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Stepping up to the challenge

Six issues facing global climate change and food security

There are several complex and interrelated challenges and barriers to achieving global food and nutrition security in an increasingly variable climate. Without urgent action for mitigation and adaptation, the world faces more loss and damage and this will further threaten the productive capacity and long-term viability of smallholder farmers.

The Fifth Assessment Report (AR5) of the International Panel on Climate Change (IPCC) tells us in stark terms that climate change is impacting food security now and that it is no longer a hypothetical future scenario. It is also accepted that the negative effects of climate change are projected to affect communities that have the lowest capacity to adapt, yet have the highest need to increase production, in order to secure food and nutrition security (Vermeulen 2014). The report states that increases in climate extremes exacerbate the vulnerability of food insecure populations and anticipates increasing impacts on agriculture and food systems. In the future, the possibility of localized warming of more than 4°C (above pre-industrial levels) will severely compromise the ability of agriculture and ecosystems to deliver food and environmental services – even with adaptation – and this will pose significant risk to food and nutrition security. Considering that food insecure small-scale producers will be the most adversely affected by climate change, it becomes obvious that policy and practice will need to move in their favour.

In 2015, governments will aim to agree on a new sustainable development framework that includes a set of longer-term Sustainable Development Goals (SDGs), a future climate change agreement under the United Nations Framework Convention on Climate Change (UNFCCC), and a post-2015 framework to address disaster risks. Collectively, these processes provide a unique opportunity to fundamentally shift course towards global and national climate-resilient development pathways. Whether these actions promote food and nutrition security in the face of climate change will be one of the key benchmarks in assessing success – six issues (see box) will be critical to this.

KEY ISSUES

- 1** Scale up proven action and practice;
- 2** Ensure equitable outcomes for women;
- 3** Give decision-making power to farmers;
- 4** Enhance nutrition security, not just food security;
- 5** Make mitigation an opportunity for, rather than a threat to food security;
- 6** Support markets and value chains for low-income producers and consumers.



RESEARCH PROGRAM ON
**Climate Change,
Agriculture and
Food Security**





Scale up proven action and practice

One of the greatest challenges we face is how to ensure increased investment in sustainable, productive, equitable and resilient agriculture, through climate finance and agriculture finance.

Just meeting projected increases in demand for agricultural products will require significant levels of private and public investment. However, adaptation to climate change within the agricultural sector entails additional costs. These have been estimated at USD 7 billion per year to 2050 (Nelson et al. 2009), USD 11.3–12.6 billion per year in the year 2030 (Wheeler and Tiffin 2009) and a cumulative USD 225 billion to 2050 (Lobell et al. 2013). Policy-makers and investors, from multilaterals to bilaterals to the private sector and beyond, must find better ways to reach the poorest and most vulnerable, who invest more time and effort in securing food and nutrition for their families than most people in the world. It is farmers, fisherfolk and pastoralists who develop the most enduring solutions, so it is logical that new investments should link with these proven approaches. How can we do this? What are the roles of different institutions, from local

to global levels, in connecting finance with farmer-led good practice – and what are the models of cooperation required? Given the IPCC’s most recent findings, how do we get a bigger share of climate finance, including private finance, into adaptation – particularly adaptation driven by the world’s poorest producers?

Take technology transfer, for example. This is an inherently unequal process whereby one party provides solutions to another. How can we move to genuine co-generation of technologies? Where and under what circumstances is “transfer” of hardware or scientific knowledge absolutely necessary? How can we support capacity-building for technology application and south-south cooperation to ensure that approaches and technologies are sustainable and equitable, in the sense that they are delivering positive outcomes for the poorest?

Photo © N. Palmer / CIAT: Irrigation of food crops during the dry season in drought-affected Nicaragua, made possible by the use of special reservoirs to capture and store excess rainwater during the country’s rainy season.



Ensure equitable outcomes for women

Persistent and growing inequality is an unacceptable truth in global development – particularly considering that we have proven ways to address it.

