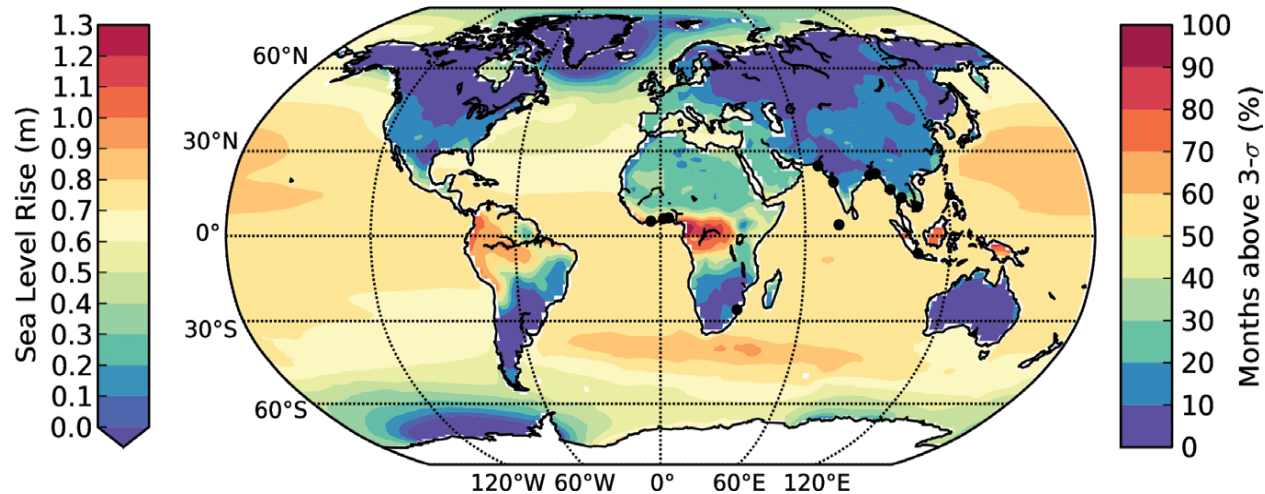


# The Economic Implications of Climate Change: What Approach for Financial Institutions?

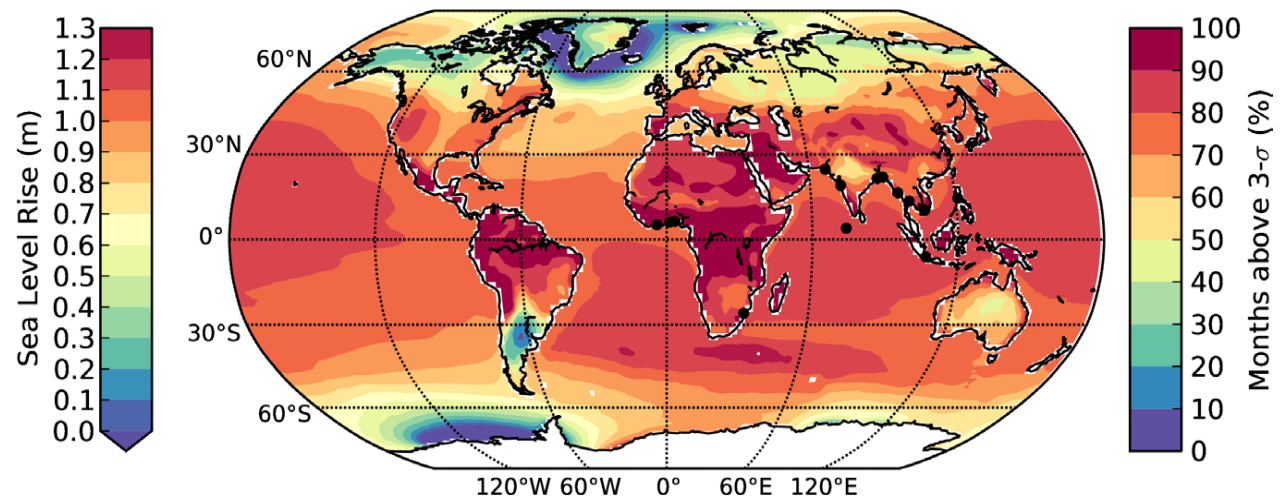


