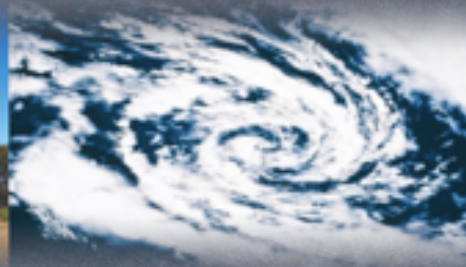
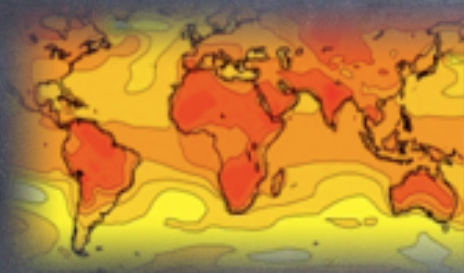


Economic Impacts of Climate Change in Burundi



Paul Watkiss, Jane Olwoch,
Tom Downing, Jillian Dyszynski

April 2009

DFID Department for
International
Development

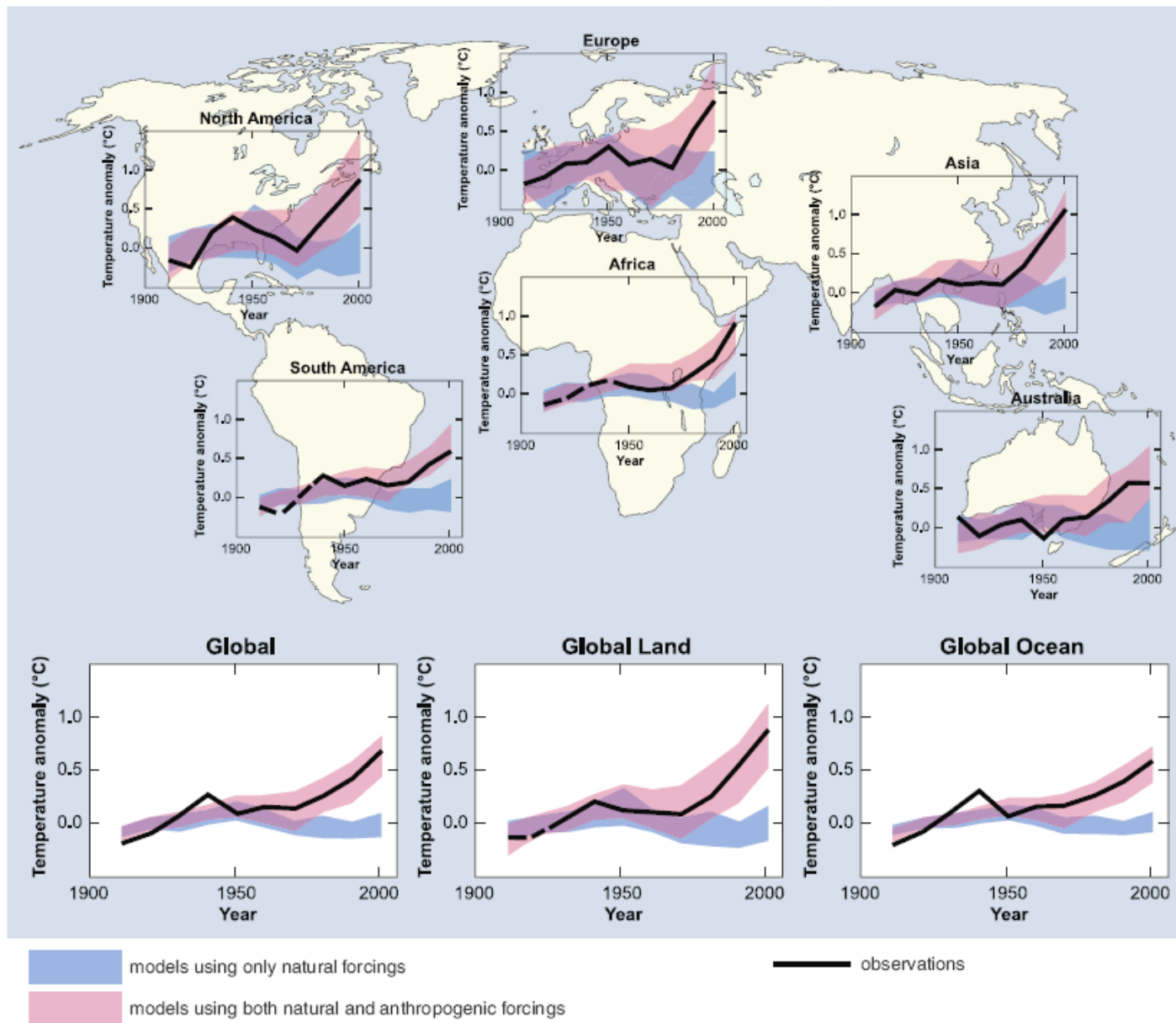
DEW Point
DEVELOPMENT RESOURCE CENTRE
ENVIRONMENT – WATER – SANITATION

SEI STOCKHOLM
ENVIRONMENT
INSTITUTE

Climate Change and Burundi

- Burundi is changing vulnerability is increasing
- The climate is changing ...observing higher temperatures and changes in frequency, intensity, persistence of extremes (floods)
