CLIMATE RISK INFORMATION FOR CLIMATE-RESILIENT ACTION: KEY PRODUCTS AND TOOLS
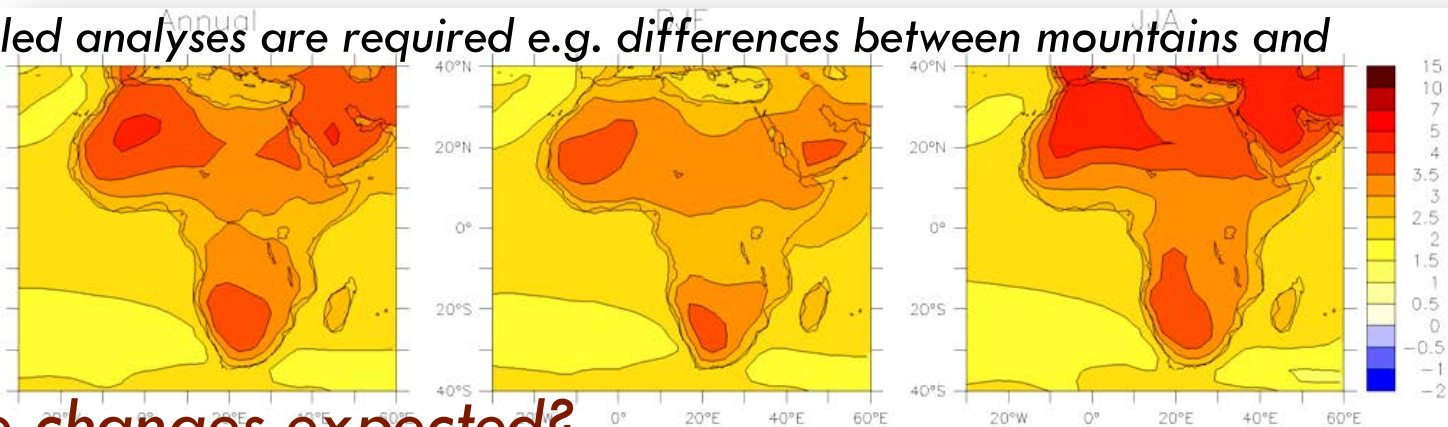
THE WORLD BANK

Ana E. Bucher

Climate Change Team -Environment Department

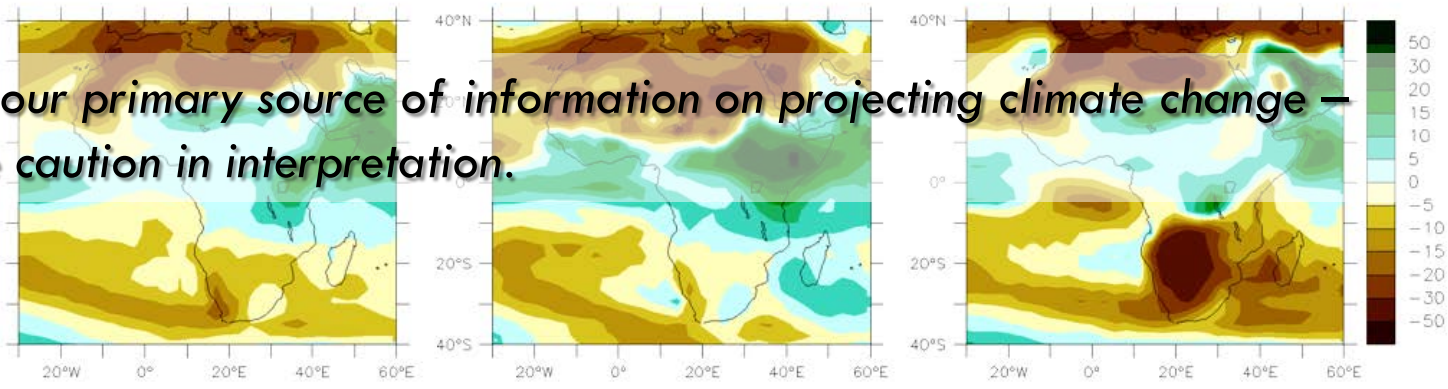# Climate Information for Decision Making

