Food and Agriculture Organization of the United Nations

LOSS AND DAMAGE



Beyond silos: Loss and damage in agrifood systems - In Brief

Understanding, assessing and addressing the impacts of climate change through a comprehensive risk management approach

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Understanding, assessing and addressing the impacts of climate change through a comprehensive risk management approach

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Food and Agriculture Organization of the United Nations
Rome, 2026

Required citation: Turot, O., Wabbes, S., Bernoux, M., Malec, R., Nakamaru, H., Parodi, L., Rajagopalan, P., Wang, X. and Zhang, H.. 2026. Beyond silos: *Loss and damage in agrifood systems – Understanding, assessing and addressing the impacts of climate change through a comprehensive risk management approach.* Rome, FAO.

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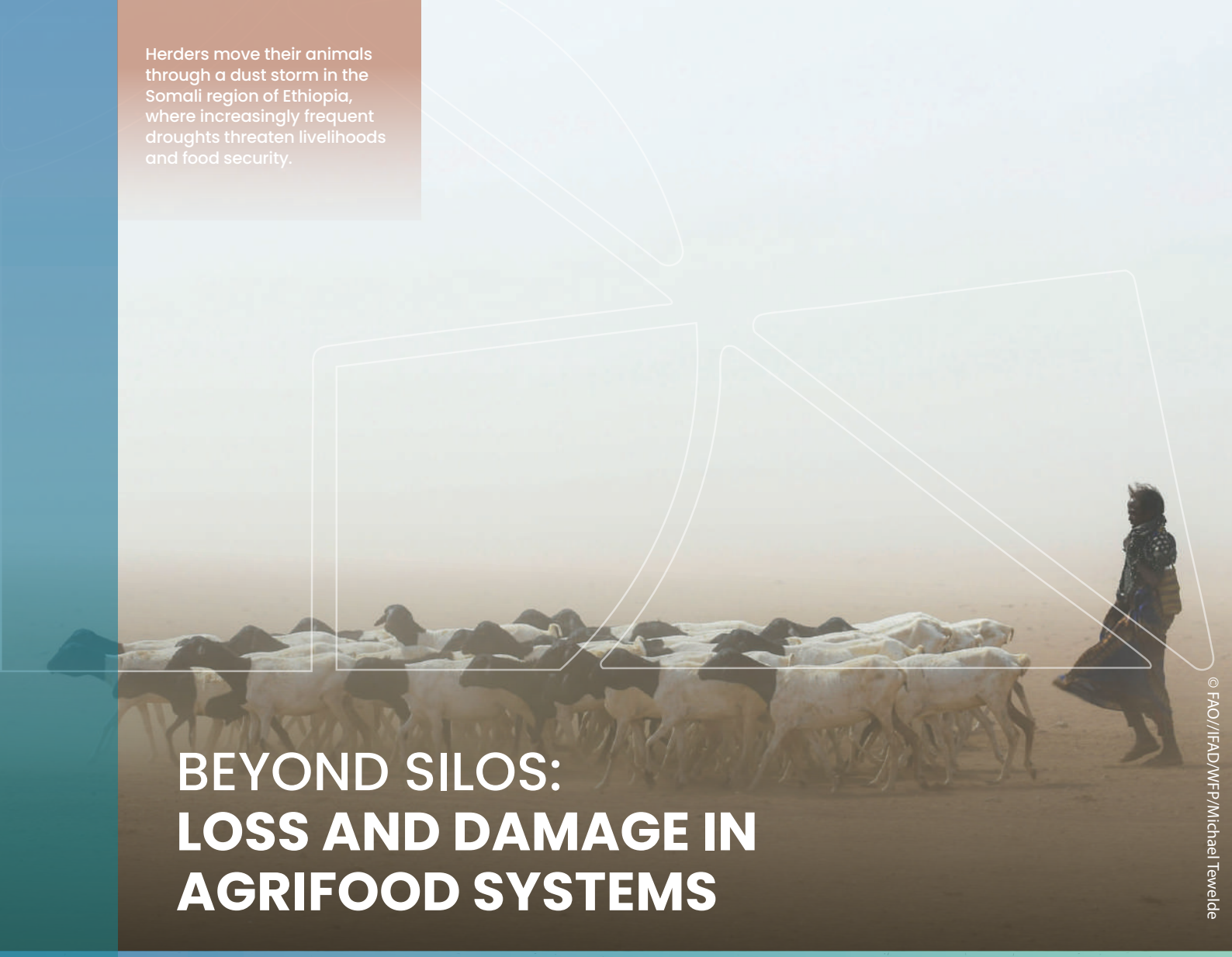
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Herders move their animals through a dust storm in the Somali region of Ethiopia, where increasingly frequent droughts threaten livelihoods and food security.

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BEYOND SILOS: LOSS AND DAMAGE IN AGRIFOOD SYSTEMS

IN BRIEF

Understanding, assessing and addressing the impacts of climate change through a comprehensive risk management approach

This brief is a summary of the full report, which carries the complete evidence base, methods, country cases and references.

The paper in brief

Loss and damage is the third pillar of climate action[1] – and the one where the shortfalls of the other two land. The Paris Agreement assigns each pillar its role: mitigation reduces emissions to avoid future impacts (Article 4); adaptation reduces exposure and vulnerability to the impacts that can still be avoided (Article 7); and loss and damage takes on the risk the first two leave – averting and minimizing it where possible, and addressing the impacts that materialize – from extreme weather events and slow onset events, economic and non-economic (Article 8, building on the Warsaw International Mechanism of 2013). The three form one continuum: the less the world mitigates and adapts, the more falls to loss and damage – the costliest and least reversible end of the chain.

More is now falling to the third pillar than the first two were meant to allow. Most of today's losses and damages stem from risk that could have been reduced – the limits reached so far in agriculture are predominantly financial, technological and institutional, not physical. The pressure is set to grow: warming is expected to cross 1.5 °C within a few years (WMO, 2026) and to peak near 1.9 °C even if every current plan and pledge is delivered (Climate Action Tracker, 2025). Even if temperatures subsequently decline over the following decades, during the period of overshoot extreme events will intensify, slow onset events will accelerate, and more systems will reach limits beyond which losses – of species, ecosystems and the livelihoods they support – cannot be reversed by falling temperatures. Every increment of warming avoided and every year of overshoot shortened helps keep hard limits and the irreversible losses beyond them further away.

Loss and damage is also the youngest pillar – and the least resourced. Its architecture is only a decade old: the Warsaw International Mechanism (WIM) for knowledge and policy (2013), the Santiago network for technical assistance (2019), and the Fund for responding to Loss and Damage (FRLD), which is now beginning to operate. Demand from countries is rising: 86 percent of nationally determined contributions (NDCs) reference loss and damage as of April 2026, and nearly two-thirds in relation to agrifood systems – a relative increase of more than 50 percent since the second round of NDC submissions in 2023 (FAO, 2026a). When the FRLD opened its first call in December 2025, within six months 119 countries had submitted 176 requests seeking USD 2.8 billion (FRLD, 2026) – against an initial allocation of USD 250 million, since raised to USD 342 million[2] .

Nowhere are losses more concentrated than in agrifood systems, yet much of the harm goes unrecorded. Disasters caused an estimated USD 3.26 trillion in crop and livestock production losses between 1991 and 2023 – 89 percent from climate-related extreme events. The trend is also accelerating, with annual losses rising from an average of USD 64 billion in the 1990s to USD 144 billion since 2010 (FAO, 2025a). These figures capture only a fraction of the loss and damage occurring: they do not include damage to assets and infrastructure, nor impacts on fisheries and aquaculture, forestry and value chains beyond primary production; nor harm

[1] The term "pillar" is used descriptively in this brief for the three areas of climate action under the Paris Agreement - mitigation (Article 4), adaptation (Article 7), and loss and damage (Article 8). It is not a formal designation under the Agreement.

[2] The initial allocation of USD 250 million for the Fund's start-up phase was decided at the fifth meeting of the FRLD Board (April 2025) and raised to USD 342 million at the ninth (July 2026).

from gradual climate processes that never registers as a disaster – including depleted soils, weakened biodiversity and eroded assets; nor non-economic losses such as narrowing diets and the knowledge and livelihoods lost with those forced out of farming. The figures also stop counting when the disaster ends – the losses continue: one failed season can consume seed stocks and savings and deepen debt, with consequences for nutrition and recovery that unfold over months and years, leaving households weaker when the next shock arrives.

Yet climate finance for agrifood systems meets only a portion of their needs and is declining faster than finance for any other sector. Overall climate-related development finance fell by 2 percent in 2024, whereas finance to agrifood systems fell by 10 percent. Food-producing sectors – crop production, livestock, forestry and fisheries – now receive only 5 percent of total climate-related development finance (FAO, 2026b). Finance for responding to loss and damage is as yet untracked, as no agreed methodology yet tags or tracks loss and damage finance flows (FAO, 2023).

