Mainstreaming Climate Change Adaptation in Agriculture and Water Sectors:
Current Status, Issues and Challenges in the Asia Region

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Presentation outline

► Climate change impacts
► Vulnerability of AP region
► Brief update on what is going on
► Way forward

In IPCC Words

“Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level”

Impact: Global temperatures

Impact: Sea level rise

Impact: Natural disasters

Observed cyclonic storms in Indian ocean
Impact: Global Trend of Hydro-met Disasters*

Some projected impacts on agriculture and water sectors in AP Region

- Crop yields could increase up to 20% in East and South-East Asia while they could decrease up to 30% in Central and South Asia by the mid-21st century. Along with population growth, the risk of hunger is projected to remain very high in several developing countries.
- Pressure on natural resources and the environment associated with rapid urbanization, industrialization, and economic development.
- Glacier melt in the Himalayas is projected to increase followed by decreased river flows as the glaciers recede.
- Freshwater availability in Central, South, and South-East Asia, particularly in large river basins, is projected to decrease which, along with population growth and increasing demand arising from higher standards of living, could adversely affect more than a billion people by the 2050s.
- Coastal areas, especially heavily populated mega delta regions in South, East, and South-East Asia, will be at greatest risk due to increased flooding from the sea and, in some mega deltas, flooding from the rivers.

Impacts: Water Scarcity

- China: The Haihe-Luanhe River basin will face water scarcity, followed by Huaihe River basin and Yellow River basin. Northern arid provinces are most important.¹
- Mekong: Upper Mekong (Yunnan Province of China), Korat Plateau and Southern Lowland will experience further reduction in rainfall and runoff + water demand due to agriculture and population growth.²

2. Chinvanno, S. Reg Conf on Digital GMS, 2003

Source: IPCC, 2007

Source: Gosain et al., 2004

Source: P.K. Aggarwal. IARI, New Delhi, India
Impacts on Food Prices

Changes in global cereal prices under seven SRES scenarios with and without CO2 effects, relative to the reference scenario (no climate change).


Vulnerability: High dependence on agriculture

<table>
<thead>
<tr>
<th>Region</th>
<th>Economically active population in agriculture (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>44</td>
</tr>
<tr>
<td>Latin America and Caribbean</td>
<td>19</td>
</tr>
<tr>
<td>E &amp; N Africa</td>
<td>33</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>62</td>
</tr>
<tr>
<td>Developed market economies</td>
<td>3</td>
</tr>
<tr>
<td>Countries in transition</td>
<td>15</td>
</tr>
</tbody>
</table>

Table source: FAO. State of food & agriculture 2003-04

Vulnerability: Rural Poverty in Asia

<table>
<thead>
<tr>
<th>Region</th>
<th>Economically active population in agriculture (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural South Asia</td>
<td>45</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>60</td>
</tr>
<tr>
<td>Developed market economies</td>
<td>3</td>
</tr>
<tr>
<td>Countries in transition</td>
<td>15</td>
</tr>
</tbody>
</table>

Average 80% 22%

Table source: Assessment of rural poverty in Asia and the Pacific, IFAD, 2002

Vulnerability: Water Scarcity

The drought-prone countries in this region are Afghanistan, Iran, Myanmar, Pakistan, Nepal, India, China, Sri Lanka and parts of Bangladesh, Philippines, Thailand, Australia and the Pacific islands of Fiji, Vanuatu and Samoa.

The majority of the estimated 500 million rural poor in the Asia-Pacific region are subsistence farmers occupying mainly rain-fed land.


Vulnerability: Poor Progress in MDGs

MDGs cont...

Source: UN Millennium Development Goals: 2006 progress chart
Hydro-Met Disaster Vulnerability

- "The vulnerabilities of people due to the developmental path chosen is a major cause of concern, while the role of climate change cannot be ruled out behind the increasing disasters."
- The Asia-Pacific region accounted for 91% of the world's total deaths and 49% of the world's total damage due to natural disasters in the last century. 

Source: Munich Re, 2006

Agriculture...

- Major adaptation initiatives being taken up by the countries in Asia Pacific region could broadly be grouped into the following:
  - Development of crop varieties that are tolerant to perceived threats that includes droughts, pests and diseases (Australia, India, Indonesia, Malaysia, Vietnam).
  - Expanding area under irrigation and efforts for better water management including watershed management practices (Australia, Bangladesh, China, India, Indonesia, Malaysia, Russia, Vietnam).
  - Improving weather forecasts and linking with farm decision making (Australia and India).
  - Drought monitoring systems are being put in place though do not completely cover the entire country of are in inception stage (China, India, Vietnam, Australia).
  - Investment in infrastructure that promotes access to markets that in turn enhances the resilience of rural communities which is more relevant for the developing countries in the region (India, China, Sri Lanka).

