CCAFS Deep Dive Assessment of Climate-Smart Agriculture (CSA) in the Feed the Future Portfolio in Honduras

Osana Bonilla-Findji, Andy Jarvis, Ana Maria Loboguerrero, Nelson Diarte

1. Objective

The Climate Change, Agriculture and Food Security (CCAFS) program of the Consultative Group for International Agricultural Research (CGIAR) system is working with USAID to identify opportunities for mainstreaming Climate Smart Agriculture (CSA) in its Feed the Future portfolio. While climate has always been a cross-cutting theme in Feed the Future, the Bureau of Food Security (BFS) is now interested in framing this cross cutting theme as CSA.

CSA is an integrative approach that aims to support efforts from the local to global levels for sustainably using agricultural systems to achieve food and nutrition security for all people at all times, integrating necessary adaptation and capturing potential mitigation (Lipper et al. 2014). It addresses the linked challenges of climate change and food security and refers to an improved agricultural system that is developed and implemented with three main objectives:

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

As part of a global effort that will inform how Feed the Future tracks CSA across the 19 focus countries (plus aligned) the CCAFS and USAID/BFS team selected 5 to carry out a deeper analysis of their portfolio. In September 2015, CCAFS' visit to the USAID Honduras mission provided an opportunity to identify and discuss CSA-related activities within the country and the USAID zone of influence (ZOI), highlighting the importance of addressing the effects of climate change in the agricultural sector and the current and potential benefits of Feed the Future's presence for climate resilience. The visit included meetings with USAID Mission staff, Feed the Future implementing partners, and three government agencies. The process also included the review of Feed the Future strategy and project documents provided by the Mission, as well as a limited external literature review. This report outlines the key findings of the visit and highlights some ways in which CSA approaches can be further incorporated into the Mission's future programming.

2. Honduras context

Honduras is a lower middle income country facing significant challenges, with two thirds of the country's population living in poverty and 40% in extreme poverty. Honduras also exhibits the most extreme case of inequality in Latin America as measured by a Gini coefficient near to 58 [1]. Though Honduras has experienced a moderate recovery since the 2008-2009 global economic crisis, the country remains highly vulnerable to external shocks and susceptible to disasters including hurricanes and drought[2].

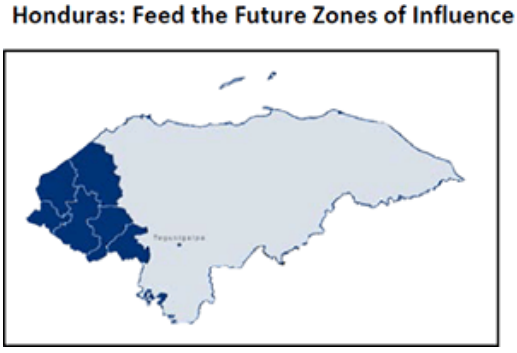

***Figure 1**. Feed the Future zone of influence covering six western departments - Ocotepeque, Copán, Santa Bárbara, Lempira, Intibucá, and La Paz*

[1] Juan Pablo Jiménez (ed.), *Desigualdad, concentración del ingreso y tributación sobre las altas rentas en América Latina*, Libros de la CEPAL, N° 134 (LC/G.2638-P), Santiago de Chile, Comisión Económica para América Latina y el Caribe (CEPAL), 2015;
[2] CDCS, 2015-2019

USAID Feed the Future Honduras focuses its interventions on six departments in the western region, one of the most impoverished and chronically undernourished in the country. This region presents low educational levels and high climate change vulnerability (Figure 1).

According to estimates from the Government of Honduras, a staggering 92% of the Dry Corridor population earns incomes below the national extreme poverty line and more than half of the children under five years of age suffer from stunting. In some parts of Western Honduras, 67% of households lack access to electrical energy, suppressing farm and household productivity.

Two value chains, fresh fruits and vegetables (horticulture) and coffee, have been identified by Feed the Future Honduras as target value chains. These crops are often a part of a diversified farming system of the households of this region and together represent 36% of the national agricultural Gross Domestic Product (GDP). Both of these value chains represent areas of competitive advantage for Honduras, with strong and growing market demand. Horticulture has national, regional and international market opportunities, whereas coffee is an international market-oriented value chain[3].

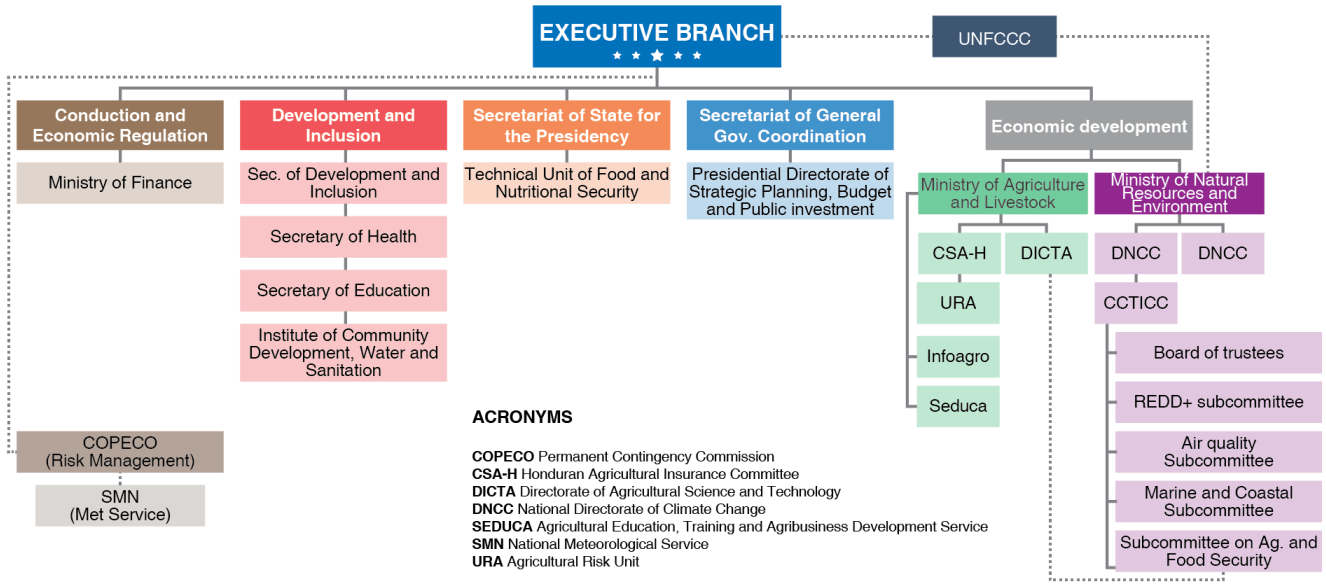

***Figure 2**. Mapping of Key national stakeholder relevant to Climate Change issues [6].*

A. Risk and Vulnerability

Natural variability governs annual-decadal temperature trends in Western Honduras through the El Niño-Southern Oscillation (ENSO), which causes weather disruptions almost every other year. The ZOI is also affected by extreme weather events such as severe flooding, landslides, and droughts as well as by slow, long-term changes in temperature and rainfall patterns that put additional pressure on water resources (e.g through decreased groundwater recharge rates, disappearance or reduced discharge rates of springs, and reduced soil moisture), but also on remaining watersheds and ecosystems -as the poor look for new productive land. These pressures make the livelihoods of poor households that heavily depend on agriculture particularly vulnerable.