Finance gaps will continue to widen as losses and damages in agrifood systems remain inadequately accounted for. Losses that are not assessed enter no national adaptation plan (NAP), no budget and no funding request: what goes unmeasured attracts no finance, however scarce. Capturing the full scope of losses and damages would show the real depth of the financial gap – and the cost of inaction, since responding to impacts costs more than reducing the risk would have, and every loss left unaddressed deepens vulnerability and increases future needs. Scarcity itself argues for convergence: where resources fall short of needs, aligning the finance, institutions and instruments that today address fragments of the same loss separately becomes a necessity – one that comprehensive risk management can meet (UNDRR and REAP, 2025).

The deepening finance gap and compounding impacts make fragmented action increasingly untenable. Yet silos persist in three areas: understanding, as separate communities of practice consider parts of the risk continuum in isolation; management, as climate and non-climate hazards are handled separately even though their impacts compound in practice; and implementation, as solutions are often delivered independently rather than through a comprehensive approach.

This paper proposes a foundation for understanding, assessing and addressing loss and damage in agrifood systems: a common understanding of how climate hazards affect agrifood systems; a complete typology of economic and non-economic losses and damages; an assessment framework that captures gradual change as well as sudden shocks; a comprehensive risk management and governance approach to prevent losses from falling between institutional mandates; and a portfolio of solutions structured as a coherent system across the full risk continuum – reducing risk, anticipating impacts and addressing them when they materialize.



A woman collects drinking water from a polluted watering hole in the Horn of Africa, where recurrent droughts make safe water scarce and leave communities less time to recover between one shock and the next.

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THE CHALLENGE: RISING RISK, MOUNTING LOSSES

Losses and damages arise through a traceable chain: climate change multiplies risk in systems already under pressure; it increases both hazard types – extreme weather events and slow onset events; and the losses are borne disproportionately by vulnerable groups. Some risk remains after adaptation, whether by constraint or by design, and most of the resulting impacts today were avoidable rather than unavoidable (Figure 1).

1. Climate change is weighing on agrifood systems already facing a polycrisis

Climate change affects agrifood systems that are already under pressure – from natural climate variability, whose droughts, floods and storms have long shaped agriculture, and from a wider polycrisis of land degradation, water scarcity, biodiversity loss, growing pest and disease pressures, economic fragility, energy crises, inequality and conflict. **Climate change multiplies this risk:** it increases the frequency and intensity of extreme weather events, drives and accelerates slow onset events, and interacts with and amplifies existing shocks and stresses, both climate-related and non-climate-related.

Agrifood systems are among the most affected because they depend directly on climate-sensitive ecosystems and natural resources at every stage, from production through processing, transport and markets to consumption, and because they sit on both sides of the risk equation. Degraded land and forests create a feedback loop: they retain less water and topsoil, worsening the effects of floods, droughts and erosion on agriculture – and they also store less carbon, weakening a natural buffer against climate change.

Interconnected value chains are a double-edged sword: they buffer local shocks by moving food and inputs, but transmit them across sectors and borders when the disruption is large enough (FAO, 2025c). In 2007–2008, poor harvests in several exporting countries met markets already under stress: prices doubled and food riots reached cities that had seen no drought. Climate change raises the frequency and intensity of the shocks that can trigger such dynamics – and El Niño shows how they compound (Box 1).

Act: *Design risk management for the polycrisis as it is – involving compound, cascading and transboundary risks – rather than for single hazards in isolation.*

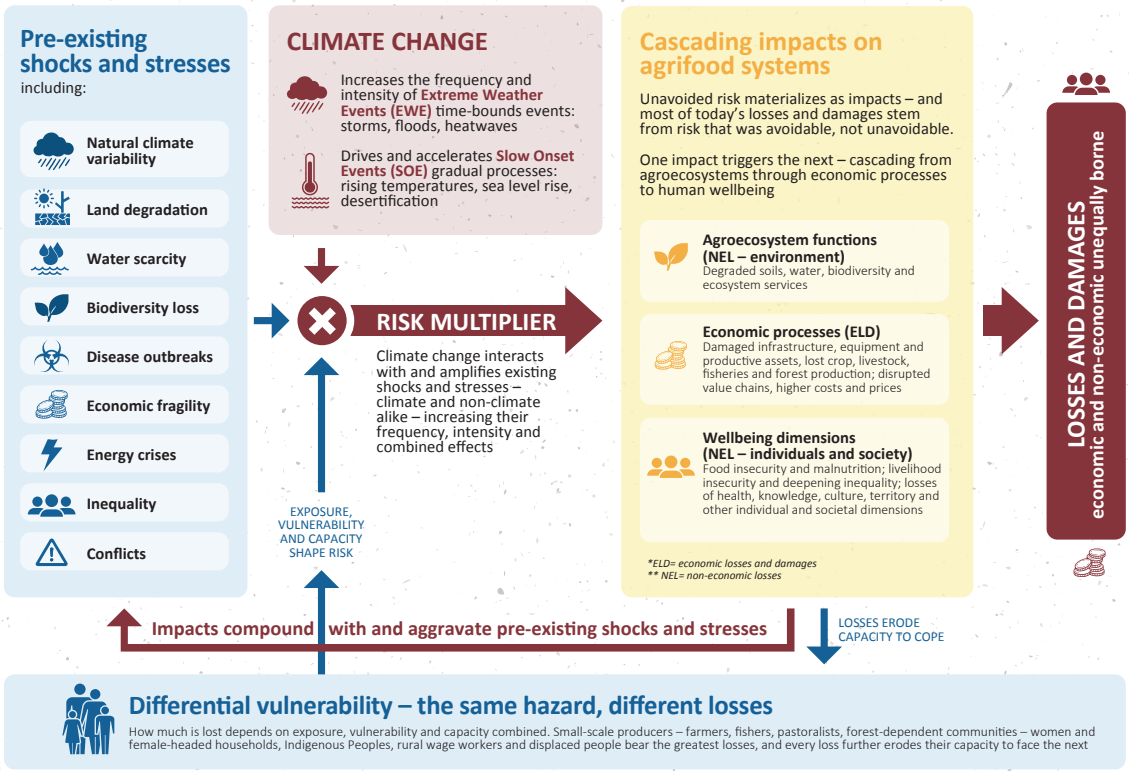
Box 1. El Niño: compounding impacts, foreseeable harm

El Niño is a natural cycle of the tropical Pacific, but a warmer atmosphere amplifies the rainfall swings through which it causes harm. Its impacts show how climate risk compounds. Through global teleconnections, a single event drives simultaneous droughts, floods and heat extremes across continents; hydrological extremes can also trigger biological hazards, as in the 2019 desert locust upsurge that followed exceptional El Niño-related rains; and coincident non-climate shocks deepen the damage, as in 2026, with El Niño conditions emerging while shipping disruptions were raising energy, fertilizer and transport costs worldwide (FAO, 2026c).

The 2023/24 event caused southern Africa's most severe drought in a century. In Zambia, nearly half the planted maize area failed; in Malawi economic losses and damages to the agriculture sector amounted to USD 311 million; and households consumed seed stocks and sold breeding animals, converting one season's damage into the next season's vulnerability. A new El Niño, identified in the first half of 2026 and forecast at the time of writing to reach strong to very strong intensity, arrives barely two years after that event – against baselines only partly rebuilt during a brief La Niña. Because the El Niño–Southern Oscillation (ENSO) can be forecast months ahead of its agricultural impacts, El Niño is also the clearest recurring case for anticipatory action: FAO and the World Food Programme launched a joint appeal in mid-2026, ahead of the harvests at risk in 2027 (FAO and WFP, 2026).

Figure 1. How climate change drives losses and damages in agrifood systems

In a context of polycrisis, climate change acts as a risk multiplier
compounding pre-existing shocks and stresses, cascading through agrifood systems and landing unequally



Source: Authors own elaboration

Figure 1 summarizes how climate change drives losses and damages in agrifood systems. *From left to right, climate change increases the frequency and intensity of extreme weather events, drives and accelerates slow onset events, and multiplies the risk carried by the shocks and stresses that already weigh on agrifood systems – climate and non-climate alike. Where the resulting risk is not avoided, it materializes in impacts that cascade through the three functional dimensions of agrifood systems – agroecosystem functions, economic processes and wellbeing dimensions – producing losses and damages that are both economic and non-economic. Two further dynamics complete the picture: impacts compound with and aggravate the pre-existing shocks and stresses, and differential vulnerability – exposure, vulnerability and capacity combined – determines who loses most from the same hazard.*

2. Climate change is increasing the frequency and intensity of climate hazards

The two types of climate hazard operate on different timescales and trigger responses differently. Extreme weather events (EWEs) are discrete episodes with a beginning and an end, lasting from hours to months: a cyclone, a flood, a heatwave, a drought**.** Slow onset events (SOEs), in the United Nations Framework Convention on Climate Change (UNFCCC) terminology, are gradual processes unfolding over decades rather than discrete events: desertification, sea level rise, salinization, glacier retreat, ocean acidification, land and ecosystem degradation. The distinction has direct operational consequences. Assessment systems built around disastrous events compare conditions before and after an event, whereas gradual processes involve shifting trends and accumulating harm without any disaster declaration. Decision-making instruments follow the same pattern: they activate on events, and the gradual disappearance of a pastoral water source or a decade-long decline in soil fertility does not have the same triggering power – without identification and agreed thresholds for action, the response is lacking.