-*What is expected to Change?*

☐ *Historical change needs to be quantified as context for future change.*

☐ *Changes in climate and their associated impacts will be location specific and spatially detailed analyses are required e.g. differences between mountains and valleys*
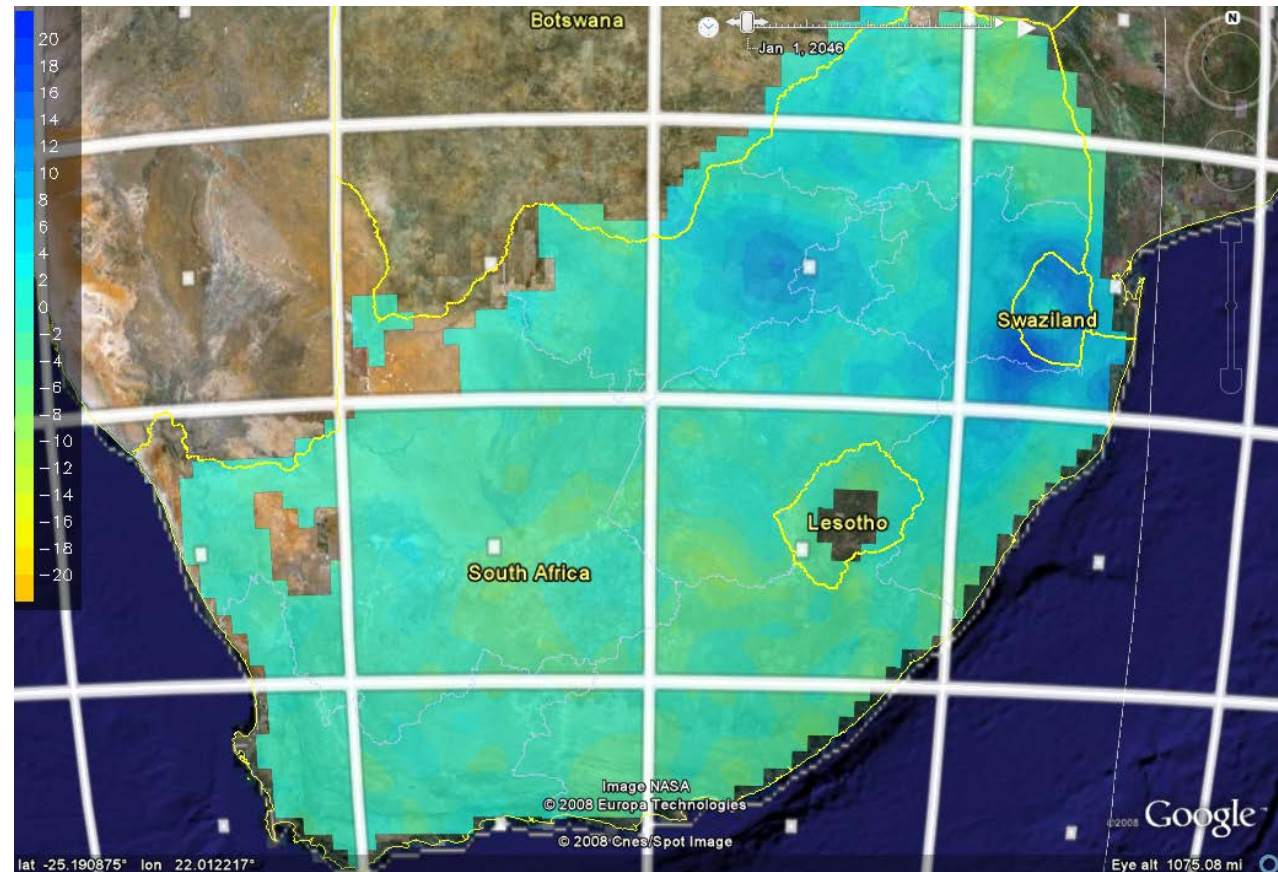
-*Where are the changes expected?*

☐*GCMs are our primary source of information on projecting climate change – but require caution in interpretation.*

-*Where are the changes expected (cont.)?*

Point location variation is not represented by GCM grid cell data

- *When are the changes likely to take place?*

What are the timescales of vulnerability and what climate data can be used to relate to them ?

