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Can social protection tackle emerging risks from climate change, and how? A framework and a critical review

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ABSTRACT

Climate change is transforming the risks individuals and households face, with potentially profound socioeconomic consequences such as increased poverty, inequality, and social instability. Social protection is a policy tool that governments use to help individuals and households manage risks linked to income and livelihoods, and to achieve societal outcomes such as reducing poverty and inequality. Despite its potential as a policy response to climate change, the integration of social protection within the climate policy agenda is currently limited. While the concept of risk is key to both sectors, different understandings of the nature and scope of climate change impacts and their implications, as well as of the adequacy of social protection instruments to address them, contribute to the lack of policy and practice integration.

Our goal is to bridge this cognitive gap by highlighting the potential of social protection as a policy response to climate change. Using a comprehensive climate risk lens, we first explore how climate change drives risks that are within the realm of social protection, and their implications, including likely future trends in demand for social protection. Based on this analysis, we critically review existing arguments for what social protection *can do* and evidence of what it currently *does* to manage risks arising from climate change. From the analysis, a set of reconceptualised roles emerge for social protection to strategically contribute to climate-resilient development.

1. Introduction

Climate change is transforming the risks individuals and households face, with potentially profound socioeconomic consequences such as increased poverty, inequality, and social instability. It has been estimated that climate change could push over 130 million

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more people into extreme poverty by 2030 alone (Hallegatte et al., 2016). The social and economic impacts of climate change are a key concern within the climate change policy agenda (IPCC, 2022).

Social protection policies could play an important role in addressing the socioeconomic implications of climate change, given their long-standing and central role in managing poverty and income risks. Formal social protection can be defined as the transfer of resources to individuals and families implemented or mandated by governments with the goal to help them maintain income in times of adversity or to raise their living standards (Adapted from Midgley, 2022). Social protection includes social assistance, social insurance, and a number of other schemes including employer mandates, universal allowances, active and passive labour market policies, and some tax benefits (ILO, 2022; Midgley, 2022). Social assistance (sometimes also called “social safety nets”) are non-contributory schemes that mainly provide conditional and unconditional poverty transfers. They have significant reach, estimated to cover 2.5 billion people in 120 lower and middle income countries (LMICs), of which 650 million are from the poorest quintile (Banerjee et al., 2022). Social insurance include contributory schemes such as unemployment, disability, maternity benefits, and pensions; the latter reaching 77.5 per cent of people above retirement globally (although major disparities remain) (ILO, 2022). Overall, social protection schemes help individuals and households manage income risks, including – but not exclusively – from large shocks, such as, recently, the large socioeconomic impacts of COVID-19 (Gentilini et al., 2021).

Despite their potential as a policy response to climate change, the integration of social protection policies and schemes within the climate policy agenda around the world, and, importantly, in lower- and middle-income countries (LMICs), is currently limited. Social protection policies rarely integrate climate change concerns strategically while climate policies seldom recognise the potential of social protection in climate change adaptation or mitigation (Berrang-Ford et al., 2021; Tenzing, 2020). In part, this is because the two communities tend to have different perceptions of the nature and scope of climate risks, as well as how and to what extent social protection instruments might be able to address them. On the one hand, scholars and practitioners in the social protection sector have not traditionally seen climate change as being within the realm of social protection or, when they do, as necessitating a different kind of response from social protection systems. On the other hand, scholars and practitioners in the climate community might not fully appreciate the connection between the complex risks brought about by climate change and the role of social protection schemes such as cash transfers or unemployment benefits in addressing them. Our goal is to bridge this cognitive gap by developing a comprehensive, risk-based conceptual understanding of the implications of climate change for social protection, and by systematically reviewing how and to what extent social protection mechanisms can and do currently address those risks, and how they can do so in the future.

The concept of risk is key to the climate and social protection fields. In the climate sector, it “provides a framework for understanding the increasingly severe, interconnected, and often irreversible impacts of climate change on ecosystems, biodiversity, and human systems; [...] and how to best reduce [their] adverse consequences” (IPCC, 2022, p. SPM-4). At the same time, social protection is a form of public action primarily concerned with “levels of [...] risk and deprivation, which are deemed socially unacceptable” within a society (Conway et al., 2000, p. 5 emphasis added). The central goal of social protection is to reduce individual and households’ vulnerability to poverty and deprivation as a way to reduce risk (Barrientos & Hulme, 2008). Thus, there is scope for significant overlaps between the risks arising from climate change and the risks social protection intends to help individuals and households manage. However, existing operational frameworks and guidance on the role of social protection for climate change in LMICs rarely consider in full the nature and scale of climate change risks and their implications, potentially reducing their applicability and outcomes.

Some international development scholars and practitioners have recently argued the importance of social protection for managing the impacts of climate change. In 2008, Davies et al. (2008) introduced the notion of “adaptive social protection”, and argued for the integration of social protection, climate change adaptation, and disaster risk reduction, with social protection having a primary role in addressing the structural causes of poverty as part of these joint efforts. Kuriakose et al. (2013) later built on this framework, proposing that “climate-responsive social protection” could provide ex-ante security against, and ex-post response to climate shocks, as well as support long-term climate change adaptation. Later, others have addressed social protection’s role regarding various climate-related concerns. For instance, scholars and practitioners have explored social protection as a policy response for responding to covariate shocks – some of which originate from climate hazards (O’Brien et al., 2018a, 2018b) –, and facilitating climate change adaptation (Tenzing, 2020), mitigation (Aleksandrova, 2019a; Malerba, 2021), and climate resilience (Agrawal et al., 2019; Aleksandrova, 2019a; Ulrichs et al., 2019).

Despite these conceptual advances, analytical and evidence gaps remain, such as the relatively narrow understanding of the implications of climate change for social protection. A frequent critique is that conceptual framings and practice around social protection and climate change are overwhelmingly focused on the role of social protection for managing shocks and disasters (i.e. extreme events), missing other important climate-related risks such as slow onset events (Aleksandrova & Costella, 2021; Tenzing, 2020). Indeed, key scholarly and practitioner literature on social protection and climate change (Agrawal et al., 2019; Aleksandrova, 2019a; Ulrichs, 2016) does not explore climate change risks systematically or comprehensively. This conceptual gap can translate into policy and programmatic gaps, where the design of social protection schemes is overly focused on one risk (e.g., climate extremes) and overlooks important considerations that relate to other risks, such as slow onset events or risks arising from climate change responses (e.g., transition risks). Moreover, while some authors do explore the role of social protection for climate change more comprehensively – for instance looking at its functions for both adaptation and mitigation (e.g. Malerba, 2021)–, they do not review in detail how different social protection mechanisms can address new and evolving climate risks, and to what extent they are currently doing so, potentially limiting their practical applicability.

In high-income countries (HICs), especially in Europe, some social policy scholars have explored how risks arising from climate change overlap with those traditionally addressed by social policy. While their work primarily concerns policies in advanced economies, their arguments might offer parallels for LMICs, given the shared roots between social protection in LMICs and the larger body

of social policy and the welfare state in Europe (Jawad, 2019). These authors argue not only that climate change is a relevant concern for social policy, but also that it changes the nature of social policy-related risks in direct and indirect ways (Johansson et al., 2016). The risks of climate change are “quantitatively and qualitatively different” from the “traditional” risks which in the past have fostered the emergence of social policy responses (e.g., income-risks emerging from industrial transformation and or globalization) (Gough et al., 2008, p. 327). They propose to “reconceptualise” social policies to better manage risks arising from climate change (Fitzpatrick, 2014; Gough et al., 2008; Johansson et al., 2016).