Both EWEs and SOEs can have disastrous impacts, but they do not receive equal attention. When Pakistan's 2022 monsoon floods put a third of the country under water, a national emergency was declared and a post-disaster needs assessment completed within weeks, recording USD 9.2 billion in agricultural losses. In the Mekong Delta, salinization crept inland for years, silently reducing cultivated areas and yields, but became a declared disaster only when the 2015–16 drought made it visible, with rice unplantable on 400 000 hectares across 11 of 13 provinces.

Climate change intensifies both hazard types, which also increasingly interact. Gradual processes make extreme events more destructive: sea level rise amplifies storm surge and coastal flooding, and desertifying land has lost the moisture and vegetation that would have buffered the next drought. In turn, extreme events accelerate gradual processes: repeated droughts and heatwaves push degrading land toward desertification and shorten the recovery between shocks, and each coastal flood leaves salt behind, accelerating the salinization process. Losses become chronic through either pathway, most often through their combined effects.

Climate change affects agrifood systems across the domains that sustain them – the atmosphere, ocean, land and living systems. Figure 2 consolidates the hazards most relevant to agrifood systems across ten domains, each driving both EWEs and SOEs. In doing so, it reconciles the Intergovernmental Panel on Climate Change (IPCC), UNDRR and Global Climate Observing System (GCOS) classifications into a single reference.

Act: *Design assessment, finance and response for both hazard types – event-based logic for extreme events and threshold-based logic for gradual processes.*



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Heng Saphen, in Kouy traditional dress, at her cashew farm in Kampong Thom, Cambodia, where communities restore and protect forests so that ecosystems and livelihoods withstand a changing climate.

Figure 2. Climate change across ten domains



Source: Authors own elaboration

***Figure 2 maps how climate change manifests across ten domains relevant to agrifood systems**, grouped in three families: atmospheric, Earth system and biological. Each domain generates both hazard types, illustrated by paired examples around the wheel: gradual, continuous slow onset events (such as aridification or progressive ocean warming) and discrete, time-bound extreme weather events (such as heatwaves, storms or harmful algal blooms). In the land and biological domains, climate change acts in combination with ecological conditions and human pressures. The wheel brings together hazard classifications from the IPCC, UNDRR and GCOS into a single reference for hazards most relevant to agrifood systems, which is neither universal nor exhaustive.*

3. Impacts cascade through agrifood systems – and fall hardest where protection is thinnest

Where this multiplied risk is not avoided, it materializes as impacts – and most of today's losses and damages stem from risk that was avoidable, not unavoidable. The impacts cascade through the three functional dimensions of agrifood systems. They affect agroecosystem functions and the soils, water, biodiversity and ecosystem services on which production depends; they disrupt economic processes through damage to assets, lost production, disrupted value chains and rising production costs; and they harm human wellbeing in particular through food insecurity, livelihood insecurity and losses of health, knowledge, culture and territory.

The impacts are not linear: they compound with and aggravate climate-related and non-climate shocks and stresses, leaving systems more vulnerable to other hazards.

The same hazards result in far greater losses for some groups than for others. The scale of loss depends on exposure, vulnerability and capacity: small-scale producers – including farmers, fishers, pastoralists and forest-dependent communities – along with women and female-headed households, Indigenous Peoples, rural wage workers and displaced people, are the most vulnerable to climate hazards in agrifood systems. Each loss further erodes their capacity to face the next hazard. These groups are also the least reached by instruments that reduce, share and absorb risk – early warning systems, social protection, insurance and other risk transfer mechanisms. As a result, those most vulnerable to climate risks also retain most of the losses.

Those bearing the heaviest losses are those with the fewest options. A 1 °C rise in long-term temperature raises poor rural households' reliance on farm income by 53 percent while off-farm opportunities contract by a third; the same warming that increases exposure also removes alternatives that could soften its effects. Gender compounds this: on average, female-headed households lose 8 percent more of their income to heat stress than male-headed households, and the same 1 °C rise is associated with a 34 percent fall in their total incomes relative to male-headed households (FAO, 2024). Vulnerability is therefore not inherent to any group: it results from social conditions aggravated by shocks and stresses, and can be overcome by widening people's options. The solutions presented in the final section are also designed to do so.

Where support falls short, households are forced into hard choices whose costs extend beyond what money can measure. Selling assets, cutting meals or withdrawing children from school leaves a household more vulnerable to the next hazard. In Indigenous and local farming, fishing and pastoral communities, repeated shocks force changes in crop varieties, livestock breeds and seasonal calendars, weakening place-based knowledge systems and the customary support networks that underpin recovery – losses that compound economic vulnerability and are among the hardest to reverse.

Act: *Put differential vulnerability – small-scale farmers, pastoralists, fishers, forest communities, agricultural workers, women, Indigenous Peoples, youth, persons with disabilities – at the centre of assessment and targeting.*

4. Losses and damages arise from risk that was not reduced – by constraint or by design

The IPCC adopts the risk framework, in which climate risk arises from the interaction of hazard, exposure and vulnerability. Adaptation reduces risk, with tangible results: mangroves replanted along Viet Nam's coast cut sea-dyke maintenance by about USD 7 million a year, and safety-net households in Ethiopia were 23 percent less likely to experience crop losses and 48 percent total crop failure in drought years. Even so, adaptation cannot prevent all impacts: some residual risk remains.

Residual risk has three layers: tolerated risk, risk that could have been reduced by overcoming soft limits, and risk beyond hard limits. Some risk is tolerated by design: adaptation measures are designed to address a level of risk determined by probability and economic considerations – for example, in engineering, building all structures and infrastructure to the highest standards may cost more than reconstruction after rare extreme events. Societies therefore deliberately tolerate some risk. This tolerated level of risk is a natural area for risk transfer: insurance and similar instruments price and carry these losses – but the populations bearing most of these losses also have the least coverage under such mechanisms.

Other risk is not tolerated but lies beyond adaptation limits, whether soft or hard. Soft limits are reached when options exist but remain out of reach because of financial, technological or institutional constraints, leading to impacts that could still be avoided but are not. Hard limits are reached where no amount of adaptation can avoid intolerable impacts: early warning and stronger infrastructure reduce damage from a powerful cyclone but cannot prevent all of it; and once coastal waters warm past what a reef fishery can withstand, no adaptation restores it. Together, tolerated risk and risk beyond soft and hard limits constitute the residual risk from which losses and damages arise (Figure 3).

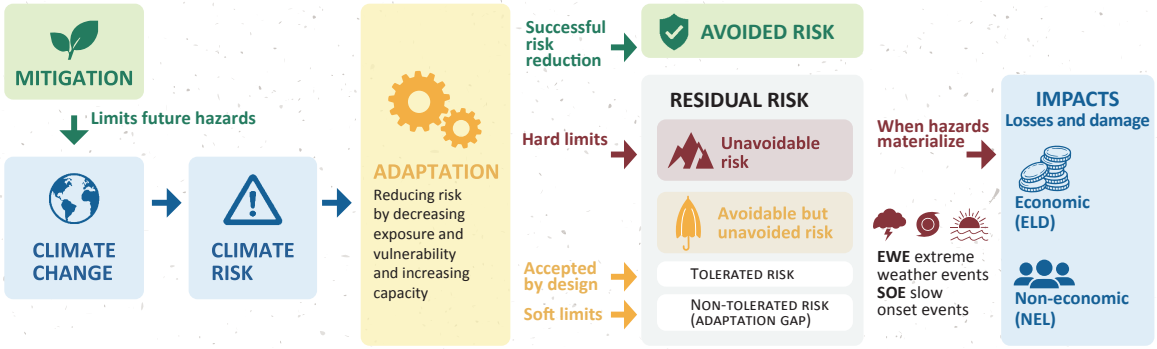
Soft and hard limits are context-specific, and adaptation efforts must avoid maladaptation. Where canals are missing and water resources are available and renewable, the limit is soft: an investment constraint that finance can overcome. Where the water itself turns saline, no canal helps: the limit is hard. Where groundwater pumping responds to drought by depleting the aquifer, adaptation turns into maladaptation, deepening future risk. When incremental adaptation – doing more of the same – becomes unsustainable or insufficient, transformational measures are needed.

It is not always clear how close systems are to reaching hard limits. Hard limits are reached first in natural systems, where crossing viability thresholds – such as the temperature beyond which pollination fails or the rainfall level below which rainfed production cannot be sustained – leads to abrupt losses and system disruption. When an entire system crosses such a threshold, it can tip: the change feeds on itself and the system reorganizes, often irreversibly.

Approaching hard limits calls for an early transition that can reduce irreversible impacts. In some cases, transformational adaptation – changing the activity or system itself, as where rice gives way to shrimp farming in salinizing deltas – offers a way forward before hard limits are reached. The transition has its own costs, and planning it before the limit is reached is what separates a managed transition from an irreversible loss.