➢**What: Information tool**

Collaborative on-line knowledge portal with a suit of climate and climate-related data and tools to support climate resilience measures at different levels and for specific user context and needs

➢**Why**

to facilitate access of consistent and easily accessible datasets and resources across the WB and external sources

http//climateknowledgeportal.worldbank.org

Climate Change Knowledge Portal

For Development Practitioners and Policy Makers

Search   GO ▶

The Climate Change Knowledge Portal (CCKP) Beta is a central hub of information, data and reports about climate change around the world. Here you can query, map, compare, chart and summarize key climate and climate-related information. Read More

Click on an area of the map to get started >

Disclaimer

AFRICA

OPEN DATA INITIATIVE
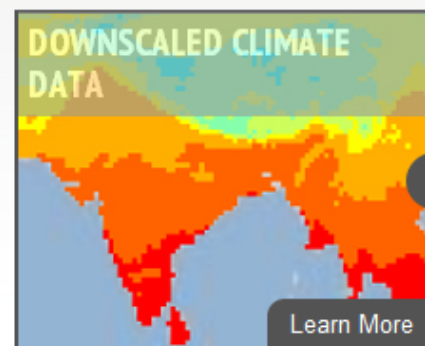
OPEN DATA

A world of data at your fingertips

Get Data

Use your creativity to integrate, visualize and synthesize climate and development data through the application of Information Technology.

CLIMATE INFORMATION MICROSITES

View Apps

Tour the portal highlights in these development and climate change storylines. And take them with you!

GLOBAL CLIMATE DATA

Learn More

Explore and use our vast library of climate information. Chart, Map, Use historical, variability, and future projections.

DOWNSCALED CLIMATE DATA

Learn More

Preview the forthcoming downscaled data! These data will enhance our information base for assessing and modeling changes in water availability, flood and drought stress and associated changes in agricultural productivity, etc.

Climate Change Knowledge Portal
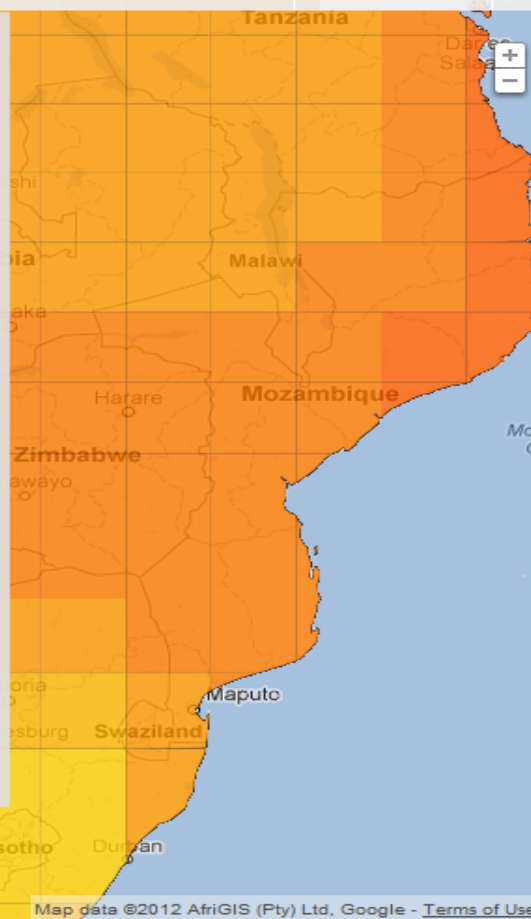
For Development Practitioners and Policy Makers

Search   GO ▶

| CLIMATE | IMPACTS | VULNERABILITIES | COUNTRY ADAPTATION PROFILE |

HISTORICAL   FUTURE GCM   DOWNSCALED   COMPARISONS   HISTORICAL VARIABILITY TOOL

Variable: Temperature   **Time Period:** 2080 to 2099   **Statistic:** Mean   **Scenario:** A2   **Model:** CGCM3.1(T47)
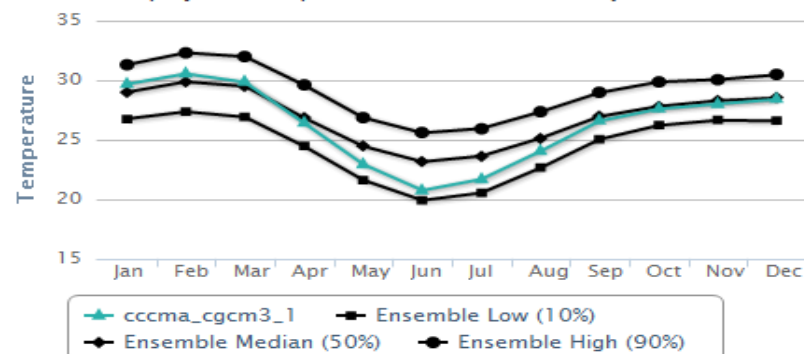
- ○ Rainfall
- ◉ Temperature
- ○ Days with rain
- ○ Days with moderate rain
- ○ Days with heavy rain
- ○ Days with extreme rain
- ○ Days without rain
- ○ Daily rain
- ○ Month rain
- ○ Cool Days
- ○ Hot Days
- ○ Maximum Temperature
- ○ Cold Nights
- ○ Warm Nights
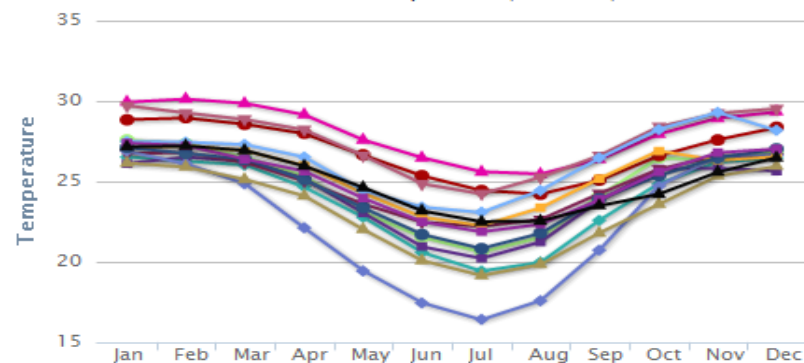- ○ Minimum temperature
- ○ Days below freezing