Climate change is increasingly compelling governments and international development actors to consider social protection as a policy tool for managing climate risks (GCA, 2019; O’Neill et al., 2022; World Bank, 2021). A broader and nuanced understanding of the ways in which climate change not only increases but also changes the nature of risks social protection typically deals with, and importantly, how social protection responds to them, can improve policymaking in this space. For instance, it can more accurately inform financing, targeting, and coverage of social protection now and in the future.

This paper aims to provide a comprehensive overview of the implications of climate change for social protection, and to review current arguments and evidence on social protection’s role to manage them, including how it might need to evolve in order to strategically support climate-resilient development. First, through a high-level and broad analysis of climate risk drivers and their impacts, we develop a framework to understand in what way and to what extent climate change influences the risks that are relevant for social protection in LMICs (Section 2). The framework is based on a limited review of flagship literature on climate risk and climate change, and on social protection, and, given its interdisciplinarity, the section includes explanations of basic concepts from both sectors. Using this framework, we then critically review existing conceptual arguments for what social protection *can do* (its functions) and evidence of what it so far *does* to manage risks arising from climate change (Section 3). This critical review of functions and their evidence is informed by a systematic examination of conceptual and empirical literature on social protection and climate change. Finally, we generate a set of aggregated and improved roles for social protection to strategically contribute to climate-resilient development in the future (Section 4) and then conclude (Section 5).

The paper adds to the body of literature on social protection and climate change by providing both a comprehensive climate risk perspective and a review of the evidence, as well as proposing roles for climate-resilient social protection that are based on that comprehensive analysis. It hopes, in this way, to speak to both the climate and the social protection communities.

2. Conceptual framing: climate change risks and implications for social protection

2.1. Climate risks, vulnerability, and risk drivers

The concept of climate risk has evolved significantly over the last two decades, increasingly recognising vulnerability¹ as a key factor. Initially, climate change was understood primarily as a one-directional increase in climate hazards (IPCC, 2001), with little consideration of the local factors (i.e. exposure and vulnerability) that might influence the scale of impacts (van Aalst et al., 2008). But as climate impacts started to be observed, vulnerability factors gradually became central, with the IPCC first acknowledging differences between regions and groups as relevant in determining impacts in AR4 (IPCC, 2007), and, later, grounding its risk framework equally around hazards, exposure and vulnerability (IPCC, 2012, 2014). In this framing, the concept of vulnerability highlights the role of factors outside the climate system – e.g. factors arising from human systems such as socioeconomic settings – in determining the circumstances where hazards (e.g. extreme or slow onset events) do or do not result in negative impacts (Oppenheimer et al., 2014).

Thus, the impacts of climate change are influenced not only by the climate system, but also by the human system; and are complex and multidimensional (IPCC, 2022)². The *climate system*³ directly affects the patterns and intensity of climate-related hazards (extreme and slow onset events⁴) and because these hazards are increasing and intensifying, these changes will affect risk for individuals and households, regardless of their exposure or vulnerability. At the same time, *human systems* can also drive climate risks, primarily through policies, measures, or practices that modify exposure and vulnerability of people, assets, and natural resources. Within the human system, *human responses to climate change* (e.g. climate change mitigation and adaptation policies and measures) can influence risks both in positive and negative ways, sometimes inadvertently (O’Neill et al., 2022). This is for example the case for measures that on one hand can reduce carbon emissions but on the other lead to job and income losses for people and communities dependent on high-emitting industries, thus increasing vulnerability. Likewise, *human processes that are not climate-specific can also interact with climate change* to increase risk, for instance, policies or measures that increase or decrease individual and household vulnerability and

¹ Vulnerability is understood in this paper as the propensity or predisposition to be adversely affected, including sensitivity or susceptibility to harm and lack of capacity to cope and adapt (IPCC, 2022). Social protection literature sometimes uses the terms “vulnerability” and “vulnerable groups” to refer primarily to categorical factors that produce vulnerability (gender, disability, age, etc.) but this meaning is not used in this paper.

² Ecosystems and their biodiversity can also affect hazards, exposure, and vulnerability (IPCC, 2022), but for the sake of simplicity are not considered in our framework, given that their influence on human vulnerability – the main topic of this paper- is primarily mediated by human systems.

³ Climate systems are defined here as the climate system including the ocean and the cryosphere as physical or chemical systems (O’Neill et al., 2022).

⁴ In the climate change literature, “slow-onset events” refer to the risks and impacts associated with e.g., increasing temperature means, desertification, decreasing precipitation, loss of biodiversity, land and forest degradation, glacial retreat and related impacts, ocean acidification, sea level rise and salinization (IPCC, 2022).

exposure.

A comprehensive risk perspective that recognises vulnerability as a crucial factor in increasing climate risks, and, consequently, the centrality of socioeconomic conditions in determining their impacts, connects climate change directly with social policy solutions such as social protection. Moreover, it posits that all human efforts (policies, practices, norms) play a role in addressing the challenges related to climate change and can support *climate-resilient development* (IPCC, 2022). Since social protection aims to reduce individuals and households' vulnerability to poverty and deprivation, the questions that emerge in a context of climate change are whether, how, and to what extent such policy solution is indeed well-placed to manage these new and evolving risks. To answer this question, in the next two sub-sections we conceptually explore the implications of climate change for the type of risks that social protection aims to manage. In the next section (Section 3), we assess the existing literature on the topic for a more empirically based answer to these same questions.

2.2. Risk and vulnerability in social protection provision

In the social protection literature, key risks include social and life-cycle risks, and income and livelihoods risks. Social risks (mostly used in European social policy) and life-cycle risks (preferred by UN organisations such as the ILO and used in developing contexts) refer to the traditional risks arising from employment in modern societies (ill health, disability, maternity, unemployment, old age, etc.) as well as more recent risks to employment and income arising from globalization and technological change (e.g. obsolete skills, risks unique to single-headed households, etc.) (Choi et al., 2022; ILO, 2022). Other authors broaden the scope of risks and propose that social protection aims to address income-related risks (Holzmann & Jorgensen, 2001), or more broadly, livelihood risks (Sabates-Wheeler & Devereux, 2008).

Overall, there is agreement that social protection is intended to reduce the impacts of risks within the socioeconomic sphere, such as *poverty* and deprivation, as well as *food insecurity*, *erosion of living standards*, *inequality*, and *social exclusion*. In LMICs, social protection primarily focuses on addressing vulnerability to these risks caused by a lack of sufficient income (Holzmann & Jorgensen, 2001). Hence, while social protection can have a number of social, economic, and political functions in a society (Sabates-Wheeler & Devereux, 2008), currently, raising incomes is the main mechanism to achieve social protection's intended outcomes (Midgley, 2022). For that reason, the focus of this paper is on social protection's role in relation to households' incomes – understood here as cash as well as “in-kind” income (food, assets or services) – as a way to influence vulnerability to poverty, food insecurity, and erosion of living standards.

There are two ways in which social protection achieves its income function: *income maintenance* and *income subsidisation* (Midgley, 2022). *Income maintenance* aims to prevent financial hardship, protecting basic levels of consumption, especially in the face of adversity, acting as a “safety net” for households (Midgley, 2022). This function counteracts further increases in vulnerability, for instance, caused by shocks (Barrientos and Hulme, 2008). Typical social protection schemes used for this purpose include unconditional cash transfers as well as unemployment or illness protection. *Income subsidisation* refers to social protection's goal of reducing persistent poverty and generally improving living standards (Midgley, 2022). The goal is to structurally decrease vulnerability – regardless of whether a situation of adversity materialises – by providing income that facilitates investments in human and productive assets and strengthens people's agency (Barrientos and Hulme, 2008). Examples of schemes here include universal family allowances and cash transfers that attach schooling or health conditionalities. Table 1 provides a brief and non-exhaustive overview of these schemes and functions, together with examples, for readers unfamiliar to social protection.

