



## **Acting on Loss and Damage: Linking Rural Livelihoods and Climate Mobility in Adaptation and Mitigation Planning**

*This paper looks at climate-induced losses and damages occurring at the intersection of rural livelihoods and human mobility (displacement, planned relocation, migration and immobility), a consequential and growing problem for climate-vulnerable nations and their rural communities. Referencing the newly released guiding framework and toolkit for climate adaptation and mitigation planning developed by the UN Food and Agriculture Organization (FAO) and United Nations University Institute for Environment and Human Security (UNU-EHS), the authors discuss how, with inclusive and transformative planning and action, many of the losses and damages experienced in this nexus can be reduced or avoided.*

*The authors of this article, who developed the guiding framework and toolkit, urge those involved in adaptation and mitigation planning to work with agriculture and rural development actors and affected communities to integrate rural livelihood and human mobility considerations into National Adaptation Plans (NAPs) and Nationally Determined Contributions (NDCs).*

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### **Introduction**

In this short paper, we outline the links between climate change, rural livelihoods and human (im)mobility and present an assessment of relevant research and policy discourses. (Im)mobility, as used in this paper, encompasses various forms of climate-related human mobility, such as labour migration, displacement and planned relocation. It also

includes immobility, recognizing those who cannot or choose not to leave their rural homes even when they experience severe climate risks.

We highlight that, although climate-related mobility and immobility are both a cause and consequence of loss and damage in rural livelihood contexts, the links between rural livelihoods and (im)mobility have not been adequately integrated into most national plans for climate action. Losses and damages are known to occur when climate change adaptation or mitigation are inadequate or when adaptation reaches its limits, and some adverse impacts cannot be avoided (Warner, van der Geest, and Kreft 2013). Losses are usually permanent or irretrievable, such as the loss of lives, a season's crop or cultural heritage, while damages can be repaired or recovered, such as damaged roads or buildings. Different types of losses and damages, frequently categorized as economic and non-economic, are intricately linked through dynamic and evolving connections and cascading impact pathways in the context of rural livelihoods and climate mobility (van Schie et al. 2024).

We argue that many losses and damages experienced at the nexus of climate change, rural livelihoods and human (im)mobility are, however, not inevitable. Countries can better protect their rural and mobile populations and prevent additional losses and damages, or at least minimize their adverse impacts, by explicitly considering the links between climate change, rural livelihoods and human (im)mobility in their adaptation and mitigation plans and policies. This requires confronting the current disconnect between relevant science and the policy landscape, which stands in the way of effectively responding to losses and damages at the intersection of rural livelihoods and climate-related (im)mobility.

To support those involved in the development and implementation of National Adaptation Plans (NAPs) and Nationally Determined Contributions (NDCs) to overcome this disconnect between science and policy, the Food and Agriculture Organization (FAO) of the United Nations and the United Nations University Institute for Environment and Human Security (UNU-EHS) have jointly developed a new [Guiding framework](#) and [Toolkit](#) to facilitate the integration of 'human mobility' into national adaptation and mitigation planning using a 'rural livelihoods' lens. We

designed these resources to promote plans and policies that consider the intricate links between climate change, rural livelihoods and human (im)mobility.

### **Climate-related loss and damage in agrifood systems**

Changes to climate conditions – both slow incremental processes, such as increasing rainfall variability, and sudden onset events and weather extremes, such as tropical cyclones – are threatening agricultural production and food security (FAO 2023a). Agricultural livelihoods, like farming, pastoralism, fishing and forestry, are the mainstay of economic activity in some of the world's most vulnerable regions, which are highly exposed to the impacts of climate change but also face low levels of socio-economic development. For example, in sub-Saharan Africa, which is home to nearly 60 percent of the world's poorest people (Hoogeveen, Mistiaen, and Wu 2024), over 60 percent of the population depends on agriculture for food and income (FAO 2021b).

As climate change impacts accelerate and intensify, losses and damages are escalating, with rural agricultural livelihoods bearing the brunt (FAO 2023a). In the fifteen-year period between 2007 to 2022, agricultural losses represented on average 23 percent of the total disaster impacts across all sectors, and over 65 percent of drought-related losses were incurred in the agriculture sector (FAO 2023a). Additionally, during the last three decades, on average USD 123 billion worth of crops and livestock production has been lost due to disasters each year (FAO 2023a).

This puts rural populations who depend on climate-sensitive livelihoods within agrifood systems on the frontlines of the climate crisis. Agrifood systems include the production, processing, and distribution of food and other agricultural products (FAO 2023b). The very ecosystems and resources that underpin agrifood systems are highly sensitive to fluctuations and changes in climatic and environmental conditions.