Biased and discriminatory practices surrounding women's access to land and other natural resources is a key driver of inequality. The Food and Agriculture Organization of the United Nations (FAO) estimated that if women had the same access to productive resources as men, farm yields could increase by 20-30% and that global hunger could be significantly reduced as a result (FAO 2011). But while gender discrimination in agricultural policy and practice must be tackled, this cannot be achieved by targeting women as instruments for boosting yields. More thoughtful attention must be afforded to interrelated issues of power, social structure and relations that define interactions between women and men (Bernier et al. 2013). Social analysis must become much more comprehensive – and it must be active analysis, whereby policy-makers and service providers themselves internalize the challenges. Because adaptation decisions depend on opportunities governed by the varied and complex interplay of social relations, institutions, organizations, and policies (Perez et al. 2014), it is imperative that our

understanding of inequality in agriculture advances.

Given the potential for improvement, how do we lock in guarantees that inequality (and particularly gender-based inequality) is addressed in policy formulation and implementation? On the cusp of 2015, we have emerging and long-existing paradigms such as climate-smart agriculture, agro-ecology and sustainable intensification that pay little more than lip service to the need for balancing household and community decision-making power and delivering services, incentives, resources and rewards equally to women and men. For example, what approaches do we take to ensure equal access to climate and agriculture information and advisory services? How do we best address gender gaps through frameworks such as the Voluntary Guidelines to support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security (FAO 2004) – or through national legislation, good practice protocols or social and environmental safeguards that will drive good practice and raise standards?

Photo © N. Palmer / CIAT: A farmer tends her field of cassava, in the village of Tiniu, near Mwanza, northern Tanzania.



Give decision-making power to farmers

Some 475 million farms, or between 80-90% of the total number globally, are under two hectares in size (Lowder et al. 2014). With the IPCC's Fifth Assessment Report stating that vulnerable small-scale producers are likely to be adversely affected by increasing climate extremes, it is imperative that these producer communities are prioritized with appropriate policies.

What have we learned from employing social learning approaches; improving farmer field and business schooling; building collectives and local institutions and connecting farmers with village savings and loans associations? What are the dividends for farming communities when there is transparent and accountable governance at local levels that considers their needs and understands the risks they take? What are the demand-driven models that work? Participatory methods are a proven success and approaches such as participatory scenario planning thus become crucial. This form of planning breaks through orthodox approaches, as it puts communities and service providers in control of generating knowledge – providing opportunities to address inequitable service delivery in the process (CARE 2012). It allows the consideration of indigenous knowledge and carries considerable advantages as relationships between communities, local authorities, ministry officials and meteorological officers are brokered,

often for the first time. How can we ensure innovations such as these are brought to scale?

Giving decision-making power to farmers needs to extend beyond generation of knowledge on the farm. How do we develop the capacity and profile of farmers' groups to effectively engage in well-informed agricultural (and related) policy processes that facilitate demand-driven technologies that address climate change and food security? What more can be done to ensure compliance by all development actors with formal and customary law that is designed to protect the most marginalized and poorest? Both statutory and customary rights to lands, territories and resources, including indigenous genetic resources, which local communities have traditionally owned, occupied or otherwise used or acquired, must be upheld if meaningful decision-making power is to rest with farming communities.

Photo © S.Kilungu / CCAFS: A participant at the community-based adaptation and resilience project - East and Southern African drylands.



Enhance nutrition security, not just food security

With current attention focused on global food crop forecasts, it is increasingly necessary to stress that nutrition outcomes for the poorest and most vulnerable – and not simply production increases to feed a growing global population – remain primary goals.

And because women and girls are disproportionately affected by inadequate nutrition – especially in the global South (particularly in the context of crises) – the need for rights-based and empowerment-based approaches to food and nutrition security becomes acute. Women effectively translate enhanced knowledge into improved nutrition outcomes. Compelling evidence from Bangladesh, for example, demonstrates that child stunting can be reduced by up to 4.5% with approaches that address the empowerment and capacities of women (Smith et al. 2012). With this in mind, how can interventions be planned so that they are nutrition specific or sensitive, and so that every effort is made to reduce chronic malnutrition, one of humanity's greatest challenges?