# Section I. The challenge of our generation

2C WORLD



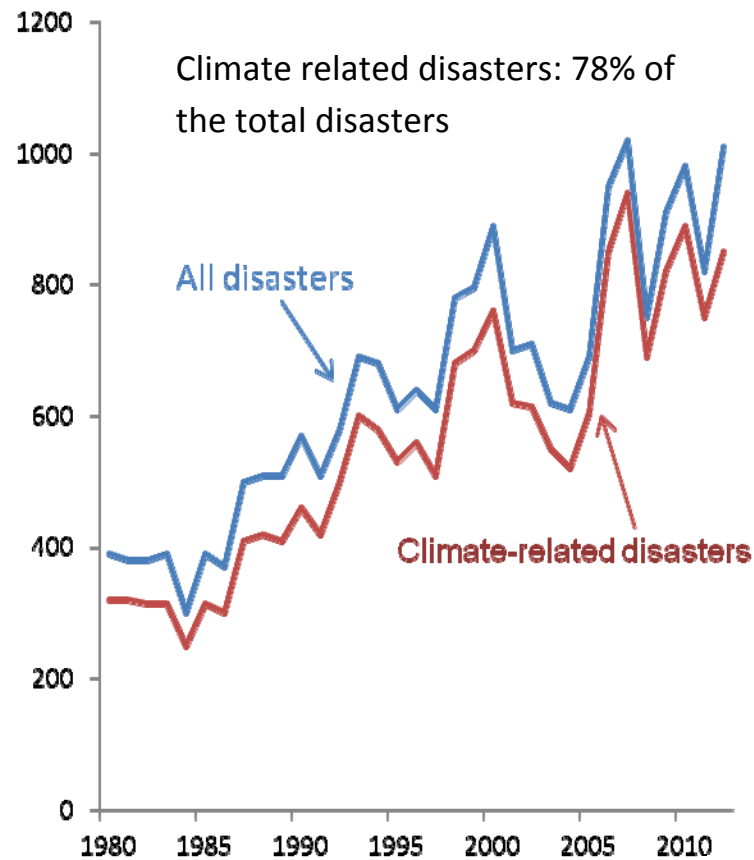
4C WORLD



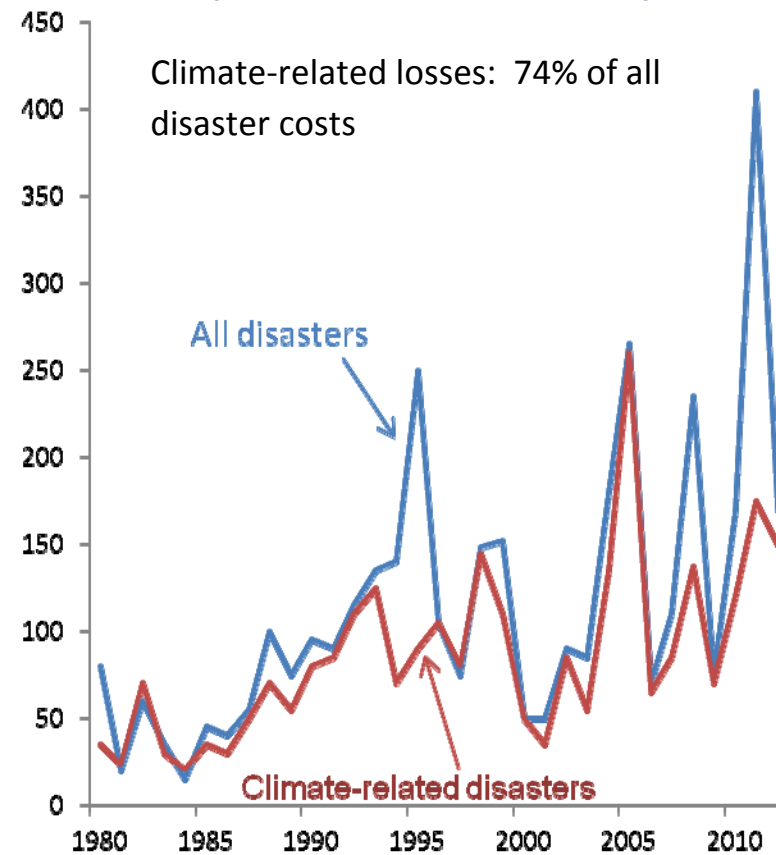
A 4C warming  
would lead to  
much larger  
impacts on the  
poor than a 2C one

