Food and Agriculture Organization of the United Nations

Impact of Climate Change on Plant Health

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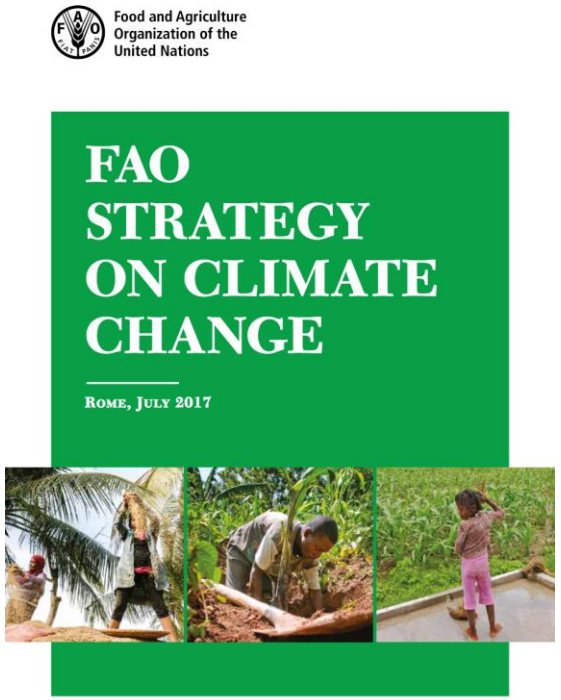
FAO Strategy on Climate Change

- To enhance institutional and technical **capacities** of Member States;
- To improve **integration** of food security, agriculture, forestry and fisheries within the international climate agenda;
- To strengthen internal **coordination** and delivery of FAO's work.



Impact of Climate Change on Plant Health

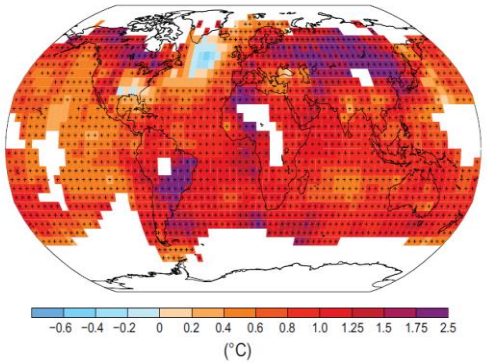
Linkages at two levels:

1. Plant protection level
2. Plant genetic resources level

Impacts – Plant Protection Level

Impact on distribution, incidence and intensity of plant pests and diseases

- Impacts induced by **changes in temperature and precipitation patterns** (slow-onset & extreme weather events)



Map of the observed surface temperature change from 1901 to 2012 (IPCC, 2013)

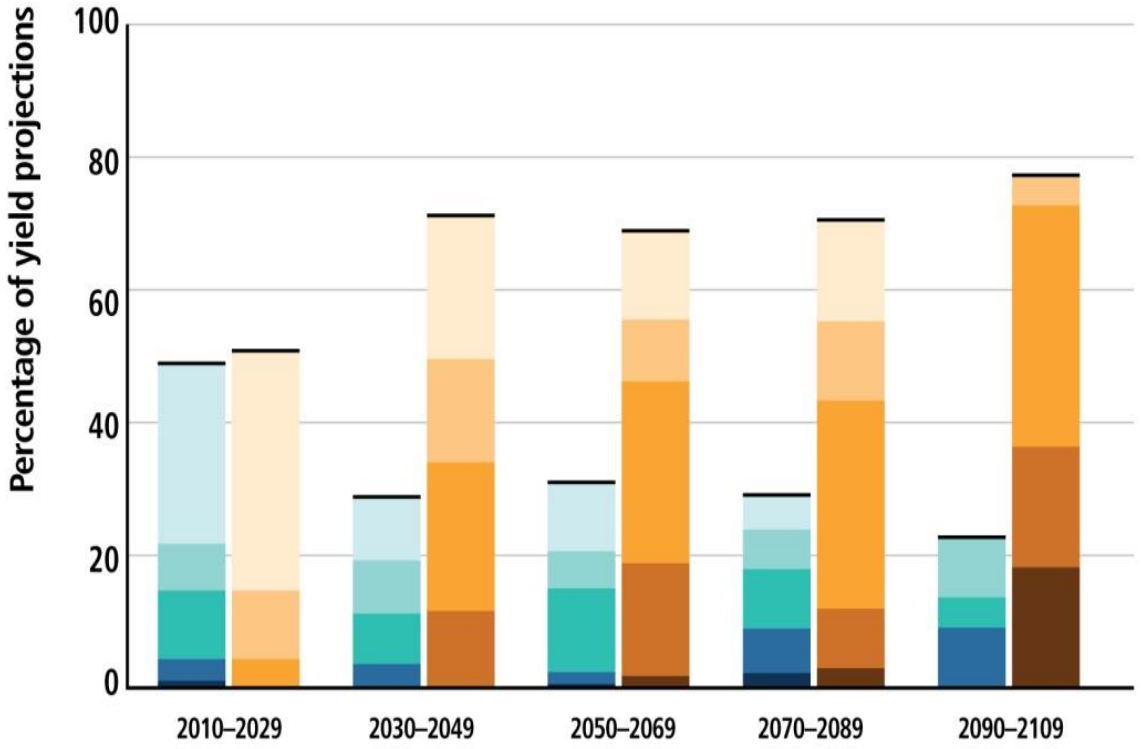
- Movement of plant pests into new areas and across boarders, **threatening food security and nutrition**

