



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

CLIMATE SMART AGRICULTURE IN FEED THE FUTURE PROGRAMS

February 2016



USAID
FROM THE AMERICAN PEOPLE

CLIMATE SMART AGRICULTURE IN FEED THE FUTURE PROGRAMS

February 2016

Foreword

Feed the Future was launched in 2010, building on earlier efforts to increase food security. The U.S. government Feed the Future program aims to reduce hunger and poverty, and at the same time improve nutrition, in particular as it affects child stunting. Three cross-cutting issues were also highlighted: gender, environment and climate change. Since the inception of Feed the Future, thinking around climate change impacts on agricultural transformation among smallholders, which is at the heart of the Feed the Future theory of change, has progressed. This newer understanding has become known as Climate Smart Agriculture (CSA), which incorporates three specific goals (or pillars), namely sustainably increasing productivity and income, increasing adaptation, and reducing greenhouse gas emissions below business as usual. This paper from USAID's Bureau for Food Security is intended to convey how newer thinking, in particular with respect to Climate Smart Agriculture (CSA), should be integrated into Feed the Future programs.

The document has benefited from extensive review and comment from USAID, other USG agencies, partner organizations and the interested public. A wide range of suggestions was received, drawing on deep experience in the nexus of climate, agriculture, nutrition, and food security. Comments evidenced a strong interest to be engaged in CSA as a focus that spans the full range of partners, public, private and NGO, that are contributing to food security gains. A number of changes have been made to the paper as a result, but several aspects stand out as points of convergence across diverse stakeholders and bear repeating here. Most fundamentally, many writers cautioned that Feed the Future sustain its top focus on reducing poverty and under-nutrition. There was also broad consensus on reemphasizing the need for strategies regarding smallholder inclusion and decision-making. This came through in many ways but especially with regard to the provision of choices and information that could then be integrated at the local level by producers with existing knowledge and practices. Similarly, many commenters noted that, as with other innovations, it is not about replacement of existing techniques and approaches but rather refinements that confer advantages for producers, especially those related to climate resilience.

An interesting issue arose around terminology. There was generally strong support for adaptation and the need to keep that as a priority in smallholder-oriented investments. On the other hand, mitigation was sometimes understood as mitigating the effects of climate change on communities, rather than its more widely used meaning around reducing or reversing the drivers of climate change. For the purpose of clarity, the paper will continue to use mitigation as included in the third pillar of CSA—connoting emphasis on reducing greenhouse gas emissions and sequestration of carbon. Activities which aim to reduce the effects of impacts of climate change will continue to be included under the term adaptation.

One challenge that was reflected in the views received was the intention that CSA reflect all aspects of sound agricultural programming for food security outcomes. While this is the intent of FTF investments overall, the degree to which the paper can delve into depth on important dimensions (e.g., youth, value chains) of FTF that integrate but also go beyond CSA is limited by its length. Nevertheless, care has been taken to highlight connections to broader considerations. Some commenters argued for a wider scope around agriculture generally, rather than focused attention on Feed the Future, for example through

more detailed discussions around agriculture and deforestation. Conversely, others argued for much greater specificity in the examples used, citing experience in particular production systems or situations. These were all valuable suggestions, and some additions were made, but greater detail will generally be found at the planning and analysis at the level of FTF mission portfolios and other investments. The intent here is to provide framing that informs FTF programming decisions at the level of concepts and strategies.

Operational aspects of enhancing CSA in FTF programming and Monitoring and Evaluation systems are referred to here, but are being more fully developed elsewhere. This document is intended to share USAID's approaches with partners involved in USAID programs, along with the wider agricultural development and food security development community. Agricultural and climate sciences are advancing, as is understanding of how they interact. Learning organizations benefit from new understanding and experience, and the Bureau for Food Security views CSA in this dynamic context, reflecting USAID investment and approaches generally. It may also be useful to allied development objectives where climate smart agriculture can contribute—including climate change but also biodiversity, economic growth, environment and resilience, among others.