# Section I. The costs of extreme weather are stunning and growing

**Number of disasters worldwide  
(1980 – 2012)**



**Disaster-related losses  
(US\$ billion, 2012 values)**

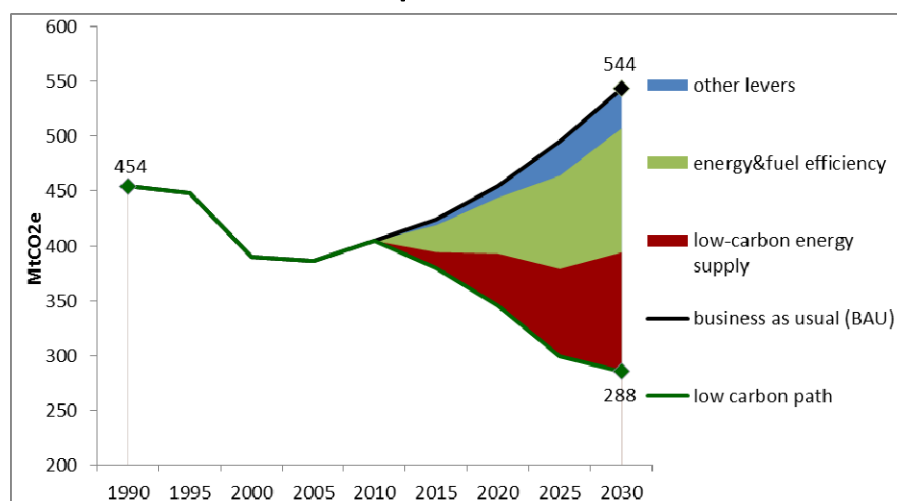


Source: World Bank estimates based on data from Munich Re © 2013 – as of January 2013

# Section II. Countries Taking Action

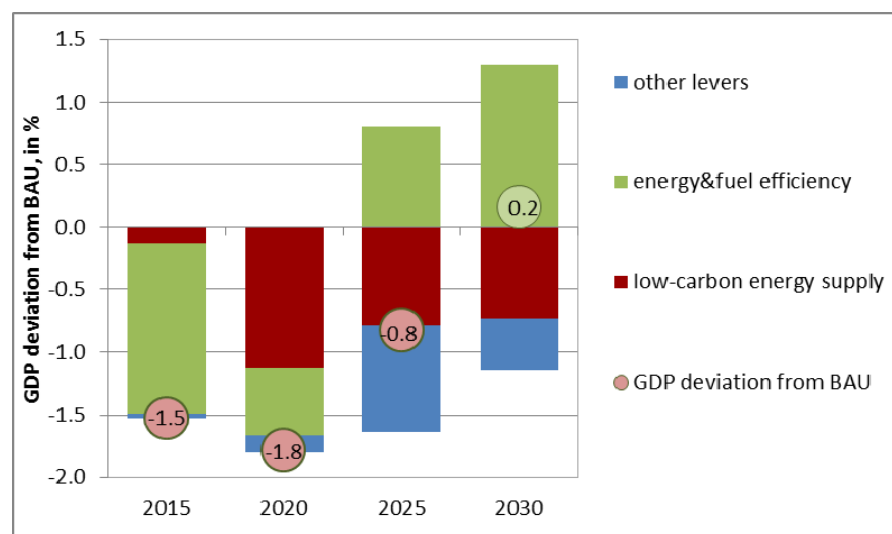
## Poland: Transitioning to a low emissions economy

