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Development Report

Financing climate adaptation and resilient agricultural livelihoods

by
Leslie Lipper
Romina Cavatassi
Ricci Symons
Alashiya Gordes
Oliver Page

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Contents

Abstract

Climate change is imposing a transformative process on agricultural and food systems, threatening the livelihoods of people dependent on them, which includes a large proportion of the world's poor people. Moving to a process that contributes to improving rather than endangering livelihoods is the challenge that climate change adaptation and resilience-building efforts currently face. Transformative adaptation that addresses the interactions between food system components and climate change is an essential element of effective transformation of food systems, which requires financing that is adequate, accessible and appropriate. Expanding climate finance resources from the public sector and creating an incentivizing environment for private sector investments is needed to attain adequate levels of financing. Accessibility of finance is affected by the rules and procedures for obtaining public sector finance, their capacity to use existing administrative structures, and better targeting of underserved but vulnerable populations and activities. Appropriate finance must be designed to address specific characteristics of adaptation investments, such as risk, delayed returns, high social values, and new and unproven activities. Using blended finance integrated with development finance can generate financing appropriate to the investment needs.

Keywords: climate change adaptation, climate finance, food system transformation, rural poor, small-scale agriculture, resilience

1. Introduction

Food systems and the way they function determine not only the quantity and quality of the food supply and people's diets, but also the quality, sustainability and resilience of the livelihoods of a large proportion of the world's population. This is particularly true for poor people in rural areas, who are the focus of the present paper. Climate change threatens these livelihoods and imposes the need for systematic and transformative adaptation, which in turn calls for expanded and innovative financing.

By "livelihood," we mean a system of life in which people have access to food, education, security, basic infrastructure and standards of living in a measure that allows them to achieve a minimum level of well-being while sustaining their capability to choose between different options in life. In this paper, we are referring to livelihoods that are dependent on farming, fishing, forestry and herding, as well as the processing, storage, trading and distribution of food. These activities frequently do not generate a decent standard of living, as manifested in the higher incidence of poverty in rural areas compared with urban areas. The livelihoods of the rural poor are characterized by low productivity and low returns, uncertainty and instability, constraints in access to markets, employment and income sources, and a high degree of vulnerability to shocks arising from natural as well as socio-economic sources.

Rural small-scale producers and workers play an important dual role in local and national food systems, both as providers and consumers of food. Yet many of these rural families do not have secure access to a diversity of foods for a healthy diet. An estimated 3 billion people could not afford a healthy diversified diet in 2017, which included many rural poor families and people working in the agrifood sector (FAO 2020). After decades of progress, since 2015 we have been losing ground on achieving the objectives of eradicating hunger and improving nutrition embodied in Sustainable Development Goal (SDG) 2. This coincides with an acceleration in the loss of biodiversity, land degradation and increasing impacts of climate change to which the agrifood sector is a major contributor, responsible for approximately 37 per cent of global greenhouse gas emissions.

Climate change is imposing a transformative process on agricultural and rural systems and livelihoods. Increasing and more erratic temperatures and rainfall patterns, and increased incidence of extreme weather events such as droughts and flooding, tropical storms and major heatwaves pose an even stronger barrier to improving the livelihoods of poor people. Moving from a transformative process that threatens the livelihoods of the rural poor to one that contributes to improving them is the challenge that adaptation and resilience-building efforts are currently facing. Financing has a key role to play therein. Rethinking how we design, finance and implement actions and investments needed to improve the livelihoods of the world's rural population is fundamental to achieving the transformative adaptation and resilience-building needed in the agricultural and rural sectors, and in the overall food system, with the objectives of generating better livelihoods, improved environmental footprints and good nutritional outcomes.

The focus of this paper is on financing as a key mechanism to enable and incentivize the massive changes that transformative adaptation and the resilience it builds call for. Transformative adaptation means undertaking adaptation actions and investments that support and/or integrate with the ongoing transformative processes, leading to a series of investments and actions to improve rural livelihoods. This can be thought of as a "push factor" in the context of the International Fund for Agricultural Development's (IFAD) Rural Development Report 2021 framework, incentivizing change in the behaviour of international and national actors engaged in rural development and climate change adaptation in inclusive and equitable food system transformation. We argue that financing for adaptation and resilience needs to be adequate, accessible and appropriate to achieve alignment with adaptation and resilience needs, rural development and food system transformation processes. We focus on international public sector finance channelled through international financial institutions and multilateral development banks, and use examples from IFAD's experience to illustrate key points. International financial institutions, including IFAD, have been playing an important role in this sphere, and important lessons can be learned from this experience.

The rest of the paper is organized as follows. In section 2 we provide a short overview of climate risks and their actual or potential impacts on rural livelihoods, and strategies to improve them. Section 3 provides a discussion of the potential links between adaptation and transformative change to improve rural livelihoods,

and section 4 on the interaction between transformative adaptation and transformation of food systems. Section 5 goes into a discussion on the features of adequate, accessible and appropriate financing and what is needed to achieve them, using examples from IFAD's experience to illustrate the concepts. Section 5 concludes with recommendations on financing approaches to support transformative adaptation in the process of improving rural livelihoods and food systems.

2. Climate change impacts on ways to improve livelihoods of the rural poor

The effects of climate change are manifested in various forms such as temperature increases (on average and peak levels), increases in the number of hot days and hot nights, shifts in rainfall patterns, and increased incidence and severity of extreme events and natural hazards. Any of these can have significant effects on current rural livelihoods and their underlying assets and endowments, as well as the potential to improve them in the future.

Within the broader context of food system transformation, as outlined in figure 1, climate change is an external driver which affects agricultural production and the various components of food value chains, directly impacting the livelihoods of people working in those components and, ultimately, their food security and the sustainability and resilience of their livelihoods (IFAD and WUR, 2019).

