# Millennium Development Goals and Climate Vulnerability and Adaptation

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# Agenda

- **Aligning Millennium Development Goals and Climate: A Perspective**
- **Building capacity in developing countries**
- **Some Illustrations (from India)**
  - Aligning Energy Security and Technology Transitions with Climate Goals
  - Co-benefits from Aligning Energy-Water Markets in South-Asia
  - Sustainable Development and Adapting Long-life Assets to Climate Risks
- **Conclusions**

# Mainstreaming Climate Change in National Development

**Aligning climate policies and actions with:**

- *MDGs / National development targets*
- *Agreed goals under extant international agreements*
- *Developing resilience to Vulnerabilities and Adapting to changing Climate Parameters*

**MDG, India's National Targets and Climate Change**

| MDG and global targets | India's National plan targets | Interface with Climate Change |
|---|---|---|
| ***Goal 1: Eradicate extreme poverty and hunger***<br><br>Targets: Halve, between 1990 and 2015, the proportion of people with income below $1 a day and those who suffer from hunger | • Double the per capita income by 2012<br>• Reduce poverty ratio by 15% by 2012<br>• Contain population growth to 16.2% between 2001-2011 | • Higher income enhances access to services, food, fuel, information, an enhances mitigative and adaptive capacity<br>• Higher climate variability would enhance risks to meet the goal |
| ***Goal 7: Ensure environmental sustainability***<br><br>Targets: Integrate SD principles in country policies/ programs to reverse loss of environmental resources<br><br>Target: Halve by 2015 the proportion of people without sustainable access to safe drinking water | • Increase in forest cover to 25% by 2007 and 33% by 2012 (from 23% in 2001)<br>• Sustained access to potable drinking water to all villages by 2007<br>• Electrify 80,000 additional villages by 2012 via decentralized sources<br>• Cleaning of all major polluted rivers by 2007 and other notified stretches by 2012 | • Enhanced sink capacity, reduced GHG and local emissions; lower fossil imports; reduced pressure on land, resources and ecosystems<br>• Higher adaptive capacity to from enhanced supply of water, health & education in rural areas |

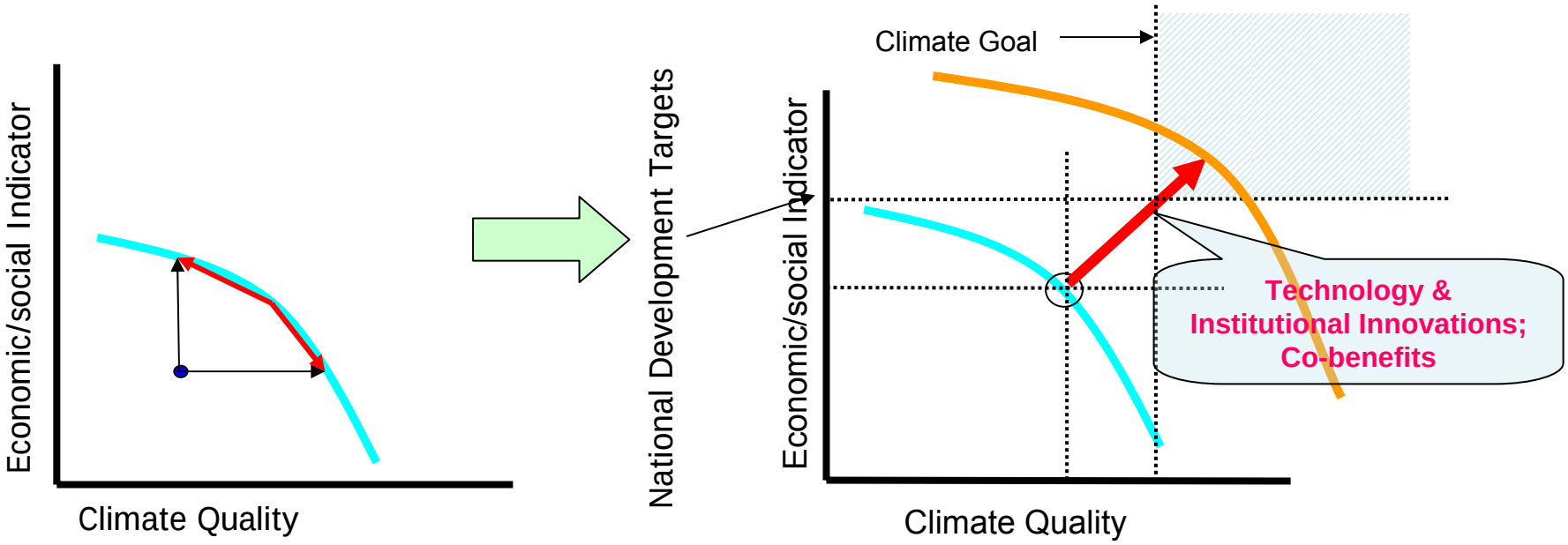
# Development and Climate: Some Key Propositions