**An affordable low carbon growth path for Poland** - Applying a suite of models to assess abatement potential and economic impact



- Growth and jobs affected, but only moderately--the move to low carbon is affordable
- Costs in early years of almost 2% of GDP
- Impact on growth and jobs turns positive by 2030
- Energy efficiency boosts growth within a decade of implementation

- GHG emissions can be reduced by 30% by 2030 through an optimal mix of low-carbon options using existing technologies
- Switching to low-carbon energy and energy efficiency measures provide the bulk of abatement.



# Section II. Countries Taking Action

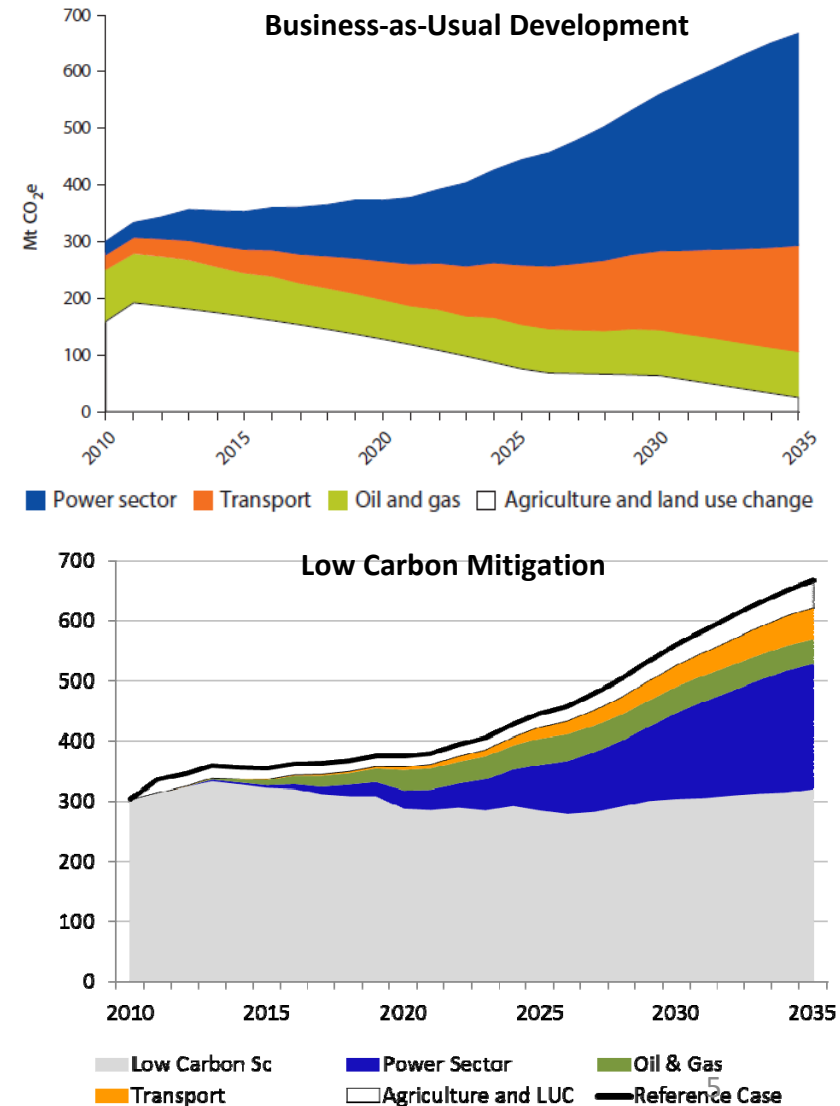
## Nigeria: Towards resilient, low carbon development

