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Climate Centre

Managing climate risks through social protection

Reducing rural poverty and building resilient agricultural livelihoods

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Food and Agriculture Organization of the United Nations
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PHILIPPINES | A farmer wraps up planting a rice variety in one of the provinces susceptible to flooding in Pampanga.

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Abbreviations and acronyms

A2R	Anticipate, Absorb, Reshape
ASEAN	Association of Southeast Asian Nations
CADENA	Componente de Atencion a Desatres Naturales
CCA	Climate change adaptation
CCM	Climate change mitigation
CCT	Conditional cash transfer
CGP	Child Grant Programme, Lesotho
CLP	Chars Livelihoods Programme, Bangladesh
CSA	Climate-smart agriculture
DEVCO	European Commission's Directorate-General for International Cooperation and Development
DFID	United Kingdom's Department for International Development
DRM	Disaster risk management
DRR	Disaster risk reduction
ECHO	European Civil Protection and Humanitarian Aid Operations
ESCAP	Economic and Social Commission for Asia and the Pacific
EWEA	Early Warning Early Action
FAO	Food and Agriculture Organization of the United Nations
FbF	Forecast-based Financing
FSIN	Food Security Information Network
ha	hectares
HSNP	Hunger Safety Net Programme, Kenya
IAASTD	International Assessment of Agricultural Knowledge, Science and Technology for Development
IFAD	International Fund for Agricultural Development
IFRC	International Federation of Red Cross and Red Crescent Societies
ILO	International Labour Organization
INDCs	Intended Nationally Determined Contributions
IPCC	Intergovernmental Panel on Climate Change
KLIP	Kenya Livestock Insurance Programme
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
NDMA	National Disaster Management Authority
OPM	Oxford Policy Management
PROEZA	Poverty, Reforestation, Energy and Climate Change project, Paraguay
PSNP	Productive Safety Net Programme, Ethiopia
SAGARPA	Ministry of Agriculture, Livestock, Rural Development, Fisheries and Food
SDGs	Sustainable Development Goals
UNC	University of North Carolina
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations Children's Fund
UNDRR	United Nations Office for Disaster Risk Reduction
WFP	World Food Programme
WWP	World Without Poverty

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GUATEMALA | A child finishes her tasks before the school feeding in Chiquimula. The food that students receive derives from family farming and is prepared by volunteer mothers.

Introduction

Climate change, variability and risk pose significant challenges to the concept of accelerating results around poverty eradication and sustainable development. In this context, the 2030 Agenda for Sustainable Development has prioritized the need to promote and develop integrated climate risk management approaches that tackle the underlying causes of climate vulnerability, while also addressing drivers of chronic poverty and food insecurity. An integrated approach would have the potential to mitigate negative impacts as well as to enhance the capacity of households to adapt to climate risk and change, in both the short and long term.

This paper highlights one key component of such approaches: the contribution of social protection to climate risk management, including disaster risk reduction and management (DRR/M) as well as climate change adaptation and mitigation (CCA/M).

Section 1 discusses how climate change is accelerating the frequency and intensity of extreme climate events, which have severe impacts on people's lives and livelihoods – especially those whose livelihoods depend heavily on agriculture and natural resources. Section 2 describes the benefits of managing climate risks through social protection by assessing its key contributions: reducing vulnerability and negative coping strategies; providing a stepping stone towards climate-resilient livelihoods; and supporting inclusive disaster preparedness and response. The final section guides the reader through the challenges of promoting more coherent approaches to social protection, DRR/M and CCA/M.

INDIA | Survivors return to the site of the tsunami to assess the damage and loss and possibly salvage anything that wasn't swept away in Nagapattinum, Tamil Nadu

©FAO/Ami Vitale

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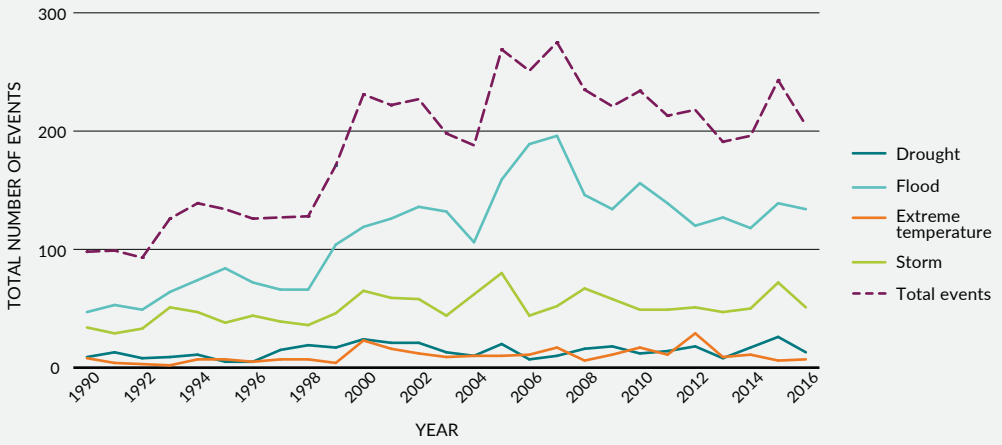
Climate risks and vulnerability

1.1 The climate challenge: vulnerability to poverty, food insecurity and climate risk

Climate change poses a major challenge to achieving Agenda 2030, particularly efforts around eliminating poverty and reaching zero hunger. According to the Intergovernmental Panel on Climate Change (IPCC), climate change will have a direct impact on many aspects of sustainable development, including poverty eradication and reduction of inequality, and therefore will be detrimental to the achievement of certain sustainable development goals (SDGs), such as those that relate to hunger, health, poverty, water and sanitation, cities and ecosystems (SDGs 1, 2, 3, 6, 11, 14 and 15). We are already seeing some of these impacts, as shown by the latest figures on hunger and malnutrition in the State of Food Security and Nutrition Report (FAO *et al.*, 2019). The report clearly revealed that global hunger appears to be on the rise, with undernourishment currently affecting just under 11 percent of the global population (821.6 million people). Climate variability and extremes are one of the key drivers of the recent rise in hunger, as analysed by the previous edition of the SOFI report (FAO *et al.*, 2018). Moreover, it is estimated that current climate trends will double humanitarian needs by 2030, significantly taxing an already strained humanitarian system (FSIN, 2017).

The reasons are twofold. Climate change is accelerating the frequency and intensity of extreme climate events, leading to an increase of disasters, which have severe impacts on people's lives and livelihoods (Hallegatte *et al.*, 2016). Climate-related shocks are already major drivers of food security crises, particularly in contexts of chronic vulnerability to poverty and fragility, and have already contributed to reversing decade-long trends of steady declines in undernourishment (FSIN, 2017). For instance, climate-related shocks – particularly El Niño-driven droughts – led to high levels of food

Figure 1. Total number of climate-related disasters, 1990-2016



The number of climate variations and extreme events, including extreme heat, drought, floods and storms, has doubled since early 1990s, with an average of 213 events occurring every year during the period of 1990–2016.

Source: FAO, et al., 2018, p.39.

insecurity in countries such as Ethiopia, Lesotho, Malawi, Mozambique and Zimbabwe in 2015 and 2016. Furthermore, while some longer-term impacts of climate change may not be apparent for many decades (e.g. changes in mean annual rainfall), observed changes, such as increases in temperature, are already significant and important, especially to those involved in agriculture (Porter *et al.,* 2014; Tadross *et al.,* 2009). These impacts, further exacerbated by human-induced environmental degradation (i.e. land degradation, overfishing and deforestation) are undermining natural resources and increasing exposure to hazards, with long-term impacts on food systems and agricultural livelihoods. Indeed, poor and vulnerable households whose livelihoods are based on agriculture[1] need, but rarely have the resources, to change or adapt their production systems to meet the challenges posed by climate and environmental changes.

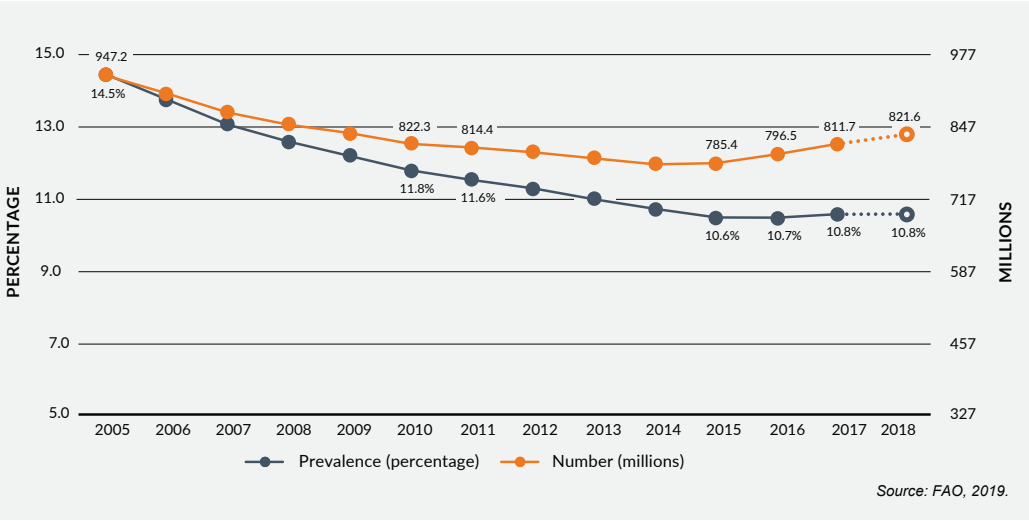
Additionally, climate change, coupled with institutional and socio-economic fragility, is expected to increase the risk of violence and conflict by acting as a stressor driving at least two critical factors: forced displacement and resource scarcity. This is in a context where 80 percent of the humanitarian crises with an interagency humanitarian appeal are already conflict-related.

The implications for food security are several. In 2017, for the third year in a row, there was a rise in world hunger. The absolute number of undernourished people – i.e. people facing chronic food deprivation – increased to nearly 821 million in 2017, from around 804 million in 2016. This is the same level as almost a decade ago (FAO *et al.*, 2018). Climate change will increasingly affect the availability, accessibility, utilization and stability of food (FAO, 2016c). Crop yields are expected to decrease by 10-25 percent or more by 2050,[2] and by 2055 fish species might see reductions of up to 70 percent as a result of climate-induced species redistribution (Challinor

[1] Agriculture sectors include crops, livestock, fisheries and aquaculture and forestry.

[2] The impact of climate change will differ across types of crops and geographical locations. Studies state, for instance, with "medium confidence," that climate trends will affect the production of wheat and maize globally, whereas crop production in high-latitude regions will benefit (see Porter *et al.*, 2014, for a more detailed discussion).

Figure 2. Number of undernourished people in the world in 2017

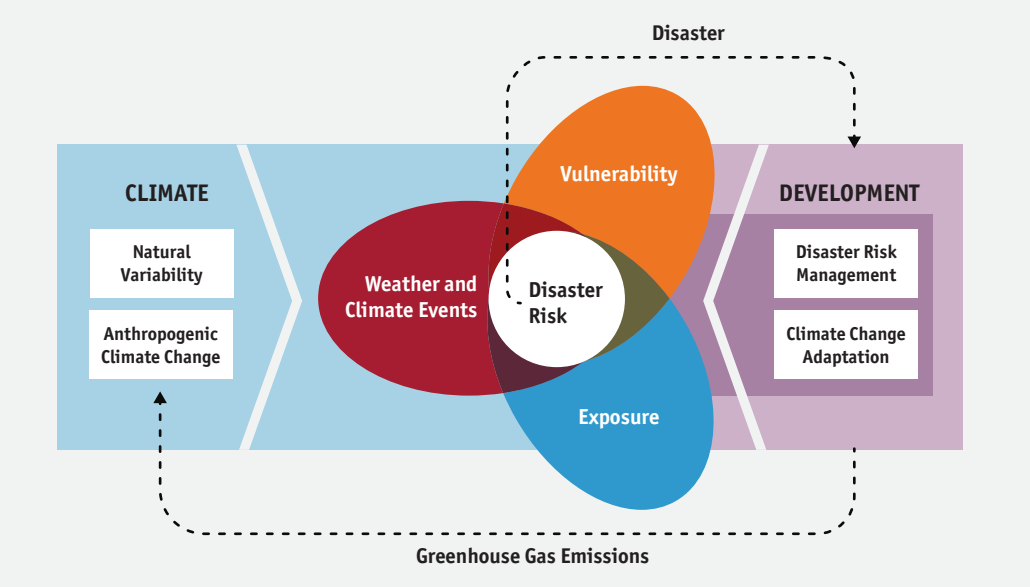


et al., 2007; Sarr, 2012; IPCC, cited in FAO, 2016d). This will not only affect food availability, but also the ability of many people, especially the poor, to access food, due to market disruptions, food price increases and volatility of agriculture-dependent incomes (FAO, 2016b).

Decreased quality of drinking water and increased prevalence of water-borne diseases, among other factors, will further impact the utilization of food and the nutritional well-being of vulnerable groups. Changing rainfall patterns and a changing seasonal magnitude, timing and duration will negatively affect agricultural production for rainfed small-scale farming and lead to increasingly recurring cyclic and seasonal food insecurity (Feng, Porporato and Rodriguez-Iturbe, 2013). Recurring seasonal food insecurity, which will be exacerbated by climate change, will also increase undernourishment, particularly for women and children who are unable to meet their required nutritional intake during critical phases, with long-term consequences for human capital and economic growth (Wijesinha-Bettoni *et al.*, 2013).

Increases in climate variability and the frequency of extreme events will also affect the stability of food systems and increase the volatility of incomes of smallholder farmers (FAO, 2016c). Ultimately, this has consequences for poverty and vulnerability to poverty. Not only are the poor and vulnerable more affected by climate-related risks, it is also expected that climate change will increase the number of people living in poverty. According to the recent Special Report from the IPCC on the impacts of global warming of 1.5°C above pre-industrial levels, climate risk is expected to be a poverty multiplier that makes poor people poorer and increases the poverty head count (IPCC, 2018; Hallegatte *et al.*, 2016; Hallegatte and Rozenberg, 2017). Poor people could be heavily affected even when impacts on the rest of population are limited. Climate change could contribute to forcing more than 100 million people into extreme poverty by 2030, with the numbers attributed to climate change alone amounting to 3-16 million, mostly through impacts on agriculture and food prices (Hallegatte *et al.*, 2016; Hallegatte and Rozenberg, 2017). Unmitigated warming could reshape the global economy later in the century by reducing average global incomes and widening global income inequality (Burke *et al.*, 2015). The most severe impacts are projected for sub-Saharan Africa and Southeast Asia (IPCC, 2018).

