National Adaptation Planning for Agriculture sectors

UNFCCC LEG Regional Training Workshop

National Adaptation Plans (NAPs) for Asian Countries

Yangon, Myanmar, 10 - 14 August 2015

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Outline of presentation

1. Challenges in the agriculture sectors
2. FAO-Adapt Framework and Climate-Smart Agriculture
3. Example of adaptation options
4. VA and Collection of adaptation options in the agricultural sectors
5. Tools in line with UNFCCC NAP guidelines
6. FAO support to the NAP process

Climate change - Why adapt?

Climate change represents a serious threat to global food security

- 795million hungry people today
- 490million in Asia (62% of the total)
- With a growing population, food production needs to increase by 60% by 2050

Agriculture and food systems must undergo fundamental transformations in order to meet the related challenges of global food security and climate change.

Key CC challenges for food security

Yield reductions, animal and crop shifting to new areas, agro-biodiversity and ecological services losses

Loss of agricultural and non-agricultural incomes, humanitarian aid dependency

Increase of food prices, food chain modifications and increase on trading costs

Pollution of irrigation water, new diseases affecting human health and productivity, dietary patterns changing

Climate change impacts in agriculture sectors

Crops and livestock production will be affected by:

- increasing temperatures,
- changing precipitation patterns, and
- more frequent and intense extreme weather events.

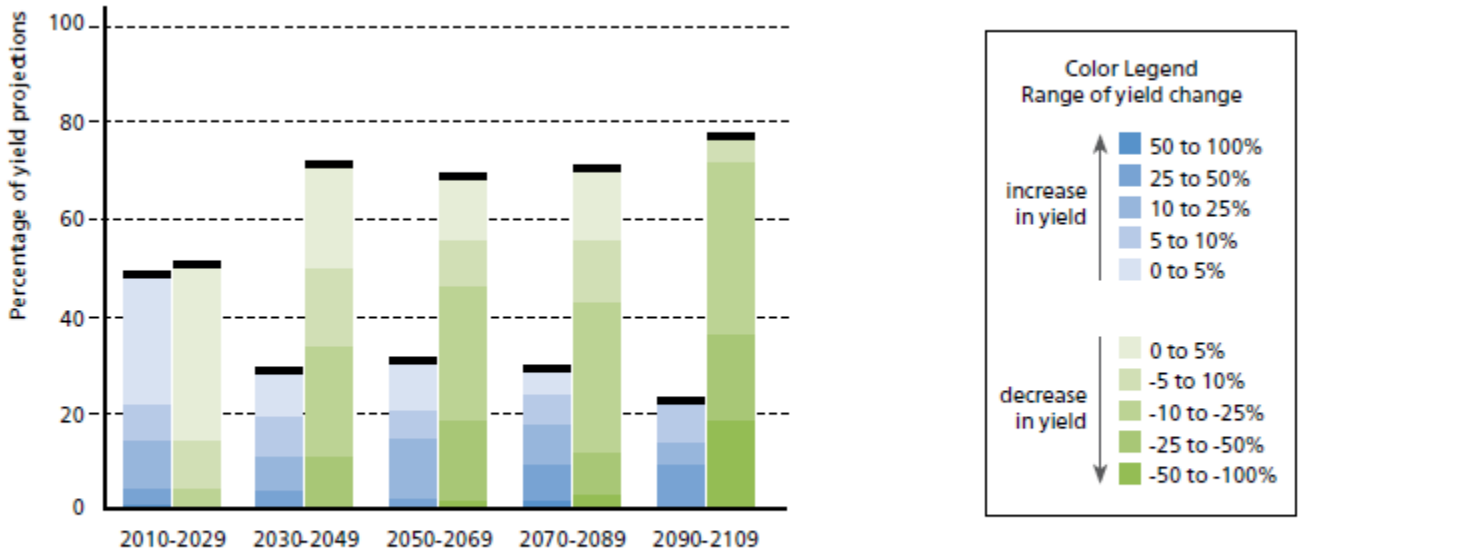
Direct effects on crop growth and their need for water, as well as soil fertility, water supply for irrigation, and prevalence of pests and diseases.

Livestock will be affected by the quality and amount of feed supply and the carrying capacity of pastureland. At the same time, they will have indirect effects on market prices, due to the different regional effects of climate change. (UNFCCC, 2010)

Forests are declining at a rate of 2.6 percent per annum, the major contributing factor being deforestation for cultivation and fuel wood purposes. The major climate hazard to forest is drought, landslides and mudslides.