### By 2035, under normal development:

- GHG emissions expected to double with shift from oil & gas to the power sector
- Climate change could worsen vulnerability to weather swings, impact delivery of Nigeria's Vision 2020

### Low carbon resilient development can help Nigeria:

- Achieve Vision 2020 goals, stabilize GHG emissions at 2010 levels, deliver net domestic benefits (≈2% of GDP over 2010-35)
- Address current climate variability AND prepare for future change
  - CSA strategy can cut GDP impacts by 50%
  - But need decisions soon on long-lived investments (e.g. hydropower), and cross sector policy coordination



# Section III. How the WBG can add value: Financing climate action

## Deploy Finance

### Finance climate action

- ✓ \$5.9-10.2 bn p.a. in WB lending since FY11, or 20-30% of commitments
- ✓ \$2.5 bn for mitigation at IFC in FY13 (14% of commitments), up 50% from FY12
- ✓ \$1 bn in new guarantees for mitigation in FY13 at MIGA

### Package & leverage instruments

(e.g., risk-mitigation, policy and institutional reforms, capacity strengthening)

- ✓ 3-6x for products on commercial terms
- ✓ 5x for commercial guarantees
- ✓ > 8-15x for concessional blended finance

## Mobilize Resources

### Innovative concessional finance,

avoid fragmentation

- ✓ \$7.6 bn for Climate Investment Funds

### Access to climate

**finance** (e.g., carbon finance, CIF, GEF, Montreal Protocol, bilateral funds)

- ✓ \$1 bn p.a. FY12-13 (WB)
- ✓ \$126 m in FY13 (IFC)

### Capital markets & investors

- ✓ \$4 bn, WB Green Bonds
- ✓ \$2.2 bn, IFC Green Bonds
- ✓ \$347 m, IFC Catalyst Fund (one of IFC's Asset Management Company's six funds)

## Build Readiness

### Policy & institutional platforms

- ✓ \$4.8 bn, WB Development Policy Operations in FY11-13
- ✓ Climate Public Expenditures and Institutional Reviews in Morocco, the Philippines, and Vietnam

### Groundwork for new instruments

- ✓ \$260 m, 36 countries with the Forest Carbon Partnership Facility
- ✓ \$120 m, 16 countries with the Partnership for Market Readiness

### Bankable projects & programs

- ✓ ESMAP, CIF

## Catalyze Markets

### Broaden scope & reach of carbon markets

- ✓ \$3.4 bn through 15 WB carbon funds and facilities
- ✓ Supporting 150 projects in 65 countries, reducing over 181 million tons

### Pilot performance-based approaches

### Innovative products and advisory services for CAT-risk financing

- ✓ 24 governments covered through WBG operations since 2005
- ✓ 1 million farmers and herders benefit from WBG schemes

## Section III. Deploying Climate Finance Responding to demand from IDA countries

### Analysis

- Mainstream climate and disaster risk management into analysis of country development challenges and priorities
- Screen operations for short- and long-term climate change and disaster risks
- Develop and consolidate the necessary data, tools and capacity

### Planning

- Support preparation of country-led, multi-sector plans and investments that manage climate and disaster risk
- Develop and implement policy for longer-term outcomes
- Establish multi-sector institutional coordinating mechanisms

### Action

- Package and leverage grants and credits from bilateral donors
- Support selective market-driven private sector interventions
- Provide implementation support
- Design monitoring and evaluation frameworks to measure outcomes



# Section III. Mobilizing Resources

## CIFs leveraging climate finance at scale

### CLIMATE INVESTMENT FUNDS (CIF) \$7.6 BILLION



CLEAN  
TECHNOLOGY  
FUND  
[CTF]