Finally, thanks to all those, across Feed the Future, partners and interested organizations and individuals, who shared their perspectives and made suggestions. We hope the resulting paper provides helpful framing for more fully integrating climate smart approaches into agriculture and food security investments, within the context of Feed the Future and beyond it.

Introduction

For over 50 years USAID has pushed the frontiers of innovation to develop, test and advance best practices in agriculture and rural development. USAID's agriculture programs aim to improve nutrition, economic and social circumstances of agricultural producers and communities, and enhance food security of countries and regions as a whole. Smallholder producers, particularly women, and vulnerable consumers, particularly young children and mothers, are emphasized in program design. The livelihoods of about 2.5 billion people around the world depend on rain-fed crops, fisheries, and livestock – sectors all vulnerable to changes in climate. Investments under the U.S. whole of government Feed the Future initiative focus on agricultural and food systems as means to achieving two overarching goals of reducing poverty and child stunting. In practice this means improving the efficiency and productivity of agricultural systems, and protecting livelihoods by developing the capacity of farmers so they are more resilient to shocks, especially those posed by weather variability and market and climate risks. This document brings climate smart agriculture into focus as integral to the effectiveness and sustainability of agriculture and food security programs over the longer term.

In 2010, the Feed the Future Guide advised that both climate change adaptation and climate change mitigation be considered throughout the program cycle. These efforts align with the Agency's 2012 Climate Change and Development Strategy, which outlines the three strategic objectives of mitigation, adaptation and integration. Feed the Future has offered specific further guidance on adaptation and resilience, as well as around environmental sustainability. In fully integrating climate-smart analysis and practice, Feed the Future needs to promote smart agriculture that takes into account the challenges and risks, as well as the opportunities, associated with climate change. Given the existing focus on adaptation and resilience in current FTF programs, this paper lays out further considerations especially in the area of mitigation that can complement existing climate adaptation programming.

The intersection of climate change and agriculture

Climate change poses drastic risks to every facet of our lives, from diminishing water availability, higher temperatures, changing precipitation patterns, rising sea levels, ocean acidification, and more frequent extreme weather events. Populations in the developing world, where many are already vulnerable and food insecure, are likely to be the most seriously affected by the impacts of climate change. Nearly half of the economically active population in developing countries relies on agriculture for their livelihood and about 75 percent of the world's poor live in rural areas. Combined with global population growth and increasing demands on agriculture, climate change threatens the progress of global food security and the long-term sustainability of agricultural production systems and the larger landscape.

Small-holder farmers, pastoralists and fishing communities in the least developed countries (LDC) are among those most vulnerable to climate change, as their production systems often lack the resources to manage an effective response to climate threats. Increasing the adoption and sustained use of crop, livestock and mixed farming system practices and technologies that both respond to climate change and reduce its drivers (emissions) are critical to enhancing global food security. Although adaptation and resilience have been USAID's main focus for addressing climate change in agricultural programs, many programs also encompass opportunities to reduce emissions. This reflects the fact that adaptation and mitigation frequently go together, as can be seen in practices that reduce energy use (e.g., zero tillage) or enhance soil organic matter (e.g., conservation agriculture, incorporation of perennials) in smallholder production systems.

Although many food-insecure developing countries contribute relatively little to global emissions, land use can constitute the main sources of emissions in these countries. More specifically, emissions associated with land conversion for agricultural use, such as tropical deforestation, constitute the majority of those emissions. While FTF programming targets agrarian areas, many approaches promoted in FTF could be relevant to conserving natural resources and enhanced sustainability in ways that could help reduce incentives for land use change. For example, in more humid zones, multi-story agricultural systems integrating trees, crops and livestock may be feasible. Good governance around land and resource tenure also have important roles to play. USAID invests extensively outside of FTF in a range of approaches to reduce deforestation and greenhouse gas emissions both directly and through associated supply chains (e.g., TFA 2020). The goal of reducing land conversion, through both direct (e.g., policy and governance supporting conservation, valuation of ecosystem services, etc.) and indirect means (increasing productivity and resource-use efficiency in existing agricultural systems), is an area where USAID investments in agriculture, climate change and environment complement and reinforce each other.