The Intergovernmental Panel on Climate Change (IPCC) model consensus strongly asserts that significant drying on the magnitude of a 10-20% decrease in precipitation and close to 2°C of warming will characterize the regional climate by the year 2050[4]. It is also predicted that intense precipitation events will likely be more frequent and periods of drought longer, thereby increasing

[3] FTF Multiyear Strategy 2011-2015
[4] USAID Report, Vulnerability and Resilience to Climate change in Western Honduras, 2014

the likelihood of agricultural losses. The phenological analysis of the most widely grown crops in western Honduras — coffee, maize, beans, and two horticultural crops, lettuce and potatoes — has shown that all crops are vulnerable to projected climate change impacts. In the case of maize and beans, potential decreases in yields could reach 30% and 15%, respectively, unless offset by research to adapt seeds and farming techniques[5]. Overall, future losses in agricultural GDP due to climate change are expected to amount to between 4 and 19% [2].

As reflected in discussions with implementing partners, changes in agricultural activities associated with changes in climate and increased variability (e.g reduction of traditional production areas and appearance of new suitable areas) are already being observed.

> *"When taken with the model consensus of close to 2°C of warming … climate models suggest that by mid-century, western Honduras may be a "hotspot" of magnified climate change stress as compared to other areas of Central America and Mexico"[3].*

B. Government Agricultural Strategy and Policy

The agricultural sector plays a major role in economic development, employment generation, and reducing poverty and malnutrition in the Honduran rural population. Over the last 30 years, economic growth has averaged 3.6%, with the agriculture sector averaging 2.6%. Since the 2008-2009 economic crisis the country has experienced a moderate recovery driven by public investment, exports and higher income from remittances. This recovery is reflected in GDP's growth of 3.7 % in 2011 and 3.3% in 2012. In 2014, it accounted for 3.1% but current projections estimate a 3.5% growth for 2015. In 2014, agricultural production contributed to 13.2% of the GDP[6]. The agricultural GDP was primarily comprised of: coffee (21.2%); African palm (7.8%) shrimp 6.4% and sugar (1.9%). Exports of agricultural products in 2014 totaled USD $705 million, or 17.3% of total goods exported[7]. The sector also employs 35.8% of the economically active population. Of the total country area of 11.2 million hectares, 3.1 million hectares (27%) are suitable for agricultural activities, while 5.9 million hectares are forested.

Honduras has potentially the highest vulnerability to climate change in Central

Domain	Normativity
National Planning	National Plan, 2010-2022
Climate Change	Climate Change National Strategy, (ENCC) 2010
	Climate Change Law, 2014
Agriculture	Strategic Operating Plan for the Agri-Food Sector (Peagroh), 2010-2014
	Country Investment Plan for the Agri-Food Sector (PIPSA), 2011-2014
	Strategy for the Agri-Food Sector (ESA), 2011-2014
	State Policy for the Agri-Food sector and rural areas, 2004-2021
Food Security	Food Security and Nutrition Policy (PSAN), 2002
	Food and Nutrition Security Strategy (ENSAN), 2010-2022
	Food Security Law, 2011
Water	National Water Policy, 2007
	National Plan to Combat Desertification and Drought, 2005-2021
	Honduran General Law of Water, 2009
Risk Management	National Risk Management System Law (Sinager), 2010
	Sinager Regulations, 2010
	State Policy for Integrated Risk Management in Honduras (PEGIRH), 2013.

Table 1. Regulations related to climate change, agriculture and food security (CCAFS 2014).

[5] CIAT- CIMMYT- CRS Report Tortillas on the Roaster 2012
[6] World Bank: http://data.worldbank.org/indicator/NV.AGR.TOTL.ZS/countries/1W-HN?display=graph
[7] https://presencia.unah.edu.hn/facultades/articulo/el-funcionamiento-de-la-agroindustria-y-la-agricultura-en-honduras

America[8], but it also has a favorable policy and institutional framework (figure 2) to address this vulnerability, particularly in the agricultural sector, as reflected by the content of the National Plan (2010-2022), the National Strategy for Climate Change (2010, ENCC), the Climate Change Law (2014) and the Strategy for Food and Nutrition Security (2010-2022,ENSAN) (table 1).

Climate change and food security related aspects are addressed under the Operational Strategic Plan for the Agri-Food sector (2010-2014, Peagroh) as well as through the Country Investment Plan for the Sector (2011-2014, PIPSA), which was prepared by the Ministry of Agriculture (SAG) with assistance from representatives of USAID and FAO.

The State Policy for Comprehensive Risk Management (PEGIRH) adopted in 2013 considers imperative the development of long term strategies that include rapid learning on impacts evaluation, the development of communities' resilience (namely related to livelihoods), the prevention of the occurrence of new risks associated with natural hazards, climate change policy, and territorial and financial management to reduce vulnerability and increase resilience while contributing to sustainable development processes[9]. Several government initiatives such as the Agricultural Insurance Committee and the Adaptation Fund Project support the inclusion of social and economic benefits at the local level as part of the adaptation agenda, complementing the efforts of civil society and technical cooperation[10].

Honduras, climate variability and climate change are dominant themes from government through to international cooperation. Almost all projects are now addressing climate-related challenges in their interventions conception and implementation (Figure 3). Aimed at reducing rural poverty levels by increasing incomes through improved competitiveness and inclusive economic growth, employment generation and sustainable food and nutritional security, beyond supporting market driven value chain development[11], the Country's Investment Plan includes aspects such as: the promotion of diversification and sustainable utilization of natural resources, the development and transfer of new/innovative technologies, and climate change adaptation measures that mitigate risks complemented by microcredit and financial services[12], and new irrigation infrastructure among others.