- Climate change is a derivative problem of development; hence development is the key to mitigative and adaptive capacities

- Developing economies are more dependent on climate. Dealing with climate change exclusively is very expensive & expected to cost several trillion dollars over this century

- Strategies for dealing with sustainable development and climate change have many common elements, and aligning these would deliver multiple dividends but would require '**institutional capacities'**

# Shifting the Development and Climate Frontier




***Using MDGs / National Development Goals to align the:***

- *deployment of resources to deliver multiple dividends;*
- *diverse interests of multiple stakeholder;*
- *technology innovations, deployment and investments;*
- *sequence of policies and measures to accrue co-benefits.*

# Building Capacity for Adaptation

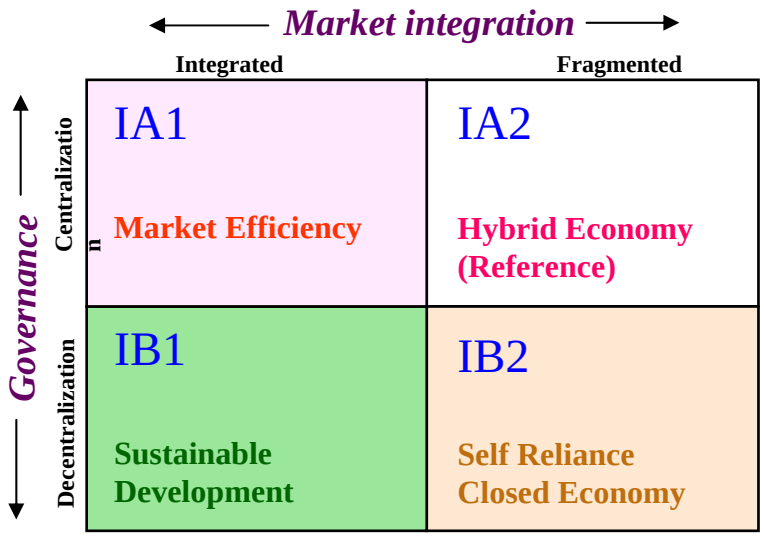
- **Correct Coordination Failures**
  - Market
  - Governance
- **Align Stakeholder Preferences and Interests**
  - Community
  - Interest Groups
- **Reduce and Share Risks**
  - Social Networks
  - Governments
  - Markets
- **Reduce and Share Transaction Costs**
  - Scale
  - Supply of Public Goods
  - Investments in Information and Innovations
- **Align actions for multiple dividends/ co-benefits**
  - Time: Short-term to Long-term
  - Space: Local, National, Regional, Global

