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Collaboration on climate innovation for a low carbon and climate resilient Africa: CCAFS partnerships and approaches

James Kinyangi

CCAFS Regional Program Leader – East Africa

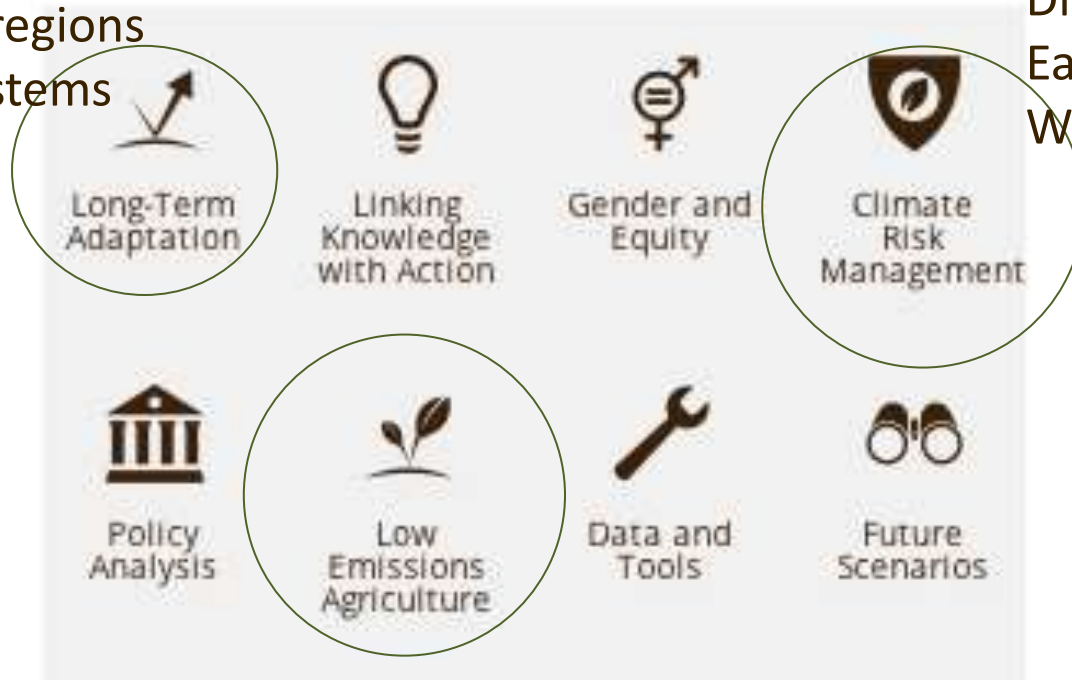
CCAFS is a global research partnership on smallholder agriculture under climate change



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Climate & impact models
Future farming regions
New farming systems
Public policy



Seasonal forecasts
Diversification
Early warning systems
Weather insurance

Low-carbon development pathways
Solutions for mitigation in smallholder systems

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Journal Articles

JOURNAL ARTICLE
2014

Uncovering consistencies in Indian rainfall trends observed over the last half century

[VIEW ALL](#)

Policy Briefs

POLICY BRIEF
2013

Seeds for needs: perceptions on climate change

[VIEW ALL](#)

Reports

TECHNICAL REPORT
2013

Planning climate adaptation in agriculture

[VIEW ALL](#)

Info notes

INFO NOTE
2014-04-19

Alternate wetting and drying in irrigated rice

[VIEW ALL](#)

Outcome cases

CASE STUDY
2014-03

Beyond the climate science: CCAFS downscaled climate data applied by development agencies around the world

[VIEW ALL](#)

Research in Action

BROCHURE OR FLYER
2014-03-15

Generating credible weather data for future climates

[VIEW ALL](#)

CSA practices and technologies

INFO NOTE
2014-04-19

Alternate wetting and drying in irrigated rice

BROCHURE OR FLYER
2013

Climate services for smallholder farmers: helping farmers cope with risk

[VIEW ALL](#)

AgClim Letters: a Science Policy Bulletin

A farm is greater than the sum of its parts

Climate change and food supplies: bit of a drag or major upheaval?

Cutting our losses? Learning from food waste in China

Searchable blog stories provide an easy entry point



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Stories

Jul 23, 2014
Adaptation models for climate-smart practices to be developed

Jul 21, 2014
It takes a village to build climate-resilience

Jul 18, 2014
Photo-story: Kenya's climate-smart farms through a lens

Jul 16, 2014
Hybrid seeds and super goats: meet Kenya's future farmers

Posts by theme

- Long-Term Adaptation
- Climate Risk Management
- Low Emissions Agriculture
- Linking Knowledge with Action
- Future Scenarios
- Gender and Equity
- Data and Tools
- Policy Analysis

Posts by region

- East Africa
- West Africa
- Latin America
- Southeast Asia
- South Asia

From the field



Climate change adaptation and mitigation initiatives for agriculture in East Africa

<http://hdl.handle.net/10568/35083>



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Climate Change Adaptation and Mitigation Initiatives for Agriculture in East Africa

Working Paper No. 60

CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)

Mary Nyasimi
Maren Radeny
James Kinyangi



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Working Paper

Climate change, food security and small-scale producers: Summary of findings of the Fifth Assessment Report (AR5) of the IPCC

<http://hdl.handle.net/10568/35215>



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The cover of the report features the logos of CGIAR, CCAFS, and CIAT at the top. The title 'Info Note' is prominently displayed in a large, light green font. Below it, the subtitle 'Climate change, food security and small-scale producers' is written in a smaller, dark font. The authors' names and the date 'APRIL 2014' are listed at the bottom of the cover. The main content area is divided into two columns: a yellow box on the left containing a list of seven priorities for action, and a white box on the right containing a summary of the report's findings and an overview of the briefing note.