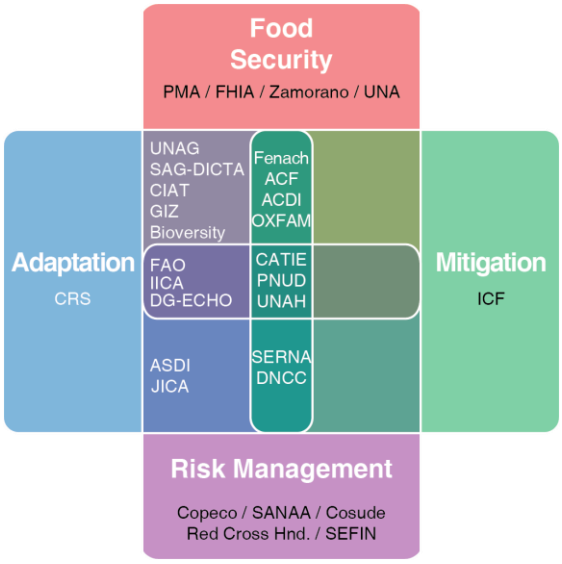

***Figure 3**. Institutions carrying out climate risk management, adaptation and mitigation work in Honduras (CCAFS 2014)*

[8] S. Kreft, D. Eckstein, L. Junghans, C. Kerestan and U. Hagen 2014. Global Climate Risk Index 2015. https://germanwatch.org/en/download/10333.pdf

[9] CCAFS. 2014. Estatus de la gestión de riesgos climáticos en el sector agroalimentario y su importancia para la seguridad alimentaria y nutricional en Honduras. March 2014. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)

[10] Bouroncle C, Imbach P, Läderach P, Rodríguez B, Medellín C, Fung E, Martínez-Rodríguez MR, Donatti CI. 2015. La agricultura de Honduras y el cambio climático: ¿Dónde están las prioridades para la adaptación? Copenhague, Dinamarca: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). https://cgspace.cgiar.org/handle/10568/45943

[11] Crops with higher market potential and suitable for smallholder identified include :These five targeted value chains are: Horticulture crops – fruits and vegetables; Coffee; Basic grains – corn and beans; Fish/aquaculture and account for almost 80% of agricultural GDP and 73% of agriculture exports

[12] These include rural village banks ("cajas rurales"), input suppliers and buyers (developed through support programs by FUNDER, MCA-H/ACA and MCA-EDA). All provide short-term loans or extend credit to small-scale producers of basic grains, vegetables, fruit and other commercial crops

3. Climate *Smart Agriculture* and USAID Honduras Feed the Future Strategy and Portfolio

Feed the Future's efforts in Honduras are built on the development hypothesis that improved household incomes for the rural poor resulting from market-oriented agricultural diversification will lift them out of poverty and result in improved diet and the utilization of maternal child health services, which in turn will lead to reduced levels of malnutrition. The Feed the Future strategic result framework lays out this hypothesis including its main causal links (Figure 4).

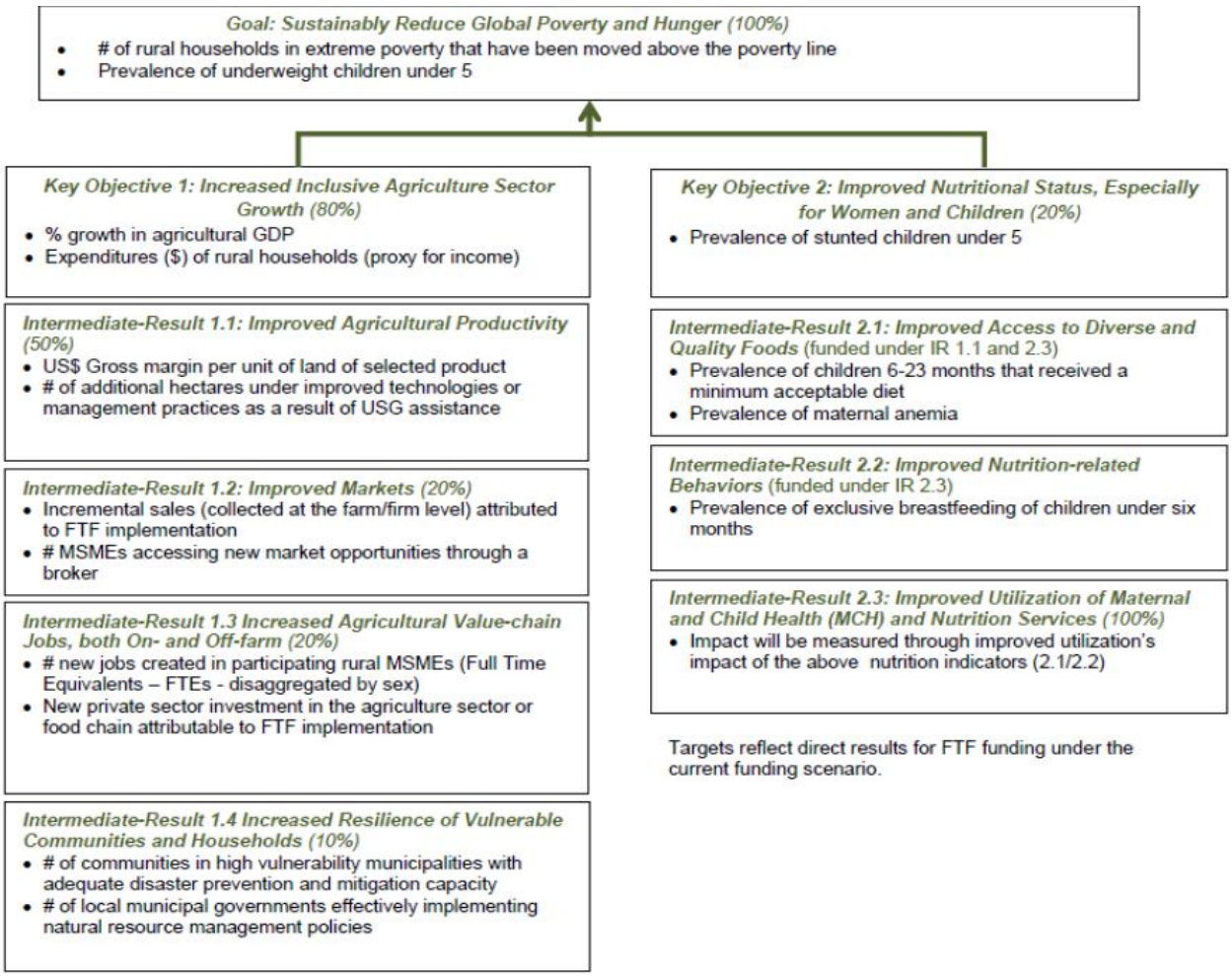

Figure 4*. Honduras Feed The Future Strategic Result Framework (FTF Multiyear strategy 2011-2015)*

One of the two key objectives to achieve this goal is to increase inclusive agricultural sector growth – focusing on the percentage growth in agricultural GDP and expenditures in rural households- as addressed in the corresponding intermediate results: *Improved agricultural productivity; Improved markets; Increased agricultural Value-Chain jobs both on and Off-farm and* ***Increased Resilience of vulnerable communities and households.*** These intermediate results specifically target communities in highly vulnerable municipalities and local municipal governments effectively implementing natural resource management policies). Climate change adaptation is an integral cross-cutting element of this strategy. Interventions at the household, farm, community, and policy level have been designed to take climate change adaptation considerations into account.