Mean projected Temperature for the 2080 to 2099 by model.

Legend:
- cccma_cgcm3_1
- Ensemble Low (10%)
- Ensemble Median (50%)
- Ensemble High (90%)

Historical modeled Temperature (1980-1999)

Show Source   Show Legend

Show Legend   Show Source

Map data ©2012 AfriGIS (Pty) Ltd, Google - Terms of Use

Google

ABOUT THIS SITE
- ▸ Why a Climate Change Knowledge Portal
- ▸ User's Guide
- ▸ Contact

OTHER CLIMATE DATA SOURCES
- ▸ IPCC Data Distribution Center
- ▸ SERVIR
- ▸ NOAA climate services
- ▸ CIAT climate models

ADAPTATION TOOLS
Knowledge Sharing and Reference
- ▸ Adaptation Learning Mechanism
- ▸ Climate Adaptation Knowledge Exchange

MITIGATION RESOURCES
Mitigation Data Sources
- ▸ WRI- CAIT
- ▸ IEA Policies and Measures Databases
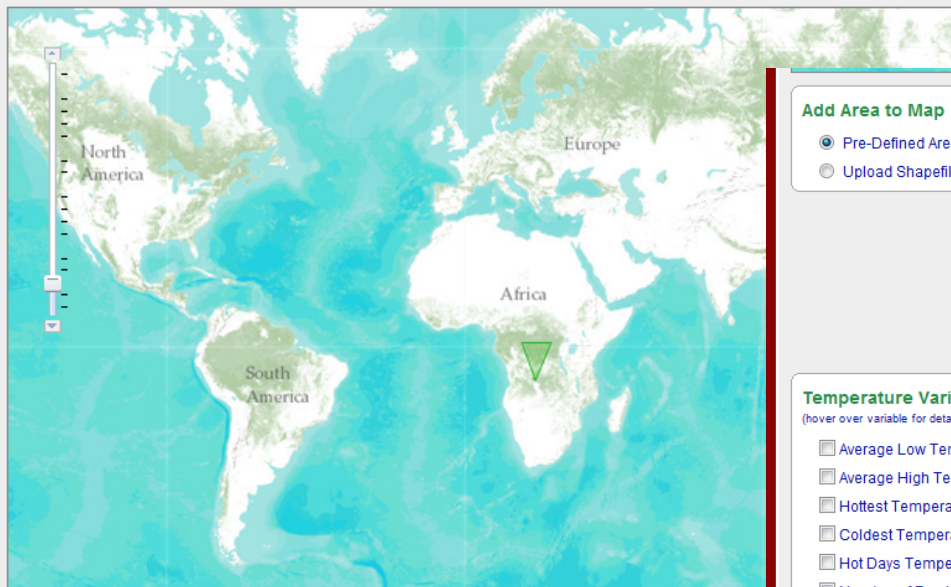
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Climate Change Knowledge Portal
Climate Analysis Tool - Powered by Climate Wizard

To use this tool, draw polygons on the map below, or select a pre-defined area from the drop down boxes. Then select the input parameters you wish to use. When you submit this form, processing will take place on the server. You will receive an email with a link to the results.

Toggle Map ⬆   Help & FAQs

Add Area to Map
- ◉ Pre-Defined Area
- ○ Upload Shapefile

Add Pre-Defined Areas
Select one or more region from any of the region types below and click "add regions". Your choices will then be added to the map display.