# Illustrations from India

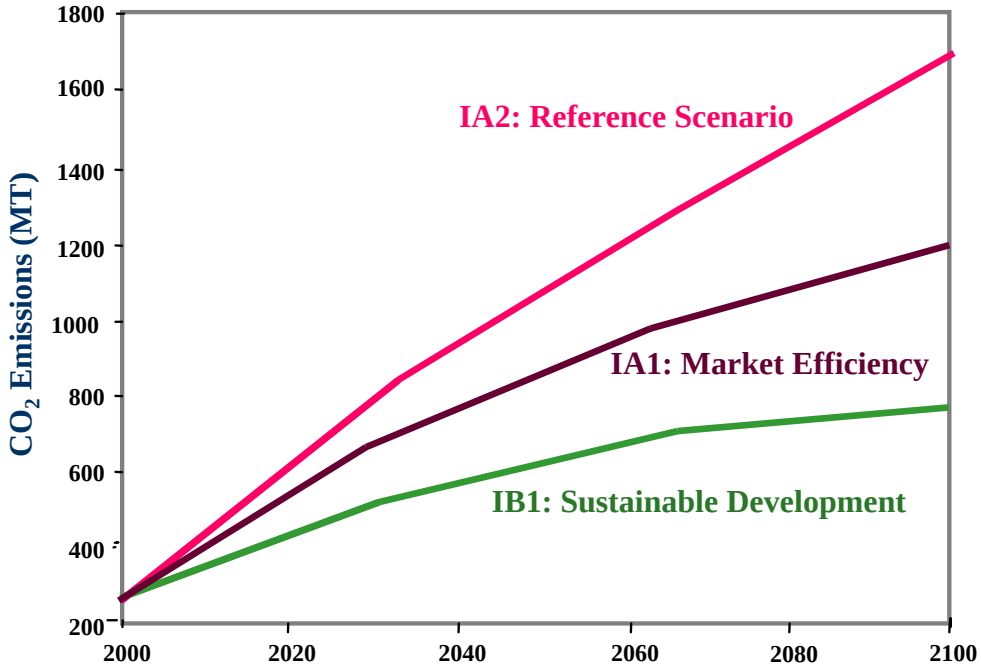
- **Aligning Technology Transitions with Climate Goals**
- Co-benefits from Aligning Energy-Water Markets in South-Asia
- Sustainable Development and Adapting Long-life Assets to Climate Risks