Risks often prioritised by social protection schemes are *idiosyncratic*, i.e. those that affect individuals or households one at a time, such as illness. However, social protection schemes now also more regularly deal with *covariate risks*, i.e. those affecting many people at the same time. For instance, large cash transfers schemes, employment programmes, and other interventions have been put in place to mitigate the impacts of financial crises and climate-related disasters, and most recently, the large-scale socioeconomic impacts of COVID-19. Finally, social protection addresses both *transitory* increases in vulnerability (e.g., temporary loss of employment), and

Table 1
Examples of Social Protection Schemes and Programs and intended function.

Types of Schemes (Examples)	Programmes in LMICs (Examples)	SP Function
Social Assistance: Cash transfers, Public Works Programmes, conditional cash transfers, economic or productive inclusion, etc.	India's MNREGA, a seasonal employment guarantee to help households maintain income during the slack agricultural season.	Income Maintenance
	Brazil's Bolsa Familia, a conditional cash transfer that aims to increase school attendance and health check-ups and decrease poverty and inequality.	Income Subsidisation
Social insurance: Unemployment, disability, and maternity benefits, among others	South Africa's Unemployment Insurance Fund, a mandatory and contributory scheme for formal and informal workers, provides benefits in case of job loss, maternity, or illness, among others (South Africa Revenue Service, n.d.).	Income Maintenance
Labour markets: Wage subsidies, training, labour market activation etc.	North Macedonia's COVID-19 related wage subsidy, which covered the minimum wage per employee at private companies for the period of April to May 2020 (Gentilini et al. 2021).	Income Maintenance
	Argentina's Continuing Education Programme, promotes training of workers as a tool to gain access to decent and quality jobs and improving competitiveness (socialprotection.org, n.d.).	Income Subsidisation

Source: Authors.

Table 2

Climate risk drivers and implications for social protection (Source: Authors, based on [IPCC, 2022](#); [O'Neill et al., 2022](#)).

Risk Driver	Main Hazard	Direct impacts	Socioeconomic impacts	Implications for social protection-related risks		
				Risk Type	Income Impacts	Demand for SP
1. Changes in the climate system	Extreme events (e.g. extreme rainfall, storms, meteorological drought, extreme temperatures)	Food systems: Crop yields Water systems: water scarcity, damages Terrestrial ecosystem: primary production, damaged areas Coastal systems: damages	Food prices; Malnutrition; Loss of lives Water- and vector-borne diseases Infrastructure damage Social conflict; Displacement/migration Within and between country inequality Macroeconomic output	Covariate , multiple households affected at the same time, with some events having very large impacts (e.g., hurricanes with impacts across multiple countries)	HH-level: Transitory decline in income (from e.g., damage to productive assets; lost income from labour, etc.). Possible cascading and cumulative effects which can turn it chronic (e.g., repeated, more intense shocks). Aggregated impacts: Sudden and short-term , poverty and food insecurity. In the long-term , if risk management inadequate: poverty, food insecurity, erosion of living standards, inequality	High certainty of increased risk, even with adaptation, given current trajectory. This will lead to an increase in social protection demand in many contexts and will stretch existing systems if they are not prepared.
	Slow onset events (e.g. sea level rise, increasing temperature means, decreasing precipitation, etc.) and cumulative impacts of consecutive extreme events	Food systems: Crop yields. Water systems: scarcity. Terrestrial ecosystem: net primary production, phenology shifts. Coastal systems: sea level rise. Marine ecosystems: phenology or range shifts	Food prices; Malnutrition Water- and vector-borne diseases Social conflict; Displacement/migration Within and between country inequality Macroeconomic output Unviable livelihoods	Covariate : Typically multiple households affected at the same time (e.g., fishing communities)	HH-level: Mainly Chronic decline in income (e.g., from disappearing income sources from agriculture, fisheries, and forests; displacement; increased incidence of health issues) Aggregated: Gradual and long-term increase in poverty, food insecurity, erosion of living standards, inequality	Increase in SOEs under current trajectory is unavoidable, thus, most likely scenario is an increase in demand for social protection, if vulnerability is not reduced.
2. Responses to Climate Change	Climate change mitigation measures: Physical, economic, financial, technological, social, and other measures. Climate change adaptation measures: Physical, economic, financial, technological, social, and other measures.	Positive impacts on carbon emissions and global warming Impacts on adaptation capacity in targeted sectors Externalities on climate, human and ecological systems	Labour market changes Food & Energy prices Transportation prices Social conflict; Displacement/migration Within and between country inequality Macroeconomic output Unviable livelihoods	Idiosyncratic or localised for some measures (e.g., factory closure). Covariate for others (e.g., energy price increases)	HH-level: Transitory decline in income (e.g., from industry closure or spike in energy prices) and chronic decline in income (e.g., from lack of adequate skills for new industries) Aggregated: Sudden and short-term , poverty and food insecurity. In the long-term , if risk management inadequate: poverty, food insecurity, erosion of living standards, inequality	Responses to climate change have both positive and negative impacts on vulnerability and exposure, direct and indirect. While overall effects on vulnerability are difficult to estimate, demand for SP as a policy solution is likely to increase given that social policy will likely be essential response tool.
3. Non-climate human processes interacting with climate change	Policies, processes & practices that mainly influence exposure and vulnerability (e.g., agriculture, water, or land use policies influence physical environment and natural resources; lack of social or human development measures increase vulnerability)	Positive and negative Sectoral impacts Potential negative externalities on climate, human and ecological systems	Amplify all impacts of natural hazard-related extreme and slow onset events and of climate-change response measures listed above.	Exacerbated Idiosyncratic & Covariate risks depending on sector (e.g., lack of urban planning policies increases exposure of poor households to landslides and other covariate risks; Overexploitation of water resources leads to unviable agricultural livelihoods for some/ individual households)	HH-level: Tend to increase chronic vulnerability to climate change risks (e.g., gender practices that prevent girls from attending schools) Aggregated impacts: Exacerbate poverty, food insecurity, erosion of living standards, inequality over the long term .	These processes are somewhat independent from climate change, and SP already addresses them to some extent, but climate change amplifies risks. Because they interact with climate change, can increase SP demand in some contexts but also possible decrease if development outcomes are achieved.

chronic vulnerability (e.g., chronic lack of income caused by a disability).

2.3. Climate change, risks, and implications for social protection

We now analyse the implications of climate change for social protection risks, based on the risk drivers discussed above (*changes in the climate system; human responses to climate change; and other human processes that interact with climate change*) and the type of impacts and risks that are relevant to social protection. Table 2 provides an overview of this simple but comprehensive conceptual analysis, which overlaps the risk drivers, their relevant impact chain, and the implications for social protection.

Changes in the climate system (Risk driver 1, primarily extreme and slow-onset events) will likely increase the need (and demand) for social protection, by increasing people's vulnerability. There is already agreement that extreme events and their impacts will increase significantly (IPCC, 2022), leading to increased covariate needs as more people lose income, health, employment, livelihoods, and lives due to larger and more frequent shocks. Increases in demand for social protection will be both transitory – i.e. related to a specific shock and limited in time – and more permanent – for instance when people fall into chronic poverty due to repeated shocks.