Act: *Invest in identifying and monitoring thresholds now: determining when progressive change becomes unavoidable loss is central to slow onset risk management.*

Figure 3. Residual risk: from climate change to climate impacts



Reducing the avoidable, anticipating the unavoidable, addressing the unavoided through comprehensive risk management

Source: Authors own elaboration

Figure 3 illustrates the climate risk that remains despite adaptation and materializes as losses and damages. *Mitigation decreases climate risk upstream by limiting the change in variables driving climate hazards; adaptation reduces climate risk downstream by decreasing exposure and vulnerability and increasing capacity – but cannot prevent all impacts. Residual risk has three layers: risk tolerated by design, risk beyond soft limits and risk beyond hard limits. Together they form the residual risk that materializes as losses and damages, economic and non-economic. Most of today's losses and damages stem from the middle layer – risk that could have been avoided but was not. In the figure, ELD = economic loss and damage; and NEL = non-economic losses.*

5. Most of today's losses and damages could have been avoided – and adaptation and loss and damage response must form a continuum of action

Even with the best adaptation efforts, losses and damages will still arise. However, most of today's impacts could have been avoided.[3] Much of the current burden, particularly in developing countries, sits in the adaptation gap: risk that could and should be reduced but remains because of soft limits, above all financial, technological and institutional constraints. The burden increases in both areas: underinvestment in adaptation leaves avoidable impacts unavoided, while insufficient support for responding to loss and damage leaves impacts unaddressed. This deepens vulnerability to future hazards and increases future adaptation needs. Agrifood systems carry 54 percent of the adaptation finance needs identified in national adaptation plans and receive about 20 percent of tracked adaptation finance (Crumpler *et al.*, 2025).

Adaptation and loss and damage response form one operational continuum. Adaptation reduces exposure and vulnerability, determining how much risk materializes; loss and damage response addresses the impacts that nevertheless occur. How those impacts are addressed affects resilience to future risks, because unaddressed losses increase vulnerability and erode the capacity to adapt. Shortfalls in either area compound those in the other, and adaptation needs are already being enlarged by unaddressed losses and damages.

Act: *Plan and finance adaptation and loss and damage response as one investment case – each gap left open widens the other.*

[3] Two lines of evidence substantiate this, despite the gaps in measuring losses and damages themselves. First, the depth of the adaptation gap: adaptation finance needs in developing countries are estimated at 12 to 14 times current international public finance flows (UNEP, 2025) – risk left unaddressed for lack of implementation, not of options. Second, the IPCC finds that the adaptation limits currently faced in agriculture are mostly soft, driven by financial, governance, institutional and policy constraints that can in principle be overcome; hard limits have so far been reached mainly in natural systems, such as warm-water coral reefs, and are projected – not yet generalized – for agriculture as warming proceeds and where adaptation lags or maladapts (IPCC, 2022). Soft limits are, by definition, limits that can still be removed: the losses accruing behind them are unavoided rather than unavoidable.



A girl runs through abandoned fields near Monywa, Myanmar, where farmland dried up after the previous year's floods - one extreme event leaving families more exposed to the next.

© Hkun Lat

WHAT IS LOST: THE FULL PICTURE

Assessing and addressing loss and damage requires precise definitions. The paper builds its typology on established approaches, extends them across the agrifood system and to both hazard types, and completes the picture by incorporating non-economic dimensions, where some of the deepest harm occurs.

6. A complete economic typology, built on the instruments countries already use

The paper extends the established FAO Damage and Loss and post-disaster needs assessment (PDNA) definitions from farms to the entire agrifood system and from discrete events to both hazard types. The framework for assessing economic losses and damages is well established: damage is the total or partial destruction of physical assets and stocks, from boats, barns, livestock and irrigation systems to stored harvests and inputs; loss is the resulting change in economic flows, including foregone production, reduced income and higher production costs. The losses and damages are monetized using current or market prices and reconstruction costs, and are then aggregated to calculate the total value of economic losses and damages. This is the measurement vocabulary of the Sendai Framework, whose agriculture indicator FAO's methodology serves, and is used for all scales of impact and global aggregation.

The impacts of gradual processes often go unnoticed. While the impacts from extreme events are visible and can be assessed by comparing conditions before and after a disaster, slow onset events offer no equivalent before-and-after comparison. Some gradual declines can be observed, but other losses become apparent only when compared with a modelled counterfactual scenario without warming: for example, such analysis reveals that climate change has slowed growth of global agricultural total factor productivity by about 21 percent since 1961 (Ortiz-Bobea *et al.*, 2021). This represents a loss in crop and livestock productive capacity that is not recorded as such. Staple crops show a similar pattern: each 1 °C of warming is estimated to reduce average global yields of maize by 7.5 percent and of wheat by 6.0 percent (FAO and WMO, 2026).

Slow onset events also cause damage through mechanisms other than sudden destruction: erosion, obsolescence and stranding. They corrode infrastructure and shorten asset lives; they render facilities inadequate before the end of their useful lives; they shorten the productive lives and reduce the reproductive capacity of biological assets under chronic heat and water stress; and they strand assets that remain physically functional, such as a landing site on a coast the fish have left. Little of this appears in event-based damage records, yet all of it constitutes damage (Figure 4).

Act: *Adopt the extended typology for agrifood systems as the shared reference for assessment and reporting across ministries, so that losses and damages are counted consistently across the system, and the slow erosion of assets is also recognized as damage.*

Figure 4. The components of economic loss and damage (ELD)



Source: Authors own elaboration

Figure 4 presents the two components of the economic account: *damage – the total or partial destruction of physical assets and stocks – and loss – the resulting change in economic flows. Both components apply to both hazard types: sudden destruction from extreme events, and the slow onset mechanisms of erosion, obsolescence and stranding that degrade assets without any disaster declaration.*

7. Non-economic values are served by economic activity – and sustain it in turn – but most accounting remains economic

The non-economic dimensions discussed under the UNFCCC include life, health, human mobility, territory, cultural heritage, Indigenous and local knowledge, social and cultural identity, and biodiversity and ecosystem services. They are defined in UNFCCC technical literature, as distinct from economic losses, as "the remainder of items [...] that are not commonly traded in markets" (UNFCCC, 2013) – yet they encompass much of what agrifood communities lose to climate change: the knowledge that tells a herder when to move, the territory that carries a people's way of farming and eating, the agrobiodiversity built into landraces and crop varieties over centuries (Figure 5).

Economic activity supports these non-economic values. The 1996 Human Development Report stated it plainly: "human development is the end - economic growth a means" (UNDP, 1996). Loss and damage accounting does not yet fully reflect this: economic means are measured with increasing precision, while the wellbeing they support is only partially captured.

This interdependence works both ways: responses that restore only the economic dimension risk underperforming even in economic terms. Replacing assets and providing income support are less effective when the social fabric that sustained a livelihood has unravelled; ecosystem restoration produces weaker ecological outcomes when it fails to engage the communities who maintain the landscape; and intervention design that excludes Indigenous and local knowledge is closely associated with maladaptation. Addressing non-economic losses alongside economic ones is therefore not a matter of completeness but a condition of effectiveness – including economic effectiveness.

Irreversible losses are among the most serious consequences of climate change, but not all losses are irreversible. Recoverable losses also require action. Non-economic losses can range from recoverable – fully, partly or potentially – to irreversible: displacement may be temporary and a degraded ecosystem may be restored, while lost lives, submerged territory and extinct varieties cannot be returned. Tropical cyclones Idai and Kenneth in Mozambique illustrated this range of outcomes for agrobiodiversity: locally adapted seed varieties were destroyed with the harvest; those rescued and multiplied by gene banks and farmers were recovered in time, while the varieties not recovered are now extinct. Establishing where an impact sits on this gradient directly informs the response: restoration while it is still possible; acknowledgement, memorialization and sustained support where it no longer is.

Not all non-economic losses can be aggregated with one another or with economic totals. Some non-economic losses can be monetized, while others cannot or should not be. Some can be quantified, while others can only be reported in qualitative terms. Some are universal, while others can only be understood through the accounts of the communities who experience them. This diversity makes non-economic losses more difficult to assess and report than economic impacts – but also encourages us to look beyond economic aggregates and consider the perspectives of the people who bear them.

Act: *Assess non-economic losses in their own units, alongside the monetary account, and evaluate recoverability early enough for restoration to remain an option.*

8. Food security and livelihood security: two proposed non-economic dimensions of harm countries are already reporting

The IPCC ranks risks to food security and to living standards and livelihoods among its eight Representative Key Risks – the highest tier of climate risk it defines – and finds "a further erosion of livelihood security" among vulnerable populations at high confidence. Yet neither food security nor livelihood security is included among the current non-economic categories. As a result, harm is recorded only at the extreme end of the impact chain – for example, acute and chronic malnutrition requiring treatment under the health dimension, or livelihood collapse and displacement under societal identity and human mobility – by which point most of these effects are irreversible. The earlier erosion of security, stability, dignity and agency goes unrecorded. The impacts of climate change on food and livelihood security need to be captured earlier, while a response could still prevent the worst outcomes.