While rural populations are among the hardest hit by the climate crisis, their capacity to respond to adverse climate change impacts and related losses and damages is often severely undermined by deep-seated structural and institutional drivers of vulnerability (FAO 2016b). These drivers range from widespread poverty to inequality to limited or

inequitable access to key services and basic rights, such as education, decent employment, training and technical advice on agriculture, financial services and social protection (FAO 2024). Globally, there are an estimated 475 million smallholder farm families (Lowder, Raney, and Skoet 2014), 500 million people are linked to small-scale fisheries (FAO, Duke University, and World Fish 2023), and up to 1.6 billion people are dependent on forests for food and income (UN DESA 2021). This underscores the magnitude of the challenge climate change is posing for vast numbers of rural people, highlighting the urgency of concerted and inclusive climate action in the context of rural livelihoods.

Against this backdrop of climate-induced losses and damages within agrifood systems, human mobility and immobility in their different forms emerge as relevant considerations when it comes to planning and implementing climate action. Climate-related mobility is often framed as a necessary response when livelihoods become untenable, disrupted or completely lost. But mobility is not an option for everyone, while some people may even choose to stay in high-risk places (Adams 2016; Schewel 2020; Zickgraf 2021). And mobility outcomes are not always positive; in some circumstances they may turn out to be erosive or maladaptive (Warner and Afifi 2014; Vinke et al. 2022).

### **The science landscape: climate mobility as a source and symptom of loss and damage**

There is growing recognition in scientific and policy discourse that human (im)mobility is both a source and symptom of climate-related loss and damage. This is evident in calls for the improved integration of mobility considerations into assessments of and interventions aimed at averting, minimizing and addressing loss and damage (IDMC 2024; L&DC and RID 2023). But what do we mean when we say that (im)mobility is a “source” and “symptom” of loss and damage? And what are the implications for climate action? This can be best understood by examining insights from research on human mobility and immobility in the context of rural livelihoods.

### *Human mobility and immobility as symptoms of loss and damage in agrifood systems*

When confronted with the adverse impacts of climate change on rural agricultural livelihoods and food security, rural populations often employ migration as part of their portfolio of adaptation strategies (Jha et al. 2018; Hoffmann et al. 2020). But migration is not always pre-emptive, and some households may resort to distress migration as a desperate measure when a dignified life and adaptation to change in rural places of origin is no longer viable. Distress migration can be triggered by prolonged climate hazards, such as droughts, that cause crops to fail over successive seasons or decimate livestock, gradually eroding livelihoods (Singh et al. 2020; Bharadwaj et al. 2022).

Others may be forcibly displaced in the context of slow-onset disasters and sudden-onset events, which can have a devastating impact on rural lives and livelihoods, causing extensive losses and damages. Sudden-onset events, such as storms, floods, or wildfires, often strike unexpectedly, while slow-onset processes, such as desertification, sea level rise, or biodiversity loss, gradually erode, damage or destroy infrastructure, resources and the ecosystems that underpin agricultural production, thus undermining rural livelihoods linked to agrifood systems.

In 2022 alone, globally, 31.9 million people were forcibly dislocated from their homes worldwide due to weather-related disasters. Floods, storms and droughts were responsible for a large share of these displacements (IDMC 2023). Some groups, such as rural and immobile populations inhabiting marginal environments like flood-, drought - or wildfire-prone areas, or those already living in conditions of displacement, are particularly vulnerable to experiencing (further) forced displacement in the context of sudden-onset climate hazards (Hossain et al. 2022; McConnell et al. 2024). The disproportionate vulnerability of these groups to climate-related displacement is exacerbated by structural factors, which range from endemic poverty to a lack of policy support, that pushed these groups to the ecological margins in the first place, where extreme climatic events are most likely to occur.

Climate-related planned relocation is usually implemented as a pre-emptive measure. It seeks to safeguard the safety and wellbeing of

communities in some of the most climate-vulnerable geographies, where limits to in-situ adaptation are likely to be reached within the short-term, rendering these places uninhabitable. Livelihood security is a key consideration in assessments of habitability (Horton et al. 2021). However, the risk of “inhabitability” as a justification for relocating entire populations is increasingly contested, pointing to tensions between Western and local or Indigenous perspectives on what makes a place habitable (Gini et al. 2024; Sterly et al. 2025; Farbotko and Campbell 2022).