Feed the Future programs on the other hand target more densely populated, agriculturally productive lands where sedentary agriculture systems predominate. In these settings, sustainable intensification, which is at the heart of the FTF Research Strategy, is increasingly being promoted. Its goal is to reduce poverty and under-nutrition and reduce production risks while sustaining or improving the natural resource base. Adaptation to climate change, diversification, resource-use efficiency and information access are essential elements in the FTF approach to sustainable intensification. Globally, sustainable intensification of prime agricultural land may help to relieve pressures on more marginal or fragile lands, or on biodiversity-rich natural areas. At the local level, governments and communities make important

decisions regarding resource management. More extensively managed agricultural areas (e.g. pasturelands, non-contiguous field cultivation) offer additional opportunities to align food security, resilience in the face of shocks, environment and climate change oriented approaches in management of crop, livestock and rangeland resources (e.g., farmer-managed forest regeneration, incorporation of trees in sloping areas, etc.). Again, both government policy and community decisions are important factors in shaping local outcomes.

FTF programs can connect to and benefit from local and national systems of governance concerning land and resource use. Land tenure frameworks have a bearing on choices made by individual families and communities and could be factors in choices made. For example, integration of perennials (e.g., trees) or willingness to invest in organic matter accumulation in soils may depend on ownership and use norms. While most projects will focus on zones of influence within partner countries, some will be directly affected by cross-border or larger regional issues. Regional organizations may provide important context or opportunities for CSA, just as they do for other issues like trade or seed policy.

Opportunities to advance adaptation and mitigation to climate change go beyond production to post-harvest handling, input and output value chains and the larger agri-food system that links producers with consumers. As farmers adopt more commercial value chains and move away from subsistence farming, there is a potential for increased emissions but also many opportunities to incorporate energy efficiencies, waste reduction and emission mitigation technologies. At the local level, collaboration with farmer organizations offers good opportunities for reducing food waste, contamination and spoilage in producing communities. Similarly, the same objectives can also be targeted through public and especially private investment across the food system.

While FTF value chains frequently address obstacles to reduce losses, there are also systemic opportunities for approaches that raise awareness among actors including through policy and governance. For example, more efficient markets and trade (e.g., faster border crossings, improved warehouses that reduce loss) offer excellent opportunities for reducing the agri-food system climate footprint, while also supporting profitability gains. Greater post-harvest efficiency can also directly contribute to enhancing overall climate smartness of the food system by reducing incentives for what could be redundant production, with its attendant costs, resource use and greenhouse gas generation. Working with the civil society, private, public sectors, FTF programs can promote environmental practices that underscore climate smart approaches as being aligned with best ecologically friendly business practices.

Development Policy Context for CSA

In September 2014 President Obama issued Executive Order #13677 on Climate-Resilient International Development at the UN Secretary-General's "Climate Summit". The Executive Order requires the integration of climate-resilience and adaptation considerations into decision-making regarding all United States' international development programming. This includes, among other things, screening, assessing, and evaluating strategies, planning, programs, projects, investments, facilities, and funding decisions for climate-related risks and vulnerabilities, using best-available climate change data, tools, and information, and then adjusting those activities, as appropriate, to make those investments more robust in the face of climate changes already happening and still to come.

At the summit, the U.S. joined many other nations and organizations in launching the Global Alliance for Climate Smart Agriculture. With leadership from Food and Agriculture Organization of the United Nations, the World Bank, the Climate Change, Agriculture and Food Security (CCAFS) program of the CGIAR (Consultative Group on International Agricultural Research) and others, the Global Alliance will seek to advance CSA in order to boost food and nutrition security through climate informed and natural resource-efficient agricultural practices, food systems and social policies. Feed the Future will foster sharing of information on steps taken and progress towards CSA impacts in ways that can reach and potentially benefit all GACSA participants. Elsewhere, the U.S. Government has shown its commitment to drawing on state-of-the-art science and policy to directly address critical climate change risks to food security and agricultural development, and to support mitigation opportunities (the Global Research Alliance on Agriculture Greenhouse Gases).

