

Planet in 2050 Vision Statement

Washington O. Ochola

Depending on local, national and regional policies, their implementation and interactions, the nexus between the ecosystem and human activities especially industrialization and agriculture will continue to determine the state and trends in environmental goods and services. Key drivers of agriculture towards 2050 will include an increasing global population, changes in dietary and trade patterns, land competition, increases in agricultural labour productivity, climate change and demands for agriculture to provide ecosystem services. Science and technology will be significant in shaping agro-ecosystems. Crop and livestock product prices will have increased sharply towards the next 4 decades driven by among others an expansion of biofuel production and rapid increases in food demand. Energy crisis, expected to impact global socio-economic, environmental and geopolitical balances will be interlinked with the Planet's status after 2030 more significantly. The expected increases in global population over the next 50 years (about 2-3 billion people), ongoing urbanization, and changing life patterns will lead to a sharp increase in demand for food and pressure on the agro-ecosystem. The demand for ecosystem goods and services will be directed by changes in diet, food and other human preferences. International trade in agricultural and ecosystems commodities will increase with many developing countries becoming net importers.

The pathway towards 2050 is likely to be characterised by a combination of intensification of agricultural production and expansion of cultivated land to meet increasing demands for food, feed, fibre and fuel. Bioenergy production will become a major use of land, possibly increasing, even in the long-term, food prices and decreasing biodiversity. Bioenergy production based on the conversion of cellulose to fuel ethanol or other hydrocarbons will impact food security and biodiversity less than 1st generation biofuels. Global Environmental Change (GEC), such as land degradation, nutrient pollution, biodiversity loss, decreasing surface and groundwater availability and climate change, will intensify. The planet and its inhabitants will also have to adapt to these changes to sustain its ecosystem and guarantee human wellbeing. Knowledge science and technology including soft systems will determine the capacity of agro-ecosystems to respond to the likely climate changes. The technologies will predict and control the emissions and impacts of GHGs such as carbon dioxide, methane and nitrous oxide. The underlying drivers and critical uncertainties about how the global context and Planet Earth may change over the coming decades will include demography, culture and society, climate change, governance and policy, education, science and technology, agriculture, industrialization and trade.

In the coming decades, the evolution of policy and a continued dependence on fossil fuels will dictate the global energy mixes. Consumption of fossil fuels, coal (1.8–2.5% per year), oil (1.3–1.4% per year) and natural gas (2.0–2.4% per year) will continue to grow up to 2030. Non-fossil fuels, nuclear (0.7–1.0% per year), hydro (2.0% per year), biomass and waste, including non-commercial biomass (1.3% per year), and other renewables (6.6% per year) will also continue to grow. Air pollutants, such as sulphur aerosol, will have a significant effect on the climate system. More scientific knowledge will emerge on anthropogenic aerosol emissions. Technology research and development (R&D) will be important for altering the emission trends. The “common but differentiated responsibilities” the environmental public and policy responsibility will hinge on global policy infrastructure as well as the rate of global diffusion and transfer of new as well as existing technologies.