USAID
FROM THE AMERICAN PEOPLE

Climate Smart Agriculture and Reg 216

Musanze, Rwanda - March 2015

OVERVIEW

- USAID's Climate Smart Agriculture Initiatives
- Climate Smart Agriculture
  - Defining Best Management Practices
  - How it links to Reg 216 and Executive Order 13677
- Adaptation and Disaster Risk Reduction (processes)
- Mitigation
- Report-out from Honduras Workshop on Best Practices

USAID'S ROLE

- USAID leads the Inter-Agency Working Group on Climate Smart Agriculture in International Development
- Additional initiatives with CCAFS, GACSA, AACSA, and AUC
- Regional Resilience efforts in East and West Africa

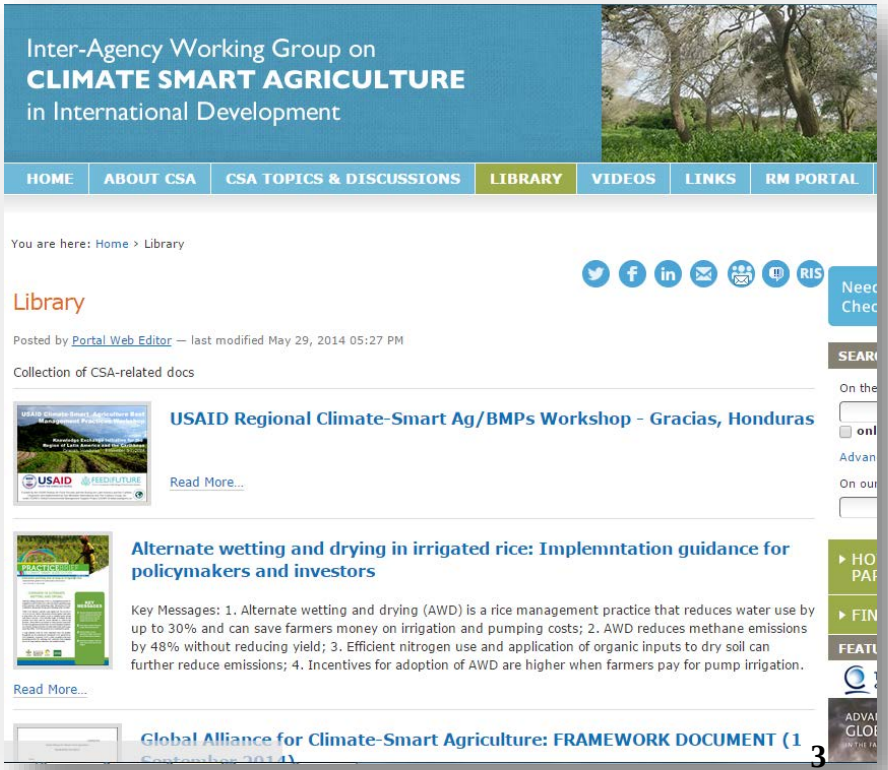


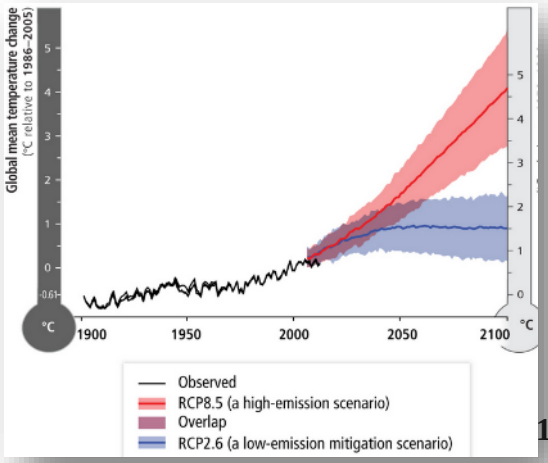
Photo credit: http://eecampaign.files.wordpress.com/2009/10/1685_elguabo_transport.jpg

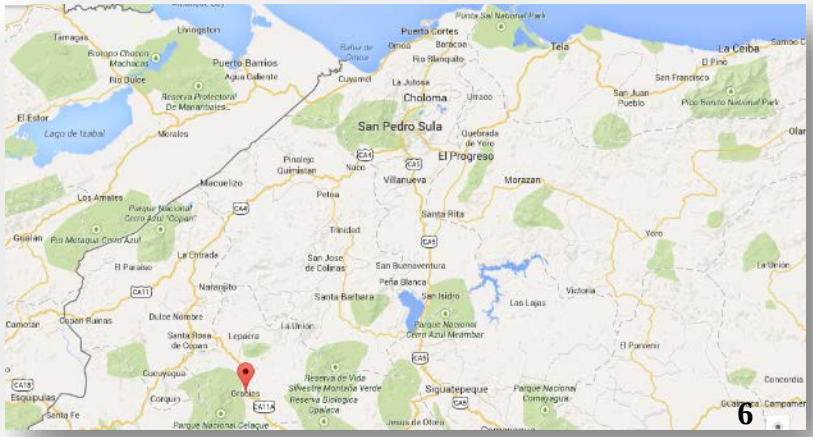
CLIMATE SMART AGRICULTURE

- 3 Wins
  - Improve productivity, nutrition, and incomes (equity)
  - Adapt and build resilience to climate change
  - Reducing and/or removing greenhouse gas emissions, where appropriate to reduce impacts on ecosystems and support conservation goals