CSA is also an increasing priority of host countries. African Heads of State recognized the importance of CSA in the Malabo Declaration (June 2014), which set a goal of 25 million farm households practicing CSA by 2025 (referred to as Vision 25x25). In addition, there are a number of regional CSA alliance efforts, including in Central America. As a learning organization, Feed the Future seeks to continually advance and refine approaches to food security that reflect the evolving policy context, reflecting the latest analyses, best practices and host country priorities.

[A working definition of CSA](#)

USAID generally follows the FAO definition of climate-smart agriculture (CSA) as presented at the Hague Conference on Agriculture, Food Security, and Climate Change in 2010, and reaffirmed at the launch of the Global Alliance. It is composed of 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 appropriate (the FAO definition uses possible).

CSA is, fundamentally, “smart agriculture informed by climate science.” It encompasses how agriculture affects and is affected by climate change, and aligns this integration with food security objectives (reduction of hunger and poverty, improved nutrition).

USAID’s definition of CSA incorporates aspirational principles as well:

- **Systems approach:** CSA is not a practice or list of practices, but a continuous process that considers challenges that arise at the intersection of climate change and agriculture holistically, including identifying and addressing barriers to adoption.
- **Intentionality:** CSA deliberately considers how climate change will impact activities (adaptation) and, how activities will impact climate change (mitigation), both on and off the farm field, even where no further action is taken.
- **Multiple benefits:** CSA seeks to integrate approaches and options in ways that that maximize synergies and reduce tradeoffs.

- Context specific: CSA is specific to the relevant geography and climate change impacts as well as socio-economic, political, cultural, and environmental factors.
- Long-term perspective: CSA acknowledges and addresses short term needs while encouraging a long-term perspective to consider future climate change impacts and their uncertainties, and takes advantage of new information.

Climate Smart Agriculture in the Context of Feed the Future

All of the above objectives around CSA need to be placed in the context of Feed the Future’s approach and theory of change that places smallholder farmers, pastoralists and fisher-folk at the center of the investment strategy. Integration of CSA will be around solutions that small-holders choose to consider and adopt as part of their production decisions. Thus CSA needs to be integrated into best practices and approaches that support overall Feed the Future goals around poverty and nutrition; this is clearly codified in the first pillar. Having stated that, objectives around sustainable productivity and income growth benefit from attention to both adaptation and mitigation, the second and third pillars of CSA. CSA adds additional importance to efforts and innovation aimed at uptake of new technologies and practices by smallholders, in particular behavioral change communication so that sustainable and feasible solutions can reach scale. In this context, as in others, CSA needs to be integrated into best practices around farmer and community engagement as emphasized across FTF.

Managing risk to increase adaptation: CSA confirms best practices around integration, sustainability, program learning and management, and especially around managing risks. Risk reduction could be its strongest selling point to farmers. Good agricultural practice inherently takes into account weather variability, spanning environmental services (e.g., water availability), on-farm production and post-harvest handling and storage, all of which are subject to shocks. In many areas where FTF programs are active, planning for weather variation constitutes important first steps towards resilience and longer term climate adaptation. FTF development investments in innovation are focused on longer term adaptation to higher temperatures in crops and animals, resource-use efficiency and new approaches to emerging threats, many of which are linked to climate change risk reduction.

Resilience: In the context of resilience, CSA is viewed as a key component of reaching higher-order goals around reduced risk and asset accumulation. Resilience programs that link humanitarian response and development, e.g., livestock watering points and market information, can also provide openings for weather and climate risk management. Climate adaptation strategies that underpin resilience often confer mitigation benefits, although that outcome is not a driver in planning. Farmer-managed natural regeneration of savannahs is an excellent example of major “tag-along” impacts on carbon sinks (soil and woody plant). Sustainability of various interventions is also seen within a lens that includes labor availability, informal safety nets based on remittances and policies governing migration for both people and livestock. Moreover, resilience programs implement services and information channels that also enhance climate change adaptation in Feed the Future agricultural programs and zones, underscoring the advantage of linking CSA enhancement across investments.