- Reports of higher economic costs from these events...which likely to increase further with future climate change
- climate change is becoming an economic, finance and planning issue, rather than (just) an environmental issue
- Global climate policy is changing.....and opportunities are emerging.CDM and low carbon futures, avoided deforestation and land degradation (REDD), adaptation funds.

Global and continental temperature change



Already
temperature
observations of
a warmer
climate

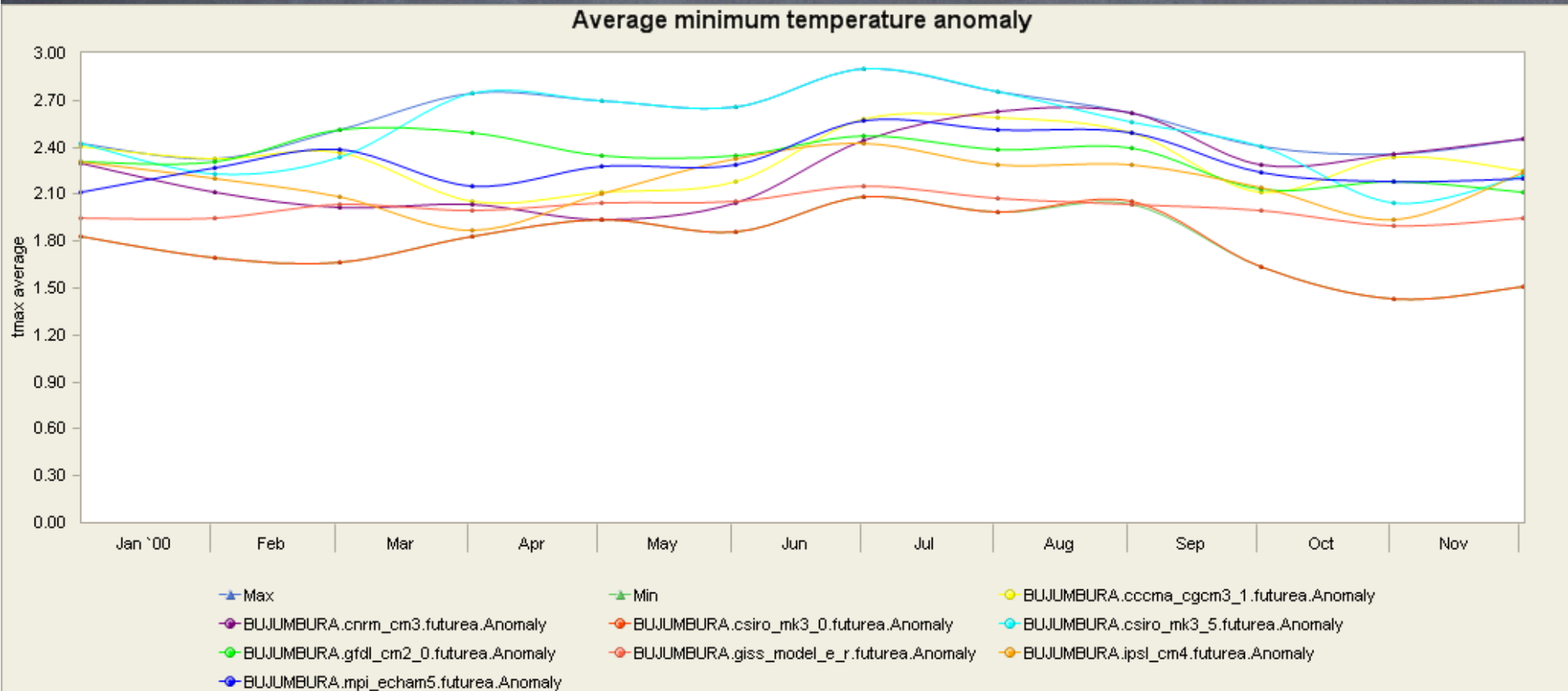
Historical
changes can
only be
explained by
including
additional
greenhouse gas
emissions

