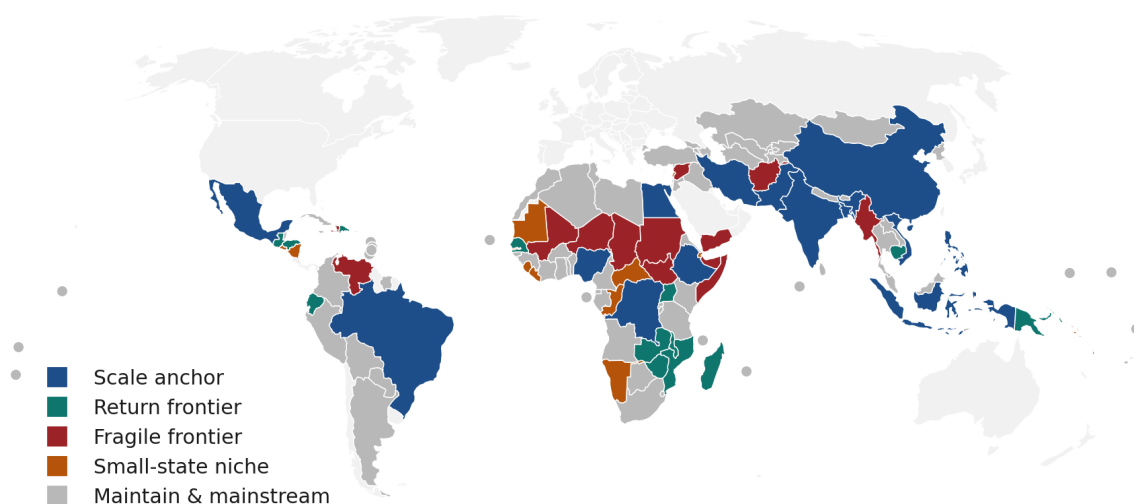


Figure 8. *The five investment tiers.*

Source: H Heuristics analysis of INFORM Risk Index mid-2026. Tier definitions in Section 3.3 and Table 2. Small island States shown as points.

4.3 What the prize measure leaves out

Risk mass tells us where risk is, but not who should pay. The anchors differ widely in their capacity to self-finance. Seven of the 14 are classified by the World Bank as low- or lower-middle-income (India, Pakistan, Nigeria, Bangladesh, Ethiopia, Egypt and the Democratic Republic of the Congo), and seven as upper-middle-income (China, Indonesia, Brazil, the Philippines, Mexico, Vietnam and Iran). The case for concessional and grant finance is strongest in the former and weakest in China or Brazil, where domestic budgets and capital markets can carry most of the load. Section 12 returns to this when it considers how an allocation might weight the tiers.

A second omission concerns the unit of analysis. A national score for Brazil averages the Amazon, the north-east drylands and the São Paulo urban corridor. A programme designed for the national average will miss the place where risk is concentrated. For the anchors above all, Section 10 shows how subnational targeting changes the picture.

5. Where Each Dollar Works Hardest: The Return, Fragile and Small-State Frontiers

Change the question from ‘where is the most risk in total?’ to ‘where does a given programme per person address the most risk?’ and the map changes. The highest return intensity lies in smaller, poorer, more exposed countries, many of which are overlooked because their total risk mass is modest. Three groups stand out: a return frontier where delivery is feasible, a fragile frontier where it is hard, and a small-state niche where single events are existential.

5.1 Return intensity versus size

Figure 9 plots each country by return intensity ($R \times D$) and population. The anchors cluster at the top, spanning a wide range of intensities; China sits far left at 2.4 and Bangladesh far right at 4.1. The countries with the highest return intensity are small or medium-sized: Madagascar (4.65), Papua New Guinea (4.61), the Solomon Islands (4.60), Haiti (4.42), Vanuatu (4.38), Mauritania (4.31), Honduras (4.28), Somalia (4.24), Mozambique (4.23) and Afghanistan (4.21). Only one anchor, Bangladesh (4.10), is in the top dozen.

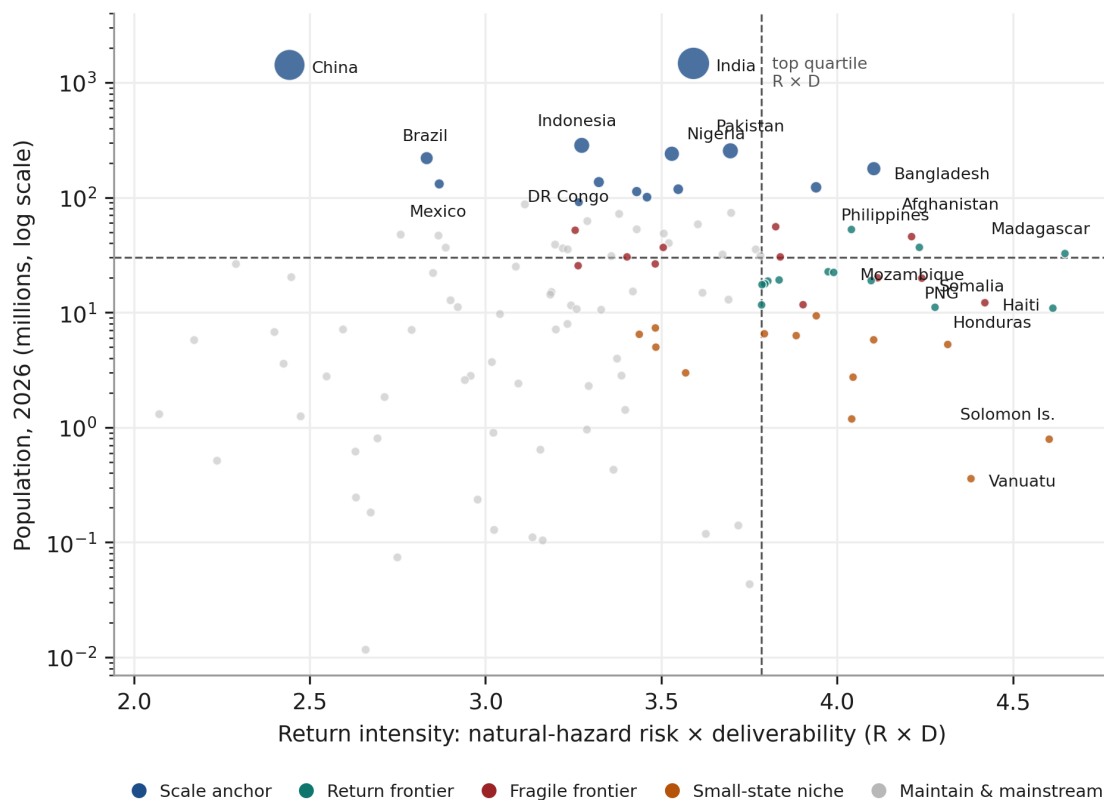


Figure 9. Return intensity ($R \times D$) against population, with bubble area showing delivery-adjusted risk mass.

Source: H Heuristics analysis of INFORM Risk Index mid-2026. Dashed lines: top-quartile return intensity (vertical) and 30 million people (horizontal). Population on a logarithmic scale.

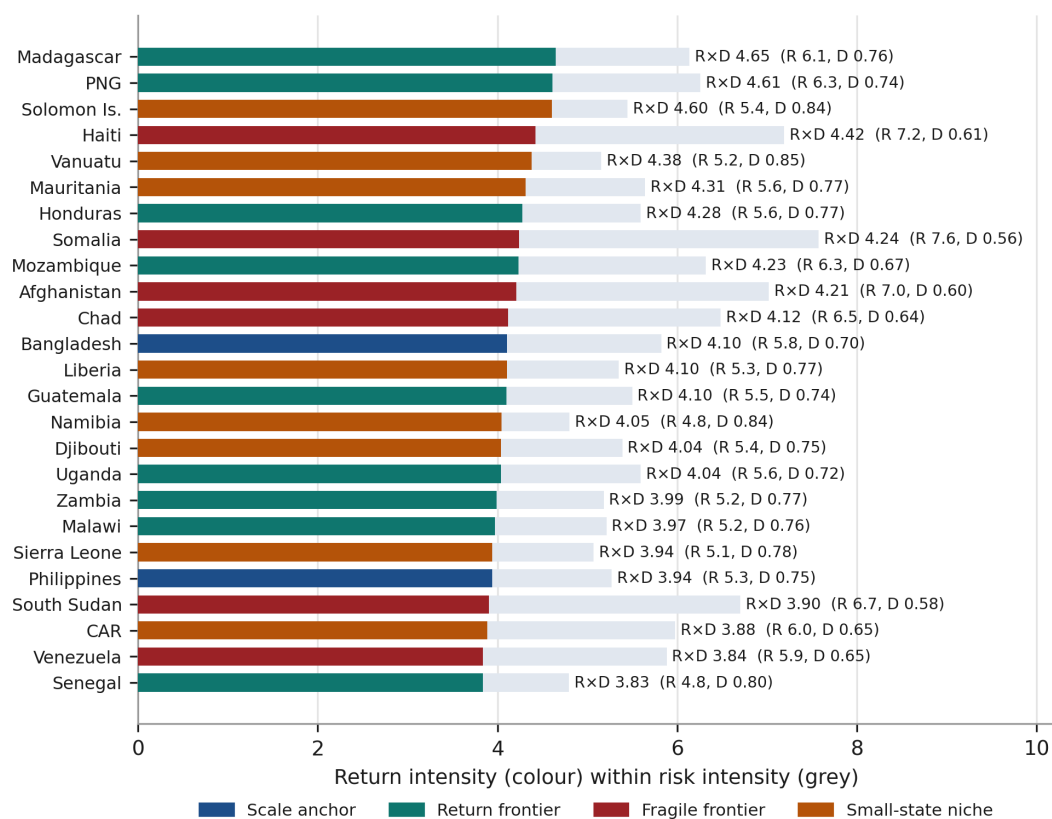


Figure 10. The 25 countries with the highest return intensity.

Source: H Heuristics analysis of INFORM Risk Index mid-2026. Colour bar = $R \times D$; grey bar = R before the deliverability adjustment. Fragile frontier countries lose the most from the adjustment.

5.2 The return frontier: 13 countries where money works hard and can be delivered

The return frontier consists of 13 non-fragile countries with at least 10 million people and top-quartile return intensity. They are listed in Table 4. Together they hold 293 million people, 4.3 per cent of the Global South population and 5.1 per cent of its natural-hazard risk mass. They are not large enough to dominate any total, but each dollar there reaches a population with high vulnerability and thin coping capacity.

Table 4. The return frontier: 13 countries

Country	Pop. (m)	R	D	R × D	Archetype	Electricity %	Soc. prot. %	Debt serv. %
Madagascar	32.5	6.1	0.76	4.65	Storm & coast	43	6	7
Papua New Guinea	10.9	6.3	0.74	4.61	Storm & coast	43	4	43
Honduras	11.1	5.6	0.77	4.28	Flood	96	32	18
Mozambique	36.8	6.3	0.67	4.23	Drought	37	6	47
Guatemala	18.9	5.5	0.74	4.10	Flood	91	63	10
Uganda	52.7	5.6	0.72	4.04	Drought	55	2	14
Zambia	22.3	5.2	0.77	3.99	Drought	54	2	30
Malawi	22.6	5.2	0.76	3.97	Drought	16	38	11
Senegal	19.2	4.8	0.80	3.83	Flood	83	34	42
Ecuador	18.7	5.5	0.69	3.80	Flood	99	41	22
Zimbabwe	17.7	5.1	0.74	3.79	Drought	62	37	20
Cambodia	17.5	5.3	0.71	3.79	Flood	99	3	11
Dominican Republic	11.6	4.9	0.77	3.79	Storm & coast	100	51	22

Source: H Heuristics analysis of INFORM Risk Index mid-2026 and World Bank Open Data (most recent value: electricity access 2024; social protection coverage, latest ASPIRE year; external debt service as % of exports, latest year). n/a = not available.

The enabling conditions in these countries are weaker than in the anchors. Median electricity access is 62 per cent, internet use 42 per cent and social-protection coverage 32 per cent, against 100, 71 and 54 per cent in the anchors (Section 9). Median external debt service is about 20 per cent of exports, the highest of any tier, so the fiscal squeeze is the most severe where the return is high. Extreme poverty is also deep: the median poverty headcount at the World Bank's US\$3.00-a-day line is about 51 per cent. Four patterns follow.

- **Grants and concessional finance matter most here.** A country spending a fifth of its export earnings on debt service cannot easily borrow at market terms for resilience assets with long payback. The [UNEP Adaptation Gap Report 2025](#) notes that realistic private flows for adaptation are about US\$50 billion a year against about US\$5 billion now; most of that gap will not close in countries like these without blended structures.
- **Southern and eastern Africa dominate the list.** Uganda, Mozambique, Madagascar, Malawi, Zambia and Zimbabwe form a belt where drought, flood and cyclone risk combine with low coverage of social protection. Hazards here are largely climate-sensitive, and the INFORM drought indicator for Zimbabwe (9.4), Mozambique (7.1), Uganda (7.0) and Malawi (6.5) is among the highest in the sample.
- **Central America and the Caribbean contribute Guatemala, Honduras and the Dominican Republic.** Earthquake and storm exposures overlap with drought in the Dry Corridor. Honduras ranks third on the Climate Risk Index's long-term list; Guatemala and Honduras are two of the four countries where return intensity ranks in the top 25 in all nine robustness tests.
- **Madagascar and Papua New Guinea are the extreme cases.** Both combine very high hazard exposure (cyclone 6.7 and earthquake 9.2 respectively) with weak coping capacity (6.8 to 7.5) and moderate conflict, so their deliverability is better than the fragile group and their return intensity is the highest in the sample.

5.3 The fragile frontier: high risk, low deliverability

Twelve countries combine high risk intensity (at least 5.5) with conflict intensity of 7 or more or a governance gap of 8 or more. They are Myanmar, Afghanistan, Sudan, Yemen, Venezuela, Niger, Syria, Somalia, Mali,

Chad, Haiti and South Sudan. They hold 367 million people, 5.4 per cent of the Global South total and 7.4 per cent of its risk mass before the deliverability adjustment. Table 5 lists them.