The findings of AR5 lead us to seven priorities for action:

- **Urgency:** since climate change is affecting food and farming now, we need to speed up the pace of adaptation, and to achieve mitigation co-benefits whenever possible.
- **Investment:** we need to increase the proportion of climate finance going into adaptation, and to secure a flow of resources to locations and populations where adaptation needs are greatest.
- **Private finance:** we need creative finance and insurance products to improve both risk management and access to capital for adaptation actions, especially among small producers.
- **Value chains:** we need to pay more attention to how food value chains are managed, to deal with climate risks, secure affordable and nutritious food supplies for poor consumers, and improve the links for small producers and processors to stable markets, whether local or distant.
- **Knowledge:** since climate change is not static, we will continually need to generate and share new knowledge, extending the information revolution into fields, forests and fisheries in remote localities.
- **Breeding:** we need to invest now in farmer-led and science-led breeding, as it is demonstrably one of the most effective adaptation measures to the 2030s, and requires 8-20 year lead times for release of new varieties of crops and livestock.

Farmers, businesses and governments around the world report growing impacts of climate change on agricultural production and food security, and are trying to find ways to adapt to change. The chance to measure these real-life experiences and efforts against new science is extremely useful, but rare. Released during 2013 and 2014, the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC) offers the first opportunity since 2007 for us to appraise the global scientific consensus on climate change drivers, impacts, adaptation and mitigation.

This briefing note offers an overview of what AR5 has to say on the impacts of climate change on food and farming – particularly the food and farming of the half a billion small-scale croppers, livestock keepers and fishers who are most immediately dependent on agricultural systems for their livelihoods. It is based on two related sources within the output of Working Group 2 under AR5: (a) Chapter 7 on Food Security and Food Production Systems and (b) the Summary for Policy Makers. The IPCC's Working Group 2 is tasked with assessing the vulnerability of socio-economic and natural systems to climate change, negative and positive consequences of climate change, and options for adaptation.

The briefing note starts with where we are at with climate change in the 2010s, then looks ahead 15 years to impacts and adaptation in the 2030s, before touching finally on the 2050s and beyond.

CCAFS offers free tools & data for all users



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Tools, Maps, Models and Data

More data, models and tools are housed at the [CIAT-GCM page](#).

Big Facts and Infographics on Climate Change, Agriculture and Food Security
Get all the Big Facts on the links between climate change, agriculture and food security. Explore over 100 stunning infographics that illustrate the most up-to-date, thoroughly researched information on these topics.

Data Management Support Pack
Welcome to the CCAFS Data Management Support Pack. This pack has been designed to help you produce high quality, reusable and open data from your research activities. It consists of documents, templates and videos covering the different aspects of data management and ranging from the overarching concepts and strategies through to the day-to-day activities. For each of the videos in the pack we have included a transcript of the narrative.

Atlas of CCAFS sites
Browse colourful maps of CCAFS research sites in three regions: East Africa, West Africa and South Asia.

Spatial Downscaling Methods: CCAFS-Climate Data Portal
Includes different Statistical downscaling methods, Pattern Scaling, MarkSim Weather Generator and Dynamical Downscaling RCMs PRECIS.

Data

Agtrials
AgTrials— Le Référentiel mondial des essais agronomiques

Agtrials
The Global Agricultural Trial Repository

Downscaled GCM Data Portal
Climate change downscaled datasets

CCAFS baseline survey data and materials
Baseline surveys took place at 15 CCAFS sites in 2010 and 2011. All information and data is openly available.



Our research themes

The Ag Trials database contains data from 35,000 crop and livestock trials, with weather information



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The screenshot displays the Ag Trials database interface. On the left is a satellite map of East Africa, showing trial locations marked with numbered blue and yellow circles across countries like Uganda, Kenya, Tanzania, and Zanzibar. On the right is a search and filter panel with the following sections:

- Filters:** Table, Crops, Tools, Information
- by identifier:** Enter a Trial ID:
- Others:** Crop/Animal: All
- Institution:** All
- Contact person:** All
- Trial group:** All
- Name:** All
- Status:** All
- Varieties/Race:**
- Variables measured:**
- Sow date:** From: To:
- Harvest date:**



www.agtrials.org

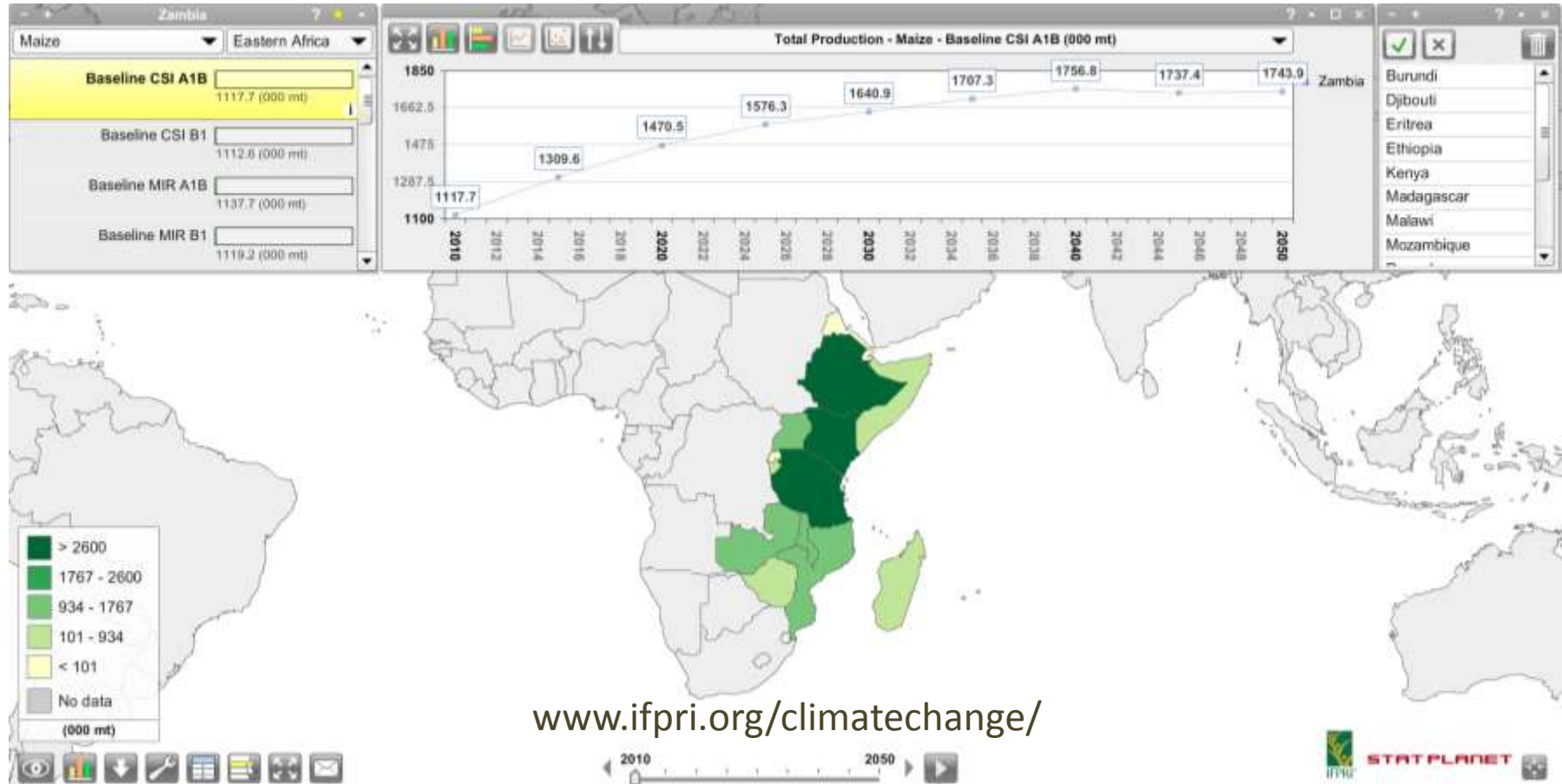
Food Security Case Maps give models of future crop yields and food security by country