Climate change impacts in agriculture sectors

Projected impact of climate change on crop yields



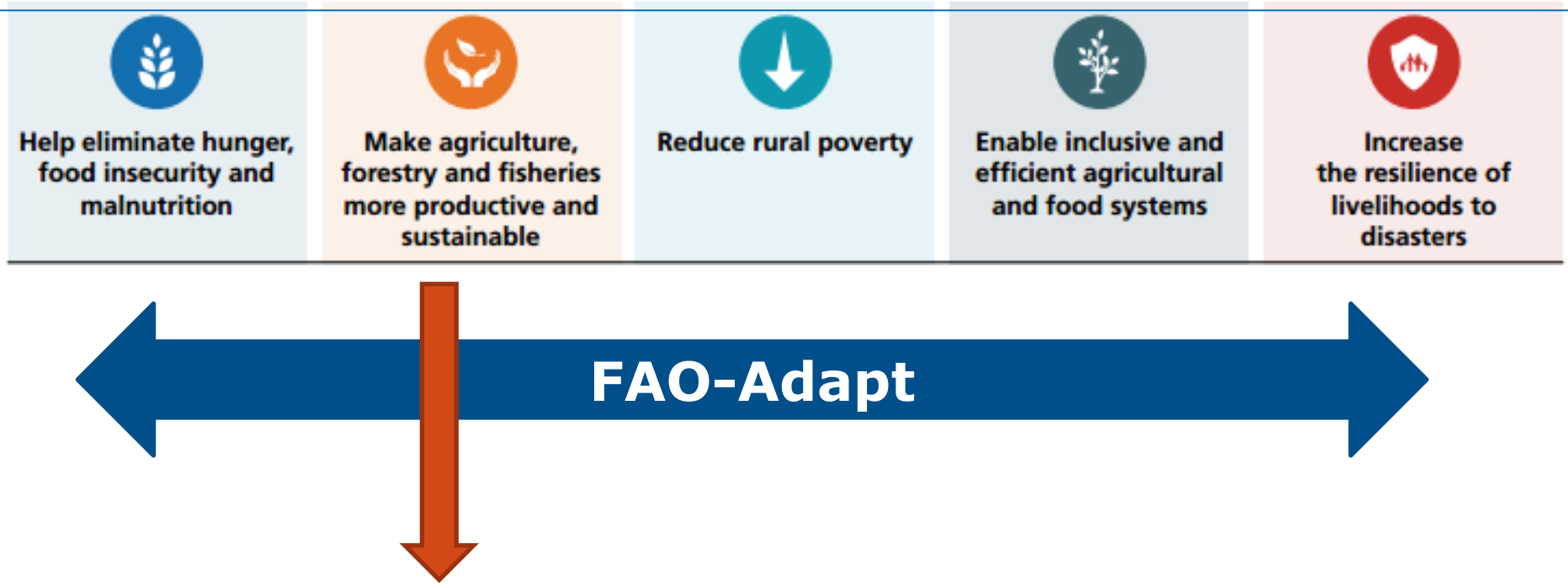
Source: IPCC 2014

Climate change impacts in agriculture sectors

Fisheries & Aquaculture - Increased water temperatures, sea-level rise and decreased pH, changes in current sea productivity patterns, flooding, droughts and increases in frequency and intensity of storms and other extreme weather events.

Coastal areas - Rising temperature affects on coral reefs. Damaged reefs will no longer provide coastal protection which, in combination with rising sea levels and increased extreme weather events, becomes a direct threat to agriculture, forestry, fisheries and other livelihoods in coastal areas.

FAO's Strategic Objectives



Major Area of Work on Climate-Smart Agriculture (MAW-CSA)

FAO Country Support - Adaptation

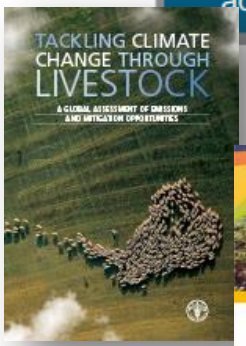
MOSAICC
Modelling System for Agricultural Impacts of Climate Change

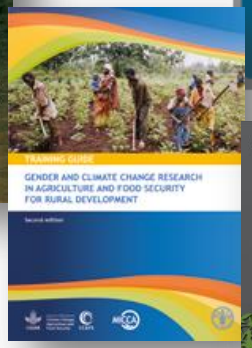
GAEZ
Global Agro-Ecological Zones

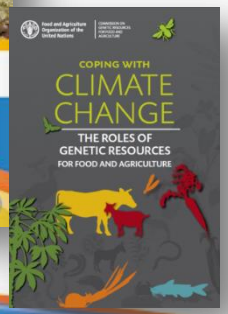
FAO EPIC

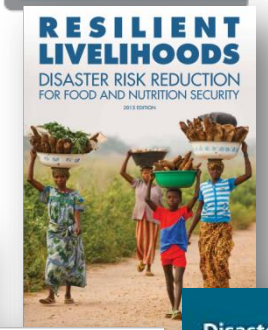
PRIORITY THEMES FOR CLIMATE CHANGE ADAPTATION

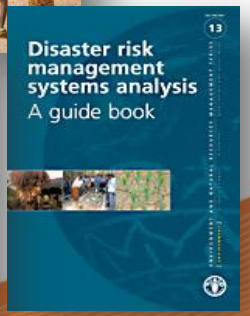
- Data and knowledge for impact and vulnerability assessment and adaptation
- Institutions, policies and financing to strengthen capacities for adaptation
- Sustainable and climate-smart management of land, water and biodiversity
- Technologies, practices and processes for adaptation
- Disaster risk management