Reducing emissions in agricultural systems: In a development context, mitigation is more complex than adaptation for agriculture. There has been considerable discussion around the implications of the mitigation component (the third pillar of CSA) across the development community. Climate change strategies envision increases in emissions associated with economic development while still looking for

opportunities for reducing their growth, and agriculture and food security are no exception. Although there may be some instances where absolute reductions are possible, in many instances achieving our hunger, poverty and nutrition goals will require pathways that lead to emissions increases. FTF programs should thus consider opportunities to promote efficiencies or enhance carbon sinks in ways that reduce emissions growth as part of an overall approach that is acceptable and likely to be adopted by smallholder farmers.

Trade-offs: This understanding will likely lead to different approaches across a range of settings, which is fully consistent with the context specific nature of CSA. In many situations, USAID's agricultural investments aimed at increasing food security through productivity, income and nutritional gains for smallholders may result in increased emissions in absolute terms. A recurring case in point is that of smallholder farmers in sub-Saharan Africa where no fertilizer is currently used. In these situations, the "triple-win" of driving productivity, adaptation and mitigations gains may mean integrating fertilizer use in ways that also take into account biological nitrogen fixation through legumes in rotation (crops and/or trees) and management of organic (e.g., manure, compost) matter. These approaches can be integrated together and with mineral fertilizers and urea in ways that enhance the overall efficiency and effectiveness of each. In other words, "bending the curve" away from where emissions would be if other productivity-enhancing innovations were adopted may offer major wins in the context of CSA.

On the other hand, in many FTF zones in Asia, farmers may already be using significant levels of inputs and the larger climate win linked to food security and nutrition may be through much greater efficiency in the production system, reflecting water savings and reduced energy use (e.g., reduced tillage, energy-efficient irrigation). Thus trajectories within lower or higher input systems, when intentionally framed and in the context of a conducive enabling environment, could be seen as climate smart, meeting adaptation and mitigation goals as well as driving income and nutrition gains. Regardless of context, a range of other factors—production and weather information, index insurance, analysis of trends and national policies—are also relevant to a climate smart approach.

Diversification and Value Chains: In general, Mission FTF programs work within diversified production systems that reflect farmer choice around crops, livestock or fish although a limited number of value chain may be the focus. Producer opportunities and decisions driven by diversification, not only through the number of crops or livestock species, but also by using a wider range of improved varieties and staggered planting times for a given crop. Over a longer time period, crop choices by farmers may shift as risks with one crop rise while another crop option is viewed as a safer bet. Thus diversification can be a strategy for managing risk and optimizing returns, particularly when informed by information on potential shocks, seasonal forecasts and long term climate trends. Diversification and risk reduction can also go together through capital investments in irrigation and mechanization; the challenge is how to achieve these in smallholder contexts. Ultimately, it will be farmers who directly determine their risks, but FTF programs can help widen the array of appropriate options that confer greater resilience as well as more efficient production with a commensurately reduced GHG footprint.

Inclusive and efficient markets and policy: Climate smart agricultural development also depends on decisions beyond the farm, as part of larger, economy-wide climate-resilient and lower emissions development strategies. Feed the Future addresses post-farm opportunities through partnerships. Market infrastructure, while largely a private good, might respond sooner to changing conditions if better information is available. Policy and governance decisions around public infrastructure (roads,

ports, etc.) will likely have an impact on market efficiency and climate smartness associated with reduced transit times and reduced postharvest losses. Positive changes in terms of efficient and resilient market systems can also lead to a responsive food system that drives greater efficiency with mitigation impacts in both public and private investment. In most situations, economic efficiency will strongly support efforts to conserve product value, reduce energy consumption and drive diverse profit centers across developing agricultural economies.