In addition, gradual processes arising from slow onset events (e.g., sea level rise and increasing average temperatures) are likely to translate into gradual losses (e.g., of livelihoods, employment, or health) increasing vulnerability overall. These losses will also affect many people at the same time (covariate), and could be large scale as well as localised, for example, when small fishing communities are affected by salinization or sea level rise. In the long-term, these impacts can deepen vulnerability by increasing chronic poverty or decreasing living standards and might necessitate constant provision of social protection.

Since hazards are unequivocally increasing, both extreme and slow onset events are likely to lead to large impacts globally (despite differences across regions), even in the face of reductions in vulnerability and exposure (O'Neill et al., 2022). Thus, changes in the climate system are highly likely to increase the need for social protection both to address transitory needs at a covariate level, as well as to address chronic, long term needs for individuals, households, and societies.

Responses to climate change (Risk driver 2), i.e., primarily climate change adaptation and mitigation measures, can have both positive and adverse implications for the risks that social protection is concerned with. For instance, the closure of high-emitting industries, fiscal reforms to influence energy production and consumption, and physical adaptation infrastructure, can reduce emissions (ultimately reducing hazards) as well as reduce exposure, all of which result in lower risk. At the same time, their externalities can negatively impact individuals and households, through changes in labour markets that affect employment at global, national, or local scale, food, housing and transport options and prices (ILO, 2018; Saget et al., 2020a). These externalities can translate into job losses for individuals as well as increased income poverty, among others, but also in new jobs that require different skills. These all represent a type of risk with which social protection already deals (mainly idiosyncratic), and can generate both transitory (e.g. support a worker's transitioning to a new job) and chronic demand (e.g. laid-off workers who lack the skills to be reinserted in the labour market). Because changes to economic structures aimed at managing climate change will likely be large, the impacts of these policies could be large, but the overall effect on vulnerability – whether it increases or decreases – is difficult to predict given their potential for both positive and negative outcomes (Büchs et al., 2011; Saget et al., 2020b). Regardless, it seems likely that social policy solutions will be a necessary part of these responses (ILO, 2018) which would lead to increased attention and demand for social protection solutions in this space.

Finally, non-climate-specific human processes interacting with climate change (Risk driver 3), i.e. policies, measure and practices in other sectors, can contribute to amplifying climate change risks and impacts. Policies (such as those in agriculture, infrastructure, land use, and human and social development) can (unintentionally) increase vulnerability or exposure, also driving risks associated with climate change (Oppenheimer et al., 2014). This driver of risks is not new, and indeed, social protection schemes exist in part to address the vulnerability associated with it, for instance when agricultural systems lead to increased poverty or gender norms increase inequality. However, because this driver now interacts with climate change, risks can become larger, especially as vulnerability is exacerbated (O'Neill et al., 2022). For that reason, we include it here separately, as a key driver that will continue to intensify demand for social protection in a context of climate change. If efforts are not made to reduce vulnerability from these sources (e.g. by achieving SDGs), then the need for social protection will be larger.

3. Literature review: Social protection through a climate risk lens

Based on the previous conceptual analysis of climate risk and its implications for social protection, we now conduct a critical review of the literature on social protection and climate change to assess how, and to what extent, social protection can manage risks arising climate change. In this section, we first discuss the methodology and then the findings for our review.

3.1. Methods

The literature review relied on a qualitative compendium of academic and grey literature, with an important focus on policy-maker and practitioner literature, given its relevance in the social protection sector. We searched through Scopus, Google Scholar, and socialprotection.org (a database widely use in the social protection sector), in that order, using following terms: (“social protection” OR “social assistance” OR “safety net*” OR “cash transfer*” OR “social insurance” OR “public works” OR “welfare state” OR “social security” OR “social policy”) AND “climate change”. We selected literature published between 2008 – the year in which the first

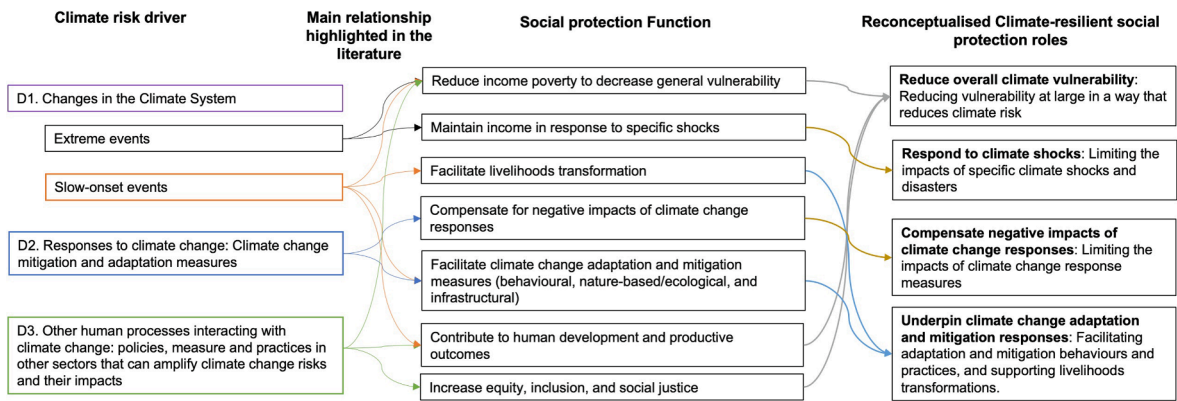


Fig. 1. Mind map of social protection functions for climate risk drivers as highlighted in the existing literature, and distilled climate-resilient social protection roles. Source: Authors.

academic article on “Adaptive Social Protection” was published (Davies et al., 2008) and 2021 – the year we conducted data collection for this research. The resulting collection contained 394 documents including academic articles, flagship reports by international agencies, other reports, and briefs, and include literature from both high and low-and-middle income contexts.

We classified the literature across the following analysis categories: 1) Geographic Region; 2) Risk drivers (Extreme events; Slow-onset events; Blend extreme-slow onset; Impacts of climate responses; Impacts of non-climate processes; All or most drivers; Not climate specific); 3) Social protection focus (Social protection only; Broader social policy; Blend social protection/policy and other sector; not social protection/policy); and 4) Social protection instrument: social assistance, labour market, social insurance, other insurance, services, others. This helped us identify and select literature exclusively or largely focused on social protection in LMICs that was climate-specific (215 documents). From these, we selected the most important or representative documents for in-depth analysis under each risk driver using the following prioritisation criteria: first, academic literature; then, flagship documents by international agencies, and last, when neither was available, other grey literature (briefs, reports, notes).

We then conducted critical content analysis for literature under each risk driver in order to identify the social protection functions that were highlighted in the literature for each driver. These suggested functions from the literature served as the structure for a second round of review to identify additional narratives, and, importantly, empirical evidence of such function. The critical literature review method aims to spur conceptual innovation (Grant & Booth, 2009), and as such - through an inductive process- we ultimately extracted a set of reconceptualised roles that aggregate the previously identified functions into broader pathways through which social protection can contribute to climate resilient development.

Fig. 1 below serves as a “mind map” for our analysis and reconceptualization process, showing on the left column the climate risk drivers that serve as the structure of our analysis, in the middle column the social protection functions that emerge from the literature for each risk driver, and on the right column, the “improved” set of aggregated roles that we propose for social protection to strategically contribute to climate-resilient development. The rest of section 3 presents both the methods and findings of the literature review along each the climate risk driver. Section 4 presents our proposed reconceptualised roles for social protection for climate resilient development.

