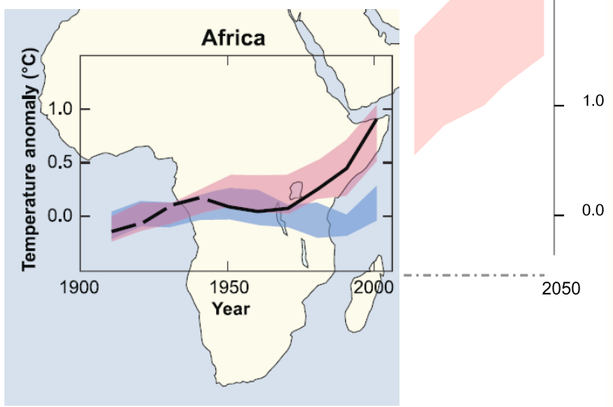
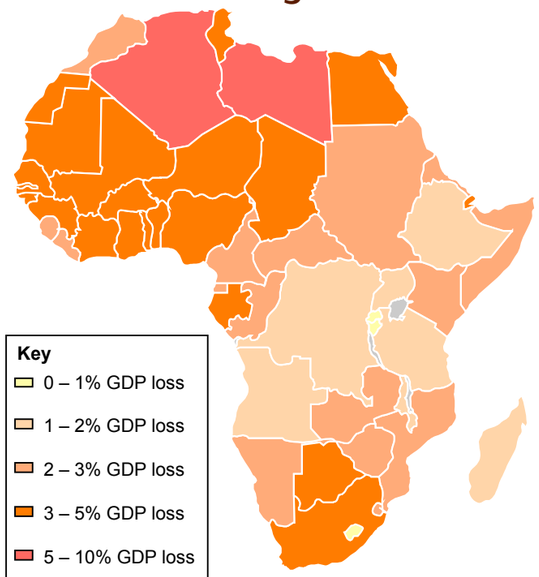
Africa is warming

The envelop of projected warming, up to 3 ℃ by 2050, is very serious for future impacts.



Annual impacts of climate change



2030

Africa is particularly at-risk, and the impacts of climate change are likely to be higher than in other world regions.

Climate change impacts across Africa from a global integrated assessment model (central values, including market and non-market sectors, aggregating positive and negative effects). Source: Fund model runs for the AdaptCost project.

ECONOMICS OF CLIMATE CHANGE IN RWANDA

Study team

The Stockholm Environment Institute (SEI Oxford Office) led the study. SEI is an independent, international research institute, engaged in environment and development issues at local, national, regional and global policy levels. The SEI has a reputation for rigorous and objective scientific analyses of complex environmental, developmental and social issues. The Oxford office leads development of the weADAPT.org platform, managed by the Global Climate Adaptation Partnership (www.ClimateAdaptation.cc).

This study was commissioned under DEW Point, the DFID Resource Centre for Environment, Water and Sanitation, led by Harewelle International Limited (Bruce Mead).

Project team for the Rwanda study:

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- SEI Nairobi: Basra Ali, Brian Harding, Adriaan Tas, Mark de Blois
- IGAD Climate Prediction and Applications Centre (ICPAC)
- Metroeconomica: Alistair Hunt, Tim Taylor
- London School of Hygiene and Tropical Medicine: Menno Bouma, Sari Kovats
- ILRI: Joseph Maitima, Simon Mugatha, Patrick Kariuki
- IIED: Muyeye Chambwera, Tom Birch
- Vi-LIFE Programme: Bo Lager, Jorge Suazo, Faustin Rwamuhizi, Ylva Nyberg
- CGISNUR: Jean Pierre Bizimana, Theodomir Mugiraneza, Robert Ford, with contributions from Jean Nduwamungu, Emmanuel Twarabamenye, Marie Christine D. Simbizi, Edward K. Mwesigye
- Rwanda NGOs Forum on Water, Sanitation and Environment (RWASEF): Frank Habineza and contributors

For further information

See the project web site: www.rwanda.cceconomics.org, or contact Tom Downing, Director of SEI in Oxford (tomdowning.sei@gmail.com) or Paul Watkiss, Project Director (paul_watkiss@btinternet.com). To follow up in Rwanda, contact Sion McGeever, DFID (S-McGeever@dfid.gov.uk).