Source: From different sources

Water Scarcity

<table>
<thead>
<tr>
<th>Country</th>
<th>Significance</th>
</tr>
</thead>
</table>
| Bangladesh | National level comprehensive disaster management initiatives that encompass drought as a factor which is much larger than climate variability |预见干旱等灾害的综合应对措施，包括气候变化因素。
| China | National level comprehensive disaster management initiatives that encompass drought as a factor which is much larger than climate variability |预见干旱等灾害的综合应对措施，包括气候变化因素。
| India | National level comprehensive disaster management initiatives that encompass drought as a factor which is much larger than climate variability |预见干旱等灾害的综合应对措施，包括气候变化因素。
| Indonesia | Development of crop varieties that are tolerant to perceived threats that includes droughts, pests and diseases |开发耐受干旱、害虫和病害的作物品种。
| Australia | Water proofing projects, water strategies at state level, improving water supply efficiency |采取水利基础设施项目，提高供水效率。

Source: IPCC, 2007

Hence, Adaptation is Important

- Some of the countries have already initiated vulnerability assessments with respect to climate change.
- These vulnerability assessments consisted of identifying and analyzing the impact of climate change and variability on natural eco-systems, socio-economic systems, and human health.
- Some assessments also considered the institutional and financial capacities of the local communities, assessing the spontaneous and planned adaptation measures already taken up, and developing technical, institutional and financial strategies to reduce vulnerabilities.

Source: EM

What have we been Doing? A Brief Update

- Development of crop varieties that are tolerant to perceived threats that includes droughts, pests and diseases (Australia, India, Indonesia, Malaysia, Vietnam).
- Expanding area under irrigation and efforts for better water management including watershed management practices (Australia, Bangladesh, China, India, Indonesia, Malaysia, Russia, Vietnam).
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Source: From different sources
Other Vulnerability Reduction Initiatives

<table>
<thead>
<tr>
<th>Country</th>
<th>Land and rural development initiatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>Livestock enterprise development</td>
</tr>
<tr>
<td></td>
<td>Microfinance through self help groups</td>
</tr>
<tr>
<td>China</td>
<td>Legal changes that would give farmers long-term security on the land (to provide tenure security)</td>
</tr>
<tr>
<td>India</td>
<td>Secure drinking water supply</td>
</tr>
<tr>
<td></td>
<td>Wage employment, employment assurance, food for work, rural housing, social security programs, land reforms etc</td>
</tr>
<tr>
<td></td>
<td>Watershed development programs such as Drought Prone Areas Program (DPAP) and Desert Development Program (DDP)</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Food security enhancement program</td>
</tr>
<tr>
<td>Vietnam</td>
<td>Agricultural diversification</td>
</tr>
<tr>
<td></td>
<td>Strengthening the agriculture extension programs</td>
</tr>
<tr>
<td></td>
<td>Ongoing efforts to improve access to rural water supply and sanitation</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>Significant investments in natural resource management</td>
</tr>
</tbody>
</table>

Two Approaches to Climate Decision Making

- Decisions those are valid for the future, based on future climate forecasts
  - Less information
  - No dependable climate forecasts
    - Time scales (near and far)
      - Spatial scale (AR4: ~ 110 sqkm, AR3: 180 sqkm, FAR: 500 sqkm)
    - Less understanding on the climate system
      - Complex ocean and atmospheric interaction
      - Solar and lunar influence

Way Forward

- Integrated river basin management should be given more thrust than they are being given at the moment.
- Demand side management of natural resources is another issue needs more consideration.
- A prudent water sharing mechanism between various water using sectors is an absolute necessity for the countries in the region (complete water balance).
- There is a clear linkage between coping capacity and land tenure arrangement. Countries in the region enhance the process of streamlining land tenure arrangements.
- Decision making based on the past climate
  - Assumes general development programs would suffice to take care of climate change
  - Most followed ideology
  - Many national communications generally list developmental programs in the place of adaptation initiatives

Way forward

- There is a need for enhancing the coordination between various institutions and governments at the local, national and regional levels.
- Regional cooperation could be identified in the areas of drought and desertification monitoring.
- Relevant weather and climate forecasts that help the end-users to take decisions with more confidence by improving the consistency, quality and value of the forecasts.
- The potential of resource conserving technologies such as zero and reduced tillage may be explored in the region as they conserve the soil moisture and reduce the off-farm inputs considerably.
Way forward

- Enhancing the capacities of local governments and communities is important for achieving resilience to climate change.
- Community based planning can enable governments to gain better understanding on the vulnerabilities of the communities.
- A shift from ad-hoc measures to planned relief interventions that aims at creating longer-term livelihood options is an important thing to be considered for better vulnerability reduction.

Way Forward: climate regime can help progress adaptation in agriculture and water sectors

- Identify agriculture and water sectors as priority areas for investment of global adaptation funds
- New and innovative financing adaptation: Soil carbon sequestration credits can help fund adaptation
- Facilitate agro-technology transfer from haves to have-nots

Way Forward: Some requisites

- Mainstreaming climate change adaptation concerns in developmental planning
  - Strategic thinking: Short term goals vs longer term problem
  - Validity of current actions in future
  - Identification of win-win strategies
  - Act where hints are clear and keep on watch where hints are not clear
  - Reducing the uncertainty: Understanding climate system for dependable climate forecast
  - Climate Vulnerability Impact Assessment of projects and programs on the lines of EIA
- Developing capacities for decision making under uncertainty: Climate integrated decision making, climate task groups (CTGs)
- Low carbon agriculture for adaptation

Thank You!

"Today's problem cannot be solved if we still think the way we thought when we created them"
- Albert Einstein

Sustainable development: A new development path

- "Many present development trends leave increasing numbers of people poor and vulnerable, while at the same time degrading the environment. How can such development serve next century's world of twice as many people relying on the same environment? This realization broadened our view of development. We came to see it not in its restricted context of economic growth in developing countries. We came to see that a new development path was required, one that sustained human progress not just in few places for a few years, but for the entire planet into the distant future."

Thank You

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Sustainable development

► ‘Development which meets the needs of the present without compromising the ability of future generations to meet their own needs.’