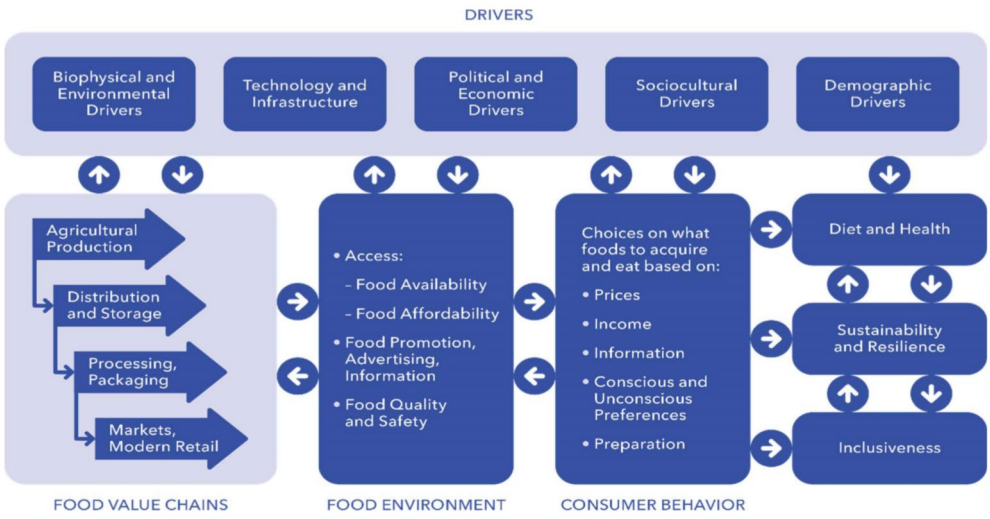
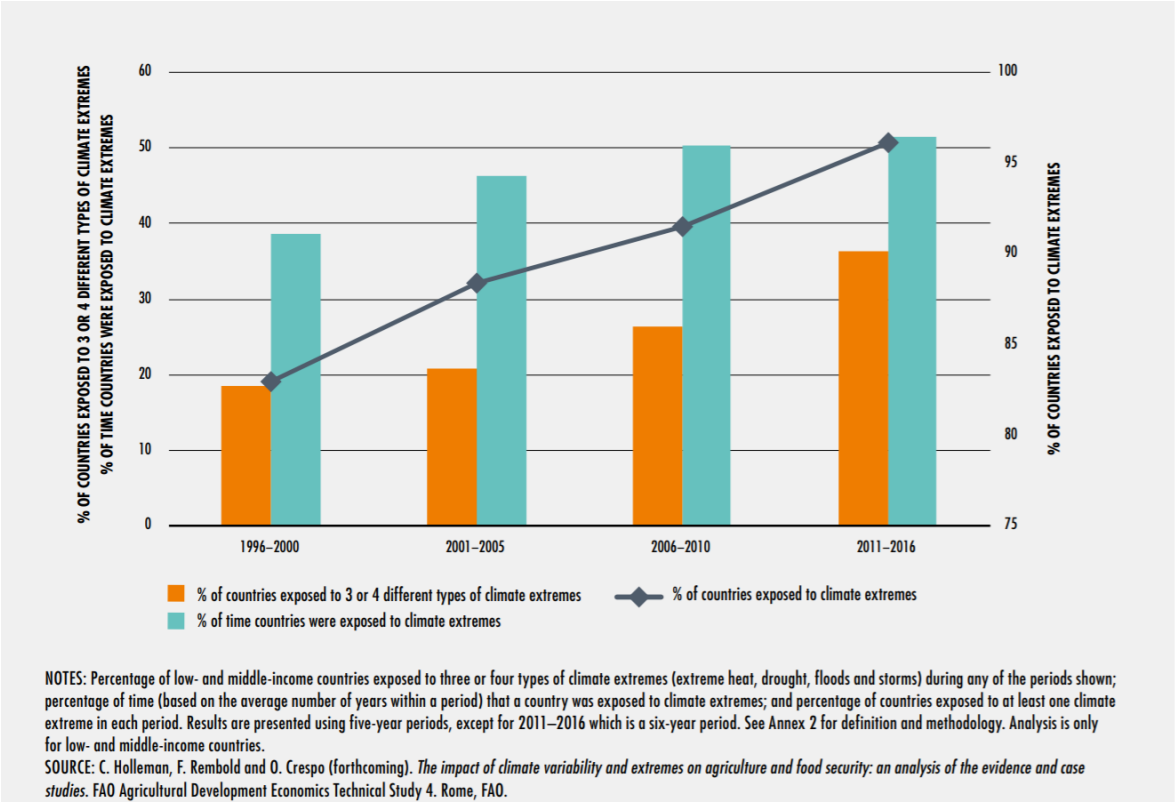


Figure 1: Conceptualization of a food system

High exposure to adverse weather events and low capacity to adapt to them results in damage or destruction of the already limited assets underlying livelihoods of the rural poor – including natural resources and human health. Recent studies indicate that climate change has already had a negative impact on crop yields at a global scale, and that adaptation to date has not been sufficient to offset these impacts – particularly at lower latitudes (Mbouw et al. 2019; Ray et al. 2019). However, these effects are quite unevenly distributed, with temperate zones potentially gaining, and tropical and sub-tropical zones mostly losing (Porter et al. 2014).

Increasing climate change impacts, together with conflicts, are key drivers of growing food insecurity, especially in Africa (FAO 2018). The incidence of extreme climate-related disasters (e.g. flood, drought, extreme temperatures, storms) increased significantly between 1990 and 2016 and accounts for more than 80 per cent of all internationally reported disasters (see figure 2).



NOTES: Percentage of low- and middle-income countries exposed to three or four types of climate extremes (extreme heat, drought, floods and storms) during any of the periods shown; percentage of time (based on the average number of years within a period) that a country was exposed to climate extremes; and percentage of countries exposed to at least one climate extreme in each period. Results are presented using five-year periods, except for 2011–2016 which is a six-year period. See Annex 2 for definition and methodology. Analysis is only for low- and middle-income countries.
SOURCE: C. Holleman, F. Rembold and O. Crespo (forthcoming). *The impact of climate variability and extremes on agriculture and food security: an analysis of the evidence and case studies*. FAO Agricultural Development Economics Technical Study 4. Rome, FAO.

Figure 2: Increased exposure to more frequent and multiple types of climate extremes in low- and middle-income countries

Source: FAO et al. (2018)

The same analysis indicates that 36 per cent of the countries that have experienced increases in the level of undernourishment since 2005 have also experienced extreme drought. In 2017, the average prevalence of undernourishment in countries with high exposure to climate risks was 3.2 per cent higher than that of countries with low or no risk, and there were 351 million more people undernourished in the countries with high exposure (FAO 2018).

There are several ways in which climate change is affecting the different dimensions of food security, nutrition and livelihoods. For example, in Ethiopia, Auci et al. (2018) find that the poorest farmers suffer the greatest decreases in crop-based income due to changes in water availability, since they have the lowest level of income diversification. Asfaw and Maggio (2018) found that in Malawi, significant increases in seasonal temperatures over the historical average had a detrimental effect on overall consumption (-17.9 per cent), food consumption (-29.8 per cent) and caloric intake (-22.2 per cent). These negative effects were even greater for households headed by women. Interviews with members of rural communities in the Peruvian Amazon (including indigenous communities) revealed that damage to crops and livestock from fires associated with changes in temperature and rainfall patterns was the greatest risk to livelihoods (Chavez Michaelson et al. 2020). Recent research by Alfani et al. (2020) in rural Zambia shows that households affected by the drought experienced a decrease in maize yield by around 20 per cent, as well as a reduction in income of up to 37 per cent. Among adaptation practices adopted, those that led to better resilience included livestock diversification, income diversification and the adoption of mechanical erosion control measures which increased water retention. Mechanical erosion control measures, which include soil and water conservation techniques, have been shown to have similar shock-buffering impacts in rural Tanzania (Arslan et al. 2017).