Region Types (Select One)	Africa Basins - Major
BASWN	Congo
CKP Regions	Niger
Countries	Nile
Africa Basins - Major	Zambezi

add selected regions

Temperature Variables
(hover over variable for detail)
- ☐ Average Low Temperature
- ☐ Average High Temperature
- ☐ Hottest Temperature
- ☐ Coldest Temperature
- ☐ Hot Days Temperature (Annual Only)
- ☐ Number of Frost Days
- ☐ Number of Warm Days
- ☐ Number of Cold Days
- ☐ Number of Warm Nights
- ☐ Number of Cold Nights
- ☐ Heat Wave Duration (Annual Only)
- ☐ Growing Degree Days
- ☐ Heating Degree Days
- ☐ Cooling Degree Days

Precipitation Variables
(hover over variable for detail)
- ☐ Total Rainfall
- ☐ Consecutive Dry Days (Annual Only)
- ☐ Number of Dry Periods (Annual Only)
- ☐ Number of Wet Days
- ☐ Wet Days
- ☐ Wet Day Rainfall
- ☐ 5 Day Rainfall (Annual Only)
- ☐ Daily Rainfall

Time Options
Time Period: Mid century (2046-2065) ▾
- ☑ Annual ☐ Monthly

Climate Model Options
(To download model documentation, click the model labels)
General Circulation Model:
©IPCC 2007: WG1-AR4
(Choose one or more)

| ECHAM5/ MPI-OM Run 1 |
| MRI-CGCM2.3.2 Run 1 |
| MRI-CGCM2.3.2 Run 2 |
| MRI-CGCM2.3.2 Run 3 |
| MRI-CGCM2.3.2 Run 4 |
| MRI-CGCM2.3.2 Run 5 |

Greenhouse Gas Concentration (CO_2)
©IPCC 2007: WG1-AR4
(Choose one or more)

☐ A2 (High) ☐ A1B (Med) ☐ B1 (Low)

Results:

Analysis Output Name:
identical names will be overwritte
no special characters such as # ? $ etc.

Email Address:
(Your results will be emailed to you)

Submit

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Santa Clara University
CLIMATE CENTRAL

Climate Change Knowledge Portal
For Development Practitioners and Policy Makers

| ⌂ | CLIMATE | IMPACTS | VULNERABILITIES | COUNTRY ADAPTATION PROFILE |

AGRICULTURE   NATURAL HAZARDS   WATER

Water

Flood indicator for 2030 (bccr_bcm2_0)

Drought indicator for 2050 (cccma_cgcm3_1)

Mean annual runoff for 2030 (csiro_mk3_5)

Annual base flow for 2050 (giss)

Storage in 2030 (ncar_pcm1)

Mean Annual Irrigation Deficit for 2030 (ukmo_hadcm3)

Water and Climate Change: Understanding the Risks

The data presented here was developed by the World Bank Water Anchor with the aim to gain insights into climate change impacts on potential future hydrology and to establish a common platform of information on the behavior of key hydrologic drivers across World Bank regions at a scale appropriate for policy and investment decisions.

Here you can explore basin and country level hydrological statistics for 3 emissions scenarios, 23 Global Circulation models and two future time periods (2030-2039 and 2050-2059).

Please be warned that this data is not intended for use in any design study.

Click here to get access to data and indicators

Google   Map data ©2012 Basarsoft, Google, ORION-ME, Tele Atlas - Terms of Use

Hide Legend   Show Source

Show Full Disclaimer

| | Low (% change < 5%) | | Medium (% change between 5% and 15%) | | High (% change >15%) |

CLIMATE DATA SOURCES   ADAPTATION TOOLS   MITIGATION RESOURCES

Climate Change Knowledge Portal
For Development Practitioners and Policy Makers

Q Search   GO ▶

CLIMATE   IMPACTS   VULNERABILITIES   COUNTRY ADAPTATION PROFILE

Population
Population density 2000
Projected population density 2015

Cuamba
Curue
Nat...
Mo...
Tete
Angoche
Mozambique
Qcelimane
Harare
Mutare
Chimoio
...ve
...svingo
Dondo
...avane
Beira