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The CCAFS Climate Portal provides place-specific climate change information relevant to agriculture



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Data Provided by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)

The data distributed here are in ARC GRID, and ARC ASCII format, in decimal degrees and datum WG584. CCAFS and its partners have processed this data to provide seamless continuous future climate surfaces. Users are prohibited from any commercial, non-free resale, or redistribution without explicit written permission from CCAFS or the data-developing institutions. Users should acknowledge CCAFS as the source used in the creation of any reports, publications, new data sets, derived products, or services resulting from the use of this data set. For commercial access to the data, send requests to **Andy Jarvis** at the International Center for Tropical Agriculture (CIAT).

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Big Facts shares simple scientific facts on food and climate



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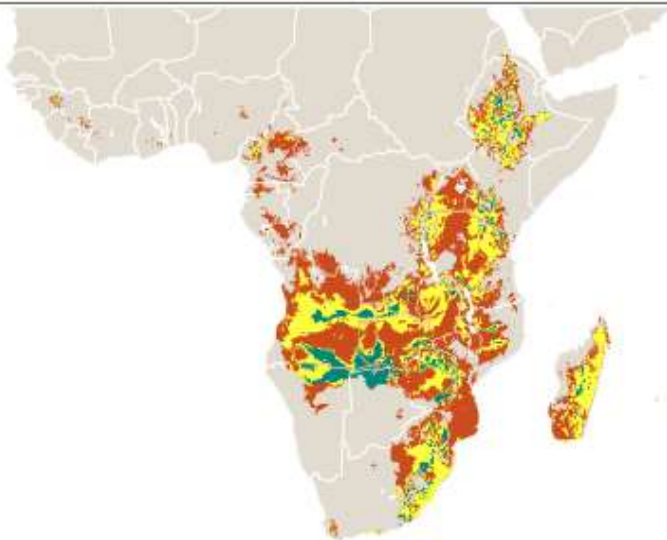


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CLIMATE IMPACTS ON CROPS

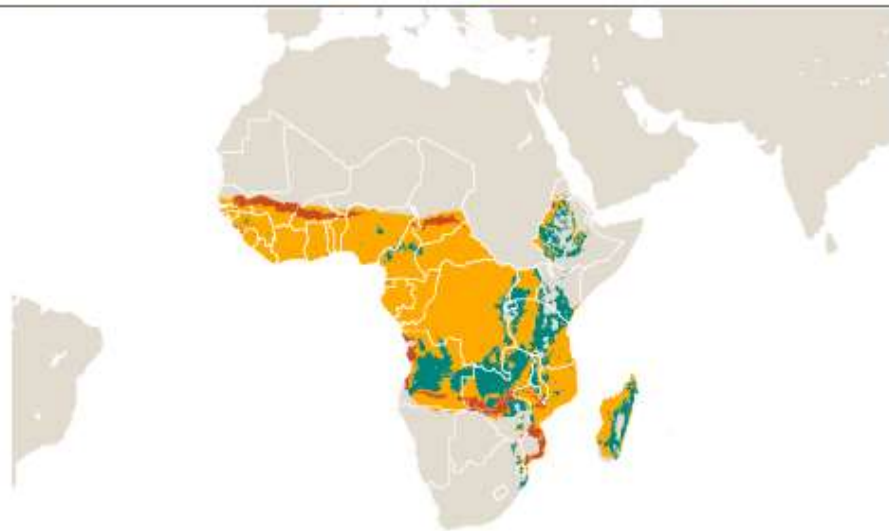
Overall, vast areas of Sub-Saharan Africa will experience a loss in suitability for bean production, while the suitability for cassava production will increase, especially in Eastern Africa.