3.2. Findings on main functions of social protection across risk Driver: Arguments and evidence

Overall, our review confirms that most of the literature on social protection’s role for climate change does not often consider the three different sets of climate risk drivers outlined above at the same time. Hazards arising from changes in the climate system (extreme and slow onset events) are the most commonly discussed drivers of risk in the literature (Aleksandrova, 2019a; Davies et al., 2008; Heltberg et al., 2009; Kuriakose et al., 2013). Within these, literature on extreme events and their impacts in the form of shocks and disasters is by far the most numerous; with slow-onset events much less explored. Only a handful of documents consider at the same time the risks arising from changes in the climate system and from responses to climate change (Costella et al., 2021; Malerba, 2021; Rigolini, 2021). While many authors mention in passing the importance of vulnerability or exposure arising from non-climate-specific human processes, in general these are not explored in-depth.

3.2.1. Changes in the climate system

3.2.1.1. *Extreme events.* From the literature, two functions emerge on how social protection can address the impacts of extreme events on households and individuals: i) reducing income poverty, thus decreasing overall vulnerability (to extreme events); and, ii) maintaining households’ incomes in response to specific climate-related shocks (Béné, 2011; Bowen et al., 2020; FAO & Red Cross Red Crescent Climate

Centre, 2019; Kuriakose et al., 2013; Ulrichs et al., 2019)⁵. The first of these functions refers to the ability of social protection schemes to reduce vulnerability against poverty risks in general, irrespective of an extreme event occurring and of the scheme having the specific objective to manage it. In the literature, this is sometimes called “ex-ante” vulnerability reduction because, it is argued, it occurs before the shock happens (Kuriakose et al., 2013). The second function refers to maintaining income in response to a specific, materialised shock.

Reducing income poverty to decrease overall vulnerability to extreme events

Social protection schemes, it is argued, can help households manage the impacts of climate extremes in general by reducing income poverty, thus overall increasing their capacity to deal with shocks when they occur (Agrawal et al., 2019, 2020; Aleksandrova, 2019a; Davies et al., 2008; Heltberg et al., 2009). There is indeed significant evidence that social protection transfers increase incomes and have positive impact on food consumption, food security, savings, and other welfare indicators and can reduce poverty in general (Bastagli et al., 2019). Albeit more limitedly, evidence also supports the argument that these basic welfare outcomes lead to increased coping capacity against climate extremes. For instance, in Kenya, Ethiopia, and Uganda, cash transfers provided regularly to the chronic poor over a significant period of time (years) help them cope with the negative impacts of climate-related shocks when these happen, irrespective of the programmes’ explicit intention to do so (Ulrichs et al., 2019). In Zambia, the Child Grant Program moderates the negative effect of weather shocks on poor households by providing them with regular transfers over the long term which increase their food security and savings (Asfaw et al., 2017; Lawlor et al., 2015). In Mexico, poverty-targeted, conditional, cash transfers have been linked to better coping capacity against hurricanes (Solórzano, 2016) and to a possible reduction in violence influenced by extreme-heat (Garg et al., 2020), even though those are not explicit goals of the programme.

While the ability of “regular” (i.e., not climate-specific) social protection transfers to help households manage climate shocks by increasing income is encouraging, the evidence remains limited. The examples above are all from social assistance interventions and we did not find evidence from schemes such as social insurance. Even for social assistance programmes, climate-related outcomes of “regular” social protection programs are not commonly evaluated. Cautionary studies from Asia, East Africa, and Latin America provide anecdotal evidence that the ability of “regular” social protection programmes to reduce climate vulnerability at large might be limited, partly due to scheme design not considering specific climate-related needs (e.g. transfers are too low to build shock-coping capacity or not well timed to address climate variables such as seasonality) (Archibald, 2021; Bedran-Martins et al., 2018; Haug & Wold, 2017; Holmes & Costella, 2017; Maione, 2020; World Bank, 2018).

Maintaining households’ incomes in response to specific climate-related shocks

Social protection programmes can help households cope with the immediate impacts of specific extreme events by providing direct income support when shocks occur (Bowen et al., 2020; FAO & Red Cross Red Crescent Climate Centre, 2019; Heltberg et al., 2009; Kuriakose et al., 2013). This function is well established, especially after large-scale social protection responses to the socioeconomic impacts of the COVID-19 pandemic were extensively documented (Bastagli & Lowe, 2021; Gentilini et al., 2021). Many social protection schemes have responded to climate extremes such as floods, storms, and droughts from around the world, sometimes in connection with disaster management and humanitarian operations (Barca et al., 2019; Beazley et al., 2019; Bowen et al., 2020; Gentilini et al., 2018; O’Brien et al., 2018a, 2018b). There is also emerging but limited literature on responses to other climate hazards such as heat extremes (Etoka et al., 2021; Nunfam et al., 2019).

The main instrument for responding to shocks consists of direct income transfers (Kuriakose et al., 2013; O’Brien et al., 2018a, 2018b; Ulrichs et al., 2019). These are often based on social assistance schemes, i.e., non-contributory cash and in-kind transfers, although social insurance and labour schemes (pensions, wage subsidies, etc.) have also been used in response to large covariate shocks (Gentilini et al., 2021). In addition, an important share of the literature suggests that commercial disaster insurance schemes such as micro-insurance can act as a social protection instrument to respond to climate shocks, especially when the premiums are subsidised and/or the main target group for the schemes are small farmers (Carter et al., 2018; Davies et al., 2008; Heltberg et al., 2009). However, others have rightly argued against considering these schemes a form of redistributive social protection, and raised concerns regarding their feasibility in contexts of increasing hazards and high vulnerability (Duus-Otterström & Jagers, 2011; Goldboom, 2013). Finally, while these social protection instruments are normally implemented after a shock has indeed materialised, a significant part of the literature highlights the potential of leveraging social protection for anticipatory action, i.e. transferring income in advance of a shock based on forecast-based mechanisms (; Daron et al., 2020; Weingärtner et al., 2019; Costella et al., 2017). These arrangements, however, have yet to be operationalised at scale (Daron et al., 2020; Tozier de la Poterie et al., 2018).

Much of the literature on the shock response function of social protection is concerned with scheme design and implementation issues. There is a focus on strengthening social protection systems, including scalable, contingency-based arrangements, and institutional linkages with disaster risk management, among other features (Beazley et al., 2021; Bowen et al., 2020; Kardan et al., 2017a,b; O’Brien et al., 2018b; Margolies et al., 2019; O’Brien et al., 2018a). Among these issues, targeting, i.e., identification of social protection schemes’ beneficiaries, is key because there might not always be an overlap between existing beneficiaries of social protection and those affected by a shock (McDowell et al., 2018; Weingärtner et al., 2019; World Bank, 2018). Targeting effectiveness could be improved by including climate risk vulnerability (Asfaw & Lipper, 2016; Dulal & Shah, 2014; Skoufias et al., 2019), as well as by targeting those ‘at-risk’ of poverty (Carter & Janzen, 2018; McDowell et al., 2018). Modelling of targeting mechanisms that include climate variables is also emerging (Baez et al., 2019; Schnitzer, 2016; UNDP/UN Environment, 2018).

⁵ While there are other indirect ways in which social protection could also influence responses to shocks and disasters, for instance by reducing environmental or physical risks, in this section we only consider the way in which social protection’s main instrument, i.e. income transfers, can influence impacts of extreme events on people.

In terms of outcomes, studies from Fiji and the Philippines show that social protection transfers and employment programs in the aftermath of cyclones helped restore consumption and (in the Philippines) improve long-term income opportunities through self-employment (AFD & ILO, 2019b; Mansur et al., 2017). Evidence from Kenya and Brazil also shows that these transfers can reduce hunger, increase food consumption, and be used for medical expenses, overall increasing resilience to drought (European Commission, 2019; Mesquita & Bursztyn, 2017). However, despite the large number of examples, there do not appear to be systematic or large-scale rigorous reviews of evidence on outcomes of these responses.