Impacts on food and livelihood security extend beyond economic losses. When crops, livestock or productive assets are lost – to a flood or to a decade of creeping salinization – the financial losses can be measured, but these figures do not capture the full consequences for people's lives: the adequacy, quality and cultural fit of what is actually eaten, the stability of access over time, and the confidence, choice and dignity with which households meet their food needs, all central to the definition of food security.[4] Livelihood security mirrors it: a household's command and agency over its means of living – the capacity to choose, maintain and adapt a livelihood on its own terms, to plan and pass it on to the next generation, and the identity and standing it carries. Like the existing non-economic dimensions, both are values served by economic activity – built on production, income and assets, but not reducible to them.

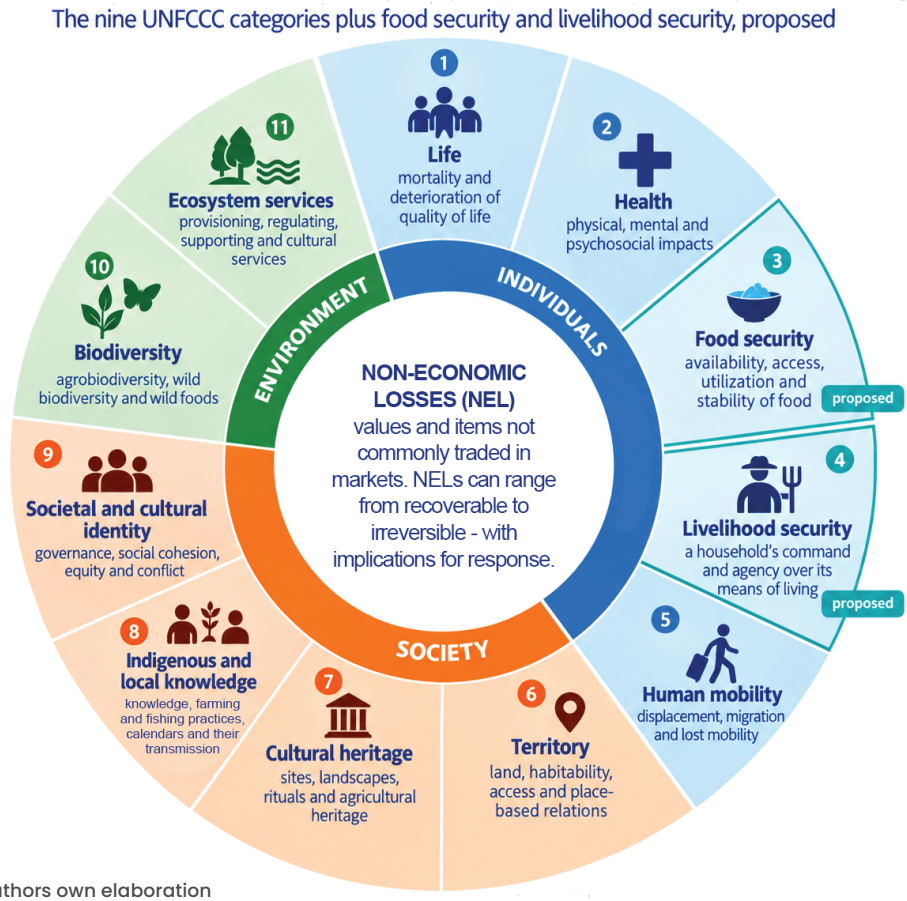
Existing instruments can be used to assess both food and livelihood security. Food security has the most developed indicators and methodologies of any dimension – the Food Insecurity Experience Scale, the Integrated Food Security Phase Classification (IPC), dietary diversity measures and food security coping strategies – which can be used directly to assess and report on how climate change threatens food security. The same data on production, income or assets can inform an economic loss estimate or be combined with other indicators to assess food and livelihood security as non-economic values – each reported in a separate account, without double-counting, because economic and non-economic impacts are not aggregated.

After environmental losses, food and livelihood security are the most frequently reported non-economic losses , with 34 percent of countries reporting food security and nutrition losses and 24 percent reporting livelihood security losses in agrifood systems in their NDCs – categories that officially do not exist (FAO, 2026a). These dimensions are proposed for testing and validation under the WIM.

Act: *Support the development and testing of food security and livelihood security as proposed non-economic dimensions under the WIM, so that these harms can be identified and addressed before they reach the extreme, often irreversible stage at which they are captured under other dimensions.*

[4] "Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (World Food Summit 1996).

Figure 5. The dimensions of non-economic losses (NEL)



Source: Authors own elaboration

Figure 5 shows dimensions of non-economic losses discussed under the UNFCCC): *life, health, human mobility, territory, cultural heritage, Indigenous and local knowledge, social and cultural identity, biodiversity and ecosystem services. Food security and livelihood security are two further proposed dimensions for review under the WIM.*

9. Economic and non-economic impacts arise together, with no hierarchy, and compound in both directions

Climate hazards cause economic and non-economic losses and damages together, and each can also cascade into the other. A drought that kills a herd destroys market value and social standing at the same time. The economic loss then compounds the non-economic harm: distress coping cuts meals, healthcare and children's schooling, while selling assets to keep food on the table limits the household's future options. The storm that destroys the boat and the catch can take lives, livelihoods and territory in the same strike. The effects can also unfold over years: where a fish stock moves away as coastal waters change, profits go first, then jobs, then families, knowledge and identity.

Non-economic losses have economic consequences. Eroded ecosystems, abandoned seasonal mobility, weakened knowledge and frayed social cohesion feed back into future production and income losses. The disaster terminology endorsed by the General Assembly recognizes this interaction, naming human and environmental impacts among the causes of economic value-added decline (UNGA, 2016). Impact pathway analysis helps capture these interactions by identifying causes and anticipating cascading dynamics, informing the design of interventions that address them.

Act: *Assess the economic and non-economic impacts together and identify the pathways between the two.*



Two girls climb a baobab to gather leaves for the evening meal in Malamawa, Niger – forest foods whose value chains sustain Sahelian diets and incomes as droughts intensify.

© FAO/ Luis Tato

WHAT IS COUNTED: CLOSING THE EVIDENCE GAP

The evidence gap is structural: it reflects how existing assessment instruments were designed. Methods and data become scarcer along two axes – from economic to non-economic impacts, and from extreme events to slow onset events – so the least measured harm is often the least reversible, in countries least equipped to assess it.

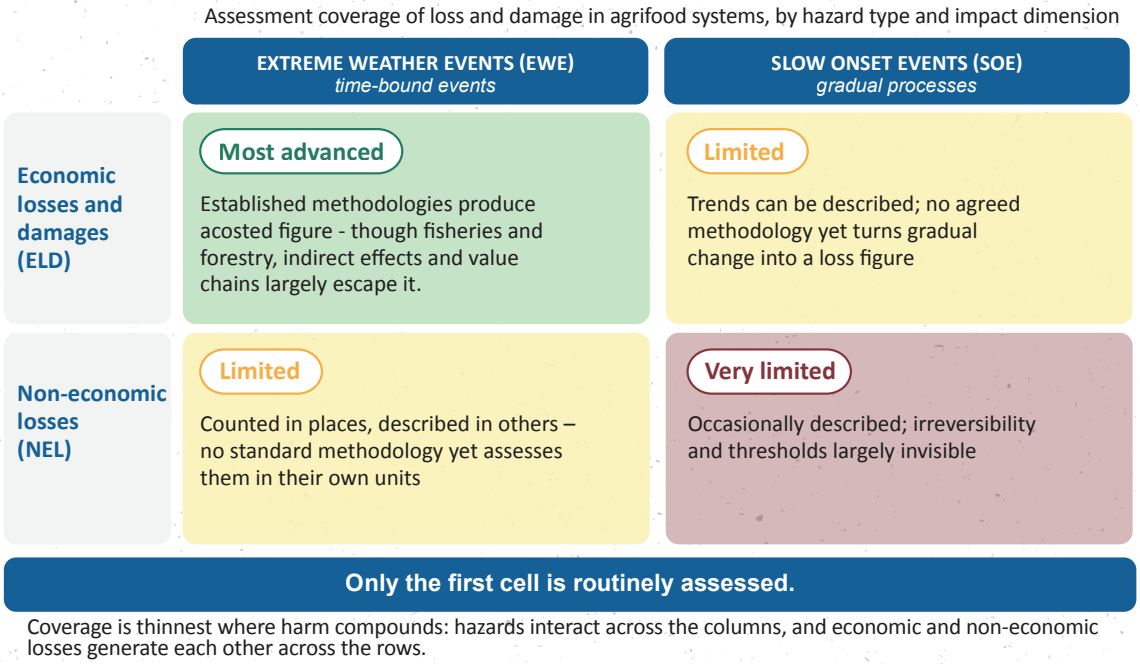
10. Unmeasured losses and damages are substantial – and unmeasured often means unaddressed

Global totals reflect what can be counted, not what is being lost. This pattern is evident in the NDCs: economic losses at the production stage dominate; non-economic losses surface mainly where economic anchors or ecosystem framings carry them, while more intangible dimensions – knowledge, heritage and identity – are scarcely recorded; value chains appear as assets but not as people (FAO, 2026a). This does not mean that these impacts are minor: the limited available studies document these harms – the IPCC records observed losses from eroded Indigenous herding knowledge to mental-health impacts among drought-affected farming communities – but such evidence is collected sporadically rather than systematically.