Decreasing precipitation and rising temperatures have had negative impacts on the availability of safe drinking water in rural areas of Bangladesh, which in turn leads to increased incidence of disease (Abedin et al. 2018). Impacts on accessibility of food and nutritional content threaten human health through changes in consumption patterns, food nutrient content and food safety. Rationing consumption in the wake of

climate change-driven reductions to food production to prioritize calorie-rich, but nutrient-poor foods is a common response in reducing food consumption (Bloem et al. 2010). The effects are a decrease in dietary quality and quantity, which are magnified by pre-existing vulnerabilities – and lead to long-term loss of health, productivity capacity and low incomes (Bloem et. al. 2010; Alderman 2010; Brinkman et al. 2010; Campbell et al. 2010; Sari et al. 2010). Heatwaves associated with climate change are a major source of health risks ranging from relatively minor heat rashes to life-threatening heat strokes (Lee et al. 2019).

Climate change also has an impact on the willingness and capacity to undertake investments that can improve livelihoods. Essentially, climate change increases uncertainty and risk, which in turn reduces incentives and willingness to invest. The effect of climate change in increasing exposure to risk among a population already highly vulnerable to food insecurity is likely to exacerbate the adoption of coping strategies that stymie economic growth potential. One of the most common of these strategies is where farmers shift to low-risk but low-return subsistence crops and reduce their investments in enhancing productivity due to higher risks of losses and catastrophic impacts on livelihoods (Dercon and Christiaensen 2011).

In an analysis of the adequacy of current adaptation efforts among small-scale farmers in developing countries, Thornton et al. (2018) surveyed 6,300 households across 21 countries and 45 sites. Their results indicate that across a wide range of locations and conditions, most agricultural households' adaptation actions are insufficient to allow for an improvement in their livelihoods or their ability to increase production to meet growing food demands. Successful cases of adequate adaptation were found to be dependent on high levels of collective action, organizational development and community awareness – i.e. the enabling environment (Thornton et al. 2018).

The negative effects on the assets and activities of the rural poor can be expected to intensify as climate change progresses. Model projections indicate increased reductions in crop productivity for a wide range of crops, from cereals to vegetables and fruits, through a variety of transmission mechanisms such as increased temperature, changes in the timing and amount of rainfall, and increased pest and disease pressures (Porter et al. 2014).

3. Transformative adaptation for improving rural livelihoods

The primary means of dealing with the threat climate change poses to rural livelihoods is through the process of adaptation, which the IPCC defines as:

> "The process of adjustment to actual or expected climate and its effects. In human systems, **adaptation** seeks to moderate or avoid harm or exploit beneficial opportunities."

Adaptation can thus be considered a necessary component of activities aimed at improving the livelihoods of the rural poor. In light of this, it is important to note that over recent years, greater attention has been paid to the linkages between climate change and development. This has been accompanied by an increasing awareness of the need for adaptation on the part of national policymakers. According to a recent analysis of national legislation on climate change adaptation, 85 countries passed a total of 133 adaptation laws and policies between 2012 and 2013 – constituting the most intense period of national legislation in this area (Nachmany et al. 2019).

A key policy instrument set up under the Paris Agreement of 2015 are the Nationally Determined Contributions (NDCs), which define each country's commitments to the adaptation and mitigation of climate change. To date, 75 per cent of countries' NDCs have adaptation targets, including 100 per cent of African countries and 92 per cent of Asian countries. Water, agriculture, and health are the sectors most frequently identified as "key priority sectors" and "vulnerable" in the NDCs (see FAO 2016b). The Koronivia Joint Work on Agriculture established under the United Nations Framework Convention on Climate Change (UNFCC) in 2017 is also generating calls for adaptation efforts which will likely be reflected in increased emphasis on agriculture and land-use change in the revision of countries' NDCs expected for 2021.

The sustainable development agenda is another global process reinforcing political will to move forward with adaptation. SDG 13 calls for urgent action to be taken to combat climate change and its impacts. It includes targets on increasing resilience and reducing vulnerability to climate change impacts, as well as mobilizing US$100 million per year in climate finance from 2020 onwards. Climate change also plays an important role in several other of the 17 SDGs. In their National Voluntary Reports outlining commitments and strategies for achieving the SDGs, over 30 countries reported that climate change impacts manifested in the form of droughts, agricultural pest incidence and extreme weather, which can affect the achievement of the targets of SDG 2, which include eradicating hunger, doubling the productivity of small-scale farmers and scaling up sustainable agriculture.

Demand for effective adaptation in the small-scale agricultural and rural sector is growing rapidly, and all indications are that it will continue to do so in the coming decades.

Adaptation policy and financing have developed in parallel to poverty reduction and development efforts, rather than as integrated components. At the global level, the discourse on the need for and means of financing adaptation emerged from the UNFCCC policy process. The science and concepts of adaptation have been developed under the aegis of the Intergovernmental Panel on Climate Change (IPCC). There has been an evolution of agencies and channels handling the financing of adaptation over time, with a prominent role for multilateral institutions. The Adaptation Fund, Special Climate Change Fund and Least Developed Country Funds were established in 2001 as trust funds managed by the Global Environmental Facility, and the Climate Investment Fund was established in 2008 with two trust funds that channel resources through multilateral development banks. Under the Paris Agreement, the Green Climate Fund was confirmed in its function as an operating entity of the Financial Mechanism of the UNFCCC with the ambition to channel a significant proportion of future climate finance from both the public and private sectors (Climate Focus 2016). The Paris Agreement acknowledged that developed countries must continue to take the lead in mobilizing climate finance.

At the national level, adaptation policies and financing are frequently managed by environmental ministries, whereas development policies and financing are handled by finance or dedicated development ministries. With regard to rural development, many policies concerning adaptation are also under the aegis of ministries of agriculture, therefore further complicating the coordination ideally required to ensure that adaptation policies in one sector are not counterbalanced by policies in other sectors and are financially and institutionally supported.

There is a fairly wide range of activities that might be considered under an adaptation strategy designed to support improved livelihoods and food security among the rural poor, and indeed a wide range of actions can be found in the adaptation experience so far. Adaptation strategies, which are part of climate risk management strategies, are geared towards increasing resilience, which is the ability of a system to respond or react to or cope with shocks. Resilience is thus determined by a combination of the presence of adaptive capacity with exposure to shocks and changes (Adger et al. 2005; Parry et al. 2007).