**\$5.2  
billion**

High-ambition, scaled-up demonstration, deployment, and transfer of low-carbon technologies in renewable energy efficiency, and clean transport

#### 16 CTF investment plans

Chile	South Africa
Colombia	Thailand
Egypt	Turkey
India	Ukraine
Indonesia	Vietnam
Kazakhstan	Middle East and
Mexico	North Africa
Morocco	Region
Nigeria	(Egypt, Jordan,
Philippines	Morocco, Tunisia)



PILOT  
PROGRAM  
FOR CLIMATE  
RESILIENCE  
[PPCR]

**\$1.3  
billion**

Mainstream resilience in development planning and action

#### 11 PPCR pilots

Bangladesh	(Dominica,
Bolivia	Grenada, Haiti,
Cambodia	Jamaica,
Mozambique	St. Lucia,
Nepal	St. Vincent and
Niger	the Grenadines)
Tajikistan	the Pacific
Yemen	Region
Zambia	(Papua New
The Caribbean	Guinea,
Region	Samoa, Tonga



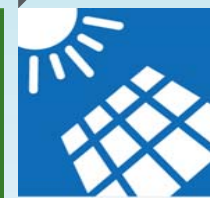
FOREST  
INVESTMENT  
PROGRAM  
[FIP]

**\$639  
million**

Reduce emissions from deforestation and forest degradation, sustainably manage forests, and enhance forest carbon stocks

#### 8 FIP pilots

Brazil	Democratic
Burkina Faso	Republic
DR Congo	Mexico
Ghana	Peru
Indonesia	
Laos People's	



SCALING UP  
RENEWABLE  
ENERGY IN  
LOW INCOME  
COUNTRIES  
PROGRAM  
[SREP]

**\$505  
million**

Demonstrate economic, social, and environmental viability of low-carbon development in low income countries' energy sectors

#### 8 SREP pilots

Ethiopia	Maldives
Honduras	Mali
Kenya	Nepal
Liberia	Tanzania

### STRATEGIC CLIMATE FUND (SCF) \$2.4 BILLION

## Section III. Catalyzing Markets

### Piloting innovations to deliver methane reductions

- **1,200 “shovel ready” methane projects**, initiated under various carbon offset standards but not implemented, can:
  - Reduce at least 850 Mt of CO<sub>2</sub>e over 2013–20
- **Designing an innovative pay-for-performance methane abatement facility (launch end 2013)**
  - Auction to allocate resources, maximize impact of funds
  - Start delivering methane reductions in 1-2 years for landfill gas, composting, wastewater treatment, agriculture waste (biogas), gas pipeline leaks
  - Several countries have indicated funding support
- **Rapid delivery of local and global benefits**, including improved air quality, agriculture yields, public health, clean power. E.g.:
  - \$543 million invested in 52 carbon finance projects to reduce methane over FY07-12 has annual benefits of 9.5 Mt of CO<sub>2</sub>e reductions, 150 incidences of avoided premature mortality, 33,000 tons of avoided crop losses



# Section IV. Working Where it Matters Most

## Getting Prices Right-Putting a Price on Carbon



### **New emissions trading schemes are under preparation and being launched: The Case of the Shenzhen**

- **Emission target:** to reduce carbon intensity by 21% between 2010 and 2015
- **Growth target:** to maintain at least 9% growth
- **Jobs target:** to increase green jobs across the city
- Launched emissions trading scheme piloting in June 2013 as an important means to achieve emissions targets and promote efficiency of the economy
  - 635 industrial companies participate in the ETS covering power, industrial and service sectors
  - 26 sectors will be included and will have mandatory compliance

**Two related initiatives to support new carbon pricing approaches and to maximize the Climate Change mitigation benefits.**

#### **Partnership for Market Readiness**

**Representatives from many jurisdictions operating or considering market mechanisms for carbon pricing:**

- Share lessons
- Peer review processes
- Develop knowledge tools for carbon pricing policy development & implementation
- Provide technical assistance for early stages of market design & development