Table 5. The fragile frontier: 12 countries

Country	Pop. (m)	R	D	R × D	Archetype	Electricity %	Soc. prot. %
Somalia	19.9	7.6	0.56	4.24	Compound	54	8
Haiti	12.2	7.2	0.61	4.42	Storm & coast	54	19
Afghanistan	45.7	7.0	0.60	4.21	Compound	88	9
South Sudan	11.7	6.7	0.58	3.90	Flood	5	6
Chad	20.0	6.5	0.64	4.12	Flood	13	11
Syria	26.4	6.4	0.54	3.48	Drought	89	8
Myanmar	55.7	6.4	0.60	3.83	Compound	80	14
Yemen	36.8	6.3	0.56	3.51	Flood	86	43
Sudan	51.9	6.1	0.54	3.26	Flood	66	7
Venezuela	30.4	5.9	0.65	3.84	Storm & coast	100	15
Niger	30.4	5.8	0.58	3.40	Flood	21	23
Mali	25.5	5.7	0.57	3.26	Flood	50	35

Source: H Heuristics analysis of INFORM Risk Index mid-2026 and World Bank Open Data. Debt-service data are incomplete for fragile States and are omitted. n/a = not available.

Fragile States rank at the very top of risk intensity and at the very bottom of deliverability: their mean D is 0.58, and their median electricity access (60 per cent), internet use (23 per cent) and social-protection coverage (13 per cent) are the lowest of any tier. Standard instruments rarely work here. Long-lived infrastructure is exposed to conflict, government counterparts may be weak or contested, and multilateral lenders face limits. The question is not whether to invest but how.

The evidence suggests four principles. **First, favour instruments that do not depend on state capacity.** Cash transfers delivered through humanitarian systems, community-managed early warning and local water infrastructure can be set up quickly and survive changes in government. **Second, pre-arrange finance before the shock.** The cost of delay is measurable: a [2023 study led by the London School of Hygiene and Tropical Medicine](#) estimated 43,000 excess deaths in Somalia in 2022 as the country's drought deepened, half of them children under five. **Third, build the delivery system first.** Social-protection registries, mobile-money rails and logistics capacity are the platforms on which anticipatory action runs. **Fourth, accept that some benefits are humanitarian-development hybrids.** In the Sahel and Lake Chad Basin, where [OCHA's 2025 overview put 28.7 million people in urgent need](#) of assistance and protection, the line between resilience and relief is blurry by design.

5.4 The small-state niche: 13 countries where one event can erase a year of output

Thirteen countries with fewer than 10 million people are in the niche because their risk intensity is high (at least 4.5) or their return intensity is top-quartile. Several are fragile-adjacent or landlocked; the island cases are the most striking. Table 6 lists them.

Table 6. The small-state niche: 13 countries

Country	Pop. (m)	R	D	R × D	Archetype
Solomon Islands	0.8	5.4	0.84	4.60	Storm & coast
Vanuatu	0.4	5.2	0.85	4.38	Storm & coast
Mauritania	5.3	5.6	0.77	4.31	Drought
Liberia	5.8	5.3	0.77	4.10	Flood
Namibia	2.7	4.8	0.84	4.05	Drought
Djibouti	1.2	5.4	0.75	4.04	Drought
Sierra Leone	9.4	5.1	0.78	3.94	Flood
Central African Republic	6.3	6.0	0.65	3.88	Flood
Congo	6.5	5.1	0.75	3.79	Flood
Gambia	3.0	4.5	0.79	3.57	Flood
Lebanon	5.0	5.3	0.65	3.48	Storm & coast
Nicaragua	7.3	4.8	0.73	3.48	Flood
El Salvador	6.5	4.6	0.75	3.44	Storm & coast

Source: H Heuristics analysis of INFORM Risk Index mid-2026. Population in millions. Several small island States (for example Tuvalu, the Marshall Islands, Dominica) score lower on national R than the niche threshold but face acute event risk; see Figure 20.

The Solomon Islands, Vanuatu and Djibouti combine very high return intensity with populations of 1.2 million or fewer. Their total risk mass is tiny (together well under 0.1 per cent of the Global South's), and a mass-based allocation would give them almost nothing. But their exposure to single events is among the highest in the world. Section 10 reviews the evidence: Cyclone Pam's damage and losses in Vanuatu in 2015 were about 64 per cent of GDP, according to a [GFDRR case study](#), and in 2025 Hurricane Melissa's physical damage in Jamaica was [estimated by the World Bank and the Inter-American Development Bank at US\\$8.8 billion, 41 per cent of 2024 GDP](#).

Small states also face structural cost disadvantages, with diseconomies of scale in procurement, thin local engineering capacity and shipping costs, and they often rely on debt: the Global Center on Adaptation's [2025 report on small island developing States](#) puts their adaptation finance at just over US\$2 billion a year, 0.2 per cent of global climate finance, against estimated needs of about US\$12 billion a year, with debt making up 44 per cent of international adaptation finance in 2021–22. For these countries the right instruments are regional pooling (of insurance, procurement and technical staff), pre-arranged risk transfer and grant-heavy finance.

5.5 The mainstream: 70 countries, but not all safe

The remaining 70 countries hold 17 per cent of the Global South's population and 16 per cent of its risk mass. They include some large economies (Thailand, Türkiye, South Africa, Colombia, Kenya, Tanzania, Iraq, Angola). The label does not mean risk-free. Cameroon (R 5.3), Iraq (5.3), Burkina Faso (5.1), Kenya (5.1), Nepal (5.1) and Tanzania (5.1) all have natural-hazard risk intensity above the Global South median of 4.7; they fall outside the frontiers only because they are large enough or stable enough, or because other countries score higher. For this group the sensible stance is to embed resilience in routine investment and monitor.

6. Robustness: What Survives Reasonable Disagreement

Any composite score embeds choices. This section re-runs the analysis under the base case and eight alternative specifications that change the weights, the aggregation and the strength of the deliverability discount. The ranking by risk mass is stable. The ranking by return intensity is less so, and its sensitivity points to a genuine value judgement about how much weight to give fragility.

6.1 Nine specifications

The base case uses equal-weight geometric aggregation and a moderate deliverability discount. The alternatives are: (1) no deliverability discount; (2) a strong discount (0.9 instead of 0.5 times the governance-and-conflict term); (3) doubling the weight on natural-hazard exposure; (4) halving it; (5) doubling the weight on lack of coping capacity; (6) doubling the weight on vulnerability; (7) an arithmetic rather than geometric mean; and (8) using INFORM's full hazard and exposure dimension, which includes conflict, in place of natural-hazard exposure alone. Table 7 reports how closely each reproduces the base ranking. Counting the base case, there are nine specifications in all.

Table 7. Agreement with the base ranking under alternative specifications

Specification	Top-10 overlap (mass)	Rank correlation: mass	Rank correlation: return intensity
Base case	10	1.000	1.000
No deliverability discount	9	0.997	0.844
Strong deliverability discount	9	0.988	0.505
Hazard weight $\times 2$	9	0.999	0.899
Hazard weight $\times 0.5$	9	0.999	0.929
Coping-capacity weight $\times 2$	9	0.999	0.936
Vulnerability weight $\times 2$	10	0.999	0.962
Arithmetic mean	10	1.000	0.979
Full hazard & exposure (includes conflict)	9	0.997	0.752

Source: H Heuristics analysis. Spearman rank correlation with the base-case ranking across 122 economies. 'Top-10 overlap' counts how many of the base top-10 countries by delivery-adjusted risk mass remain in the top 10.

The risk-mass ranking is almost immune to these choices: rank correlations are at least 0.988 and nine or ten of the top ten countries survive every change. The reason is simple. Population dominates, and none of the alternatives changes who has the people. The return-intensity ranking is more fragile. Changing the weights alone leaves it intact (correlations of 0.90 to 0.98), but changing the strength of the deliverability discount reshuffles it: with no discount the correlation with the base ranking is 0.84, and with a strong discount only 0.51.

A. Rank on risk mass across nine specifications

	Base	No D	Strong D	Hazard x2	Hazard x0.5	Coping x2	Vuln. x2	Arithmetic	Incl. conflict
India	1	1	1	1	1	1	1	1	1
China	2	2	2	2	2	2	2	2	2
Pakistan	3	3	6	4	3	3	3	4	4
Indonesia	4	5	3	3	5	4	5	3	5
Nigeria	5	4	7	5	4	5	4	5	3
Bangladesh	6	6	4	6	6	6	6	6	7
Brazil	7	7	5	7	7	7	7	7	6
Philippines	8	10	8	8	9	9	9	8	10
Ethiopia	9	8	11	11	8	8	8	9	8
Egypt	10	12	9	9	11	11	10	10	11
DR Congo	11	9	20	13	10	10	11	11	9
Mexico	12	11	12	10	12	12	12	12	12
Vietnam	13	14	10	12	13	13	13	13	15
Iran	14	13	19	14	14	14	14	14	14
Tanzania	15	16	13	17	15	15	15	15	13
Türkiye	16	15	15	15	16	16	16	16	16

B. Specifications placing country in the top 25 on return intensity

Madagascar	9 / 9
PNG	9 / 9
Honduras	9 / 9
Guatemala	9 / 9
Haiti	8 / 9
Mauritania	8 / 9
Somalia	8 / 9
Mozambique	8 / 9
Afghanistan	8 / 9
Solomon Is.	7 / 9
Vanuatu	7 / 9
Chad	7 / 9
Liberia	7 / 9
Namibia	7 / 9
Djibouti	7 / 9
Uganda	7 / 9
South Sudan	7 / 9
CAR	7 / 9

Figure 11. Robustness of the rankings across nine specifications.

Source: H Heuristics analysis. Panel A: rank on delivery-adjusted risk mass under each specification (top 16 in the base case). Panel B: number of the nine specifications in which each country ranks in the top 25 on return intensity (top 18 shown).

6.2 What this means for how to use the results

Two conclusions follow. **The list of scale anchors can be treated as settled.** Twelve of the 14 appear in the top 15 in all nine specifications, and the other two (the Democratic Republic of the Congo and Iran) in eight. Any serious allocation framework that follows risk should assign these countries a large share of attention. **The return frontier is robust at its core but not at its edges.** Four countries (Madagascar, Papua New Guinea, Honduras and Guatemala) rank in the top 25 on return intensity under all nine specifications; Haiti, Mauritania, Somalia, Mozambique and Afghanistan do so in eight. The Solomon Islands, Vanuatu, Chad, Liberia, Namibia, Djibouti, Uganda, South Sudan and the Central African Republic do so in seven. These are the countries to treat as high priority regardless of how the model is tuned.

The sensitivity to the deliverability discount reflects a genuine ethical and practical choice, not a technical flaw. If a funder cares about the largest feasible risk reduction per dollar, it should lean toward a stronger discount and favour the return frontier. If it cares most about the people with the least capacity to protect themselves, it should lean toward a weaker one and accept the higher risk of failed delivery in the fragile frontier. The framework makes the choice visible. The recommendation in Section 13 is to run both: a delivery-weighted return portfolio and a protected fragile-frontier portfolio, with different instruments and different success criteria.

6.3 Cross-checks with other indices

A further check is whether the screen reproduces the broad shape of independent rankings. The WorldRiskReport 2025's top ten includes nine Global South countries (the tenth is the Russian Federation): the Philippines, India, Indonesia, Colombia, Mexico, Myanmar, Mozambique, China and Pakistan. All nine rank in the top 30 on

delivery-adjusted risk mass in this report's base case. Six are anchors, one (Myanmar) is in the fragile frontier, one (Mozambique) in the return frontier, and one (Colombia) in the mainstream group, ranked 23rd by mass. Germanwatch's long-term leaders also line up with the tiers: Myanmar is in the fragile frontier, Honduras in the return frontier, and Haiti and the Philippines are in the fragile frontier and the anchor group respectively. The correspondence is not proof of correctness, since the indices draw on overlapping data, but it shows that the screen is not producing eccentric results.

7. Hazard Archetypes and the Investment Portfolio

A country's tier says how much and by what route to invest. Its hazard archetype says in what. This section classifies countries by dominant climate hazard and matches each archetype to a portfolio of interventions. The main finding is that 60 per cent of the risk-weighted population lives in countries facing compound hazards, so single-hazard programmes miss most of the prize.

7.1 Four climate-hazard archetypes

INFORM scores seven natural hazards. For the portfolio question, this report restricts attention to the three families that resilience investment in climate-sensitive systems can most directly address: **river flood**, **storm and coast** (the higher of tropical cyclone and coastal flood) and **drought**. Countries are classified by their highest score among the three. Countries with two or more families scoring 7 or higher are classed as **compound**. The labels are screening categories, not diagnoses. In particular, INFORM scores some Sahelian countries as flood-dominant because of their river-flood indicators, although drought is the hazard most associated with the region's humanitarian crises; local analysis should always refine the national label. Earthquake and epidemic exposure are treated as overlays: nearly every large country has substantial earthquake or epidemic exposure, so they do not discriminate between archetypes, but they affect the portfolio (building codes, health-system preparedness).

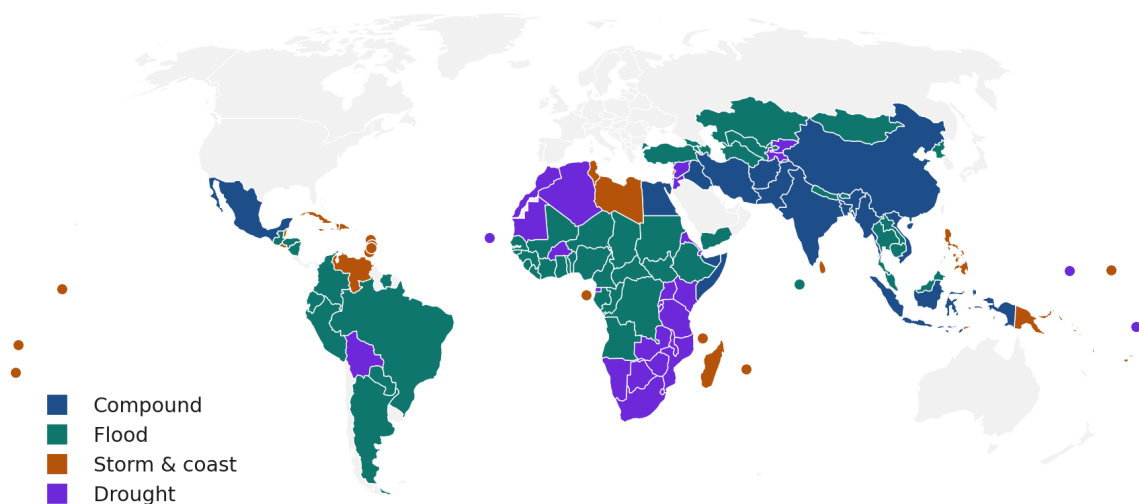


Figure 12. Dominant climate-hazard archetype by country.

