What are Expected Impacts of Climate Change in Pakistan?

VULNERABILITY OF PAKISTAN TO CLIMATE CHANGE

Pakistan is very high on vulnerability scale

Weather Changes

- Expected increases in temperatures

  Geographical location already places the country in heat surplus zone of earth

- Expected changes in precipitation patterns

  Scientists believe that Climate Change might take away or alter monsoon from the Indo-Pak Sub Continent

  Erratic and intensive rains, late monsoons, dry winters, and prolonged dry spells are expected

VULNERABILITY OF PAKISTAN TO CLIMATE CHANGE

Continued

Dependence on agriculture

Pakistan's economy and its food security is highly dependent on agriculture.

Existing pressure on land

Due to high population, there is already a heavy pressure on land and other natural resources (land use and forests), leading to severe degradation of these resources. Additional pressure due to climate change will be difficult to sustain.

Limited capacity and resource constraint

Pakistan has limited capacity, resource scarcity, and inadequate physical and institutional infrastructure to cope with and timely respond to the impacts of climate change.

CLIMATE CHANGE IMPACTS ON MOUNTAIN ECOSYSTEMS

Potential Impacts on Natural Resources

The increases in temperature and late/intensive monsoon rains will:

- Further enhance the ongoing process of land degradation
- Cause increasing glacier out-falls and enhance land slides
- Further increase siltation loads down stream
- Bring changes in species patterns (fast growing species are expected to take over and will affect the native biodiversity)
- Cause shift in special boundaries (shifts of conifers and alpine species towards higher altitude are expected)
- **Positive impact of agriculture and crop yields is expected.**

CLIMATE CHANGE IMPACTS ON IRRIGATED AGRICULTURE

Effect on Irrigation Water

Extreme fluctuations in irrigation water are expected

- Over flooding during summer season due to:
  - intensive summer rains, and
  - increase in sedimentation loads from upstream

- Acute water shortages during winter season, due to:
  - Higher crop-water requirements
  - Decline in water levels in reservoirs caused by reduced water supply caused by dry spells (or late winter rains)

  The increase in snowmelt might, however, help temporarily

  - Reduction in storage capacity of the existing water reservoirs (if there are no other mechanisms for tapping the summer overflows)

CLIMATE CHANGE IMPACTS ON IRRIGATED AGRICULTURE

Continued

Potential Impact on Agriculture

Spatial shifts in cropping zones and agro-ecological boundaries

- Shortened growing season length for wheat (wheat - rice, and wheat-cotton, wheat-sugarcane systems).
- But more time will be available for land preparation of summer crops
- Increased water logging and salinity
- Increased incidence of insects, pests, and diseases

CLIMATE CHANGE IMPACTS ON IRRIGATED AGRICULTURE

Continued

Potential Impacts on Crop Yields

- Winter crop yields (wheat) might increase due to carbon fertilisation, but the increase will be more than offset by reduced growing season and water shortages
- Summer crop yields (rice, cotton, sugarcane) might increase, again due to carbon fertilisation, and improved land preparation, but the increase will be offset by excessive heat, and water shortage.

Climate Change Adaptation Strategy

CLIMATE CHANGE ADAPTATION STRATEGY

Mountain Ecosystem

Need to minimise natural resource degradation particularly land). This would require:

- Enhancing knowledge and capacity of farming community for sustainable management of natural resources
- Minimising the effects of glacier out-falls, and land slides (check dams or other measures, in collaboration with local communities)
- Introducing integrated Watershed Management jointly with communities.

CLIMATE CHANGE ADAPTATION STRATEGY

continued

Irrigated Systems

- Developing and introducing regulatory mechanisms to manage and store summer water overflows (new reservoirs would be needed)
- Encouraging and adopting high irrigation efficiency systems, methods and techniques on farm (this would also require policy interventions)

CLIMATE CHANGE ADAPTATION STRATEGY

continued

Agricultural Research and Development

- Genetic research to develop:
  - short duration varieties for wheat and other rabbi crops
  - heat and moisture stress resistant varieties for wheat, rice, maize, cotton, and sugarcane
- Modelling/mapping of shifts and direction of special boundaries for cropping zones in particular and agro-ecological region in general.
- Capacity building of farming communities to timely adjust to changes in cropping seasons, cropping patterns etc.
- Conserving genetic variability and overall agro-biodiversity (through gene banks and other methods)

CLIMATE CHANGE ADAPTATION STRATEGY

continued

Policy and Institutional Options (continued)

- Devising national policies and incentive systems combined with national level capacity building programs to encourage demand oriented conservation technologies
- Establishing comparative advantages in agriculture and agro-based industries in light of the changing climate change scenarios at national, regional and global level
- Integrating environment and development in the Social Action or Other such programmes
- Strengthen regional co-operations and networking for joint actions

Thank you