BEANS



CASSAVA

LOSS NO CHANGE INCREASE



Source: CIAT, 2013

Big Facts

ccafs.cgiar.org/bigfacts



ccafs.cgiar.org/bigfacts2014

Big Facts shares simple scientific facts on food and climate

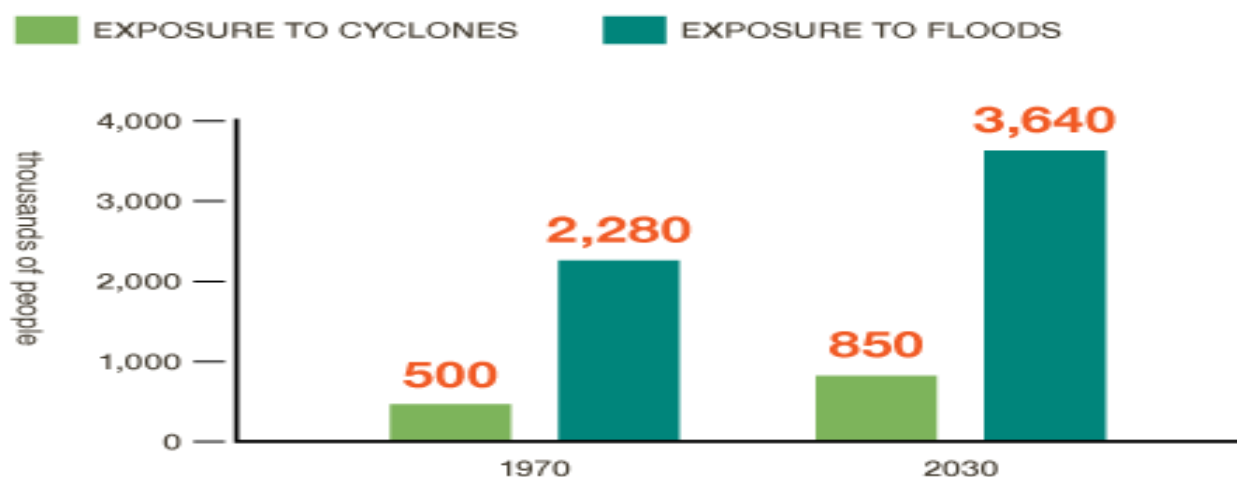


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*DISASTERS

The numbers of people exposed to cyclones and floods in sub-Saharan Africa are expected to increase substantially.



Source: IPCC, 2012

*Flood and cyclone data is for all of Africa

Big Facts
ccafs.cgiar.org/bigfacts



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ccafs.cgiar.org/bigfacts2014

Climate Smart development of the East African Dairy Sector



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In East Africa, Milk is Money

The East Africa Dairy Development (EADD) program is designed to boost the milk yields and incomes of small-scale farmers in Africa so they can lift their communities out of hunger and poverty. With help from a \$25.5 million grant from the Bill & Melinda Gates Foundation, the second phase of EADD will work with more than 200,000 farmers to improve dairy production and economic outcomes over the next four years.

Building on the success and lessons learned in Phase I, the vision for EADD II is to provide an additional 20,000 smallholder farm families the opportunity to create financial independence and social equality. Together with our program partners, we are changing the traditional landscape in East Africa, one family, one community at a time.

Advancing Climate-Smart Agriculture

THE 2013 ANNUAL REPORT

Outcomes and milestones

East African Dairy Development programme adopts climate-smart agriculture



Photo: S. Odoyo (ICRAF)

The East Africa Dairy Development (EADD) programme works to build a robust dairy industry in a region where demand for fresh milk is close to outstripping supply. But livestock emit 12% of greenhouse gas emissions caused by human activity. Producing milk with fewer emissions per litre could play a big part in mitigating climate change.

Heifer International and CCAFS scientists are tackling problems in measuring greenhouse gas emissions in smallholder systems arising from a lack of capacity and a lack of standard methods for measuring emissions. Researchers are establishing the costs and benefits of

THEMES



REGIONS



Index-Based Livestock Insurance for climate resilience



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Kenyan farmers

Insure my cows

A new kind of insurance may protect herders against drought

Apr 19th 2014 | WAJIR | From the print edition



How the private sector can catalyze innovations for feeding Africa

By Gordon Conway, Stephanie Britzin | 05 August 2014



Workers at Arusha Booms in Tanzania prepare and process green beans for export to Europe. Feed the Future helps connect smallholder farmers to international markets. Photo by: Fintrac Inc. / USAID / CC BY-NC

This week, as U.S. and African leaders convene in Washington, D.C. for the inaugural U.S.-Africa Leaders Summit, the 200 million Africans who still go to bed hungry feature prominently on the agenda.



Cornell University



<http://livestockinsurance.wordpress.com/>



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Agricultural NAMA development in Kenya: A project supported by CCAFS

Timm Tennigkeit, Suzanne van Dijk



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25 March 2014

GHG emissions inventory



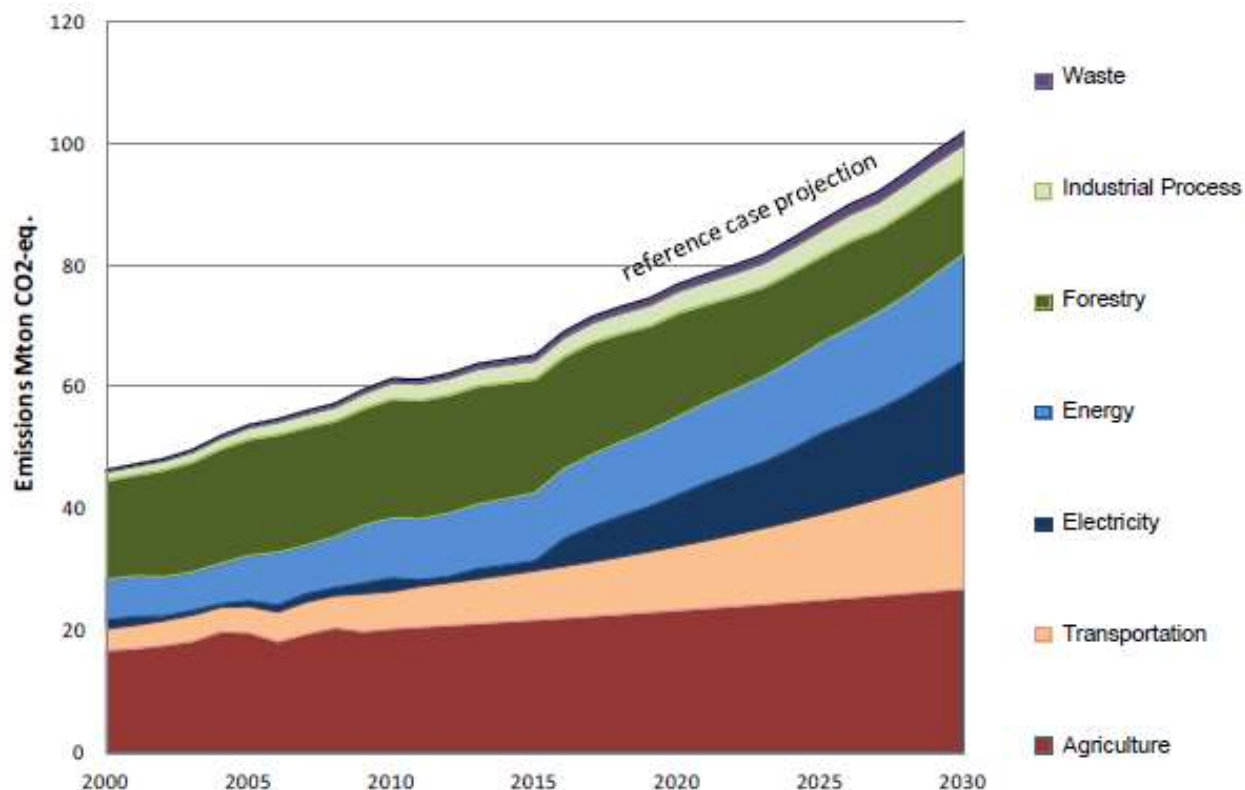
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Important to identify subsectors, regions or types of agricultural activity that should be addressed in mitigation plans