Source: H Heuristics analysis of INFORM Risk Index mid-2026 hazard sub-indicators. Compound = two or more of river flood, storm & coast, and drought score ≥ 7 .

The classification yields four groups. **Compound** countries (13) are India, China, Pakistan, Indonesia, Bangladesh, Mexico, Egypt, Iran, Vietnam, Myanmar, Afghanistan, Iraq and Somalia. **Flood** countries (51) include Nigeria, Brazil, Ethiopia, the Democratic Republic of the Congo, Türkiye, Thailand, Sudan, Colombia, Yemen, Angola, Niger and Peru. **Drought** countries (29) include Tanzania, Kenya, Uganda, South Africa, Mozambique, Algeria, Syria, Morocco, Burkina Faso, Malawi, Zambia and Zimbabwe. **Storm and coast** countries (29) include the Philippines, Madagascar, Venezuela, Haiti, Sri Lanka, Papua New Guinea and the Dominican Republic, together with most small island States.

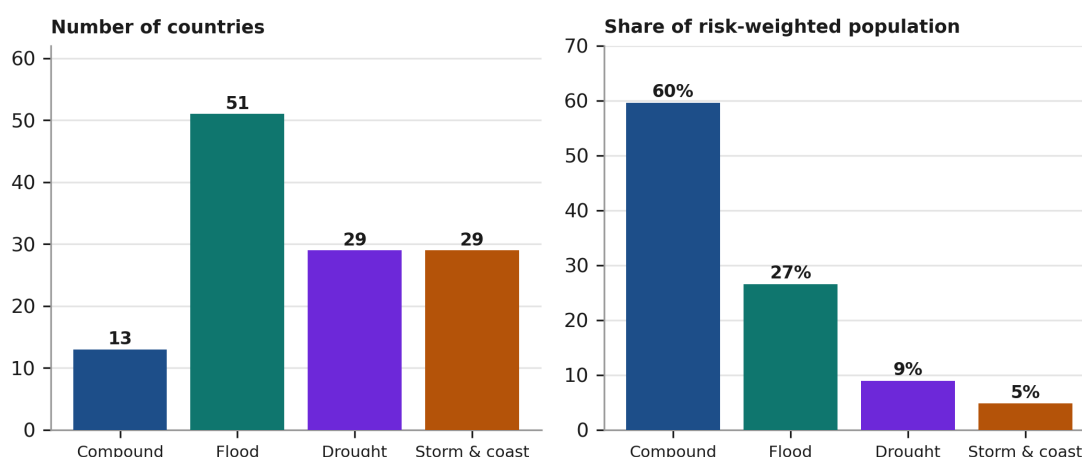


Figure 13. Number of countries and share of risk-weighted population by archetype.

Source: H Heuristics analysis of INFORM Risk Index mid-2026. Shares are of natural-hazard risk mass (population $\times$ R / 10) across 122 economies.

The distribution is lopsided. Compound countries are only 13 of 122 but hold 60 per cent of the risk-weighted population, because they include the largest countries. Flood countries hold 27 per cent, drought countries 9 per cent and storm-and-coast countries 5 per cent. By count, flood is the most common dominant hazard (51 countries) and by exposure compound hazards dominate. Two implications follow: programmes designed around one hazard type are matched to only a minority of the risk mass, and the tools that work across hazards (forecasting, social protection, standards, risk finance) deserve priority.

7.2 A five-layer resilience stack

Whatever the hazard, resilience investment can be organised in five layers that build on one another, and that arrange naturally against the evidence reviewed in Section 8.

- **Know the risk.** Hazard, exposure and vulnerability data; observation networks; forecasting. The 2025 [global status report on multi-hazard early warning systems](#) finds that fewer than one-third of countries report risk-knowledge capabilities, the least-developed of the pillars.
- **Warn and prepare.** Multi-hazard early warning, communication, evacuation planning, shelters, community volunteers.
- **Protect.** Resilient infrastructure and standards, building codes and retrofit, flood and coastal defences, nature-based protection such as mangroves and watershed restoration.
- **Cushion.** Adaptive social protection, cash transfers that scale up in a crisis, insurance and risk pooling, savings and credit.
- **Recover.** Pre-arranged contingent finance, reconstruction standards that ‘build back better’, and the institutional arrangements to disburse in days rather than months.

7.3 Matching portfolios to archetypes

Table 8 matches each archetype to its priority layers and instruments, with the evidence base reviewed in the next section and the countries in the return and fragile frontiers where it applies first.

Table 8. Priority portfolios by hazard archetype

Archetype	Priority layers and instruments	Evidence base	Examples (tiers)
Flood	Forecasting and early warning for river and flash floods; flood-plain zoning and drainage; resilient roads, power and water; flood-responsive social protection and insurance	Rentschler et al. 2022 ; Google AI flood forecasting ; Lifelines	Cambodia, Ecuador, Senegal (return); Nigeria, DR Congo (anchors); Sudan, Niger, Mali (fragile)
Storm & coast	Cyclone shelters and volunteer networks; mangrove and coastal protection; wind-resistant housing and codes; regional risk pooling for small states	Bangladesh, Odisha ; Menéndez et al. 2020 ; GFDRR Vanuatu	Madagascar, PNG, Dominican Rep. (return); Haiti (fragile); Solomon Is., Vanuatu (niche)
Drought	Adaptive social protection; drought-tolerant crops and water storage; early action triggers; rural water and recharge; livestock insurance	Knippenberg & Hoddinott on Ethiopia's PSNP ; Somalia excess deaths	Uganda, Malawi, Zambia, Zimbabwe, Mozambique (return); Namibia (niche)
Compound	Layered systems: national multi-hazard warning, universal social-protection registry, infrastructure standards, subnational basin and city programmes, sovereign risk finance	WMO and UNDRR on multi-hazard early warning ; GCA Adapt Now	India, Pakistan, Bangladesh, Indonesia (anchors); Myanmar, Afghanistan (fragile)
Seismic overlay	Building-code enforcement; retrofit of schools, hospitals and lifelines; land-use controls on liquefiable ground	National code and retrofit programmes (country evidence)	Guatemala, Honduras, PNG (return); Indonesia, Philippines (anchors)
Epidemic overlay	Surveillance and primary-care capacity; heat-health action plans; water and sanitation resilience	Lancet Countdown 2025	Uganda, Dominican Rep. (return); DR Congo, Nigeria (anchors)

Sources are discussed in Section 8. Countries listed are examples from the return, fragile and small-state tiers, not a complete list.

The table's most important message is about sequencing. In every archetype, the first layers (risk knowledge, warning and cushioning) are cheaper per person protected and quicker to deploy than the protective layers (infrastructure, coastal defence). In return-frontier countries with thin enabling conditions, they should come first. In anchors, where the first layers often already exist, the larger prize lies in standards and in the pipeline of public infrastructure.

8. What Works: Evidence on the Returns to Resilience Investment

The case for locating investment carefully rests on a simple premise: the same programme returns more where hazard, vulnerability and weak coping capacity coincide. This section reviews the published evidence on what resilience investments have delivered, in lives, livelihoods and assets, and is candid about what that evidence can and cannot show.

8.1 Lives: warning, shelter and evacuation

The clearest evidence comes from tropical cyclones, where Bangladesh and the Indian state of Odisha have reduced deaths by orders of magnitude over a generation. Bangladesh's experience is the best known. After the catastrophic 1970 Bhola cyclone (death toll estimates vary widely, from at least 150,000 to 500,000 or more), the Bangladesh Red Crescent Society established the Cyclone Preparedness Programme, now a joint programme with the government that, according to press accounts, [relies on about 76,000 volunteers, half of them women](#). The cyclone of April 1991 killed about 139,000 people; Cyclone Sidr in 2007 killed about 4,000; and Cyclone Amphan in 2020, also a very severe storm, killed 26. A [2024 comparative study of the human cost of decadal cyclones in Bangladesh](#) attributes a reduction of over 99 per cent in casualties between Bhola and Sidr to early warning, volunteer-led preparedness, shelters and afforestation. Sources disagree on the number of cyclone shelters (counts of [5,500](#) and 14,000 appear), and the same reporting notes that livelihoods and assets were far less protected than lives.

Odisha followed a similar path from a different starting point. The 1999 Super Cyclone [affected around 18 million people and killed about 10,000](#), according to the World Bank. After it, Odisha became the first Indian state to create a dedicated disaster management authority and, with World Bank support, invested in shelters, evacuation planning, embankments and drills. When Cyclone Phailin struck in 2013, warnings were issued days before landfall and, according to [one review](#), roughly 1.2 million people were evacuated (other sources say about a million). The World Bank cites 38 deaths. A review that counts storm-related deaths separately from deaths in the flash floods that followed gives 21 and 23.

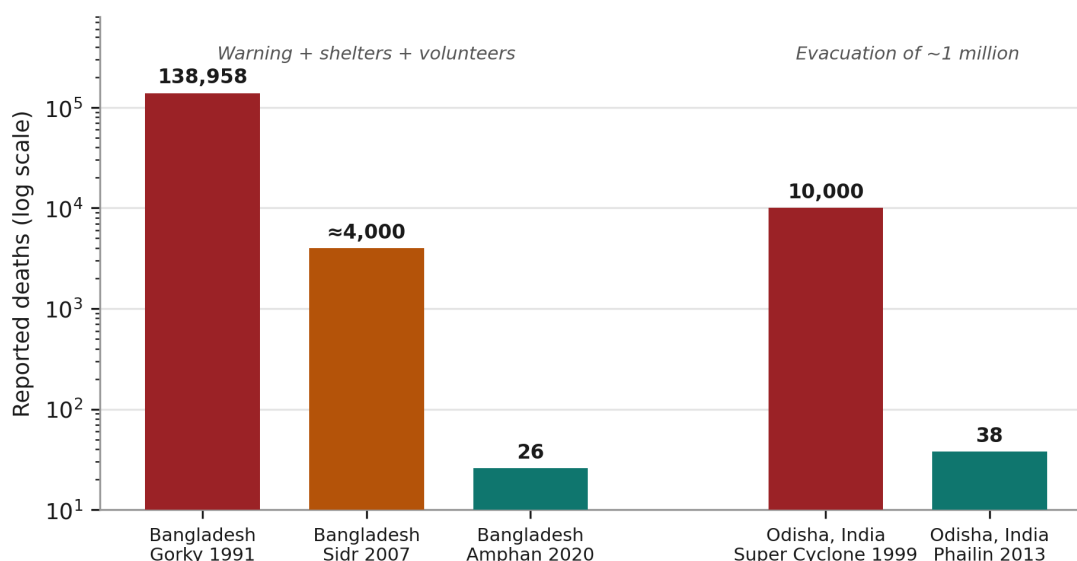


Figure 14. Reported deaths from major cyclones before and after investment in warning, shelters and evacuation.

Sources: World Bank (Odisha 1999 and 2013); reports on the Cyclone Preparedness Programme, Business Standard / TBS and PreventionWeb (Bangladesh). Bhola (1970) omitted because estimates range from 150,000 to 500,000. Sidr shown as approximate; counts vary by source. Log scale. Storms differ in track and landfall; the comparison is indicative, not causal.

Several cautions apply. The comparisons are before-and-after, not controlled: storm tracks, intensity and landfall location differ, and the 1991 and 1999 storms hit populations far less able to move. Reported tolls differ by source and by whether secondary deaths are counted. But the pattern is consistent across two large, very different jurisdictions, and it matches cross-country evidence. The 2025 [global status report on multi-hazard early warning systems](#) from the World Meteorological Organization (WMO) and UNDRR finds that disaster-related mortality is nearly six times lower in countries with more comprehensive multi-hazard early warning capability than in countries with limited capability.

New tools are lowering the cost of warning in places that lack observation networks. In a 2024 paper in *Nature*, [Nearing and colleagues showed that an AI-based model can predict extreme river floods in ungauged watersheds with lead times of up to five days](#), with reliability similar to or better than the zero-day nowcasts of the Copernicus Global Flood Awareness System; the forecasts are [publicly available in more than 80 countries](#). That matters in the return frontier. A WMO and World Bank analysis [summarised by Eos](#) found that the density of stations meeting international standards was about eight times below recommended levels, and WMO has noted that [Germany has more compliant observing stations than the whole African continent](#). Satellite-driven and machine-learning forecasts do not replace ground observation, but they can lift the floor while observation networks are built.

8.2 Livelihoods: social protection and the consumption channel

Disasters hurt the poor more than asset-loss statistics suggest. In *Unbreakable*, Hallegatte and colleagues found that in all 117 countries studied, the impact of disasters on well-being, measured as lost consumption, was larger than the loss of assets, because poor households have fewer means of recovery. The headline estimates (about [US\\$520 billion of lost annual consumption and 26 million people pushed into poverty each year](#)) rest on that insight. It implies that investments that protect the consumption of the poor, such as cash transfers that arrive before or just after a shock, can yield larger well-being gains than asset protection alone.

Ethiopia's Productive Safety Net Programme (PSNP) offers evidence on this. A study by Knippenberg and Hoddinott of the International Food Policy Research Institute (IFPRI) found that drought shocks reduce household food security for up to four years, and that [receipt of PSNP payments reduced the initial impact of](#)

[drought shocks by 57 per cent and eliminated their adverse impact on food security within two years](#). The evidence on the programme is not uniformly positive: an earlier study found little average impact when transfers fell far below intended levels, with significant gains for households that received at least half of the intended transfers. The lesson is that design and delivery reliability matter as much as the instrument.