IPCC, SPM, 2007
www.ipcc.ch

Bujumbura – future temperature change

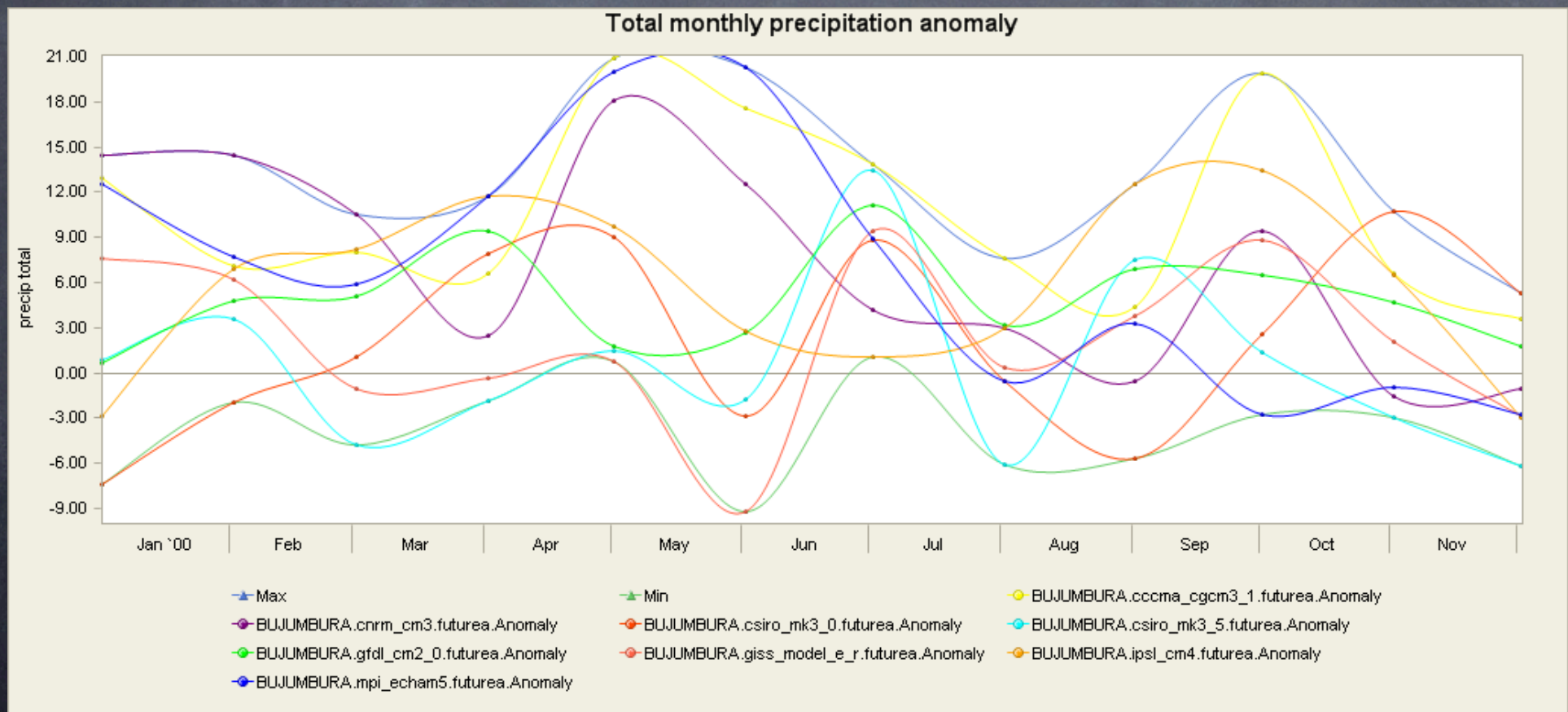
Change in temperature by 2045–2065 compared to current (1960–2000)

Bujumbura, Burundi. Average minimum temperature anomaly



Bujumbura – modelled rainfall

Future change 2045–2060





"I need to protect my business. How will I be affected by a changing climate? What are the risks? What are the opportunities?"



"The droughts are getting longer. Our community is suffering. How can we learn from other peoples' experience of how to cope?"



"The recent floods destroyed our crops. I see the climate is changing. How do I produce enough food for a growing family?"