# Indian Carbon Emissions Scenarios

## Indian Emissions Scenarios




## Carbon Emissions

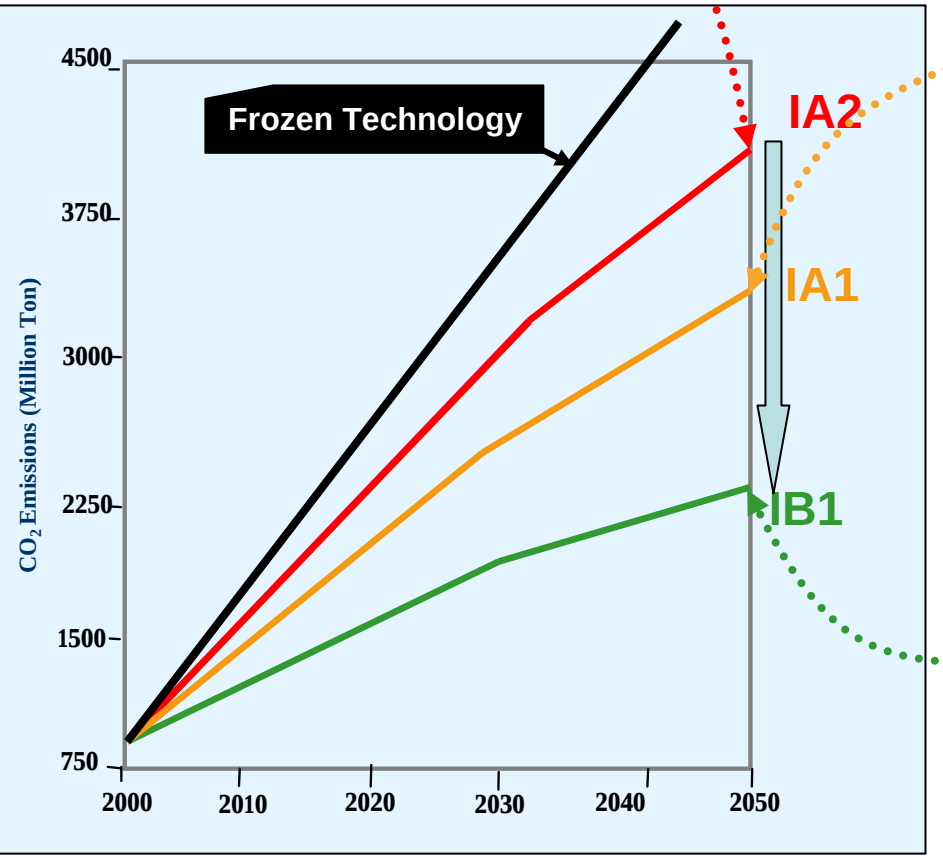



**India's Total Carbon Emission in 21st Century**
(Billion Ton $CO_2$)

| | |
|---|---|
| Reference (IA2) Scenario | : 363 |
| Market Efficiency (IA1) Scenario | : 286 (79% of IA2) |
| Sustainable Development (IB1) Scenario | : 198 (55% of IA2) |

# Technologies in Low Carbon Scenarios: Medium-Term (2050)

Conventional Technology Path: Includes significant endogenous technological change




## Globalization/Market Efficiency Scenario

- Synfuels, Next-Gen Nuclear (Thorium)
- Fuel cell vehicles, Pipeline networks
- Energy efficient appliances/ infrastructure
- Coal liquid, IGCC, Hydrogen from gas
- Advanced materials, Nanotechnology

## Sustainable Development Scenario

- Push for renewable energy & recycling
- Advanced car pooling, Shared assets
- High speed trains, Swap of transport by IT
- Dematerialization, Community institutions
- Sustainable habitats, Reforestation

# Bio-energy: Climate and Development Goals

## Jatropha Plantation in India

## Oil Extraction Plant

- **Rural Employment: (MDG1)**
  - Large scale employment potential in Jatropha plantation, seed collection and extraction
- **Farm Income (from waste lands): (MDG1)**
  - Net income Rs. 12000/Ha/year
- **Energy Security (MDG1&7)**
  - Imported fossil oil is replaced
- **Environment (MDG7)**
  - Carbon neutral, Rehabilitates waste land