Implementing Climate Smart Agriculture in FTF Programs

FTF supports a broad range of agriculture and food security efforts, in many different ecosystems, value chains, market sheds, watersheds, and cultural contexts. They include supporting partner countries to develop their capacity and policies to lead and manage their development efforts; improving agricultural research and development of existing, proven technologies to unlock agricultural growth and transform economies. All are aligned with and focused on contributing to the goals of reducing the prevalence of poverty and under-nutrition. The integration of CSA into FTF programs, which builds on previous adaptation efforts, should focus on the following five areas:

1. Use sound climate data and science. Country, Regional and Washington operating units are working together to improve our understanding of climate change impacts, and the risks that climate change pose on agro-ecosystems and food systems that are the focus of the agriculture and food security portfolio.
2. Develop and deploy climate smart technologies and innovations. USAID investments will help develop and increase the adoption of a suite of agricultural technologies and innovations that help achieve effective climate smart approaches, and that are acceptable to and benefit smallholder producers.
3. Strengthen human and institutional capacity in ways that foster adoption of CSA by smallholders. USAID will build on the capacity and knowledge of agricultural innovation systems and services that support producers and food systems to deliver climate smart agriculture practices and services.
4. Build and maintain partnerships for impact. USAID will partner with the private sector, civil society and host governments to maximize the effectiveness of CSA investments, including the enhanced use of public-private alliances.
5. Support policies and an enabling environment that facilitates climate-smart agriculture. Support and assist country governments and regional organizations to establish policies, investments and an enabling environment that facilitate climate-resilient, low-emission agricultural and food system development. Trade-related policies are extremely important in terms of all three aspects of CSA, and should be informed by the best analysis and practices in this regard that have been generated by leading FTF partners.

The following provides some background and explanation for these five areas of engagement.

Sound data and climate science: Countries and communities must be able to access and use quality climate and weather information to identify vulnerabilities to climate change and variability and to evaluate strategies to build resilience. In the interest of increasing our knowledge and understanding of

climate change impacts on agriculture and food security, USAID-led programs are currently sponsoring a number of country and regional climate-smart-agriculture focused studies and assessments.

Nevertheless, much remains to be learned about the impacts of climate change on different agriculture and food systems, and the options for adapting to or mitigating the impacts of climate change.

Attention will continue to focus on both observed weather variability and climate change vulnerability assessments at the country and regional levels to help identify the risks posed to food security, including risks to on and off farm elements of the food system.

Investments that are specific to climate change, such as those through the Global Climate Change Initiative, will be an essential complement to food security investment in achieving climate smart outcomes. These will include not only developing and using an evidence base for prioritizing development decisions, encompassing likely physical stresses but also how those translate in social and economic systems. The quality of the climate data and modeling, which can vary greatly for LCD's, will be a strong consideration in determining how the assessment results and weather predictions are used. Climate services can help in understanding long term climate trends via networks that develop aids to decision making as well as decision-making directly across economic sectors. Climate services are designed to support the production, translation, transfer, and use of climate knowledge and information in climate-smart policy and planning across sectors, and including agriculture, food security and nutrition.

Develop and deploy climate smart agricultural technologies, practices and innovations that have strong adoption potential. Investment in science, technology and innovation is integral to the success of the climate-smart-agriculture agenda. The current portfolio of research designed and supported by BFS and other Bureaus and agencies is designed to strengthen food security in the context of climate change. It includes significant investments to enhance adaptation, including a range of practices that also reduce GHG emissions. These include efforts to improve crop, livestock and production system resilience in the face of higher temperatures and more extreme weather events, as well as innovations that increase resource-use efficiency and resilience associated with mitigation-enhancing technology and practices. Determining the best opportunities for enhancing mitigation outcomes is an evolving field where improving data and experience will guide how these are best integrated into current and future FTF programs.

Similarly, social science will be needed to consider the cost effectiveness and social desirability of greater attention to mitigation in the context of CSA approaches and enhancements and conversely, to drive adaptation and resilience in ways that do not increase emissions. Technical options for reducing emissions in off farm elements of the food system need to be explored, such as solar powered technologies for chilled storage in horticulture value chains. Where feasible, the use of known effective and profitable CSA considerations and approaches need to be socialized, integrated and scaled.