3.2.1.2. Slow-onset events. Slow-onset events (SOEs) are a gap in the literature on social protection and climate change, most of which “remains centred [...] on managing the impacts of climate-related extremes” (Aleksandrova and Costella, 2021, p. 9). Increased attention to SOEs in social protection literature is key, since these events can have severe implications, especially by undermining ongoing poverty reduction efforts and increasing the demand for social support (Aleksandrova & Costella, 2021; Anshell & Tran, 2020). Moreover, there could be trade-offs between social protection measures in the short term and managing the impacts of gradual SOEs in the long term (Davies et al., 2009). From the relatively small body of literature on social protection and SOEs, two social protection functions emerge, discussed below.

Reducing income poverty to decrease overall vulnerability to slow onset events

First, the arguments for social protection to reduce income poverty and thus decrease overall vulnerability to SOEs are equivalent to those discussed under the similar function in 3.2.1.; i.e., general decreases in poverty translate into overall resilience to slow onset events (Aleksandrova, 2019b). In addition, since long-term income transfers can lead to positive health outcomes, higher education levels, income diversification, and social inclusion, these schemes could increase resilience to SOEs over the long term (Aleksandrova, 2019b). One study investigating livelihood and landscape change over a 30-year period in two communities in Southern Africa shows that social assistance interventions decreased vulnerability to long term changes in average rainfall and other environmental variables (Masunungure & Shackleton, 2018). In general, however, there do not appear to be empirical studies assessing how social protection transfers can manage the impacts of SOEs or how short-term vs long-term trade-offs play out in reality, for instance where social protection schemes might in the short term help maintain livelihoods in locations where they will no longer be viable in the longer term due to trends such as desertification.

Facilitating livelihoods transformation to manage SOEs

Social protection could facilitate approaches to transform productive livelihoods in areas where climate stresses from SOEs are already, or are projected to become, severe constraints to them (Anshell & Tran, 2020; Davies et al., 2009; Tenzing, 2020). These approaches can include building SOE-resilient livelihoods in agricultural, fisheries, and urban contexts through a combination of basic social assistance benefits (e.g., public employment schemes such as Public Works Programmes, cash transfers) and complementary interventions tailored to these contexts, such as climate risk management measures (e.g., index-based agricultural insurance) and pro-poor livelihood development programmes (e.g., extension services, financial services) (Aleksandrova, 2019b). Social protection can also facilitate measures that build “ecological resilience” to SOEs, for instance through public works approaches that combine cash transfers with measures that help reduce environmental degradation (Aleksandrova & Costella, 2021; Norton et al. 2020). In fact, most of the functions attributed to social protection in the SOE-focused literature are similar to those proposed for supporting adaptation (See section 3.3.2.). However, they have not been assessed empirically against SOEs, in part because social protection programs do not incorporate long-term climate risk considerations, and perhaps because SOEs have not yet materialised in detectable ways in most places.

Migration and displacement represent important issues in the discussion of slow-onset events (Schwan & Yu, 2018), as they might prompt a range of mobility responses. Social protection could offset migration by building general resilience through cash transfers and public works (Schwan & Yu, 2018). When migration is the most effective adaptation strategy, it could also facilitate it by subsidizing transaction costs, including at the destination (Johnson & Krishnamurthy, 2010; Schwan & Yu, 2018; Tenzing, 2020). A study from Zambia’s CGP found that cash transfers indeed offset short-distance migration for short-term shocks (extreme heat), but do not facilitate the kind of long-distance mobility that might be needed in a future climate (Mueller et al., 2020). Similarly, Bharadwaj et al. (2021) found that India’s MGNREGA, a large seasonal public employment programme, does not adequately support mobility as a coping strategy because it limits benefits to people who remain in their village and does not support migrants at destination sites. They argue for social protection programmes to consider climate in their design and outcomes (Bharadwaj et al., 2021).

3.2.2. Driver 2: Responses to climate change

Two functions emerge from the literature for social protection in the context of responses to climate change: i) *compensating for their negative impacts*, and ii) *actively facilitating climate change adaptation and mitigation measures* (Györi et al., 2021; ILO & AFD, 2019; Saget et al., 2020b; Solórzano & Cárdenes, 2019). The former is linked to the essential function of social protection in maintaining households’ incomes during hardship, while the latter connects social protection to a range of complementary interventions and objectives. The literature recognises these two as key functions of social protection to support the transition to net-zero carbon economies, particularly to support fairness and redistribution objectives as part of the Just Transition (ILO & AFD, 2019).

3.2.2.1. Compensating for the negative impacts of climate change responses. Fiscal measures aimed at reducing emissions will have income consequences on people, especially poorer groups, and social protection can help offset them and make these reforms more socially acceptable (Feng et al., 2018; Györi et al., 2021; Schaffitzel et al., 2020). For instance, replacing direct fossil fuel subsidies with poverty-targeted social transfers could not only have cost savings for governments, it would also reduce poverty (Feng et al., 2018;

MoE/UNDP, 2015; Schaffitzel et al., 2020). Similarly, recycling revenues from carbon taxes and carbon pricing – which are also likely to impact the poorest more – into poverty-targeted social protection provision would fully offset their negative effects and potentially reduce poverty (Malerba et al., 2021; Vogt-Schilb et al., 2019). In practice, there are few if any examples of these types of reforms with specific climate objectives, and each measure will need to be studied carefully (for instance, for indirect subsidies to public transportation, the cost-benefits are less clear (See Avner et al., 2017)). Finally, assessments of (non-climate) fiscal reforms show that they require strong social protection identification and registration systems to adequately include all possible beneficiaries (AFD & ILO, 2019c; Avner et al., 2017; Gelb & Mukherjee, 2019).

In addition, the closure of polluting industries, the enactment of conservation measures, and even measures that aim to contribute to adaptation (e.g. sea barriers, agricultural transformation) can limit economic opportunities and affect jobs and livelihoods (AFD & ILO, 2019a; Cohen-Rosenthal et al., 1998; Györi et al., 2021; IPCC, 2022). Social assistance measures such as cash transfers can help maintain income, especially for workers without formal employment benefits. Social insurance (unemployment insurance, early retirement, etc.) can guarantee basic income security for formally employed workers (ILO, 2015; Rosemberg, 2015). Active labour market policies, including re-skilling, re-training, and job placements can facilitate the transition of workers from high-emission industries to low-carbon jobs (ILO & AFD, 2019) or from livelihoods affected by adaptation measures such as those that can impact fisheries (Bladon et al., 2022). In an all-encompassing example, China provided job training and placement services for nearly a million workers who lost jobs in state-owned forest enterprises, while also providing rice subsidies and cash transfers to informal workers affected by the ban (AFD & ILO, 2019a; Györi et al., 2021). However, there appears to be limited examples of social protection fulfilling this function, partly because mitigation policies are only recently starting to be put in place. In HICs, social protection has played a similar role in the past century, cushioning the impacts of various industrial and technological transitions affecting labour markets (Gough, 2016) and examples of countries now considering the role of welfare policies in climate change mitigation are increasing (ILO, 2018).