Assessment coverage is deeply uneven: strongest for economic losses from extreme events, thinnest for non-economic losses from slow onset events – precisely where irreversibility is highest. Comparing assessment across the two hazard types and the two categories of losses reveals a clear pattern (Figure 6). Only economic losses and damages from extreme events are routinely assessed: established methodologies produce monetary estimates, even if data gaps remain – in particular in the fisheries and aquaculture and forestry sectors. Economic impacts of slow onset events can be described as trends, but no agreed methodology yet turns gradual change into a loss figure. Non-economic losses from extreme events are counted in some contexts and described in others; those from slow onset events are scarcely documented. The dynamics within and across these categories are missed entirely: compounding and cascading dynamics, systemic risk, viability thresholds and tipping points. The IPCC has put these gaps on its agenda – its Seventh Assessment will include, for the first time, an assessment of methodologies for observed economic and non-economic losses and damages, including compound and cascading risks (IPCC, 2025).

Act: *Bring the full account into the record – both hazard types and economic and non-economic losses and damages – and improve the understanding of the compounding and cascading dynamics.*

Figure 6. What gets assessed – and what escapes the record



Source: Authors own elaboration

Figure 6 compares the two hazard types with the two families of losses, showing where assessment is most developed and where gaps remain. *Economic losses from extreme events are the only routinely assessed cell; coverage weakens toward the slow onset and the non-economic corners, where irreversibility is highest – while compounding and cascading dynamics between the cells remain unrecorded.*

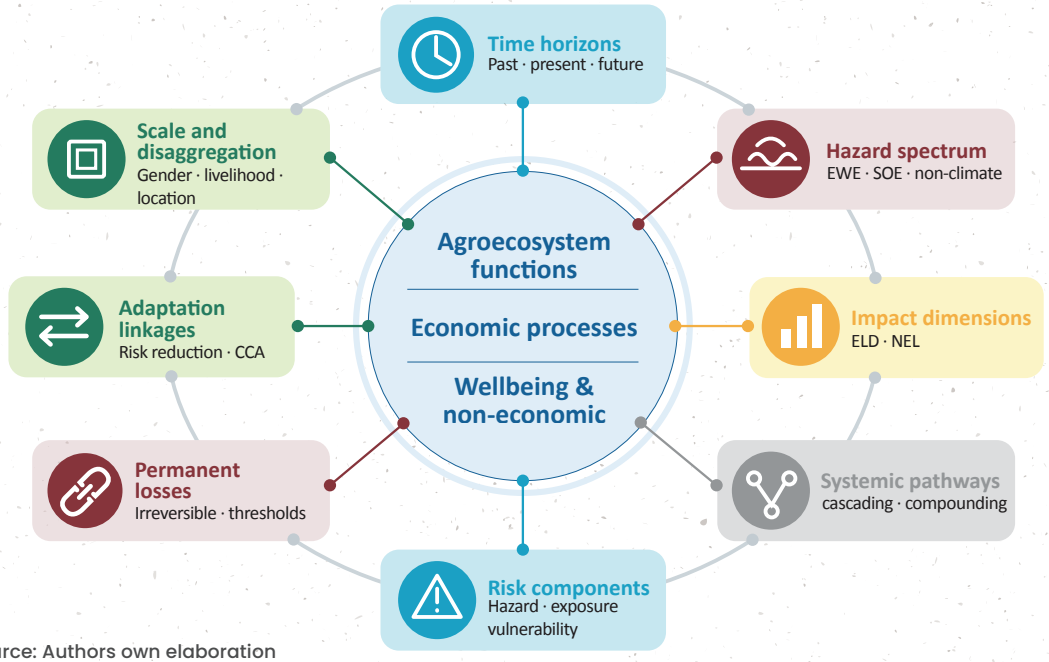
11. Assessment does not start from zero: the instruments exist, and the architecture connects them

FAO already operates a range of assessment instruments across the full time horizon. The Global Agricultural Loss Assessment (GALA) estimates historical crop and livestock production losses worldwide. The Damage and Loss methodology assesses disaster impacts at national level and feeds Sendai monitoring, alongside FAO's role in PDNA. Food security monitoring spans household experience scales and the IPC classification. The Climate Risk Toolbox provides forward-looking risk screening. However, projecting where losses will occur remains an area of active development rather than an established instrument. These instruments complement a wider set of resources – national statistical systems and disaster loss databases, UNDRR's DELTA Resilience platform, displacement and climate records, Earth observation – all of which are relevant to agrifood systems.

Each instrument, however, assesses only part of the picture. No existing system brings the pieces together into a coherent picture for agrifood systems, connecting agroecosystem functions, economic processes and wellbeing dimensions in one assessment. A comprehensive assessment architecture should build on these instruments rather than replace them and fill the remaining gaps as methods develop. This paper proposes assessing the three functional dimensions of agrifood systems through eight analytical parameters, ranging from time horizons and the hazard spectrum to systemic pathways, recoverability and scale (Figure 7).

Act: *Build on the instruments that exist and connect them through the common architecture – generating evidence on losses and damages once, so that it flows into NDCs, NAPs and biennial transparency reports (BTRs).*

Figure 7. Eight analytical parameters across three functional dimensions



Source: Authors own elaboration

Figure 7 illustrates the proposed architecture for comprehensive assessment of loss and damage in agrifood systems: *the three functional dimensions of agrifood systems – agroecosystem functions, economic processes and wellbeing dimensions – read through eight analytical parameters, from time horizons and the hazard spectrum to systemic pathways, recoverability and scale. In the figure, EWE = extreme weather event; SOE = slow onset event; CCA = climate change adaptation; ELD = economic loss and damage; and NEL = non-economic losses.*

12. Assessing non-economic losses requires a plurality of methods, and full monetization is neither feasible nor defensible

Many non-economic impacts have economic implications, and some can be partially monetized. Approaches include costing recovery needs (such as the cost of health interventions), calculating economic consequences (such as production losses following biodiversity and pollination loss), indexing support for non-economic losses to estimated economic impacts (as in top-up cash transfers to beneficiaries), or assigning a value to the non-economic loss itself (as in value-of-statistical-life approaches). However, non-economic losses cannot be reduced to an economic value. Valuation therefore captures only part of the picture, and some approaches raise ethical and equity concerns: for example, value-of-statistical-life methods imply that a life in a wealthy country is "worth" more than a life in a less developed country.

A plural approach is therefore needed: a combination of methods – qualitative, participatory, indicator-based and economic – with community-defined significance at the centre; and indicators for non-economic losses aligned with the Global Goal on Adaptation, so assessments in their own units can be reported and tracked.

Act: *Use a combination of methods to assess non-economic losses rather than relying on full monetization, build on community-defined significance, report each dimension in its own units, and develop indicators aligned with the Global Goal on Adaptation.*

13. The evidence gap closes from both ends: developing what is missing, and making better use of what exists

Addressing these blind spots requires methodological development, and innovation is expanding what can be observed. New tools are extending assessment to slow onset events, non-economic losses and projections: geospatial imagery and remote sensing track gradual change where ground-based data are limited, participatory digital platforms and mobile data collection provide evidence from households and communities, and modelling and machine learning help fill data gaps, process qualitative information and project where losses will occur. These approaches complement rather than replace ground observation and locally generated data. They are promising avenues under active development, rather than established instruments.

Much of the information countries need already exists, but it is scattered. Agricultural statistics, disaster records, food security monitoring and household surveys are held by separate institutions in different formats, and are rarely shared. Alongside new data, countries need standards, data-sharing arrangements, mandates and the capacity to turn existing information into a credible account – closing this part of the gap is as much an institutional challenge as a technical one.

Attribution science is also part of this agenda, but support must not wait for it. Event attribution examines how climate change altered a hazard's probability or intensity. Impact attribution examines how much of an observed impact is climate-driven. This is crucial for identifying non-climate drivers – such as soil management and land use – alongside the climate signal, so that responses can address all causes of observed impacts. Both forms of attribution are advancing rapidly, but remain more difficult for gradual processes, where the "noise" – the non-climate signal – is stronger. Neither attribution nor complete data is a precondition for support from the FRLD and the Santiago network. Action cannot wait for perfect evidence.

Act: *Invest in the evidence agenda from both ends – new methods for slow onset events and non-economic losses, and the standards, data-sharing arrangements and capacity needed to make use of existing data. Do not allow gaps in data or attribution to delay assessment or support.*



A Karamojong pastoralist grazes his cattle below Mount Moroto, Uganda, where communities on both sides of the Kenyan border have revived a tradition of sharing pastures, water and knowledge - from animal health to joint drought response - rebuilding resilience together.