Pakistan's 2022 floods illustrate the same channel at national scale. The government-led assessment estimated that the floods could raise the national poverty rate by 3.7 to 4.0 percentage points, potentially pushing 8.4 to 9.1 million more people below the poverty line. Where the social-protection system could be extended quickly, that blow could be cushioned; where it could not, households sold assets and cut spending. Section 9 shows how thin the coverage is in most high-risk countries.

8.3 Assets and ecosystems: infrastructure and mangroves

The World Bank's [Lifelines](#) report estimated the net benefit of more resilient infrastructure in low- and middle-income countries at US\$4.2 trillion, with US\$4 in benefit for each US\$1 invested, covering power, water and sanitation, transport and telecommunications. It also noted that disasters cause about US\$18 billion a year of direct damage to power generation and transport infrastructure in these countries, and that building resilience through the vulnerabilities of whole systems is cheaper than asset-by-asset hardening. The report's central message is that it is 'not about spending more, but about spending better', which is the premise of this report too.

Nature-based protection can compete on cost. [Menéndez and colleagues estimated that mangroves provide flood protection benefits of more than US\\$65 billion a year and that 15 million more people would be flooded annually without them](#), based on coupled hydrodynamic and economic models covering more than 700,000 kilometres of coastline. More than 45 coastal stretches of 20 kilometres, particularly near cities, receive more than US\$250 million a year in protection. In the return and fragile frontiers, where engineered defences are expensive to build and maintain, restoring and conserving mangroves is a candidate for the first protective layer on storm-exposed coasts, alongside the shelters and warning systems that save lives.

8.4 The aggregate case

The Global Commission on Adaptation's *Adapt Now* report put a number on the aggregate. Investing [US\\$1.8 trillion across five areas from 2020 to 2030 could generate US\\$7.1 trillion in total net benefits](#), with benefit-cost ratios from 2:1 to 10:1 and in some cases higher. The five areas are early warning systems, climate-resilient infrastructure, improved dryland agriculture, mangrove protection and resilient water resources. The commission's analysis was a global estimate of the potential return, not an evaluation of delivered projects, and the report itself stresses that these five areas are a portion of the total investments needed.

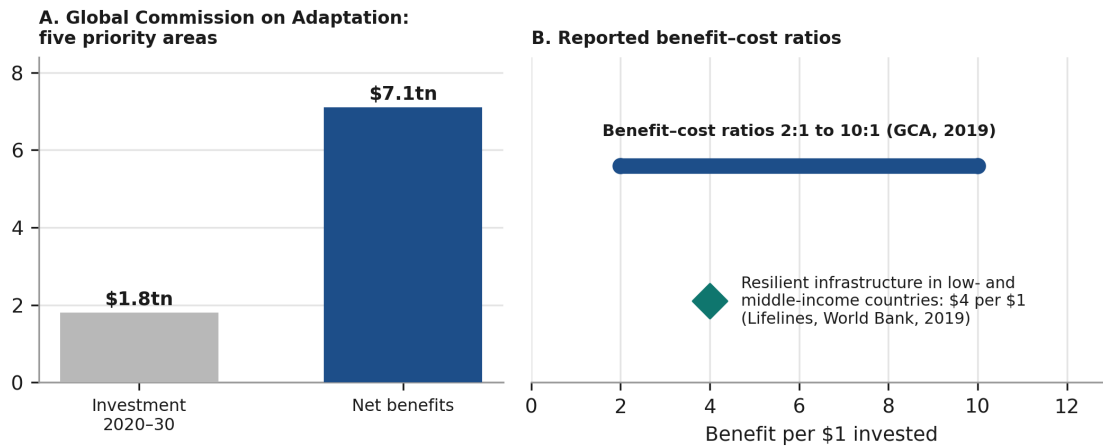


Figure 15. Reported returns to resilience investment.

Sources: Global Commission on Adaptation, *Adapt Now* (2019); World Bank, *Lifelines* (2019). Ratios are estimates reported by the studies and apply to the areas and countries they cover.

The costs of not investing are also rising. UNDRR’s 2025 assessment reports direct disaster losses of roughly US\$200 billion a year but a true cost, including cascading and ecosystem effects, of more than US\$2.3 trillion. The Germanwatch Climate Risk Index records more than 832,000 deaths and nearly US\$4.5 trillion of direct losses from 9,700 extreme weather events between 1995 and 2024, with storms responsible for 58 per cent of the economic losses.

8.5 How much weight the evidence can bear

Table 9 summarises the evidence reviewed in this section, with a note on its strength. A reader should not treat the benefit-cost ratios as guarantees. They are averages over portfolios, built on assumptions about avoided losses that depend on the probability of events during the investment’s life; they include optimistic valuations of avoided deaths and assets; and they are most reliable for the best-studied interventions (early warning, shelters, safety nets) and weakest for large infrastructure. What the evidence supports is a ranking of the layers by cost-effectiveness for the first-order task: protecting lives and consumption at low cost per person. That ranking, with risk knowledge, warning and cushioning first, informs the sequencing in Section 7.

Table 9. Summary of evidence on resilience investments

Intervention	Finding	Strength	Source
Multi-hazard early warning	Disaster mortality nearly six times lower in countries with more comprehensive capability	Strong	WMO / UNDRR 2025
Cyclone warning, shelters, evacuation	Deaths fell from ~139,000 (1991) to 26 (2020) in Bangladesh; from ~10,000 (1999) to 38 (2013) in Odisha	Moderate	World Bank ; TBS
AI flood forecasting	Up to five-day lead time on extreme floods in ungauged basins; free forecasts in 80+ countries	Indicative	Nearing et al. 2024
Safety-net programmes	Ethiopia's PSNP cut the initial impact of drought on food security by 57% and removed it within two years	Moderate	IFPRI ESSP
Resilient infrastructure	US\$4 of benefit per US\$1; US\$4.2 trillion net benefit in low- and middle-income countries	Moderate	World Bank Lifelines
Mangrove conservation	More than US\$65 billion a year of flood protection; 15 million more people flooded without them	Moderate	Menéndez et al. 2020
Five-area adaptation package	US\$1.8 trillion invested yields US\$7.1 trillion net benefits; BCR 2:1 to 10:1	Indicative	GCA / WRI
Consumption protection	Consumption losses exceed asset losses in all 117 countries studied	Moderate	World Bank, Unbreakable

'Strength' is H Heuristics' assessment of the quality and consistency of the cited evidence: Strong = multiple consistent sources including cross-country data; Moderate = well-documented cases or models, less causal identification; Indicative = single studies or modelled estimates.

9. Enabling Conditions: Money, Warning, Protection and Infrastructure

A country's tier says where investment should go, but whether it works depends on the surrounding system. This section examines four enabling conditions: the money available, the early warning and observation base, the reach of social protection, and the energy and connectivity infrastructure on which delivery runs. In all four, the countries with the highest risk intensity are the weakest.

9.1 Money: needs far exceed flows, and flows do not follow risk

UNEP's *Adaptation Gap Report 2025* estimates developing countries' adaptation needs at [US\\$310 billion a year in 2035 on modelled costs, or US\\$365 billion based on needs stated in countries' climate plans](#) (in 2023 values, before inflation). International public adaptation finance was US\$26 billion in 2023, down from US\$28 billion in 2022, leaving a gap of US\$284 to 339 billion a year, 12 to 14 times current flows. The Glasgow Climate Pact's goal of doubling adaptation finance to about US\$40 billion by 2025 is not on track. The Climate Policy Initiative's [Global Landscape of Climate Finance 2025](#) counts all tracked adaptation finance, public and private, at US\$65 billion in 2023, 16 per cent below 2022 and under 4 per cent of the US\$1.9 trillion of total climate finance, of which nearly 94 per cent went to mitigation. CPI estimates annual adaptation investment needs in emerging and developing economies at US\$222 billion by 2030.

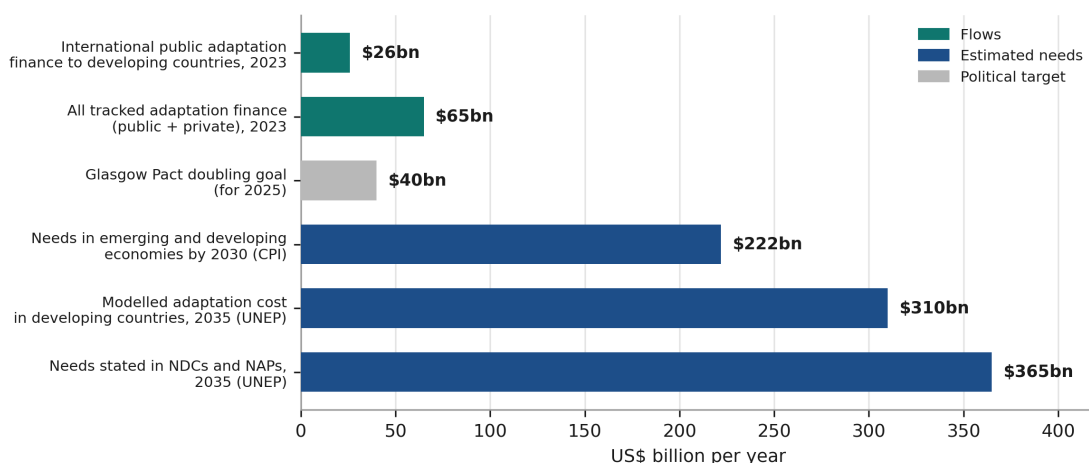


Figure 16. Adaptation finance flows and needs in developing countries.

Sources: UNEP, *Adaptation Gap Report 2025* (needs in 2023 values; international public flows 2023); Climate Policy Initiative, *Global Landscape of Climate Finance 2025* (all tracked adaptation finance 2023; needs by 2030). Needs estimates use different methods and are not additive.

Where the money goes matters as much as how much there is. The Center for Global Development's 2025 study of [climate finance allocations and vulnerability](#) found that per-capita adaptation finance across countries ranged from less than one dollar to more than US\$2,400 a year in 2016–2023, with virtually no correlation between adaptation finance per head and either vulnerability or income. Its authors caution that vulnerability indices disagree and that small island States are not clearly short-changed overall, but conclude that more attention should go to least developed and low-income countries. This is the same shape as the finding of this report: flows are not following a clear risk logic.

Debt compounds the problem. UNCTAD's [A World of Debt](#) series reports that about 3.4 billion people live in countries that spend more on interest than on health or education. In this report's data, the return frontier has the heaviest external debt service of any tier, a median of about 20 per cent of export earnings. And the form of

finance matters: the UNEP report notes that private finance could reach about US\$50 billion a year for adaptation if policy and blended-finance action is scaled up, against about US\$5 billion today.

9.2 Warning and observation

Early warning is the layer with the strongest evidence and the clearest gaps. The 2025 WMO and UNDRR status report finds that [119 countries, 60 per cent of the total, report having a multi-hazard early warning system](#), a 113 per cent increase in ten years. Coverage ranges from 72 per cent of countries in Asia-Pacific to 51 per cent in the Americas and Caribbean and only 43 per cent among small island developing States. Africa has the largest improvement in comprehensiveness since 2015 (72 per cent) but remains the lowest-scoring region; WMO reports that [fewer than 40 per cent of African countries report preparedness and response capabilities](#) for multi-hazard early warning. Risk knowledge is the weakest pillar globally: fewer than one in three countries reports capabilities in it.

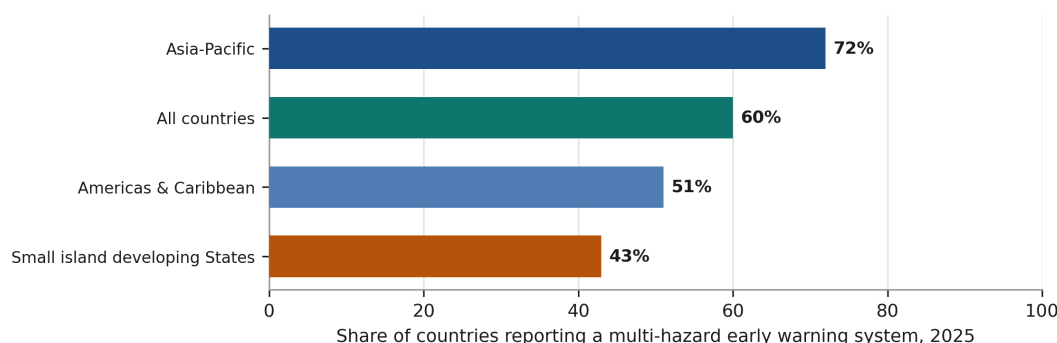


Figure 17. Share of countries reporting a multi-hazard early warning system, 2025.

Source: WMO and UNDRR, Global Status of Multi-Hazard Early Warning Systems 2025. Self-reported by countries; ‘reporting a system’ does not imply that it reaches everyone. The source does not give a percentage for least developed countries.

The observation base beneath forecasting remains thin where it is most needed. The Systematic Observations Financing Facility is supporting 24 African countries with more than US\$60 million of approved funding, and WMO says more than 1,000 stations have been added to the Global Basic Observing Network in two years, but the gap is still large. A purely national approach to this problem is inefficient: weather and flood systems cross borders, and the return frontier’s river basins (the Zambezi, the Limpopo, the Rift Valley lakes) are shared.

9.3 Social protection

Social protection is the layer that links resilience to poverty. The ILO’s *World Social Protection Report 2024–26* finds that [52.4 per cent of the world’s population is covered by at least one social protection benefit, up from 42.8 per cent in 2015, but that 3.8 billion people remain unprotected](#). Among the 20 countries most vulnerable to climate change, 91.3 per cent of people have none.

The data compiled for this report confirm the pattern. Across the 108 economies with coverage data in the World Bank’s ASPIRE database, the rank correlation between risk intensity and the share of the population covered by any social protection is -0.38 : the higher the risk, the lower the coverage. Median coverage is 54 per cent in the anchors, 32 per cent in the return frontier, 26 per cent in the small-state niche and only 13 per cent in the fragile frontier. Because ASPIRE surveys are infrequent, the reference years differ (the median is 2018 and some are older), so the figures describe the pattern rather than current coverage in any single country.