3.2.2.2. Facilitate climate change adaptation and mitigation measures. Social protection could facilitate behavioural, nature-based, and infrastructural adaptation and mitigation responses. Behavioural adaptation at individual or community level include measures such as protecting homes and crops, relocating, and shifting livelihood strategies (O'Neill et al., 2022). The literature on social protection and climate change argues that social protection can provide an income basis to support these measures, while also discussing the need to combine these schemes with complementary interventions (Ulrichs et al., 2019; FAO, & Red Cross Red Crescent Climate Centre, 2019; Weingärtner et al., 2019). For example, social assistance – when combined with economic inclusion, livelihoods, or “plus” approaches (such as livelihoods diversification, financial services, training and skills development, etc.) – can contribute to adaptation behaviours such as climate-smart agriculture, or planned relocation and migration (FAO & Red Cross Red Crescent Climate Centre, 2019; Heltberg et al., 2009; Solórzano & Cárdenes, 2019). Combining social protection with other interventions is key because on one hand extremely poor households cannot benefit from adaptation programmes unless they are first provided with regular and predictable transfers that address key liquidity constraints (Banerjee et al., 2015), while, on the other, social protection transfers alone might be too small to successfully enable households to implement adaptation behaviours (Agrawal et al., 2020; Ulrichs et al., 2019). Evidence from Nicaragua, Ghana, and Bangladesh shows that combining social assistance with asset transfers and/or vocational training, leads to positive outcomes around climate-related adaptation behaviours (Macours et al., 2022; Yiridomoh et al., 2021; Zakir Hossain & Ashiq Ur Rahman, 2018).

In addition, social protection could support nature-based adaptation and physical risk reduction. Cash transfer programmes may have a direct effect on the beneficiaries' land use and conservation behaviours, even without an explicit environmental objective – as shown by evidence from Colombia and Indonesia where deforestation was reduced by increasing incomes (Ferraro & Simorangkir, 2020; Malerba, 2020). Furthermore, schemes that offer employment to poor households through public works approaches that specifically integrate environmental or climate objectives can increase incomes while simultaneously contributing towards nature-based adaptation, disaster risk reduction, or climate change mitigation (Györi et al., 2021; McCord & Paul, 2019; Norton et al., 2020; Solórzano & Cárdenes, 2019). Evidence from a number of flagship public works programs in India, Ethiopia, Mexico, and South Africa shows that these programs can improve outcomes such as land and water availability, afforestation and drought proofing, even contributing to carbon sequestration objectives (Fischer, 2020; Györi et al., 2021; Norton et al., 2020). However, beyond these large, flagship social protection programs, there appears to be significant challenges to successfully implement these approaches to scale and achieve their environmental objectives successfully, in part due to the lack of technical inputs from and coordination with environmental and climate actors (Jordan et al., 2021; Norton et al., 2020; Schwan & Yu, 2018; Solórzano & Cárdenes, 2019).

Similar to PWP, payment for ecosystem services (PES) can sometimes combine incentives to achieve environmental and social objectives such as poverty reduction (Engel, 2019). Brazil's Bolsa Floresta programme offers a monthly payment to low-income households if they commit to zero deforestation and enrol their children in school (Hallegatte et al., 2016). Evidence shows these approaches can have positive environmental impacts (Alix-Garcia et al., 2019; Xie, 2017), as well as increase incomes and food security, and improve livelihoods, social capital, community involvement in natural resources management, and support migration (Adjognon et al., 2019; Alix-Garcia et al., 2019; Liu & Kontoleon, 2018; Tirivayi, 2017). However, balancing environmental and social objectives is the main challenge in using these schemes as part of the social protection toolbox for climate change (Jones et al., 2020; Persson & Alpizar, 2013).

Finally, social protection could support technological and infrastructural adaptation, for instance by incentivising housing, transportation, and infrastructure measures that contribute to adaptation or to emissions reductions. The poor use more of their income in keeping their dwellings warm or cool, and tend to live in less energy-efficient buildings which contribute to higher carbon

emissions (Fitzpatrick, 2014; Gough et al., 2008). Examples from HICs show that social protection can incentivise investments in energy-efficient housing and transportation (Etoka et al., 2021; Gough et al., 2008). Our review did not find examples of these types of interventions in LMICs, although this might be due to the nature of our search terms.

3.2.3. Driver 3: Non-climate human processes interacting with climate change

Non-climate-related policy processes, practices and norms are an important source of exposure and vulnerability, and while we deal with them last because they are less climate-specific than the previous two, they could be significant larger in scope as a driver of risk and vulnerability. Three functions emerge from the literature on ways in which social protection can reduce vulnerability to them.

3.2.3.1. Reduce income poverty, thus decreasing vulnerability in general. As discussed above, social protection is a widely used policy tool to address structural poverty, which can help increase overall resilience to climate change. In the context of non-climate related processes, social protection can address a range of factors that increase vulnerability, including policies, processes & practices in other sectors, such as those in agriculture, urban planning, and others (Aleksandrova, 2019b). This could be an important function to manage climate change impacts, as already discussed in section 3.2.1, although the evidence base is still limited.

3.2.3.2. Contribute to human development and productive outcomes. Social protection can increase access to health and education services and improved agricultural productivity, enhancing the outcomes of policies in those sectors and possibly increasing overall climate resilience (Agrawal et al., 2020; Aleksandrova, 2019a; Aleksandrova & Costella, 2021). There is evidence that cash transfers conditioned on health and education activities increase schooling and health outcomes (Bastagli et al., 2019), and social assistance programmes can positively impact agricultural assets, labour patterns, trade, prices, and wages all of which might translate into reduced vulnerability and increased climate resilience (Aleksandrova, 2019b, 2019a; Johnson et al., 2013). However, our review did not find evidence that these general outcomes lead to more climate resilience per se, or, even that they are not detrimental to it (for instance, as positive outcomes in agriculture might not necessarily have positive environmental impacts).

3.2.3.3. Support increased equity, inclusion, and social justice. Social protection can promote social inclusion of often marginalized populations – women, elderly, indigenous, disabled, class, caste – who tend to face disproportionate impacts of climate change (Bee et al., 2013). Positive outcomes of social assistance interventions for women include increased schooling, participation, and empowerment, which could contribute to climate-related gender outcomes (Aleksandrova et al., 2021). Empirical evidence linked to climate change is scant, and a small number of studies show that climate-oriented social protection programmes do not yet take into account gender dimensions adequately (Jordan et al., 2021; Mersha & van Laerhoven, 2018). We found no studies on climate-related social protection and intersecting inequalities other than gender (disability, age) in LMICs.

In general, social protection is an important element of citizenship and the social contract and can support important societal issues such as equal pay for women (Norton et al., 2020; Razavi et al., 2020). This could contribute to the promotion of more equal and inclusive societies, strengthened citizen engagement, and improved governance, all of which can contribute to a more equitable transition, but we found no studies that review these issues in LMICs.

4. Discussion: A new role for social protection and a research agenda

Our analysis of climate change risks, risk drivers, and implications for social protection in Section 2 (Table 2) illustrates in a simple but comprehensive way how and to what extent climate risks represent a concern for social protection and offers several key insights. First, we find that climate change represents a significant and somewhat novel source of increasing risks that is relevant to social protection. Second, these risks arise not only from the climate system – and not only from extreme events – but from a wide range of complex interactions between climate and human systems, including human responses to climate change as well as the impacts of non-climate policies and processes. While quantifying with certainty the likely increases in demand for social protection that could arise from this changed risk landscape is a difficult exercise, the analysis of the available evidence on potential impacts and current climate trajectories demonstrates that needs – and hence demand – are likely to increase. Though we do not analyse the impacts of these increased demand on social protection systems, these could become significantly stretched, especially in the short term, given both their existing operational challenges (ILO, 2022) and the low level of climate awareness of social protection schemes our review finds.

