Background Paper

Committee: Food and Agriculture Organization

Topic I: Biotechnology, GMOs, and Chemical Use in Food: Ensuring Safe and Sustainable Agriculture

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Feeding a growing global population while protecting the environment has become one of the greatest challenges of our time. Biotechnology and genetically modified organisms (GMOs) have emerged as powerful tools to help farmers produce more food with fewer resources. By making crops more resistant to droughts, pests, and diseases, these technologies can reduce harvest losses and dependence on chemicals. Still, they raise important questions about ethics, safety, and sustainability that the international community must address together.

Over the past few decades, biotechnology has led to significant breakthroughs such as pest-resistant cotton, drought-tolerant maize, and vitamin-enriched rice. These innovations have increased yields and improved resilience in many regions. However, concerns remain about potential effects on biodiversity, corporate control over seeds, and the long-term environmental impact. In many developing countries, farmers lack access to biotechnology and the knowledge to use it safely, which deepens the gap between industrial and traditional agriculture.

The use of agricultural chemicals including pesticides, herbicides, and fertilizers, has also been key to boosting food production, but it comes with a cost. When overused or mismanaged, these substances can contaminate soil and water, harm pollinators, and endanger human health. According to FAO data, millions of people are affected by pesticide exposure each year, especially in countries with limited safety regulations.

The FAO plays a central role in balancing innovation and safety. Through programs like the International Code of Conduct on Pesticide Management and the FAO–WHO Codex Alimentarius, the organization promotes responsible use of biotechnology and chemicals. These efforts aim to ensure that scientific progress supports both productivity and sustainability without compromising public health or environmental protection.

Despite clear progress, several challenges remain. Global regulations are uneven, public trust in GMOs is low in some regions, and farmers often lack resources to shift to safer practices. Some countries see biotechnology as a solution to food insecurity, while others are cautious due to ethical or ecological concerns. Building consensus and cooperation through the FAO is essential to create fair, science-based policies that benefit everyone.

Ultimately, ensuring food security in the modern era will depend on how well we integrate technology with sustainability. The FAO and its member states must keep promoting research, education, and equitable access to agricultural innovation so that every farmer, in every region, can grow food safely and sustainably.

Key Issues

1. Biotechnology and GMOs

- **Main Causes:** The search for higher productivity and resilience against climate change.
- **Global Repercussions:** Unequal access to innovation, potential biodiversity loss, and social controversy.
- **Importance:** Fair and transparent GMO regulation encourages progress while protecting ecosystems and public trust.

2. Chemical Use in Agriculture

- **Main Causes:** Dependence on synthetic pesticides and fertilizers to ensure large yields.

- **Global Repercussions:** Environmental pollution, soil depletion, and health problems in rural areas.
- **Importance:** Reducing chemical use strengthens environmental safety and food quality worldwide.

3. Sustainable Agriculture Practices

- **Main Causes:** Lack of education and resources for farmers to adopt eco-friendly alternatives.
- **Global Repercussions:** Long-term food insecurity and environmental harm.

Guiding Questions

1. How can the FAO promote innovation in biotechnology while safeguarding biodiversity and public health?

2. What policies should member states adopt to regulate chemical use without reducing agricultural productivity?

3. How can the FAO support developing countries to access biotechnology safely and sustainably?

Key Timeline

- **1996:** The first commercial GMO crops are introduced, transforming global food systems.

- **2003:** FAO and WHO establish the Codex Alimentarius guidelines on genetically modified food safety.

- **2015:** Global attention rises on pesticide impacts on pollinators and soil health.

- **2020:** WHO reports an increase in pesticide-related illnesses worldwide.

- **2022:** More countries update GMO regulations to strengthen food safety and environmental standards.

- **2023:** FAO launches initiatives promoting sustainable biotechnology and reduced chemical dependence.

- **2024 (Ongoing):** International cooperation expands to ensure that agricultural innovation remains both safe and sustainable.

Works Cited

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