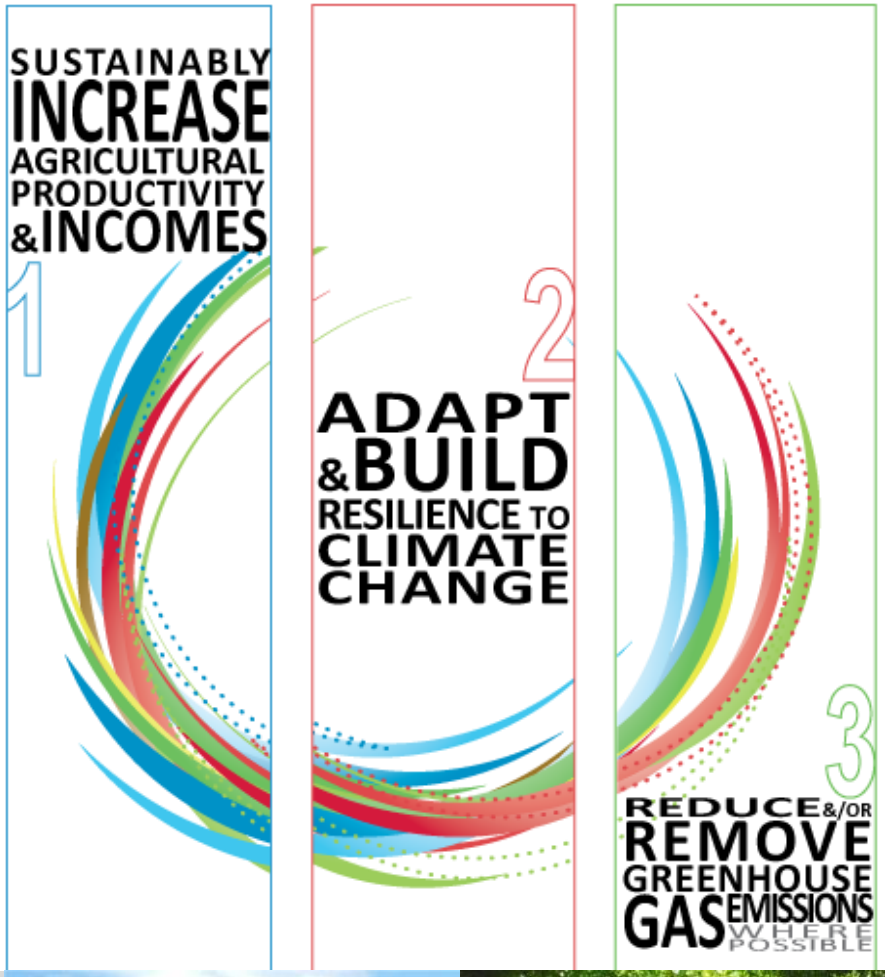








Climate Smart Agriculture



CSA is **NOT JUST** a set of practices, BUT an approach to developing the technical, policy and investment conditions to achieve sustainable agricultural development for food security under climate change.

Evolution of CSA

2009 — Food Security and Agricultural Mitigation in Developing Countries: Options for Capturing Synergies

2010 — "Climate-smart" Agriculture: Policies, Practices and Financing for Food Security, Adaptation and Mitigation

2013 — Climate-smart Agriculture Sourcebook

2014 — FAO Success Stories on Climate-smart Agriculture

Examples of Adaptation Options (i)

- altering inputs, varieties and species for increased resistance to heat shock and drought, flooding and salinization;
- altering fertilizer rates to maintain grain or fruit quality;
- altering amounts and timing of irrigation;
- altering the timing or location of cropping activities;
- diversifying towards rotation systems, including adding cover crops and shelter belts for improved soil–water retention and reduced erosion;
- making wider use of integrated pest and pathogen management, developing and using varieties and species resistant to pests and diseases; improving quarantine capabilities and monitoring programmes;
- increasing use of climate forecasting to reduce production risk;

Examples of Adaptation Options (ii)

- matching livestock stocking rates and grazing to pasture production, altered pasture rotation, alteration of forage and animal species/breeds, reassessing fertilizer use and supplementary feeds and concentrates;
- changing forest management, including hardwood or softwood species mix, timber growth and rotation periods; shifting to more productive areas under new climate conditions, adjusting fire and pest control management systems;
- introducing forest conservation, agroforestry and forest-based activities for diversification of rural incomes;
- altering fisheries catch size and effort; improving the environment where breeding occurs; reduce fishing rates to sustain yields of fish stocks; and
- diversification of fishing activities and aquaculture processes, implementing the ecosystem approach to fisheries and aquaculture, improving safety at sea, environmental monitoring and early warning systems, and improving post-harvest processes to manage increased risks and minimize losses.

Key principles for vulnerability assessment

- Linked to development goals and actions
- Clearly defined risk and vulnerability questions
- Social, economic, environmental and institutional context
- Evidence and science based
- Iterative, participatory and multi-stakeholders
- Should identify opportunities, but also risks
- Incorporated in programmes and projects' M&E

Example: Vulnerability assessments in the Lower Mekong Basin

- **Vulnerability questions:**

How are LMB fisheries and aquaculture species and production systems vulnerable to predicted climate change impacts?

- **Data and methods:**

Exposure variables, using available projection to 2050 for each zone were matched to information, such as, on the status of the species (IUCN red list status – invasive, least concern, vulnerable, endangered), water quality requirements and tolerances, migratory patterns, breeding season, diet, current trends and threats. Expert judgement was used to examine exposure, sensitivity and adaptive capacity of capture fisheries species and aquaculture systems (e.g. extensive pond culture, semi intensive pond culture, cage culture) and related species (e.g. tilapia, silver barb and carps).