In this sense, the value chains selected were considered to be sound choices in light of current expectations about climate change impacts in Honduras in the medium term (10 years). In the case of horticulture, its reliance on irrigation will buffer it from changing rainfall patterns[2]. In addition, both the horticulture and coffee value chains are supported within the same farming household to diversify income and mitigate the risks associated with either crop in a given year. Furthermore, the Zone of Influence is located in the Dry Corridor where climate risk is particularly high.

The current Feed the Future Honduras portfolio is structured around one major Feed the Future Project, which includes three "Activities": Alianza para el Corredor Seco (ACS, builds on previous ACCESO), Mercado (also builds on previous ACCESO) and Trilateral Cooperation.

The following section below provides a summary of the Feed the Future portfolio in Honduras with respect to CSA objectives and discusses current perceptions of CSA. A variety of efforts help agriculture adapt to a changing climate. These are categorized into three general approaches:

Approach 1: Farm technologies & practices. Development, dissemination and management activities that contribute to CSA outcomes, namely adaptation, mitigation and productivity/income generation;

Approach 2: Incentive mechanisms through improved performance of value chains, financial mechanisms, performance compensation, capacity building, data collection and analysis, enhanced governance or other means that promote adoption of climate smart technologies and practices;

Approach 3: Multi-institutional participation and planning that foster integration and coordination of efforts across economic sectors (agriculture, forestry, fisheries, transportation, and finance) at multiple political levels (community-based organizations (CBOs), producer organizations, businesses, agencies - national and international).[13]

A. Farm Technologies and Practices[14]

An initial identification of CSA-related projects, which emphasizes **farm technologies and practices** within the current Feed the Future portfolio, is summarized in the Table below. Included are brief descriptions of the CSA relevant activities and associated types of CSA benefits (productivity & income, adaptation, mitigation). Further suggestions on CSA entry points and opportunities to be explored are highlighted later in this report.

Table 2. CSA-relevant technologies and practices in projects and associated benefits

Feed the Future Project	CSA-relevant activities	Sustainable productivity benefits	Adaptation benefits	Mitigation Benefits
Alianza para el Corredor Seco (ACS)	Increased **access to irrigation** (offer/demand informed design of irrigation schemes, water harvest and small community reservoirs); **Community based integrated water management** (plot and micro-catchment level to	Increase in productivity supported by access to irrigation Good practices leading to increases in production of 100-150% Production	Adaptation focus is on water management and ecosystem service protection. Increased regularity and quality of water. Increased resilience	Reduction of nitrous oxide emissions enabled by precision fertilizer application through irrigation systems Reduction of

[13] Example components of an enabling environment that facilitate CSA outcomes include climate information services, programmatic support for improved risk management, safety nets, or national policy frameworks such as national adaptation plans, NAMAs, etc.

[14] Note: This matrix represents only a partial analysis of the CSA implications of the current Feed the Future portfolio in Honduras, but it is indicative of the sort of more thorough analysis that might be undertaken as a next step to the initial deep dive.

	increase regularity and quality of water); water sources' conservation funds; Promotion of **good and productivity-enhancing agronomical practices** through extension assistance (soil preparation, seed selection, weed control, fertilization, development of raised beds enabling roots to go deeper …); **Diversification** with higher value products (fruits, horticulture, silvopastoral systems); Promotion of **eco-stoves and solar based energy** (from Trilateral Cooperation project).	diversification with high value crops.	through increased drought tolerance and diversification (horticulture); Soil improvement and pH regulation (silvo-pastoral activities and good practices). Reduction of drought risk through drip irrigation associated with good practices	fertilizers use (use of coffee pulp instead, incorporation or organic matter in soils); Reduction of energy use through micro-generation clean energy projects (e.g. solar driers to dry coffee); Reduction of firewood use with biogas production and eco-stoves; Enhanced water use efficiency; solar based energy planting of fast-growing woods for firewood; reforestation
ACCESO/ MERCADO	Wide range of CSA technologies and management promoted. Soil preparation practices, the use of lime applications, seed selection, increasing planting densities, implementing weed control, and improving fertilization use (although not explicitly described in the adaptation/mitigation context).	Improved productivity (100-150%) through the adoption of 5 key good practices also allowing to free up part of the plot for other activities; the establishment of drip Irrigation (also coffee); improved seeds; Fertilization systems; integrated pest management system; Biological control; income generation and diversification as well as year round dairy production supported by forages production.	Increased resilience through the diversification of crops and livelihood sources; crop rotation; Reduction of drought risk through drip irrigation associated with good practices.	Reduction of nitrous oxide emissions enabled by precision fertilizer application through irrigation systems Reduction of fertilizers use (use of coffee pulp instead, incorporation or organic matter in soils); Reduction of energy use through micro-generation clean energy projects (e.g. solar driers to dry coffee); Reduction of firewood use with biogas production and eco-stoves; planting of fast-growing woods for firewood; reforestation
PODER (Productivity and Opportu-nities for Development through Re-newable Energy) (GOH-Brazil-	Provision of access to small-scale renewable energy and irrigation infrastructure.	Increase in productivity associated with decreased rainfall dependence associated with improved access to water, irrigation (incl. water harvesting) and solar power.	Increased resilience (drought tolerance) supported by increased water access (water harvesting, drip irrigation using gravity) and availability.	Reduction of fuelwood demand through improved cookstoves; Reduction of energy related emissions and costs (solar coffee dryers, biodigestors,

