



Sustainable Agriculture and Climate Change

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GTZ perspective and research approaches in Africa

Conference:

Implications of climate change for sustainable agricultural
production systems,

Burkina Faso, 26-31 October 2008

Presentation by:

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Structure of presentation



- Sustainable agriculture and mitigation
- Sustainable agriculture and adaptation
- Synergies mitigation and adaptation
- GTZ projects
- Research Priority „Adaptation of African Agriculture to Climate Change“ (BMZ/GTZ funded)



Sustainable Agriculture and Mitigation



→ challenge: meet the growing demand for agricultural products with sustainable, emissions saving development paths.

- Agriculture contributes 13 % of greenhouse gas emissions to global warming (2000)
- Major emission sources: fertilizer application, livestock and manure management, rice cultivation and savannah burning
- High economic potential for mitigation: rice cultivation (CH₄) and soil carbon sequestration (CO₂)

Examples:

- Increase of soil C through no tillage agriculture or organic matter accumulation in soils
- Reduced/ no use of chemical pesticides and mineral fertilizers (esp. nitrogen based fertilizers)
- Agroforestry (C sink)



Sustainable Agriculture and Adaptation



→ challenge: 9 -21% reduction in agricultural productivity are expected to be caused by climate change

- Direct effects on agricultural systems: seasonal changes (rainfall, temperature, growing seasons)
- Likely consequence: depression in major crop yields, changes in suitable crop growing areas

Examples:

- change in tillage practice, adjusted livestock management and breeds, diversification of crops
- improved water management, storage and irrigation systems
- Supporting policies
- External assistance: provide information, trainings, develop institutional capacities and policies



Adaptation and Mitigation Synergies



- Mitigation and adaptation are not stand-alone activities but have to be integrated into development projects, plans, policies and strategies and should be developed together
- Many sustainable techniques will support/ contribute to both climate change adaptation and mitigation
 - Strategies to conserve soil and water resources also provide resilience to climatic threats

Examples:

- soil carbon storage, less mineral fertilizers, diversified systems, water management
- restoration of degraded soils, agroforestry will provide resilience to draughts



Tasks of Technical Cooperation

- Encloses climate change in all relevant planning processes and development initiatives (climate check)
- Gives advice in development of adaptation strategies
- Supports adaptation measures such as introduction/spread of drought resistant seeds, weather insurances
- Strengthen smallholder producers' capacity to benefit from carbon markets





GTZ division environment and climate change



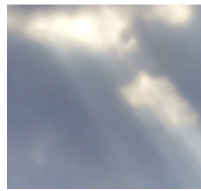
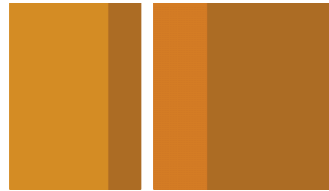
Climate Protection
Programme

Policy Advice



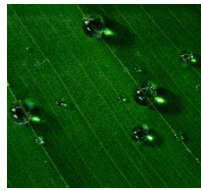
Climate Protection
Programme

Adaptation



Climate Protection
Programme

Mitigation



Climate Protection
Programme

Forest and Climate





Mitigation



- (Pilot-)projects, e.g. in the energy and transport sector
- Projects in the field of carbon markets (support of CDM and JI)
- Policy advice for partners (e.g. renewable energy law)
- Fora and Conferences (e.g. energy forum India)
- Sustainable forestry and nature reserves
- Pilotprojects in the field of Reduced Emissions from Deforestation and Degradation (REDD)



Adaptation



Climate Protection
Programme

Adaptation

- National adaptation strategies
- Risk analysis and adaptation of sector programmes
- Market instruments of risk management (e.g. weather insurance)
- Early warning systems on local scale
- Watershed management
- Adaptation for agricultural production
- Mainstreaming of adaptation (and mitigation) in technical cooperation



GTZ division agriculture, fisheries and food – projects



- **PPP** [Kenia, Tanzania, Peru, Nicaragua] adaptation to climate change in the coffee and tea sector (AdapCC)
- **PPP** [Kenia] development of a standard module for CO₂-sequestration in the coffee sector/ foster adaptive capacity of Kenian coffee farmers to climate change
- **PPP** [Peru] link of small forest enterprises to carbon markets
- **Pilot Project** [Latin America] Financial and technical linkage of small foresters to voluntary carbon markets