Example: Vulnerability assessments in the Lower Mekong Basin

System component or assets	Threat	Intrepretation of threat	Exposure	Sensitivity	Impact Level	Impact Summary	Adaptive capacity	Vulnerability
		written description of how the threat relates to the system component		*refer to table*		*written explanation of what the impact is, and why it was scored (high, med, low)*	*refer to table*	*refer to table*
SEMI INTENSIVE POND POLYCULTURE OF TILAPIA, SILVER BARB AND CARPS	Increase in temperature	Maximum temperatures increases of up to 10% in the wet season. 5-7% during other seasons. Even higher relative changes in minimum temps 3-27%, highest in the cool season.	high	high	high	Reduced oxygen levels. Poorer water quality. Disease incidence.Reduced survival rate and growth rate of fish	low	high
	Increase in precipitation	Increased precipitation in the period March-December, highest in the months of Aug & Sept and Oct. Highest perceptage increase in precipitation occurs in December (40%).	medium	low	medium	Reduced water quality through turbidity Reduced productivity of pond and growth of fish	high	medium
	Decrease in precipitation	Decreases in precipitation are projected to occur duing the months of Jan & Feb, (although these are low rainfall months they are not the driest months).	medium	very high	high	Stagnation of pond water. Ammonia accumulation. Water column stratification Potential die offs	very low	very high
	Decrease in water availability	Reduced soil water availability in period Feb-May and Aug & Sept. The dry season decrease may affect stream water flows.	low	medium	medium	Accumulation of wastes in pond. Poorer water quality. Capacity to fill ponds.Reduced survival and growth of stock	medium	medium
	Increase in water availability	No negative effect.	-	-				
	Drought	Droughts (>60% of years for 6 months) resulting in poorer water quality, increased fishing pressure in refuge areas. Negative effects compounded by temperature increase.	medium	very high	high	Difficulty in maintaining pond water levels. StratificationReduced survival and growth of stock	low	high
	Flooding	No negative effects anticipated	high	very high	very high	Control of pond water levels. Maintainence of pond fertiliity Loss of stock from pond	medium	very high
	Storms and Flash floods	Increase in the number of days with daily precipitation above 100 mm, from 7-10 days. Increase in the highest single daily precipitation; 160mm	medium	very high	high	Control of pond water. Maintenance of pond fertility in pond. Loss of stock from pond. Damage to pond infrastructure	low	high
	sea level rise	n/a						
	increasing salinity	n/a						

Example: Economics and Policy Innovations for CSA (EPIC)

NEEDS ⟷ RESEARCH COMPONENT ⟷ OUTPUTS

Develop a policy environment & and agricultural investments to improve food security and provide resilience under climate uncertainty

What are the synergies and tradeoffs between food security, adaptation and mitigation from ag. practices?

What are the barriers to adoption of CSA practices?

Legal & Institutional Appraisal: mapping institutional relationships and identifying constraints

↕

POLICY SUPPORT COMPONENT

What are the policy levers to facilitate adoption and what will they cost?

Identifying where policy coordination at the national level is needed and how to do it

Facilitating national participation/inputs to climate and ag international policy process