CLIMATE SMART AGRICULTURE

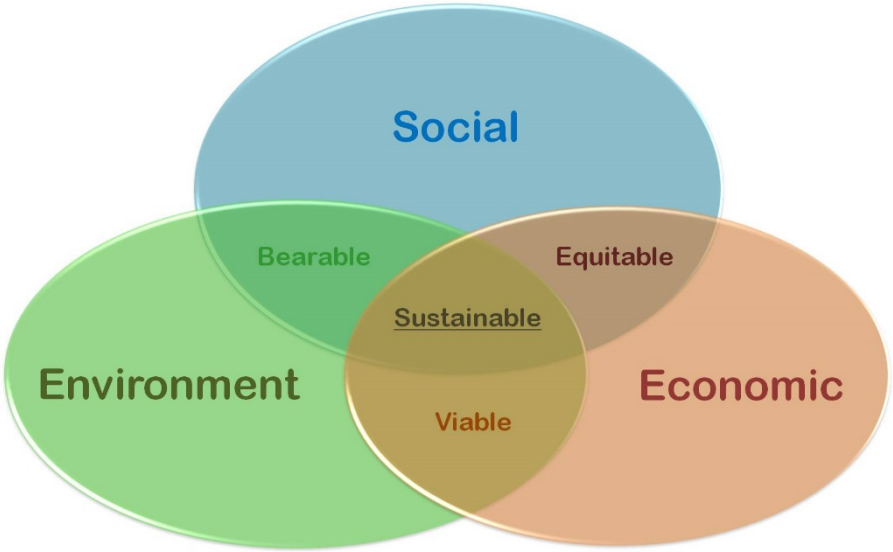
- It is **not** a single specific agricultural technology or practice (or combination of both) that can be universally applied
- It is **not** just single endpoint or objective
- It **is** an evolving set of approaches to developing the technical, policy and investment conditions to achieve sustainable agricultural development
  - It is a continuous process





GENERAL APPROACH

- Recognizes different **country-specific contexts** (i.e., site specific)



- **Identifies barriers** to adoption

- **Aligns policies** and financial investments, and **identifies strategies** for leveraging financing

GENERAL APPROACH

- Improves **access** to resources

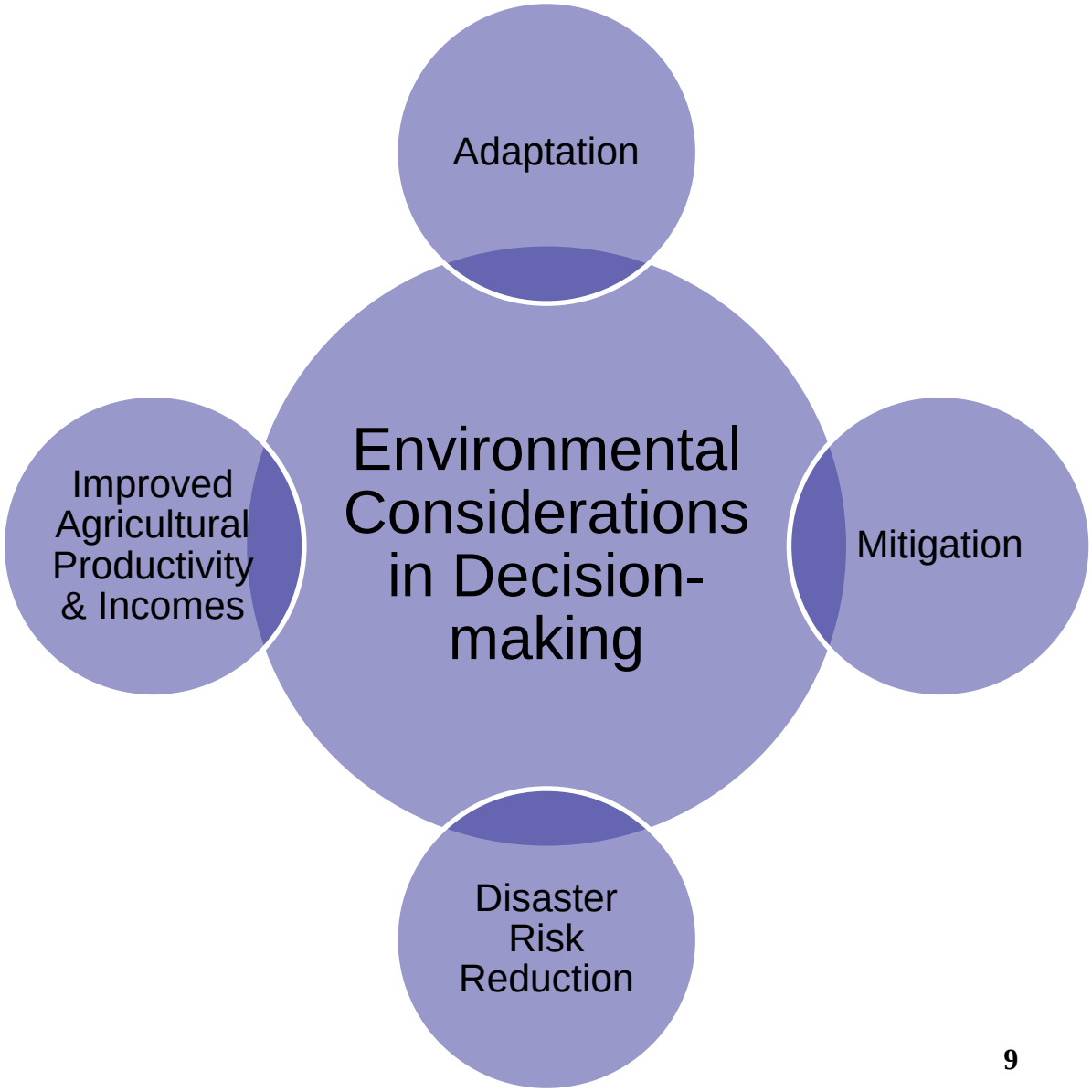
- Addresses **adaptation** and builds resilience to shocks
  - Meets the goals of Executive Order 13677 on Climate-Resilient International Development, which “requires the integration of climate-resilience considerations into all United States international development work”
  - Includes Disaster Risk Reduction

- Considers opportunities for climate change **mitigation** as a co-benefit

CSA AND REG 216 HAVE COMPLIMENTARY GOALS

- Goal of Reg 216 is to “ensure that environmental factors and values are integrated into the A.I.D. decision-making process”

- Climate change is an environmental factor!