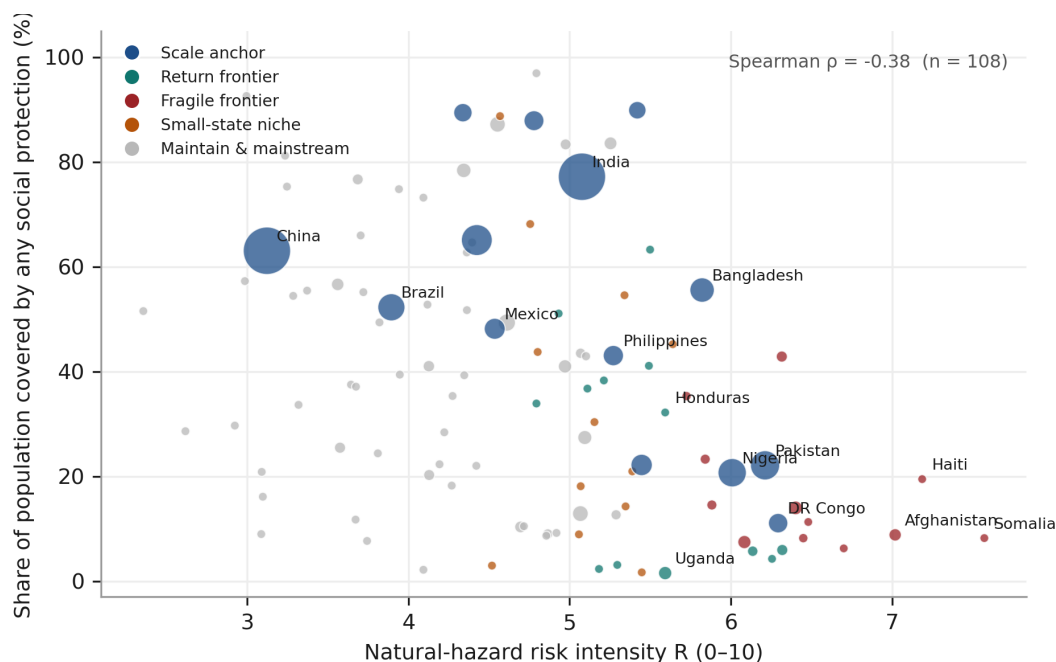


Figure 19. Risk intensity and social protection coverage across 108 economies.

Source: H Heuristics analysis of INFORM Risk Index mid-2026 and World Bank ASPIRE (indicator per_allsp.cov_pop_tot; latest available year, median 2018). Bubble area proportional to population.

Notice the cluster in the lower right: Somalia, Haiti, Afghanistan, the Democratic Republic of the Congo, Nigeria and Pakistan all combine risk intensity of 6 or more with coverage of 22 per cent or lower. India sits far above the trend line at 77 per cent (from a survey in 2011, so likely out of date); Bangladesh, at 56 per cent (2022), combines high risk with a social-protection system extensive enough to scale. For the scale anchors, the policy task is to convert existing systems into shock-responsive ones. For the return and fragile frontiers it is first to build the registries, payment rails and targeting systems.

9.4 Energy and connectivity

Resilience delivery runs on infrastructure that is itself unevenly distributed. Across the 122 economies, risk intensity is negatively correlated with electricity access (rank correlation -0.59), internet use (-0.54) and income per head (-0.60). Figure 18 shows the tier medians. Electricity access is 100 per cent in the anchors but 62 per cent in the return frontier and 60 per cent in the fragile frontier; internet use is 71, 42 and 23 per cent. Warnings travel by mobile network and radio; cash transfers move over mobile money and digital registries; vaccines, pumps, cold chains and cooling all depend on power. In the return and fragile frontiers, a resilience programme that ignores these foundations is building on sand.

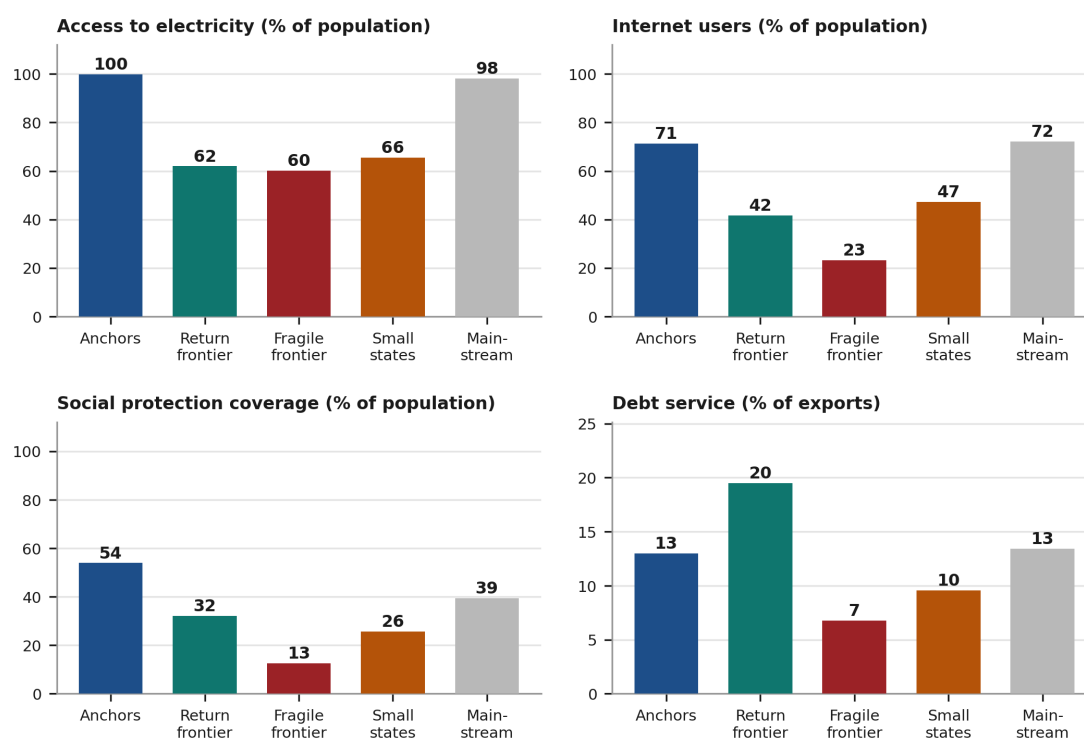


Figure 18. *Enabling conditions by tier (medians).*

Source: H Heuristics analysis using World Bank Open Data: access to electricity (2024); internet users; coverage of social protection and labour programmes (ASPIRE, latest year); total debt service as a percentage of exports of goods, services and primary income (latest year; many fragile States lack data). Medians within tiers.

The implication is that resilience investment should be packaged with enabling investment. Distributed solar with storage for clinics and pumping stations, mobile-network coverage in hazard-prone districts and digital identity and payment systems are resilience assets in their own right, because they let other layers of the stack function when the grid, the roads or the banks fail.

10. Inside the Country: Subnational Hotspots

National scores locate where to look; hotspots show where to build. Within every country, risk concentrates in a few places: deltas that are sinking, drylands where rain fails, floodplains where the poor live and islands where one storm can wipe out a year's output. This section reviews the evidence on those hotspots and sets out how to find them.

10.1 Why national averages mislead

Risk is lumpy. After Pakistan's 2022 floods, [Sindh Province bore close to 70 per cent of total damages and losses](#). After Hurricane Melissa hit Jamaica in October 2025, three parishes (St James, Westmoreland and St Elizabeth) accounted for [US\\$5.5 billion, or 63 per cent of the total damage estimate](#). In Rentschler and colleagues' global flood analysis, China and India alone account for 395 million and 390 million of the people exposed to 1-in-100-year floods, but the exposure is concentrated in river basins and coastal plains, not spread across national territory. A national programme that distributes resources by population will under-serve exactly these places.

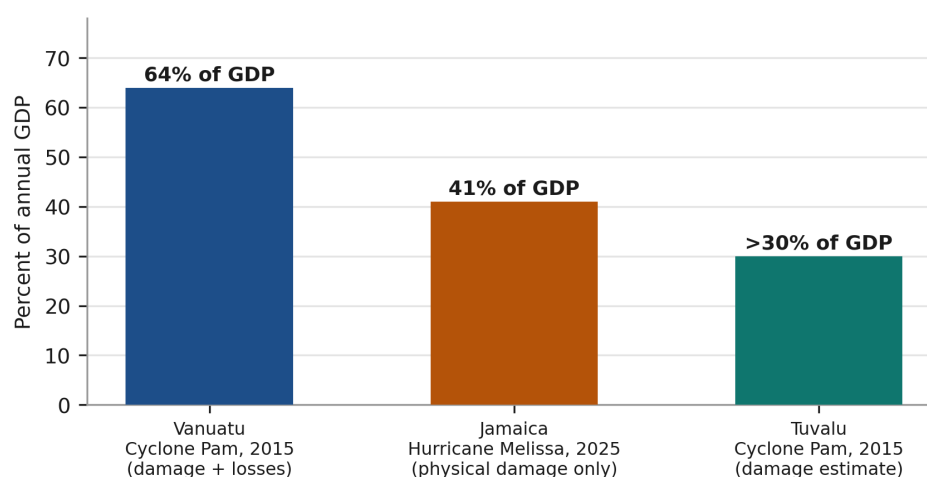


Figure 20. Single storms as a share of national GDP in small island States.

Sources: GFDRR (Vanuatu, Cyclone Pam, damage and losses $\approx$ 64% of GDP); World Bank and IDB (Jamaica, Hurricane Melissa, physical damage US\$8.8 billion = 41% of 2024 GDP, excluding broader economic losses); Radio New Zealand via Loop (Tuvalu, > 30% of GDP, damage estimate).

10.2 A typology of hotspots

Table 10 groups the main kinds of hotspot, with evidence from the literature. They overlap: a delta can be a sinking city, a floodplain and a cyclone coast at once.

Table 10. Types of subnational resilience hotspot

Hotspot type	Evidence	Examples	Priority first moves
Sinking deltas and cities	Mekong delta: groundwater-driven subsidence averages about 1.1 cm a year in the best-estimate model, with some areas above 2.5 cm, faster than sea-level rise (Minderhoud et al. 2017). Jakarta: an assessment by Indonesia's BRIN puts average sinking at 3.5 cm a year , with groundwater extraction the main driver	Mekong delta (Vietnam); Jakarta (Indonesia); Dhaka (Bangladesh)	Regulate groundwater abstraction; extend piped water; sediment management; flood defences sized to subsidence
Fast-growing flood-exposed cities	UN World Urbanization Prospects 2025: urban areas of 10 million or more have risen from 8 in 1975 to 33 in 2025, 19 in Asia; Dhaka is projected to become the world's largest city by 2050 and Karachi to enter the top ten by 2030	Dhaka, Karachi, Lagos, Kinshasa	Drainage and floodplain zoning before growth; informal-settlement upgrading; urban early warning
Drylands and pastoral belts	Somalia's 2022 drought is estimated to have caused 43,000 excess deaths ; OCHA's 2025 Sahel overview counted 28.7 million people in urgent need; the Central American Dry Corridor left 2.2 million people without crops and 1.4 million needing food assistance in the 2018 season	Horn of Africa; Sahel and Lake Chad; Dry Corridor	Shock-responsive cash transfers; anticipatory action triggers; water storage; livestock and crop insurance
River floodplains	Pakistan 2022: damages above US\$14.9 billion, losses about US\$15.2 billion, reconstruction needs about US\$16.3 billion, nearly 70% in Sindh (PDNA)	Indus and Ganges–Brahmaputra basins; Niger and Congo basins	Basin-scale forecasting; flood-plain land-use; resilient rural roads and power
Storm-exposed coasts and small islands	Vanuatu: Cyclone Pam damage and losses about 64% of GDP (GFDRR); Jamaica: US\$8.8 billion damage from Hurricane Melissa, 41% of 2024 GDP	Bay of Bengal coast; Caribbean; Pacific islands; Mozambique coast	Shelters; mangroves; codes and retrofit; pre-arranged risk transfer

Sources as linked. Hotspot evidence is drawn from case studies and published estimates, not from the national index in Sections 4–6.

The slow-moving hotspots are as important as the sudden ones. In the Mekong delta, Minderhoud and colleagues found that subsidence from groundwater extraction, averaging 1.1 centimetres a year and exceeding 2.5 centimetres in places, outpaces global sea-level rise; they conclude that large parts of the delta could fall below sea level this century if extraction continues to rise, though that is a scenario outcome, not a forecast. Jakarta's case led Indonesia's parliament in January 2022 to pass a law enabling the relocation of the national capital to Kalimantan, and the city's sinking is only partly addressed by that decision, as the great majority of its residents are not relocating. The investment lesson is that some hotspots need protection, some need managed adaptation of land use and water supply, and some need the difficult conversation about where people can safely live.

Migration is both a consequence and a response. The World Bank's [Groundswell update](#) estimated that climate change could force 216 million people to migrate within their own countries by 2050 across six regions (Sub-Saharan Africa 86 million, East Asia and the Pacific 49 million, South Asia 40 million, North Africa 19 million, Latin America 17 million and Eastern Europe and Central Asia 5 million), with hotspots emerging by 2030. The report estimated that early, concerted action could reduce the scale of climate migration by as much as 80 per cent. Resilience investment in sending areas and in receiving cities is part of the same strategy.

10.3 Finding hotspots: a subnational priority ledger

National screens such as the one in this report should be the first step toward a subnational one, not the last. The method generalises. For each country in the anchor, return and fragile tiers, a priority ledger would overlay hazard layers (flood depth, drought frequency, cyclone track density, seismic zones), population and settlement grids, poverty and vulnerability maps, and the location of services and infrastructure. Rentschler and colleagues showed that such overlays are feasible even for global analyses: their flood estimates combined fluvial, pluvial and coastal hazard data with subnational poverty data for 188 countries. A ledger of the 50 to 100 districts or

basins in each country with the highest combined score gives investors a target list that is more actionable than the national average.