Evidence Base

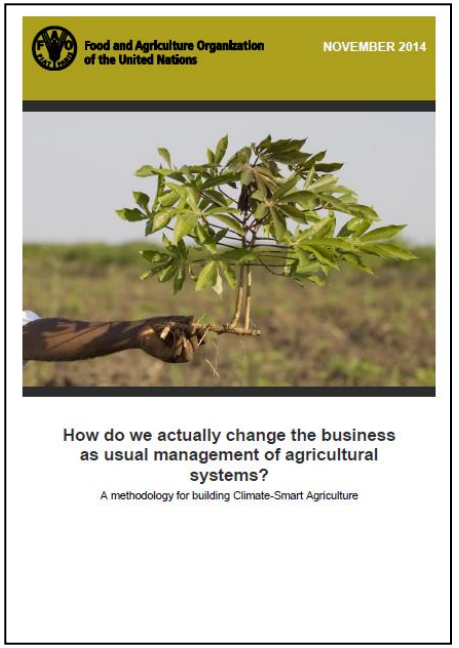
Strategic Framework & Policy Advice

Capacity Building

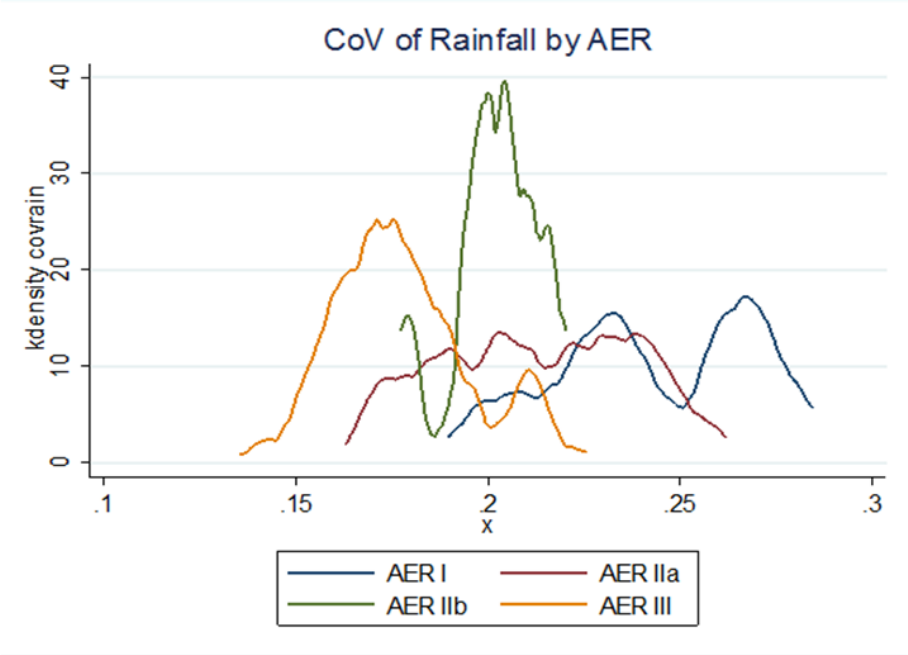
Investment proposals

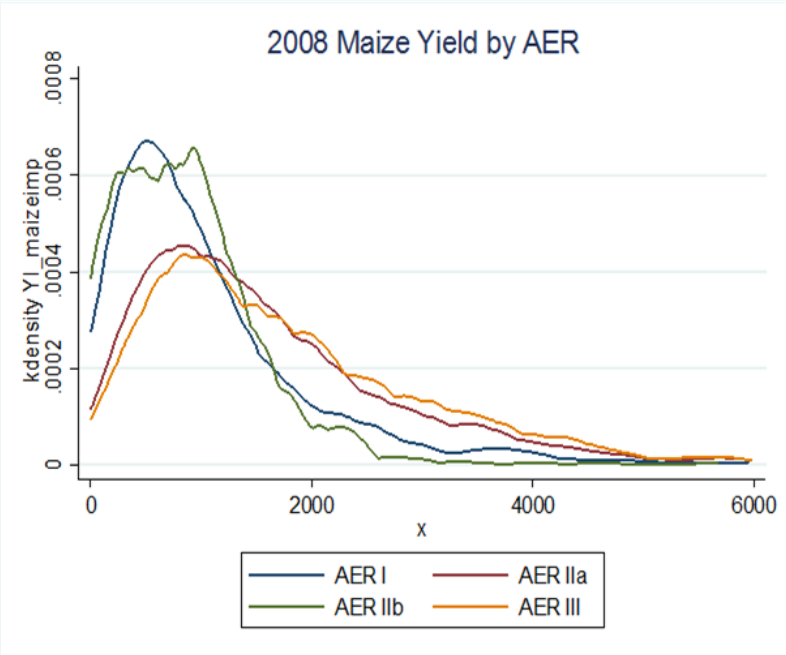
Example: EPIC methodology for CSA

- Developing weather variables that are related to shocks/risk exposure (delayed onset, rainfall temp variability)
- Linking to socio-economic HH datasets and developing variables related to resilience (e.g. probability of yield shortfall, as well as probability of falling into poverty)
- Analyzing effective responses to varying types of risk exposure (e.g. SLM techniques, various forms of diversification, safety nets)
- Assessing policy response needed (and eventually implications for investments) for effective response.



Using updated climate relevant information to support maize development strategies: areas of increasing rainfall variation have significantly lower yields



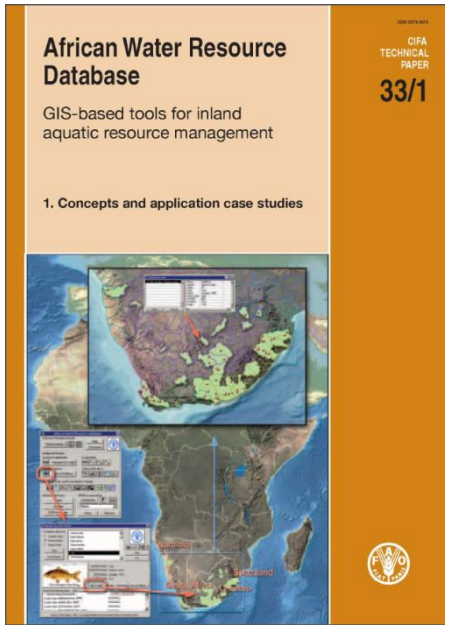


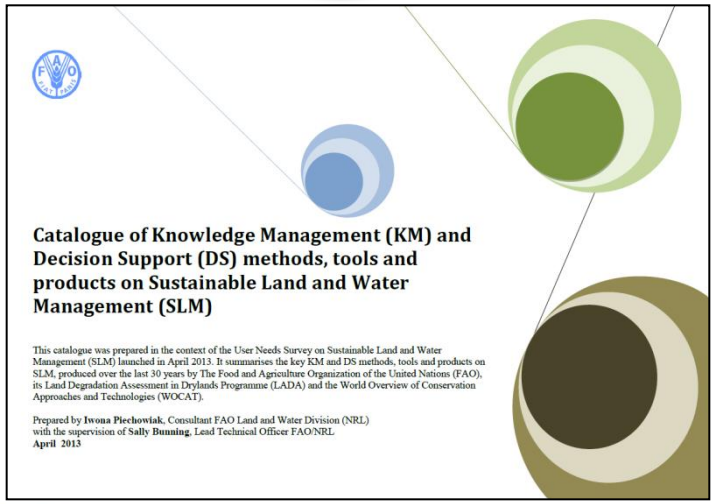
FAO Tools: Water and Agriculture

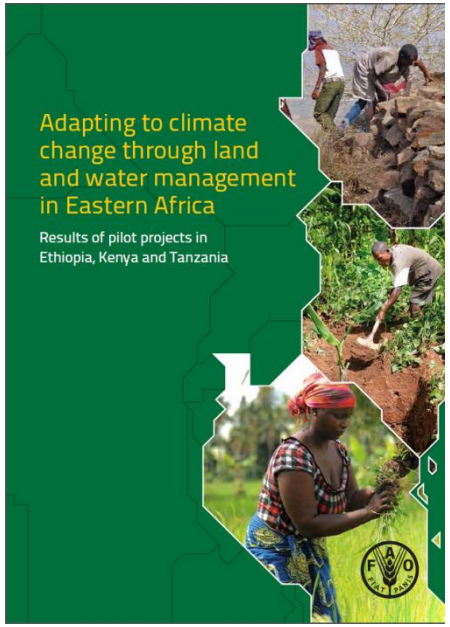
AQUACROP v4.0
Version 4.0 now available for download

