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Poor

Prospects

R. K. PACHAURI examines the poverty and energy security dimensions of global climate change, and calls for a combined initiative on renewable energy

The average surface warming of the Earth during the 20th century is estimated to have been around 0.6°C. The Intergovernmental Panel on Climate Change's (IPCC) Third Assessment Report (TAR) concluded that "there is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities." It provides projections of an average surface temperature increase between 1.4°C to 5.8°C in the current century, and an average sea level rise of between 9 cm and 88 cm.

Significantly, the report adds: "the impacts of climate change will fall disproportionately upon developing countries and the poor persons within all countries, and thereby exacerbate

inequities in health status and access to adequate food, clean water and other resources." Several of these impacts would have serious consequences for efforts to eliminate poverty, particularly in respect of our ability to achieve the Millennium Development Goals established in the year 2000 by the United Nations.

Expanding population

Perhaps the most serious concern relates to our ability to ensure adequate food and nutrition for an expanding population. The projections of climate change indicate that, though potential yields may rise with small increases in temperature in some temperate areas,

they would decrease with larger ones. And potential yields are expected to fall in most tropical and subtropical regions for most projected temperature increases.

Simultaneously, the availability of water is expected to decrease in most of these areas even as the demand for it is likely to increase as a result of population growth and economic development (though, of course, demand may decrease through increased efficiency of use in some countries, particularly in the developed world). Initially, water flows may actually grow in regions which depend on water flows from glaciers, such as the northern parts of the Indian subcontinent, but they are also expected to decline over time as the glaciers which feed water supply retreat.

Negative effect

Reduced water supply would also hit agricultural production. Since the largest source of jobs in several parts of the world is related to agriculture, the TAR assessed that climate change would have serious consequences for the employment of an expanding population. A high per centage of GDP in the agrarian economies of Asia and ►

Africa also comes from agriculture. Such indirect effects as changes in soil moisture and the distribution and frequency of pest infestation and diseases can have a negative effect on agricultural output, over and above possible declines in yields, on account of temperature increases and growing water scarcity. These changes could reduce income for the most vulnerable sections of society and increase the absolute number of people at risk of hunger. Thus the outlook for agriculture provides cause for concern, not just in terms of food and nutritional security but in reduced incomes and livelihoods for agrarian communities.

One likely effect of climate change is that the duration, location, frequency and intensity of extreme weather and climate events are likely to change, resulting mostly in adverse impacts on biophysical systems. These could cause changes in the variance and frequency of extreme climatic variables. More hot days and heat waves, and fewer cold and frost days, are very likely over nearly all land areas. These changes in temperature extremes are likely to result in greater crop and livestock losses, higher energy use for cooling (though lower for heating), and increased human morbidity and heat-stress-related mortality. These effects are also likely to have a disproportionately high impact on poor people.

Global responses

The health effects of climate change also have implications for poverty and the state of the poor. Climate change can affect human health through multiple pathways. Direct effects include the changes in extreme events and loss of life from floods and storms. Indirect effects would occur through increased heat stress, reduced water and air quality, and changes in ranges of disease vectors such as mosquitoes and water-borne pathogens.

Most of the impacts of climate change require greater emphasis on adaptation measures. Some require global responses, but all would involve a restructuring of local institutions and actions to permit suitable anticipatory adaptation measures to be taken. There is need, for instance, for major research

and development at the global level on developing drought-resistant and salt-tolerant crop species. These would, of course, require specific attention to local conditions in different parts of the world. As water is likely to get scarcer, it will be essential to bring about institutional changes in managing its supply and use, particularly in agriculture. These would be most important in areas dependent on rain-fed agriculture, where changes in precipitation patterns could adversely affect activity.

Premature mortality

Over two billion people lack access to electricity and modern forms of energy. Their economic condition is characterized by low-income levels and consequently of a low range of choices. In Amartya Sen's words: "poverty is deprivation of basic capabilities, rather than merely low income, which can be reflected in premature mortality, significant undernourishment (especially of children), persistent morbidity, widespread illiteracy, and other failures."

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Choices, particularly for the poor in rural areas, can be enhanced only through the appropriate provision of energy, preferably through decentralized and distributed technology. Using renewable energy technologies limits emissions of carbon dioxide and other greenhouse gases compared to conventional energy supply. Such solutions would also enhance the incomes of poor people, providing them with a capacity to adapt to the impacts of climate change, which could otherwise be constrained by persistent poverty. A combined institutional initiative for mitigation and adaptation measures would be essential in this area.

Development strategies

In view of the likely impacts of climate change, and their implications for economic development at the basic grassroots level – particularly for poor communities – it is essential that

they are carefully integrated in future development strategies in different parts of the globe. This would, of course, call for substantial region-based assessment of the nature and extent of climate change and its impacts.

For this reason the IPCC's Fourth Assessment Report (AR4), has included the assessment of the regional aspects of climate change – among cross cutting themes identified for emphasis – in greater depth than in its predecessors. The extent to which regional assessments become possible, however, would directly depend on the extent of research that is carried out in different parts of the world. Multilateral organisations and national governments both have a responsibility to support such research if the predicament of the poor is to be understood. It is needed as the basis on which effective mitigation measures can be undertaken globally, and adaptive measures locally. Even more critical – over and above assessing the biophysical impacts of climate change – is the need to support and foster research on their socio-economic dimensions ■

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