Immobility can be an expression of agency, whereby people decide to stay, including in rural areas, even when they are aware of the risks and hazards that climate change poses for their lives and livelihoods (Adams 2016). Or it can be involuntary when people have the aspiration to move but lack the capability to do so, and acquiescent when people neither have the desire nor the capability to move away from hazard-prone areas (Schewel 2020). Climate-induced losses and damages are but one of many factors that can lead to immobility, for example, when successive droughts erode rural people’s assets and they cannot afford to move (Benveniste, Oppenheimer, and Fleurbaey 2022).

However, it is important to note that mobility and immobility are not static or homogenous phenomena, and it is often not possible to identify who are the voluntary and involuntary immobile in climate affected rural areas. As Caroline Zickgraf (2021) notes, “(Im)mobility is dynamic, not fixed: mobile people may become immobile and immobile populations may become mobile; people may stay by choice but then eventually find themselves trapped.”

#### *Human mobility and immobility as sources of loss and damage in agrifood systems*

The role of ‘migration as adaptation’ has gained traction in policy debates, reflected in calls for enabling migration with dignity. For example, the UN Network on Migration issued a statement ahead of COP29, emphasising that creating safe and regular migration channels and upholding the rights of migrant workers and their families back home are key to making migration part of the solution to climate change (UN Network on Migration 2024).

However, a critical assessment of global evidence on the success of migration as adaptation revealed that the benefits of migration are neither guaranteed nor equitably distributed (Szaboova et al. 2023). The 'migration as adaptation' narrative has also come under criticism for placing the responsibility for responding to climate change impacts, and resulting losses and damages, on vulnerable populations who have not caused these in the first place (van der Geest et al. 2023). These insights have important consequences for the scope of migration as a sustainable and just adaptation strategy in the context of rural livelihoods. They indicate that there may be important limits to migration as adaptation, which can be observed through trade-offs across different social, spatial and temporal scales (Sakdapolrak, Borderon, and Sterly 2024; Szaboova et al. 2023). For example, at different social scales, trade-offs emerge between the potential household-level economic gains and individual costs of migration (Siddiqui et al. 2021; Vinke et al. 2022). Such trade-offs can exacerbate existing losses and damages and lead to new ones in the realm of rural livelihoods. For example, children of migrant parents can miss out on the intergenerational transfer of knowledge and skills related to resource management and agriculture (Thomas et al. 2018). At the same time, children may be required to help out on farms to compensate for the labour of absent family members. This might come at the expense of their education and result in elevated exposure to climatic and environmental hazards through engagement in outdoor manual labour. Migration-related child labour, in turn, undermines children's development and future resilience as well as the resilience and sustainability of rural livelihoods linked to agrifood systems (FAO 2021a).

Rural populations undertaking distress migration are at disproportionate risk of experiencing losses and damages through their mobility because distress migration tends to be unplanned, poorly resourced and, when migrants cross international borders, mostly irregular. This leaves migrants vulnerable to multiple human rights violations, such as trafficking and other forms of abuse and exploitation (Singh et al. 2020; Bharadwaj et al. 2022). Laws, policies and interventions that facilitate safe and dignified migration, guarantee labour rights, facilitate the transfer and investment of remittances and promote the equitable distribution of

migration benefits can help avert and minimize additional losses and damages to livelihoods incurred as a result of migration. And NAPs and NDCs that consider the links between human mobility and rural livelihoods through an intersectional lens and are guided by the principles of gender-responsiveness, inclusion and diversity (FAO and UNU-EHS 2025a) can also help planners, development actors and community members anticipate and respond to livelihood-related losses and damages linked to migration, such as child labour.

Losses and damages at the intersection of human mobility and rural livelihoods are even more readily observable in the context of forced displacement and planned relocation. Climate-induced displacement creates new and reinforces existing social, economic and ecological vulnerabilities (L&DC and RID 2023). Displaced rural populations, including farmers, pastoralists and fishermen, lose access to their lands and vital natural resources, from which they derive their subsistence. This places the continuity of their livelihoods in jeopardy with negative implications for food and income security. Those who end up in cities or refugee and IDP camps, where re-establishing traditional rural livelihoods is less feasible, are some of the worst affected by these challenges. A recent assessment by the Internal Displacement Monitoring Centre (IDMC) found that IDPs often struggle to access sufficient and nutritious food at their destination, prompting them to employ food-based coping strategies, including skipping meals (IDMC 2023). As the [Guiding framework](#) emphasises, NAPs and NDCs can help avert and minimize losses and damages by drawing on existing guidance, such as those developed by Fiji and Vanuatu, that aim to facilitate access to livelihoods following displacement as well as opportunities for livelihood diversification (FAO and UNU-EHS 2025a). And durable solutions approaches could be a valuable framework within NAPs and NDCs for identifying and responding to economic and non-economic losses and damages in the context of climate-related displacement (L&DC and RID 2024).