Three principles apply. **Use open data and publish the method**, so that governments, civil society and communities can challenge the results. **Weight vulnerability, not just hazard**, as the cross-country analysis in Section 2 suggests: the places where the same hazard does the most damage are the places with the poorest housing, the least services and the weakest safety nets. **Include the people in the data**. Informal settlements, pastoral communities and displaced populations are often missing from administrative data, and are often the most exposed.

11. Regional Playbooks

Tiers and archetypes combine differently in each region, and so do the opportunities. This section summarises the findings by region and sets out the investment moves that follow. Table 11 gives the overview.

Table 11. Regional overview: tier composition and priority moves

Region	Tier composition	Dominant archetypes	Priority moves
South Asia (8 economies)	3 anchors (India, Pakistan, Bangladesh); 1 fragile (Afghanistan); 4 mainstream	Compound (4 of 8)	Basin-scale flood forecasting and data sharing; cyclone-shelter model; urban flood and heat plans in Dhaka and Karachi; make social protection shock-responsive (median coverage 33%)
East Asia & Pacific (22)	4 anchors; 2 return frontier (Cambodia, PNG); 2 small-state; 1 fragile (Myanmar); 13 mainstream	Storm & coast (10), Flood (6), Compound (4)	Standards and codes in anchors; groundwater and subsidence management; pooled risk transfer for Pacific islands; targeted programmes in Myanmar and PNG
Sub-Saharan Africa (47)	3 anchors (Nigeria, Ethiopia, DR Congo); 7 return; 6 fragile; 7 small-state; 24 mainstream	Flood (23), Drought (19)	Observation networks and AI forecasting; adaptive social protection (median coverage 18%); electrification of clinics and pumping; cyclone belt in the south-east; anticipatory action in the Sahel and Horn
Latin America & Caribbean (23)	2 anchors (Brazil, Mexico); 4 return (Guatemala, Honduras, Ecuador, Dominican Rep.); 2 fragile (Haiti, Venezuela); 2 small-state; 13 mainstream	Storm & coast (11), Flood (10)	Dry Corridor resilience; seismic retrofit in Central America and the Andes; hurricane risk pooling in the Caribbean; Haiti through humanitarian-development nexus
Middle East & North Africa (13)	2 anchors (Egypt, Iran); 2 fragile (Yemen, Syria); 2 small-state; 7 mainstream	Drought (5), Compound (3)	Water security and groundwater; Nile delta and Gulf of Suez coastal protection; heat action; resilience in conflict settings
Central Asia, Caucasus & Türkiye (9)	9 mainstream	Flood (7), Drought (2)	Seismic risk (7.9 on average); glacier-fed water systems; maintain and mainstream

Source: H Heuristics analysis of INFORM Risk Index mid-2026 and World Bank Open Data. Tier counts by World Bank region (122 economies). Median electricity and social-protection coverage are for the economies in each region.

11.1 South Asia: the compound-hazard core

South Asia holds 29.5 per cent of the Global South’s population and 33.5 per cent of its risk-weighted population, the largest regional share. Four of its eight economies are compound-hazard, and three are scale anchors. The Indus and Ganges–Brahmaputra basins are shared rivers on which the flood season of one country is the other’s warning time, so cooperation on data and forecasting yields benefits that no country can capture alone. The region’s own record on cyclone warning, from Bangladesh to Odisha, is a global asset that could be transferred to other storm coasts through South-South partnerships. Social protection coverage is highly uneven, from Bangladesh at 56 per cent to Pakistan at 22 per cent and Afghanistan far lower, which determines how quickly cash can reach people after a flood. Dhaka and Karachi, two of the fastest-growing megacities, are the largest urban hotspots.

11.2 East Asia and the Pacific: capable anchors, vulnerable edges

East Asia and the Pacific contains four anchors (China, Indonesia, the Philippines and Vietnam) and the highest-intensity small states in the sample, the Solomon Islands and Vanuatu, along with Papua New Guinea in the return frontier. The anchors have more domestic capacity than any other group; the value of outside engagement lies in technical assistance, standards, groundwater and subsidence management, and urban resilience in cities

such as Jakarta, Manila and Ho Chi Minh City. At the edges, the Pacific islands face a different problem: events that can erase a large fraction of GDP and no scale economies in response. Regional pooling, as through the Pacific Catastrophe Risk Assessment and Financing Initiative that, according to a [World Bank case study cited by GFDRR](#), enabled a recovery payout to Vanuatu after Cyclone Pam, is the natural instrument. Myanmar sits in the fragile frontier with high exposure to cyclone, flood and earthquake and ranks second on the Climate Risk Index's long-term list.

11.3 Sub-Saharan Africa: the largest number of countries in need

Sub-Saharan Africa has the highest mean risk intensity (5.5) and the largest number of countries in the frontier tiers: seven return, six fragile and seven small-state, alongside three anchors. It has the weakest enabling conditions: median electricity access of 57 per cent and social-protection coverage of 18 per cent. The region faces compound risk in a distinctive way. Drought and flood alternate within a few years, as in the Horn of Africa; cyclones strike the south-east coast; and fragile States in the Sahel and Central Africa face insecurity on top of climate shocks. The priorities are to build the observation and forecasting base, to extend and make shock-responsive the social-protection systems that exist, to electrify the facilities that deliver services in a crisis, and to prepare finance in advance.

11.4 Latin America and the Caribbean: storms, quakes and the Dry Corridor

Latin America and the Caribbean has a lower average intensity (4.5), but a distinctive cluster of high-return countries in Central America and the Caribbean. Guatemala and Honduras combine very high earthquake exposure (9.5 and 8.1) with drought in the Dry Corridor and storms; the Dominican Republic's cyclone exposure scores 10. Haiti (R 7.2) is the region's highest-intensity country and sits in the fragile frontier. Brazil and Mexico are anchors with capable institutions, though Mexico carries the fragile flag because of conflict intensity. Caribbean risk pooling and catastrophe-linked financial instruments are well-developed; the opportunity is to extend them to social protection and to the countries and people who fall outside them.

11.5 Middle East, North Africa and Central Asia: water and heat under conflict

The Middle East and North Africa have two anchors (Egypt and Iran), two fragile States (Yemen and Syria) and a high share of drought and compound archetypes. Egypt's exposure is concentrated in the Nile delta, where coastal flood exposure scores 9.0, and Iran's combines earthquake and drought with high fragility scores. For the region the binding constraints are water scarcity, heat and the protection of the poor from both. Central Asia, the Caucasus and Türkiye are, on this screen, mainstream: seismic exposure (7.9 on average) is the defining hazard, and deliverability scores are moderate.

12. Allocation Implications: Reweighting Resilience Finance

What would change if a funder allocated resilience money by these lenses? At the level of tiers, less than one might expect: the anchors take the lion's share under any rule that follows people or risk. The real difference lies in how the money is delivered and in the protection of the small, high-return and fragile groups from being crowded out.

12.1 Four allocation keys

Figure 21 compares the distribution of an illustrative allocation across the five tiers under four keys: population, natural-hazard risk mass (M), delivery-adjusted risk mass ($M \times D$) and delivery-adjusted risk mass restricted to low- and lower-middle-income economies, the group typically eligible for concessional terms. The last is intended as a rough guide to how a concessional window might be split; it is not a recommendation to exclude upper-middle-income countries from all support.

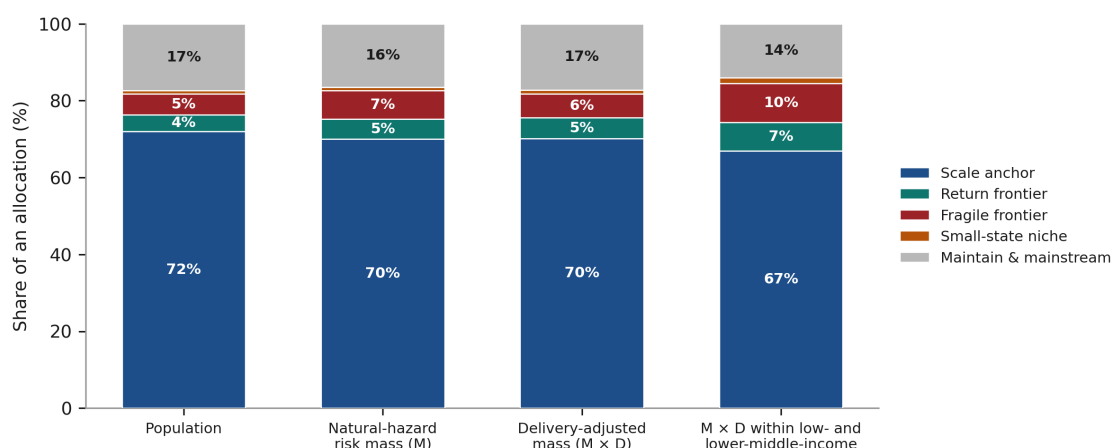


Figure 21. Share of an illustrative allocation by tier under four allocation keys.

Source: H Heuristics analysis of INFORM Risk Index mid-2026. Each bar sums to 100% of the Global South. Concessional key counts only economies classed as low- or lower-middle-income (72 economies, 3.7 billion people).

Three results stand out. **First, the anchors' share is robust:** 72 per cent by population, 70 per cent by risk mass or delivery-adjusted mass, and 67 per cent under the concessional key. Any rule that follows risk gives them most of the funding. **Second, the three frontier tiers together are 10.6 per cent of the population, 12.5 per cent of delivery-adjusted mass and 19.0 per cent under the concessional key.** A concessional window that is allocated on risk, deliverability and eligibility would give those 38 countries nearly twice their population share. **Third, the concessional key concentrates very heavily in India.** India alone would take 39 per cent of a concessional pot allocated this way, followed by Pakistan (7.0 per cent), Nigeria (6.3 per cent) and Bangladesh (5.4 per cent). That is the arithmetic consequence of a mass-based key, and it is a reason to cap any single country's share and to apply a separate poverty or fiscal-capacity weight. Judgements of that kind are outside the screen.

12.2 What each tier calls for

The tiers differ less in how much they should receive than in how it should be delivered. Table 12 summarises.

Table 12. Delivery models by tier

Tier	Population share	Lead instruments	Finance mix	Success metric
Scale anchors (14)	72%	Standards and codes; national early warning and social-protection platforms; policy-based and programmatic lending; subnational basin and city programmes; sovereign risk finance	Domestic budgets and market finance; concessional blend for low- and lower-middle-income anchors	Share of public investment meeting resilience standards; share of population covered by warning and shock-responsive protection
Return frontier (13)	4.3%	Early warning and observation; adaptive social protection; resilient rural infrastructure; mangrove and watershed restoration; health-system preparedness	Grant-heavy concessional; debt-service relief clauses	Lives and livelihoods protected per dollar; coverage of warnings and cash transfers
Fragile frontier (12)	5.4%	Pre-arranged cash and anticipatory action; community-managed warning and water; mobile-money rails; humanitarian-development nexus	Grants and humanitarian-linked; contingent financing triggers	Speed of disbursement after a trigger; excess mortality in shocks
Small-state niche (13)	0.9%	Regional risk pooling; pre-arranged risk transfer; shelters and wind-resistant housing; shared technical staff	Grants and highly concessional; premium support	Payout within days; share of GDP lost per event
Maintain & mainstream (70)	17.4%	Mainstream resilience in routine investment; monitor risk intensity; technical assistance on request	Domestic and market finance	Re-scoring every three years; early detection of rising risk

Source: H Heuristics. Shares are of the Global South population (122 economies). Success metrics are suggestions for monitoring, not targets agreed with any government.

12.3 Guardrails

A screen of this kind can be misused. Four guardrails are worth stating. **Do not treat the tiers as entitlements or exclusions.** A country in the mainstream group may contain hotspots as severe as any in a frontier country. **Do not let deliverability become an excuse.** The discount reflects difficulty, not worth; the fragile frontier should be addressed with different tools, not left out. **Do not mistake a mass-based key for a fairness criterion.** It follows people, not need, and a poor small country will always lose to a large middle-income one on that basis. **Always pair a national allocation with a subnational one,** because the benefits depend on reaching the right districts.

13. Recommendations and a Roadmap to 2040

The evidence supports ten recommendations, addressed to development banks, bilateral donors, philanthropic funders and the governments of the countries concerned. They are sequenced in three horizons, and each comes with a measure that can be tracked.

13.1 Ten recommendations

- **1. Adopt a two-lens screen and publish the results.** Every major funder should screen countries on risk mass and return intensity, adjusted for deliverability, and publish a priority ledger each year. The screen in this report uses open data and can be replicated and improved by others.
- **2. Treat the 14 anchors as system-change targets.** In India, China, Pakistan, Indonesia, Nigeria, Bangladesh, Brazil, the Philippines, Ethiopia, Egypt, the Democratic Republic of the Congo, Mexico, Vietnam and Iran, link finance to standards (building codes, resilient-infrastructure criteria), national early warning and shock-responsive social protection, rather than to isolated projects.
- **3. Open a grant-heavy return-frontier window.** The 13 return-frontier countries (Uganda, Mozambique, Madagascar, Malawi, Zambia, Guatemala, Senegal, Ecuador, Zimbabwe, Cambodia, Papua New Guinea, Honduras and the Dominican Republic) hold 293 million people and the highest return per person where delivery is feasible. Their heavy debt service argues for grants and debt-relief clauses.
- **4. Protect a fragile-frontier portfolio with state-light instruments.** Pre-arranged cash, anticipatory action, community-managed warning and humanitarian-development partnerships should be funded to a floor, not subject to the usual project-readiness tests.
- **5. Pool risk for small states.** Regional insurance, shared technical teams and pre-arranged risk transfer address diseconomies of scale and the very high loss-to-GDP ratio of single events.
- **6. Close the early warning and observation gaps first.** Early warning has the strongest evidence and the clearest gaps. Support national observation networks, risk-knowledge programmes and AI-based forecasting for data-poor basins, and ensure warnings reach the last mile.
- **7. Build adaptive social protection as the cushioning backbone.** Extend registries and payment systems in high-risk countries where coverage is low, and make existing systems shock-responsive so that cash can scale up within days.
- **8. Package resilience with enabling infrastructure.** Solar and storage for clinics and pumps, mobile coverage in hazard-prone districts and digital identity and payment systems let the other layers work when the grid or the roads fail.
- **9. Build subnational priority ledgers.** For each anchor, return-frontier and fragile-frontier country, identify the 50 to 100 districts or basins with the highest combined risk and direct a share of finance there. Pay special attention to sinking deltas, drylands, floodplains and fast-growing informal cities.
- **10. Align the financing architecture with risk.** Raise the share of grants and concessional finance, build contingent-finance and debt-pause clauses into lending to high-risk countries, and report the flows per person against vulnerability each year, so that the allocation can be corrected.