Figure 3. Risk as a product of the physical climate system, exposure and vulnerability



Source: IPCC, 2012.

Understanding climate risks as a combination of hazards, exposure and vulnerability helps to highlight the linkages between climate change and poverty. It is now accepted that the interaction of a hazard, the exposure to this hazard and the vulnerability of societies and ecosystems defines the level of risk (see Oppenheimer *et al.*, 2014; Cardona *et al.*, 2012; and IPCC, 2012, for a review of approaches).

The poor, especially those living in rural areas whose livelihoods depend heavily on natural resources, are disproportionately affected by climate risks (e.g. river floods, lack of or excess rainfall, extreme changes in temperature) due to multiple reasons. These include their greater likelihood of living in high-risk geographical locations (highly exposed), as well as their high vulnerability to, and limited capacity to cope with, climate hazards due to low incomes, lack of savings, weaker social networks, low asset bases and heavy reliance on agriculture and natural resources. Consequently, the poor experience relatively higher income and asset losses following disasters, as well as higher mortality rates in disaster-affected areas, compared with the non-poor[3] (ESCAP, 2017; Hallegatte *et al.*, 2016; Winsemius *et al.*, 2015). Additionally, there is a large body of evidence regarding the disproportionate impact of climate shocks on particularly marginalized groups, such as women, minority ethnic groups, migrants or people with disabilities (Cardona *et al.*, 2012).

In 2017, 80 percent of the world's extreme poor lived in rural areas; 64 percent worked in agriculture and most of them relied on subsistence farming as their main source of income (De La O Campos *et al.*, 2018; World Bank, 2016). In order to develop sustainable strategies to escape poverty, the provision of support to access more sustainable and climate-resilient agricultural strategies or to diversify income-generating activities must go hand

[3] For instance, examining the ex post impacts of Hurricane Mitch, which struck Nicaragua in 1998, Jakobsen (2012) found that poorer households faced a larger absolute decline in productive assets immediately after the storm. Furthermore, among those households affected by Mitch, the share of asset-poor households (those who own less than a given asset-poverty line) increased from 75 percent in 1998 to 80 percent in 2001.

in hand with interventions that reduce vulnerability to climate-related risks. However, high levels of risk aversion among smallholders have led to an "adaptation" deficit, where investments in more innovative, climate-smart technologies, as well as agro-ecological and conservation agriculture practices have been neglected due to limited access to capital and protection from risks (World Bank, 2010; FAO, 2011). For the rural poor, the investment of scarce resources to transition to new production techniques can have detrimental impacts if expected returns fail to materialize. Climate variability increases uncertainty, and with it risk aversion, which becomes a disincentive to invest in new, yet potentially higher-return, climate-smart agricultural practices (e.g. conservation agriculture, stress-adapted crop germplasms) (Rosenzweig and Binswanger, 1993, cited in Prifti *et al.*, 2019). Indeed, when people do not have the proper tools to manage risk, they tend to spread risk over a large array of lower-risk activities and to reduce their investments, thereby reducing returns to assets and income (Hallegatte *et al.*, 2016).

DRR and CCA/M strategies that focus on technical solutions to reduce the impacts of climate hazards on agricultural livelihoods might not be sufficient or even fail to achieve desired outcomes if they are not cognizant of the implications that immediate food needs and chronic poverty have on household behaviour (Hansen *et al.*, 2018).[4] Understanding the importance of addressing the socio-economic drivers of environmental vulnerability calls for a wider developmental approach to climate risk management strategies that integrate objectives for long-term poverty reduction with CCA/M and DRR objectives (Oppenheimer *et al.*, 2014; Eriksen *et al.*, 2011).

Given that limited human capital and precarious income sources inhibit the poor from moving into more climate-resilient livelihoods, social policies – i.e. universal access to health, education and social protection – could significantly reduce the long-term impacts of climate change on poverty (Rozenberg and Hallegatte, 2015). At the policy level, a combination of different risk reduction strategies is required, which support different groups of the population depending on their vulnerability profile and the type of climate hazard they are exposed to.

1.2 Climate change, agriculture and poverty

The relationship between climate change and agriculture is complex and has important consequences for poverty and food insecurity. On the one hand, the agriculture sectors are uniquely affected by climate change due to their reliance on natural resources and weather conditions to achieve productive outcomes. Changes in temperature and rainfall patterns and the occurrence of extreme weather events, among others, have direct repercussions on the productivity and sustainability of these sectors. On the other hand, agriculture is an important driver of climate change, as it is the second largest economic sector contributing to anthropogenic greenhouse gas emissions (21% in 2010, preceded only by the energy sector which contributed 47%) (FAO, 2016a), mainly through deforestation, livestock production, soil and nutrient management (Smith *et al.*, 2014). Indeed, it is widely recognized that the agriculture sector needs to reduce greenhouse gas emissions, as reflected in many Intended Nationally Determined Contributions (INDCs) (FAO, 2016b).

While it is difficult to establish what proportion of these emissions stem from activities of poor smallholder farmers, rough estimates show that smallholders might contribute 5 percent of total global greenhouse gas emissions (including on-farm production and land use change), with the majority (71%) coming from just three countries – China, India and Indonesia (Vermeulen and Wollenberg, 2017). Despite the small size of this contribution compared with industrial agricultural systems, it is often considered that early adoption of climate-smart practices among smallholders can provide an opportunity to tackle greenhouse gas

[4] For comprehensive discussion on the Poverty and Climate Change Nexus, with a specific focus on coastal communities, please refer to FAO (forthcoming): A framework for linking responses to rural poverty and climate change with a focus on coastal communities, coastal areas and Small Island Developing States.

LEBANON | A farmer milks a cow received through an FAO livestock project in Aitit village.

emissions. By adopting climate risk-sensitive and sustainable agricultural practices that are tailored to the local context, smallholders can increase production and income gains, while simultaneously making their livelihoods more resilient to extreme events and long-term effects of climate change (FAO, 2017e). Given that two-thirds of the world's extreme poor rely on agriculture for their livelihoods and food security, climate risk-sensitive and sustainable agricultural practices should be considered an integral component of poverty reduction strategies.

Indeed, climate risk-sensitive and sustainable agriculture is a fundamental part of the solution to mitigate greenhouse gas emissions and promote adaptation to a changing climate, especially for smallholder farmers. More resilient farmers, foresters, herders and fishers can deliver transformative change that enhances their livelihoods and shields them from the negative impacts of climate change. Within this context,the Food and Agriculture Organization of the United Nations (FAO) is promoting a global transformation to sustainable agriculture, while helping poor farmers and national governments to set up climate-resilient systems to feed the world, now and in the future (FAO, 2017e).

However, while sustainable agriculture may both reduce vulnerability to climate shocks and increase the production capacity and income of smallholders, shifting into low-emission agricultural practices can create disproportionately high risks and costs for the rural poor, whose livelihoods are highly dependent on agriculture, especially in the transition period. Studies have discussed how programmes that aim to reduce poverty with the co-benefit of mitigation need to be accompanied by substantial investments to provide risk management mechanisms and safety nets that reduce the risks of adopting new technologies (Vermeulen and Wollenberg, 2017).

Box 1. Small-scale fishing, fish-farming and forest-dependent communities

While focus is mostly placed on crops and livestock, agriculture sectors also include aquaculture, fisheries and forestry. Poor households whose livelihoods depend on these subsectors are often highly exposed to climate risks.

Small-scale fishing and fish-farming communities in developing countries are often marginalized and at the bottom of the socio-economic ladder. Around 90 percent of those employed in the fishing and fish farming sector are engaged in small-scale activities, including processing and marketing, where poverty is most prevalent (Macfadyen and Allison, 2007, cited in FAO, 2018b). Small-scale fisheries and aquaculture are particularly vulnerable to climate change, due to their geographical locations and poverty status. Located at waterfronts, fishing and fish-farming communities are exposed to climate-related extreme events and natural hazards, such as coastal erosion, cyclones, floods, hurricanes, ocean acidification and sea-level rise. In addition, climate change impacts are harming human and natural systems, including damaging infrastructure, disturbing fish stocks, eroding natural resources and endangering species and ecosystems (FAO, 2018b).

Fisheries and aquaculture are already facing the effects of ocean warming and acidification. These risks are projected to increase at 1.5°C of global warming and will impact key organisms such as fin fish and bivalves (e.g. oysters), especially at low latitudes. Small-scale fisheries in tropical regions, which are very dependent on habitat provided by coastal ecosystems such as coral reefs, mangroves, seagrass and kelp forests, are expected to face growing risks at 1.5°C of warming because of loss of habitat. Risks of impacts and decreasing food security are projected to become greater as global warming exceeds 1.5°C and both ocean warming and acidification increase, with substantial losses likely for coastal livelihoods and industries.

Similarly, climate change poses enormous challenges for forests and people. Forests support the livelihoods of more than 1 billion people living in poverty worldwide and provide paid employment for over 100 million people. They are home to more than 80 percent of the world's terrestrial biodiversity and help protect watersheds that are critical for the supply of clean water to most of humanity (FAO, 2017c).

Climate change could affect the growth of trees, the frequency and intensity of fires and the incidence of forest pests. It could also increase the damage caused to forests by extreme weather conditions such as droughts, floods and storms. Forestry interventions can play a crucial role in the mitigation of, and long-term rehabilitation following disasters, the frequency of which could increase in the face of climate change. For example: re-establishing forest cover where it has been cleared will increase protection against future floods; re-establishing or increasing forest cover on steep lands that have been affected by landslides will reduce the risk of future landslides; and coastal forests, such as mangroves, can help protect coastal inhabitants, infrastructure and productive land from storm surges (FAO, 2017c).

MEXICO | Farmers working on an irrigation canal in a soya field in the Carrizo Valley, Sinaloa State in the context of an irrigation project that has turned a desert into fertile land.

Within this context, access to social protection programmes can provide diverse incentives for poor smallholder family farmers to manage natural resources more sustainably, while complementary climate-smart agricultural interventions can build smallholders' resilience to shocks and stresses over the long term. However, the way these programmes are designed and adapted is key to yielding the intended results. For instance, the circumstances in small-scale fishing and fish-farming communities will be extremely different from those of pastoralist groups or forest-dependent communities. The rural poor, particularly the extreme poor, are often geographically concentrated in marginal areas (e.g. high-mountain, pastoral, arid, rainforest jungle, small islands) with low population densities, poor agro-ecological endowments, limited access to markets or extension services and few employment opportunities. Therefore, poverty reduction and risk management strategies need to consider the specific context and needs of the different subgroups of rural poor (De la O Campos *et al.*, 2018).

1.3 The need for a coherent approach

As discussed in the previous sections, the challenges posed by increasing climate risks to achieving sustainable development and poverty reduction are significant. To effectively reduce them an integrated, cross-sectoral approach able to tackle the climate challenge and promote sustainable development and poverty reduction is needed.

The SDGs 1, 2 and 13 present a vision for integrated approaches to eradicate poverty, hunger and malnutrition in the context of climate change, through sustainable and climate-resilient agriculture. Indeed, to accelerate progress towards zero hunger, poverty reduction and sustainable climate risk management, it is necessary to recognize the critical linkages between social exclusion, poverty, and vulnerability. This is key to put in place the required mechanisms that address the economic and social barriers to the uptake of agricultural practices that ensure productive livelihoods, as well as the conservation and restoration of biodiversity and the sustainable management of natural resources. We describe here some components needed to address these challenges through an integrated approach.

Inclusive CCA/M and DRR/M policies

To effectively contribute to these processes, this paper stresses the importance of promoting inclusive CCA/M, and DRR/M strategies and ensuring that these strategies explicitly and effectively reach the most vulnerable and poorest groups of the population, contributing to strengthen their risk management capacity. Such an inclusive approach would reduce vulnerability to poverty and enhance capacity to mitigate negative impacts (damage and losses) generated by climate-related shocks. At the same time, it would contribute to reducing poor

Box 2. International call to action on vulnerability reduction

Three landmark global agendas were endorsed in 2015, which have at their core an integrated, cross sectoral approach to tackling the climate challenge and promoting sustainable development and poverty reduction: the Paris Agreement and the Sendai Framework for Disaster Risk Reduction, which both contribute to the overall achievement of the 2030 Agenda for Sustainable Development.

The international community has pledged to "leave no one behind" on the journey towards more sustainable, low-carbon development. This means that efforts to achieve more sustainable development should also contribute to poverty reduction by prioritizing and fast-tracking action for those "furthest behind". This requires explicit and proactive policy approaches that are tailored to the poor and address structural and intersecting inequalities based on, for example, ethnicity, gender and socio-economic status, rather than basing expectations of poverty reduction on a "trickle-down" effect (Stuart and Samman, 2017). This commitment to reducing vulnerability and enhancing the resilience of societies, ecosystems and economies has been identified as the common feature and starting point for supporting integrated approaches across CCA, DRR and sustainable development programmes (UNFCCC, 2017).

In this context, social protection mechanisms are viewed as playing a key role in vulnerability reduction in the face of climate shocks. The Sendai Framework specifically emphasizes "the need to promote and support the development of social safety nets and social protection as disaster risk reduction measures integrated with livelihood enhancement programmes" (UNDRR, 2015).

While awareness of an integrated approach linking CCA/M, DRR/M and social protection is growing at the international and national policy level, there are still knowledge gaps on how these can be effectively implemented (UNDRR, 2015).

NEPAL | Some 3,000 farmers learned to grow crops that are better adapted to the impacts of climate change, and practice climate-smart and sustainable agriculture in the context of an FAO-supported project.

©Chris Steele-Perkins/Magnum Ph/FAO

people's vulnerability to climate change, providing them with the necessary incentives, training and resources to embark on more climate-resilient and sustainable livelihoods. Linking CCA/M and DRR/M strategies to social protection policies and programmes from their early formulation can contribute to making these initiatives more inclusive.