ADAPTATION AND DISASTER RISK REDUCTION

Photo credit: Joe Torres

DEFINITIONS

- **Adaptation**. Adjustment to actual or expected climate and its effects
  - Human systems. Moderate harm or exploit beneficial opportunities
  - Natural systems: Human intervention may facilitate adjustment to expected climate and its effects

- **Disaster Risk Reduction**. The policy goal and the measures for:
  - Anticipating future disaster risk
  - Reducing existing exposure, natural hazard/threat, or vulnerability; and
  - Improving resilience

- **Resilience.** The ability of people, households, communities, countries, and systems (social, economic, and ecological) to mitigate, adapt to, and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth

ADAPTATION AND DISASTER RISK REDUCTION

- Climate change **adaptation** focuses on:
  - Impacts already being experienced, especially increased **variability**
  - Long-term changes, both detrimental and beneficial

- **DRR and resilience** focus on responding to acute hazards and shorter-term shocks
  - Especially those exacerbated by climate change
  - Unpredictable climate change impacts (i.e., extreme events)

- Example:
  - Shifting rainy seasons (long-term change)
  - More flash floods (hazard that could lead to a disaster)

ADAPTATION OVER TIME – METHODS AND RESPONSES

- Adaptation needs to be informed by an understanding of vulnerability
  - Past experience
  - Predictive modeling
  - Ability to respond to multiple triggers and increased variability in more than one direction (i.e., drought one year, flood the next, etc.)

VULNERABILITY AND ADAPTATION

- **Vulnerability** is the degree to which something can be harmed by or cope with stressors such as those caused by climate change

- Function of:
  - Exposure
  - Sensitivity
  - Adaptive capacity

VULNERABILITY STUDIES SHOULD COVER

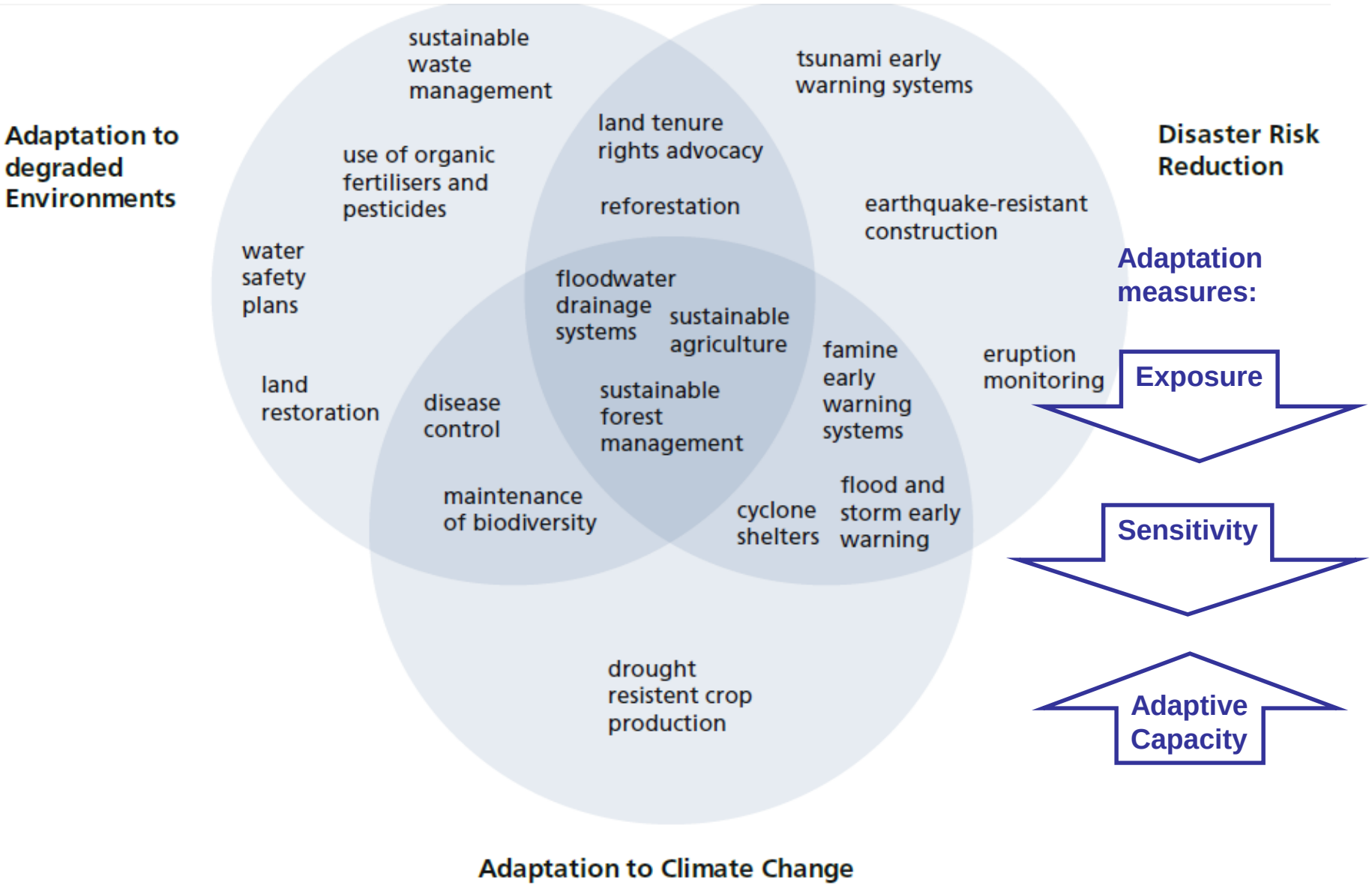
- **Exposure**: the extent to which something is subject to a stressor