- Agriculture and forestry are the largest emitters
- Projections for 2030 show agriculture will



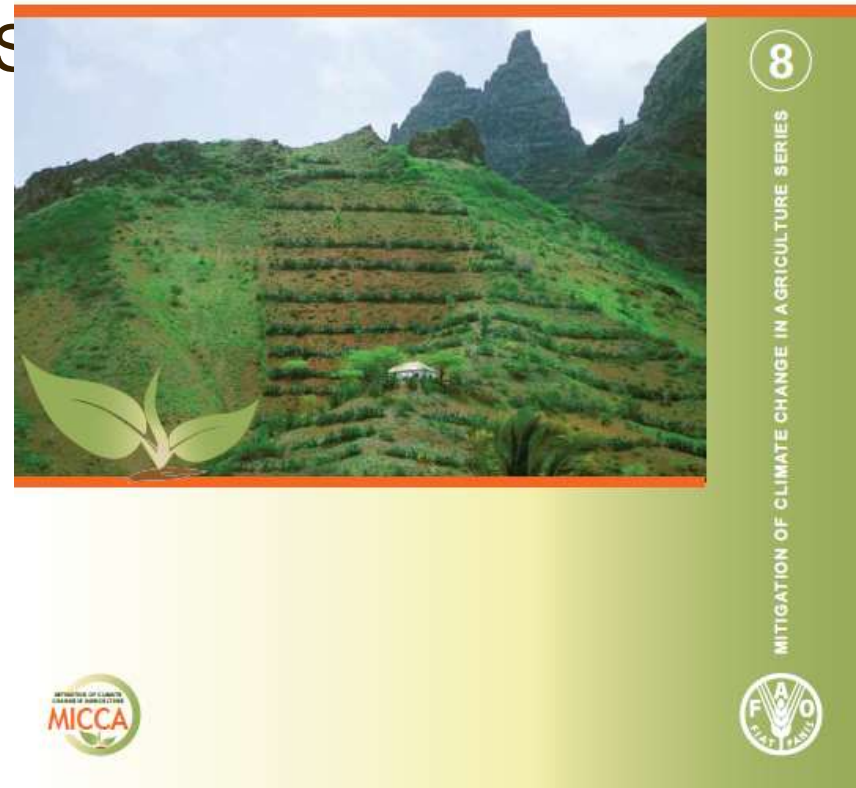
Source: GoK NCCAP Mitigation Analysis 2012

cause 72% of

Leaves' CHG

- Two main approaches to mitigation planning in developing countries: Low Emission Development Strategies (LEDS) and Nationally Appropriate Mitigation Actions (NAMAs)
- Policy, institutional and technical elements

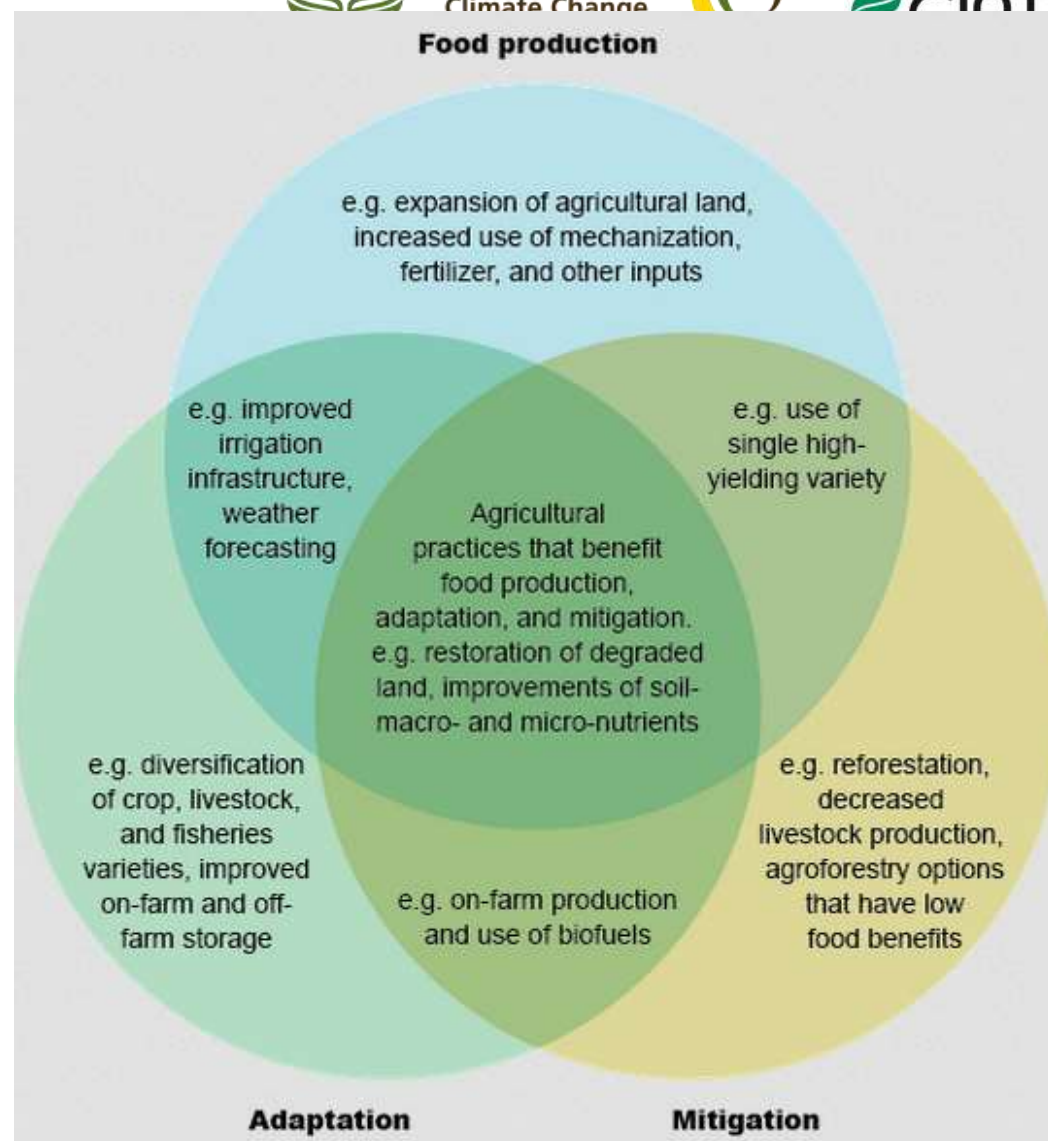
National planning for GHG mitigation in agriculture: A guidance document