Adequate design to respond to multiple and compounding vulnerabilities

Inclusive strategies should take into consideration the specific type of hazard and shock, and the vulnerability profile and livelihood characteristics, as well as the poverty level (income and multidimensional) of different population groups. For instance, vulnerable smallholders might have the capacity to cope with moderate droughts, but may be challenged by the damage and loss generated by catastrophic events. Similarly, smallholders who are slightly above the poverty line may be able to mitigate negative impacts of climate shocks, but have limited options to transition into sustainable practices, while those who are labour-constrained or lacking assets may require basic support, such as social assistance, to supply basic needs and support their capacity to cope with shocks.

These strategies also need to consider that poverty is dynamic and households move constantly in and out of poverty and rely on different types of support. In rural contexts, poverty dynamics are strongly influenced by seasonality, which is a key factor in creating and perpetuating poverty due to the close dependence of livelihoods on weather-dependent production systems (Devereux *et al.*, 2013a). In this context, interventions should consider the depth of poverty of different groups to ensure the stabilization of consumption and the protection of productive assets in the face of shocks.

Integrated planning to bridge the humanitarian-development nexus

At the same time, disaster preparedness and response mechanisms also need to be embedded in resilience-building strategies, to contribute to bridging the humanitarian–development nexus and setting the basis for more resilient and sustainable livelihoods.

Aggravated by climate change, pressures on renewable and non-renewable natural resources continue to increase. And, as discussed, small-scale farmers who are the custodians of natural resources are often constrained. Addressing the social and economic vulnerability of households and livelihoods is central to the concept of climate resilience and to preventing and mitigating climate-induced food crises.

In this sense, effective risk management strategies would require, for example, strengthening long-term livelihood resilience-building, including through access to credit, improved agricultural technologies or resources to diversify into off-farm livelihoods (Hansen *et al.*, 2018). Moreover, strategies might also need to consider the risks associated with predictable seasonal patterns in production and consumption shortfalls that lead to food insecurity, in addition to disaster preparedness and response mechanisms that provide protection from the impoverishing impacts of climate extremes (Holmes and Costella, 2017). Supporting the development of national systems that enable people to cope with small and moderate shocks could potentially relieve the strain on an already overburdened humanitarian sector in cases where disasters emerge out of a context of chronic vulnerability.

This section has presented to the reader the complexity of the challenge posed by climate change and reason for which a systems approach where different sectors contribute to an integrated climate risk management and poverty reduction strategy is needed. The following section introduces the reader to the specific role that social protection plays within this framework, supporting CCA/M and DRM by: reducing people's vulnerability to poverty and reliance on negative coping strategies; providing a stepping stone towards climate-resilient livelihoods to reduce vulnerability to climate risk; and supporting inclusive disaster preparedness and response.

MALI – Members of the Women's association "Coopératif Kotodjongontala" attend a field lesson in an onion-growing garden in Finkolo in the context of an FAO project to support sustainable intensification of African cotton sectors.

2 The role of social protection in climate risk management

Given the need for stronger integration between climate risk management and poverty reduction strategies, this section highlights how social protection can complement programmes designed to specifically reduce climate and disaster risks and promote adaptive capacity, by:

- reducing vulnerability to poverty and reliance on negative coping strategies;
- providing a stepping stone towards climate-resilient livelihoods; and
- supporting inclusive disaster preparedness and response.

2.1 What is social protection?

Social protection comprises a set of policies and programmes that address economic, environmental and social vulnerabilities to food insecurity and poverty through protective, preventive, promotive and transformative effects for its beneficiaries (FAO, 2017a; Devereux and Sabates-Wheeler, 2004). The numerous policies and programmes included within the conceptual framework of social protection can be categorized into the following three main types:

- **social assistance –** non-contributory programmes for the most vulnerable groups with no other means of adequate support;
- **social insurance –** contributory programmes to cushion the risks associated with life cycle-related events; and

- **labour market interventions –** policies and programmes designed to facilitate employment and promote the efficient operation of labour markets.

Table 1 below provides further detail on these different types of social protection as well as specific examples of related programmes.

Despite significant progress in the extension of social protection in many parts of the world, only 45 percent of the global population are effectively covered by at least one social protection benefit, while the remaining 55 percent – as many as 4 billion people – are left unprotected (World Bank, 2019).

It is important to note that the type and combination of social protection (assistance, insurance and labour market) changes according to the different stages of the life cycle, income levels, vulnerabilities and livelihoods. For instance, those living in extreme poverty in rural areas would need social assistance support that can progressively help them to move from subsistence farming to more complex livelihood strategies that allow them to be active players in local economies. As they move into broader processes of economic inclusion, they may require, and be able to contribute to, other types of social protection, including contributory insurance to help them address the inherent risks linked to the agriculture sectors.

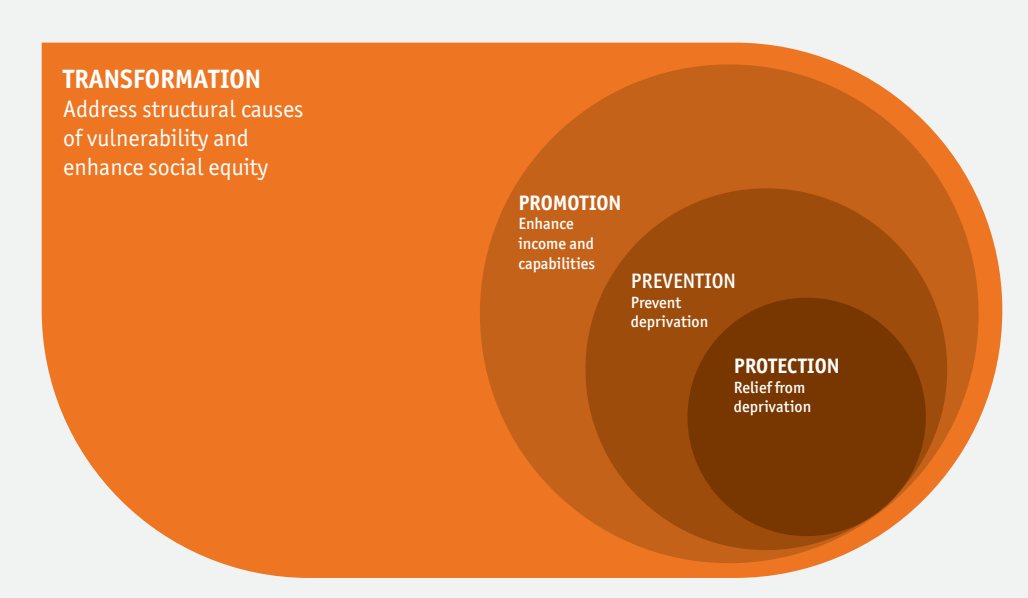
Social protection interventions can be classified under protective, preventive, promotive and transformative functions. For instance, social transfers providing regular cash or in-kind support may have a protective role when they enable poor households to access food and other basic consumption items – even during times of shocks – thus *protecting* them from livelihood risks. This also *prevents* further impoverishment, which averts deeper deprivation by avoiding income and asset losses, while allowing households to stabilize and accumulate assets. By reducing liquidity constraints through basic income support, social transfers may enable households to invest in human capital, as well as productive resources, thus *promoting* their livelihoods. Programmes that have a stronger focus on livelihood promotion often pair cash or in-kind consumption support with asset transfers, skills development courses and facilitated access to complementary services, such as health care or agricultural extension services, in order to encourage this promotion function. Finally, social protection can have a *transformative* function by addressing structural causes of social exclusion and empowering households living in poverty (FAO, 2017a; Devereux and Sabates-Wheeler, 2004).

Table 1. Types of social protection

Types	Examples of programmes
Social assistance: direct, regular and predictable cash or in-kind transfers that are means-tested, or categorically targeted programmes for vulnerable groups (e.g. senior citizens, children). The programmes are non-contributory and financed through taxes and/or international development aid.	• Cash or in-kind transfers (including cash-for-work) • Input or food subsidies
Social insurance: contributory programmes established or mandated by government to protect people from the potential financial losses linked to life cycle-related events (e.g. pregnancy, old age), livelihood risks (e.g. unemployment, illness) or climate-related shocks and stresses (e.g. droughts, floods).	• Maternity benefits • Unemployment insurance • Pensions • Health insurance • Agriculture risk insurance
Labour market interventions: protective measures for the working age population, which aim to enhance employment opportunities, improve skills of workers and offer livelihood support.	• Skills transfer programmes • Employment guarantee schemes • Self-employment support

Source: adapted from Ulrichs and Slater, 2016 and World Bank, 2015

Figure 4. Social protection functions



Source: adapted from Devereux and Sabates-Wheeler, 2004.

Table 2. Social protection's potential contributions to climate adaptation and risk management

Social protection functions	Implications for climate risk management
Prevention (of deprivation)	Risk mitigation – ex-ante security against climate shocks
Protection (relief from deprivation)	Risk coping – ex-post protection against shocks and disasters arising from climate change and variability
Promotion (enhancing income and capabilities)	Risk reduction & adaptation – long-term adaptation via livelihood promotion and diversification
Transformation (advancing social equity)	Adaptation – addressing structural causes underlying vulnerability

Source: adapted from Kuriakose et al., 2013

The four functions of social protection help increase people's capacities to manage risks, which can have important implications for CCA and DRR/M objectives (see Table 2).

Social protection programmes have proven to generate a broad range of impacts across their different protective, preventive, promotive and transformative functions. Impacts are clear in terms of access to social services, smooth consumption and removal of liquidity constraints, as well as progressive support for small-scale protective investments. Interventions, such as cash transfers, also generate multiplier effects in the local economy, benefiting even non-participants of programmes. However, to maximize, sustain and further enhance these impacts it is important to be effectively linked with interventions in other sectors (such as land rights and access to productive assets, economic inclusion, territorial development, market information, insurance, education, health, etc.), which together address the range of factors that might inhibit people from making lasting changes in their livelihoods and moving sustainably out of poverty. For instance, unfavourable conditions for participating in markets, limited access to good quality education and health care services, and poor infrastructure are a few constraining factors that can particularly inhibit significant and sustainable improvements in the livelihoods of the rural poor.

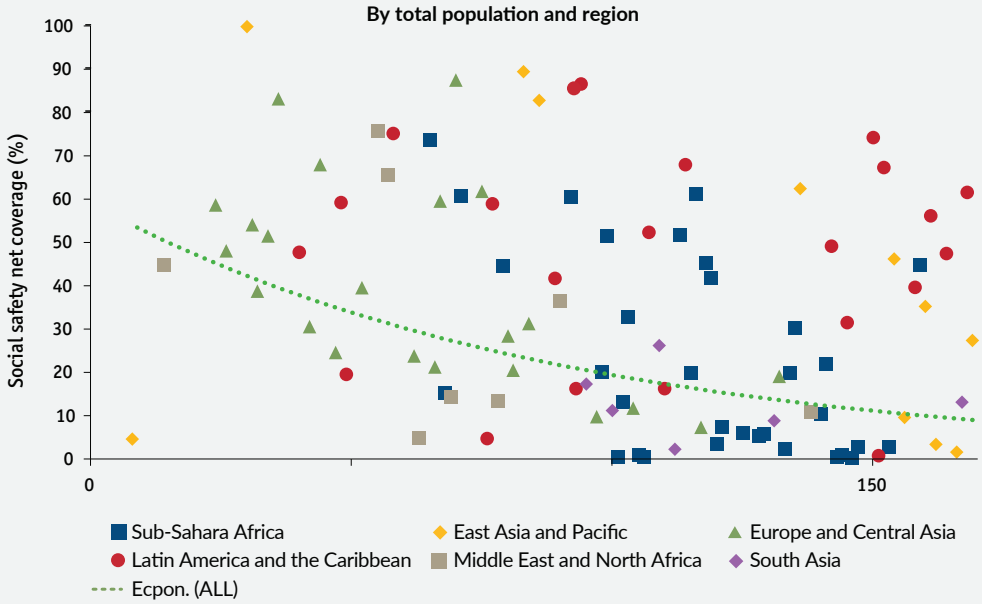
According to a recent publication by the World Bank, social protection programmes (including cash, in-kind transfers, social pensions, public works and school feeding programmes targeted to poor and vulnerable households) are making a substantial contribution to the fight against poverty. From the available household survey data, the World Bank estimates that 36 percent of people escape absolute poverty because of receiving social protection transfers. Even if the transfers do not lift beneficiaries above the poverty line, they reduce the poverty gap by about 45 percent. Social protection programmes also reduce consumption/income inequality by 2 percent, on average. These positive effects on the poverty head count, poverty gap and inequality are observed for all income groups in a country. However, limitations in social protection coverage restrict the ability to protect households that are vulnerable to shocks (World Bank, 2018).

In other words, for programme participants to escape poverty sustainably, social protection interventions must have "comprehensive and integrated benefits that create opportunities for human capital and other productive investment, livelihoods activities and employment" (Samson, 2015). This can best be achieved through the integration of social protection within broader multisectoral developmental frameworks and sectoral macro policies, with the objective of sustainably reducing poverty and vulnerability while promoting pro-poor and inclusive growth (FAO, 2017a).

Some countries, such as Ethiopia, Brazil and Mexico, have championed the design of comprehensive programmes with the objectives of linking participants in social protection programmes with other productive and economic processes. For instance, Ethiopia's Productive Safety Net Programme (PSNP) promotes integrated packages of cash, nutrition-sensitive agriculture and specific training to enhance nutrition and productive impacts. Mexico's *Prospera* and Chile's *Solidario/Ingreso Ético Familiar*, which also attempt to promote productive inclusion by providing employment and training schemes to recipients, are examples of more systemic approaches to social protection (Larrañaga *et al.*, 2012) that promote linkages to other interventions. However, despite the importance of these more comprehensive approaches, moving sustainably out of poverty requires the progressive integration of the poorest into broader processes.

Figure 5 suggests that countries with high risk index often have lower social protection coverage (World Bank, 2018).

Figure 5. Social protection coverage and risk index



Source: World Bank, 2018.

Box 3. Diverse approaches and conceptual frameworks linking social protection and climate risks

In the last few years, two main approaches have been developed that frame social protection as a tool to reduce climate risks through more climate-sensitive programming and better integration with CCA and DRR/M interventions.