- **Scala** Tool for the assessment of sustainability, climate relevance and scaling-up potential of project approaches
- **BEAF** [Africa] Funding of agricultural research- adaptation of African agriculture to climate change



GTZ division agriculture, fisheries and food – examples



- Dominican Republic: Programme Management and Protection of Natural Resources in Watersheds
- Cameroon: Sustainable Management of natural resources in Cameroon (Forest Program)
- Madagascar: Conservation and sustainable use of natural resources (Erosion Control, Energy saving stoves, Forest Management)
- Mali: Support of the Environmental Policy in Mali (Convention on Desertification, Conservation of natural resources)
- Namibia: Water Resources Management Namibia
- Asia (Hindu Kush): Regional Forest Programme; Protection of Sustainable Policy initiatives in the Management of natural resources
- India: Adaptation to Climate Change in Rural Areas
- Vietnam: Capacity Building for Collaborative Management of Coastal Wetlands
- China: Sustainable Forest Management, Environmental Policy



GTZ / BMZ funded research approaches

“Adaptation of African Agriculture to Climate Change”

- 10 million € in total
- 3 years project duration (2008-2010)
- 9 projects:
 - 5 CGIAR-research institutes (CIP, ICRISAT, IFPRI, ILRI, IWMI)
 - 2 German universities: Hohenheim and Goettingen
 - 1 Leibniz center: ZALF

Aim

- Climate Change differs locally, precise understanding is essential to be able to adapt to Climate change appropriate.
- Enhance capacity of stakeholders to adapt to climate change:
Through a cooperation of research institutes with either farmer organizations / national agricultural research centers / non governmental organizations.





Modeling



- Leibniz-Centre for Agricultural Landscape Research (ZALF), Germany

Climate change impact assessment and adaptation options in vulnerable agro-landscapes in East Africa

- Partner institutions: World Agroforestry Centre (ICRAF), Kenya; Potsdam Institute for Climate Impact Research (PIK), Germany
- Country: Tanzania

- Department Crop Water Stress Management in the Tropics and Subtropics, University of Hohenheim

Developing rice and sorghum crop adaptation strategies for climate change in vulnerable environments in Africa - RISOCAS

- Partner institutions: Africa Rice Center (WARDA),
- Countries: Senegal, Mali und Madagascar



Modeling II



- Center for Tropical and Subtropical Agriculture and Forestry (CeTSAF), University of Göttingen, Germany

Adaptation of Landuse to Climate Change in Sub-Saharan Africa - ALUCCSSA

- Partner institutions: ICRAF and Centre for Interdisciplinary Research on Africa, Frankfurt a.M., Germany
- Countries: Burkina Faso and Ethiopia

Adaption of Livestock

- International Livestock Research Institute (ILRI)

Supporting the vulnerable: Increasing the adaptive capacity of agro-pastoralists to climatic change in West and Southern Africa using a transdisciplinary research approach

- Partner institutions: PIK and German Institute for Tropical and Subtropical Agriculture (DITSL), University of Kassel, Germany
- Countries: Mali and Mozambique



Water / Food Security



- International Water Management Institute (IWMI)
Re-thinking water storage for climate change adaptation for sub-Saharan Africa
 - Partner institutions: PIK and Center for Development Research (ZEF), University of Bonn, Germany
 - Countries: Ethiopia and Ghana

- International Food Policy Research Institute (IFPRI)
Strategies for Adapting to Climate Change in Rural Sub-Saharan Africa: Targeting the Most Vulnerable
 - Partner institutions: PIK and ZALF, Germany
 - Countries: Ethiopia, Uganda, Zambia



Adaption of Crops



- International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)

Community management of crop diversity to enhance resilience, yield stability and income generation in changing West African climates

- Partner institution: University of Hohenheim, Germany
- Countries: Niger, Mali and Ghana

- International Potato Center (CIP)

Participatory development and testing of strategies to reduce climate vulnerability of poor farm households in East Africa through innovations in potato and sweet potato technologies and enabling policies