A balance between synergies and trade-offs is needed to meet multiple objectives

We strive for:

- **Win-win** options;
- **No-regret** options.





THE FLOWS OF CLIMATE FINANCE 2013

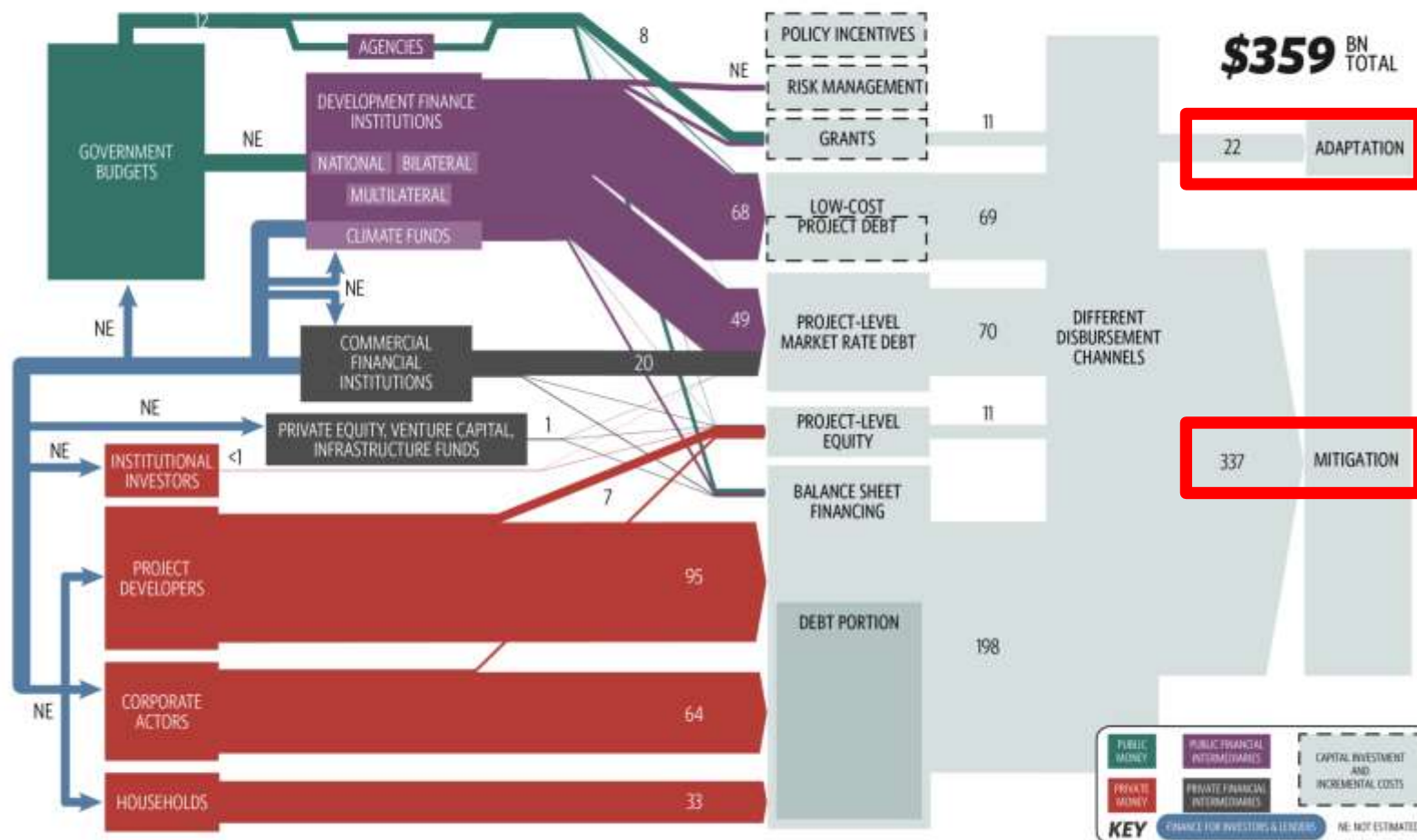
The Flow of Climate Finance 2013, also known as the 'spaghetti' diagram, illustrates the landscape of climate finance flows along their life cycle for the latest year available, mostly 2012.