- **Sensitivity**: extent to which something will change if it is exposed to a stressor

- **Adaptive capacity:** the combination of:
  - strengths
  - attributes
  - resources

  That are <u>available</u> to reduce adverse impacts, moderate harm, or exploit beneficial opportunities

EXAMPLES OF ADAPTATION AND DRR MEASURES



Climate Smart Agriculture and Reg 216

CEDRIG, 2012. http://www.sdc-drr.net/system/files/CEDRIG_Part_I_Aim_Concept_and_Support_Material_EN_Web.pdf

ADDITIONAL ADAPTATION AND DRR MEASURES

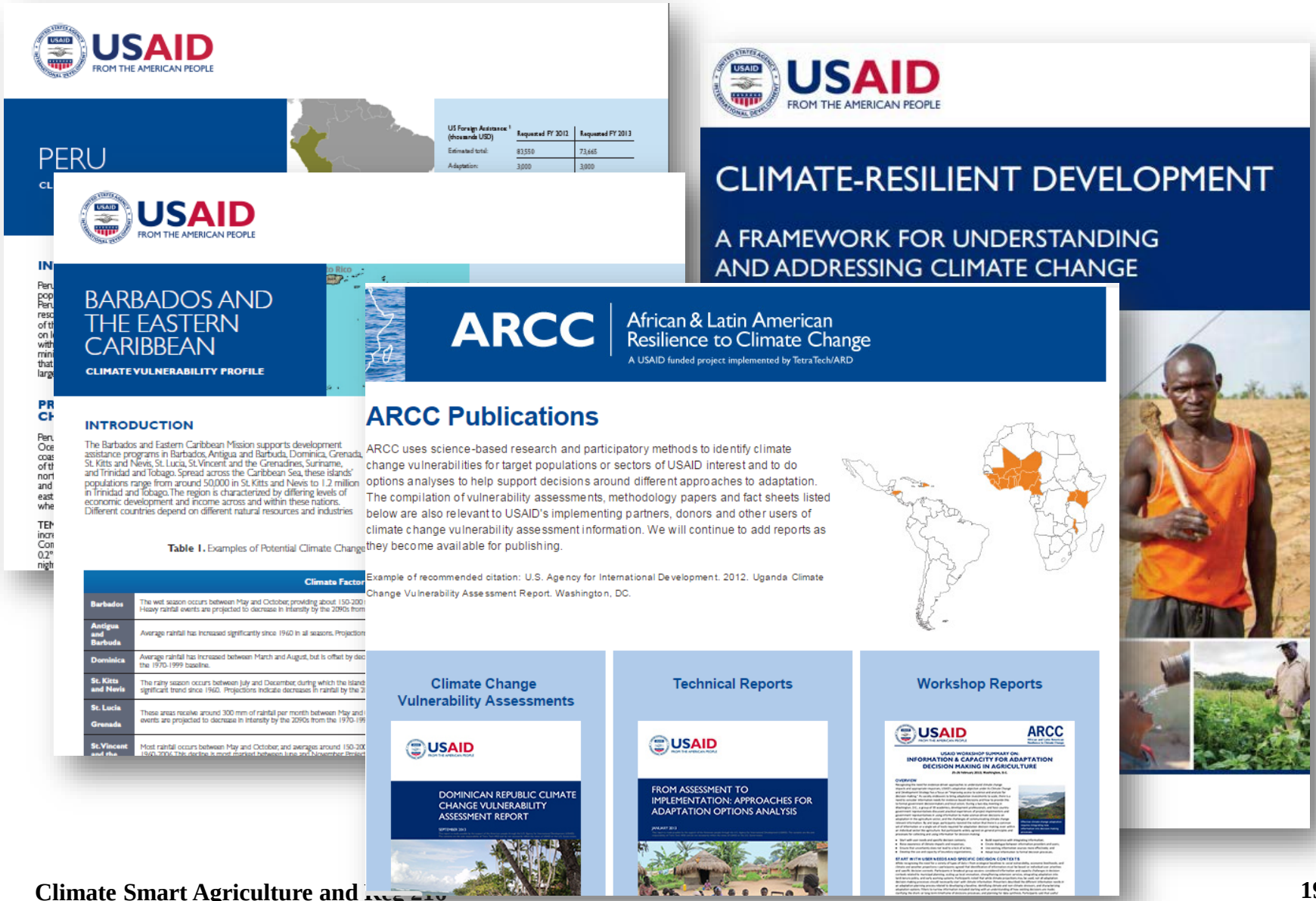
- Farmer-managed natural regeneration
- EverGreen Agriculture
- Alternate Wetting and Drying (AWD) and fertilizer efficiency
- Crop, aquaculture, and livestock production measures in response to:
  - Heat
  - Flood
  - Soil degradation
  - Pests
  - Disease
  - Fire