Developing and deploying climate smart elements of agricultural systems will, like other innovation strategies, reflect a range of factors that reflect context and the priorities of farming households, communities and actors across the agri-food system. To the extent feasible, activities should take into account the interaction of technologies and practices, market demands and farmer preferences and incentives. Ultimately, however, farmers, and in some instances communities, will take decisions based on their perceived needs, opportunities and risks. FTF programs should endeavor to provide them with

the best, most relevant information about considerations, pre- and post-harvest, that foster climate resilient, resource-efficient and sustainable production systems.

Strengthen capacity for increased uptake of practices and services for CSA by smallholders. USAID Country and Regional missions support and promote the development of local capacities, services and systems for agriculture and food security. Scaling up the adoption of practices and technologies that can support a CSA approach will require local delivery systems to be effective, including public and private service providers with the requisite knowledge, skills, and tools. Increased effort and resources will need to be dedicated to achieving this with and through existing and new programs that consider, maintain or strengthen practices for CSA that benefit smallholder farmers. BFS will work with FTF country and regional teams, and other technical staff to develop knowledge and skills needed to integrate, program and monitor CSA efforts within their agriculture and food security portfolios, building on the leadership of host country efforts and priorities.

Of particular importance is the provision of improved information and access to a range of alternatives. Climate services are developing rapidly and offer important resources to agricultural investments in particular. These can be complemented by food security programs that incorporate improved information on markets, technologies and better agronomic and resources management practices. A third factor driving uptake of climate smart approaches is access to appropriate technologies. With both abiotic and biotic stresses likely changing more rapidly than in the past, enhanced seed systems will be needed to provide farmers with an expanded range of choices, in both current and different crops.

BFS will also network with the global community engaged in CSA efforts, and link the global initiatives and centers of with country and regional missions to increase and enhance field based CSA partnerships. To better achieve this, research on farmer decision-making that drives innovation uptake can be very helpful. As an example, researchers are studying the impact of risk-mitigating incentives (e.g., index insurance) on the effectiveness of technology scaling of climate-resilient, nitrogen-efficient, maize hybrids and varieties.

Build and maintain partnerships for impact: FTF programming recognizes that meeting the needs of smallholder farmers adapting to climate shocks will require all relevant actors be engaged. For example, private companies are essential to the commercialization and sustainable scaling of new technologies and practices for resilience and adaptation to smallholders. Other civil society organizations will also play important roles in transmitting information, technologies and practices. Due to the nature of agriculture, many activities that build resilience can also provide mitigation benefits. New and enhanced public-private or NGO alliances are a way to vastly extend USAID's reach on climate smart-technologies and innovations. In both instances, an active learning agenda will be needed, and steps are being taken to put this in place. Not enough is known about the best ways international development agencies like USAID or other development partners can help incentivize NGO and private investment, as well as positive business or operational practices related to CSA. USAID has embarked on a systematic approach to deepening knowledge about more effective private sector engagement in this area, to identify cost effective approaches, opportunities for value added alliances, and guidelines for field missions.

With regard to public sector collaboration, climate-related issues are common problems that donors must collaborate closely on, in order to extend the impact of limited funds. FTF programs seek to work

closely with the private sector, other donors, and host governments to maximize the pace and impact on food security, and this mindset of partnering should extend to CSA.

Support policies and an enabling environment that facilitates climate-smart agriculture: Achieving the CSA goals will require policies that help producers, especially smallholders, businesses, communities and others manage risk effectively. A central tenet of USAID's agriculture and food security efforts is to work with country officials and leaders to support and secure their commitment to strategies, programs and policies to achieve their goals and our shared interest in reducing poverty and hunger. In Africa, Heads of State and Governments committed to ensuring that 30% of African farmers, herders and fishers are using climate resilient techniques by 2025. In Africa, Asia and Latin America achieving greater resilience to climate change requires continued integration CSA into their national agriculture and food security plans. Secure access and control of land, water and natural resources will be crucial for success on adoption of CSA technologies and innovations by farmers, pastoralists and fisher-folk. Policies that promote changes at the farm and community level can foster enhancement in land, water, crop and livestock management in ways that promote outcomes consistent with CSA. It also must be recognized that many of the transformational changes therefore depend on altering existing power relations (eg. gender dynamics), which involves recognizing the social and political processes that both undermine and constrain resilience.