SOURCES AND INTERMEDIARIES

INSTRUMENTS

CHANNELS

USES



Notes: Figures are indicative estimates of annual flows for the latest year available, 2013 or 2012 (variable according to the data source). Flows are expressed in USD billions and rounded to produce whole numbers. Where ranges of estimates are available, the mid-point is presented. All data presented relates to commitments in a given year due to the limited availability of disbursement data. The diagram captures upfront capital investment costs of low carbon, climate resilient activities plus grants for e.g. capacity building and enabling environment activities. The diagram highlights with a dotted line those financial resources which contribute to paying for upfront incremental investment costs, that is the difference in investment cost between cheaper, more polluting options and costlier, climate-friendly ones. This includes some portion of low cost debt. As Landscape 2013 only tracks upfront investments and not lifetime inflows (revenues) or outflows (costs), our estimate of finance only includes policy incentives provided as grants or concessional loans, excluding the value of policy-induced revenues, such as feed-in tariffs or carbon market payments.

Nationally Appropriate Mitigation Actions



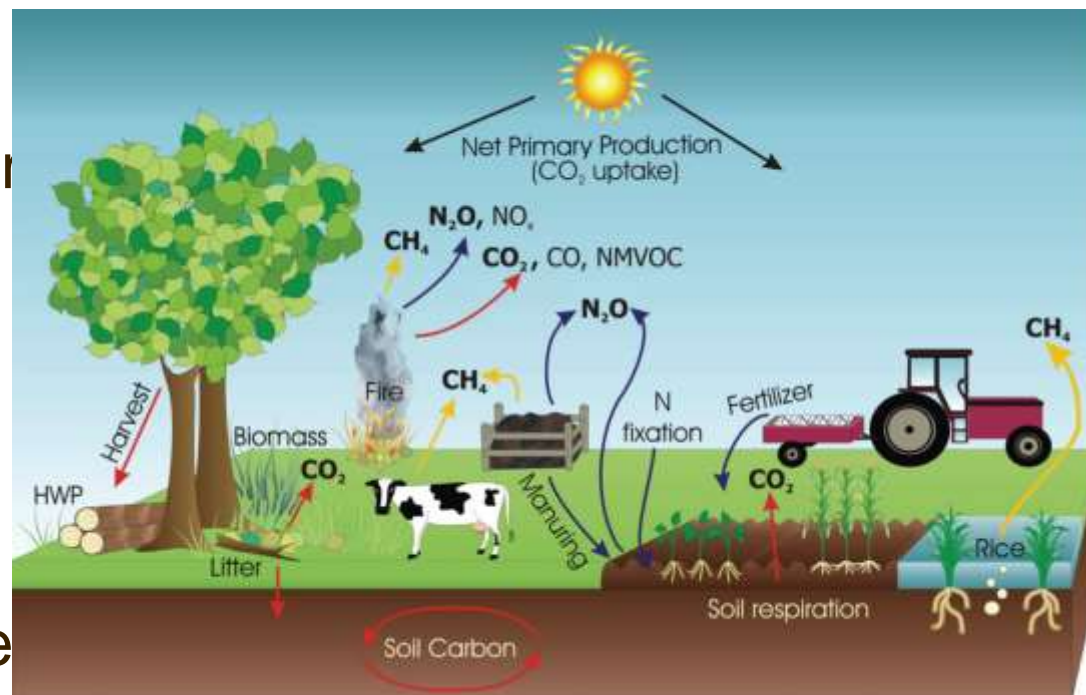
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- NAMAs: climate finance and planning instrument for national appropriate mitigation actions
- Can be integrated into national adaptation actions that have mitigation co-benefits
- Can support national or sectoral programmes, strategies or project-level action
- NAMAs and agriculture



IPCC, 2006

Development pathway of a NAMA



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NAMA development pathway

1. Analysis of framework conditions and policy gaps → Country sets overall policy goal:

National goal

2. National infrastructure is put in place: inventory, registry, approval and MRV procedures

Institutional & operational procedures

MRV system

3. Set of actions that reduce emissions below BAU and form part of NAMAs are identified

Mitigation activities

Agriculture

Livestock

G

4. A concrete project or a whole sector NAMA applies for national approval and finance

F

National public finance

Inter. Climate finance

Financing vehicle

Private climate finance

5. NAMA approved → MRV system validated → seeking finance

6. Project/NAMA financed and implemented

F

7. National NAMA registry

8. International NAMA registry

F

Key elements of a NAMA



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Technical dimensions

GHG inventory – assess GHG measurement options

Estimate abatement and/or mitigation potentials

Understand barriers to adoption

Identify policies and measures

Identify adaptation benefits

Analyze economic costs and benefits

Identify finance needs

Institutional dimensions

Sector institutions and procedures

MRV systems

Stakeholder involvement

Policy dimensions

Alignment with national development and climate change policies

Setting priorities and targets for the NAMAs

Assess supporting legal and policy framework

Financing mechanisms

Key elements of a NAMA



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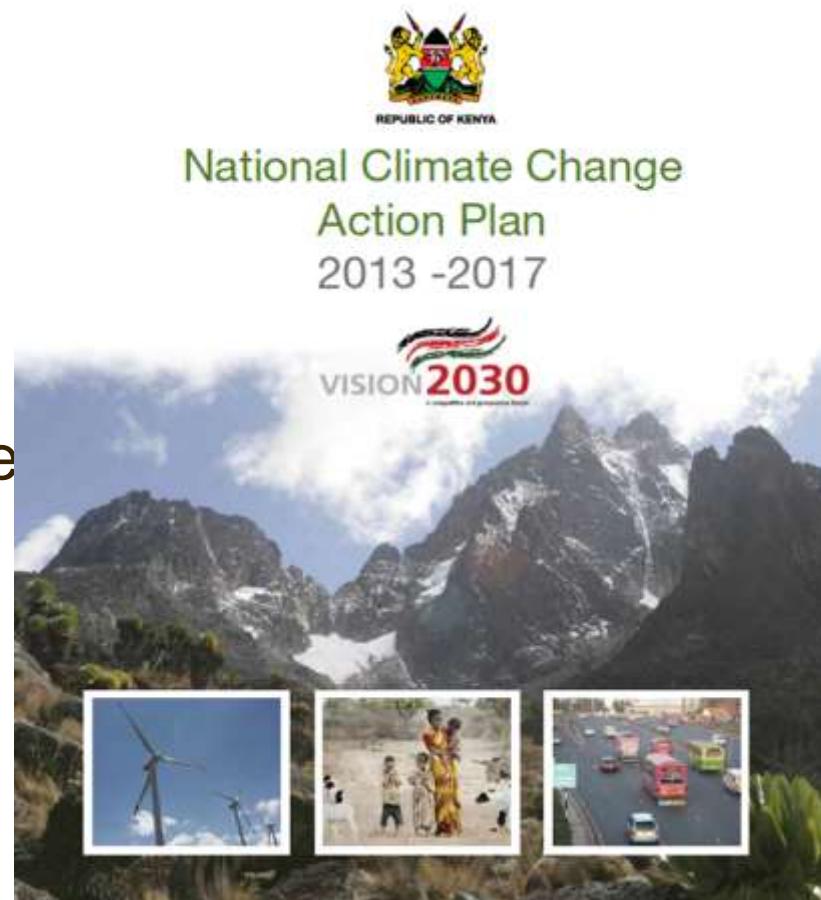
Assess supporting legal and policy framework