## Rural Employment

# Illustrations from India

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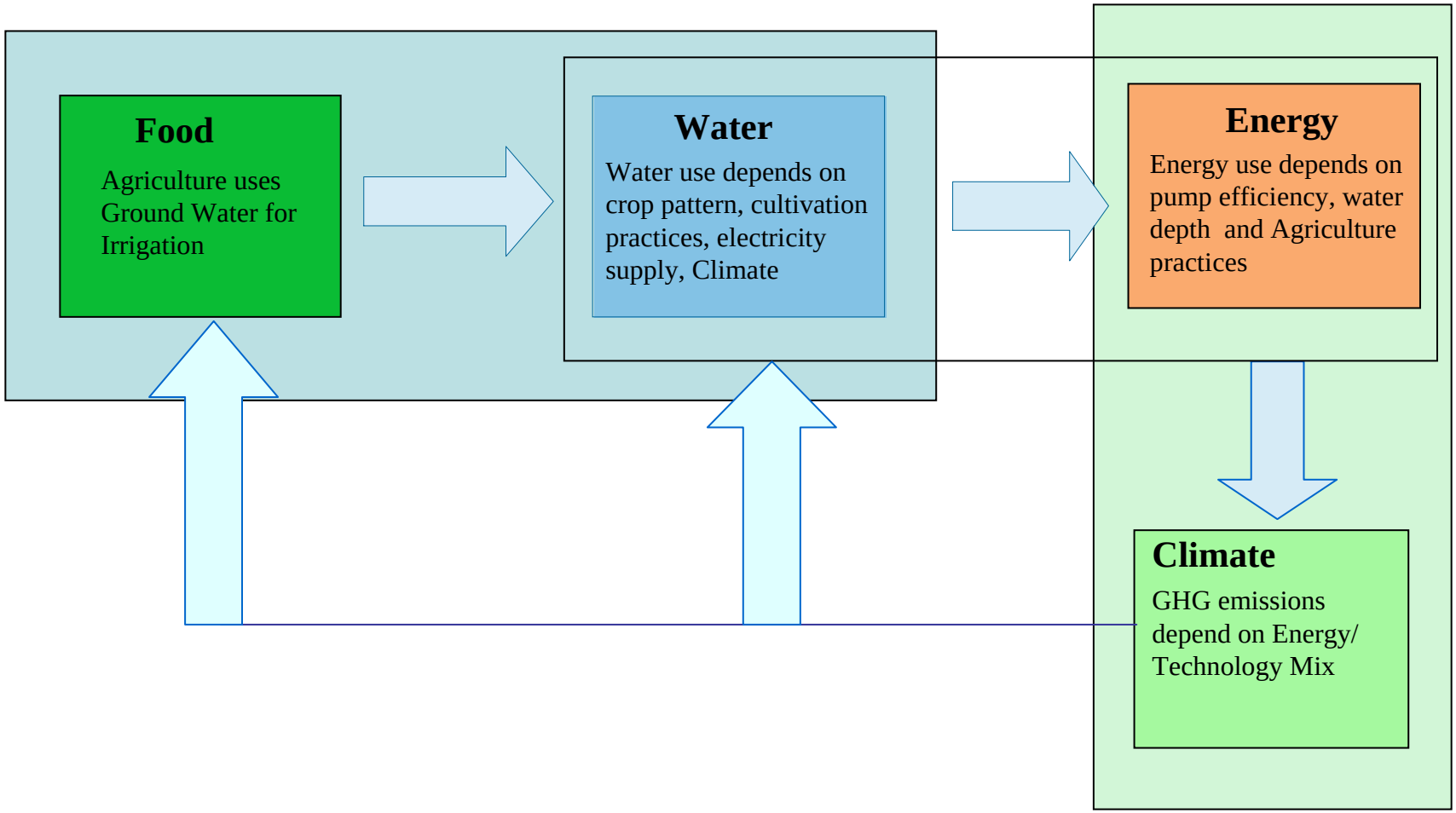