Three key adaptation approaches driven by different concepts are highlighted below.

No- and low-regrets adaptation options: These are adaptation measures that are very likely to deliver positive socio-economic benefits under any future climate scenario – i.e. an action that will have positive returns regardless of the level and type of climate risk imposed. Sustainable agricultural development in reducing the vulnerability of poor rural populations has aspects that may coincide with no- and low-regrets adaptation (IFAD 2016; Heltberg et al. 2009). Two aspects of sustainable agricultural development strategies stand out in this regard: (i) the importance of including local institutions in the participation and consultation for successful design and implementation of change on the ground; and (ii) the importance of well-functioning ecosystems services in farming systems, and more generally in rural areas, to underpin agricultural productivity and stability, as well as quality of life in rural areas.

Community-based adaptation: According to Noble et al. (2014, 847), “Community-based adaptation (CBA) refers to the generation and implementation of locally driven adaptation strategies, operating on a learning-by-doing, bottom-up, empowerment paradigm that cuts across sectors and technological, social, and institutional processes.” Community-based adaptation is a response to the importance of identifying locally rooted vulnerabilities to food insecurity and how they interact with new and uncertain hazards

imposed by climate change. In addition, it seeks to empower communities to identify their preferred options, which increases the likelihood of continued uptake after the project ends (Forsyth 2013).

Ecosystems-based adaptation: Ecosystems-based adaptation (EbA) was introduced by the Convention on Biodiversity in 2008 and has since gained much traction and many examples of implementation in the field. The Convention defines EbA as follows:

> "Ecosystem-based adaptation (EbA) is the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people adapt to the adverse effects of climate change. EbA aims to maintain and increase the resilience and reduce the vulnerability of people and the ecosystems they rely upon in the face of the adverse effects of climate change."

EbA approaches are expected to deliver multiple benefits beyond climate change adaptation, such as poverty reduction, sustainable development, climate change mitigation and disaster risk management, and for this reason it is considered a no-regrets adaptation strategy (Lo 2016).

More recently there has been increasing focus on the many different facets of increasing resilient livelihoods in rural areas. "Resilience" is the ability of a system and its component parts to anticipate, absorb, accommodate or recover from the effects of a hazardous event in a timely and efficient manner, including by ensuring the preservation, restoration or improvement of its essential basic structures and functions (IPCC 2012). Resilience is a powerful concept in the overall context of adaptation for rural livelihoods, as it directly addresses reducing vulnerability to negative impacts of climate shocks and increasing capacity to respond and limit damage. Examples of actions that can reduce vulnerability include early warning climate information systems allowing farmers to make adjustments in cropping and livestock strategies, or protection of harvest and assets through better storage management, and spreading of risks through diversification in household income sources, or polyculture intercropped and crop-livestock systems building soil water and nutrition storage and drainage capacities. Examples of actions to enhance adaptive capacity to ensure ability to respond and recover more quickly include building buffer zones, having access to saving finance or insurance schemes, membership of supporting organizations, and effective government emergency and recovery schemes.

4. Adaptation as a force for transforming food systems

While there are several definitions and approaches to food system transformation, they are all based on the need for systematic changes in the way food is produced, processed, distributed and consumed, to achieve better environmental and nutritional outcomes, as well as better livelihoods for people working throughout the food system.

With the focus on system change, the transformation of food systems goes beyond incremental improvements to the current system and instead calls for a major shift in the dynamic links between various components of the food system, as well as within the components, to move to new and better performance. To contribute to food system transformation, transformative adaptation needs to focus on these same dynamic links and how climate change is already affecting them and will do so in the future – and how adaptation actions can contribute and drive the new dynamics needed for a transformed food system.

The role of adaptation, then, is not to merely maintain an undesirable status quo, but rather to support the transformative processes needed to move from a poorly performing system to one that generates higher welfare for poor people, better nutrition for both rich and poor, and better environmental outcomes (Few 2017). For example, a livelihood diversification project that reduces women's vulnerability to climate change could be termed a transformative adaptation activity if it also triggers a sustained shift in gender relations, gender agency and women's empowerment (ibid.). In a review of 80 studies, Fedele et al. (2019) conclude that "transformative adaptation is characterized as being restructuring, path-shifting, innovative, multiscale, systemwide, and persistent." They conclude that if policymakers and practitioners supported and implemented transformative adaptation to address real or potential changes triggered by climate change, they would efficiently and sustainably develop and be able to anticipate or recover from the impact of climate change. Vermeulen et al. (2018) define transformative adaptation in agriculture by three criteria: the response to climate risks; a redistribution of at least a third of the primary factors of production and

consumption; and within a timeframe of 25 years. They document examples of transformative adaptation already occurring, finding that capacity for effective collective action at local levels is a key factor in most cases. Investing in knowledge and information services at local levels to support effective local-level action, together with financing for investments that have long-term and delayed returns, are two of the recommendations they make.

Transformative adaptation integrates responses to climate risks as part of the dynamic transformation of agricultural and rural livelihoods needed to achieve decent and resilient livelihoods. In practice, this means adaptation actions should take account of not only specific vulnerabilities to climate change but also those most vulnerable and left behind in agricultural and rural development processes – such as women, youth and indigenous groups. Likewise, transformative adaptation requires system-level changes to reduce risks to agriculture-based livelihoods and increase adaptive capacity.

The above analysis of the potential effects of climate change on rural livelihoods, as well as adaptation approaches, gives some indication of priority areas where transformative adaptation can contribute to the dynamic of agricultural and rural development. Integrating the need to protect and enhance ecosystem services from climate risks and build diversity in farming systems and food production so as to maintain these key assets of the rural poor in spreading risks and building better livelihoods is one facet. Another is building effective means of coordinating actions and building community cohesion. Reducing exposure to risks – for instance, by ensuring the resilience of rural infrastructure to climate shocks, to support stable growth in agricultural value chains and employment opportunities – is another example, as is expanding the capacity to cope with adverse events.

Financing to support the major shifts in the enabling environment, incentives and capacity to undertake actions is key to achieving successful transformative adaptation. Both the absolute level and configuration of financial resources are key levers for stimulating major shifts in agricultural and rural livelihoods and food systems. These are the issues we turn to in the following sections.

5. Climate finance for transformative adaptation

One of the most effective forms of strategic leverage we have for building transformative adaptation in the context of food system transformation is financing. The issue is not just having sufficient funds to support the investments needed for change. Financing must come in an appropriate form that matches the types of constraints, uncertainties and time horizons required for transformative adaptation. Financing must be accessible to the right people and entities to undertake significant change.