Both because of an increase in risks (and demand), as well as the somewhat different nature of those risks, social protection will require some degree of reconceptualization. However, our literature review in section 3 shows that, while the academic and operational literature on social protection and climate change is sizable, a comprehensive or detailed analysis of climate risks is lacking, leading to a limited or partial view of the roles of social protection for climate change. This can have implications for policymaking and the practice of social protection.

First, a partial understanding of the drivers of risks associated with climate change can lead to social protection inadvertently creating new sources of risk and vulnerability. This is the case for trade-offs between short- and long-term policy or programme outcomes. For instance, a study found that while Ethiopia's Productive Safety Nets Program (PSNP) helped some households diversify sources of income, some of the new sources were associated with longer-term environmental damage, such as charcoal production (Weldegebriel & Prowse, 2013). Second, misunderstanding the scale and complexity of the interconnected risks that arise from climate change can lead to the assumption that doing more of the same can be a sufficient social protection response. Another study of Ethiopia's PSNP showed that time and labour demands of program participation prevented some households from engaging in

strategies that could be more ‘transformational’ from a climate change perspective such as investing in their own farms and livelihoods diversification (Mersha & van Laerhoven, 2018). Overall, while the evidence is anecdotal and only comes from Ethiopia (in part because the PSNP has been studied far more than any other similar scheme), it points to the importance of considering climate risks broadly, even in the design and evaluation of “regular” social protection policies and programmes.

Based on the various interactions between social protection and climate change identified in the previous section, we propose four roles for “climate-resilient social protection” (Fig. 1, far right column).

- i. **Reduce overall climate vulnerability:** Reducing vulnerability at large in a way that reduces climate risk
- ii. **Respond to climate shocks:** Limiting the impacts of specific climate shocks and disasters
- iii. **Compensate for negative impacts of climate change responses:** Limiting the impacts of climate change response measures
- iv. **Underpin climate change adaptation and mitigation responses:** Facilitating adaptation and mitigation behaviours and practices, and supporting livelihoods transformations

These roles aggregate the functions of social protection for climate change that emerged from our review. Some of them are traditional functions of social protection, but we propose ways in which they can be upgraded to deal with the new challenges from climate change. After introducing the roles, we summarise the main functions contained within them as well as the current state of the evidence and propose a way forward.

4.1. Reducing overall climate vulnerability

Social protection can reduce overall vulnerability to climate change by directly *reducing income poverty*, as well as by *contributing to human development and productive outcomes* such as on education and health and productive livelihoods, and *supporting increased equity, inclusion, and social justice*. This is a core role of social protection and is important all-around for managing climate change now and in the future: not only for worsening climate extremes, but also for managing slow-onset events, managing the externalities of responses to climate change, facilitating adaptation and mitigation, and managing other risks that interact and amplify climate change.

While there is indeed strong evidence of social protection’s ability to improve incomes and support human development and some productive outcomes in LMICs (and less evidence on equity and social justice), social protection interventions do not appear to integrate climate change risks concerns strategically or at scale, which leads to a lack of evaluations and assessments of climate-specific outcomes. Some studies show that, when they do not consider climate risks, social protection schemes could provide insufficient benefits to reduce climate vulnerability or could even inadvertently lead to maladaptive outcomes.

In a context of increasing climate hazards, existing social protection schemes aimed at reducing vulnerability in general will need to evolve to consider climate change as part of their design. This could include more careful considerations of climate vulnerability and climate objectives (and trade-offs) in their design, as well as in the evaluation and assessment of outcomes.

4.2. Responding to climate shocks

Social protection plays an important role in responding to climate-related shocks, preventing or minimising increases in vulnerability from these hardships primarily by maintaining households’ incomes. This role is particularly important in the face of increasing and intensifying extreme events.

Responding to covariate shocks is already a core function of social protection, although intensifying climate change will bring out new challenges such as multi-hazard, compounded, and cascading impacts (Donoghoe et al., 2022). Evidence of adequacy of responses is still limited, and there are significant operational and policy issues that require attention to prepare social protection to meet the scope of these new challenges. Social protection can incorporate climate disaster preparedness and risk mitigation elements to increase preparedness, as part of both its operational and institutional systems. This will need to be accompanied by a more nuanced understanding of the contexts and ways in which social protection is more cost-effective and adequate as a disaster response instrument.

4.3. Compensate for negative impacts of climate change responses

Social protection can *compensate for the negative impacts* of climate change mitigation and adaptation measures, thus minimising or preventing increases in vulnerability from these responses. This role is new and inherently unique to the externalities created by human responses to climate change.

So far, there is little evidence that social protection is being used in this way in LMICs to address climate-related concerns or responses. However, social protection policies have played similar roles before (industrial transformations in HICs, for example), the instruments that are required are not new (cash transfers, social insurance, and labour benefits), and they have been used to some extent for similar purposes in LMICs (e.g., fiscal and labour market reforms). Adapting social protection instruments to climate change – and to the particular political economy of climate policy reforms – will be key. Given the growing interest, especially for countries with higher levels of institutionalization, there is a sizable learning, testing, and evaluation agenda for the future.

4.4. Underpin climate change adaptation and mitigation responses

Social protection can support climate change adaptation and mitigation strategically by *facilitating specific behaviours and practices*,

and by supporting livelihoods transformations. This is an important role not only for climate extremes and slow-onset events, but also for actively underpinning responses to climate change. It includes incentivising behaviours that reduce risk and support adaptation, including in some cases, enabling migration. It also includes combining social protection approaches with natural resources management or infrastructure measures that support ecosystems.

While this role of social protection is unique to climate change – and hence new and important – the evidence shows that social protection transfers alone are unlikely to reach the expected adaptation or mitigation outcomes. Experiences with approaches that combine social protection with other sectoral approaches (e.g., productive inclusion programs, public works programmes) have been difficult to operationalise at scale, and in general have not been systematically or strategically informed by climate change considerations. Overall, it is a role that requires significant cross-fertilisation with environment and climate sectors and might require important investments, including on knowledge and guidance for practitioners.

5. Conclusions

Given the likely consequences of climate change for poverty, inequality, and other socioeconomic outcomes, rethinking the way social protection policies and programmes in LMICs integrate climate change risks will be a crucial task in both the climate- and social policy-making spaces for governments and international development actors. In this paper, we take a comprehensive climate risk lens, shining a light on the central question of vulnerability and social protection's role in reducing it, both to prevent the worse impacts of climate change and to accelerate the transition towards a climate resilient future. It becomes clear that social protection can be a significant response to climate change for its potential to: (i) reduce vulnerability at large; (ii) respond to climate shocks and disasters; (iii) limit the negative impacts of climate change responses; and, (iv) facilitate positive mitigation and adaptation measures.

However, more strategic efforts to carefully design and assess climate resilient social protection approaches at national level in LMICs appear to be needed. Policymakers in the climate change space will need to explore ways in which international or national climate change policies and plans can make use of social protection at scale. Practitioners in the social protection space will be faced with an increasing need to integrate climate concerns in their interventions; and approaching such task with a climate risk lens should allow them to define the operational priorities for developing climate-resilient social protection programs, while thoroughly evaluating their outcomes.

It will be important to develop a research agenda that can help guide researchers, practitioners, and policy makers as they move forward in this area. Key areas for research will include in-depth learning from social protection schemes that already incorporate climate change concerns in LMICs; empirically assessing effectiveness, readiness, and adequacy of social protection as a response to climate change -including the extent to which social protection can reduce climate vulnerability without explicitly integrating climate change considerations-; and developing a deeper understanding on ways in which social protection can help accelerate climate change mitigation and adaptation measures in LMICs. Overall, an important agenda lies ahead for policymakers and practitioners in international development and in national contexts to support climate-resilient social protection.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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