While planned relocation is usually framed as a pre-emptive adaptation strategy, its outcomes are far from overwhelmingly positive. In fact, it poses a multitude of risks and challenges for those who are relocated (Farbotko and Campbell 2022; Ferris and Bower 2023). One major



concern is the disruption or complete loss of traditional rural livelihoods (Piggott-McKellar et al. 2020). The livelihood impacts of planned relocation can, in turn, have adverse implications for economic, social and cultural domains of wellbeing and human security, thus leading to both economic and non-economic forms of loss and damage. For example, research shows that when a relocated fishing community loses access to their fishing grounds, they may experience reduced levels of well-being and elevated levels of anxiety (Abu et al. 2024). But well-planned and participatory relocation interventions could promote sustainable livelihood pathways, thus averting and minimizing loss and damage resulting from planned relocation (UNU-EHS 2022; Bower et al. 2023). Such pathways may be particularly important for some rural populations, among them Indigenous Peoples, for whom their livelihoods represent much more than just a source of income. As emphasised in the [Toolkit](#), NAPs and NDCs that consider the livelihood implications of planned relocation within their context analyses, their definition of adaptation and mitigation goals and actions, and their analysis and identification of potential risks, can facilitate solutions that help avert or minimize losses and damages for relocated populations (FAO and UNU-EHS 2025b). For example, partial planned relocations, which allow communities to retain access to their ancestral lands or fishing grounds, where possible, are one potential solution that can simultaneously enable the continuity of livelihoods while also protecting people from climate harms (Yee et al. 2024).

Immobile populations, including those who remain in rural areas when family members migrate, can be particularly vulnerable to livelihood-related losses and damages. People who stay in climate-affected rural areas – whether as a matter of choice or the lack thereof – may experience a variety of losses and damages, such as the loss of productive lands due to saline intrusion and coastal erosion, or damage to homes and infrastructure due to frequent flooding (Yee et al. 2022). For those who remain in rural areas in migrant-sending households, losses and damages occur at the junction of mobility, immobility and multiple intersecting social identities (such as age, gender, disability). For example, in patriarchal societies, women whose spouses migrate often endure economic and non-economic losses, because as women, they might face

prohibitions against engaging in some agricultural activities and accessing training and technical advice on agriculture. They may also lose control over key resources, such as land or water, for not being welcome in male-dominated spaces where decisions about the use and management of shared resources are made (Szaboova et al. 2023). And these losses are not necessarily offset by migrant remittances, either because they are insufficient or because the remittances cannot be accessed and used by women. Importantly, financial remittances alone may not be able to replace what is lost, such as in the case of non-economic losses relating to health, cultural heritage, and rural social structures. Yet, such non-economic losses can have paramount implications for the resilience and adaptive capacity of those household members who remain in rural areas. An enabling policy environment can help those affected to respond to losses and damages in the context of immobility and can support people's right to stay and adapt in their rural places of origin (Thornton, Serraglio, and Thornton 2023; Black et al. 2013; Farbotko and McMichael 2019).

These insights from research clearly signal that different forms of mobility and immobility can be both sources and symptoms of loss and damage to rural livelihoods linked to agrifood systems. However, not all of these losses and damages are inevitable, as they can be averted and minimised through inclusive and targeted policies and interventions.

### **The policy landscape: missed opportunities in adaptation and mitigation planning**

Despite the science showing that rural and (im)mobile populations are at disproportionate risk of experiencing climate-related losses and damages through their agricultural livelihoods, existing gaps in climate policy stand in the way of much needed transformational solutions that can address these challenges. These gaps manifest through three areas of insufficiency.

*First, the insufficient integration of (im)mobility within national adaptation and mitigation plans.* While some progress can be detected through the evolving consideration of climate-related (im)mobility in National Adaptation Plans (NAPs) and Nationally Determined Contributions (NDCs) (SLYCAN Trust 2022, 2024), NAPs often stop at merely recognizing that mobility is one potential outcome for climate-

affected populations and fail to elaborate strategies for addressing climate-related mobility (Mombauer, Link, and van der Geest 2023). And immobility is still a real blind spot in both NAPs and NDCs (Link, van der Geest, and Miron 2024; SLYCAN Trust 2024). Its omission, however, means that some of the most vulnerable rural groups, such as the endemic poor, women, people with disabilities and older people, are completely overlooked and least likely to be supported in the context of national climate action.