FAO //Climpag Climate Impact on Agriculture

FAO Tools

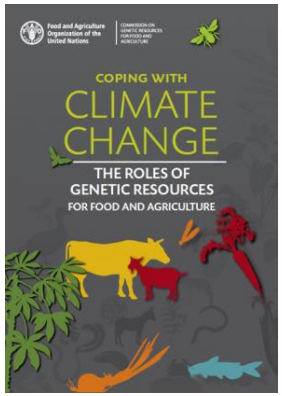


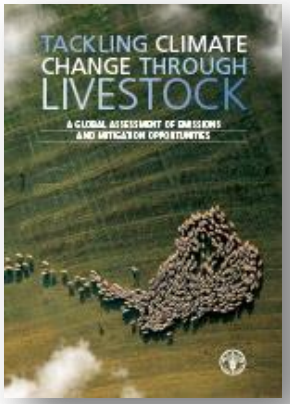


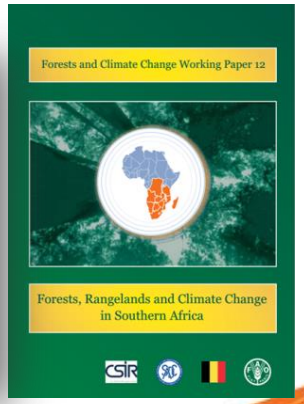


Element A. Lay the groundwork and address gaps

- How do we know that Agriculture has been considered in the NAP?
- How do we ensure that the NAP process is anchored to good development effectiveness and capacity development practices that include alignment with real country need, foster strong country ownership and leadership for more sustainable results?
- How do we ensure that the short-term priorities in climate change adaptation are aligned with the medium-to-longer term climate change adaptation challenges?







Element B. Preparatory elements

- Which climatic patterns in the country, according to observed data, are most important in terms of adjustment, adaptation or acclimatization of social systems?
- What risks does climate change hold for the country?
- What are appropriate indices of climate trends which could support planning and decision-making?
- Analyse the current climate to identify trends in variables and indices that could be used to support planning and decision-making

FAO EPIC ECONOMICS & POLICY INNOVATIONS FOR CLIMATE-SMART AGRICULTURE

MOSAICC Modelling System for Agricultural Impacts of Climate Change

FAO //Climpag Climate Impact on Agriculture

Element C. Implementation strategies

- How can adaptation work best be prioritized for implementation at the national level considering development needs, climate vulnerabilities and risks and existing plans?
- What criteria can be used to define priority actions?
- What is the most appropriate strategy for the implementation of adaptation activities including timing, target areas or beneficiaries, responsible authorities and sequencing of activities?
- How can the implementation build on and complement existing adaptation activities?
- What are the potential costs of the NAP and how can these costs be met?

Element D. Reporting, Monitoring and Review

- Which areas of the NAP process are key for its effectiveness and should thus be the focus of the monitoring process?
- What information and metrics are needed to monitor progress, effectiveness, gaps and lessons of the NAP process?
- Is there an appropriate M&E plan and set of responsibilities, and resources for agriculture in NAP?
- Which are the stakeholders involved?
- Are the capacities there to implement it?
- What are the resources allocated to agriculture sectors?

Element B. Preparatory elements

EF. 5 Analysing climate data and assessing vulnerabilities to climate change and identifying adaptation options at the sector, subnational, national and other appropriate levels

Step 2	Assessing climate vulnerabilities and identifying adaptation options at sector, subnational, national and other appropriate levels	
Indicative activities	Assessing climate change vulnerability in Benguela Fisheries and Aquaculture	http://www.fao.org/docrep/018/i3389e/i3389e.pdf
Output	• Analysis of vulnerability methodologies to propose appropriate VA frameworks for the Benguela Region • Through participatory sharing of experiences from Tanzania, Kenya, Brazil and Chile	

Element B. Preparatory elements

EF. 5 Analysing climate data and assessing vulnerabilities to climate change and identifying adaptation options at the sector, subnational, national and other appropriate levels

Step 2	Assessing climate vulnerabilities and identifying adaptation options at sector, subnational, national and other appropriate levels	
Indicative activities	FAO //Climpag Climate Impact on Agriculture	www.fao.org/nr/climpag
Output	• methodologies, tools for a better understanding and analysis of the effect of the variability of weather and climate on agriculture as well as data and maps.	

Element B. Preparatory elements

EF. 5 Analysing climate data and assessing vulnerabilities to climate change and identifying adaptation options at the sector, subnational, national and other appropriate levels

MOSAICC
Modelling System for Agricultural Impacts of Climate Change

MOdelling **S**ystem for **A**gricultural **I**mpacts of **C**limate **C**hange

- Integrated impact assessment on crop yields, from climate data handling to economic assessment
- Provides information to support decision-making at national level
- Delivered to national institutions with training
- 4 main parts: **Climate** **Hydrology** **Crops** **Economy**

Element B. Preparatory elements

EF.6 Appraising adaptation options to support decision-making on adaptation investment plans and development planning

Step 1	Reviewing and appraising adaptation options	
Indicative activities	FAO EPIC ECONOMICS & POLICY INNOVATIONS FOR CLIMATE-SMART AGRICULTURE	www.fao.org/climatechange/epic
Output	• Analyzing and identifying impacts, effects, costs and benefits as well as incentives and barriers to adoption of CSA practices • Advice on formulation and implementation of CSA policies • Formulating CSA investment proposals	

EF.6 Appraising adaptation options to support decision-making on adaptation investment plans and development planning

FAO-EPIC approach: country-level evidence-based approach

1. Participatory process: potential CSA options
2. Analysis of exposure and sensitivity to climate risk in recent years
3. Analysis of barriers to adoption and yield impacts
4. Analysis of mitigation potential
5. Cost-benefit analysis
6. Understanding Risk Management Options
7. Strengthening Country Policies
8. Capacity development
9. Guiding investments