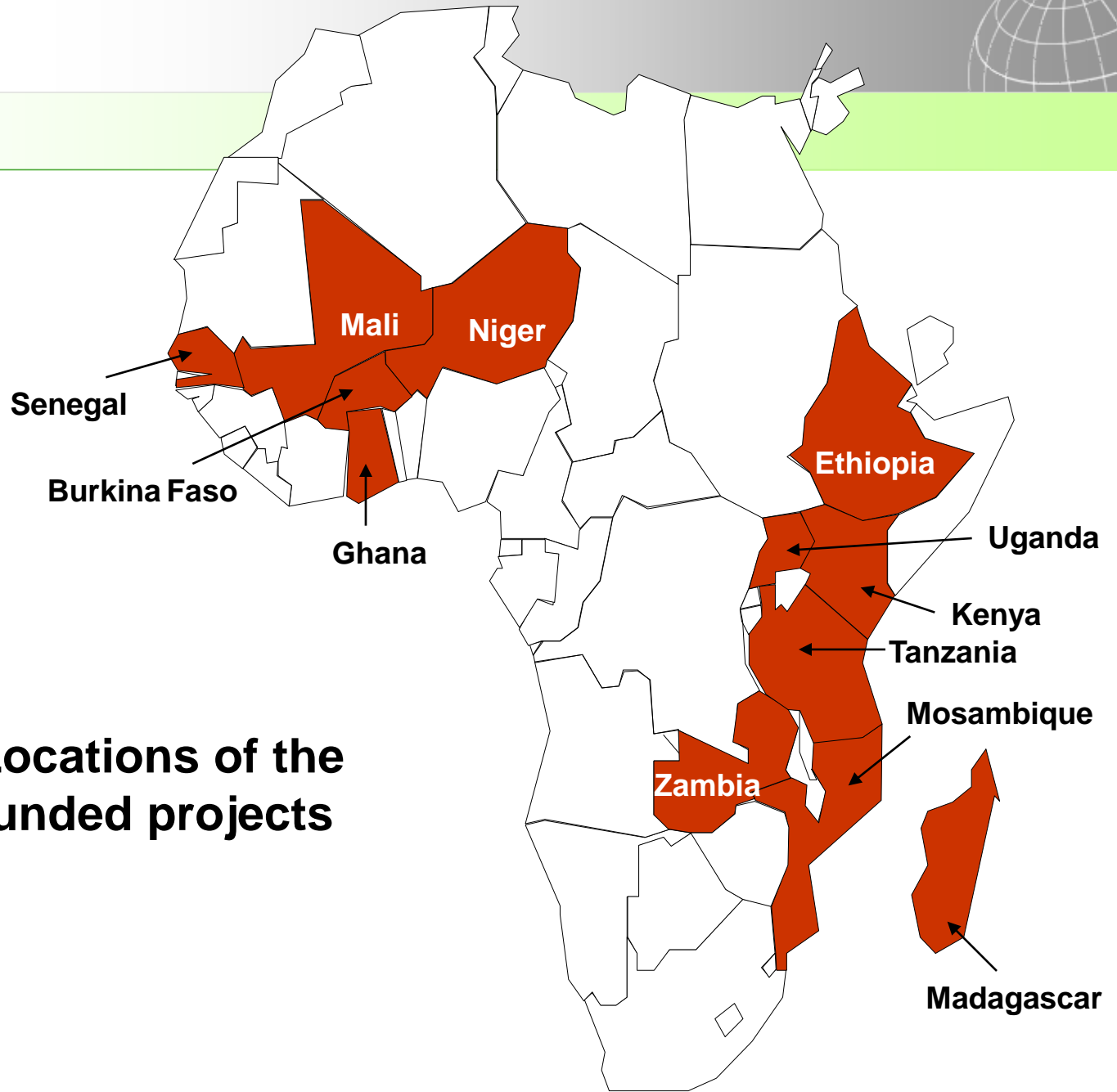
- Partner institution: Max Planck Institute for Meteorology, Hamburg, Germany
- Countries: Ethiopia, Kenya and Uganda



Role of biofuels in the climate change context



- Leibnitz Centre for Agricultural Landscape Research (ZALF)
Strategies to use biofuels value chain potential in Sub-Saharan Africa to respond to Global Change – Enhancing low productivity farming and linking to SMEs
 - Partner institutions: Institute for Environmental Economics and World trade (IUW), University of Hannover, Wuppertal Institute for Climate Environment and Energy (WI), ICRAF, IFPRI
 - Country: Tanzania



 **Locations of the funded projects**



Summary



- Portfolio of interdisciplinary and multi institutional research projects
- Aim: Interlink the projects
- Waiting for first results to inform political decision makers and a broader public about the first outcome
- Incorporate these projects scientifically into Challenge Program on Climate Change of the CGIAR
- Identify new research areas
- Further information available: www.gtz.de/agrarforschung



Thank you for your attention!

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commissioned by



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