Google   Map data ©2012 AfriGIS (Pty) Ltd, Google - Terms of Use
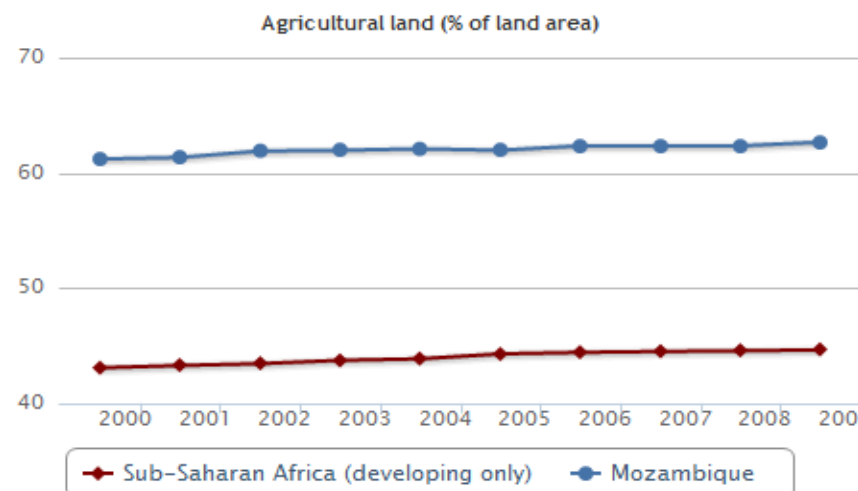
Hide Legend   Show Source

Number of Children
estimated to be under 5 years old per 1000
persons in 2000

0   1,603

Vulnerability Indicator: Agricultural land (% of land area) ▼

Agricultural land (% of land area)

— Sub–Saharan Africa (developing only)   — Mozambique

The differential impacts and opportunities brought about by climate change relies on a variety of interconnected factors including socio-economic conditions, advances in relevant technology (e.g. agriculture), and the natural resource base. The variables presented here provide a quantitative foundation for understanding these impacts.

Learn more about these variables

CLIMATE DATA SOURCES   ADAPTATION TOOLS   MITIGATION RESOURCES
IPCC Data Distribution Center   Knowledge Sharing and Reference   Mitigation Data Sources
Why a Climate Change

Country Risk and Adaptation Profiles

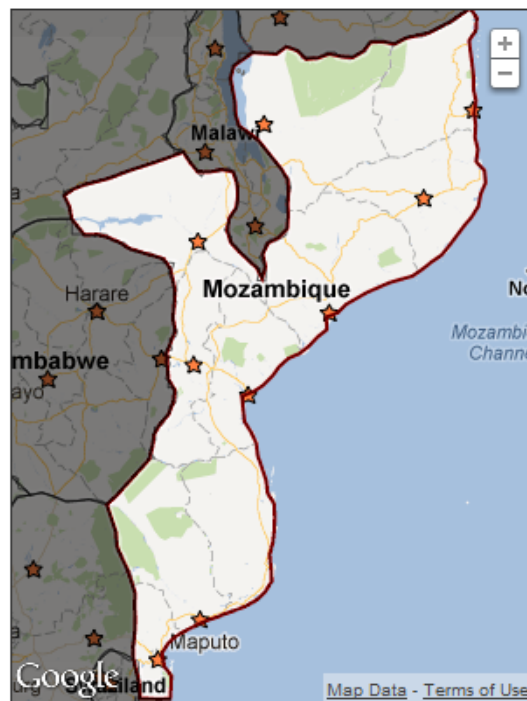➢ Demand for more detailed climate and disaster risk data/information at national and sub-national level and at different tiers of specification

➢ First of a kind synthesis of climate adaptation profiles for most than 50 pilot countries based on best available climate and climate related data

o intended for fast and easy operational reference to better integrate climate resilience in development planning and operations

Mozambique Dashboard
Overview

Recent Trends

Mean rainfall	2.5 mm/mo	▼
Mean temperature	0.6 C	▲
'hot' days per year	25	▲
'cold' days per year	Explore Further	

Key Sectors

Agriculture/Food Security
Coastal Zones/Marine Ecosystems
Water Resources
Natural Hazards
Biodiversity

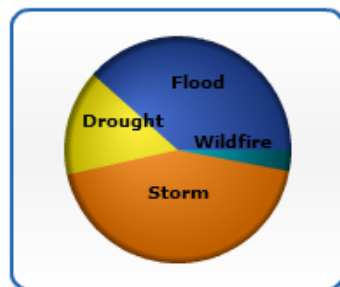Explore Further

Select a layer to visualize it on the map.

