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Integrating science for simultaneously addressing loss and damage from climate change and strengthening social protection

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Expanding social protection to at-risk communities in climate-vulnerable countries is proposed to become a core pillar of addressing loss and damage associated with climate change. Conceptual advances have been made but remain disconnected from realities: expanding the currently low coverage of social protection in climate-vulnerable countries will require significant additional resources, including from the newly set up Fund for Loss and Damage. Moreover, the evidence base for resource allocation and programme delivery will have to become significantly stronger, and the required integrated science approaches and corresponding assessment tools are yet to be developed.

KEYWORDS

social protection, adaptation, loss and damage, transformative, climate risk

The disconnect between potential and practice

Loss and damage derived from extreme weather events or slow-onset events—such as sea level rise, desertification, or ocean acidification—can permanently alter socio-ecological systems. Affected communities will require support to transition to new livelihoods (O'Neill et al., 2022). Addressing these impacts requires efforts from a range of disciplines, political domains, and economic sectors. Accordingly, they require integrated approaches to social protection that simultaneously address environmental and social drivers and outcomes of loss and damage (Aleksandrova and Costella, 2021; Johnson et al., 2013).

Social protection encompasses a range of policies and programmes that primarily aim to reduce individuals' poverty and vulnerability over the life course. Approaches have evolved over the past decade to combine and expand the key functions of social protection with climate risk management tools, including climate services, such as anticipatory action, early warning systems and social promotion (Tenzing, 2020). Yet, most of these social protection programmes are delivered through humanitarian or civil protection agencies and support relatively short-term protection objectives in the context of climate change. Regardless of whether they are labeled “shock responsive,” “climate responsive,” “transformative” or adaptive, such social assistance programmes are unlikely to be sufficient for individuals' or communities' adaptation to longer-term climate change or to transform livelihoods as new socio-ecological tipping points are reached (Aleksandrova and Costella, 2021).

Whilst these social protection instruments go beyond mere crises-responsive social assistance and show promise to build some dimensions of resilience to climate change, they also have limitations in addressing loss and damage. They are not designed with a deliberate connection to longer-term climate change projections or environmental policies; nor do they take a comprehensive climate risk management approach that considers changing socio-ecological systems, including slow-onset events, and the residual and permanent losses and damages associated with them (Aleksandrova and Costella, 2021). Thus, there exists a disconnect between the conceptual potential of social protection for addressing loss and damage versus what can be realistically expected from the type of social protection support typically promoted by international actors, particularly in the context of emergency response or humanitarian assistance. A lack of rigorous assessment and use of scientific evidence to understand how loss and damage is already being experienced by communities on the ground, and how social protection can be enhanced to respond, further exacerbates the disconnect.

In the remainder of this article, we first distinguish between the different yet overlapping framings of social protection in the context of climate change, and how this plays out in practice. We then identify some of the issues that prevent a closer integration of social protection and climate change adaptation to date and conclude with the role that adequate assessment tools may play in addressing some of the existing gaps.

Concepts and ideologies

Terminology across different social protection and climate change frameworks is often used interchangeably, yet there are key distinctions. These distinctions relate to different timescales and coverage, but also to differences in the social, economic, and moral logic in their underlying ideologies (Tenzing, 2020; Davies et al., 2008). The most prominent framings of social protection in the context of climate change use the terms “adaptive,” “transformative,” “climate-responsive” and “shock-responsive.” “Transformative” social protection frameworks usually align with rights-based approaches and are concerned with longer-term structural changes to address underlying causes of risk. However, they do not necessarily seek to accelerate “transformation” of livelihoods or of land use practices, as the term is often used in the context of climate change. In contrast, “shock-responsive,” “adaptive,” or “climate-responsive” social protection is typically oriented toward addressing immediate risks and views social protection from a coping perspective.