#### **Globally-Networked Carbon Markets**

**Looking ahead: Exploring ways to achieve price signal and scale of a global carbon market, in a world of bottom-up heterogeneous markets.**

- Taking a risk-based approach to rating climate change mitigation value of various carbon assets across markets
- International Carbon Reserve
- Cross Boarder Settlement Platform

## Section IV. Working Where it Matters Most

### Getting Prices Right-Reducing Harmful Fossil Fuel Subsidies

- Getting energy prices right will send a strong signal for investment to flow into low-carbon growth.
- Fossil fuel subsidy reform is an economic issue as much as a climate issue. At its core, reforming subsidies to fossil fuels can be a mechanism to raise revenues.
- Yet – it is difficult. Many emerging economies have attempted reform but implementation is complex, takes time and has high risk of being reversed



*The World Bank Group is playing a key role in facilitating, catalyzing and accelerating action with partners on this issue, with two main areas of emphasis:*

**Building Coalitions and  
Advocating for Removal of  
Fossil Subsidies**

**Increasing Client Country  
Alignment & Support**

## Section IV. Working Where it Matters Most Livable Cities



### ***LOW-CARBON LIVABLE CITIES (LC2) INITIATIVE***

**As climate change and rapid urbanization coincide, cities need support designing low-carbon development paths.**

**LC2 offers a comprehensive suite of tools** and activities tailored to cities' specific needs and level of progress, ranging from:

- **Greenhouse gas inventories and low-carbon investment planning to**
- **Enhancing city credit-worthiness and creating large scale-financing solutions for low-carbon growth**

*We aim to reach 300 of the largest developing country cities within four years.*

# Section IV. Working Where it Matters Most

## Identifying gaps for growth and competitiveness

### Mozambique – Investing in Resilience



#### The Situation


- **Natural disasters:** 68 natural disasters in past 50 years; killed > 100,000 people; affected 28 million.
- **Flooding:** The 2000 floods killed around 800 people, displaced 540,000, and inflicted costs of around 10% of annual GDP.
- **Seawater inundation:** affects more than 12.6 million living in coastal areas; 2,700 km long highly vulnerable coastline. Storm surges can temporarily raise sea level as much as 5 m; poses threat to coastal infrastructure.
- **Cyclone:** 3 or 4 cyclones each year; increases risks of extreme wind and rainfall, seawater inundation and storm surge.
- **Vector-borne diseases:** Malaria causes 44,000 to 67,000 deaths annually in all age groups; warmer temperatures may prolong the seasonality of its transmission.
- **Future climate:** Temperature is predicted to increase between 1°C and 2°C by 2050; precipitation is likely to become increasingly variable and uncertain. By 2080-2100, sea-level is projected to be more than 100 cm above the 1986-2005 level.

#### Economic Impacts

- **Agricultural loss:** The impact of climate change over the next forty years would lead to a 2-4% decrease in yields of the major crops. Production losses due to drought could range between \$12 and \$170 million for maize alone in Zambezi Province.
- **Road damage:** Maintenance costs of paved and unpaved roads, are currently about \$250 million per year representing about 12 per cent of total government spending, are increasing due to temperature and precipitation changes.
- **Water sector:** 5.5% average decrease in GDP due to water shocks.

#### *Mozambique Quick Facts*

- Mozambique ranks third amongst the African countries most exposed to risks from multiple weather-related hazards
- More than 60 per cent of Mozambique's population of 21 million lives in coastal areas
- GDP falls between 4 per cent and 14 per cent relative to baseline growth in the 2040-50 decade if adaptation strategies are not implemented
- The net present value of climate change damages in Mozambique reaches to an annual payment of a bit more than \$400 million by 2050.



“If we don't confront climate change, we won't end poverty.”  
-Jim Yong Kim, June 2013