Essentially, financing to successfully support transformative adaptation must be **adequate**, **appropriate** and **accessible**. The first refers to the overall availability of financing and of sufficient amount; the second refers to the nature of the channels through which financing is obtained, and how well target groups can access them; and the third focuses on the instruments of financing, their costs, their transparency, the ways they are structured and their effectiveness in conveying information and thus in promoting transformative adaptation. Transformative adaptation and its financing must be coordinated within the broader framing of food system transformation.

5.1 Adequacy of climate finance for small-scale agriculture

Estimates of the level of financing required for transformative adaptation are difficult to make, but clearly of a significant magnitude in the next 25 years. FAO (2017b) estimated that an additional US$265 billion per year would be needed to generate the level of agricultural growth and rural development needed to eradicate poverty and hunger by 2030. This is in addition to estimated annual investment needs of US$105 billion per year for adaptation, US$480 billion for investments related to mitigation of climate change related to increasing energy end-use efficiency, and US$600 billion annually for investments in energy supply with low greenhouse gas emissions. The total estimate of investment needs is US$1,452 billion per year (ibid.). The Ceres 2030 project estimated that Official Development Assistance (ODA) should increase by US$14 billion per year, and public sector investments on the part of low- and middle-income countries by US$19 billion per year, to eradicate hunger and double agricultural productivity among smallholder producers by

2030. The additional public sector spending is expected to generate an additional US$52 billion per year of private sector resources (Laborde et al. 2020).

Current levels of financing for adaptation or agricultural and rural development are nowhere near these levels of estimated need. This is evidenced in the Ceres 2030 work, as well as a recent report which found that the cumulative climate finance tracked for agriculture, forestry and land use was only US$20 billion per year in 2017/18, representing 3 per cent of the total tracked global climate finance for the period (CPI 2019). Tracking the amount that has actually been committed to climate finance is complicated, since definitions and boundaries are not clearly identified or agreed. Differentiating between climate finance and ODA has proven controversial, over the inclusion of development resources redirected to climate finance and relabelling of ODA as climate finance (Yeo 2019). One of the most contentious issues in the UNFCCC negotiations has been that financing for adaptation should come from new and additional resources and not just relabelled ODA. There is a climate justice element in this argument: poor countries that have contributed the least to causing climate change bear the greatest costs in adapting to it, and it should be paid for by those who created the problem – i.e. the “polluter pays” principle. For these reasons, there has been considerable focus on distinguishing adaptation financing from development finance.

In 2020 a detailed analysis of the flows of climate finance to the small-scale agricultural sector was conducted for the first time (Chiriac et al. 2020). The analysis indicated that tracked climate finance flows to small-scale agriculture in developing countries amounted to an annual average of US$10 billion in 2017/18. This represents approximately 1.7 per cent of total climate finance tracked in the same period. Figure 3 illustrates just how minuscule the share of climate finance flowing to small-scale agriculture within overall climate financing is.

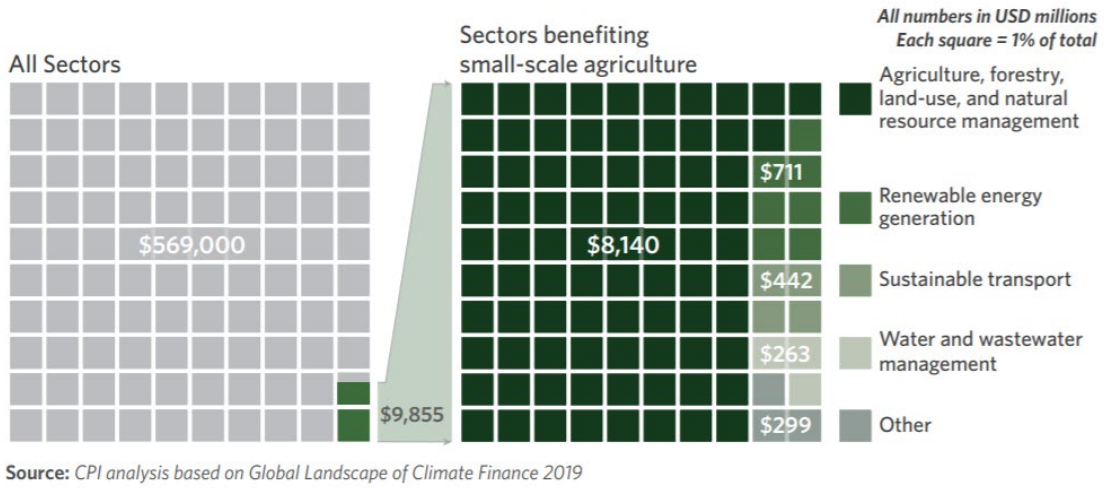


Figure 3: Share of annual climate finance in small-scale agriculture relative to other climate finance

Source: Chiriac et al. (2020)

The IFAD Adaptation for Smallholder Agriculture Programme (ASAP) and the Global Agriculture and Food Security Programme (GAFSP) both already successfully channel climate finance to small-scale producers, though not at the scale that is or will be needed by 2030. For GAFSP, as of December 2019, close to 70 per cent of public sector funds (US$787million) and about 65 per cent of projects have elements that contribute to climate change co-benefits, either through adaptive or mitigative climate-sensitive interventions, while the Private Sector Window projects are well on their way to meeting international climate finance targeting (GAFSP 2019, 34). In 2019, IFAD committed about US$568 million in climate finance across 38 approved projects. Of this total, US$507 million has been identified as adaptation finance, and about US$61 million as mitigation finance. This was supplemented with US$43.4 million from environment and climate funds.

International public sector financing is the main source of adaptation investment resources for agricultural and rural sectors in low- and middle-income countries. At present the financing from this sector is clearly inadequate for the investment needs. It is also inadequate to support the increase in private sector

investments needed. Millan et al. (2019) make the case for public sector investments to address core market failures to create new sustainable investment opportunities that will stimulate private investment flows. This involves investments in data and information, risk management mechanisms and regulatory approaches that embed environmental values in market transactions (Millan et al. 2019).

5.2 Accessibility of climate finance

Multilateral development banks are a key conduit of adaptation finance to agricultural and rural sectors in developing countries. Direct transfers of climate finance from governments of developed countries to governments of developing countries are often perceived as risky due to information asymmetries, the unfeasibility of perfect contract enforcement at the international level, and uncertain recipient capacities and respective outcomes (Brunner and Enting 2014). Access to dedicated climate funds is often highly constrained – usually to national governments – although some funds such as the Adaptation Fund and the Green Climate Fund have expanded access to wider groups of receiving entities.