Adaptive Social Protection focuses on the potential of linking social protection, CCA and DRR to enhance resilience to shocks and stresses for agriculture-dependent rural communities (Davies *et al.*, 2009). This approach has been designed in order to use social protection tools and mechanisms to tackle climate risk and improve capacities for humanitarian aid to respond to and anticipate the impacts of climate change while strengthening the economic opportunities of vulnerable groups (World Bank, 2017). Adaptive social protection programmes are currently piloted in six Sahel countries (Burkina Faso, Chad, Mali, Mauritania, Niger and Senegal) with support provided by the World Bank in partnership with several development partners.

Shock-Responsive Social Protection focuses on the potential for using social protection systems to deliver response to shocks in low-income countries and fragile contexts, thus reducing the need for separate emergency responses. In the framework of this approach, it is important to link with the humanitarian sector in order to build systems that can provide more timely and flexible support in advance, or in the aftermath, of shocks (O'Brien *et al.*, 2018).

Traditionally, social protection has focused on the reduction of social- and economic-related risks. However, within the last decade, the flexible and adaptive nature of social protection has been recognized and increasing efforts have been devoted to assessing how to take advantage of these systems and programmes in order to respond to climate risks, thus fostering stronger linkages with CCA and DRR/M strategies.

Throughout this paper, it will be argued that regular and predictable social transfers can alleviate liquidity constraints faced by poor households, thereby enabling them to make small-scale productive investments in their agricultural activities and/or climate-resilient assets, education and/or health expenses, while simultaneously reducing the risks associated with new types of livelihood strategies, which would ultimately result in more climate-resilient livelihoods for the poor. In order to further explore the diverse possibilities through which social protection can support climate risk management, the following sections will provide a detailed reflection of each of the following three pathways:

- **Reducing vulnerability and reliance on negative coping strategies in the event of shocks –** protecting people from potential losses incurred by shocks, by helping them to smooth consumption and protect their assets, increasing their capacity to cope and reduce impacts of shocks.

- **Providing a stepping stone towards climate-resilient livelihoods –** contributing to reducing climate vulnerability by addressing economic barriers in order to adopt more productive and climate-resilient investments or complementing other production-focused programmes.

- **Supporting inclusive disaster preparedness and response –** acknowledging that well-functioning scalable social protection systems can also be an important part of a country's disaster management strategy, by reaching poor populations affected by climate risks in a fast and cost-efficient manner.

2.2 Reducing vulnerability to poverty and reliance on negative coping strategies

As mentioned previously, risks emerge out of a combination of vulnerability, exposure and hazards. Social protection's key contribution to risk management is by strengthening people's capacity to cope with shocks and reducing their dependence on negative coping strategies, which can exacerbate vulnerability to poverty and food insecurity.

Evidence from cash transfer programmes across different regions highlights this positive impact of social protection on risk management (Davis *et al.*, 2016). Ethiopia's PSNP, for example, allowed 60 percent of programme participants to avoid selling assets following a drought (Devereux *et al.*, 2008), while cash transfers in Ghana and Kenya reduced reliance on child labour, begging, sale of assets and indebtedness as coping strategies during times of food shortage (OPM, 2013a; OPM, 2013b). Similarly, in Bangladesh, the Chars Livelihoods Programme (CLP), which transfers assets and provides training on livelihoods and nutrition to extremely poor women, has increased the social and economic abilities of programme participants to prevent and cope with the impacts of floods and erosions (Jasper *et al.*, 2016). Women noted that the knowledge they gained in terms of food nutrition and coping with seasonal crises, as well as opportunities created in homestead gardening through the programme, had an important and perceived long-term effect on food consumption and diversification (Siddiki *et al.*, 2014).

This protective and preventive role of social protection provides people with a basic level of security, which is the foundation for other behaviour changes that reduce vulnerability to risks and enhance the resilience of people and livelihoods in the face of climate risks (FAO, 2017d). Limited access to assets, for instance, is a key feature of vulnerability as it impairs people's capacity to cope with shocks and crises (Cardona *et al.*, 2012). Having consumption protection not only allows people to retain assets during times of higher household expenses (e.g. food shortage, illness),

but the regular provision of income through social assistance programmes also allows them to set aside cash during good times and invest it in asset accumulation, or to build up savings or access loans to be better prepared to cope with climate-induced shocks in the future (Pelham *et al.*, 2011; Ulrichs and Slater, 2016). It also protects human capital, which is critical to overcome the intergenerational transmission of poverty. Evidence has shown that cash transfers not only reduce school drop-out rates (Bastagli *et al.*, 2016), but that they have specifically done so in contexts like Malawi and Mexico, where households would have resorted to child labour as a way to cope with climate risks (de Janvry *et al.*, 2004; Tirivayi *et al.*, 2016).

In recent years, FAO and its partners have been building a solid body of evidence on the economic and productive impacts of national cash transfer programmes, including on agricultural livelihoods and rural local economies (Davis *et al.*, 2016). By improving nutrition and health, and increasing educational attainment, social protection interventions develop human capital and enhance labour productivity and employability, and can have a more direct impact on production capacity and vulnerability reduction (Davis *et al.*, 2016).

The evidence also shed light on the importance of specific design features to ensure desired impact in terms of transfer size, predictability, regularity

Box 4. From Protection to Production

FAO has been working in partnership with the United Nations Children's Fund (UNICEF), University of North Carolina (UNC), national research institutions and the national governments of seven countries (Ethiopia, Ghana, Kenya, Lesotho, Malawi, Zambia and Zimbabwe) to gather evidence on the economic and productive impact of national cash transfer programmes. The development of rigorous impact assessments was carried out in close coordination with government counterparts and embedded in national policy processes and platforms. This collaboration strengthened the case that social protection should be seen as an investment and not simply as expenditure. It also addressed public misperceptions around dependency and labour disincentives, and provided solid findings on how cash transfers can help poor and marginalized families to build assets, empower themselves and engage in economically productive activities.

The evaluations found that cash transfer programmes had a variety of impacts on agricultural activities. In **Zambia**, the Child Grant model of the Social Cash Transfer programme led to a 36 percent increase in the area under cultivation and an increase in the use of agricultural inputs, including seeds, fertilizer and hired labour. This resulted in an approximately 37 percent increase in the value of overall production. Overall, the grants in Zambia initiated a transformative process that permitted beneficiary households to make more investments in capital for agricultural production and new economic activities. In **Lesotho**, the Child Grants Programme led to an increase in the use of crop inputs and expenditures. As in Zambia, the increase in the use of inputs resulted in an increase in maize production. For households that had labour constraints, sorghum production increased. These households also obtained bigger harvests from their garden plots. In **Zimbabwe**, the Harmonized Social Cash Transfer Programme led to increases in expenditure on fertilizer and in the percentage of households producing groundnuts. In **Malawi**, the Social Cash Transfer Programme facilitated an increase in both maize and groundnut production. Cash transfer programmes led to an increase in expenditure on seeds in **Ghana**, but a decrease on such expenditures in **Kenya**. In these two countries, evidence did not indicate that transfers led to growth in agricultural production. In both Kenya and Malawi, however, cash transfers did increase family food consumption obtained from domestic production (Daidone *et al.*, 2017; Thome *et al.*, 2016,).

PHILIPPINES | Farmer gathers rice seedlings in preparation for the second planting season of the year in Magalang town in Pampanga province where floods occur as a result of torrential downpours.

and profiles of programme participants, among other factors. For instance, a comparative study on unconditional cash transfers in Kenya, Lesotho and Zambia revealed that the size of the impact on investments in a variety of livestock was more significant where the transfer size was the highest (compared with per capita income) (Daidone *et al.*, 2015). Additionally, the regular and predictable delivery of cash transfers is also essential to increase people's capacity to plan and manage their household resources to cope with risks (FAO, 2017d).

The impacts on consumption stabilization and asset protection (including human capital) in the face of risks highlights the role social protection plays as a climate risk management strategy – it reduces the impact of shocks and contributes to the capacity to cope and adapt by building productive, human, social and financial assets (Jones *et al.*, 2010; McDowell *et al.*, 2018; Hansen *et al.*, 2018). While the protective, stabilizing function of social protection is in itself insufficient to achieve climate resilience and livelihood transformation, it is a necessary prerequisite for any programme that aims to do so – particularly when targeted at the chronic poor (Béné *et al.*, 2012; McDowell *et al.*, 2018).

2.3 Providing a stepping stone towards climate-resilient livelihoods

Regular, predictable and sizable transfers address key liquidity constraints often faced by small- scale farmers. They can contribute to meeting basic needs, paying off debts and investing in children's development – thus progressively freeing up scarce household resources that can be used to make investments in productive and/or climate-resilient assets. If complemented by specific information and incentives, this financial "buffer" can help to promote the transition towards new livelihoods strategies, which usually require upfront investments (e.g. investing in new types of crops such as drought-tolerant species). This transition represents one key strategy to reduce climate vulnerability. In other words, access to social protection can contribute to promote livelihood changes that can reduce poverty, as well as climate vulnerability.

Thus, to harness the potential synergies between social protection and CCA/M strategies for vulnerable groups and to exploit the promotive function of social protection, more explicit linkages between the two types of interventions are desirable, either through layering or sequencing of support.

Box 5. A key challenge to address: shifting towards climate risk-sensitive and sustainable agricultural practices

As shown in Section 1, poor rural households have limited resources and lack the financial means and security to engage in high-return activities. Indeed, exposure to a number of natural risks tends to force them to adopt lower-risk activities that may shield them from the negative impacts of potential shocks but generate lower returns, trapping them in poverty (Rosenzweig and Binswanger, 1993). One of the main reasons for this is the lack of access to insurance markets, especially against weather shocks, which leads poor farmers to avoid investing in new technologies as they cannot afford to take the risk of failure that may lead to asset depletion below a critical level from which recovery is impossible. Social protection compensates for missing insurance markets and reduces farmers' risk avoidance, allowing them to make riskier investments, including climate risk-sensitive agricultural practices (Lamb, 2003).

Social protection programmes, including cash transfers, reduce farmers' risk avoidance in two ways: first, farmers are aware that they can smooth consumption after risks materialize (i.e. loss of investment in case of failure of the adopted technology); second, a cash transfer translates into higher wealth, which allows farmers to endure a higher risk in the form of income volatility or fluctuations (Hennessy, 1998). In sum, access to social protection can help farmers to address some of the economic costs of, and barriers to, engaging in new agricultural technologies as well as in higher-risk agricultural strategies that are a key prerequisite for the promotion of climate risk-sensitive and sustainable agricultural practices. As described above, in order to achieve sustainable results, cross-sectoral coherence is key. For instance, a recent FAO study in Zambia analysed the effects of its national cash transfer programme – the Child Grant Programme, an unconditional cash transfer – on risk-taking and found that not only did the transfer reduce the farmers' risk aversion, but it also encouraged them to invest in modern inputs (Prifti *et al.*, 2019).

Through its promotive functions, social protection can provide the complementary support that vulnerable farmers need to build skills, acquire knowledge and gain access to the assets they require to engage in climate-smart agricultural practices (Kim *et al.*, 2017).

As discussed, social protection can increase the capacity of poor smallholder farmers to invest resources in productive assets, as observed in FAO's research on social cash transfer programmes in Ethiopia, Kenya, Lesotho, Malawi, Zambia and Zimbabwe (Daidone *et al.*, 2015). Also, social protection is found to reduce the barriers to adopting some CSA practices, including capital constraints and the underlying risks that farmers face when adopting new practices. Moreover, access to regular social protection support is found to enable farmers to sustain the adoption of CSA practices for multiple years, which enhances the benefits farmers derive from these practices (Scognamillo and Sitko, forthcoming).

There are, however, limitations to how extensive the impact of cash transfers alone can be, particularly in contexts with limited access to inputs, information, financial services or markets. Hence, to support social protection's contribution to livelihood promotion, specific programmes can link cash transfer recipients to complementary interventions in other sectors (e.g. agricultural inputs, training, microfinance, vulnerability reduction measures). In a range of different contexts, these have led to positive (yet varied) impacts on production and diversification into on-farm and off-farm opportunities (FAO, 2016d; Mariotti *et al.*, 2016).

Box 6. CASH+

FAO's Cash+ approach aims to enhance the livelihoods and productive capacity of poor and vulnerable rural households. Cash+ interventions combine cash transfers with productive assistance and/or technical training. The productive assistance is tailored to the specifics of beneficiaries' livelihoods. This might include improved crop and vegetable seeds, planting materials, fertilizers, gardening equipment, fishing tools, livestock vaccines or animal feed. Training is designed so that programme participants know how to best utilize the productive assistance (e.g. specialized technical training, support on marketing and market assets, entrepreneurial skills).

The Cash+ approach can consist of standalone programmes that provide different types of support, or integrated approaches where social protection programmes are effectively linked with interventions in the agriculture or CCA sector. The aim is to ensure access to rural development of climate-smart interventions for the poorest, when available (e.g. promoting coherence between social protection and existing rural development programmes, or design-specific complementary packages to enhance productive and resilience-related impacts).

Cash+ programmes can be designed to achieve specific objectives, such as nutrition-sensitive agriculture or promotion of the uptake of CSA. Factors such as the commercial viability of productive activities promoted through Cash+, as well as the choices and preferences of programme participants, need to be considered to ensure sustainability of impact.

While interventions are tailored to be context-specific, Cash+ generally includes the following components:

- Cash transfers, which are typically unconditional, although the exact modality, amount and frequency of the transfers are determined by the context.

- Productive assets and inputs for agriculture, livestock, fisheries and aquaculture, forestry and productive uses of other renewable natural resources. Productive assets and inputs can include crop seeds, tools, fertilizers, livestock, fishing kits, home-grown gardens and processing equipment, among others. They can be provided either in-kind or through vouchers.

- Technical training adapted to the needs of beneficiaries. This component can comprise training on sustainable farming and pastoral practices, including input use, business and other "soft" skills, nutrition education, agricultural value chain development, access to markets, finance and information. Training can be provided through farmer or pastoral field schools.

- More information on Cash+ can be found in Section 3 of this paper and in the accompanying Guidance Note.

A cross-country evaluation (Ethiopia, Ghana, Honduras, India, Pakistan, Peru) found that complementary interventions increased the number of hours adults dedicated to entrepreneurial activities (e.g. livestock-rearing, but also agricultural activities) per year by the end of the programme as well as the income generated through non-farm activities (Banerjee *et al.*, 2015). Similarly, in Nicaragua, the combination of conditional cash transfers (CCTs) with vocational training or a productive investment grant increased the likelihood of recipients engaging in non-agricultural self-employment by 13 percent. The programme also reduced drought-induced income and consumption fluctuation among participants, compared with non-participants (Macours *et al.*, 2012).