"I need to coordinate adaptation planning within my department. How do we develop a policy framework and strategies to reduce vulnerability on the ground?"

The demand for information?

- ▶ Different users, different needs

Economics of impacts of climate change: Aims

- ✓ Assess the potential impacts and economic costs of climate change on key sectors: what is at-risk?
- ✓ Analyse cost and benefits of adapting to these effects over time
- ✓ Assess the opportunities – the potential for low carbon growth, including development benefits and finance options

Led by a national advisory committee, and working with local partners, to...

- ✓ Build national capacity
- ✓ Inform decision making in Burundi, and Africa for different end-users

Priorities for impacts & adaptation

- ✓ degradation and exhaustion of soils fuelled by demographic pressure on arable lands and natural resources;
- ✓ the degradation of forestry resources relating also to natural vegetation and artificial woodlots (which are the primary source of fuel);
- ✓ human environmental degradation relating to underdeveloped and fragile sanitation infrastructure and consequent degradation of sanitary conditions.
- ✓ Infrastructure, risks of floods in particular - current variability and also infrastructure associated with future development
- ✓ Energy, and land-use, and low carbon opportunities. Ancillary benefits

A high proportion of Burundi's population has high vulnerability because they depend on services that are directly provided by ecosystems (food and energy), and because such a high proportion of the population (and economy) depends on agricultural and livestock sectors (noting previous climate related food crises).

Source NAPA, National Communication, other

How important are these...

- East Africa studies indicate current periodic droughts and floods have significant economic losses – long-term fiscal liability of ~ 1-3% of GDP / year
- Studies indicate African economies could face additional losses from climate change of at least 1-2% of GDP and probably 5-10% or more
- Potential to threaten Vision objectives and MDG, plus potentially reverse development gains and growth
- Larger impacts in Africa / Burundi
 - economies rely more on climate-sensitive activities;
 - existing vulnerability, and adaptive capacity reduced by technical, economic and institutional limitations
- Estimate headline economic costs for Burundi?
- Estimates cost by sector, including market and non-market sectors

Costing Adaptation Action...

- Studies of the cost of adaptation to climate change
- UNFCCC estimates - \$28 - 67 Billion / year by 2030 in developing countries
- African Development Bank - \$2 to 7 billion / year short-term in Africa
- Emerging evidence.....Few validated studies...
- But potentially large finance flows through Adaptation Fund
 - Estimate costs of adaptation for Burundi? Information for negotiations

Outline of the study

- ✓ Assess the aggregate economic costs of climate change, and costs of adaptation (top down) in Burundi
- ✓ Assess the potential impacts and economic costs at a national level for Burundi, by sector (bottom-up), and adaptation options (costs and benefits), and low carbon growth finance opportunities
- ✓ Assess key vulnerabilities and hot-spots with local case studies – linking to economics – but considering non-formal economy and adaptation.

And to use this to provide

- ✓ Lines of evidence
 - ✓ input to international negotiations
 - ✓ information for national priority setting
 - ✓ local narratives and storylines to highlight real issues

Community

Sectoral studies down

Aggregate-top

Synthesis of existing local case study work

Local adaptation signatures to inform local adaptation and capture vulnerability

Extension of existing case studies to consider the economic impacts and economics of adaptation

Examples likely to include case studies in areas of:

- Health.
- Agriculture.
- Water.
- Forests.
- Infrastructure
- Energy (hydro/bio)
- Low carbon growth

These local stories ground-truth the more aggregated sector analysis

Health

Agriculture

Water resources

Infrastructure

Biodiversity &
ecosystem services
inc forests

Low carbon growth/
Energy

Integrated Assessment
Modelling (IAM)

- Aggregate economic costs of climate change
- Aggregate costs and benefits of adaptation

Potential for major and
socially contingent effects

- Conflict and migration
- sub-national collapse

case studies

national

economy-wide

The combined evidence across the framework provides the economic costs of climate change and the costs and benefits of adaptation, to provide information for national priority setting and as input to international negotiations

Adaptation signatures

Costs



Timeline

- April 2009 – national advisory committee meeting and study launch
- May –local partners, data collection
- April – integrated assessment and costs of adaptation analysis (top-down) – results ready for African ministerial meeting in May
- May 2009 – AMCEN
- July–September 2009 – bottom-up results, re-iteration (aggregate)
- December 2009 – COP 15

Questions

- Comments on methodology
- Local partners
- Existing studies
- Potential local case studies

Thank you

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Climate change explorer with all data can be downloaded from weadapt
www.weadapt.org