FAO EPIC ECONOMICS & POLICY INNOVATIONS FOR CLIMATE-SMART AGRICULTURE

Element B. Preparatory elements

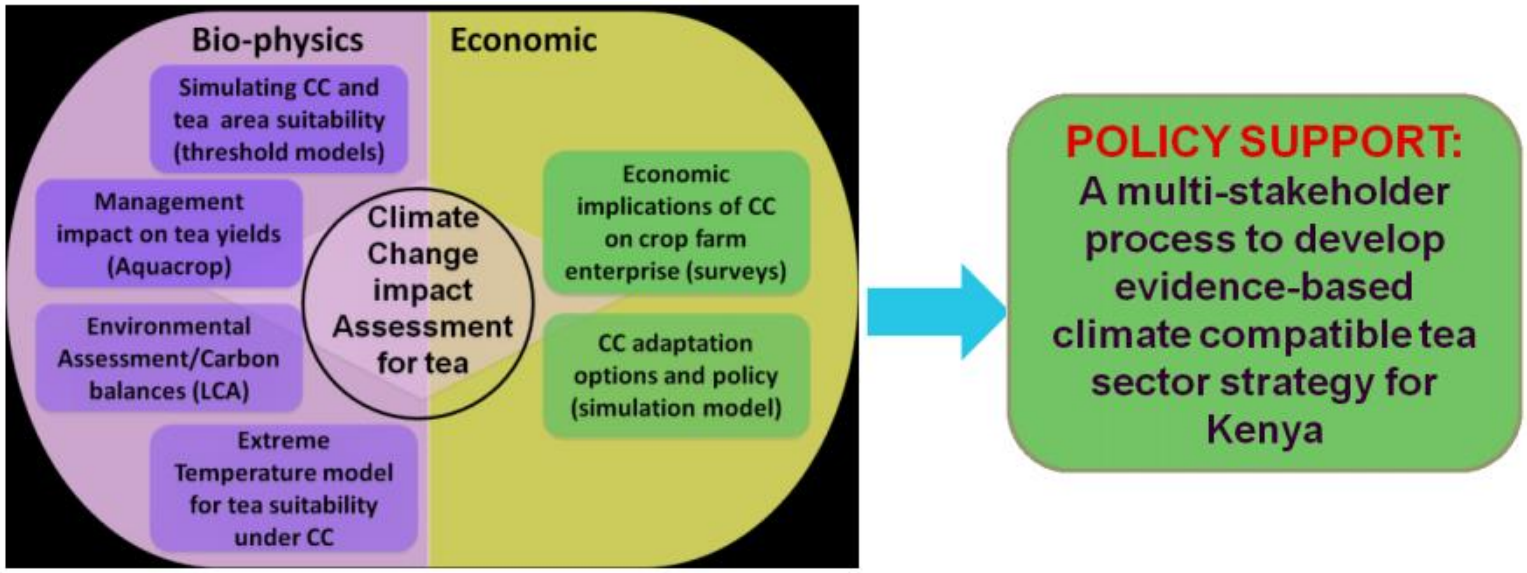
EF.6 Appraising adaptation options to support decision-making on adaptation investment plans and development planning

Step 1	Reviewing and appraising adaptation options	
Indicative activities	Integrating climate change adaptation into national agricultural strategy for small holder agriculture, - The case of Tadla-Azilal region, Morocco	www.fao.org/economic/est/issues/est-climatechange/cc-morocco
Output	• Develop an integrated multi-disciplinary methodology for climate-smart adaptation strategy including technical/scientific, economic and socio-institutional dimensions; • Test pilot an approach to generate and implement sustainable development projects for small scale producers in line with best climate-smart practices; • Develop tools and training materials for climate change adaptation appraisal and program and investment planning at national and local levels;	

EF.6 Appraising adaptation options to support decision-making on adaptation investment plans and development planning

Climate change impact assessment and Tea Policy Response in Kenya

STAGE 1 **STAGE 2**



EF.6 Appraising adaptation options to support decision-making on adaptation investment plans and development planning

Step 1	Reviewing and appraising adaptation options	
Indicative activities	Gap Analysis of National and Regional fisheries and aquaculture priorities and initiatives in Southern and Eastern Africa in respect to climate change and disasters	http://www.fao.org/3/a-i3756e.pdf
Output	• through a combination of a survey, website searches and reviews of documents – including policies, strategies or agreements • Regional workshop to provide input into the gap analysis process and provide recommendations for addressing climate change adaptation and disaster risk management in fisheries and aquaculture.	

FAO's work on the "agriculture supplement"

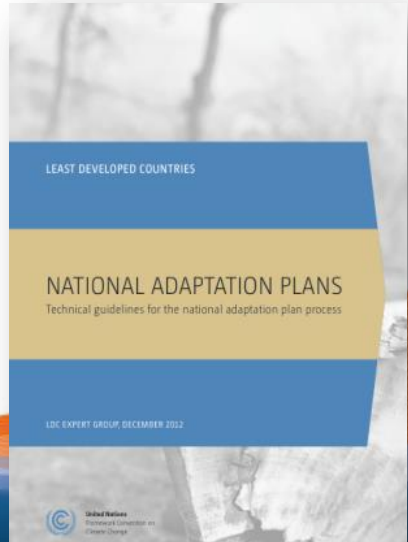
FAO is developing a supplement on agriculture (including crops, forestry, fisheries and aquaculture) to the NAPs Technical Guidelines prepared by the LEG.

Objectives:

- To facilitate the integration of food security and agriculture concerns and perspectives into the NAP process;
- To enable agriculture stakeholders to better identify and understand the issues at stake in a mid/long term perspective and to empower them to participate efficiently in the process; and
- To provide guidance for non-agriculture specialists to understand the issues at stake.

Timeline:

- Consultations with UNFCCC, the LEG, other UN Agencies and countries are ongoing (2014-2015).
- To be launched at COP 21.