A review commissioned by FAO on the impacts of combining agricultural and social protection interventions in 18 countries found that joint interventions have positive impacts on income, consumption and expenditure that go beyond those of an individual intervention. The review looked at three types of programmes: sustainable livelihoods programmes, which include both agricultural and social protection elements; complementary programmes, which attempt to coordinate interventions from the two sectors to some degree; and overlapping programmes, which coincide by chance in location or target population. All types of programmes stimulated more profitable and decent employment, including self-employment, and the diversification of economic activities in agriculture as well as prompting a shift to non-farm businesses. There were positive impacts on savings and access to formal credit, which was unsurprising since mandatory or incentivized savings are key components of many interventions. The programmes prompted investments in productive assets and increases in access to land and its use. Programmes that fostered self-help groups and associations increased interactions between beneficiaries and their social networks, reducing social exclusion and increasing access to public services and community support (Veras Soares *et al.*, 2016).

The examples above highlight the need for a range of complementary and integrated benefits to create opportunities for human capital development and productive investment (Samson, 2015). But more importantly, they also emphasize the need to integrate social protection within a broader developmental framework that reduces poverty and vulnerability while promoting pro-poor and inclusive growth, and with climate risk management programming that aims to increase the resilience of the rural poor.

Additionally, these examples highlight the potential of social protection to address the barriers that prevent households from moving towards more sustainable and productive livelihoods, including increasing their asset bases and diversifying their income sources. However, it should not be assumed that a combination of cash and complementary interventions always leads to these outcomes, as the evidence varies widely across programmes and contexts (Mariotti *et al.*, 2016). The lack of evidence on the long-term sustainability of the reported impacts – specifically when former recipients face climate extremes – leaves the question unanswered as to whether and/or how these programmes contribute to long-term climate resilience. This also points to the need for stronger linkages with long-term adaptation programmes and close collaboration across the relevant sectors.

Within this process, some of the obstacles and barriers to allowing the rural poor to move towards more climate-resilient livelihoods need to be assessed more closely. Social protection's protective and preventive functions – through income support, for instance – can provide the necessary "buffer" that allows people to take some risks associated with adopting new livelihood strategies, as their basic needs are protected (assuming these programmes have adequate design in terms of regularity, transfer size and predictability). This can complement and mutually reinforce, for instance, agricultural programmes that aim to promote the uptake of climate-smart practices among the rural poor (Asfaw *et al.*, 2014). While there is extensive evidence on the production-related combined impacts of social protection and agriculture, limited attention has been devoted to exploring the role of social protection in supporting the uptake of specific climate-smart

NIGERIA | An internally-displaced person receives FAO agricultural assistance during the ongoing rainfed cropping season in Kukareta.

strategies, such as in the case of conservation agriculture or the adoption of climate-resilient technologies. Considering the crucial role of climate-smart agriculture in improving the resilience of rural livelihoods, it is necessary to fully understand how improved coherence between social protection and CSA practices can take place. This should include, for instance, an analysis of other factors influencing uptake, such as the willingness of smallholders to engage in more labour-intensive strategies like conservation agriculture, the long-term sustainability of agriculture in areas suffering long-term environmental degradation, and contextual factors inhibiting successful implementation of alternative livelihood strategies, such as a lack of access to training and expert guidance to implement more knowledge-intensive practices like agroforestry (Giller *et al.*, 2009; Hellin, 2012; Hansen *et al.*, 2018).

What is climate- smart agriculture? CSA relates to actions in fields, pastures, forests, oceans and freshwater ecosystems. It involves the assessment and application of technologies and practices, the creation of a supportive policy and institutional framework and the formulation of investment strategies. CSA systems include different elements such as:

- the management of land, crops, livestock, aquaculture and capture fisheries to balance near-term food security and livelihood needs with priorities for adaptation and mitigation;
- ecosystem and landscape management to conserve ecosystem services that are important for food security, agricultural development, adaptation and mitigation;
- services for farmers and land managers that can enable them to better manage the risks and impacts of climate change and undertake mitigation actions; and
- changes in the wider food system including demand-side measures and value chain interventions that enhance the benefits of CSA.

FAO work on CSA includes five action points: expanding the evidence base; supporting enabling policy frameworks; strengthening national and local institutions; enhancing financing options; and implementing practices in the field.[5]

[5] More information on Climate Smart Agriculture available at http://www.fao.org/climate-smart-agriculture-sourcebook/en/

For CSA to be effective and implemented at the required scale, it must be inclusive. That means it must be an accessible option for the poorest and the most food-insecure, and linked to efforts that ensure their access to food and nutrition. To achieve this, linking CSA interventions to social protection mechanisms (i.e. targeting, delivery and monitoring systems) would be of key importance to reach those most in need and maximize the synergetic effect between income support and livelihood transformation (FAO, 2017a).

As previously discussed, social protection programmes can also provide a platform for introducing specific CSA-related activities – for example, capacity development on skills and adaptation practices and technologies to be applied in homestead vegetable production or agroforestry – and to support the reach of these approaches to the poorest and most vulnerable (FAO, 2017a). Within this context, CSA practices need to be selected carefully to ensure they are appropriate to the climatic, environmental and socio-economic context and can deliver the welfare benefits to those who adopt them.

Another risk management mechanism that is proven to increase the uptake of climate-smart technologies has been weather-indexed insurance (Karlan *et al.*, 2014; Cole *et al.*, 2014). This complementarity between interventions has been demonstrated in studies in Ecuador (Lybbert and Carter, 2015) as well as in India, where uptake of drought-resistant seeds increased among smallholders if they were paired with insurance (Ward *et al.*, 2015; Hansen *et al.*, 2018). However, insurance mechanisms are not always accessible or beneficial to poor smallholders and can – if premiums are set too high – push people below the poverty line (Chantarat *et al.*, 2017).

Agricultural insurance schemes can fall into the contributions-based category of social protection if the insurance products are tailored and adapted for low-income groups (Wiechers, 2013; World Bank, 2012). In many countries, micro-insurance forms part of government-run social protection strategies and can be administered by a range of actors (community-based, government, private sector). The challenge for these schemes is to be financially sustainable, which requires significant coverage and

Box 7. CADENA

Finding financing strategies for pro-poor insurance mechanisms is a key challenge for achieving substantial coverage of these schemes. To address this challenge, Mexico's crop and livestock insurance for smallholders, CADENA, developed a funding model that shifts the responsibility for paying the premiums from smallholders to the government. The scheme is administered through the Ministry of Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA) and was introduced in 2003 to provide relief to smallholders when weather-related crop failures occurred. To incentivize the scale-up of the insurance, the federal government subsidizes up to 90 percent of the premiums, which are paid by the state government. Indemnity payments are triggered once precipitation falls below a predetermined level and are paid out to the state government, which distributes direct transfers to farmers in the affected area. While initially focused on crop insurance against drought, CADENA has gradually expanded the types of weather shocks covered, as well as incorporating index-based livestock insurance into the programme (de Janvry *et al.*, 2016).

Evidence suggests that insurance payouts allow farmers to cultivate larger areas of land in the subsequent growing season and lead to welfare gains due to higher household expenditure. While there are still challenges related to whether the payouts sufficiently cover the actual losses incurred by farmers CADENA's funding model has ensured the sustainability and longevity of a subsidized insurance scheme protecting vulnerable smallholders from climate risks (de Janvry *et al.*, 2016).

effective risk-pooling mechanisms. In some contexts, agriculture risk insurance schemes for smallholder farmers are largely state-subsidized to make them accessible to vulnerable groups. Subsidized, well-targeted schemes can be an effective safety net for vulnerable farmers who are just above the poverty threshold, as they prevent them from entering a downward spiral of asset de-accumulation following a climate shock (Lybbert and Barrett, 2011; Chantarat *et al.*, 2017). In Mexico, the CADENA programme was launched in 2003 under the Ministry of Agriculture, Livestock, and Fisheries (SAGARPA), making Mexico one of the first countries to recognize the opportunities for using macro-level climatic catastrophe agricultural index products as a form of social protection for small subsistence farmers for whom commercial crop insurance is not necessarily an appropriate or cost-effective mechanism.

In Kenya, the index-based livestock insurance increased the probability of maintaining asset levels above a defined threshold associated with poverty traps and reduced the probability of child undernourishment during a drought year (Janzen and Carter, 2013; Chantarat *et al.*, 2017). It found that the poverty impacts of index-based insurance are likely to be highest through prevention of long-term, climate-induced impoverishment. For this to occur, households close to the poverty line need to be targeted and schemes need to find the right balance between affordability of the premiums and the size of the transfers, which must be able to cover actual losses (Chantarat *et al.*, 2017). On the other hand, in order to build long-term climate resilience it is important that insurance programmes, when targeted to the most vulnerable or subsidized by the state, encourage at-risk populations to engage in sustainable livelihood transformation processes.

In summary, and as previously stated, what is critical to not only help the rural poor to manage climate risks better, but also to escape poverty in the long term, is to develop a range of risk management strategies that will work depending on the poverty profile of different groups. As highlighted above, these can range from basic income support for the chronic poor to providing livelihood opportunities and access to services. These strategies also involve supporting integration into broader economic inclusion processes at territorial level, ensuring access to insurance mechanisms to enhance the risk management capacity of those working in the rural sector and minimizing their vulnerability – especially during and/or after a climate-related shock. Different types of social protection schemes can thus become part of wider, cross-sectoral strategies that combine pro-poor agricultural policies with sustainable livelihood schemes and national investment plans to assist the rural poor's transition into more climate-resilient livelihoods.

2.4 Supporting disaster preparedness and response

Well-functioning, scalable social protection systems can also be an important part of a country's disaster management strategy, with the potential to reach populations affected by climate risks in a fast and cost-efficient manner, while not leaving behind the poorest people (Winder Rossi *et al.*, 2017). A growing body of research is analysing how long-term social protection systems can be used to respond to covariate, large-scale shocks and identifying where opportunities exist for better coordination and/or integration with humanitarian assistance and DRM (O'Brien *et al.*, 2018). Particularly in contexts of recurring climate-related shocks and stresses, social protection programmes can not only provide protection through ex ante vulnerability reduction, but also be effective mechanisms to deliver humanitarian aid in response to, or anticipation of, a shock. For instance, according to O'Brien *et al.* (2018), this can be achieved by: providing additional assistance to individuals that are already receiving social transfers (vertical scale-up); expanding assistance temporarily to an additional caseload that is transitorily vulnerable to the shock (horizontal scale-up); and allowing humanitarian actors to deliver assistance through social protection systems ("piggybacking"). Another option ("design tweaks") entails modifying the design of existing social protection programmes to meet specific needs created by a crisis or shock (for instance, relaxing conditions

Table 3. Options and approaches for shock-responsive adaptation to social protection mechanisms

Typology of options	Approach
Vertical expansion	Temporarily increasing the value or duration of benefit for existing recipients
Horizontal expansion	Temporarily increasing the number of recipients in an existing programme
Piggybacking	Using part of an established social protection system or programme by a new programme in response to shock (either by government or partners). One or more elements could be used (e.g. beneficiary list, staff, payment mechanism)
Alignment	Developing one or more elements of a humanitarian response that align as closely as possible with those used in a current or possible future social protection programme (e.g. alignment of objectives, targeting method, transfer value, delivery mechanism)
Design tweaks	Changing the regulatory environment of routine social protection interventions to ensure the ongoing provision of the regular service for its usual beneficiaries in the event of a shock

Source: adapted from OPM, 2017.

on a CCT programme for households in areas affected by shock). Finally, in contexts where social protection systems do not exist, or are not mature enough to be expanded or piggybacked, humanitarian agencies may align their systems with those of the government or vice versa. This option ("alignment"), offers the opportunity to mimic social protection provision in an environment where the core intervention cannot operate, which might facilitate future integration.

Table 3 above synthesizes the typology of options for shock-responsive adaptation to social protection mechanisms, and provides a brief description of each approach.

Disaster assistance delivered through existing social protection systems can be potentially faster and more cost-effective than conventional humanitarian responses when scalable, well-functioning, shock-responsive systems with high population coverage are in place. In addition, using social protection to deliver aid after a shock ensures accuracy in reaching the poorest and most vulnerable. Kenya's Hunger Safety Net Programme (HSNP) – a regular cash transfer programme for food-insecure households in northern Kenya – is set up in a way that enables it to scale up assistance in the case of a drought emergency. It can deliver assistance within ten days of declaring an emergency, compared to the 3-9 months it takes to deliver humanitarian aid (NDMA, 2016). In Ethiopia, a World Bank review estimated that assistance through the PSNP in response to the food crisis in the Horn of Africa in 2011 was cost-efficient, at USD 53 per beneficiary, compared with USD 169 through the United Nations channel (World Bank, 2013). Increasing the speed of response also reduces the overall cost of humanitarian crises. A cost-benefit analysis of the regional risk-pooling mechanisms – the African Risk Capacity – calculated that the cost of response four months after a failed harvest averaged USD 49 per household, compared with USD 1 294 after six months (Clarke and Hill, 2013). A key precondition to enable fast horizontal scale-up is the pre-identification and registration of vulnerable households (see Section 3).

Other programmes have more limited ability to scale up horizontally, but aim to provide top-ups to existing beneficiaries to ensure the transfers can continue to fulfil their functions, despite an increased need. Several programmes have institutionalized contingency funds for vertical scale-up, such as calamity grants in Guatemala's CCT programme, Bono Seguro, or the emergency grant in Ecuador's Bono de Desarrollo, which increased the support for CCT

Box 8. Early Warning Early Action systems

Disasters triggered by natural hazards now occur nearly five times more often than 40 years ago. The impact on local economies, people's livelihoods and lives has similarly grown. Expanding needs, competing priorities and scarce resources globally mean that new tools are needed to ensure smart, effective investments that help attenuate the impact of disasters before they occur.

Early Warning Early Action (EWEA), also known as Forecast-based Financing (FbF), is a mechanism that aims to change the way disasters are managed. EWEA systems translate warnings into anticipatory actions that are put in place before the targeted extreme event reaches its peak in order to reduce its impact. EWEA focuses on consolidating available and reliable forecasts, while putting in place early actions to make sure a response is delivered as soon as a warning has been issued.