US)				photovoltaic systems, wind turbines, water pumping systems with photovoltaic panels, wind water pumping, gravity water systems).
Trilateral Cooperation Project (GOH-Brazil-US)	Increased access to **renewable energy** and support food security through capacity building; Brazilian technology (drought tolerant and bio fortified seeds).	Adapted technologies to support seed production, storage and dissemination using renewable energy; water mobilization enabled by solar energy; increased income through solar-based community managed cellphone charging stations; more women time devoted to food security related activities enabled by the time saving linked to the use of eco-stoves.	Reducing drought risk through specific photoperiod adaptation; crop and market diversification; value-added opportunities (honey, sesame oil, cashew sweets); low cost infrastructure for seeds conservation; increased adaptive capacity supported by central and community level seed banks.	Reduction of wood use by the cooking **stoves** (60-70 % per family); Energy savings (20-30%).
PROPARQUE * ***(GCC Project)***	Implementation of coffee certification (Agroforestry and climate change adaptation); agroforestry; sustainable economic growth around conservation areas; REDD (initial focus) and adaptation actions; improve access to renewable energy; environmentally-friendly certification (good adaptation practices); integrated ecosystem management of protected areas (buffering areas).	Improved productivity in buffer zones (good practices, water; solar based irrigation system).	Increased resilience in upper lands and protected areas upstream (PES, watersheds conservation plans); Reduction in production risk associated with floods (early warning systems related to increase in rivers water and watershed precipitation levels); increased resilience through adoption of good practices (shade and agroforestry systems for coffee); avoiding upwards migration of coffee (increase productivity in lower areas enabled by solar based irrigation).	Reduction of firewood (eco-stoves) and biogas production; reduced emissions (responsible pesticide use); improvement of soils through silvo-pastoral systems; REDD.

B. Incentive Mechanisms

Achieving widespread practice of CSA requires adequate incentives to make changes. This sub-section describes how Feed the Future Honduras projects provide three types of incentives that foster transformative processes: (i) improved performance of value chains, (ii) financial mechanisms, business skills and governance, (iii) enhanced reach of communications and iv) policy.

i. Value chain performance

In addition to the projects that emphasize input technologies and production practices for poor and extremely poor farmers highlighted above, six projects contain additional efforts that (to different extents) improve the production performance, access to inputs (incl. water and clean energy), and marketing links of value chains.

ACCESO, implemented by FINTRAC (2011-2015), developed market-driven production programs for cash and staple crops to enhance the opportunity for smallholder farmers to benefit from **access to inputs** through interventions that included the introduction/transfer of good agricultural practices and basic technologies that increase (sometimes doubled or tripled) traditional yields[15] and reduce production and postharvest losses, while also **standardizing harvest and small-scale storage systems**. Some practices enabled coffee farmers to lengthen harvest periods, maintain and determine quality, and obtain **certifications** to expand into higher-value coffee lines (e.g organic, Fair Trade and others) while diversifying their production into the high-value horticultural value chain.

Building on ACCESO, **MERCADO** and **ACS** will pursue the implementation of an integrated package of technologies and promote diversification, improved productivity and **market linkages** facilitating **access to services and information** that foster commercial viability. **ACS** also aims to **increase regularity and quality** of water through **community based integrated water management** (at plot and micro-catchment level).

The **Trilateral Cooperation** project brings technologies from US and Brazil to increase food security and agricultural competitiveness and focuseson **supporting seed production** (validation of varieties from analogue regions from Brazil), **management** (incl. drip irrigation), **storage, post-harvest infrastructure, transformation and dissemination** (incl. special markets).

Finally,**PODER,** the *Productivity and Opportunities for Development through Renewable Energy* project, supports value chain performance improvements through the implementation of small-scale renewable **energy infrastructure[16] and irrigation** (incl. water harvesting, drip-irrigation using gravity avoiding fuel costs andsolar coffee dryers that reduce burning and transport weight while improving coffee quality). Finally, the GCC **Proparque** project, supports sustainable economic development around protected areas and connecting corridors promoting good agricultural practices through **farm schools as vehicles to improve productivity and transformation processes** (efficient energy use in *panela* production) while avoiding further extension of the agricultural frontier.

ii. Financial mechanisms, business skills and governance

Projects within Feed the Future foster a variety of support mechanisms that facilitate adoption of CSA practices. Some examples are highlighted below:

[15] Such as: improving land preparation, increasing plant densities, modifying fertilizer applications, utilizing weed control systems. (ACCESO staff personal communication)

[16] The wide range of technologies promoted by this activity, include: improved cookstoves, solar dryers biodigestors, photovoltaic systems, wind turbines to generate electricity, water pumping system with photovoltaic panels, wind water pumping systems, hydraulic rams, nano-hydroelectric systems, gravity water systems, water retention ponds (water harvesting), among others

ACCESO and MERCADO's integrated package of technologies includes **tools and market assistance training** to improve grower groups' basic business practices and skills (e.g ensure or locate new buyers and markets, obtain required group-level certifications and develop logistical supply programs with buyers). Beyond developing linkages of farmers to market opportunities and stimulating longer-term business relationships for small producers and buyers (brokers, processors, retailers), these Feed the Future **promote value chain investment** to increase productivity and off-farm income generating activities.

ACS, ACCESO and MERCADO support the expansion of and **access to financial and risk management services. A**ctivities include: i) developing trust funds, ii) encouraging savings for re-investment, iii) assisting financial institutions to develop new suitable financial products for small farmers, iv) working with non-financial institutions[17] - agricultural input supplier wholesales to expand credit to input stores and in turn to small farmers, and v) expanding the reach and use of insurances as well as other more nascent non-traditional products such as warehouse receipts, *Cajas Rurales, Carnét de Crédito*[18]

Environmental-friendly Certification
As a successful result of ACCESO's project training and promotion on the use of worms to decompose waste of coffee pulp (major contaminant for water supplies in the area), many municipalities in sestern Honduras developed their own stocks to be sold to growers and some also developed *ordenanzas municipales* for control of waste pulp. Also, the use of microorganisms for pulp disposal on farms enabled growers to obtain an **environmental-friendly certification** that allowed them to enter into higher value markets. This type of certification model has also been piloted by Proparque (together with partners such as Rainforest Alliance) with 2200 coffee producers adopting good agronomical practices.

Other financial support mechanisms developed include **cost sharing mechanisms** for management of natural resources and water sources and p**ayment for ecosystem services schemes** (ACS and PROPARQUE)

In the case of PODER, a specific model "PEC" (Projects Executed by the Community, PEC) is been implemented to build projects' sustainability from the start. . In PEC, thedevelopment ofsmall-scale renewable energy infrastructure and irrigation projects is based on the fact that local beneficiaries and public and private entities provide counterpart funding of project costs, including non-specialized labor and local construction materials while participating communities ensure the management, planning, operation and sustainability of the projects through specially created committees.

iii. Enhanced reach of communications

In addition to personal communication via local project leaders, broader audiences are in a few cases reached via sms messages (climate information, early warning systems) and radio. However, there is much room for improvement in the use of ICT channels namely related to the provision of relevant climate information.

iv. Policy

ACCESO's coordinated actions with a wide range of players (see section C) led to the organization of new water boards – including legal registration- and support committees for the development of

[17] The Trilateral project also includes a component on financial mechanisms aiming to improve communities' access to solar power and eco-stoves.