In practice, temporary programming aimed at responding to specific compound shocks - framed as either adaptive, shock responsive, or climate sensitive - may be prioritized over the forward-looking risk assessments and longer-term investments needed for social protection systems to truly build resilience among communities (Devereux et al., 2024). Further, whilst shock-responsive approaches frame the role of social protection as helping people cope with what are perceived to be external stressors, “adaptive” or “transformative” approaches - at least in principle - seek to transform the drivers inherent in social and economic systems, i.e., address the root causes social exclusion and inequality, and thereby of risk creation (Fedele et al., 2019). Adaptive social protection is often also presented as a link between social security and welfare mechanisms on the one hand, and

disaster risk reduction and climate change adaptation on the other (Tenzing, 2020). This framing highlights the overlaps of the different domain’s objectives for vulnerability reduction and resilience, mainly through the provision of social insurance, public works, and livelihoods and risk diversification programmes (Aleksandrova and Costella, 2021; Tenzing, 2020; Devereux et al., 2024).

Recent studies suggest that certain social protection designs can explicitly strengthen communities’ adaptive capacities through livelihood diversification and simultaneously enhance environmental resilience - for example, through community investments and public works programmes that build local infrastructure or support land conservation (e.g., small dams and water reservoirs, or soil protection and enhancement) (Johnson et al., 2013). However, longer term impacts on climate change adaptation outcomes of these projects are yet to be evaluated, and will depend on their quality and maintenance, as well as the extent to which they address the most vulnerable community members’ adaptation needs and preferences.

Ideologies in practice

Differences in the underlying ideology and logic are reflected in the practices of social protection programmes across low-income and climate-vulnerable countries. In high-income countries, social protection, including social assistance, is usually provided within a national welfare framework based on a solidarity principle, with agreed social protection floors that are delivered through a basic set of social security guarantees and are financed by taxes and other social contributions (ILO, 2022). In many low- and middle-income countries, however, such national systems do not exist or are limited in their scope. As a result, social protection is provided by multiple actors as distinct, separate, and even disparate programmes and projects, mostly in the form of social assistance (Tenzing, 2020). These often struggle with limitations of their core sub-systems, including limited coverage and inefficiencies across the delivery chain. Furthermore, shock-responsive social assistance delivered by humanitarian agencies is often employed in a repetitive manner to cope with crises that occur regularly and are increasing in frequency and intensity.

In these situations, broader objectives of social protection, such as promotion and transformation, can be taken over by the logic and practice of humanitarian assistance, at the expense of investments in the adequacy, comprehensiveness, and coverage of the social protection system (Desai et al., 2023). Institutional mandates and existing funding mechanisms, particularly of external humanitarian actors, can reinforce this process to the detriment of supporting broader development objectives. Further, data collected and assessments undertaken as part of humanitarian programmes may often be tailored to informing short-term assistance rather than long-term transformation. At the same time, in the absence of adequate infrastructure and human resources, increasing coverage of existing social assistance can take precedence over expanding the range of instruments and making programmes climate sensitive.

There are notable exceptions with large-scale and relatively mature national programmes that take a long-term perspective to climate resilience and vulnerability reduction, and also mobilize significant domestic resources to support their social protection schemes (Tenzing, 2020): such as in Brazil, Ethiopia, India, South Africa, and

more recently Mauritania. Moreover, several national programmes now include explicit consideration of environmental resilience and climate adaptation, even if they do not specifically address loss and damage from climate change (Desai et al., 2023). In India, the national employment guarantee scheme has evolved to explicitly function as a shock response against weather-related disasters and the impacts of climate change. Mozambique has invested in coordination between disaster risk management and social protection, and in early 2024 the country managed to leverage its social protection system for anticipatory cash payouts in advance of forecasted droughts.

These examples and others highlight that social protection systems have promise in addressing loss and damage but often fall short. One notable limitation is that established practices for the use of climate risk information are lacking. Whilst rainfall data and weather forecasts are used in some social protection systems on an ad-hoc basis, the regular use of climate science and mid- to long risk assessments is not common. Further, vulnerability analysis at the required granularity is often missing, and targeting and planning are usually based on a limited set of market and nutrition indicators and consumption measures, usually combined with some local assessments, but rarely include comprehensive vulnerability mapping. The tools and expertise for effectively combining long-term climate risk assessments with analysis of a changing environmental and social footprint are still not available to many social protection programmes and practitioners.