Legend
★ Major Cities

Layers
Major Cities
Major Rivers
Water Bodies
Dams
Roads
Wetlands
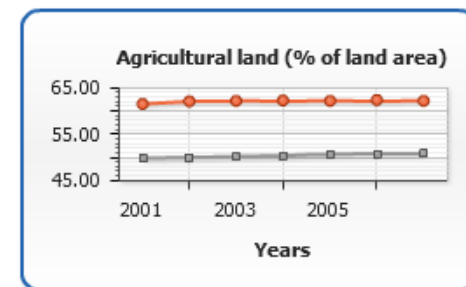Elevation

Natural Hazards

Flood, Drought, Wildfire, Storm

Explore Further

Overview

Mozambique is one of the poorest countries in the world. It faces many development challenges, including pronounced and widespread income poverty, low life expectancy, and wide gaps in educational achievement. Moreover, the country experiences high levels of climate variability and extreme weather events (i.e., droughts, floods and tropical cyclones). Droughts are the most frequent disaster, occurring every three to four years, and are a major constraint to development, since most of the country's population, especially the poor, reside in rural areas and rely on rainfed agriculture. Mozambique also lies at the end of numerous transnational river basins, and so flooding in its deltas is a perennial threat to both farmers and infrastructure, especially when coupled with cyclonic storm surges.

Mozambique is already placing special emphasis on the prevention of natural hazards and improving early warning systems. Adaptation measures are being implemented in the agriculture, fisheries, energy, environmental and water sectors, with particular attention being paid to the coastal zones and erosion control.

Selected Indicators for Impacts and Vulnerabilities

Agricultural land (% of land area)

Years: 2001, 2003, 2005

Explore Further

GFDRR — Global Facility for Disaster Reduction and Recovery | Climate Investment Funds | Climate Change Team ENV | SDNIS

Mozambique Dashboard
Impacts & Vulnerabilities

Mozambique ▾
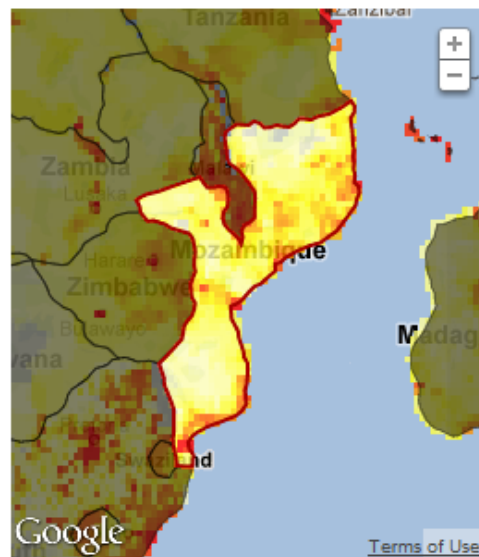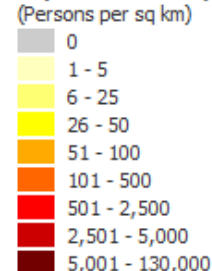
Implications for Disaster Risk Management

➡ Cyclones are likely to become less frequent but their intensity and associated precipitation is likely to increase.

➡ There is a high risk of increased intensity storm surges along soft coastlines, which are already vulnerable to coastal erosion, especially when extreme sea level events such as tropical cyclones prevail.

➡ The rainy season is expected to start earlier over most of the country, though it is also expected to end earlier in the south and later in the far north, leading to longer rainy seasons in the north and southern regions towards the coast, but decreases in seasonal duration over the central regions and Zambezi valley. This could have significant implications for agriculture.

➡ Hydrological modeling indicates that some areas in the north will experience floods more frequently.

➡ The Centre region requires greater monitoring for all type of natural Natural Hazards and weather related parameters in this region needs to be extended and improved as matter of urgency as climate change is happening.

Legend
Population Density
(Persons per sq km)

▫	0
▫	1 - 5
▫	6 - 25
▫	26 - 50
▫	51 - 100
▫	101 - 500
▫	501 - 2,500
▫	2,501 - 5,000
▫	5,001 - 130,000

Layers

- ⦿ Population 2000
- ○ Population 2015
- ○ Number of children under the age of 5
- ○ Prevalence of Child Malnutrition
- ○ Irrigated Cultivated Land Year 2000
- ○ Rainfed, Cultivated Land, Year 2000
- ○ Crop Land