FAO Country support on NAPs for the agricultural sectors

NAPs Country support in Malawi and Uganda:

- Support in developing an **integrated adaptation approach**
- **Supporting the Ministries of Agriculture** to be a strong stakeholder in the national NAP process
- **Defining a baseline on adaptation and identification of cc knowledge gaps** of agriculture sector
- Developing an agriculture specific **roadmaps** for NAPs to be integrated to the national NAP.
- Developing and conducting capacity training
- Identify and **help leverage** climate finance for adaptation
- Conducting **advocacy and knowledge sharing** on NAPs

Integrating Agriculture in NAPs

Safeguarding livelihoods and promoting resilience in National Adaptation Plans (NAPs)

A Joint UNDP-FAO Programme:

"To integrate climate change risks and opportunities as they relate to agriculture sector-related livelihood options within existing national planning and budgeting processes"

The programme is funded by the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) through the International Climate Initiative (ICI)

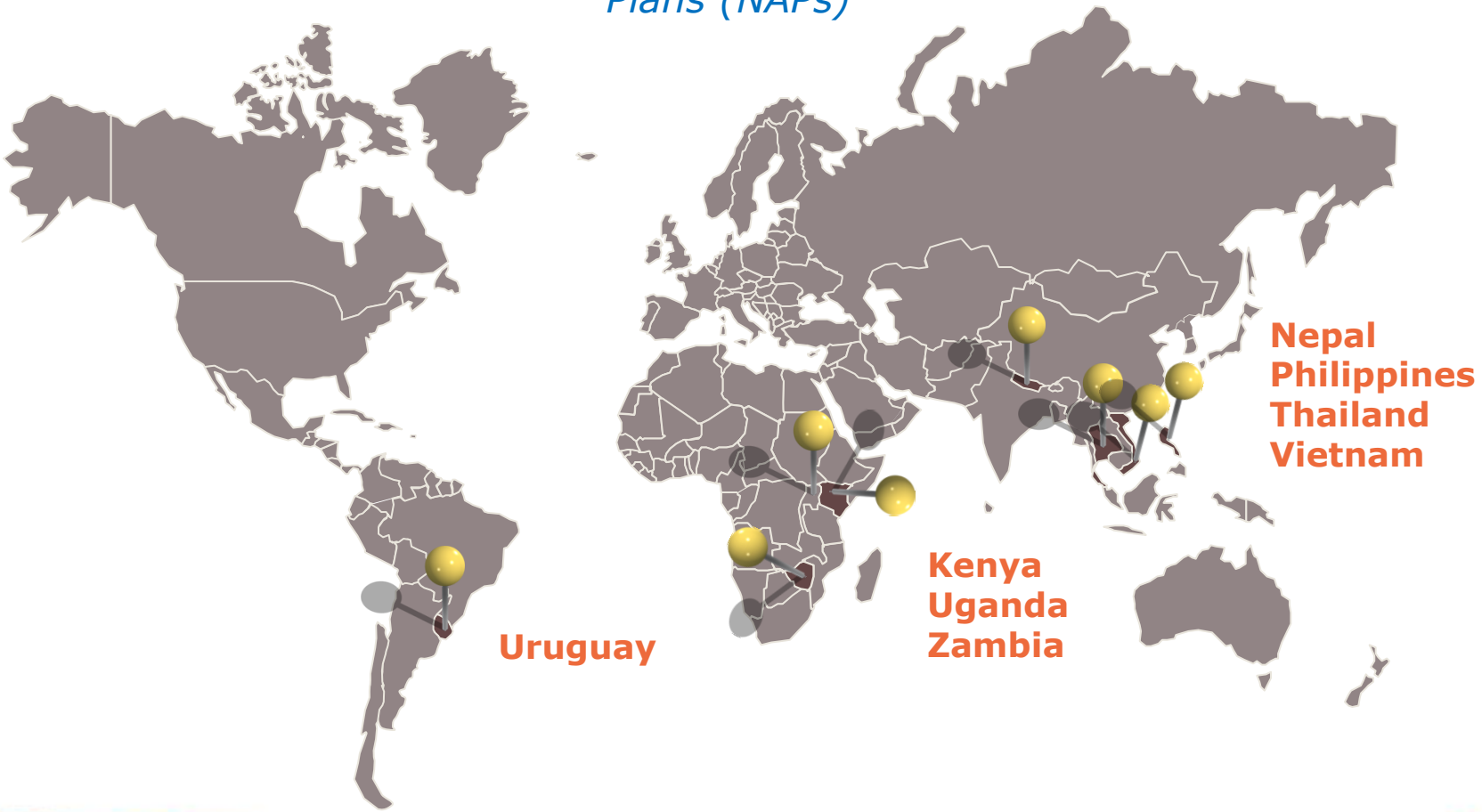
Food and Agriculture Organization of the United Nations

UNDP Empowered lives. Resilient nations.

Supported by:
Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety
based on a decision of the German Bundestag

Integrating Agriculture in NAPs

Safeguarding livelihoods and promoting resilience in National Adaptation Plans (NAPs)



Overview

- **Target countries (8)**: Nepal, Kenya, the Philippines, Thailand, Uganda, Uruguay, Vietnam, Zambia
- **Total budget:** US$12 million
- **Duration**: 4 years (2015 to 2018)
- **Expected start-up:**
  - Preparatory phase: Spring 2015- Country consultation
  - Expected start-up of implementation phase: August 2015
  - Board Meeting: October 2015
  - Country- Agency Project launch: Dec 2015

Programme Outcomes

- **Technical capacity and institutions on NAPs strengthened:** Ministries strengthened to enable climate-risk informed planning and budgeting
- **Integrated roadmaps for NAPs developed**: Incorporate adaptation options for the agriculture sector
- **Evidence-based results for NAPs improved:** Impact assessment framework for the agriculture sector
- **Advocacy and knowledge-sharing on NAPs promoted**: shared lessons learned regionally for the agriculture sectors.

Thank you!

For more information, please visit:

www.fao.org/climatechange

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