Financing mechanisms

NAMAs should support the achievement of national development objectives

Priority actions:

- Agroforestry
- Conservation tillage, limiting use of fires
- Adaptation
- Other climate change actions



Agricultural sector development strategy



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- Vision: *“a food-secure and prosperous nation”*
- Overall goal: to achieve an average growth rate of 7 per cent per year over the next 5 years
- Two thrusts:
 1. Increasing productivity, commercialization and competitiveness of agricultural commodities and enterprises
 2. Developing and managing the key factors of production
- Critical role of institutional reforms and improved coordination

Key elements of a NAMA



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Setting priorities and targets for the NAMAs

Assess supporting legal and policy framework

Financing mechanisms

Monitoring

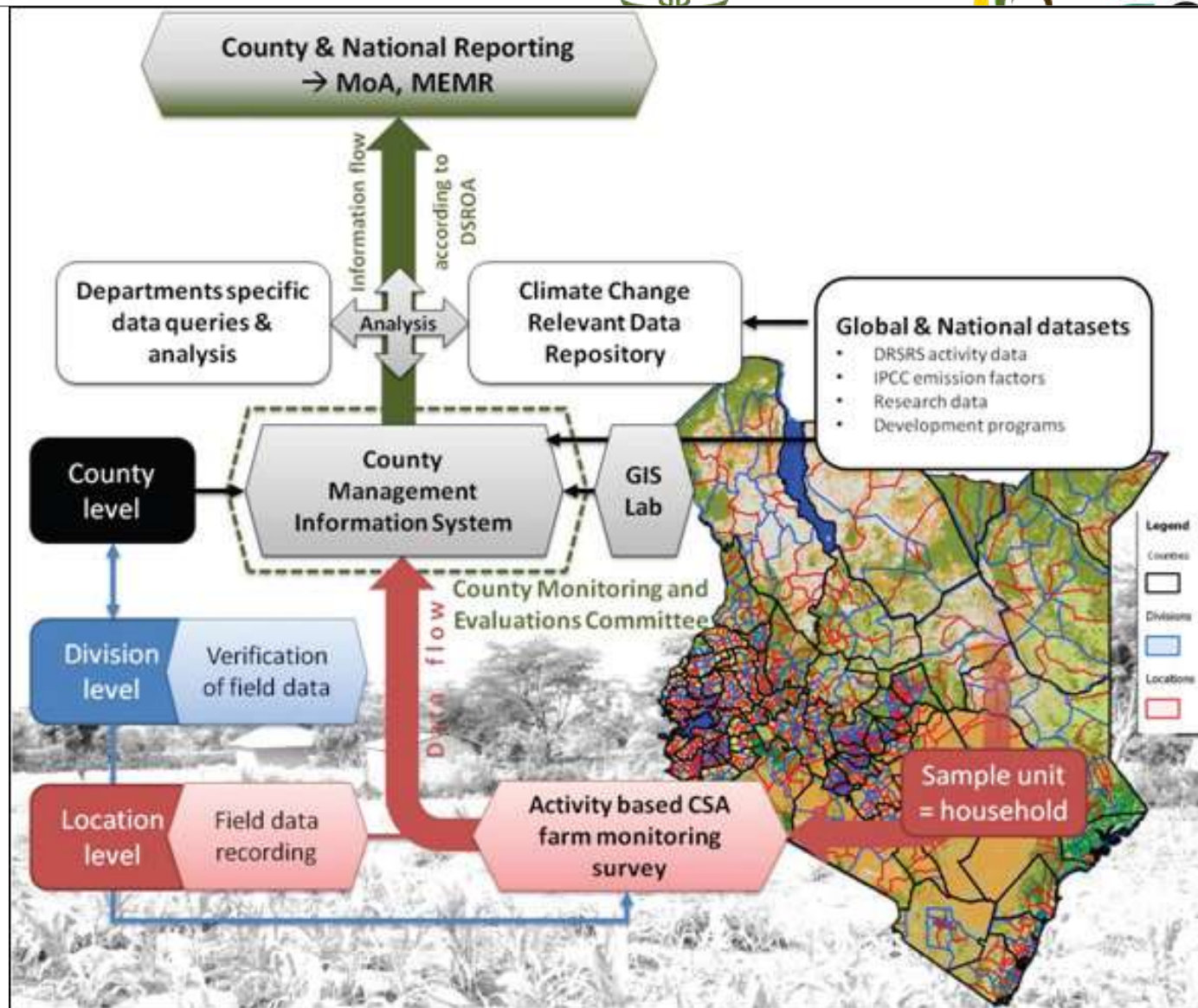


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CCU, 2013

Key elements of a NAMA



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Technical dimensions

GHG inventory – assess GHG measurement options

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Institutional dimensions

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MRV systems

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Financing mechanisms

Pathway to NAMA design and development



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- Pilot NAMA design in Kisumu and Kericho;
- Production systems: dairy livestock, poultry
- Other priorities: inputs (improved seeds, fertilizer), pests and disease management, extension
- Set up of institutional, MRV and investment framework

Questions:

- Initial response?
- What are important stakeholders to involve?

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