KEY RESOURCE: FAO SOURCEBOOK

A.3.1
A typology or major agricultural systems at risk and response options

Major agricultural systems	Sub-system and location	Vulnerability			Typical response options
		Main climate change exposure	Sensitivity	Adaptive capacity	
Highlands	Densely populated highlands in poor areas: Himalayas, Andes, Central American highlands, Rift Valley, Ethiopian plateau, Southern Africa	Rainfall variability, droughts, floods	High: mostly rainfed agriculture, marginal lands, poor soil moisture capacity	Low: high prevalence of poverty, limited options, knowledge, social safety nets and resources	Watershed management and on-farm water storage for water conservation; integrated water resources management in river basins; investment in social infrastructures
Semi-arid tropics	Smallholder farming in Western, Eastern and Southern Africa savannah region and in Southern India; agro-pastoral systems in the Sahel, Horn of Africa and Western India	High temperatures, rainfall variability, droughts	High: crop and animal sensitivity to high temperature and droughts, high population density on marginal lands	Low: high prevalence of poverty, limited options, knowledge, social safety nets and resources, limited capacity for water storage	On-farm water storage; crop insurance; increased productivity through better crop-livestock integration; integrated water resources management
Sub-tropics	Densely populated and intensively cultivated areas, concentrated mainly around the Mediterranean basin	Reduction in annual rainfall, increased rainfall variability, reduction in runoff and aquifer recharge, high temperatures, higher occurrance of droughts and floods	Variable, depending on the region and level on reliance on agricultural activities. Agricultural systems highly sensitive to changes in temperature and water availability.	Low adaptive capacity for agriculture in water scarce areas	Water conservation where possible; integrated water resources management; crop insurance; improved floods and drought management plans; shifting out of agriculture
Temperate areas	Highly intensive agriculture in Western Europe. Intensive farming in United States, Eastern China, Turkey, New Zealand, parts of India, Southern Africa, Brazil	Increased rainfall variability, reduced water availability in places.	Medium to low. Some high yielding varieties more sensitive to temperature and water stress	Possibilities to compensate water stress through supplemental irrigation in many regions; low capacity in water scarce areas	On-farm storage for supplemental irrigation; integrated water resources management at river basin level
Rice-based systems (irrigated)	Southeast and Eastern Asia, Sub-Saharan Africa, Madagascar, Western Africa, Eastern Africa	Increased rainfall variability, increased rainfall, increased occurrence of droughts and floods	Medium, depending on the capacity to cope with floods and droughts	Medium, depending on the capacity to invest in protection against droughts and floods	Increased water storage for flood control and for second and third crop; alternate wet-dry rice