[18] loans to large numbers of small farmers and other rural MSMEs

watershed protection plans to ensure the sustainability of water-producing areas, the operation and maintenance of irrigation schemes' and the development of forest fire prevention and control plans. The project also supported the preparation of *ordenanzas* at the local level to prohibit farmers from burning land or clearing trees to plant crops. ACS work also focused on policy frameworks for catchment protection and the generation of enabling conditions to improve water availability within zones of influence. One of Proparque's expected results includes the establishment and implementation of the climate change Policy by the GOH, emphasizing the improvement of national efforts on carbon sequestration based on sustainable landscapes, support to adoption of renewable energy and the strengthening of communities' capacity to manage, cope and adapt to climate related variability and risks.

C. Multi-Institutional Participation and Planning

Multi-institutional collaboration appears to a significant degree within all the Feed the Future project. The best illustration is ACS, which is contributing to a larger multi-donor and GoH initiative for the sustainable development of the southwest border area in Honduras. In addition to the Government of Honduras, the U.S. Government, and the World Bank (WB), the Dry Corridor Alliance involves the Central American Bank for Economic Integration (CABEI), the European Union (EU) and the Government of Canada. Under Feed the Future, USAID worked with the GoH to prepare Honduras' proposal to the multilateral Global Agriculture and Food Security Program (GAFSP), which led to the implementation of this Initiative. Multi-institutional collaboration is also reflected in the two Trilateral Cooperation activities (USG-GOH-Brazil Government), and at the operational level with shared beneficiaries and staff. Elements of the trilateral project have been hosted by SAG-DICTA, and implemented by the *Instituto de Desarrollo Comunitario Agua y Saneamiento* (IDECOAS).

A good example of articulation and collaboration with local authorities is evident in ACCESO which collaborated and coordinated actions with a wide range of players present in the ZOI, ranging from municipalities, regional offices, the National Institute for Forest Conservation, the Ministry of Health and International Cooperation development projects (some successful results are highlighted in the above Policy section). Another case is Proparque who, though articulated work with local and national authorities and institutions member of the National System for Risk Management (SINAGER), is strengthening local capacities to manage risk and enhance response to climate variability, and supporting government actors (i.e COPECO) to integrate novel planning and vulnerability assessment tools and processes, meant to inform national level process.

4. Discussion and Recommendations

This section provides a commentary on current perception on CSA, highlight comments that arose during conversations with implementing partners, and documents future opportunities and challenges for Feed the Future programing in Honduras.

A. Emerging Messages

Current perceptions of CSA

The discussions with the Honduras Feed the Future staff made evident not only the very high level of understanding, awareness and demand for CSA, but also the proactive efforts already taken towards pushing further the concept of Climate-Smart Development by fostering further integration of CSA into the portfolio as well as on implementing partners' thinking. Three clear examples are:

- The USAID Workshop on CSA practices for Latin America and the Caribbean, held in November 2014 in Gracias whose main objective was to promote collaboration and

strengthen USAID and implementing partners 'capacities to address climate vulnerability and change as well as to incorporate CSA practices,

- The Vulnerability Analysis (2014) that provided recommendations and adaptation options along five adaptation pathways[19], informed the current portfolio and brought an overarching and holistic strategy for building resilience of ecosystems and livelihoods in the ZOI. And finally,
- The development of a 2 pager CSA document to help implementing partners to better understand and capitalize current opportunities to move forward further integration on this approach in their project design and implementation.

B. Future opportunities & challenges

Government Policy and Strategy

- National Climate Change committee has acted so far as an informative assembly and needs to become more operational through its different sub-committees (e.g. agriculture, food security, forest, health etc).Over the last years the GoH has been very active and engaged on the development of Climate change/adaptation frameworks, strategies and plans and has recently formed the Climate Change unit within SAG, setting a solid basis for a Climate-smart agricultural development. The National Adaptation Plan been developed under the leadership of SERNA expected by mid- 2016.
- Important opportunities exist for USAID/FTF to contribute to the implementation of instruments such as the National Climate Change Strategy for the Agri-food Sector (2014-2024) and the National Climate Change Action Plan , both at the national and local level.
- Another major opportunity lies in the implementation of Honduras's Intended Nationally Determined Contribution (INDC) INDC[20] as most of the sectorial adaptation and mitigation measures prioritized for the agricultural sector (and identified in the National Climate Change Strategy) are fundamentally or potentially climate- smart.

Crop insurance

- Index-based insurance, a component currently absent in the Feed the Future Portfolio is an area with high potential to strengthen climate-resilient agricultural development, directly contribute to the CDCS sub-IR 2.1.2[21] (Adaptation of poor households to climate risks increased) and support initial efforts from the GOH in this domain.
    - A concrete entry point is the current project focused on the participatory design and development of a commercial index based insurance in El Paraiso led by SAG, Zamorano University and the International Research Institute for Climate and Society (IRI) with the participation of MAFPRE and the *Comités de Investigación Agrícola Local* (CIALes) and aiming to have a first prototype for maize and beans by the end of 2015.

Feed the Future support

- The very strong government demand and support for CSA was reflected across the meetings with the different agencies (SAG, SERNA, Info Agro Service) and seems to be reinforced by the current drought crisis.

[19] Those were developed along five adaptation pathways: 1) knowledge generation, management, and learning; 2) resilient water resources management; 3) conservation of critical ecosystems; 4) diversification; and 5) risk management.
[20] INDC-Honduras. Contribución Prevista y Determinada a nivel nacional.
http://www4.unfccc.int/submissions/INDC/Published%20Documents/Honduras/1/Honduras%20INDC_esp.pdf
Contribution target: 15% reduction in greenhouse gas emissions and 1 Million Ha reforested by 2030
[21] CDCS sub-IR 2.1.2 specific indicator: *2) Number of people with a crop insurance policy as a result of USG assistance;*

- Cooperation with governmental agencies was evident in some Feed the Future activities but mainly at the local/ sub-national level. More exchange of knowledge and successes as well as joined efforts between implementing partners and government agencies (e.g SAG and SERNA) could generate greater synergies, impacts and sustainability.

