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Use of climate information for socio-economic benefits

Dr Don Gunasekera
Centre for Complex Systems Science, CSIRO
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Outline

- Role of climate information: the context
- Use of climate information: some examples
- Challenges and the way forward

Setting the scene: the diabolical problem

- **Annual average global GDP growth to 2050: 2.5 – 3%**
 - **Developing countries will have higher growth rates**
- **Global population by 2050: around 9 billion**
- **Global food production: needs to increase by 50% by 2030 to feed the growing population**
- **Global agricultural area: needs to increase by about 10% to sustain this production**
- **Climate change challenge: adapting to climate change and mitigating damages**

Role of climate information: the context

- A sustainable global system needs balancing of:
 - Economic growth and development
 - Supply of food and basic necessities
 - Climate change adaptation and mitigation
- Every country/economy/industry is affected by climate/weather conditions
- Key vulnerability: food production and food security
 - 16% fall in global food output by 2080 due to climate change
 - South Asia and Southern Africa: key vulnerable regions
- Climate information is crucial in adaptation and mitigation

Need for adaptation to a changing climate

- Variable and changing climate is associated with:
 - Wide ranging global impacts affecting:
 - Food production systems
 - Water availability
 - Human health
 - Energy demand
 - Regional changes in temperature and precipitation, affecting
 - Regional variation in agricultural systems
 - Localised stresses on food production
- Uptake of adaptation options underpinned by
 - Climate information
 - Impacts assessment

Value of climate information: key issues

- Climate information is used in decision making under uncertainty or risk
 - Climate sensitive activities or sectors
- Value of climate information is in practical application
 - How they affect people's decisions
- People's decisions and their consequences may involve economic, social and environmental activities
- Value of climate information increases by influencing user behaviour and with increasing:
 - quality, accuracy, timeliness, locational specificity and user friendliness of information

Valuing the benefits of climate information

Three stage generic approach

1. Identify / estimate the climate / weather events that affect users
 - E.g. min/max temp, monthly rainfall
2. Estimate physical impact on users by using relevant decision making tools (e.g. crop growth simulation model)
 - E.g. change in crop yields
3. Assess economic impact of changes in activity affected by a particular climate / weather event
 - E.g. economic impact on producers due to changes in crop yields

Use of climate and other meteorological information

- Focus of climate information applications
 - Mainly on developed country agriculture
 - Very limited analysis of developing countries
- Areas of further/potential applications
 - Fisheries management
 - Energy supply-demand management
 - Natural disaster management
 - Public health risk management
 - Biosecurity risk management
- Use of climate information in IPCC assessments
 - Earth system modelling (ESM)
 - Integrated assessment modelling (IAM)
 - Impact, adaptation and vulnerability (IAV) modelling

Use of climate information: a few examples

- **Value of improved ENSO prediction to US agriculture**
 - Value of 'modest' and 'high' skill ENSO predictions is \$240 m and \$266 m respectively per year (1995 US\$)
- **Use of climate forecasts in drought relief planning in Brazil**
 - Illustrated the benefits for planning seed distribution, emergency drought relief and water reservoir management in Northeast Brazil
- **Value of climate forecasts for livestock farmers in South Africa**
 - Demonstrated the use of climate forecasts for raising long term average annual income of livestock farmers in Northwest Province of South Africa
- **Value of cotton field weather service for growers in Australia**
 - Benefit-cost ratio of 12:1 based on reduction in cotton production costs using weather services

Sources: Solow *et al.* (1999), Lemos *et al.* (2002), Thornton *et al.* (2004), Anaman and Lellyett (1996)

Impediments to use of climate information

- Low accuracy and lack of lead time
- Institutional constraints
- Lack of:
 - Decision models to use climate information
 - Knowledge in climate information
 - Locational specificity of climate information
 - Knowledge about climate variability impacts and the associated decision responses

Sources: Hill and Mjelde (2002) and Hansen (2002)

Way forward

- Removing impediments to effective use of climate information
- Multi-disciplinary approach
 - Collaboration between scientists, users and policy makers
 - Use of relevant analytical tools
 - Domestic and international collaboration between public and private sector stakeholder agencies
- Outreach program
 - Greater priority to extension and communication
 - Educational activities
 - Better explanation of forecast uncertainties and probabilistic climate information
- Comprehensive user-focussed climate services
- Global Framework for Climate services

Dr Don Gunasekera
Visiting Scientist
Centre for Complex Systems Science
CSIRO Marine and Atmospheric Research

Email: don.gunasekera@csiro.au

www.csiro.au

Thank you

Contact Us

Phone: 1300 363 400 or +61 3 9545 2176
Email: enquiries@csiro.au Web: www.csiro.au