New tools needed: the science-base for social protection's contribution to addressing loss and damage

To assess loss and damage from climate change, tools to quantify the respective contributions of vulnerability and exposure are particularly needed. These are in their infancy, however, further limiting the role that attribution science can play assessing and addressing loss and damage (King et al., 2023). Current practice indicates that social protection programmes have the potential to reduce and buffer the impacts of loss and damage through a range of tools and methods: by integrating climate risk information tools and climate change projections with the purpose of informing social protection vulnerability analysis, programme design, targeting and area-based approaches; by including climate resilience as an explicit outcome and objective for complementary programmes to cash transfers, such as knowledge and technology transfer to build new skills when new livelihood strategies need to be pursued; by layering climate insurance and financial products and services, including mobile money for displaced populations; and by making climate resilience a concrete objective of existing social protection instruments, creating environmental assets and resilient infrastructure through public works programmes (Desai et al., 2023). A stronger evidence-base can help make the case for investments or programmatic shifts in these directions, but it remains a challenge, especially for assessing benefits to addressing longer term climate change impacts and loss and damage.

Methodological advances in assessing the costs of loss and damage, in attributing specific losses to climate change, and estimating required financing have been made and inform the development of bilateral and multilateral financing instruments for climate action

(O'Neill et al., 2022). Missing still, are methods to estimate – and where programmes exist, assess – the combined impact of systematically addressing loss and damage together with social inequalities and deprivation. The lack of rigorous assessments contributes to the disconnect between ambition and reality, but also further holds back the required shift in ideology, from short-term protection to long-term transformation. The latter becomes particularly important in the context of potential loss and damage associated not just with permanent impacts of climate change but also of mitigation actions, i.e., to contribute to a just transition (McCord, 2023).

The links between adaptation and loss and damage, and between social protection and resilience are commonly acknowledged, but authoritative assessments of how practices (must) change and what success looks like are limited (Thomas, 2024; Van Costella et al., 2023). Furthermore, the current methods underlying attribution science usually link losses to the changing likelihood and intensity of specific sudden-onset climate events and cannot yet fully consider changes in environmental and social resilience resulting from climate change (King et al., 2023). This limitation is despite the recognition that vulnerability usually determines whether an extreme event turns into a disaster, generating loss and damage, and that slow-onset events erode the resilience of social and environmental systems just as much as sudden-onset climate anomalies (Van Costella et al., 2023).

In the absence of standardized indicators and metrics, assessing vulnerability in the context of loss and damage – and the role that climate change plays in changing it – requires time-intensive local data collection and consultations. These needs often exceed the remit of existing studies, and the skill sets of risk modelers (van Oldenborgh et al., 2021). However, since expanding the currently low coverage of social protection in climate-vulnerable countries will require significant additional resources – including from domestic budgets and new multilateral financing instruments, such as the Fund for Loss and Damage recently negotiated under the UNFCCC, which seeks to support countries in managing already materialized losses associated with climate change – the scientific base for resource allocation and programme delivery will have to become significantly stronger. Moreover, national capacities and skills to deliver on these objectives must also be strengthened. Therefore, more authoritative assessments are needed that show whether and how social protection can build longer-term resilience to climate change and can be designed to better meet its theoretical potential for addressing loss and damage for the most vulnerable.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

BD: Conceptualization, Data curation, Investigation, Methodology, Supervision, Writing – original draft, Writing – review & editing. PL: Conceptualization, Funding acquisition, Project administration, Resources, Supervision, Writing – review & editing. SR: Funding acquisition, Project administration, Writing – review &

editing. GM: Conceptualization, Data curation, Investigation, Methodology, Writing – review & editing. CC: Conceptualization, Resources, Writing – review & editing. NB: Investigation, Resources, Writing – review & editing. AS: Investigation, Resources, Writing – review & editing. RC: Conceptualization, Data curation, Investigation, Methodology, Writing – review & editing.

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