Agriculture – managing risk and enhancing resilience

Climate change poses significant risks for the agricultural sector and for global food security. Resilience to the impacts of a warming world will be enhanced by keeping the inevitable rise in average global temperature below certain key thresholds.

Recent extreme climatic events, such as heat waves, floods, droughts, and wildfires, are combining with long-term trends including rising temperatures and changes in precipitation patterns, with broad and deep implications for the agricultural sector.

Greenhouse gas (GHG) emissions from agriculture comprised about 10–12% of man-made GHG emissions in 2010. This is the largest contribution from any sector of non-carbon dioxide (CO₂) GHGs such as methane, accounting for 56% of non-CO₂ emissions in 2005. The agricultural sector has significant potential to make cuts in GHG emissions.

Adaptation is highly context-specific, and no single approach for reducing risk is appropriate across all regions, sectors, and settings. Farmers can adapt to some changes, but there is a limit to what can be managed. Agricultural companies can draw from a range of options to maximise adaptive capacity based on a solid understanding of risks.

Resilience requires both mitigation and adaptation.

We are currently on a path to a global mean temperature rise in the range 1.5 to 4.5°C by the end of the century. The higher end of this range would push agriculture far beyond manageable thresholds. The agricultural sector’s own interests are best served by implementing ambitious approaches to mitigation to ensure that key temperature thresholds are not crossed, while also working to enhance adaptive capacity to inevitable temperature rises and associated climate events.

**Steps for Mitigation**

- Reduce livestock feed and dietary additives for livestock
- Improve agronomy, nutrient and fertilizer management for cereals
- Establish agro-forestry systems
- Replace fossil fuels by biofuels
- Integrate bioenergy production and food production

**Steps for Adaptation**

- Improve crop rotation systems
- Alter cultivation and sowing times
- Use adaptive water management techniques
- Crop cultivation and harvesting times
- Improve crop resistance systems

**Crop Options**

- Improve tolerance of crops to high temperature
- Breed additional drought-tolerant crop varieties
- Use adaptive water management techniques
- Crop cultivation and harvesting times
- Improve crop resistance systems

**Livestock Options**

- Reduce livestock density in regions where it is prevalent
- Reduce loss and waste of food in supply chains
- Change diets towards less GHG-intensive food

**Supply Side Options**

- Integrate bio-energy production and food production
- Establish agro-forestry systems
- Improve feeding and dietary additives for livestock

**Demand Side Options**

- Reduce meat consumption in regions where it is prevalent
- Reduce loss and waste of food in supply chains
- Change diets towards less GHG-intensive food

**Policy Options**

- Index-based weather insurance
- Risk sharing and transfer mechanisms
- Public-private finance partnerships
- Payments for environmental services
- Improved resource pricing
- Trade reform

**Key Findings from the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5)**

- Global temperature increases of 1.5°C or more, combined with rising food demand, would pose large risks to food security globally and regionally.
- Adaptive capacity is projected to be exceeded in regions closest to the equator if temperatures rise by 3°C or more.
- Local warming of up to 3°C is expected to reduce average yields for the major cereals (e.g., wheat, rice, maize) in temperate regions.

For more information, visit: climatechange-everyonebusiness.org