Acknowledgements

The project has been funded by DFID, the UK Department for International Development. Additional resources on the economics of climate adaptation and low carbon growth in Africa were provided under the AdaptCost project from UNEP and the EC ClimateCost project.

We acknowledge the valuable contributions of many people and organisations. In particular, we would like to thank the national steering committee, led by Mr Prosper Musafiri, Director General of the Ministry of Finance and Economic Planning, and Dr Rose Mukankomeje, Director General of the Rwanda Environment Management Authority.

UKaid from the Department for International Development

"The environment is our life-blood…we should plan to be heard as a coherent, united voice at Copenhagen, thus demonstrating that Africans are equal partners with the rest of the world in working to protect our environment."

President Kagame
African Ministerial Conference on Financing for Development in Kigali, 21 May 2009

weADAPT.org…explore, learn, share

SEI STOCKHOLM ENVIRONMENT INSTITUTE

DEW Point DEVELOPMENT RESOURCE CENTRE ENVIRONMENT – WATER – SANITATION

Existing climate impacts already have significant economic costs in Rwanda

The current burden of climate-sensitive disease is high in Rwanda; malaria risk could increase 150% by 2050

37% of GDP is from agriculture: 1 million affected by 2005/6 drought; intense rainfall causes soil erosion

Economic costs of the 2007 flood were over $20 million in 2 regions; a 5-fold increase in costs might occur by 2030

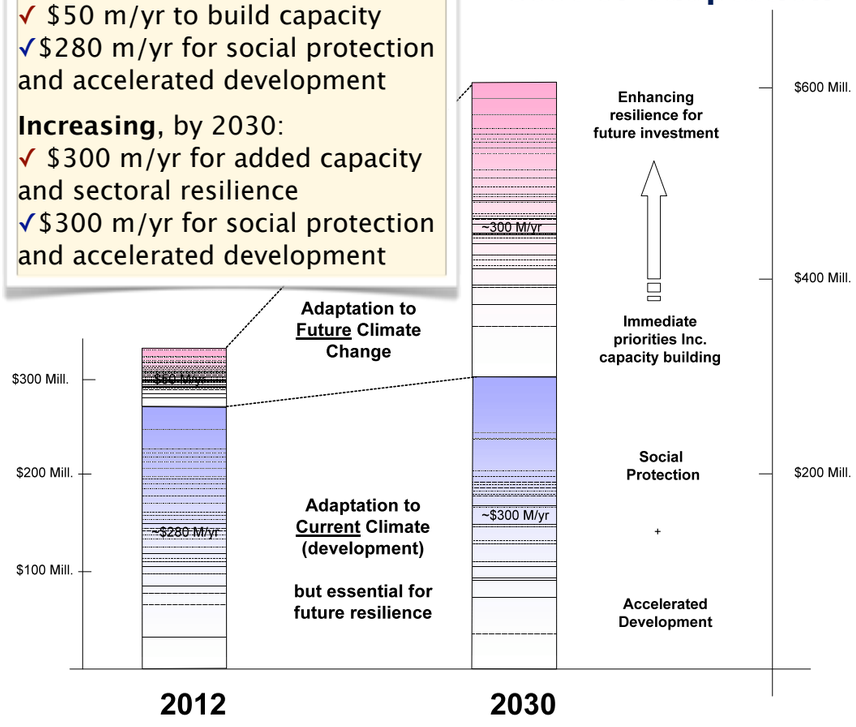
Water resources are under developed: demand is growing by 3% per year; drought and floods induce shortages

Ecosystem services underpin over 50% of GDP, climate change increases pressure on vulnerable systems

Urgent, by 2012:
✓ $50 m/yr to build capacity
✓$280 m/yr for social protection and accelerated development

Increasing, by 2030:
✓ $300 m/yr for added capacity and sectoral resilience
✓$300 m/yr for social protection and accelerated development