The process by which this finance is channelled is notorious for the high transactions costs it entails. The transactions costs associated with achieving quality at entry standards needed to access adaptation funding include: (i) the costs associated with developing the rationale and analysis required to support it; and (ii) costs associated with accessing funds such as establishing fiduciary standards and safeguards or costs of working through an intermediary organization. Experience with direct access has indicated the high costs and difficulties faced by national or subnational entities in meeting standards (Soanes et al. 2019).

Donor governments have also minimized climate financing risks by delegating the provision of climate finance to bilateral and multilateral organizations that implement and monitor projects in recipient countries. Figure 4 – from Chiriac et al. (2020) – on climate finance for small-scale agriculture indicates the importance of multilateral development financing institutions in channeling public international climate finance. However, using this channel can generate an additional set of transaction costs in the form of the multilateral development banks' administrative requirements (Brunner and Enting 2014).

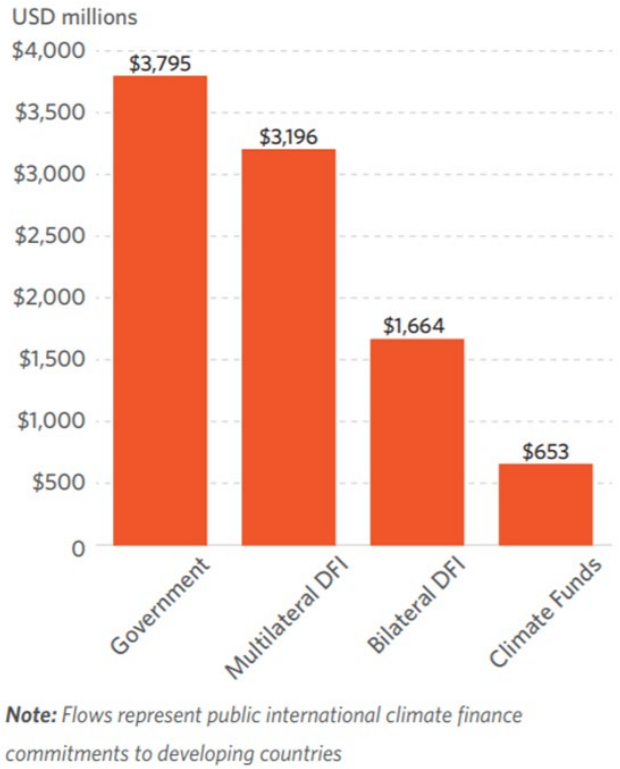


Figure 4: Annual commitments of public international climate finance to developing countries

Source: Chiriac et al. (2020)

The experience of the IFAD ASAP programme gives some insights into the potential for reducing transactions costs. The ASAP programme directly linked the ASAP grant to IFAD rural development project loans or grants. Since ASAP was implemented jointly with IFAD lending activities, there was a rigorous process of ensuring safeguards were in place and fiduciary standards met at the country level as part of the loan process on which ASAP then piggybacked. The application for the grant itself was then relatively simple. While this approach reduced transactions costs for accessing climate finance, it also picked up the problems inherent in the development lending process, such as delays in approvals and disbursements.

Another major issue in the accessibility of adaptation finance is its relationship to ODA. However, since adaptation needs to be an integrated part of development actions on the ground, this has created a somehow contradictory conceptualization, increasing transactions costs in project planning and justification, and debate around the potential double counting of financing.

In the process of planning, financing and implementing adaptation actions in the context of agricultural and rural development, two key concepts differentiate climate finance from traditional ODA: **new and additional resources** calls for funding to be clearly oriented towards quantifiable and measurable climate targets that can be distinguished from traditional development resources; and **agreed full incremental costs** requires a technical analysis that directly attributes the partial or full cost of an intervention to climate change drivers.

As a result of this mandate, donors, institutions and funds established to provide climate finance to developing countries have developed tools and methodologies to ensure that the required attribution to climate change is well justified, traceable and calculated. While this serves the purpose of justifying a climate finance intervention and recording climate-related financial flows, it poses significant challenges to the mainstreaming of addressing climate-related risks in a project intervention. The additional analysis associated with climate finance results in high transaction costs, given that detailed technical assessments are necessary to justify the suitability of the funding for a given intervention and to validate the amount assessed. Such assessments include, among others, sophisticated modelling, documentation of historical trends, and development of counterfactual baseline/alternative scenarios. This often makes climate finance inaccessible, both technically and financially, to public and private stakeholders that are not specialized in such analysis.

The third concept of finance accessibility to take into account is the targeting of recipients and actions. The CPI (2020) report provides best estimates of funding split between recipients, with the caveat, however, that, in general, projects target several types of recipients/beneficiaries; therefore, an exact allocation of funds per beneficiary is difficult. While global climate finance flows have continued to increase, little of it makes its way to small-scale producers, despite the risk they are facing. Of the US$569 billion in average global climate finance flows in 2017/18, US$253 billion was from the public sector, and only US$9.855 billion was directed to the agriculture, forestry, land-use and natural resource management sector (Chiriac et al. 2020). Until now, much of the adaptation financing in agriculture has been focused solely on food production, with limited focus on the full range of food system vulnerability and implications for livelihoods and food security (Coneska et al. 2019).

About 41 per cent of climate funds aimed at the small-scale agricultural sector were channelled through projects targeting rural communities in general. These projects potentially include activities such as creating climate-resilient infrastructure (receiving 35 per cent of climate financing) or improving the livelihoods of rural communities (receiving 14 per cent) (CPI 2020).

Adaptation projects that foster collective action and community cohesion are an important means of increasing accessibility of adaptation finance to a wider community. The experience of the PAPAM/ASAP programme in Mali illustrates this. The project was funded by IFAD through a loan of US$40 million and an ASAP grant of US$9.9 million. The ASAP grant funded a participatory mapping exercise which resulted in the development of 30 municipal adaptation plans identifying priority adaptation actions based on analysis of vulnerabilities and ecosystem conditions. The municipalities were given direct responsibilities and financial support to implement the plans.

According to Chiriac et al. (2020), finance benefiting individual small-scale producers (16 per cent) and cooperatives or farmer associations (15 per cent) constitute another large share of overall adaptation finance aimed at agricultural and rural development (31 per cent combined). It indicates the strong focus of

climate finance on agricultural production at farm level. Only 7 per cent of the funds were found to target actors in the value chain, including agricultural and small and medium-sized enterprises (SMEs), and even less (3 per cent) targeted formal financial institutions. However, many of the barriers to adaptation in the small-scale agricultural sector are commercial in nature – for instance, lack of agribusiness development, low and risky financial returns discouraging engagement of private sector lending, and investment risks due to a lack of information. This suggests that people operating agricultural enterprises and SMEs face severely constrained access to climate finance (Chiriac 2020).