Climate Information Services

- Climate information is being incorporated to some extent in the diagnosis to identify and plan appropriate irrigation technologies. ACS, ACCESO and Proparque use the InfoAgro bulletin but limiting factors are related to the capacity to translate raw meteorological information into agricultural actionable knowledge (e.g water index forecast, Pest and diseases index, dissemination of the information using ICTs) and measures, as well as to the resolution/ limited geographical coverage of the available meteorological station network of the National Met Department.
- Capacity building activities carried out by Proparque to promote the use of climate information and perform local data analysis and interpretation are to be further encouraged and strengthen, building on the current interest in multiplying access to the coffee rust early warning system from IHCAFE.
- Similarly, their ongoing effort to install 10 additional weather stations would greatly benefit from articulation with the national system (incl. Info Agro) and any other relevant actors to encourage further investment in this area and/or in improving their application and use (incl. climate services and forecast research institutions)

Water management

- Across the different projects implementing irrigation planning, this appears to be based on "average" and current climate. Yet investments are long term (multi-decade impact desired), hence climate variability and change must be a more explicit factor.

Improved Seeds

- Improved seeds appeared, but seemed rather limited in the portfolio as did linkages to DICTA and the research into development chain, which might not be working to full effect in the portfolio. Drought resistant materials for both staples and high value crops could be more actively and strategically sourced from international, regional and national research agencies. The Crowdsourced Crop Improvement (CCI) approach been piloted in Honduras with the support of USAID could be a useful methodology to be further incorporate in this initiative.

Monitoring and Evaluation

- A clear aspect identified and discussed with the Mission and implementing partners was the current lack of reporting (and thus specific indicators) focused on the impacts of practices and interventions on both the Resilience/Adaptation and Mitigation pillars of CSA. (e.g associated with the use of eco-stoves or renewable energy). Efforts on this direction have already been initiated by the mission[22] but given the early stage this still represents an excellent opportunity for strengthening.
- A temporal element of Stability needs to be brought into the current indicators. Given major challenges related to increase resilience to climate short term variability and extreme events, a true test of CSA would be if poverty and nutrition indicators that projects currently report on are stable, not only during the primary cropping season, but also in the dry season and especially in particularly dry (or wet) years.

[22] CSA two pager developped

- There is also a need to increase the capacity to measure and promote the efficient use of water/irrigation systems, namely taking into account the Missions' scaling up plan to to promote drip irrigation.

Thoughtful Comment by implementing partners

- Several implementing partners recalled the need for an **Integrated Water Management Plan** at the national level (Plan Maestro). Current model is extractive and lacks management and conservation aspects.

Great opportunities to strengthen links between Feed the Future projects and with the Secretariat of Energy, Natural Resources, Environment and Mines SERNA building e.g ACS's active engagement on:

- supporting the establishment of local (at the micro watershed level) and regional water conservation Fund
- ACS' work on policy frameworks for catchment protection to generate enabling conditions to improve water availability and

plans to present a macro analysis of water supply and demand across the 6 departments of the ZOI and identify potential conflicts.

5. Conclusions

The CCAFS CSA deep dive assessment in Honduras resulted in a number of conclusions relevant to USAID's strategy and Feed the Future program portfolio, as well as on the identification of opportunities for building on current success, including:

- Climate variability and climate change is a dominant theme from Honduras government through to international cooperation and is hence a focus that almost all projects are taking in their conception and implementation. The Feed the Future portfolio is fundamentally climate smart in its focus.

- The current Honduras Feed the Future portfolio includes a large set of CSA practices and options, however in some cases there is limited intentionality.
  - ✓ Training and sensitization of implementing partners and local operators and partners on what CSA is and how it is relevant to the region would bolster CSA related outcomes in the portfolio.

- Similarly, the current reporting and indicators structure does not allow USAID to properly and fully capture the positive impacts of the current practices and interventions on the CSA pillars, and particularly on resilience building and mitigation.
  - ✓ A key indicator to measure success of Feed the Future interventions, currently absent, would be stability in income through drought/flood periods.

- Climate variability and risk could be more of a criteria for the design *perse* of interventions.
  - ✓ Beyond the great impacts and resilience aspects linked to the interventions promoting increased access to irrigation, there are two opportunities for stronger and more intentional inclusion of the climate variability context: one is to further bring climate information into the design phase of these schemes so that their use can be sustainable during good and bad years, and the second one is is to promote dynamic management plans able to adjust e.g to extreme drought periods.

- ✓ There is great opportunity of using CSA as an instrument to strengthen synergies between activities and implementing partners.

- Despite investment in climate stations, there is limited activity in transforming data into information that is relevant to Feed the Future clients or implementers to deliver desired bottom-line impacts.
  - ✓ Strengthening of the Infoagro bulletin, and support to SAG in their desire to develop Local Technical Agroclimatic Committees (similar to the ones established in Colombia, See Annex 2) in the zone of influence and other climate related agricultural services could help bring more agroclimatic thinking into the development activity.

The current Feed the Future strategy and portfolio in Honduras provide a very solid platform for CSA. There is no doubt that the holistic vision and integration with GCC (translated in both co-localization of activities and co-investment) promoted within Mission, together with the rich array of practices currently implemented in the portfolio (which have wide adaptation and mitigation benefits, even in those cases when not explicitly intended) place Honduras far along the climate-smart path and bring promising opportunities to move to the next level and be showcased as inspiring learning case.

Annex 1

Reported results from electro-survey

CSA tech & practice	Score	Comments
Reduce post-harvest loss	4	Practices from the theme of *soil & fertilizer management* brown cells), *crop management* (green cells*)* and *livestock management* (pale pink cells) were reported as being adopted by >66% of FtF farmers in the ZOI. Practices pertaining to *water management* (blue cells), *soil & fertilizer management* (brown cells) and *other CSA activities* (pale orange) were being adopted by 33-66% of farmers. Practices from *water management, crop management* (pale green cells) and *energy and fuel management* (purple cells) are being adopted by <33% of farmers, while one practice from *crop management*, and one from *information and financial services* (grey cells) are in the pilot stage. One practice from *livestock management* was reported as unknown, and another from *water management* was reported as not applicable. *Legend* 4 = > 66% 3 = 33-66% 2 = <33% 1 = pilot 0 = none U = unknown *N* = not applicable A = already common *With respect to participating FtF farmers*
Organic matter management	4	
Diversification w/ trees	4	
Other conservation ag	4	
Avoided conversion	4	
Ruminant management	4	
Fertilizer & residue inputs	3	
Reduced tillage	3	
Nitrogen fertilizer efficiency	3	
Other CSA activities	3	
Reduced biomass burning	3	
Irrigation efficiency	2	
New irrigation mechanics	2	
New/different crops	2	
Wood lot establishment	2	
Other bioenergy	2	
Reduced energy use	2	
Biogas from manure	2	
Stress-tolerant varieties	2	
Farmplot crop diversification	1	
Weather/climate information	1	
Crop harvest risk insurance	0	
Grassland management	U	
Water saving in rice	*N*	

Annex 2 : Local Technical Agroclimatic Committees

Acercando los pronósticos estacionales a las necesidades de los agricultores

CCAFS América Latina

El Programa de Investigación de CGIAR en Cambio Climático, Agricultura y Seguridad Alimentaria (CCAFS) es un programa de investigación global, resultado de la alianza entre el Consorcio CGIAR (experto en agricultura) y Future Earth (experto en clima). Trabaja con los 15 centros de investigación que hacen parte del CGIAR, especializados en diferentes ramas de la agricultura; su objetivo es superar las amenazas que el cambio climático impone sobre la agricultura y la seguridad alimentaria, explorando maneras innovadoras para ayudar a que las comunidades rurales se ajusten a los cambios globales del clima.