USAID ADAPTATION RESOURCES



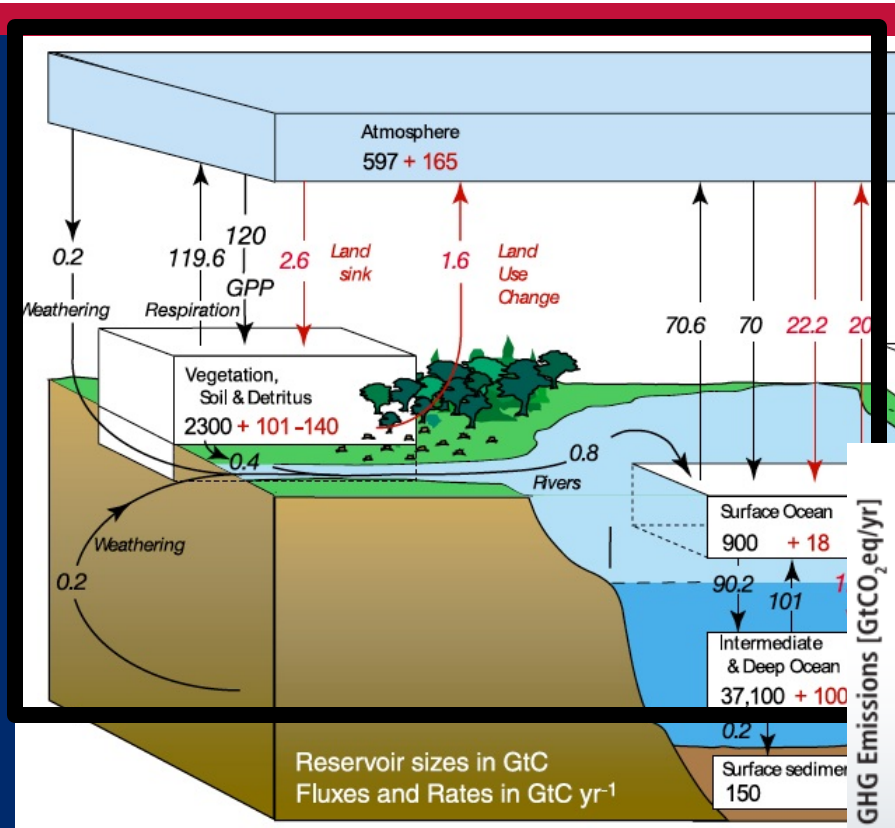
MITIGATION

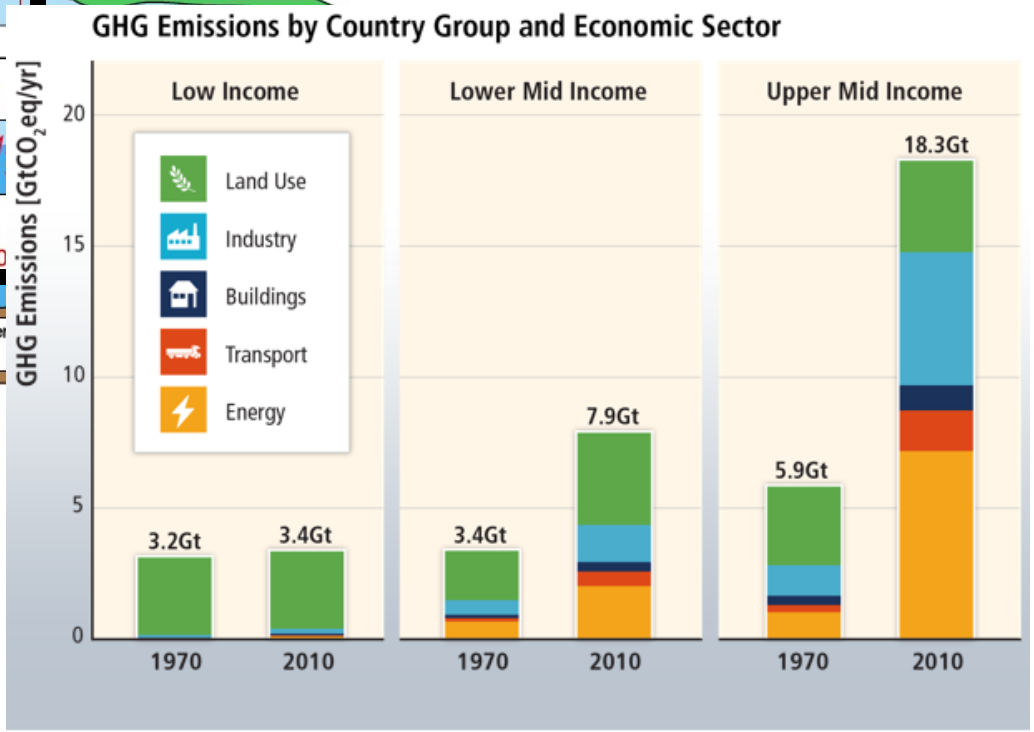
Photo credit: Joe Torres

DEFINITION

- **Mitigation**. Human intervention to reduce sources or enhance sinks of GHGs or other substances which may contribute directly or indirectly to climate change

EMISSIONS AND TERRESTRIAL SEQUESTRATION

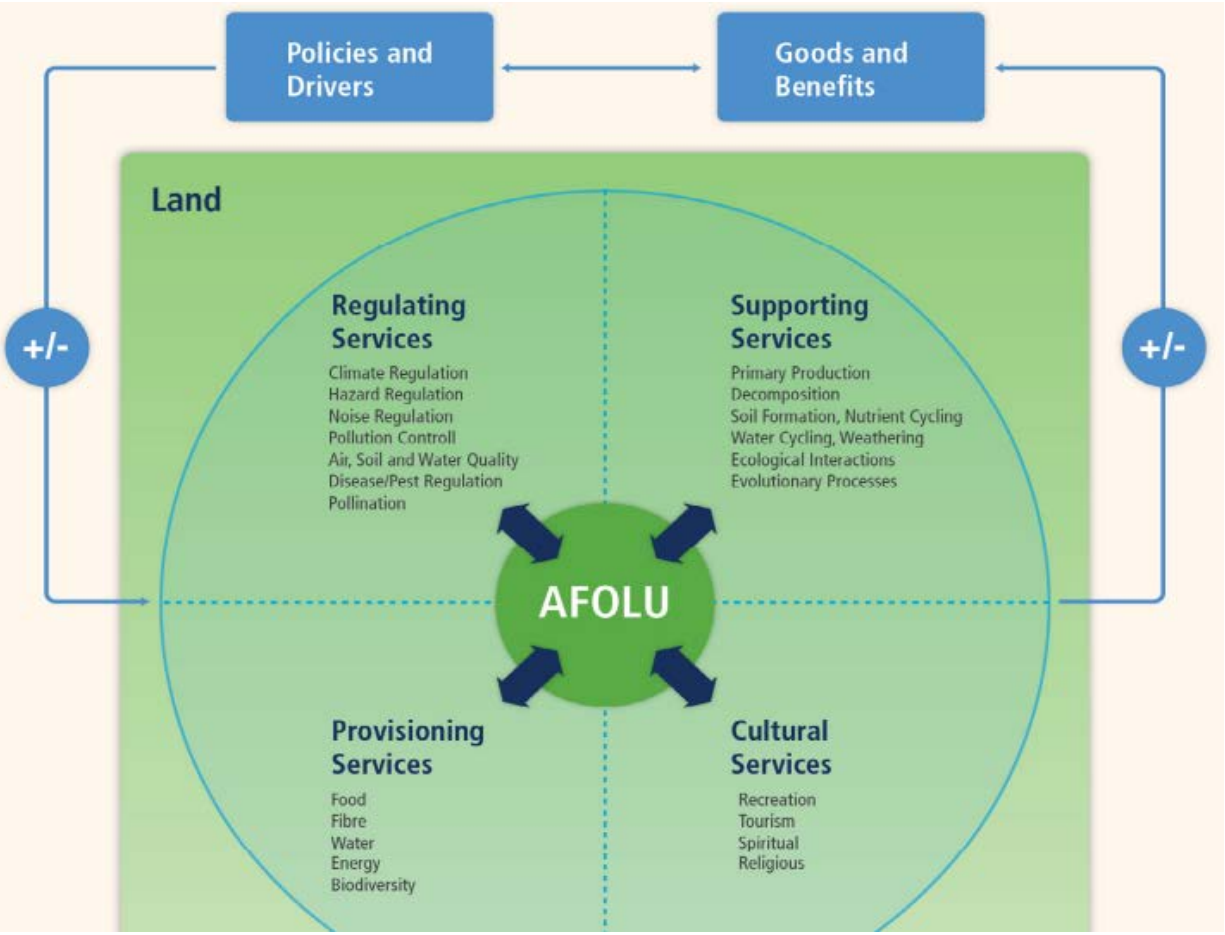




Agricultural expansion is one of the principle causes of deforestation
(carbon emissions from land use change)

IPCC Fourth Assessment Report: Climate Change 2007.
http://www.ipcc.ch/publications_and_data/ar4/syr/en/contents.html