A study of the vulnerability of agricultural value chains to climate risk conducted in Kenya found that risks and where they occurred in the value chain varied by type of commodity. Although adaptation options did exist, the people most likely to benefit from them did not adopt these measures, due to a lack of awareness of the options, as well as the costs involved (Mwongera et al. 2019). Liverpool-Tasie and Parkhi (2020) analysed adaptation responses in Nigerian maize value chains and found that climate change risk was reducing the incentives to adopt value-adding measures, and that insufficient attention and financing were being directed to the problem (Liverpool-Tasie and Parkhi 2020).

5.3 Appropriateness of climate finance

In practice, smallholder farmers are vulnerable as a result of numerous factors, including inadequate agricultural practices, a deteriorating natural resource base, market demand for specific crops and animals, and limited access to land and secure water sources, which are exacerbated by climate change. It is reasonable to accept that an integrated operation to address such vulnerabilities cannot be entirely attributed to climate change adaptation and, therefore, should not be financed fully or solely by climate finance sources. However, an intervention to address such challenges is best designed and implemented holistically, in which development- and climate-related challenges are integrated in a response that is specific to the local context. The tendency of climate finance sources to require a climate-specific justification for an intervention often clashes with the practical need to integrate development and climate objectives.

An effective and pragmatic way to address the problem of designing financing for a broader range of objectives – essentially transformative adaptation – is through the use of blended finance. This is defined by the Organisation for Economic Co-operation and Development (OECD 2018) as the “strategic use of development finance for the mobilization of additional finance towards sustainable development in developing countries.” Blended finance combines climate and development financing from different sources of private and public finance to achieve a broad development goal – such as transformative adaptation and sustainable and resilient food systems. Including climate finance as one of the multiple funding sources in a rural development intervention allows for a problem definition that explicitly addresses the entire range of risks and vulnerabilities faced by rural smallholders and poor people, and focuses attention on the need and way to increase their resilience to shocks accordingly. While justifying the climate rationale of such an intervention is still complex, the possibility of allocating climate finance to achieve climate-related outcomes within the context of broader transformative development results in a more effective intervention.

Furthermore, the justification for climate finance ranges from a “climate justice” approach, in which funds are raised “according to the responsibility for climate impacts, and allocated putting the most vulnerable first” (Grasso 2010), to a more market-based approach in which resources are allocated as efficiently as possible, in terms of both the financial instrument used and the impact achieved. Market-based approaches are less likely to be accessible and appropriate for the rural poor and small-scale agricultural producers, since their lack of market participation is one of the causes of their vulnerability. Private and climate finance is available through a number of financial instruments, including loans, bonds, guarantees, equity investment and grants, among others. Likewise, indicators such as cost per ton of CO_2 or cost per beneficiary are used to compare the relative cost-effectiveness of interventions. This inclusion of varying degrees of concessionality adds further complexity to access to climate finance, as the choice of financial instrument to be accessed must be justified.

Financing instruments should be selected to suit the nature of the adaptation investment and its financial and social returns over the short and long run. The type of financial instrument to be applied should be defined not only by the type of intervention but also by the target beneficiaries and the project context. A

climate change-oriented rural development intervention targeting organized, medium-scale producers in an upper-middle-income country will have completely different requirements from those of small-scale individual subsistence farmers in a low-income country. A climate justice-based argument points towards the allocation of grant climate financing to strengthen adaptive capacity and increase resilience. The principle that smallholder farmers, as bearers of a disproportionate impact of climate change, should have access to highly concessional financing still applies, and the inclusion of other instruments should only be considered when appropriate in the given context.

Nevertheless, activities intended to address climate vulnerabilities can have significant economic and social co-benefits such as reduced health costs from making diversified healthy diets accessible to low-income families, which may justify the allocation of other financial instruments in a given intervention. For example, an intervention may implement sustainable, diversified food production systems with climate-resilient crop varieties, and "climate-proof" infrastructure across a value chain. In such a context, a combination of grant, concessional loan and equity resources may be justifiable to provide adequate incentives to achieve a desired result. For example, the Planting Climate Resilience Project in Brazil is a blended finance project that includes a loan of US$65 million and a grant of US$34.5 million from the Green Climate Fund, US$30 million from IFAD and US$73 million from Brazil's National Social and Economic Development Bank [Banco Nacional de Desenvolvimento Econômico e Social] (BNDES). Technical assistance and higher-risk initial investment in climate-resilient production systems are financed with a blend of grants and concessional loans from the Green Climate Fund, while well-proven investments in water harvesting/management and agro-processing are financed through IFAD and BNDES loans.

Haveman (2020) makes the case that there is a serious financing gap for sustainable agricultural development, and that blended finance is a key solution to filling it. While the analysis is not specific to climate finance, it is very relevant to the overall issue of financing transformative adaptation. The range of potential financing sources includes equity and debt investments, grants, concessional loans, revolving funds and loan guarantees. Expanding the use of blended finance is also a key recommendation in the discussion starter papers' Action Track 5 on building resilience to vulnerabilities, shocks and stresses (United Nations Food System Summit 2020).

The appropriateness of the financing instrument is not solely driven by the nature of the financial return on investment. Risk and incentives to try new and untested approaches are also important. Millan et al. (2020) focus specifically on the issue of financing adaptation in the context of food system transformation and identified high investment risk and lack of primary data/information asymmetries and unproven and early-stage business models with long development lead times as a leading cause of core market failures to incentivize private sector investment in adaptation. Experience from the IFAD ASAP programme indicates that grant financing provided a key incentive for adoption of the programme activities overcoming reluctance linked to the unknown and untested effectiveness of the adaptation actions and their potential effects on development outcomes. The importance of grant financing to test new approaches is borne out by the experience of some countries which had ASAP grants, including Bolivia, Cambodia, Gambia, Mali, Mozambique and Niger, subsequently using loan funding to scale adaptation activities. These governments have recognized the benefit of certain adaptation activities through a trial and error process and now, despite not being grant-supported, are willing to borrow money to achieve similar results.

Table 1 builds on Haveman's and Millan's analyses, laying out a set of adaptation activities which are likely to arise in transformative adaptation efforts, together with an indication of an appropriate financing instrument based on the nature of the investment, the amount and timing of financial returns and the degree of uncertainty/inexperience with the activity.