Socios del proyecto MTA:

MINAGRICULTURA · Todos por un nuevo país · Corpoica · Fedearroz · fenalce · Río Las Piedras · Fundación EcoHabitats Colombia · CIAT

Las Mesas Técnicas Agroclimáticas (MTA) son una innovadora iniciativa que busca integrar actores del sector agropecuario a nivel local para informar, especialmente a los pequeños productores, sobre los cambios esperados en el clima de su región; cómo estos pueden afectar sus cultivos y qué pueden hacer para reducir los impactos negativos.

Mover una o dos semanas la fecha de siembra puede significar que un cultivo tenga un rendimiento sobresaliente, o evitar pérdidas que parecían inminentes; esta recomendación proviene de un pronóstico agroclimático que advierte que es altamente probable que las lluvias se retrasarán por lo menos una semana. Al correr la fecha de siembra, el suelo estará más apto y el cultivo podrá recibir la cantidad de agua y radiación solar que requiere.

Las medidas adaptativas son solo uno de los valiosos insumos que mes a mes proporcionan las MTA, implementadas por CCAFS, y coordinadas a nivel local por socios clave, realizando estas reuniones en cuatro departamentos de Colombia. En las reuniones participan el Ministerio de Agricultura y Desarrollo Rural (MADR), las secretarías de agricultura departamentales, gremios, corporaciones autónomas regionales (CAR), universidades, asociaciones de productores, unidades municipales de asistencia técnica (UMATA), centros de investigación, entre otros, para integrar conocimientos y acciones sobre agricultura sostenible adaptada al clima, dirigidos especialmente a los agricultores más vulnerables.

Las MTA permiten generar espacios de discusión entre estos actores para la gestión de información agroclimática local, con el fin de identificar las mejores prácticas de adaptación a los fenómenos climáticos, que luego son transferidas a técnicos y productores locales por medio del Boletín Agroclimático Regional. Este boletín resume las predicciones estacionales y los pronósticos climáticos analizados en la mesa, junto con recomendaciones y medidas adaptativas por tipo de cultivo.

Cómo funciona una MTA

Durante cada reunión, expertos en agrometeorología socializan los pronósticos agroclimáticos, realizados a partir del análisis de los predicciones estacionales para la región, y los modelos de cultivos. Posteriormente los actores participantes de la mesa se reúnen en grupos y analizan cómo se afectarían los cultivos, basándose en los pronósticos presentados y su propia experiencia para determinar qué variedades sembrar, fechas sugeridas de siembra, y otras medidas adaptativas a partir de la combinación del conocimiento local con la información científica.

Las MTA son también un espacio que congrega a los actores a discutir temas relacionados con la actividad agrícola y el clima y sirve como un vehículo para coordinar actividades entre instituciones. El enfoque de las MTA también busca fortalecer las capacidades de los participantes, realizando talleres en herramientas de modelación agroclimática y empoderando a los miembros de la Mesa para que se apropien de la misma, alternando los roles y tareas entre las organizaciones participantes.

Área de influencia de las MTA

Córdoba: Valle Medio del Sinú, que abarca zonas de los municipios de Cerete, Ciénaga de Oro, Cotorra, Montería, Chima y San Pelayo.

Sucre: Mojana sucreña, especialmente en áreas de los municipios de Majagual, San Benito Abad, San Marcos, Caimito, y La Unión.

Cauca: Subcuenca del Río Las Piedras: sectores de Polindara, Puracé y Popayán.

Escalando el impacto

Cada región enfrenta diferentes retos en términos de clima y cultivos priorizados, es por eso que las MTA promueven el diálogo intersectorial entre actores, y acerca los pronósticos estacionales de la escala nacional a la escala local, para que tomen mejores decisiones sobre sus cultivos.

El proyecto ya está ofreciendo resultados. Edinson Salgado, técnico de la UMATA del municipio de Chimá, en Córdoba, compartió cómo los boletines han ayudado a los productores locales: *"En el boletín se nos recomendó sembrar en la segunda decena del mes, en lugar de la primera; socializamos esto con los productores y quienes tomaron la recomendación evidenciaron un desarrollo más vigoroso del cultivo comparado con los que no atendieron la recomendación"*.

Las MTA han dado tan buenos resultados, que tras establecer las primeras Mesas en los departamentos colombianos de Córdoba y Cauca a finales del año 2014, en el 2015 se crearon las Mesas de Sucre y Magdalena, y **la meta es llegar a quince mesas en todo el territorio colombiano, con pronósticos que beneficien a un millón de productores**, como quedó consignado en las contribuciones nacionales previstas determinadas (INDC en inglés) presentadas por el Gobierno de Colombia ante la Convención Marco de las Naciones Unidas sobre el Cambio Climático (CMNUCC).

Más información

Ana María Loboguerrero
Líder Regional CCAFS América Latina
a.m.loboguerrero@cgiar.org

Córdoba: http://bit.ly/MTA_Cordoba

Cauca: http://bit.ly/MTA_Cauca

Sucre: http://bit.ly/MTA_Sucre

Blog en iAgua.es: Colombia presentó su INDC y la agricultura es protagonista http://bit.ly/1QGaptJ

La iniciativa 'Mesas Técnicas Agroclimáticas' es liderada por CCAFS, junto con el Ministerio de Agricultura y Desarrollo Rural de Colombia (MADR), la Corporación Colombiana de Investigación Agropecuaria (Corpoica), la Federación Nacional de Cultivadores de Cereales (Fenalce), la Federación Nacional de Arroceros (Fedearroz), la Fundación Procuencia Río Las Piedras y la Fundación EcoHabitats. El proyecto es parte del portafolio de CCAFS en América Latina.

CCAFS es liderado por CIAT
Socio estratégico futureearth

Programa CCAFS América Latina
Centro Internacional de Agricultura Tropical (CIAT)
Km. 17 Recta Cali-Palmira - Palmira, Colombia
www.ccafs.cgiar.org