Monitoring Progress

Climate Smart Agriculture is context specific and depends on factors such as climate concerns, time frames, agro-ecologies, and enabling environments. Thus, a process that intentionally articulates relevant parameters and then considers an intervention within those parameters is a promising approach to monitoring CSA progress. Feed the Future is developing a process based approach that first frames the CSA effort, and then selects appropriate indicators to track progress. The process is drawing from current monitoring and evaluation systems and teams within the Agency, including that of Feed the Future (e.g., indicators around agriculture and environment) and the Global Climate Change Initiative indicators (4.8 series) and will be designed to be manageable, fitting within the ongoing reporting system and complement existing efforts.

To advance FTF thinking on approaches to CSA monitoring, BFS sponsored a CCAFS led workshop with a range of development partners in early 2015. The workshop engaged leading experts in the Global Alliance on Climate Smart Agricultural community and built on work from the Food and Agricultural Organization and the CGIAR centers, which have been thought leaders in this realm. This USAID-supported work stream is helping make strides on metrics, supporting Agency needs and contributing to

USG leadership in CSA. On an annual basis, BFS will lead an effort to prepare an Agency-wide update on CSA implementation to present to the Board on International Food and Agricultural Development (BIFAD) and for sharing with other interested partners (e.g., in the Global Alliance for Climate Smart Agriculture, and specifically the Knowledge Action Group). Even as this occurs, building and conveying a broad, integrative vision that encompasses the range of FTF activities contributing to CSA analysis and outcomes remains critically important, both internally in USAID and beyond (in ways that include a range of program partners.)

Next Steps

Drawing from the areas outlined above and fulfilling the FTF goals of monitoring efforts, next steps for more fully incorporating CSA into FTF include:

- The development of CSA Action Plans: BFS will work with FTF Missions and partners to develop both regional and Mission- level planning for how CSA will be integrated in USAID led food security programming.
- Consultations and input: Implementation of CSA in FTF will draw from continued consultation across USAID, it will continue to leverage expertise from global experts, and FTF programs will continue to engage a broad spectrum of stakeholders, including private companies, NGOs, and research and advocacy organizations to seek input on the best and most cost-effective ways to encourage private investment in CSA approaches.
- Knowledge management: FTF will share learning through engagement with the GACSA actions groups, CCAFS, World Bank, IFAD, FAO, civil society, NGO's and other partners. We will use AgriLinks to make information widely available. Regional meetings called Global Learning Evidence Exchange events are in process. A focus training course is being planned for USAID staff managing agricultural programs.
- Integrating CSA in Research Programs: Most research supported under Feed the Future was developed with climate change adaptation as a key consideration, and many research programs explicitly target climate-linked challenges. Over the coming year, USAID will consult widely across its research partners to assess opportunities for emphasizing or better characterizing potential contributions associated with priorities related to food security and nutrition, for example biological nitrogen fixation, nitrogen use efficiency and integration of perennials in targeted production systems.
- Scaling agricultural technologies: Working across central and Mission investments, USAID will work with partners, both public and private, to promote adoption of technologies that can support CSA at scale. As always, technologies cannot be seen in isolation and should incorporate best agricultural and climate-resilient practices around key factors such as rotations, fertilization and soil fertility management, market responsiveness and other considerations that fill in the systems-oriented context on which farmer decision-making is based.

In conclusion, BFS sees the challenges and opportunities associated with CSA as building on our on-going work of achieving lasting food security through programs and partnership that offer the best knowledge and technology available as options to smallholder farmers. These partnerships, and the contributions of multiple disciplines that they include, provide the foundation for progress in the ability of smallholder farmers to achieve sustainable growth in both productivity and incomes, along with wider nutrition and socio-economic benefits in our partner countries.