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## Conclusions and Recommendations

The participants in the Inter-Regional Workshop on Human Health Impacts from Climate Variability and Climate Change in the Himalayan Region:

- became more aware of the rapid onset of climate variability and change in mountain regions and in particular the Hindu Kush-Himalaya;
- identified the potentially significant health impacts from the rapid climate change that is projected to occur over the next decades; and
- identified and proposed intersectoral and trans-boundary strategies for evidence-based and timely interventions for the most vulnerable populations.

**The participants proposed a framework for action** to prevent and adapt to the health impacts from increasing climate variability and change in the Hindu Kush-Himalaya mountain region.

The main objectives of the framework were to:

- (1) Describe the exposure-response relationships between climate and health, identify the current distribution and calculate the burden of climate-sensitive health determinants and outcomes, with special emphasis on the most vulnerable populations

- (2) Identify and review existing strategies, policies, and awareness and capacity building measures to reduce the burden of climate-sensitive health determinants and outcomes (adaptation baseline) and evaluate effectiveness of existing interventions.
- (3) Review the health implications of the potential impacts of climate variability and change on other relevant sectors.
- (4) Estimate future health impacts under different climate change and socioeconomic scenarios.
- (5) Identify additional adaptation measures needed to reduce future estimated negative health effects.
- (6) Identify approaches to mitigate the emission of greenhouse gases by: ensuring a stronger engagement of the health sector in the national regional and global climate change negotiations, and by minimizing greenhouse gas emissions from the health sector itself (such as energy efficiency, alternative fuel supplies).

The participants noted that while adaptive measures and interventions to protect human health from the consequences of climate change require immediate attention, mitigation measures, in the form of reduced emissions by all countries, are vital. Countries that have contributed the majority of

greenhouse gas emissions should acknowledge their responsibility for generating climate change and consequent health impacts, reduce their emissions, and support mountain regions in adapting to climate change, to help ensure the long-term sustainability of mountain regions.

The participants identified recommendations to address the following areas of action: data, research, and resource needs; policy; adaptation options; awareness and capacity building. The participants also agreed on the immediate steps to be undertaken at country level to implement the framework contents. Further activities should focus on populations and areas that are most vulnerable to climate-sensitive health determinants and outcomes.

## Data, Research, Resource Needs

The current evidence supports the view that climate change accelerated by humans is now affecting mountain regions. Human health impacts are being experienced by local people, and by distant populations that rely on the ecosystem services provided by mountain regions (particularly water quality and quantity).

Climate-sensitive health determinants and outcomes of concern in the Hindu Kush-Himalaya regions include: glacier lake outburst floods; flash floods; landslides; riverine floods; malaria and other vector-borne diseases; water-borne diseases; water scarcity (quality and quantity); food insecurity; dust storms; and forest fires.

Populations that are particularly vulnerable in these mountain regions include the poor, children, women, the elderly and independently-living ethnic groups in remote areas.

The burden of some of these health determinants and outcomes is increasing. There may be other health determinants and outcomes of concern, but the evidence base is yet limited.

There is an urgent need to:

- Collect more accurate and comprehensive health, meteorological, environmental, and socio-economic data, and indigenous knowledge at appropriate local, regional, and temporal scales.
- Obtain political, financial, and technical support for long-term and ongoing data collection and analysis.

- Determine the current climate-sensitive population in each country.
- Conduct analysis to better understand the current relationship between weather/climate and health determinants and outcomes, and to use this more accurately to project the health impacts of climate change (positive and negative).
- Better understand the relationships between dust storms, air pollution, non-communicable diseases, and climate change.
- Better understand how climate change could interact with population growth and other drivers to affect water quantity and quality, and food security.
- Better understand the health-seeking behaviour of people in the Hindu Kush-Himalaya mountain region.
- Develop health and environmental indicators for monitoring and evaluating the health impacts of climate variability and change.
- Create partnerships that involve all relevant stakeholders (particularly climate/meteorology, environment, and public health/medical specialists) to develop and improve:
  - national and regional climate forecasting, and the downscaling of climate change projections
  - the response to climate variability and change in health impacts.
- Assess the health benefits of reductions in greenhouse gas emissions and emission sources.