Cost of adaptation



Adaptation strategies

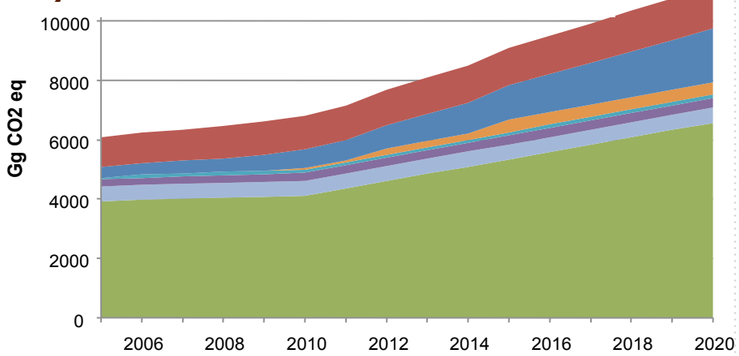
The foundation for adaptation is sound development to address current vulnerability:

- Accelerate 'no regrets' development: natural resource management (e.g., payment for ecological services), agricultural improvement, development infrastructure (e.g., health, water, markets, transport)
- Reduce poverty and protect vulnerable social groups to achieve sustainable development

To prepare for additional climate change:

- Build capacity with coordinated national policy and sectoral strategies and targets, information systems and knowledge management, mainstreamed climate risk screening, research and training; promote strategies and actions in East African region
- Plan sectoral resilience, scale up prototype actions, monitor targets and outcomes, invest in critical infrastructure for future adaptation options

Increasing emissions in Rwanda by 2020



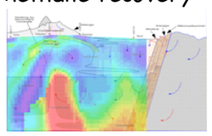
Current emissions are low but might double by 2020 with planned population and economic growth. Transport (dark blue) and agriculture (green) are dominant sources of future emissions.

Low carbon options

Biomass: efficient stoves

Micro-hydro potential

Methane recovery

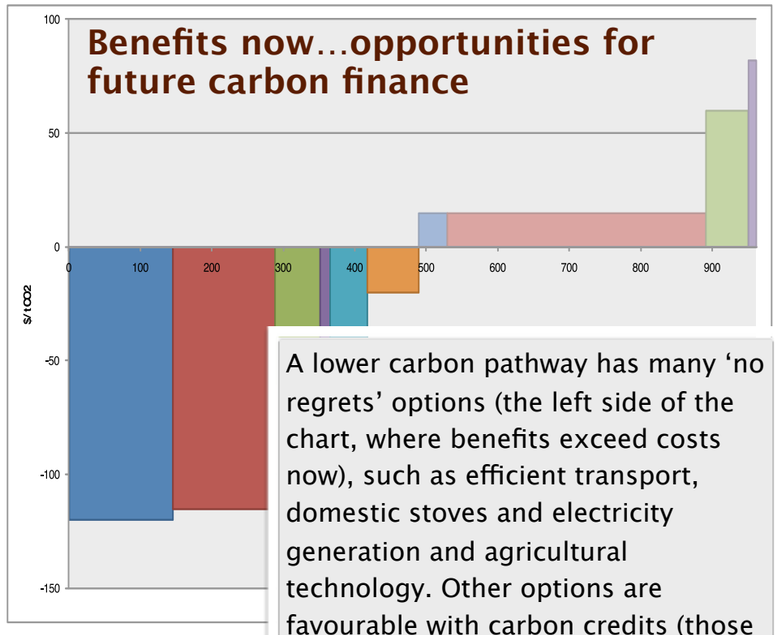


Solar power

Large-scale hydro

Rwanda is already implementing low carbon options, which have economic, environmental and social benefits.

Benefits now…opportunities for future carbon finance



A lower carbon pathway has many 'no regrets' options (the left side of the chart, where benefits exceed costs now), such as efficient transport, domestic stoves and electricity generation and agricultural technology. Other options are favourable with carbon credits (those on the right side of the chart).

CLIMATE POLICY — **SET STRATEGIC OBJECTIVES AND TARGETS** — **LEARN FROM PROTOTYPES** — **ACHIEVE ECONOMIC GROWTH WITH RESILIENCE**

ADAPT NOW: National planning * Information, innovation and knowledge management * Reduce poverty/protect the vulnerable * Sectoral targets and actions * Prioritize drought & flood responses * Anticipate residual impacts

LOW CARBON FUTURES: Institutional capacity for carbon finance * Appraisal of low carbon options * Mainstream options in sectoral planning * Prioritize agriculture, transport, electricity * Exploit land use and adaptation synergies