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WHY LOSSES FALL THROUGH: GOVERNANCE BEYOND SILOS

Unaddressed losses persist not only for lack of resources: recognition creates a commitment, but only institutional ownership enables implementation. The trajectory of a loss crosses the mandates of multiple institutions, and where responsibilities are unclear or unconnected, parts of it fall between mandates. Comprehensive risk management requires clear leadership and shared ownership among existing institutions, rather than the creation of new ones.

14. Each part of the loss has an institution; the whole trajectory has none

Responses to losses and damages are often fragmented: a cyclone prompts emergency response, recovery, disaster risk reduction, adaptation and social protection, each governed by separate mandates, metrics and financing. Every institution and community of practice brings essential expertise and serves an important function, but these activities are not connected as part of a coherent response to the loss. Progressive salinization often fails to prompt even a fragmented response: its effects are monitored separately, with no consolidated assessment until the window for anticipation has closed.

Responses to loss and damage are fragmented by institutional as well as technical silos. The same fragmentation is evident at national level: of 45 countries with both a disaster risk reduction (DRR) strategy and a national adaptation plan, only two had a joint implementation plan (UNDRR and REAP, 2025). Aligning frameworks on paper has proved insufficient because institutions continue to operate under separate mandates, incentives and funding arrangements. Financing reinforces this fragmentation: budgets for disaster risk reduction, adaptation and response are managed separately, and funding remains largely reactive. Consequently, loss and damage in agrifood systems is addressed piecemeal, one instrument at a time.

An effective institutional response requires clear leadership on loss and damage, either at the centre of government or in a designated lead ministry. Responsibilities must also be anchored in sectoral ministries and budget lines, with focal points that have the authority to coordinate across them. These arrangements are often grounded in a national policy can establish this ownership and allocate resources for implementation. A shared understanding of risk, a common assessment approach, a coordination mechanism, a clear financing pathway and transparent monitoring connect these responsibilities within one system.

Countries are already developing different institutional arrangements. Vanuatu runs a dedicated loss and damage policy and national working group organized around comprehensive risk management; Kiribati and Tonga plan climate and disaster risk jointly; Nigeria links statutory climate governance with an emerging loss and damage policy framework (Government of Vanuatu, 2025; UNDRR and REAP, 2025). The arrangements differ, but each model depends on clarity of responsibilities and effective coordination within existing institutions, rather than through the creation of a new one. Financing will also draw on several sources: dedicated FRLD resources alongside repurposed climate, humanitarian and development finance. These streams need to complement one another in support of common national priorities, rather than fund disconnected activities.

Act: *Align mandates, metrics and money around the trajectory of loss, not around the instruments that observe fragments of it.*

15. Comprehensive risk management connects mandates without merging institutions

Climate risks span several institutional mandates along the risk management continuum and interact with non-climate hazards. A cyclone triggers landslides, contamination and disease outbreaks; floods drive pest infestations; desertification fuels tensions over water and grazing. Loss and damage responses retain their climate mandate but operate in a multi-hazard context, sharing warning systems, data and delivery channels with disaster risk reduction rather than duplicating them.

Article 8 of the Paris Agreement includes "comprehensive risk assessment and management" among the areas of cooperation and facilitation on loss and damage. Article 8.1 also situates risk reduction within the loss and damage framework, recognizing "the role of sustainable development in reducing the risk of loss and damage".

These connections across the risk cycle and between hazards are supported by the Comprehensive Risk Management (CRM) approach, anchored under the WIM. This approach is not a separate agenda; it provides a framework for connecting existing areas of action – climate action, DRR, humanitarian response, social protection and development – around a shared understanding of risk. Its application in practice, however, has yet to be mainstreamed: its promise needs to be tested through programming, analytics and context-specific governance solutions, supported by advocacy to establish it as an operational norm. National policy development is already advancing: Vanuatu has built its national loss and damage policy on explicitly multi-hazard CRM foundations, with costed loss and damage targets in its NDC, ahead of the international support available to implement it.

Act: *Use CRM to connect loss and damage governance in agrifood systems. Apply it through programmes and document the results to build the evidence needed to establish CRM as standard practice.*



Egypt: desert land irrigated with treated wastewater and planted with seedlings, turning degraded drylands into peri-urban forest.

© FAO/ Noel Guevara



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WHAT WORKS: ONE PORTFOLIO ACROSS THE CONTINUUM

Most components of the response already exist and have demonstrated their value. What is missing is their organization across solution clusters, phases, and hazard types within one system, and the finance that supports them.

16. Adaptation and loss and damage response operate along a continuum of risk and impact management – and need to be programmed through a shared portfolio

Acting across the continuum requires a comprehensive portfolio: six clusters of solutions spanning the three phases of risk and impact management and, both hazard types The proposed clusters, intended to apply across sectors and systems, are climate risk and impact evidence; nature-based solutions; resilient infrastructure; resilient livelihoods and communities; social protection, risk transfer and insurance; and managing climate-related (im)mobility. The clusters are analytical categories that organize the portfolio, rather than discrete sets of interventions (Figure 8).

Each cluster contributes throughout the risk and impact management cycle. For example, a social protection system reduces risk through regular transfers, anticipates impacts by scaling up in response to forecasts and responds when impacts materialize. The same registry can also deliver risk transfer payouts.

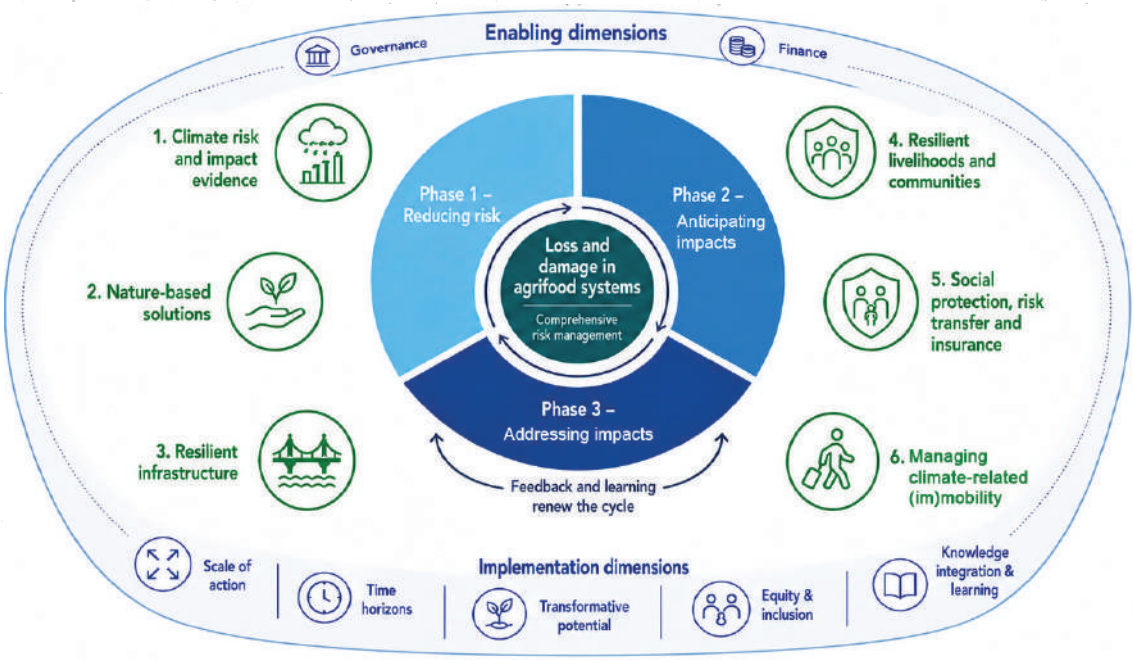
The portfolio's value lies primarily in the connections across clusters and phases, with activities programmed as one system rather than parallel projects. Innovation and refinement continue, but most practices in these clusters are not new – what is needed is to combine them in a systems approach. Evidence also points to the benefits of combining these solutions: nature-based solutions reduce risk while sustaining the livelihoods other clusters protect; managing climate-related mobility depends on social protection and livelihood support at both ends of the journey.

In Sudan, a programme financed by the Green Climate Fund (GCF) shows the connection across clusters: in 138 villages, drought-resistant varieties, village microfinance, crop insurance and water rehabilitation – activities that usually sit with different institutions – are funded and managed through a single programme, with expected results stated in loss and damage terms, including zero lives lost to drought.

In Kenya, the Hunger Safety Net Programme shows the connection across phases: the same programme that delivers regular transfers in normal times ensures that households are registered and bank accounts are opened in advance, so that when a drought threshold is crossed, emergency payments reach them within days.

Act: *Programme the portfolio as one system: coherence across clusters, phases and finance.*

Figure 8. Portfolio of solutions: six clusters across three phases



Source: Authors own elaboration

Figure 8 shows the six solution clusters across the three phases of risk and impact management*. The value of the portfolio lies in the connections across clusters and phases when they are programmed as one system.*

17. The three phases of risk and impact management

Three phases structure the response across the risk and impact continuum. Reducing risk addresses hazards, exposure and vulnerability to limit what can be avoided. Anticipating impacts addresses risk that can no longer be avoided – forecast events or identified viability thresholds – and seeks to minimize harm through anticipatory action (for EWEs) or managed transitions (for SOEs). Addressing impacts is responding to losses and damages that nevertheless materialize, from relief and recovery to support for what cannot be restored.