13.2 A three-horizon roadmap

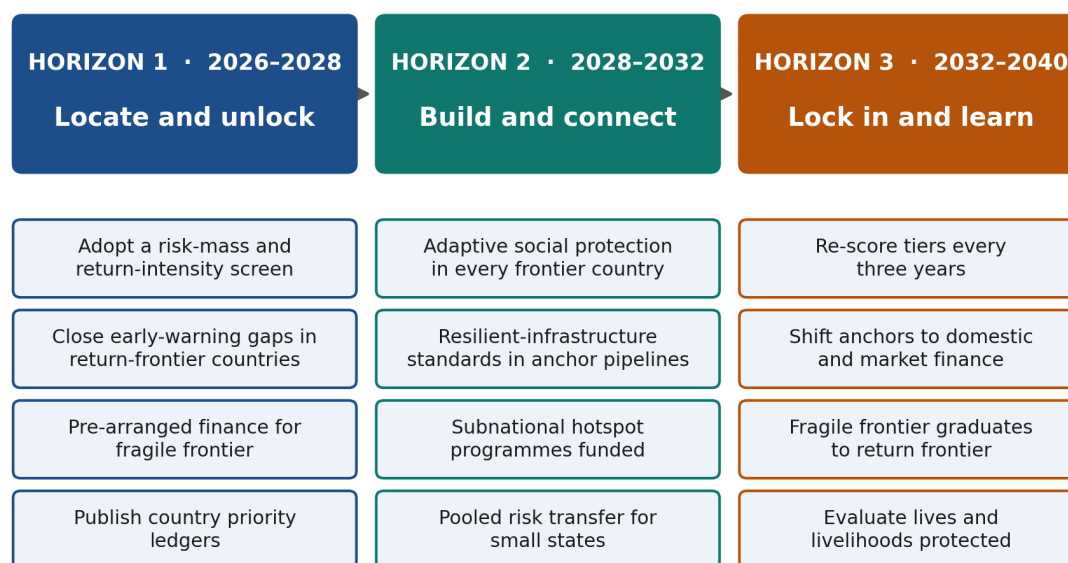


Figure 22. A roadmap in three horizons, 2026–2040.

Source: H Heuristics. Horizon boundaries are indicative.

Horizon 1 (2026 to 2028): locate and unlock. The priority is to adopt the screen, publish country priority ledgers, close the cheapest and best-evidenced gaps (early warning in return-frontier countries) and put pre-arranged finance in place for the fragile frontier. These steps need little new money and some changes of practice.

Horizon 2 (2028 to 2032): build and connect. Adaptive social protection should be built or upgraded in every frontier country, resilient-infrastructure standards embedded in the anchors’ investment pipelines, subnational hotspot programmes funded, and regional pooling established for small states.

Horizon 3 (2032 to 2040): lock in and learn. Tiers should be re-scored every three years; anchors should shift to domestic and market finance as their capacity grows; and the best-performing fragile-frontier countries should graduate to the return frontier as their deliverability improves. The work should be evaluated on lives and livelihoods protected, not on money disbursed.

13.3 A monitoring scorecard

Table 13. Monitoring scorecard with baselines from this report

Indicator	Baseline	Suggested direction by 2030
Countries reporting a multi-hazard early warning system	60% of all countries; 43% of small island developing States (WMO / UNDRR)	Universal coverage in all frontier and anchor countries
Social-protection coverage, return frontier	32% of population (median)	Rising materially; at least shock-responsive in all
Social-protection coverage, fragile frontier	13% of population (median)	Pre-arranged cash capacity in all
Electricity access, return and fragile frontier	62% and 60% (median)	Clinics, pumping stations and shelters electrified first
Internet use, return and fragile frontier	42% and 23% (median)	Mobile coverage in all hazard-prone districts
Debt service as share of exports, return frontier	About 20% (median)	Contingent clauses in all new loans
International public adaptation finance	US\$26 billion in 2023 (UNEP)	Rising toward estimated needs of US\$310–365 billion by 2035
Priority ledgers published	None	Annual ledger from each major funder and each anchor government

Source: H Heuristics analysis of INFORM Risk Index mid-2026, World Bank Open Data, and WMO / UNDRR (2025). Suggested 2030 directions are illustrative, not agreed targets. Baselines are medians within each tier.

14. Limitations and a Research Agenda

A screening exercise earns its keep by being clear about what it cannot do. This section states the main limits of the analysis and sets out what would improve it.

14.1 Limitations

- **National scale.** The screen scores countries, and risk is lumpy within them. Section 10 draws on literature and case evidence for subnational patterns; it does not provide a subnational score.
- **Exposure, not trajectory.** INFORM's hazard indicators describe present exposure, not projected change. A country whose hazards are intensifying faster than average, such as one on a rapidly warming coast, may be under-ranked.
- **Composite-index limitations.** INFORM is a composite of many indicators of different vintage and quality. Its authors advise using it with other information; in this sample, the median share of missing indicators is 8 per cent and the maximum 33 per cent.
- **An explicit but judgemental deliverability term.** The discount for governance and conflict is moderate by design, and the results for return intensity are sensitive to it (Section 6). It treats governance and conflict as barriers to delivery, not as outcomes that investment can improve.
- **No cost data.** Return intensity assumes that the cost of a standard package scales with the number of people covered. In practice, unit costs vary by terrain, scale, labour costs and conflict. The screen identifies where risk per person is highest, not where cost per life saved is lowest.
- **A uniform illustrative package.** The 14 per cent risk cut in Section 3.4 is a scale illustration, not a forecast, and a real programme would differ in how it affects exposure, vulnerability and coping capacity.
- **Differing data vintages in enabling indicators.** Social-protection coverage in particular comes from surveys of different years (median 2018), and some country values are a decade old. Fragile States often lack debt data.
- **Secondary sources for some figures.** A few of the statistics cited from other organisations were confirmed through summaries or press coverage rather than the original documents; the text flags where sources disagree.
- **Scope of 'resilience'.** The analysis does not address conflict prevention, pandemic resilience beyond the epidemic exposure indicator, or financial and economic resilience, all of which matter in their own right.

14.2 Research agenda

- **Subnational ledgers.** Build open subnational priority ledgers for the anchors and the frontier countries, combining hazard grids, population, poverty and service-access data.
- **Cost-effectiveness by tier.** Collect unit-cost and outcome data on early warning, shelters, safety nets and nature-based protection by country type, so that the return-intensity lens can be replaced with measured cost per life or livelihood protected.
- **Forward-looking risk.** Replace exposure-based hazard scores with climate-projection-based ones, and re-score the tiers under 1.5, 2 and 3 degrees of warming.
- **Deliverability.** Study how deliverability changes in fragile States, and which instruments perform best at different levels of fragility.
- **Allocation audits.** Compare actual adaptation and disaster-risk-reduction flows by country with the tiers in this report, to measure the gap between where finance goes and where the evidence says it works.

Appendix A. Methods and Data

A.1 Data

Risk data. The [INFORM Risk Index mid-2026 workbook](#) (release of 1 September 2026, v0.7.3) provides, for 191 countries, scores on hazard and exposure, vulnerability and lack of coping capacity on a 0 to 10 scale, together with sub-indicators for each hazard and for institutional capacity. INFORM is a collaboration of the Inter-Agency Standing Committee Reference Group on Risk, Early Warning and Preparedness and the European Commission, with the Joint Research Centre as scientific lead. The data are published under a CC BY 4.0 licence. Population (2026) and the World Bank region and income group come from the same workbook.

Enabling indicators. From the [World Bank Open Data](#) API, using the most recent non-missing value for each economy: access to electricity (EG.ELC.ACCS.ZS), individuals using the internet (IT.NET.USER.ZS), coverage of social protection and labour programmes (per_allsp.cov_pop_tot), total debt service as a percentage of exports of goods, services and primary income (DT.TDS.DECT.EX.ZS), and the poverty headcount ratio at the international poverty line (SI.POV.DDAY), as well as GDP per capita (PPP).

Boundaries. Country boundaries for maps are from Natural Earth (public domain), at 110-metre resolution, projected using the Robinson projection. Island States too small to draw are shown as points.

A.2 Calculations

- **Sample.** 122 economies classified as low-, lower-middle- or upper-middle-income, excluding European economies other than Türkiye and the Caucasus and Central Asian republics (Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan).
- **Risk intensity** $R = (N \times V \times L)^{(1/3)}$, where N is INFORM's 'Natural' hazard and exposure score, V is Vulnerability and L is Lack of coping capacity.
- **Risk mass** $M = P \times R / 10$ (P = population in 2026).
- **Deliverability** $D = 1 - 0.5 \times (0.5 \times G + 0.5 \times C) / 10$, where G is INFORM's Governance score and C is Current Conflict Intensity (both 0 to 10, higher is worse).
- **Delivery-adjusted mass** $= M \times D$. **Return intensity** $= R \times D$.
- **Fragile flag** $= C \geq 7$ or $G \geq 8$. **Scale anchors** = countries with rank ≤ 15 on $M \times D$ in the base case and rank ≤ 15 in at least eight of nine specifications. **Return frontier** = not an anchor, not fragile and $R \times D$ at or above the 75th percentile (3.78) of the non-anchor, non-fragile countries, with population of at least 10 million. **Fragile frontier** = not an anchor, fragile flag and $R \geq 5.5$. **Small-state niche** = not an anchor, population under 10 million, not fragile, and $R \geq 4.5$ (or in the top quartile of $R \times D$). Remaining economies are 'Maintain & mainstream'.
- **Archetypes.** River flood, storm & coast (the higher of tropical cyclone and coastal flood) and drought, using INFORM's sub-indicators. Highest of the three; 'compound' if two or more score ≥ 7 .
- **Sensitivity.** Nine specifications: base; no deliverability discount; strong discount (0.9 for 0.5); hazard weight $\times 2$ and $\times 0.5$; coping weight $\times 2$; vulnerability weight $\times 2$; arithmetic mean; and INFORM's full hazard and exposure dimension in place of natural hazard.
- **Illustrative package.** A 20 per cent proportional reduction in both vulnerability and lack of coping capacity lowers R by $1 - (0.8 \times 0.8)^{(1/3)} \approx 13.8$ per cent.

The country-level results are in Appendix B. Statistical measures (Spearman rank correlations) were calculated across the 122 economies, or across the subset with available enabling data (108 for social protection coverage).

Appendix B. Country Results

All 122 economies, ranked by delivery-adjusted risk mass ($M \times D$). Regions: EAP = East Asia & Pacific; ECA = Europe & Central Asia (here Türkiye, the Caucasus and Central Asia); LAC = Latin America & Caribbean; MENA = Middle East & North Africa; SA = South Asia; SSA = Sub-Saharan Africa. Income: LIC, LMIC, UMIC = low, lower-middle, upper-middle. Archetype: ‘Storm’ = storm & coast. Population in millions; $M \times D$ in million person-equivalents.

Table B1. Risk intensity, deliverability and tier for 122 economies

#	Country	Reg.	Inc.	Pop. (m)	R	D	$M \times D$	$R \times D$	Archetype	Tier
1	India	SA	LMIC	1467	5.1	0.71	526.9	3.59	Compound	Anchor
2	China	EAP	UMIC	1423	3.1	0.78	347.7	2.44	Compound	Anchor
3	Pakistan	SA	LMIC	255	6.2	0.59	94.2	3.70	Compound	Anchor
4	Indonesia	EAP	UMIC	284	4.4	0.74	93.0	3.27	Compound	Anchor
5	Nigeria	SSA	LMIC	240	6.0	0.59	84.7	3.53	Flood	Anchor
6	Bangladesh	SA	LMIC	178	5.8	0.70	73.1	4.10	Compound	Anchor
7	Brazil	LAC	UMIC	220	3.9	0.73	62.3	2.83	Flood	Anchor
8	Philippines	EAP	UMIC	123	5.3	0.75	48.3	3.94	Storm	Anchor
9	Ethiopia	SSA	LIC	136	5.4	0.61	45.2	3.32	Flood	Anchor
10	Egypt	MENA	LMIC	118	4.8	0.74	41.9	3.55	Compound	Anchor
11	DR Congo	SSA	LIC	113	6.3	0.55	38.6	3.43	Flood	Anchor
12	Mexico	LAC	UMIC	131	4.5	0.63	37.6	2.87	Compound	Anchor
13	Vietnam	EAP	UMIC	101	4.3	0.80	34.8	3.46	Compound	Anchor
14	Iran	MENA	UMIC	91.0	5.4	0.60	29.7	3.27	Compound	Anchor
15	Tanzania	SSA	LMIC	73.5	5.1	0.73	27.2	3.70	Drought	Mainstream
16	Türkiye	ECA	UMIC	87.1	4.6	0.68	27.1	3.11	Flood	Mainstream
17	Thailand	EAP	UMIC	72.0	4.6	0.74	24.3	3.38	Flood	Mainstream
18	Myanmar	EAP	LMIC	55.7	6.4	0.60	21.3	3.83	Compound	Fragile
19	Uganda	SSA	LIC	52.7	5.6	0.72	21.3	4.04	Drought	Return
20	Kenya	SSA	LMIC	58.5	5.1	0.71	21.1	3.60	Drought	Mainstream
21	South Africa	SSA	UMIC	62.3	4.3	0.76	20.5	3.29	Drought	Mainstream
22	Afghanistan	SA	LIC	45.7	7.0	0.60	19.2	4.21	Compound	Fragile
23	Colombia	LAC	UMIC	52.9	5.0	0.69	18.1	3.43	Flood	Mainstream
24	Iraq	MENA	UMIC	48.6	5.3	0.67	17.0	3.51	Compound	Mainstream
25	Sudan	SSA	LIC	51.9	6.1	0.54	16.9	3.26	Flood	Fragile
26	Mozambique	SSA	LIC	36.8	6.3	0.67	15.6	4.23	Drought	Return
27	Madagascar	SSA	LIC	32.5	6.1	0.76	15.1	4.65	Storm	Return
28	Angola	SSA	LMIC	40.1	4.7	0.75	14.1	3.52	Flood	Mainstream
29	Argentina	LAC	UMIC	46.6	3.6	0.81	13.4	2.87	Flood	Mainstream
30	Peru	LAC	UMIC	35.4	5.0	0.76	13.3	3.77	Flood	Mainstream
31	Algeria	MENA	UMIC	47.5	3.7	0.76	13.1	2.76	Drought	Mainstream
32	Yemen	MENA	LIC	36.8	6.3	0.56	12.9	3.51	Flood	Fragile
33	Morocco	MENA	LMIC	38.9	4.1	0.78	12.4	3.20	Drought	Mainstream
34	Côte d'Ivoire	SSA	LMIC	31.1	4.9	0.78	11.8	3.78	Flood	Mainstream
35	Nepal	SA	LMIC	31.9	5.1	0.72	11.7	3.67	Flood	Mainstream
36	Venezuela	LAC	LMIC	30.4	5.9	0.65	11.7	3.84	Storm	Fragile
37	Ghana	SSA	LMIC	36.1	4.1	0.78	11.6	3.22	Flood	Mainstream
38	Malaysia	EAP	UMIC	35.4	3.7	0.88	11.4	3.23	Flood	Mainstream
39	Uzbekistan	ECA	LMIC	36.6	3.6	0.81	10.6	2.89	Flood	Mainstream
40	Cameroon	SSA	LMIC	30.9	5.3	0.64	10.4	3.36	Flood	Mainstream
41	Niger	SSA	LIC	30.4	5.8	0.58	10.4	3.40	Flood	Fragile
42	Syria	MENA	LIC	26.4	6.4	0.54	9.2	3.48	Drought	Fragile
43	Malawi	SSA	LIC	22.6	5.2	0.76	9.0	3.97	Drought	Return
44	Zambia	SSA	LMIC	22.3	5.2	0.77	8.9	3.99	Drought	Return
45	Somalia	SSA	LIC	19.9	7.6	0.56	8.4	4.24	Compound	Fragile