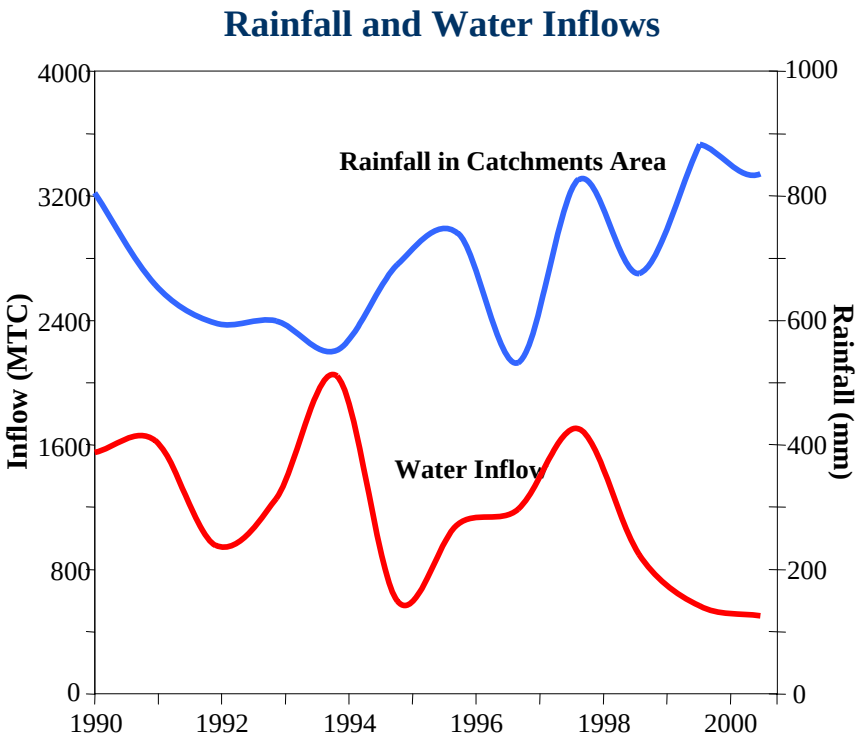
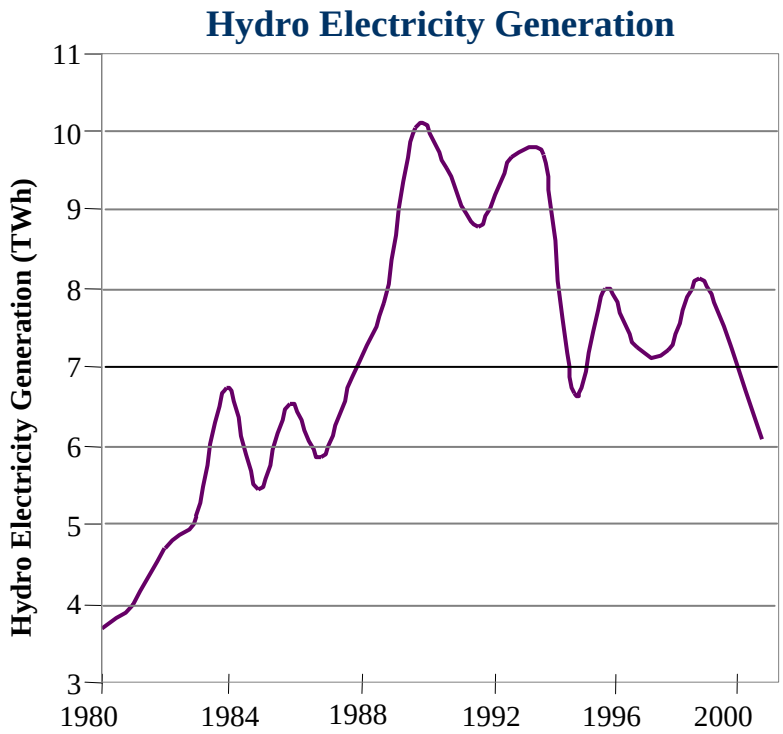
# Adaptation Challenge: Food/Water/Energy/Climate



