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Climate smart agriculture- an overview

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Introduction

By 2050 approximately 70% more food will have to be produced to feed growing populations, particularly in developing countries. Agriculture is already causing increased conversion of lands and placing greater pressure on biological diversity and natural resource functions than ever before. As climate change causes temperatures to rise and precipitation patterns to change, more weather extremes will potentially reduce global food production. At a global scale, both intensification and extensification are currently having a significant negative effect on the environment; depleting the natural resource base upon which we rely. The need to reduce the environmental impacts while increasing productivity requires a significant change in the way agriculture currently operates.

Preserving and enhancing food security requires agricultural production systems to change in the direction of higher productivity and also, essentially, lower output variability in the face of climate risk and risks of an agro-ecological and socio-economic nature. In order to stabilize output and income, production systems must become more resilient, i.e. more capable of performing well in the face of disruptive events. More productive and resilient agriculture requires transformations in the management of natural resources (e.g. land, water, soil nutrients, and genetic resources) and higher efficiency in the use of these resources and inputs for production. In this view climate-smart agriculture' has the potential to increase sustainable productivity, increase the resilience of farming systems to climate impacts and mitigate climate change through greenhouse gas emission reductions and carbon sequestration. Climate smart agriculture (CSA) also aims to support sustainable and equitable transitions for agricultural systems and livelihoods across scales, ranging from smallholders to transnational coalitions and forming a core part of the broader green development agenda for agriculture.

Concept of climate smart agriculture

Climate-smart agriculture (CSA), as defined and presented by FAO at the Hague Conference on Agriculture, Food Security and Climate Change in 2010, contributes to the achievement of sustainable development goals. It integrates the three dimensions of sustainable development (economic, social and environmental) by jointly addressing food security and climate challenges. It is composed of three main pillars:

1. Sustainably increasing agricultural productivity and incomes;
2. Adapting and building resilience to climate change;
3. Reducing and/or removing greenhouse gases emissions, where possible.

Approaches in climate smart agriculture

Climate smart agriculture is not a single specific agricultural technology or practice that can be universally applied. It is an approach that requires site-specific assessments to identify suitable agricultural production technologies and practices. This approach helps to

- Addresses the complex interrelated challenges of food security, development and climate change, and identifies integrated options that create synergies and benefits and reduce trade-offs;
- Recognizes that these options will be shaped by specific country contexts and capacities and by the particular
- Social, economic, and environmental situation where it will be applied;
- Assesses the interactions between sectors and the needs of different involved stakeholders;
- Identifies barriers to adoption, especially among farmers, and provides appropriate solutions in terms of policies, strategies, actions and incentives;
- Seeks to create enabling environments through a greater alignment of policies, financial investments and institutional arrangements;
- Strives to achieve multiple objectives with the understanding that priorities need to be set and collective decisions made on different benefits and trade-offs;
- Should prioritize the strengthening of livelihoods, especially those of smallholders, by improving access to services, knowledge, resources (including genetic resources), financial products and markets;
- Addresses adaptation and builds resilience to shocks, especially those related to climate change, as the magnitude of the impacts of climate change has major implications for agricultural and rural development;

- Considers climate change mitigation as a potential secondary co-benefit, especially in low-income, agricultural-based populations;
- Seeks to identify opportunities to access climate-related financing and integrate it with traditional sources of agricultural investment finance.

Climate-smart agriculture can have very different meanings depending upon the scale at which it is being applied. For example, at the local scale, it may provide opportunities for higher production through improved management techniques such as more targeted use of fertilizers. At the national scale it could mean providing a framework that incentivizes sustainable management practices. And at the global scale it could equate to setting rules for the global trade of biofuels. It is not clear how actions at one scale may affect the others. For smallholder farmers in developing countries, the opportunities for greater food security and increased income together with greater resilience will be more important to adopting climate-smart agriculture than mitigation opportunities. For intensive mechanized agricultural operations, the opportunities to reduce emissions will be of greater interest.

Implications

CSA aims to increase the resilience of livelihoods and ecosystems through combinations of technologies and practices and improved access to and use of weather and risk forecasts and through the sustained support of innovations, both local and external. Although the focus is often on the technical components of CSA, the institutional aspects are absolutely vital, both for the adoption of CSA and as a contribution to resilience in its own right.

Constraints

Climate change challenges farmers' decisions by altering risks and uncertainty and incorporating new information into their traditional knowledge-processing systems. Many climate-smart agricultural practices can be integrated into a single farming system and will provide multiple benefits that can improve livelihoods and incomes. However, there are practices that cannot be integrated because they impact upon other elements of the farming system. For example: the timing of a practice may lead to labour constraints; high investment or maintenance costs may exceed the capacity of asset poor farmers; and competition for crop residues may restrict the availability of feed for livestock and biogas production. Identifying these constraints is important to developing economically attractive and environmentally sustainable management practices that have adaptation and mitigation benefits.

Conclusion

Rapid adoption of the CSA concept into the global development lexicon places a premium on understanding what is really known about CSA practices and technologies, the synergies and tradeoffs among its three pillars, and the socio-ecological niches where CSA works. Without such information, at best CSA will be a passing fad and at worst a large of influx of resources– both time and money– will be wasted, distracting from other productive agendas or generating unintended consequences for the communities and issues CSA aims to help and solve.

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