Data description: Gridded Population of the World, Version 3 (GPWv3) estimates population for the year 2000 (in 2.5 minute grid cells) by using raw count and population density datasets.
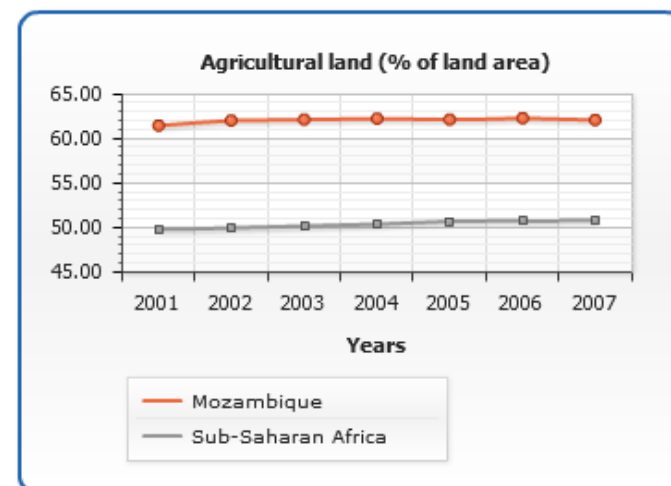
Source link: Columbia University's CIESIN

Further reading: GFDRR Country Disaster Risk Management Programs

Vulnerability Indicators

Agricultural land (% of land area) ▾

Agricultural land (% of land area)

Years

— Mozambique
— Sub-Saharan Africa

GFDRR Global Facility for Disaster Reduction and Recovery CLIMATE INVESTMENT FUNDS Climate Change Team ENV SDNIS

Mozambique Dashboard
Adaptation

| Overview | Climate Baseline | Natural Hazards | Climate Future | Impacts & Vulnerabilities | Adaptation | Print | References |

Adaptation Options by Key Sectors

| Agriculture/Food Security | Coastal Zones and Marine Ecosystems | Energy | Infrastructure | Urban Areas | Water Resources |

- Switch to different cultivars (drought tolerant/shorter cycle)
- Improve and conserve soils
- Agricultural research and transfer of technology
- Establish seed banks
- Target degraded areas for new cultivars, including crorps with shorter growing cycles
- Improved and expanded irrigation systems, monitoring and control of pests and diseases, improving grazing practices to conserve soil fertility and promoting hay feeding
- Encourage community reforestation using native species
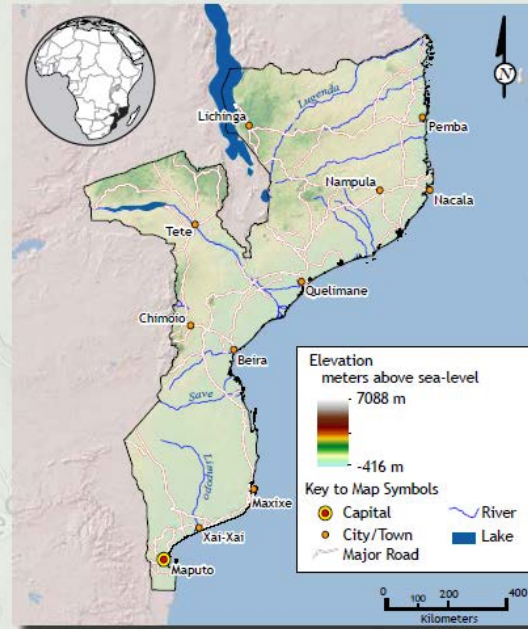
Priority Adaptation Projects

| Improving early warning systems |
| Strengthening farmer coping capacities |
| Improving the knowledge and management of rivers |
| Limiting erosion |
| Develop sustainable fishing |
| Promote Public Awareness of Climate Change |
| Improving agency coordination |
| Integrating climate change into decentralized district planning |

Gaps and Needs

| Research Gaps | Institutions and Response | Data and Information Gaps |

- Modeling of extreme events under a changing climate, including localized definitions of critical climate thresholds that may exacerbate Natural Hazards in the future is required in order to better inform disaster management response.
- A coastal zone mapping and vulnerability baseline are required in order to support future environmental impact assessments and guide new developments. A plan has been in place in the Ministry of Environment to conduct this study for several years.
- Risk assessments considering the cumulative effects of multiple hazards and related vulnerability, particularly in the Limpopo basin, are needed.
- Limited attention has been paid to urban areas and future climate change, the potential risks and responses to cities needs to be understood.

GFDRR — Global Facility for Disaster Reduction and Recovery

CLIMATE INVESTMENT FUNDS

Climate Change Team ENV

SDNIS

http://countryadaptationprofiles.gfdrr.org

OPENCLIMATEDATA
OPEN   ACCESSIBLE   SEARCHABLE

Resources for a wide range of uses and users

Open Climate Data

Climate Knowledge Portal

Data Finder for iPad & iPhone

From World Development Indicators

The Little Data Book on Climate Change

11

Climate
Exposure to impacts
Resilience
GHG emissions and energy
National level actions
Carbon markets

THE WORLD BANK

Open Data for Resilience

Climate for Development site

Thanks!!!

abucher@worldbank.org