ECOSYSTEM SERVICES AND AGRICULTURE



- IPCC Fifth Report: Factors considered in land use:
  - Agriculture
  - Forestry
  - Other land use
- All land use mitigation options are considered together
- Allows consideration of systemic evaluations between mitigation options related to agricultural land use

IPCC WGIII AR5. Chapter 11: Agriculture, Forestry and Other Land Use (AFOLU). http://report.mitigation2014.org/drafts/final-draft-postplenary/ipcc_wg3_ar5_final-draft_postplenary_chapter11.pdf

MITIGATION: METHODS

- **Reducing/preventing emissions**
- **Sequestering carbon** in terrestrial reservoirs
  - Can take place above ground or below ground
  - Can also increase other ecosystem services (e.g., soil fertility, water regulation)

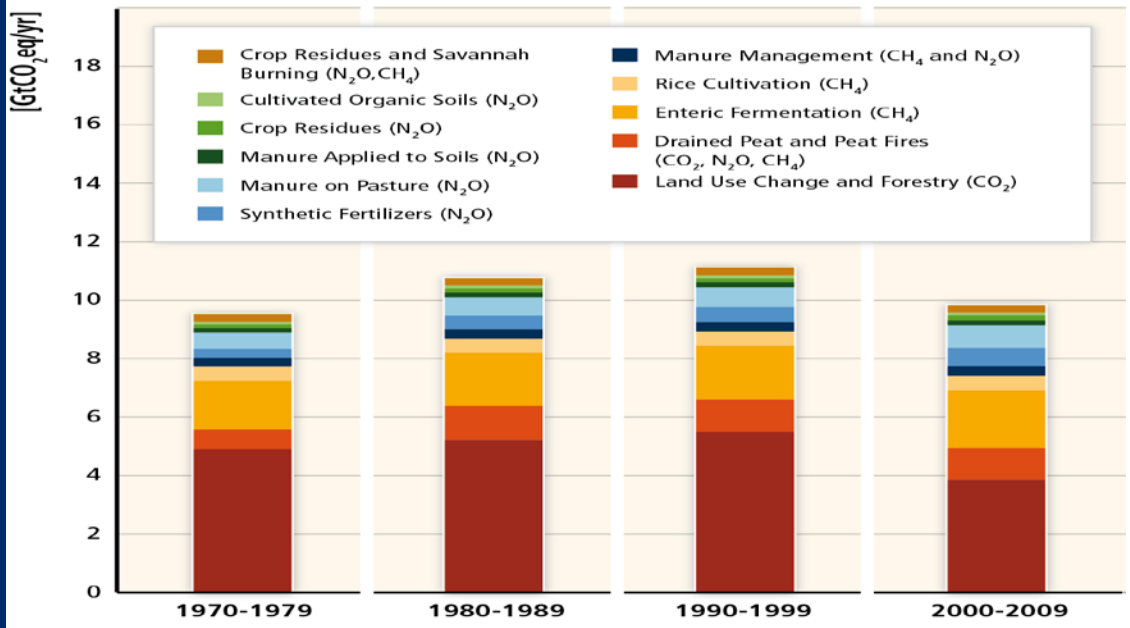
MITIGATION, CONTINUED

- Reporting on mitigation involves:
  - Baseline conditions
  - Implementing mitigation measures
  - Monitoring emissions/ sequestration
  - Reporting change compared to the baseline
- Carbon markets
  - Offset credits can finance mitigation
  - Requires reporting and capacity

ESTIMATING BASELINE EMISSIONS … IS A GOOD PRACTICE

- Estimating emissions or sequestration builds capacity
  - May be critical to leveraging mitigation-oriented finance
  - Precision is important if seeking credits in carbon markets (e.g., voluntary, EU ETS, California)

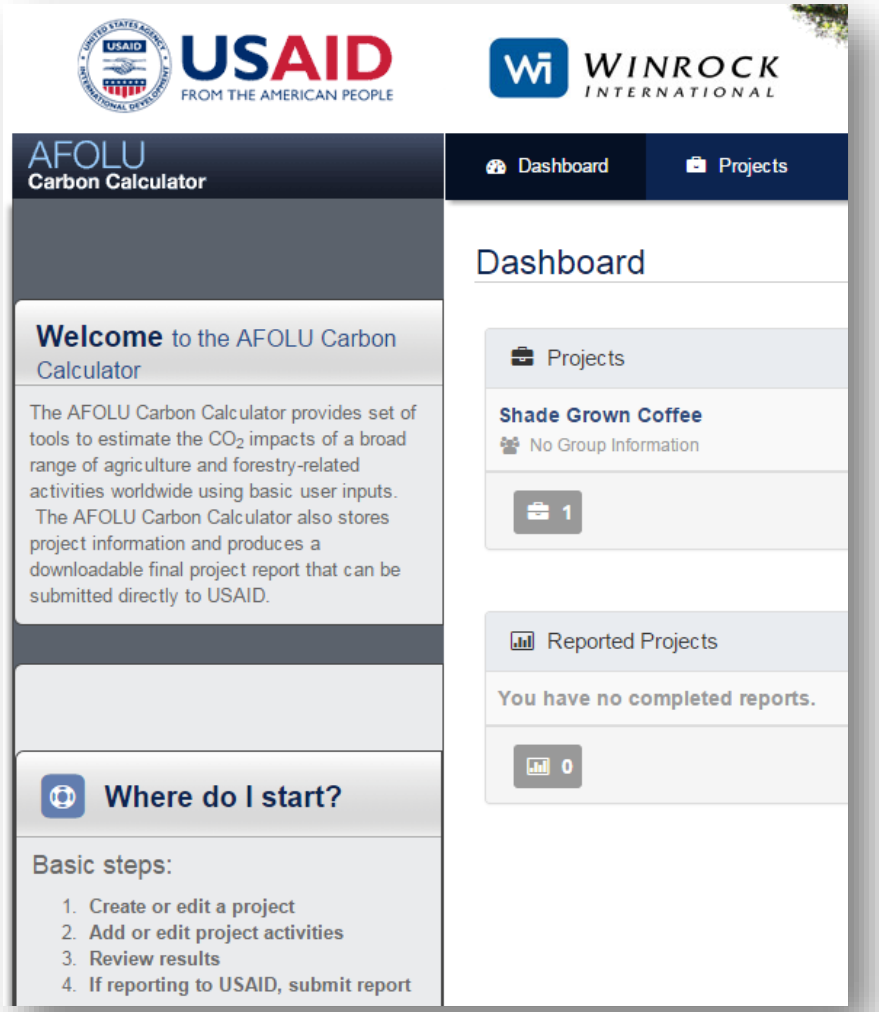
- Significant mitigation opportunities in agriculture
  - The efficiency of water and fertilizer
  - Efficiency, livestock and grazing management
  - Agro-forestry and legumes
  - Conservation agriculture
  - The integrated management of watersheds
  - Range and forest restoration