Early actions are identified for a definite time frame between an early warning trigger and the actual occurrence of a disaster. These differ from "early response" actions, as they occur before the disaster has happened, and as a result are able to offset part, or all, of its impact. Examples include interventions to protect assets and livelihoods against an impending shock (such as rebuilding river banks or repairing irrigation schemes) and pre-positioning assets to ensure timely humanitarian assistance (such as seeds or tools) to those most in need.

recipients following a climate-related shock such as drought (Beazley *et al.*, 2016; World Bank, 2016). In Lesotho, the Child Grant Programme (CGP) was scaled up with the provision of vegetable seeds and training as part of the El Niño drought response (FAO, 2017a). Vertical scale-ups have also been provided following lower-frequency (but high-impact) climate shocks, such as the 2015 earthquake in Nepal, where UNICEF delivered a top-up grant to existing social assistance beneficiaries, or in Fiji and the Philippines, where top-up payments were made following tropical storms (Kukrety, 2016; Doyle, 2017, cited in OPM, 2017; OPM, 2017; Zimmerman and Bohling, 2015). In the Philippines, the programme was further adjusted to waive the requirement of compliance with conditions following disasters to ensure beneficiaries can still receive transfers, despite limited access to health and education services (Smith *et al.*, 2017).

Social protection programmes can also serve as platforms to reduce the burden of shocks on vulnerable populations and increase the cost-effectiveness of support by acting earlier, even before the shock has happened (Costella *et al.*, 2017). Many climate-related hazards, such as storms, floods and droughts, can be predicted, often including estimates of their location, intensity, probability and duration. When combined with complementary information such as poverty, exposure and vulnerability (including data from social registries), it is possible to identify populations at risk of being impacted before disaster strikes (RCCC, 2017). Additionally, when standard operating procedures are in place, early action interventions, triggered by early warnings, can be activated or linked with social cash transfers or other social protection mechanisms. This will depend on the capacity of the system to pre-identify beneficiaries as well as to execute distribution in the short window of time between a forecast and the occurrence of the hazard (Costella *et al.*, 2017).

One of the prime examples of social protection systems that are linked to early warning systems is Kenya's HSNP. The programme can scale up assistance before a drought turns into a food emergency, by triggering additional payments once a threshold set by a Vegetation Condition Index for extreme or severe drought has been passed. Similarly, the Third Northern Uganda Social Action

MEXICO | Women from the Huaves ethnic group carry maize cobs in baskets on their heads and materials for weaving baskets under their arms San Mateo del Mar, Oaxaca.

Fund, through a Disaster Risk Financing component, triggers labour-intensive public works activities to provide temporary employment and income support to affected households (World Bank, 2017). These examples highlight how established social protection programmes can be complemented by the necessary contingency funding and linkages to early warning systems to deliver assistance in advance of a shock.

Social protection programmes can be useful avenues to channel and support humanitarian action to address different types of climate shocks. However, specific attention needs to be paid to the design of these programmes – for instance, with regard to the transfer size, which should be adequate in relation to the scale of the shock. In the case of Ethiopia, access to PSNP enabled programme participants to meet basic needs, manage risks and invest in productive interventions. The impact of the 2008 drought was very severe, such that programme participants fell below their pre-entry poverty levels; however, it would have been even worse if they had not been covered by the programme, as demonstrated by the impact on non-beneficiaries (Sabates-Wheeler and Devereux, 2010).

In addition, evidence from the HSNP in Kenya showed that the impacts on programme participants are different if they receive regular assistance, versus when they only receive a temporary humanitarian short-term response. The HSNP evaluation compared routine recipients with emergency payment recipients and found that the emergency payments only allowed people to meet their basic needs, but did not prevent the distress sale of assets such as livestock, which is the most negative impact of drought on pastoral livelihoods (Farhat *et al.*, 2017). A key aspect of the HSNP, which increases the speed of emergency response and allows horizontal scale-up, is the pre-identification and pre-registration of households that are above the eligibility threshold for regular social protection assistance but will require assistance to avoid falling into poverty in the event of a shock.

Social protection's primary role in reducing the risk of disasters and building resilience, particularly in the case of slow-onset, drought-induced food emergencies, is arguably through its protective function, delivered through regular cash transfers (Ulrichs and Slater, 2016). Social registries with information on vulnerable households are thus key to facilitating the rapid identification of those who will require humanitarian assistance in case of a shock.

LESOTHO | Mope Makara and his classmates at the Thabang High School build a "Keyhole Garden" under the guidance of their agriculture teacher on the school property in Morija, Maseru District.

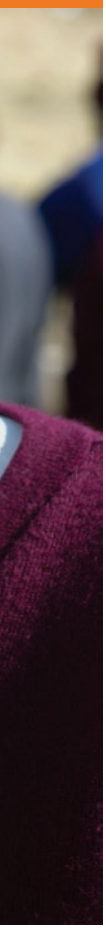
©FAO/Rodger Bosch

3

Challenges, opportunities and way forward

As discussed in previous sections, social protection plays an important role in achieving the overarching objectives of reducing vulnerability and increasing climate resilience, leaving no one behind. However, the effectiveness of social protection depends on a range of context-specific factors, such as the level of fragility, propensity of shocks and drivers of poverty, as well as the objectives, design features and institutional set-ups of social protection programmes (O'Brien *et al.*, 2017). This underlines the fact that, while social protection is a key measure to address people's acute needs, provide predictable and reliable support and enhance productive and risk management capacity, social protection interventions should be part of a wider coordinated strategy that aims to reduce vulnerability in the long term, in tandem with other programmes and services.

Indeed, integration and coherence at the policy and programme levels between social protection, CCA/M and DRR/M are required in order to address the multiple risks and increasing climate-related vulnerabilities experienced by the rural poor. This section provides material for reflection regarding the main challenges and opportunities towards achieving this goal.



3.1 Key challenges for integrating social protection and climate risk management

There are a number of key challenges that hinder effective integration among social protection, CCA/M and DRR/M actors and institutions.

The first challenge relates to a lack of awareness across sectors of each other's roles and responsibilities and thus of the potential ways in which complementarities between interventions could be achieved to reach the broader objectives of reducing vulnerability while building sustainable livelihoods to reduce poverty. In the case of social protection, CCA/M and DRR/M, the different disciplinary origins among policy-makers and technical experts can be a challenge to incentivizing and operationalizing cross-sector coordination. The three sectors often use different terminologies for similar processes, which can pose conceptual barriers to linkages. Misperceptions also include issues relating to the selection of programme participants. For instance, in many cases, social assistance is perceived as a way of reaching the poorest of the poor; segments of the population that are wrongfully considered not to have transformative capacity. Indeed, social assistance target groups are often considered unable to participate in adaptation or mitigation programmes. However, evidence conducted on the impact of unconditional cash transfers has proven this wrong; social assistance beneficiaries engaging in agricultural activities do have productive potential (e.g. Davis *et al.*, 2016; Tirivayi *et al.*, 2016). Moreover, emerging evidence is also shedding light on how their engagement in adaptation and also potentially in mitigation programmes (although to a lesser extent) can lead to positive synergetic effects, including reduction of poverty and a shift towards sustainable and climate-resilient livelihood strategies. This needs to be communicated to initiate a shift in mindsets across critical line ministries working on agriculture, finance and the environment. This phenomenon is not unique to the specific role of social protection, and several challenges just to integrating CCA and DRR have also been identified. According to Birkmann and Teichmann (2010), most challenges can be categorized with respect to different spatial and temporal scales, knowledge bases, and norm systems (Birkmann and Teichmann, 2010). In short, lack of awareness of potential synergies, misconceptions about each other's approaches and priorities, and different conceptual frameworks limit the potential for greater collaboration among sectors.

The second challenge concerns the capacity to operationalize synergies. Contexts that present high levels of vulnerability to climate risks may also lack the institutional capacity or advanced operational systems to effectively respond to them. While social protection is often heralded as a useful platform to reach the most vulnerable, and while there has been a significant growth in social protection programmes in low-income countries over the last decades, it needs to be recognized that its coverage is still limited. As mentioned in Section 1, only 45 percent of the global population are effectively covered by at least one social protection benefit, while the remaining 55 percent – as many as 4 billion people – are left unprotected (World Bank, 2019). In countries where social protection is rapidly growing but is still a relatively new part of government policy, the immediate priority may be to expand coverage or to strengthen coherence within the sector (addressing fragmented social protection programming) as opposed to enhancing coordination with other sectors (Ulrichs and Mphale, 2016). Particularly in low-income countries, social protection systems are not fully developed and often lack the maturity or capacity for cross-sector linkages (e.g. social protection registries may not be present or able to target populations affected by climate hazards or humanitarian caseloads).

Similar capacity challenges are faced in other sectors. For instance, the limited capacity of meteorological information services in many developing countries is an obstacle to the provision of reliable forecasts that can be linked to early action and increased preparedness. Without adequate meteorological information, the ability of a social protection system to respond in the case

of an upcoming shock is limited. Furthermore, to facilitate access to and uptake of more adaptive and knowledge-intensive production technologies, such as conservation agriculture or agroforestry, access to training and expert guidance is important. Yet deep cuts to publicly funded extension services in many developing countries have reduced access to these (Hansen *et al.*, 2018; Hellin, 2012). The arguments made for the potential of synergies between sectors is often based on the "best-case scenario" but, on the ground, lack of capacity is often a barrier to achieving these synergies.

Limited awareness and capacity gaps produce the third key challenge, which plays out at the operational level. Countries that have adopted isolated approaches for each sector have incompatibility among existing systems, which leads to obstructions at different operational levels – programme financing, beneficiary targeting, information management systems, and delivery and monitoring mechanisms. Funding structures at the national and international levels are still mainly divided along sectoral lines and provide few incentives and little flexibility for cross-sector planning. At the administrative level, fragmented approaches have set up parallel systems and different methodologies for adequately reaching beneficiaries, despite the potential overlap of vulnerable and poor people living in rural areas, who could benefit from income support but also from CCA/M and DRR/M interventions. Putting in place national registries that include data on the whole population and serve as the basis for identifying groups of beneficiaries across sectors would be a useful step in identifying gaps in coverage as well as ascertaining vulnerable households that would benefit from complementary interventions. There are also striking similarities between sectors regarding modalities for delivering support; cash and in-kind transfers, subsidies, insurance, public works, livelihood training and business development often span interventions in the three sectors. While there are some overlaps in ministries and organizations working on more than one issue (e.g. Ministry of Agriculture on public works programmes and climate management), more often institutional roles and mandates limit

the scope for cross-sectoral linkages. Innovative solutions and cross-sectoral leadership will be needed, which are further discussed in the opportunity section below.

Given these challenges, it is critical for policy-makers to highlight the added value of coordination and the complementarity of different sectoral approaches for climate risk management, and to establish mechanisms through which this can be achieved. The following section focuses on three potential ways to pursue improved coordination and coherence across sectors.

3.2 Opportunities for integrating social protection and climate risk management

This section focuses on three key opportunities in which coherence across social protection, CCA/M and DRR/M can be made more effective, translating global commitments into national policies, effective programmes and evidence generation.

MONGOLIA | FAO Mongolia Country Office has implemented several emergency programmes in response to severe dzuds to try to mitigate the devastating impact on the poorest livestock herders and their families.

3.2.1 Translating global commitments and best practices into national policies and programmes

Although there are several frameworks at the global and regional levels that can help countries adopt more integrated approaches to climate risk management, their effective transition into national policies and programmes is still limited. This section explores global processes and commitments to promote greater integration, while identifying some best practices at regional and national levels.

At the global level, the Sendai Framework for Disaster Risk Reduction highlights the need to promote and support the development of "social safety nets as disaster risk reduction measures linked to and integrated with livelihood enhancement programmes in order to ensure resilience to shocks at the household and community levels". Following the World Humanitarian Summit in 2016, the scope for more integration between social protection and humanitarian assistance, particularly in the context of cash-based interventions and shock-responsive social protection, is also now increasingly promoted across both sectors (e.g. The Cash Learning Partnership, 2014; High Level Panel on Humanitarian Cash Transfers, 2015). Additionally, the United Nations Climate Resilience Initiative (Anticipate, Absorb, Reshape, or A2R) launched at COP21 Paris in 2015, explicitly positions social protection as a key intervention to increase the capacity of people to absorb climate shocks. Nevertheless, more policy attention must be placed on how social protection's role in reducing vulnerability to poverty and risk ties in with and complements the objectives of strategies to reduce vulnerability to climate risk, particularly DRR and CSA. Discussions at global level need to raise awareness and increase visibility of the complementary roles that these sectors play in allowing vulnerable people to manage climate risks and to then engage in more resilient livelihood strategies.

A clear demand for this integration comes from the country level, particularly in relation to building resilience of the rural poor. Among the developing countries that specified adaptation commitments or actions in their INDCs, 90 percent make reference to the agriculture sector and 30 percent specifically refer to CSA (FAO, 2016f). Given this focus, and the fact that two-thirds of the world's extreme poor (750 million) depend on agriculture for their livelihoods (FAO, 2016a), it is pertinent to incorporate policies addressing underlying poverty, food insecurity and vulnerability to climate risks into national policies aiming to promote adaptation and mitigation in the agriculture sector. This includes integrating or linking social protection and insurance mechanisms as necessary preconditions to implement CCA strategies for smallholders in National Adaptation Plans or Nationally Appropriate Mitigation Actions. It is also important to ensure that adaptation and mitigation strategies not only go hand in hand with sustainable poverty reduction interventions, but that they avoid any unintended negative consequences (e.g. promoting livelihood transformation or uptake of new technologies with no protection from the risks associated with them). Similarly, existing coordination frameworks and

mechanisms should be used, rather than introducing new ones and duplicating efforts. For instance, to coordinate efforts in combating hunger, countries such as Bangladesh (Food Planning and Monitoring Committee) and Mexico (National Crusade Against Hunger) have established multisectoral coordination bodies that include representation from agriculture and social protection sectors (Gordillo *et al.*, 2016 in FAO, 2016d).