# Rainfall, Inflows and Hydro Electricity Generation

State of Andhra Pradesh



# South-Asia Energy-Water Cooperation: Co-benefits

**Integrated South-Asia Energy-Water Market**


| Benefit (Saving) Cumulative from 2010 to 2030 | | $ Billion | % GDP |
|---|---|---|---|
| Energy | 60 Exa Joule | 321 | 0.87 |
| $CO_2$ Equiv. | 5.1 Billion Ton | 28 | 0.08 |
| $SO_2$ | 50 Million Ton | 10 | 0.03 |
| | Total | 359 | 0.98 |

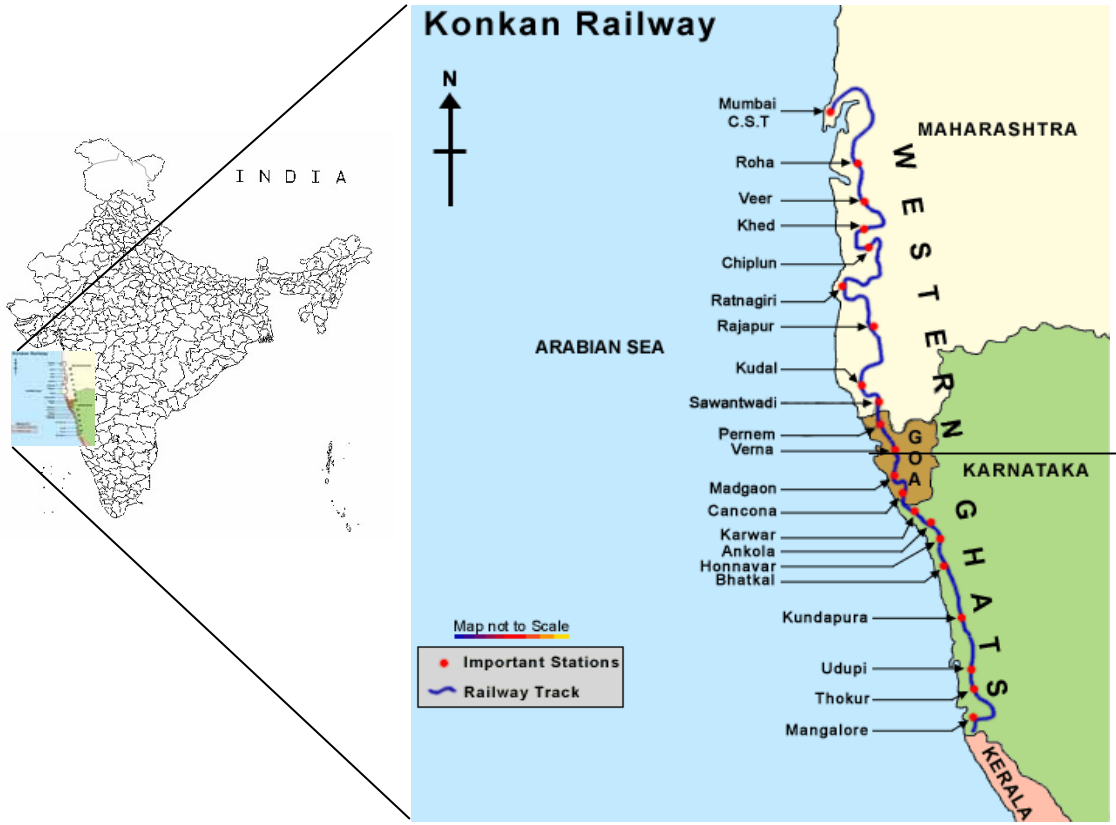
## Spill-over Benefits / Co-Benefits

- More Water for Food Production (MDG1)
- 16 GW additional Hydropower (MDG1&7)
- Flood control (MDG1&7)
- Lower energy prices would enhance competitiveness of regional industries (MDG1)

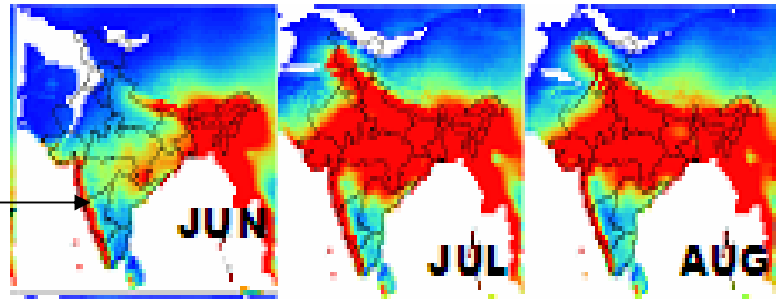
# Illustrations from India

- Aligning Technology Transitions with Climate Goals
- Co-benefits from Aligning Energy-Water Markets in South-Asia
- **Sustainable Development and Adapting Long-life Assets to Climate Risks**