There are also significant agronomic adjustments and adaptations that can be promoted to improve nutrition outcomes. Among the crops identified by CGIAR research centers as having particular potential to achieve positive nutritional outcomes in a warming world are cassava, bananas, barley, cowpeas, lentils, and millet (Thornton 2012). Home gardens, including the cultivation of micronutrient-rich vegetables like orange-fleshed sweet potatoes, and the keeping of small livestock are examples of agricultural interventions particularly accessible to women and likely to enhance household nutritional outcomes. So what kinds of investments and policy adjustments are required to advance the uptake and scale out of these approaches, which are at the same time climate and environmentally sensitive, nutrition positive and gender transformative?

Photo © N. Palmer / CIAT: AgroSalud's biofortification program based at CIAT in Colombia aims to improve children and women's health, and farmers' adaptation to climate change through the introduction of a range of new, nutritionally-enhanced food crops.



Make mitigation an opportunity for, rather than a threat to food security

When countries come forward with their mitigation pledges for the future, it will be critical to observe the role that agriculture will play and critical that marginalized and food-insecure farming families do not bear the burden of mitigation targets.

The UNFCCC encourages all parties to come forward with voluntary mitigation pledges for 2020 under the Copenhagen Accord. Political impetus has grown through the Durban Platform for Enhanced Action, the subsequent Warsaw Conference, a series of ministerials during 2014 and the UN Secretary General's Climate Summit in September 2014. While more than 100 countries have made pledges, few include mitigation actions in agriculture, even though there are considerable opportunities, as detailed for example in the UNEP 2013 Emissions Gap Report. As a sector, mitigation measures in agriculture could make up between 6.5-25% of the overall contribution necessary for closing the current gap between business-as-usual emission levels and levels that meet the goal to stay below a 2°C (ideally a 1.5°C) temperature increase (UNEP 2013).

A key challenge for governments, farmers and the private sector is to undertake

mitigation actions that enhance rather than reduce food security, particularly for poor producers and consumers. Which actions might be "best bets" and what policy support can provide the best incentives? Many actions to improve resilience and adaptation result in mitigation benefits; in some contexts, key actions that deliver for both mitigation and food security include improved pasture management, increased nutrient and water use efficiency and increased use of trees and perennials on farms. It is important to note that poor smallholder farmers are insignificant contributors to carbon emissions and they should not be obliged to reduce emissions as a precondition of financial or technical support. Some techniques appropriate to their circumstances can enrich the carbon stored in their farming landscape – how can we work with these farming communities to enable them to develop these techniques while not compromising the priority of their realization of food and nutrition security?

Photo © Z. Bennett / CARE: Roque Ramirez Gomez works on his eco-farm in Carhuaz, Ancash Province, Peru. Residents of Carhuaz have experienced changing climatic conditions including more extreme frosts, erratic rains and increased pests and plant illness.



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Support markets & value chains for low-income producers and consumers

With food security inextricably linked to income, it is important to ensure the development of local, gender and nutrition sensitive, sustainable value chains.

Maximizing climate investments in agriculture to ensure sustainable economic growth offers opportunity. But what financial services and risk management options are available for small-scale producers? How do we ensure they are accessible and that there is inclusive access to finance and markets?

Value chains represent a critical lens by which we can understand how a product moves from producer to customer. This perspective provides an important means to understand commercial and socio-economic relationships, mechanisms for increasing efficiency, and ways to enable business to increase productivity and add value. Additionally, it provides a reference point for improvements in services and the business environment. There are significant opportunities for pro-poor initiatives that build resilience to climate change, while linking small businesses with markets. Value chains sit at the core of

high-impact and sustainable initiatives that can improve productivity, competitiveness, entrepreneurship, and small and medium enterprise growth. The productivity and efficiency of agricultural value chains are thus essential for the success of rural economies and to the incomes of the poorest. What kinds of investments in value chain development can deliver increased returns to the primary actors – the small-scale producers who are often the poorest and most vulnerable?

How can we build on good practice in value chain development that increases socio-economic equity and protects and enhances environmental integrity and natural resource bases? With climate change and weather extremes now the “new normal”, how do we ensure that value chains and market engagement work plays a more central role in risk management for vulnerable farming communities?

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