Table 1
Appropriate financing instruments for certain adaptation activities

Activity	*Appropriate financing instrument*
Technical assistance to identify climate risks and potential responses	Grant
Capacity-building across stakeholders to assess climate change risks and develop a response	Grant
Adaptation investment with uncertain or highly delayed financial returns	Grant
Agricultural investment project generating positive financial returns	Concessional loan and/or revolving fund
Climate risk reduction (index-passed insurance, etc.)	Guarantees, first-loss tranches

As can be seen in figure 5 – from Chiriac (2020) – grant finance dominates all the instruments for climate financing to small-scale agriculture. Concessional lending is also a widely used instrument, and even lending at market rates is being used in a significant share of climate financing to small-scale agriculture.

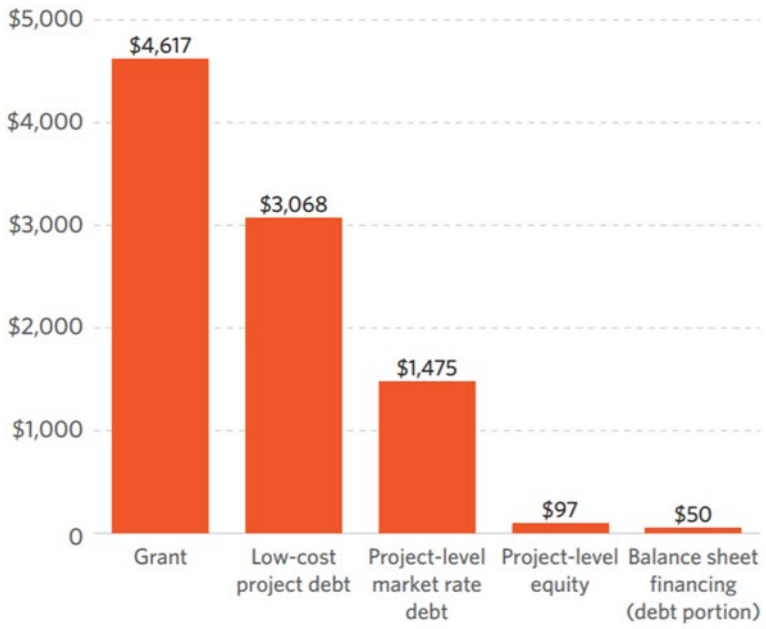


Figure 5: Annual commitments of international public finance to developing countries by instrument
Source: Chiriac et al. (2020)

Flexibility to allow for adaptive learning is another important dimension of appropriate financing that is fundamental in the context of adaptation. An adaptive management approach involves real-time monitoring and evaluation, learning among stakeholders, innovating and re-strategizing whenever necessary. A particular feature of climate risks is that the situation is becoming increasingly dynamic, as temperatures are rising and impacts accelerating. The adaptation needs of small-scale producers are constantly evolving, which is why the focus on general resilience-building to shocks and variations is key. Adaptive management is important for managing uncertainty on the basis of best available information, and to avoid maladaptation (figure 6). This requires a financing structure that allows for some flexibility to adapt based on monitoring and assessment.

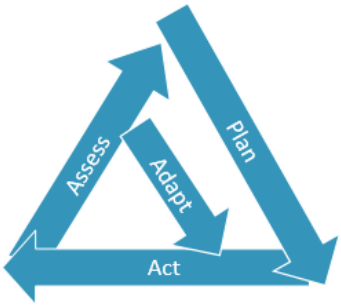


Figure 6: The process of adaptive management

Source: Authors

Flexibility can be built into the financing plan, as was the case in the IFAD PROCAVA project in Mozambique. The project includes a "component 0" aimed at disaster risk reduction and management, which enhances the flexibility of the financing. Component 0 allows PROCAVA to promptly react to weather extremes, facilitating the quick adoption of remedial actions such as construction of dykes, dams or canals to manage flood water, and climate-proofing infrastructure such as rural roads, through adaptation investments for natural disaster recovery. Component 0 is, therefore, a smart adaptive mechanism that will facilitate and allow faster processing.

6. Conclusions

We all hope by 2030 to be living in a world where poor people have decent livelihoods that are resilient to climate change and where food systems are a key generator of environmental, health, nutritional and social benefits. However, to get from where we are now to that desired state requires major transformations in agricultural and rural systems, as well as the food systems serving low-income families and vulnerable rural people. Adaptation to climate change is an essential feature of these transformations; therefore, we are looking to support a process of transformative adaptation – an adaptation that is systemic and addresses development needs through a climate-sensitive lens and through socio-economic drivers.

The management of climate finance offers the potential to enhance the transformative properties of adaptation in contributing to food system transformation. Expanding climate finance resources from the public sector and creating an incentivizing environment for private sector investments offers a tremendous opportunity to ensure adequate funding. Reducing the transaction costs associated with obtaining climate finance and integrating it with financing for agricultural and rural development is essential to increase the accessibility of climate financing to the countries and entities that need it. Adopting standardized approaches and indicators with supporting tools, and piggybacking on existing financial arrangements and fiduciary standards are important measures here. Some key leverage points in food systems for improving rural livelihoods that are highly vulnerable to climate change are not receiving the climate financing resources they deserve. This is particularly the case for small and medium-sized agrifood enterprises in low- and middle-income countries. Better targeting of climate financing resources is needed to increase the accessibility of financing to this group. Financing needs to be tailored to be appropriate to the investments and the investors involved. Using blended finance to deal with managing risk, delayed returns on investment, and new and untried activities and lending instruments is emerging as an important means of the tailoring required. Increasing flexibility in financing is also clearly an important aspect of appropriate financing for transformative adaptation.

The opportunities that improved management of climate finance offers coincide with the types of proposals emerging from the discussion starter papers for the five Action Tracks of the 2021 United Nations Food System Summit. Action Track 1 – on ensuring access to safe and nutritious food for all – calls for an expansion of funding by an extra US$33 billion per year to sustainably end hunger, as well as targeting more impact investments to small and medium-sized agrifood enterprises. Action Tracks 2 and 3 – on shifting to sustainable consumption patterns – call for the implementation of government-driven

mechanisms to achieve true cost accounting to include environmental and nutritional values in food choices, and investor-driven mechanisms can include shareholder divestment to avoid harm and social impact investing. Action Track 4 – on advancing equitable livelihoods and value distribution – has a strong focus on strengthening community-level coordination and multisectoral approaches. Action Track 5 – on building resilience to vulnerabilities, shocks and stresses – calls for an enhancement of investment in holistic food systems approaches that address people-planet prosperity, and exploring blended finance facilities and public-private partnerships to mobilize finance for underresourced initiatives to drive positive change in food systems.

The analysis presented in this paper indicates that we have not yet met these requirements for financing, although we do find some promising examples and processes from IFAD's experience to build on. Our analysis indicates that multilateral development institutions such as IFAD can play an important role in mobilizing and channelling financial resources to support multi-objective and transformative adaptation contributing to the overall objective of transforming food systems.

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