There are several best practices that can pave the way for raising awareness and serve as reference points in this regard. On the DRR/M side, Kenya's HSNP – described in Section 2 – has, from the start, been an integral part of the Ending Drought Emergencies Framework, which was put in place as the national response to the regional effort led by the Intergovernmental Authority on Development to reduce the risk of humanitarian crisis following the 2011 drought. On the CCA/M side, Paraguay's Poverty, Reforestation, Energy and Climate Change project (PROEZA) specifically aims to utilize the national CCT programme to promote the adoption of ecosystem-based adaptation practices in agroforestry by poor smallholder farmers in areas with high levels of deforestation (see Box 9). In Latin America and the Caribbean, the Community of Latin American and Caribbean States developed its Regional Strategy for Disaster Risk Management in the Agricultural Sector and Food and Nutrition Security with support from FAO and United Nations Office for Disaster Risk Reduction (UNDRR), which includes social protection mechanisms as a key element for risk reduction through early action.

To translate global processes and best practices into the systematic integration of policy and programmes and reduce fragmentation across sectors at national level, strong coordination among international development actors is key.

3.2.2 Opportunities in programme design

As global frameworks are translated into regional and national agendas, attention needs to be placed on adequate programme design and effective operationalization. With regard to integrating climate risk management into programme design, social protection programmes need to be informed by potential climate risks to ensure that they can continue to fulfil their key functions of preventing, and protecting people from livelihood risks in the context of a changing climate (Davies *et al.*, 2009). This needs to go beyond "shock response" alone, as the programme design and implementation mechanisms also need to be sensitive to predictable weather-related seasonal patterns of production and consumption, as well as climate extremes. For example, the timing of support through social cash transfers, as well as the size or type of the transfer, should be adapted in order to reduce the risk of predictable seasonal food gaps turning into food crisis situations (Holmes and Costella, 2017). Indeed, as pointed out in Section 2, incorporating current and future climate risks into social protection programming also needs to include a focus on transforming productive livelihoods in line with changing climate conditions and enhancing resilience building, as opposed to merely reinforcing coping mechanisms (Berhane-Weldegebriel and Prowse, 2013; Johnson *et al.*, 2013). This requires broadening the vision of social protection targeting approaches, which should include not only current vulnerability but also projected future vulnerability and long-term sustainability of livelihoods (Heltberg *et al.*, 2009; Johnson and Krishnamurthy, 2010).

Recent innovations in programme design also highlight that there is great potential for programmatic linkages and synergies between environmental and development objectives, which require more active engagement and dialogue among policy-makers in the respective fields (Rodriguez *et al.*, 2011). Brazil's *Bolsa Verde* programme, for example, delivers payments for ecosystem services using CCTs – a mechanism also used in social protection – to promote environmental outcomes. Furthermore, in social protection programmes where complementarities already exist, they could be explored and promoted more actively. For example, cash-for-work programmes targeted at the working-age poor already incorporate vulnerability reduction measures that contribute to DRR and CCA/M objectives in their design in many countries, such as

soil and water conservation through tree planting, climate proofing infrastructure, and construction of terraces, bunds and irrigation channels (Kuriakose *et al.*, 2012). India's Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) or Ethiopia's PSNP, for instance, have strong DRR and CCA/M objectives in their asset-building components and the timing of the activities is planned according to seasonality to reduce climate-related food insecurity (Tefera *et al.*, 2015; Steinbach *et al.*, 2016).

Enhanced shared planning at the stage of programme design could address some gaps. For example, a weakness detected in a range of cash-for-work programmes is the need to develop a more solid theory of change on how community assets are expected to impact the resilience of communities, as well as individual livelihoods (McCord, 2013). Indeed, cash-for-work programmes and payments for ecosystem services offer clear opportunities for synergy but the distinct final objectives of these two similar approaches should not be underestimated. More active knowledge sharing among DRR/M, CCA/M and social protection actors could help in filling this gap, as DRR/M and CCA/M interventions have achieved important results in building community resilience, while social protection programmes have been shown to be a key tool to move people out of poverty. The comparative advantages of both sectors could strengthen these types of programmes to ensure they contribute to both poverty reduction and adaptation (Kuriakose *et al.*, 2013).

Another positive impact of shared planning could be to reduce the likelihood of unintended consequences of social cash transfers that could undermine the resilience of livelihoods, as well as the environment. For example, an unintended consequence could be if cash transfers allowed people to engage in new income-generating activities that are dependent on the exploitation of natural resources in already depleted environments (Berhane-Weldegebriel and Prowse, 2013). Social assistance programmes, if implemented in isolation, can also maintain people in livelihoods or locations that are highly precarious and vulnerable to climate risks. Assessing potential risks in a forward-looking social protection

CHINA | A farmer carries the harvest from fields of rice paddies in the Valley of Guilin.

agenda, however, would aim to support vulnerable households in combination with complementary support – such as livelihood training or enterprise grants – to shift into more sustainable livelihoods (Davies *et al.*, 2009; Kuriakose *et al.*, 2012; Johnson *et al.*, 2013). This underlines the fact, once again, that while social protection is a key intervention needed to meet people's acute needs and provide them with predictable and reliable support, social protection interventions should be part of a wider coordinated strategy that aims to reduce vulnerability in the long term, in tandem with other programmes and services.

As mentioned in Section 3.1, social protection, climate-related programmes and disaster response programmes do not necessarily target the same groups of people, nor do they use the same targeting mechanisms. Social protection programmes often target poor and vulnerable households using wealth and income indicators (e.g. means test, proxy means test, household economic analysis, often combined with categorical

targeting or community-based validation). Climate-sensitive targeting typically uses area- and household-level data on climate exposure to inform the targeting as well as distinguishing the transitory poor from the chronic poor, for instance, in places where climate-related crises are likely to occur and for which the rapid scaling up of programmes would be required (Kuriakose *et al.*, 2013). For disaster response, geographic targeting is often used to deliver assistance to affected households, particularly when combined with other targeting methods.

Recent investments in the social protection sector to establish infrastructure for targeting, data management and delivery have the potential to be used by the DRR/M and CCA/M sectors for pro-poor interventions. For example, social registries contain data on the population below, or just above, the poverty line. They are important cross-sector coordination tools as they can be utilized to collect census-like data, which can then be used by a range of programmes in a dynamic manner to target eligible groups and feed information back into the system. Indeed, for the DRM and CCA sectors, such registries can be an important mechanism to identify individuals or households that are highly vulnerable to climate risks, due to their geographical location and the socio-economic or demographic conditions. Having information systems that can be accessed by different programmes reduces the cost of data collection compared with fragmented approaches and can facilitate coordination and complementarity of different interventions (Leite *et al.*, 2017). In Brazil, the social registry *Cadastro Único* was used by the Ministry of the Environment to target extremely poor households for the *Bolsa Verde* cash transfer programme, which had the dual objective of poverty reduction and conservation through the more sustainable use of natural resources (WWP, 2017).

With regard to disaster preparedness and response, Section 2 highlighted how elements of established and well-functioning social protection systems can be linked to EWEA mechanisms. Several early actions can be taken, based on forecast information, and selected on the basis of their effectiveness, such as the pre-positioning of relief items, distribution of goods, etc. In countries where social protection has significant coverage and where its systems and infrastructure are well-functioning (i.e. social registries and cash-based delivery systems), early support to the affected population can be channelled through existing systems. To deliver rapid assistance in anticipation of, or after, a shock, the registries should ideally include information that allows programmes to locate households quickly (e.g. Geographic Information System data, addresses) (O'Brien *et al.*, 2018).

Efforts to promote cross-sectoral linkages need to be accompanied by financing arrangements that allow or even incentivize them. Sectoral funding streams, where budgets are earmarked for specific programmes and types of interventions, can be an obstacle for greater integration. The co-financing approach used within the PROEZA programme can be a good foundation for effective coordination in cross-sectoral programmes. In the case of disaster response, building contingency funds and agreeing on delivery mechanisms can reduce the amount of time needed to access and disperse these resources. To incentivize cross-sectoral interventions, governments can earmark funds for projects that need to be put forward jointly by different sectors (O'Brien *et al.*, 2018).

The areas above highlight the different types of actions that are needed to reduce the vulnerability of poor people in rural areas to climate risks. First, social protection programmes themselves need to become more climate-sensitive in their design to ensure they achieve their objectives of reducing poverty and vulnerability in a climate-sensitive way, as livelihoods and food security are directly dependent on the climate. Second, intersectoral linkages, shared administration, infrastructure and innovations in financing are needed to provide more comprehensive support for long-term livelihood adaptation, as well as a more effective disaster response. A few entry points were identified earlier in this paper, based on existing evidence and experience.

3.2.3 Generating evidence for better integration

As highlighted throughout this paper, there are still important knowledge gaps to be filled to fully understand how linkages between sectors can increase the capacity of people to manage climate risks. Following this analysis, two key evidence gaps have been identified that need to be addressed to inform policy and programming in this area:

- Need for long-term evidence on the impact of social protection programmes on the uptake of climate-resilient livelihoods; and
- Need to understand the types of linkages needed across sectors, depending on the context-specific risk, vulnerability profile and poverty level of a given population.

Regarding the first point, while one contribution of social protection is to provide a "buffer" for vulnerable rural households in the transition towards more climate-resilient livelihoods (either through implementing risk vulnerability reduction measures, adopting climate-smart technologies, or through livelihood transformation into non-farm income-generating activities), there is little evidence yet to suggest that it effectively functions in this way – particularly for households close to, or below, the poverty line. There is evidence regarding the contribution of income support to accumulating assets and to increasing productivity and income (see Mariotti *et al.*, 2016, for an overview), but there is enormous scope for building evidence on whether these impacts continue after programme support ends, particularly in the case of short-term projects. The importance of an enabling environment (e.g. access to markets, access to basic services) has been raised (Devereux and Sabates-Wheeler, 2011), but the way programme evaluations are designed provides little scope for gathering the evidence necessary to understand what types of contextual factors are relevant for sustainable escape from poverty or what the long-term impacts of interventions are, including in contexts of climate vulnerability (Devereux *et al.*, 2013b; Hansen *et al.*, 2018). This is a relevant area that needs exploring, particularly to understand how project-based, small-scale approaches can be scaled up to the national level (Samson, 2015).

Even when rural households have managed to stabilize income and protect their assets – thus increasing resilience – there will always be shocks, particularly in contexts where climate extremes are predicted to increase so much in frequency and severity that people will be unable to cope unless additional protection is provided. Delivering disaster assistance through social protection systems is one area that has shown potential to improve delivery within contexts where social protection systems are well-established, functioning and have large enough coverage. However, more evidence is needed on whether the disaster assistance delivered (through social protection or the humanitarian sector) manages to adequately protect people from the negative impacts of shocks. There are currently a great number of initiatives that aim to test, set up or build evidence about shock-responsive social protection; however, this is a relatively new area that has gained a lot of traction only in recent years. The evidence base on shock-responsive systems is currently heavily focused on the impacts on the systems' abilities to deliver response faster, with attention given to technical aspects (e.g. forecasting, trigger mechanisms, coordinating delivery mechanisms through which assistance can be delivered), rather than on the impact on the recipients. This area warrants further research to ensure that shock-responsive programmes are effective enough to protect people from the impoverishing impacts of climate shocks. This knowledge base needs to be completed with evaluations of the ability of these systems to sufficiently protect vulnerable people from impacts that can exacerbate poverty and vulnerability – especially as there is evidence (albeit scarce) that it might not be sufficient (del Ninno *et al.*, 2001; Noy and Patel, 2014; Farhat *et al.*, 2017). Additionally, while the evidence from a few well-established shock-responsive programmes is certainly compelling, caution should be taken not to overburden social transfer programmes that lack the capacity and robustness of systems to deliver emergency response.

The other area that requires more evidence building relates to the different contexts and types of linkages where more integration among social protection, CCA and DRM makes sense. While the objective of more coherence and coordination between the three sectors is to reduce overall vulnerability to climate shocks and stresses and improve the capacity of people and systems to manage risks better, the nature of those linkages differs depending on the sector. As highlighted in this paper, social protection can contribute to long-term climate resilience by providing vulnerable households with the capacity to mitigate climate risks, either through consumption protection by means of regular cash transfers, or through insurance mechanisms that reduce the climate-induced risks for production and income. This would require linking safety nets more effectively with programmes that promote productive inclusion, either through improved agricultural technologies or through access to non-farm enterprises or employment.

While these linkages can build livelihood resilience and contribute to DRR by reducing vulnerability, the functionality of linking disaster preparedness and response to social protection systems is different in nature. It requires closer integration between the sectors to either deliver disaster assistance through social protection systems or use the existing delivery mechanisms of social protection programmes to channel humanitarian assistance. However, there is a need for better understanding of the types of contexts in which integration between social protection and disaster preparedness and response works best. In contexts where social protection targets food-insecure households that are vulnerable to climate risks, additional humanitarian assistance – e.g. during extreme droughts – through the social protection system might work well if it is already set up to address drought-induced food insecurity. In contexts where social protection targets categorically vulnerable groups, such as households with vulnerable children or older people, the system might not be able to reach the population affected by the shock. In other contexts, such as fragile and conflict-affected states, delivering humanitarian assistance through government-run social protection programmes might not be adequate as it jeopardizes the humanitarian principles (humanity, neutrality, impartiality and independence) (Haider, 2013; Ovadiya *et al.*, 2015).

SOUTH SUDAN | Seed fair in Rumbeck East where beneficiaries receive 3,500 South Sudanese Pounds (about 10 USD) to purchase peanut, sesame, vegetable and sorghum seeds from traders, who later take the vouchers in exchange for cash.

It is therefore necessary to gain a more nuanced understanding of the types of contexts and shock responses in which linkages between disaster preparedness and response and social protection can add value and build resilience to climate shocks. This evidence is also critical in making a convincing argument for when and how social protection can be an important ally for the CCA and DRR/M sectors in achieving the objectives set out by the 2030 Agenda for Sustainable Development, the Paris Agreement and the Sendai Framework for Disaster Risk Reduction. This depends on the type of systems that are in place in different countries as well as the main drivers of vulnerability for the rural poor in a given context.

3.3 Conclusions

Within this paper, the relationship between climate risk management and social protection has been explored at length. The document complements different frameworks discussing the nexus between climate change and poverty reduction. Given the imminent challenges climate change poses for poverty reduction and sustainable development, it is necessary to promote coherent and integrated climate risk management approaches that address the underlying causes of vulnerability to poverty and food insecurity, as well as to increase the capacity of people to cope and adapt to climate shocks. Protecting the rural poor from the negative impacts of climate risks is imperative in order to reach FAO's strategic objectives.