#	Country	Reg.	Inc.	Pop. (m)	R	D	M × D	R × D	Archetype	Tier
46	Mali	SSA	LIC	25.5	5.7	0.57	8.3	3.26	Flood	Fragile
47	Chad	SSA	LIC	20.0	6.5	0.64	8.2	4.12	Flood	Fragile
48	Guatemala	LAC	UMIC	18.9	5.5	0.74	7.7	4.10	Flood	Return
49	Burkina Faso	SSA	LIC	25.0	5.1	0.60	7.7	3.09	Drought	Mainstream
50	Senegal	SSA	LMIC	19.2	4.8	0.80	7.3	3.83	Flood	Return
51	Ecuador	LAC	UMIC	18.7	5.5	0.69	7.1	3.80	Flood	Return
52	Zimbabwe	SSA	LMIC	17.7	5.1	0.74	6.7	3.79	Drought	Return
53	Cambodia	EAP	LMIC	17.5	5.3	0.71	6.6	3.79	Flood	Return
54	Sri Lanka	SA	UMIC	22.0	3.6	0.78	6.3	2.85	Storm	Mainstream
55	North Korea	EAP	LIC	26.4	3.6	0.64	6.0	2.29	Flood	Mainstream
56	Haiti	LAC	LMIC	12.2	7.2	0.61	5.4	4.42	Storm	Fragile
57	Benin	SSA	LMIC	14.8	4.9	0.74	5.4	3.62	Flood	Mainstream
58	Guinea	SSA	LMIC	15.2	4.7	0.72	5.2	3.42	Flood	Mainstream
59	Papua New Guinea	EAP	LMIC	10.9	6.3	0.74	5.0	4.61	Storm	Return
60	Kazakhstan	ECA	UMIC	20.3	3.0	0.82	5.0	2.45	Flood	Mainstream
61	Rwanda	SSA	LIC	15.1	4.2	0.76	4.8	3.19	Drought	Mainstream
62	Bolivia	LAC	LMIC	12.9	4.8	0.77	4.8	3.69	Drought	Mainstream
63	Honduras	LAC	LMIC	11.1	5.6	0.77	4.7	4.28	Flood	Return
64	South Sudan	SSA	LIC	11.7	6.7	0.58	4.6	3.90	Flood	Fragile
65	Burundi	SSA	LIC	14.3	4.9	0.65	4.6	3.18	Drought	Mainstream
66	Dominican Republic	LAC	UMIC	11.6	4.9	0.77	4.4	3.79	Storm	Return
67	Jordan	MENA	UMIC	11.5	4.1	0.79	3.7	3.24	Drought	Mainstream
68	Tunisia	MENA	LMIC	12.8	3.7	0.79	3.7	2.90	Storm	Mainstream
69	Sierra Leone	SSA	LIC	9.35	5.1	0.78	3.7	3.94	Flood	Small
70	Azerbaijan	ECA	UMIC	10.6	4.4	0.76	3.5	3.33	Flood	Mainstream
71	Tajikistan	ECA	LMIC	10.7	4.3	0.75	3.5	3.26	Drought	Mainstream
72	Cuba	LAC	UMIC	11.1	3.8	0.77	3.3	2.92	Storm	Mainstream
73	Togo	SSA	LMIC	9.68	4.3	0.71	2.9	3.04	Flood	Mainstream
74	Lao PDR	EAP	LMIC	7.94	4.1	0.79	2.6	3.23	Flood	Mainstream
75	Nicaragua	LAC	LMIC	7.33	4.8	0.73	2.6	3.48	Flood	Small
76	Congo	SSA	LMIC	6.53	5.1	0.75	2.5	3.79	Flood	Small
77	Central African Republic	SSA	LIC	6.29	6.0	0.65	2.4	3.88	Flood	Small
78	Liberia	SSA	LIC	5.78	5.3	0.77	2.4	4.10	Flood	Small
79	Libya	MENA	UMIC	7.11	4.8	0.67	2.3	3.20	Storm	Mainstream
80	Mauritania	SSA	LMIC	5.26	5.6	0.77	2.3	4.31	Drought	Small
81	El Salvador	LAC	UMIC	6.45	4.6	0.75	2.2	3.44	Storm	Small
82	Kyrgyzstan	ECA	LMIC	7.04	3.7	0.75	2.0	2.79	Drought	Mainstream
83	Paraguay	LAC	UMIC	7.11	3.3	0.79	1.8	2.59	Flood	Mainstream
84	Lebanon	MENA	LMIC	4.99	5.3	0.65	1.7	3.48	Storm	Small
85	Turkmenistan	ECA	UMIC	6.75	3.1	0.77	1.6	2.40	Flood	Mainstream
86	Eritrea	SSA	LIC	3.96	4.8	0.71	1.3	3.37	Drought	Mainstream
87	Palestine	MENA	LMIC	5.75	3.8	0.57	1.2	2.17	Flood	Mainstream
88	Georgia	ECA	UMIC	3.70	3.7	0.81	1.1	3.02	Flood	Mainstream
89	Namibia	SSA	LMIC	2.73	4.8	0.84	1.1	4.05	Drought	Small
90	Gambia	SSA	LIC	2.98	4.5	0.79	1.1	3.57	Flood	Small
91	Jamaica	LAC	UMIC	2.82	4.1	0.82	1.0	3.39	Storm	Mainstream
92	Mongolia	EAP	UMIC	3.58	3.0	0.81	0.9	2.43	Flood	Mainstream
93	Botswana	SSA	UMIC	2.81	3.4	0.88	0.8	2.96	Drought	Mainstream
94	Gabon	SSA	UMIC	2.58	3.8	0.77	0.8	2.94	Flood	Mainstream
95	Guinea-Bissau	SSA	LIC	2.29	4.4	0.74	0.8	3.29	Flood	Mainstream
96	Lesotho	SSA	LMIC	2.41	3.9	0.79	0.7	3.09	Drought	Mainstream
97	Armenia	ECA	UMIC	2.78	3.2	0.79	0.7	2.55	Flood	Mainstream
98	Equatorial Guinea	SSA	UMIC	1.84	3.7	0.73	0.5	2.71	Drought	Mainstream
99	Timor-Leste	EAP	LMIC	1.42	4.3	0.80	0.5	3.40	Storm	Mainstream
100	Djibouti	MENA	LMIC	1.18	5.4	0.75	0.5	4.04	Drought	Small

#	Country	Reg.	Inc.	Pop. (m)	R	D	M × D	R × D	Archetype	Tier
101	Solomon Islands	EAP	LMIC	0.79	5.4	0.84	0.4	4.60	Storm	Small
102	Fiji	EAP	UMIC	0.96	3.7	0.90	0.3	3.29	Storm	Mainstream
103	Eswatini	SSA	LMIC	1.25	3.2	0.77	0.3	2.47	Drought	Mainstream
104	Comoros	SSA	LMIC	0.90	3.7	0.81	0.3	3.02	Storm	Mainstream
105	Mauritius	SSA	UMIC	1.30	2.4	0.88	0.3	2.07	Storm	Mainstream
106	Bhutan	SA	LMIC	0.80	3.1	0.87	0.2	2.69	Flood	Mainstream
107	Suriname	LAC	UMIC	0.64	3.7	0.85	0.2	3.16	Flood	Mainstream
108	Cabo Verde	SSA	UMIC	0.62	2.9	0.90	0.2	2.63	Drought	Mainstream
109	Vanuatu	EAP	LMIC	0.36	5.2	0.85	0.2	4.38	Storm	Small
110	Belize	LAC	UMIC	0.43	3.9	0.85	0.1	3.36	Storm	Mainstream
111	Maldives	SA	UMIC	0.51	2.6	0.85	0.1	2.24	Flood	Mainstream
112	Samoa	EAP	UMIC	0.24	3.3	0.90	0.1	2.98	Storm	Mainstream
113	Sao Tome and Principe	SSA	LMIC	0.25	3.1	0.85	0.1	2.63	Storm	Mainstream
114	Kiribati	EAP	LMIC	0.14	4.4	0.85	0.1	3.72	Storm	Mainstream
115	Saint Lucia	LAC	UMIC	0.18	3.0	0.89	0.0	2.67	Storm	Mainstream
116	Micronesia	EAP	UMIC	0.12	4.2	0.86	0.0	3.63	Drought	Mainstream
117	Grenada	LAC	UMIC	0.13	3.4	0.88	0.0	3.02	Storm	Mainstream
118	Tonga	EAP	UMIC	0.11	3.6	0.87	0.0	3.13	Storm	Mainstream
119	Saint Vincent and the Grenadines	LAC	UMIC	0.10	3.5	0.90	0.0	3.16	Storm	Mainstream
120	Dominica	LAC	UMIC	0.07	3.1	0.89	0.0	2.75	Storm	Mainstream
121	Marshall Islands	EAP	UMIC	0.04	4.4	0.86	0.0	3.75	Storm	Mainstream
122	Tuvalu	EAP	UMIC	0.01	3.2	0.84	0.0	2.66	Drought	Mainstream

Source: H Heuristics analysis of INFORM Risk Index mid-2026 (European Commission JRC, CC BY 4.0).

Appendix C. Sources and Links

External sources cited in the text, grouped by topic. Links were active when the report was prepared in October 2026.

C.1 Risk indices and datasets

- [INFORM Risk Index: results and data; methodology](#). European Commission Joint Research Centre and the Inter-Agency Standing Committee.
- [WorldRiskReport 2025: Focus floods](#). Bündnis Entwicklung Hilft and Ruhr University Bochum; see also the [DKKV summary](#).
- [Germanwatch Climate Risk Index 2026](#) and the [full report](#).
- [World Bank Open Data](#).
- [Natural Earth country boundaries](#).

C.2 Exposure, vulnerability and losses

- [IPCC Sixth Assessment Report, Working Group II: press conference slides](#).
- Rentschler, Salhab and Jafino (2022), [Flood exposure and poverty in 188 countries](#); World Bank [blog summary](#).
- World Bank (2023), [People exposed to, vulnerable to, and at high risk from weather shocks](#); [Poverty, Prosperity, and Planet Report 2024](#).
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- World Bank (2021), [Groundswell Part II: climate change could force 216 million people to migrate within their own countries by 2050](#).
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- FAO et al. (2025), [State of Food Security and Nutrition in the World](#).
- UNCTAD, [A World of Debt](#).
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C.3 Evidence on what works

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- Global Commission on Adaptation (2019), [Adapt Now](#), via WRI.
- ILO (2024), [World Social Protection Report 2024–26](#).

C.4 Finance

- UNEP (2025), [Adaptation Gap Report 2025: Running on Empty](#).
- Climate Policy Initiative (2025), [Global Landscape of Climate Finance 2025: executive summary](#).
- Center for Global Development (2025), [Climate finance allocations and vulnerability](#).
- Global Center on Adaptation (2025), [State and trends in adaptation report 2025: Small Island Developing States](#).

C.5 Hotspots and case evidence

- UNDP et al. (2022), [Pakistan floods 2022: Post-Disaster Needs Assessment](#).
- World Bank and IDB (2025), [Hurricane Melissa damage to Jamaica totals an all-time high of US\\$8.8 billion](#).
- GFDRR, [Vanuatu: Cyclone Pam case study](#).
- UNICEF, WHO and LSHTM (2023), [43,000 excess deaths may have occurred in 2022 from the drought in Somalia](#).
- OCHA (2025), [Sahel humanitarian overview](#); FAO and WFP, [Central American Dry Corridor](#).
- Minderhoud et al. (2017), [The sinking mega-delta: subsidence of the Vietnamese Mekong delta](#); Asia News Network, [Jakarta sinks deeper as subsidence worsens flood risks](#).

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