

Some priorities for future research may be summarised as follows:

- Improved knowledge is needed of effects of changes in climate on crop yields and livestock productivity in different regions and under varying types of management. To date, less than a dozen detailed regional studies have been completed, and these are insufficient as a basis for generalising about effects on food production at the regional or world scale. Further research in vulnerable regions in particular should be encouraged.
- Improved understanding of the effects of changes in climate on other physical processes is needed: for example on rates of soil erosion and salinisation; on soil nutrient depletion; on pests, diseases and soil microbes, and their vectors; on hydrological conditions as they affect irrigation water availability.
- An improved ability is required to 'scale-up' our understanding of effects on crops and livestock, effects on farm production, on village production, and on national and global food supply. This is particularly important because policies must be designed to respond to impacts at the national and global levels. Further information is needed on the effects of changes in climate on social and economic conditions in rural areas (eg employment and income, equity considerations, farm infrastructure, and support services).
- Further information is needed on the range of potentially effective technical adjustments at the farm and village level (eg irrigation, crop selection, fertilising etc) and on the economic and political constraints on such adjustments. In particular, it is

recommended that national and international centres of agricultural research consider the potential value of new research programs aimed at identifying or developing cultivars and management practices appropriate for altered climates.

- Further information is needed on the range of potentially effective policy responses at regional, national and international levels (eg reallocation of land use, plant breeding, improved agricultural extension schemes, large-scale water transfers etc).

Potential impacts on managed forests and the forest sector

All impacts referred to in this section reflect the current uncertainty in the extent of warming, and levels and distribution of precipitation. They reflect the consensus that anthropogenic change is occurring; the direction is towards higher temperatures, with the extent affected by latitude and continentality.

The distinction between managed and unmanaged forests is often unclear, but it is taken here to be one of degree in the intensity of human intervention. In managed forests, harvesting takes place and the forests are renewed, replaced or restructured in such a way that actual physical inputs are needed to achieve goals.

Managed forests are quite distinct from the unmanaged forests. They supply a wide variety of products and are found in a wide variety of countries with different social, physical and political environments. The intensity of forest management may not necessarily parallel the degree of economic development; different countries depend to different degrees on the products from forests.