IPCC: http://mitigation2014.org/report/figures/chapter-11-figures

A KEY RESOURCE FOR MITIGATION

- USAID projects with mitigation co-benefits can estimate and report using the AFOLU tool for:
  - Cropland Management
  - Grassland Management
  - Agroforestry



HONDURAS WORKSHOP

- Identified tangible Climate-Smart Agriculture Practices for USAID-supported rural development, agricultural and food security projects in the LAC Region,
- Enhanced collaboration, networking, and knowledge exchange among staff and partners,
- Developed technology transfer strategies to advance CSA and implement BMPs on the ground.

BEST PRACTICES IN THE FIELD

BEST PRACTICES IDENTIFIED IN HONDURAS

Color Key

Coffee/Cacao/Mango
Maize & Beans
Plantain & Bananas
Livestock
Rice
Coffee

Change(s) in climatic conditions	**Impact to Agricultural Production, Value Chain or Food Security System to be addressed** (please note the change in climatic conditions that will cause this impact)	**Best Practice**	**Adaptation** How it: 1. Reduces exposure 2. Reduce sensitivity 3. Increases adaptive capacity 4. Promotes positive impacts of climate change	**Mitigation** How it: 1. Reduces or prevent emissions 2. Increases sequestration 3. Substitutes for fossil fuels	**Applicability**			**Challenges, Barriers or trade-offs**	**Solutions** Identify possible solutions to challenges or barriers
					Stage in Value Chain / Food Security System or Policy Intervention? Financing	If landscape or ecosystem specific, specify which ones	If crop-specific, specify crops		
Increased temperature and/or precipitation changes	Increased pests	IPM / Biological controls	Reduces pest incidence/severity by something related to temp or precip If beneficial "pests," may have increased range, too. Increase adaptation capacity by making crops more robust	Reduces fossil fuels via more efficient use of petrochemical pesticides/more use of organic pesticides Reducing crop loss reduces carbon/GHG emissions and demand for increased land for "higher" food production	On-farm Inputs and primary production		Global? Coffee/ cacao/ mango?	Availability of technicians to spread practice and knowledge Availability of weather/climate forecasting Availability of inputs Adequate management, validation, and demonstration of benefits	Extension services and increased funding for these (national or donor) Availability of weather stations, increased capacity of meteorological groups, ability to diffuse immediate forecasts; Establish early warning systems Creating linkages with entities / businesses that have those inputs (organic or petrochemical; tools/implements); Creating market linkages for reinvestment in value chain

ADDITIONAL RESOURCES

SUMMARY

- Agriculture is unique:
  - It both drives and is affected by climate change
  - Mitigation and adaptation methods are often symbiotic, with sequestration benefiting adaptation practices, etc.
    - Adaptation and mitigation as a continuum, not an either/or

- Agricultural mitigation and adaptation measures often difficult to measure, but still worth pursuing

SUMMARY

- Climate smart agriculture is a continuous process
  - Best practices will continuously evolve
- Both adaptation (long-term) and resilience/DRR (short-term) are vital to vulnerable agricultural systems, and along with sequestration (for its productive benefits) are the main foci of CSA for smallholders
- Goals of CSA are complementary to Reg 216
- Tools are available
  - Summer CSFS course, future regional CSA workshops

- Questions?
- Discussion

RESOURCES

- ARCC's library: http://community.eldis.org/.5b9bfce3/publications.html
- From the Interagency Working Group on Climate-Smart Agriculture in International Development. http://rmportal.net/groups/csa/about-csa. First defined and presented by FAO at the Hague Conference on Agriculture, Food Security and Climate Change in 2010.
- IPCC WGIII AR5. Annex I: Glossary. http://report.mitigation2014.org/drafts/final-draft-postplenary/ipcc_wg3_ar5_final-draft_postplenary_annex-i.pdf.
- IPCC. 2012. Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX). p. 556. http://ipcc-wg2.gov/SREX/report.
- FAO. 2013. Climate Smart Agriculture Sourcebook. P. ix-x. http://rmportal.net/library/content/csa-sourcebook.
- Hansen, J. W., Baethgen, W. E., Osgood, D. E., Ceccato, P. N., & Ngugi, R. K. (2007). Innovations in climate risk management: protecting and building rural livelihoods in a variable and changing climate.
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- IPCC. 2012. SREX Chapter 5. Managing the Risks from Climate Extremes at the Local Level. http://ipcc-wg2.gov/SREX/images/uploads/SREX-Chap5_FINAL.pdf.
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- UN CFP-PCR: Green Coffee. 2013. p. 5, 23. http://environdec.com/en/PCR/Detail/?Pcr=8539#.VEbBuU10zcs.