

SOCIO - ECONOMIC DRIVERS OF CLIMATE CHANGE

That climate change will determine shifting patterns of plant growth and present challenges and opportunities to current agricultural practice is not in dispute. But the rate at which any climate change will apply has to be considered against rates of change in the socio-economic systems upon which they are superimposed.

Future socio-economic development will strongly influence the impacts of climate change on food security (Schmidhuber and Tubiello, 2007). The interaction with socio-economic drivers such as population and income growth has the potential to exacerbate and counteract the direct impacts of climate change. Management responses to environmental variability and socio-economic change are themselves varied, and has exhibited varying degrees of success and failure.

Below are presented a number of key drivers that will interact with climate change.

Population growth

the global population will increase by almost 50% in 50 years. Regional differences will be dramatic and most of the population increase will coincide with countries already facing severe development and management problems.

Population distribution and dynamics

Populations will not only increase but also move. Urbanization will continue to drive development patterns. Urbanisation can exacerbate climate change impact on water by changing physical properties(run-off, soil water and groundwater recharge, evaporation, etc.), thus influencing the capacity for agriculture in the vicinity of the city, but growing cities are also a competitor for water. In addition, urbanization has a general impact on consumption patterns. The urbanization trend will continue and by 2050, the urban population is expected to have doubled.

Overall Economic development

Economic development can be both a negative and positive driver. There is, for example, a direct relationship between Gross Domestic Product (GDP) and diet, and as global economy is expected to grow at a rate far exceeding population growth, this is clearly a fact or that needs to be considered. Economic growth tends also to lead to increasing competition over natural resources, including land and water. Economic development also generates resources that can be reinvested in agriculture.

Consumption patterns

According to a recent report, the livestock sector generates more green house gas emissions as measured in CO₂ equivalent– 18 percent – than the transport sector. This is one example of how trends in consumption patterns can shape future resource use and impacts. With increased prosperity, people are consuming more meat and dairy products every year. Global meat production is projected to more than double. Understanding the effect of consumption patterns is also essential from a wider climate change mitigation perspective.

Natural resource constraints and competition

Development related drivers, such as economic growth, would increase pressure on natural resources. Resource constraints and increased competition are in themselves drivers that could have potentially serious effects on food production capacities – competition over land, water, energy, and fertilizers, just to mention a few. Constraints may be a result of the lack of adaptation to the physical limitation of the resource, weak distribution systems and lack of relevant infrastructure, capacity(management and economic) problems, or a combination of these factors. Economic development, urbanization and population growth will also require more resources for other ‘sectors’ – such as energy, industry etc.

Although there are economic activities that will ‘compete’ with agriculture, the energy sector is likely the single most important. Water and energy is intrinsically correlated, and it is through the shared requirements of abundant water resources that agriculture and energy are so closely linked. Climate change, making less water available in some regions, can entail increased competition (e.g. hydro power versus irrigation).

Energy production requires water resources in the production phase (hydropower, bio-energy, geothermal energy, wave and tidal energy) or for cooling purposes.

Although not always a consumptive user of water, there are direct water related challenges, for example increased evaporation from reservoirs, water use for bio-energy production or water quality degradation.

Bio-energy

Increases in bio-fuel production have direct impacts on water consumption and food availability. Although bio fuels could be a potential for many poor countries, areas already or on the brink of experiencing water stress could see reduced water availability for more basic needs of people as well as for vital ecosystems. Demand for biofuels based on agricultural feed-stocks will be a significant fact over the next decades and it has already contributed to higher food prices.

Source: <http://www.iwawaterwiki.org/xwiki/bin/view/Articles/Producingenoughfoodinaclimateinsecureworld>