*Second, insufficient recognition of the intricate links between rural livelihoods and human (im)mobility.* Many NAPs and NDCs tend not to consider (im)mobility and rural livelihoods together, which means that their links are usually not reflected in proposed climate actions. As a result, countries risk missing opportunities for leveraging migration as adaptation and may fail to ensure access to sustainable rural livelihood pathways in the context of climate-related mobility. Not least as a large share of migrants originate from rural areas, which in turn receive around half of global remittances (FAO 2016a; IFAD 2019). And while diasporas can also play a key role in propelling climate action in their rural places of origin, they often face barriers to engaging with national planning processes in their home countries (IOM 2025).

*Third, insufficient attention to socially differentiated experiences of loss and damage among rural and mobile populations.* There is a clear recognition in NAPs and NDCs that agriculture is among the most at-risk sectors when it comes to the adverse impacts of climate change (FAO 2023a). However, a recent report by the Food and Agriculture Organization (FAO) of the United Nations found that only around six percent of the analysed NAPs and NDCs mentioned farmers (FAO 2024). Moreover, the plight and suffering of disproportionately vulnerable groups, such as smallholder farmers, small-scale fishers, nomadic pastoralist, women or Indigenous Peoples is often overlooked. Climate action that fails to consider the diverse ways in which climate change is experienced can exacerbate the social, economic and ecological vulnerabilities of rural and (im)mobile populations and may lead to additional losses and damages.

Addressing these gaps in national climate policy is urgently needed. NAPs and NDCs can be instrumental for mobilising climate finance for action to address losses and damages that occur at the nexus of climate change, rural livelihoods and human (im)mobility. While the challenges of funding climate action are well documented - for instance, the adaptation finance gap (UNEP 2024), the disappointing outcome of COP29 regarding the New Common Quantified Goal on climate finance (WRI 2024), and insufficient pledges for the new Fund for Responding to Loss and Damage relative to the estimated annual value of L&D (Heinrich-Böl-Stiftung and L&DC 2023) - NAPs and NDCs can nonetheless help streamline countries' access to UNFCCC funding mechanisms such as the Global Environment Facility, Green Climate Fund, Adaptation Fund, and the new Fund for Responding to Loss and Damage. NAPs and NDCs can also contribute to national, sub-national and community-level preparedness, and can help align climate planning and actions at all levels of governance (FAO and UNU-EHS 2025a). Therefore, it is crucial that considerations of the links between climate mobility and rural livelihoods are at the forefront of new and revised NAPs and NDCs – for example, the enhanced NDCs 3.0, which are due in 2025.

### **Integrating human mobility through a rural livelihood lens into climate action**

We propose that by explicitly recognizing and articulating the links between rural livelihoods and human mobility in NAPs and NDCs, countries have an opportunity to address avoidable losses and damages that are often borne by some of the most vulnerable rural groups, among them smallholders, pastoralists, refugees, IDPs and involuntary immobile populations. The new [Guiding framework](#) and [Toolkit](#), jointly developed by FAO and UNU-EHS, is designed to support the integration of human mobility through a rural livelihoods' lens into NAPs and NDCs and can help countries:

- address persisting vulnerabilities that are at the root of both mobility and immobility in climate-affected rural areas;
- address social, economic and environmental risks that can lead to additional losses and damages in the context of climate mobility; and

- harness migration and mobility for climate change adaptation and mitigation within agrifood systems.

By expressly focusing on the links between rural livelihoods and climate mobility, the [Guiding framework](#) and [Toolkit](#) complement and extend important existing guidance, including FAO's guidelines on integrating agriculture into NAPs (FAO 2017) and the Taskforce for Displacement's (TFD) technical guide on integrating human mobility and climate change linkages into national climate plans and processes (WIM ExCom 2024).

The [Guiding framework](#) presents an overarching approach, core values and key actions that can help those involved in developing NAPs and NDCs to create the strategies and conditions required for inclusive and transformative climate action. The accompanying [Toolkit](#) is made up of nine tools and offers guiding questions, checklists and examples that can help identify and address relevant connections between climate change, rural livelihoods and human mobility as they relate to country-specific needs and circumstances.

The [Guiding framework](#) and [Toolkit](#) are intended to help close the gap between the fragmented science and policy landscapes, thus supporting transformational climate action that protects rural and (im)mobile populations from suffering additional but avoidable losses and damages at the nexus of climate change, rural livelihoods and human mobility.

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