# Climate Impacts on Long-life Assets

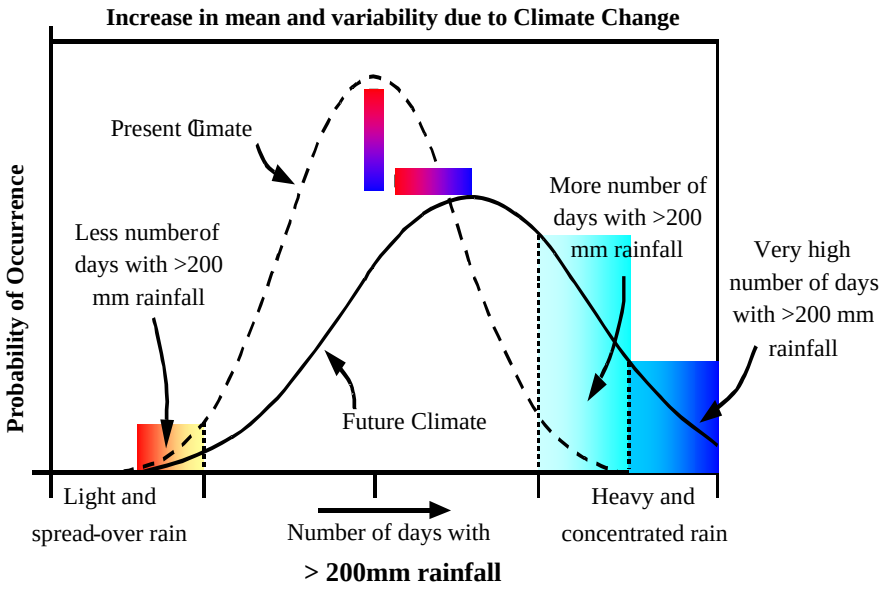



Monsoon Rainfall (2050)

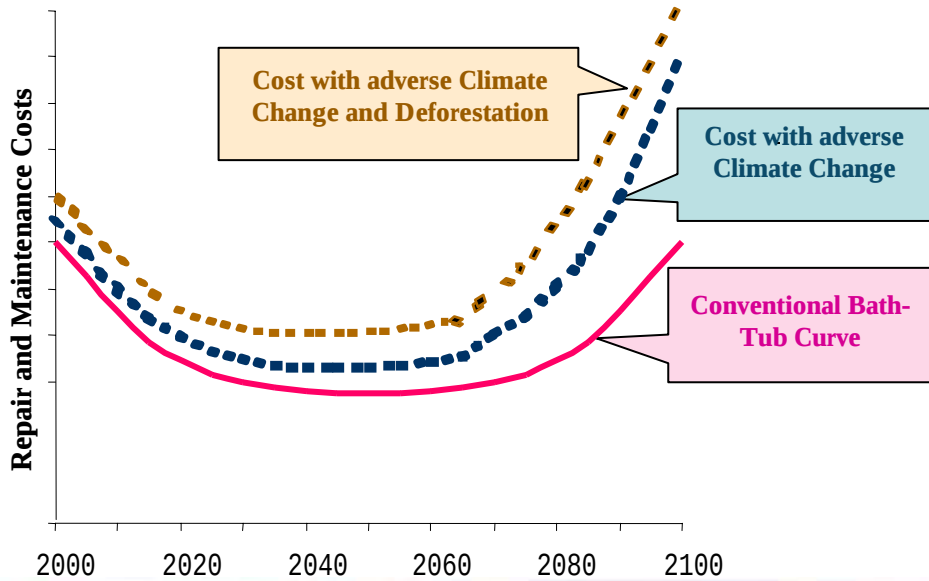


# Sustainable Development & Adaptation to Climate Impacts

## Increase in Climate Intensity and Variability




## Maintenance Cost Curve



# Conclusions

## Sustainable Development for Climate Resistant Society

- Most **sustainable development actions** are climate friendly
- **Mainstreaming** climate change in development actions enhances adaptive capacity to meet MDGs - reducing costs, risks and welfare losses

## Enhance Institutional Capacity in Developing Countries

- Gaining **co-benefits** require **institutional capacity**
- Climate actions and actors are **diverse** and therefore require coordination and capacities across **multiple dimensions**

## Development Goals and Adaptation

- Any level of stabilization would induce **climate risks** that would require **adaptation**
- Climate burden on developing countries would be low if climate risks are managed by evolving **development pathways** which are inherently **climate resistant** rather than those where adaptation actions are **incremental and exogenous** to development actions
- Therefore, **development centric** climate programs/ funding would deliver **robust and sustainable dividends** than the **climate centric** efforts