Impacts – Plant Protection Level

- Focus is most often on impacts for crop production

Declines in global crop yields could reach 10-25% or more by 2050

(IPCC AR5)



Source: IPCC, 2014a; p.18

Impacts – Plant Protection Level

- Yield projections often do not consider **biotic factors** (e.g. climate change-induced pest, diseases and weed impacts)
- Impacts of climate change on yield *through biotic factors* **still uncertain** and not well documented
- Impact of climate change on plant health has **not received much attention** so far

Impacts – Plant Protection Level

Impacts on food security, environment and trade

- Plant pests and diseases responsible for **losses of at least 10%** of global food production
- Plant pests **spreading into new areas**, with devastating effects on food security, the environment and trade
  - SPS Agreement
  - Impact on international trade of agricultural commodities
  - International harmonization

Impacts – Plant Protection Level

Impact on species composition and interactions

- **Risk** to have **new pests and diseases emerging** from new climate conditions (temperature and precipitation patterns)
- **Risk** for pests to **extend their range** with climate change

More attention should be paid to:

- The effects of climate change on **biotic factors** in the tropics, such as weeds, pests, and pathogens
- **Interactions** between pathogens, hosts environment and human systems

Impacts – Plant Protection Level

- FAO hosts the **IPPC and its secretariat** since 1952 (entry into force of the Convention)
- 180+ contracting parties developing and implementing **International Standards** on Phytosanitary Measures to address these challenges
- The establishment of **international plant health standards** is essential to ensure healthy plants

Impacts – Plant Genetic Resources Level

Plant genetic resources:

- **Vast diversity** of heritable traits that have enabled crops to adapt to physical and biological stresses (e.g. drought, heat, cold, pests and diseases)

- Diversity can help crop production systems **adapt to climate change impacts**, and reduce the need for external inputs that can be damageable to the environment

Impacts – Plant Genetic Resources Level

Climate change and plant genetic resources:

- Increased **risk of emergence and spread** of pests, diseases or pathogens induced by climate change
- **Lack of genetic diversity in crop production: plants** become uniformly **susceptible**
- In turn this can **increase vulnerability** and may create the potential for widespread crop losses

Impacts – Plant Genetic Resources Level

- Approaches to **reduce the vulnerability** of crops to changing conditions created by climate change include:

  - Introduction of **varieties of more suitable crops** from elsewhere

  - Incorporating into cultivars through breeding **the novel traits** (e.g. resistance to biotic and abiotic stresses) that are often found in crop wild relatives, landraces and farmer varieties

Impacts – Plant Genetic Resources Level

- Climate change will also affect the **ability** of many crop wild relatives to **survive** in their current locations
  - ➢ These crop wild relatives are **potential gene donors** for crop improvement programs

- Consider use of plant genetic resources to support climate change **adaptation** in food and agriculture sectors

Conclusions

- Strengthen capacity development; sustainable human and financial support,
- Develop international and national strategies for plant health to address climate change impacts
- 2020 International Year of Plant Health
  - Raise awareness of plant health, and financial resources
  - Trigger further action to achieving Sustainable Development Goals (especially SDGs 1, 2, 8, 13, 15, and 17)
- Preparations for UNFCCC COP24 in Katowice, Poland, Dec 2018

Thank you