In recent years, FAO has been working towards scaling up its efforts around social protection and climate risk management. These efforts include: supporting several national governments in expanding the coverage of social protection to poor farmers, foresters, herders and fishers; strengthening coherence between social protection and agricultural and disaster management policies; making social protection programmes more nutrition-sensitive; and building risk-informed social protection programmes. FAO has also been working towards enhancing early warning systems, rapid reaction mechanisms and contingency planning for natural hazards and related shocks and stresses, and to building a large body of evidence regarding the impacts of social cash transfers on local economies, food security and nutrition, agricultural production, human capital and risk-taking, among others.

On the climate side, FAO has developed policies that support farmers to accelerate the adoption of tools and practices to reduce climate risk and disaster impacts and enhance adaptation capacities. These include: climate change impact and vulnerability assessments for crops, livestock, fisheries and forestry (as well as for those who depend on these sectors for their livelihoods); technical solutions to improve weather and climate forecasting; predicting changes in aquatic ecosystems (e.g. salinity, oxygen and pH) and communicating these to farmers; and best practices to improve natural resource management (e.g. sustainable land and water management, soil conservation, and resilient crops, trees and breeds).

Social protection is an integral part of the FAO Strategic Framework, but in order to meet the pressing challenges posed by worsening climatic patterns and the growing gap between humanitarian appeals and response capacity, stronger sectoral coordination and alignment among social protection, DRR/M and CCA/M is essential. Within this scenario, the following points should be considered as key elements for the way forward:

- Increased use of social protection instruments to deal with the negative effects of climate risk. This would include: using social protection information systems (i.e. social registries) to inform the identification of DRR/M and CCA/M programme participants; using social protection delivery systems (i.e. cash transfers) to channel support for DRR/M and CCA/M interventions; and designing cross-sectoral programmes with the aim of tackling poverty and vulnerability to climate risk.

- Enhanced evidence-generating efforts with the aim of designing coordinated interventions able to build synergies between social protection systems (including both social assistance and

social security) and programmes aiming at promoting the uptake of CSA and DRR practices by poor rural households. This would include using social transfers and social insurance as incentives for the uptake of sustainable agricultural practices while ensuring the poorest and most vulnerable farmers are included in the transition towards resilient agricultural systems

- Leveraging corporate expertise in risk analysis and early warning systems to inform the design of social protection systems. This would include: using early warning systems to determine at-risk areas and adjusting provision of social protection programmes when pre-defined thresholds are reached; informing the design of social protection programmes and regularly updating system features to maximize efficiency and effectiveness; and expanding the data available in social registries in order to adapt targeting criteria to also include indicators of vulnerability to climate hazards.

- Leveraging corporate expertise in crop and livestock insurance to help national governments to develop agrosocial insurance products to support poor and vulnerable rural households in coping with the impacts of natural hazards on their livelihoods.

Although stronger coordination is needed, FAO is already looking at the joint objectives of poverty reduction and climate resilience. For instance, FAO recently supported the development of an innovative programme, financed by the Green Climate Fund, which aims to meet both objectives: Paraguay's PROEZA project.

Box 9. Paraguay's Poverty, Reforestation, Energy and Climate Change (PROEZA) project

Paraguay's PROEZA project is a five-year, USD 90 million initiative, developed jointly by FAO and the Government of Paraguay, that uses an innovative territorial approach towards climate change resilience in targeted areas. The programme enables the poorest households to produce food while adopting low-emission and climate-resilient methods through Tekoporã CCT – the government's social protection scheme.

PROEZA provides technical and financial support to 17 100 poor and extremely poor households with the highest levels of social and environmental vulnerability. These are located in 64 municipal districts in eight departments of Paraguay's Eastern Region. The project covers a total land area of 10.9 million hectares (ha), of which only 19.5 percent (2.1 million ha) remains covered with forests.

PROEZA aims to support the adaptive capacity and resilience of these households by supporting the diversification of production and income-generating activities through the provision of income support, as well as technical and social assistance for the establishment of climate-smart agroforestry production systems. The technical and financial support to establish agroforestry systems and close-to-nature forest plantations as well as the management of forest regeneration is designed to complement the monetary assistance poor households receive through Tekoporã CCT. PROEZA will top up the Tekoporã cash transfer over five years with a payment conditional on continued adoption in the expectation that, in the future, the agroforestry production system promoted through the programme will generate sufficient income for the households. Apart from the support provided to poor and extremely poor households, PROEZA also provides concessional credit to the owners of medium-sized private land, which aims to incentivize private investments in reforestation.

PROEZA is a promising example of an integrated approach to jointly tackle issues relating to chronic poverty, deforestation and unsustainable agricultural practices, which could further perpetuate the high levels of vulnerability to climate risks of extremely poor households in Paraguay. Implementing this large-scale project along with evaluation of its impact and sharing results with the international community should pave the way to more systematic integration of social protection and climate risk management.

FAO has also recently started to expand the scope of its rigorous impact evaluations to fill some of the knowledge gaps identified in the previous subsection and to assess how access to social protection can influence the management of natural resources within agricultural production systems in the context of climate change, while promoting the uptake of CSA practices.

In terms of promoting the use of social protection systems for disaster preparedness and response, FAO is working in close collaboration with key development partners, including UNICEF, the World Food Programme (WFP), the United Nations High Commissioner for Refugees and the World Bank, as well as with donors such as the European Commission's Directorate-General for International Cooperation and Development (DEVCO) the Directorate-General for European Civil Protection and Humanitarian Aid Operations (ECHO), and the UK's Department for International Development (DFID), to support national governments in terms of capacity building, technical assistance and evidence-based policy design. Given the fact that the use of social protection systems for disaster preparedness and response is a relatively new practice, strong coordination and alignment are crucial in order to avoid overburdening national systems. An example of these joint efforts is in Southeast Asia, where FAO is leading a joint programme in partnership with UNICEF, the International Labour Organization (ILO), WFP and UNISDR aimed at developing risk-informed and shock-responsive social protection systems among Association of Southeast Asian Nations (ASEAN) Member States. The first phase of this programme is focusing on four countries: Cambodia, Myanmar, the Philippines and Viet Nam.

FAO is also working towards changing the way extreme natural hazards are managed using the EWEA approach. Working with national governments and humanitarian, development and scientific partners, FAO monitors risk information systems and translates warnings into anticipatory actions. Every quarter, FAO's EWEA report on food security and agriculture ranks risks by their likelihood and potential impact and identifies the best interventions. When the risk reaches certain pre-identified thresholds, FAO releases financial resources via its Special Fund for Emergency and Rehabilitation Activities. The fund supports tailored plans that are rapidly put into place, drawing on FAO's technical knowledge and expertise in supporting rural livelihoods. In the last two years, EWEA activations supported rural households in better coping with the effects of natural disasters in Colombia, Ethiopia, Kenya, Madagascar, Mongolia, Niger, Somalia and Sudan. As of late 2018, FAO was exploring the feasibility of channeling EWEA activation through national social cash transfer programmes. Within this framework, FAO is currently evaluating an early action intervention in the Philippines, in partnership with the Mindanao Local Government Units implemented in order to minimize the negative effects of the forecasted drought that reached its peak in early 2019. Similarly, in Lesotho, in partnership with UNICEF and ECHO, FAO has recently started a joint programme to strengthen disaster preparedness and response through national social protection systems.

FAO contributes a key added value in helping national governments introduce a climate risk lens into the design of social protection programmes and promote coherent and integrated climate risk management approaches that address the underlying causes of vulnerability, poverty and food insecurity, as well as increasing the capacity of people to cope and adapt to climate shocks.

While there are many gaps and remaining obstacles to ensure adequate integration of these sectors, the aim of this paper was to highlight the entry points as well as the different ways in which global frameworks can be rapidly translated into concrete actions.

Glossary

Adaptive capacity – The combination of strengths, attributes and resources available to an individual, community, society or organization that can be used to prepare for and undertake actions to reduce adverse impacts, moderate harm or exploit beneficial opportunities (IPCC, 2012).

Agriculture sectors – For FAO, refers to crop-based farming systems and livestock systems, including rangelands and pasturelands, forestry, fisheries and aquaculture and the related resources they use (water, land, soils, genetic resources and biodiversity). When the discussion concerns a specific agriculture sector it is specified in the text.

Cash-for-work – Also called "temporary employment schemes" or "public works" programmes, targeted to poor or vulnerable working-age people who receive a payment (usually below the minimum wage) to engage in work activities benefiting the community.

Climate change – A statistically significant variation in either the mean state or the variability of the climate that persists for an extended period (typically decades or longer). Climate change may be due to natural internal processes or external pressures, or to persistent anthropogenic changes in the composition of the atmosphere or in land use (IPCC, 2014).

Climate change adaptation – In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate (IPCC, 2014).

Climate extreme (extreme weather or climate event) – The occurrence of a value for a weather or climate variable that is above (or below) a threshold value near the upper (or lower) end of the range of observed values for that variable (IPCC, 2014).

Climate risk management – A broad range of actions required for building resilience, which range from risk prevention and reduction to mitigation and long-term adaptation.

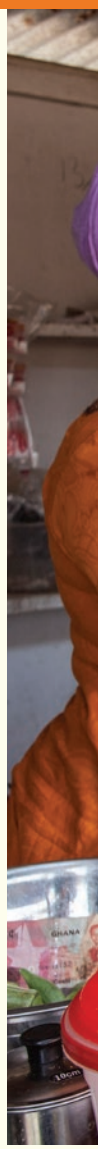
Climate-smart agriculture – An approach that helps to guide actions needed to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate. CSA aims to tackle three main objectives: sustainably increasing agricultural productivity and incomes; adapting and building resilience to climate change; and reducing and/or removing greenhouse gas emissions, where possible (FAO, 2014).

Climate shock – An extreme climate-related event that occurs at a specific time and place. The term covers a range of quick-onset shocks, such as avalanches or tropical storms, with different levels of predictability.

Climate variability – Variations in the climate (as measured by comparison with the mean state and other statistics such as standard deviations and statistics of extremes) at all temporal and spatial scales beyond those of individual weather events. Variability may be due to natural internal processes within the climate system (internal variability) or to variations in natural or anthropogenic external forcing (external variability) (IPCC, 2014).

Coping capacity – The ability of people, organizations and systems, using available skills and resources, to manage adverse conditions, risks or disasters. The capacity to cope requires continuing awareness, resources and good management, in normal times as well as during disasters or adverse conditions. Coping capacities contribute to the reduction of disaster risks (UNDRR, 2017).

Disaster – Severe alterations in the normal functioning of a community or a society due to hazardous physical events interacting



GHANA | Thanks to cash transfers, some of the Livelihood Empowerment Against Poverty (LEAP) Programme beneficiaries managed to open little shops in the local markets.

with vulnerable social conditions, leading to widespread adverse human, material, economic or environmental effects that require immediate emergency response to satisfy critical human needs and that may require external support for recovery (IPCC, 2012).

Disaster preparedness – The knowledge and capacities developed by governments, response and recovery organizations, communities and individuals to effectively anticipate, respond to and recover from the impacts of likely, imminent or current disasters (UNDRR, 2017).

Disaster risk – The potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity (UNDRR, 2017).

Disaster risk management – The organization, planning and application of measures preparing for, responding to and recovering from disasters (UNDRR, 2017).

Disaster risk reduction – Measures aimed at preventing new, and reducing existing, disaster

risk and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development (UNDRR, 2017).

Early warning system – An integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication, and preparedness activities systems and processes that enables individuals, communities, governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events (UNDRR, 2017).

Exposure – The situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas (UNDRR, 2017).

Hazard – A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation (UNDRR, 2017).

Maladaptation – Any changes in natural or human systems that inadvertently increase vulnerability to climatic stimuli; an adaptation that does not succeed in reducing vulnerability, but increases it instead (IPCC, 2012).

Mitigation (of climate change) – Human intervention to reduce the sources or enhance the sinks of greenhouse gases (IPCC, 2014).

Mitigation (of disaster risk and disaster) – Lessening of the potential adverse impacts of physical hazards (including those that are human-induced) through actions that reduce hazard, exposure and vulnerability (IPCC, 2014).

Poverty trap – Understood differently across disciplines. In the social sciences, the concept, primarily employed at the individual, household, or community level, describes a situation in which escaping poverty becomes impossible due to unproductive or inflexible resources. A poverty trap can also be seen as a critical minimum asset threshold, below which families are unable to successfully educate their children, build up their productive assets, and get out of poverty (IPCC, 2014).

Resilience – The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management (UNDRR, 2017).

Social assistance – Direct, regular and predictable cash or in-kind transfers that are means-tested, or categorically targeted programmes for vulnerable groups (e.g. senior citizens, children). The programmes are non-contributory and financed through taxes and/or international development aid.

Social safety nets – Often used interchangeably with social assistance, refers to non-contributory provision of benefits (cash or in-kind).

Social protection – A set of policies and programmes that provide cash or in-kind support to help people manage risks by smoothing consumption, thereby preventing the adoption of negative risk-coping strategies and their impoverishing impact.

Social protection systems – Definitions vary across different institutions and contexts, but generally describe a set of integrated social protection programmes that provide comprehensive protection from a range of social, economic, life cycle-based and climate-related risks.

Vulnerability – The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards (UNDRR, 2017). It is referred to as social vulnerability when the objects discussed are people (Adger, 1999).

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Given the imminent challenges climate change poses for poverty reduction and sustainable development, the need for coherent and integrated climate risk management approaches that address the underlying causes of vulnerability – and that simultaneously increase the ability of the rural poor to adapt to and cope with natural hazards - has never been more pressing.

Climate change is accelerating the frequency and intensity of extreme natural hazards and those living in rural areas are disproportionately affected. Life in high-risk geographical locations, heavy reliance on agriculture and natural resources, and limited coping capacity as a result of low income, lack of savings, weak social networks, low asset bases are all contributing factors.

Protecting poor and vulnerable small-scale producers from the negative impacts of climate risks is necessary to effectively carry out FAO's strategic objectives and achieve Sustainable Development Goals 1 (ending poverty) and 2 (zero hunger). As shown in this report, managing climate risks through social protection is a valid and effective investment to safeguard the livelihoods of small-scale producers and to strengthen their essential role in ensuring food security across the globe.

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