Loss and damage response has its home in the third phase - but it is not confined there, since it builds on what needs to be put in place in the first two phases. Read as a continuum, the three phases correspond to the objectives of Article 8: reducing risk is how loss and damage is averted, anticipation is how it is minimized, and addressing responds to what materializes. These are objectives, not pillars: the Paris Agreement does not formally assign each objective exclusively to one pillar. Mitigation, adaptation and loss and damage responses all contribute to risk reduction: mitigation by containing the hazard; adaptation by strengthening systems' tolerance and reducing exposure and vulnerability; and loss and damage responses when recovery rebuilds in ways that lower vulnerability to future or ongoing hazards. Adaptation and loss and damage response both drive anticipation through early warning and stronger capacities for anticipatory action and planned transitions. Only the third phase falls to loss and damage response alone, once impacts have materialized. This is the point of the continuum: loss and damage response cannot be left to the end of the cycle – it draws on the first two phases and feeds back into them.

The later the action, the higher the cost. risk reduction at farm level returns around four times its cost – and Anticipatory action ahead of forecastable extremes up to USD 7 per dollar invested yet receives under 1 percent of humanitarian finance. The cost of late action also compounds: loss and damage needs are rising, and losses left unaddressed deepen vulnerability and feed the next round of adaptation needs – a feedback loop in which today's unmet response increases tomorrow's costs.

Act: *Address current loss and damage needs while increasing financial efficiency by reducing risk and anticipating impacts.*

18. For slow onset events, the choice is not between acting early and acting late – it is between managing a transition and administering a loss

Anticipatory action has demonstrated its efficiency for forecastable extreme events. Its counterpart for slow onset events – trend monitoring, threshold-based activation, planned transitions and pre-arranged finance – is still largely absent. Acting before irreversible limits are reached means transforming systems and shifting production while land remains productive, reskilling people before livelihoods become non-viable, and negotiating planned relocation with communities rather than imposing it on them. Such measures need to be sustained over years rather than activated in days. This distinguishes a managed transition that preserves assets, dignity and choice from a response that arrives to administer what has already been lost.

Act: *Build arrangements to anticipate slow onset events – trend monitoring, threshold identification and activation, prepared transitions and pre-arranged finance – before the windows for action close.*



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Boats at Coliumo, Chile, one of four fishing coves where diversification and new technologies are building the adaptive capacity of small-scale fisheries to a changing ocean.

19. Recovery sets the terms of the next event

Recovery from loss and damage provides an opportunity to strengthen resilience to future shocks. Rather than building back what was destroyed, recovery should "build forward" in anticipation of projected climate risks. This may involve reconstructing facilities outside flood-prone areas, rebuilding irrigation systems to account for projected water resources, replanting orchards and forests with varieties better suited to changing temperatures and rainfall, or rebuilding fisheries infrastructure to withstand stronger cyclones and rising sea levels. Speed also matters: faster reconstruction – within ten years – can roughly halve the cumulative gross domestic product losses of a major disaster. Where losses are irreversible, recovery gives way to recognition and sustained support. Financing the response effectively is therefore an investment: the quality of today's response shapes future risk.

Act: *Scale up loss and damage finance – demand far exceeds the FRLD's resources – and treat recovery that builds forward better as an investment in reducing future losses, rather than focusing only on the costs of the last disaster.*

20. Equity is a condition of effectiveness

Support tends to reach those already served by delivery systems rather than those experiencing the heaviest losses: those least covered are often the most exposed, and only 14 percent of adaptation actions in agrifood systems in national adaptation plans are tailored to specific vulnerable groups (Crumpler *et al.*, 2025). Alongside the finance gap is an access gap: communities experiencing the heaviest losses face the greatest barriers to available finance. The FRLD's Governing Instrument recognizes this by providing for direct access, including small grants funding for communities. The challenge is to ensure that these channels reach groups overlooked by other systems.

Equity has both distributional and procedural dimensions: who benefits from support and who shapes it. Communities bearing the heaviest losses are not simply recipients of support: they also drive change through the knowledge, practices and coping systems that underpin resilience. Engaging this knowledge strengthens resilience and is itself at risk of irreversible loss. Resilience must therefore be built with affected communities rather than for them. Community-led design, in line with the Principles for Locally Led Adaptation, turns support into lasting capacity.

Act: *Direct finance and technical support to the most affected. Measure the portfolio by whom it reaches, not only by what it disburses, and work with communities rather than for them.*



Fatou Diene farms oysters in the mangroves near Dionewar Island, Senegal, where women's incomes depend on an ecosystem under pressure from warming and rising seas - restoring the mangroves and diversifying the value chain protects both.

© FAO/Sylvain Cherkaoui

THE CALLS TO ACTION, IN BRIEF

Climate-related losses are concentrated in agrifood systems, where much of the capacity to respond is already in place. The following calls to action identify what is required and who should act: strengthen the evidence base, establish clear governance, converge in practice and finance the response.

To governments and their technical partners: design assessments and responses for both hazard types, using thresholds to trigger action on slow onset events as forecasts do for extreme events. Build the national loss and damage evidence base from existing systems: agricultural statistics, disaster loss databases, food security monitoring, displacement data, and trade and industry statistics for agricultural value chains. Connect these systems through shared standards, data-sharing arrangements and clear mandates so that evidence collected once informs all relevant reporting streams – NDCs, NAPs, BTRs and the new Global Goal on Adaptation indicators, where food and agriculture have a dedicated target.

To the WIM and its expert groups: support the development and testing of food security and livelihood security as proposed dimensions of non-economic loss, and consider the technical proposals set out for further development in the full report.

To governments: establish a clear institutional home for loss and damage within existing national governance, with one accountable lead and several operational owners. Connect them through a common assessment approach, a coordination mechanism, a clear financing pathway and transparent monitoring. Organize the response through comprehensive risk management within existing institutions rather than creating new ones.

To all communities of practice – climate change adaptation, disaster risk reduction, humanitarian action, social protection and development: comprehensive risk management is not a new mandate but a meeting point for the existing ones. Joint practice remains to be built: programmes designed, tested and documented together, with affected communities shaping them.

To countries facing mounting losses: strengthen technical capacity to improve both the evidence on losses and the responses to them. Identify technical gaps and bring them to the Santiago network.

To Parties and the finance community: scale finance for loss and damage in agrifood systems alongside adaptation finance. Countries recognize the need – 54 percent of the adaptation finance needs identified in national adaptation plans relate to agrifood systems – yet only about 20 percent of tracked adaptation finance reaches them (Crumpler *et al.* , 2025). Investing in risk reduction now is the least costly option, yet impacts are rising. These unavoided, rather than unavoidable, impacts still require a response, as demand for the FRLD shows. Scale up both funding streams and connect them: avoid building silos between adaptation and loss and damage finance, and improve coordination across funding streams so that risk reduction and adaptation are financed and integrated with responses to impacts, rather than sequenced behind them.

FAO will continue its engagement on the loss and damage agenda, drawing on its long-standing climate change adaptation work in the Office of Climate Change, Biodiversity and Environment, and its disaster risk reduction, anticipatory action, emergency and resilience work in food crises in the Office of Emergencies and Resilience. This paper brings these strands of work together. The full report underpinning these messages contains the complete evidence base. The forthcoming FAO technical guidelines on loss and damage in agrifood systems, to be completed in 2027, will translate the assessment framework into operational guidance – developed with countries and anchored in the WIM process – as FAO continues to support the countries bearing these losses.

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Agrifood systems are where losses and damages from climate change concentrate - and where much of the harm still escapes every account. Disasters have cost agriculture an estimated USD 3.26 trillion in crop and livestock production losses between 1991 and 2023, 89 percent of it from climate-related extreme events - and these figures capture only a fraction of the loss and damage already happening. Gradual processes that never register as disasters, impacts beyond the farm gate, and the non-economic toll - from narrowing diets to the knowledge and livelihoods lost to a changing climate - remain largely invisible to the systems that decide what gets measured, financed and addressed.

Beyond silos names the problem: in a multi-hazard landscape, climate, disaster risk, humanitarian and development communities each address a fragment of the same loss, under separate mandates, metrics and finance. This brief proposes foundations for connecting them. In twenty key messages, it presents a common understanding of how climate hazards translate into losses and damages in agrifood systems; a complete typology of economic and non-economic losses - proposing food security and livelihood security as new dimensions for testing under the Warsaw International Mechanism; a review of current methodologies and proposed parameters to capture all dimensions of losses and damages; and a comprehensive risk management approach that brings adaptation and loss and damage response into one portfolio of solutions, so that no loss falls between institutional mandates.

Most of today's losses and damages could have been avoided - and most of tomorrow's still can be. Drawing on the full report of the same title, this brief speaks to the technical and policy communities at once: the evidence of what is being lost, and the architecture for acting on it - from reducing risk to addressing the impacts that materialize.

CE2334EN/1/11.26

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