## Policy Advocacy

- Ensure that recommendations from this workshop receive full consideration in ongoing policy processes at the local, national, regional, and global levels.
- Ensure that messages regarding the health impacts of and possible adaptation measures to climate variability and change in mountain regions are directed at political, financial, and religious leaders.
- While adaptive measures and interventions to protect human health from the consequences of

climate change require immediate attention, mitigation measures, in the form of reduced emissions by all countries, are vital. Countries that have contributed the majority of greenhouse gas emissions should acknowledge their responsibility for generating climate change and consequent health impacts, reduce their emissions, and support mountain regions in adapting to climate change, to help ensure the long-term sustainability of mountain regions.

- The reduction of greenhouse gas emissions should occur at the individual, community, and national levels.
- Climate-sensitive health determinants and outcomes should be included in future reporting on the Millennium Development Goals.

## Adaptation Options

- Adaptation measures are urgently needed to address the projected health impacts of climate variability and change in mountain regions. At a minimum, the existing infrastructure and interventions designed to minimize climate-sensitive health determinants and outcomes need to be strengthened.
- Ensure that the human health risks of climate variability and change are addressed in national emergency preparedness response plans.
- Use a systems-based approach to develop adaptation options that increase resilience to the full range of drivers that affect population health. Adaptations should be:
  - implemented over the short, medium, or long term
  - specific to the local health determinants and outcomes of concern
  - facilitate the development of community-based resource management, and
  - determine the costs and benefits of different interventions.
- Promote sustainable water resource use and management to prevent, mitigate, and adapt to the forthcoming water scarcity. Ecological sanitation solutions should be considered.

- As the estimated health impacts of climate variability and change are common to many mountain regions, regional collaboration is required to:
  - effectively and efficiently address cross-border hazards (for example, vector surveillance and control)
  - develop and install early warning systems for flash floods and glacier lake floods (including the collection, analysis, and exchange of data); and
  - improve disaster management and community preparedness and adaptation.
- Create, promote, and strengthen national, regional, and international working groups, non-governmental organizations, and civil society, to develop appropriate adaptation options.
  - Ensure that appropriate sectors, regions, and disciplines are included.

## Awareness and capacity building

- Strengthen and integrate national information management on climatological, geo-hydrological, land-use changes, and disease statistics.
- Facilitate understanding of the scientific evidence and interdependencies among climate variability and change, human livelihood, disasters, and disease vulnerability in mountain regions at country and intercountry levels.
- Build awareness amongst political and financial leaders, including local and religious leaders, of the projected health impacts of climate variability and change on populations in mountain regions.
- Develop learning resource materials for local communities (particularly women and children), health and other relevant professionals, and the media on the potential health impacts of climate variability and change and on appropriate measures to reduce climate-sensitive health determinants and outcomes.
  - Develop materials for health education, health promotion, and behavioural change committees.

- Develop school and university curriculum.
- Ensure that school and media programmes are of sufficient length and frequency that critical information is communicated.
- Ensure that messages are communicated effectively, including translation into local languages.
- Seek training and technical assistance from the World Health Organization, World Meteorological Organization, United Nations Development Programme, the United Nations Environment Programme, and other international agencies on:
  - Development of programmes on climate change and health, such as exchange programmes and short courses.
  - Methods to determine the environmental burden of disease.
  - Methods for cost-effective analysis of environmental health interventions specific to climate change and health.
  - Measures for “greening” the health sector.
- Organize national and regional workshops with support from the World Health Organization and other relevant agencies to address all aspects of climate change and health, including mountain regions.
  - Include in WHO/Ministry of Health work plans for 2006/2007.

### The workshop participants agreed on the following next steps:

At the country level, the workshop participants, or a nominated person, will:

1. Submit a formal report on the workshop outcomes to the relevant authorities in each country.
2. Disseminate information through professional media, webpages, and relevant organizations.
3. Use the workshop recommendations as input for a national policy on climate change and health impacts.
4. Prepare, if possible through environmental health cells, a proposal detailing inter- and intrasectoral stakeholder meetings to highlight the issues raised in the workshop.
5. Prepare a national inventory of key stakeholders for addressing the health impacts of climate variability and change.
6. Identify available resources (people, materials, methods, and finances) to address health impacts of climate change.
7. Engage in local, regional, and national initiatives to reduce climate-sensitive health determinants and outcomes.
8. Encourage governments, when negotiating climate change issues, to include health concerns.
9. Become involved in the preparation of the regular National Communications under the United Nations Framework Convention on Climate Change.