UN Commission on Science and Technology for Development

The role of science, technology and innovation in ensuring food security by 2030

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Outline

01.Challenge of Food Security

02. Role of Science, Technology, and Innovation in Food Security

03.Fostering Innovative Food Systems

04. Policy Issues and Conclusion

01. Challenge of Food Security

Food Security: Dimensions

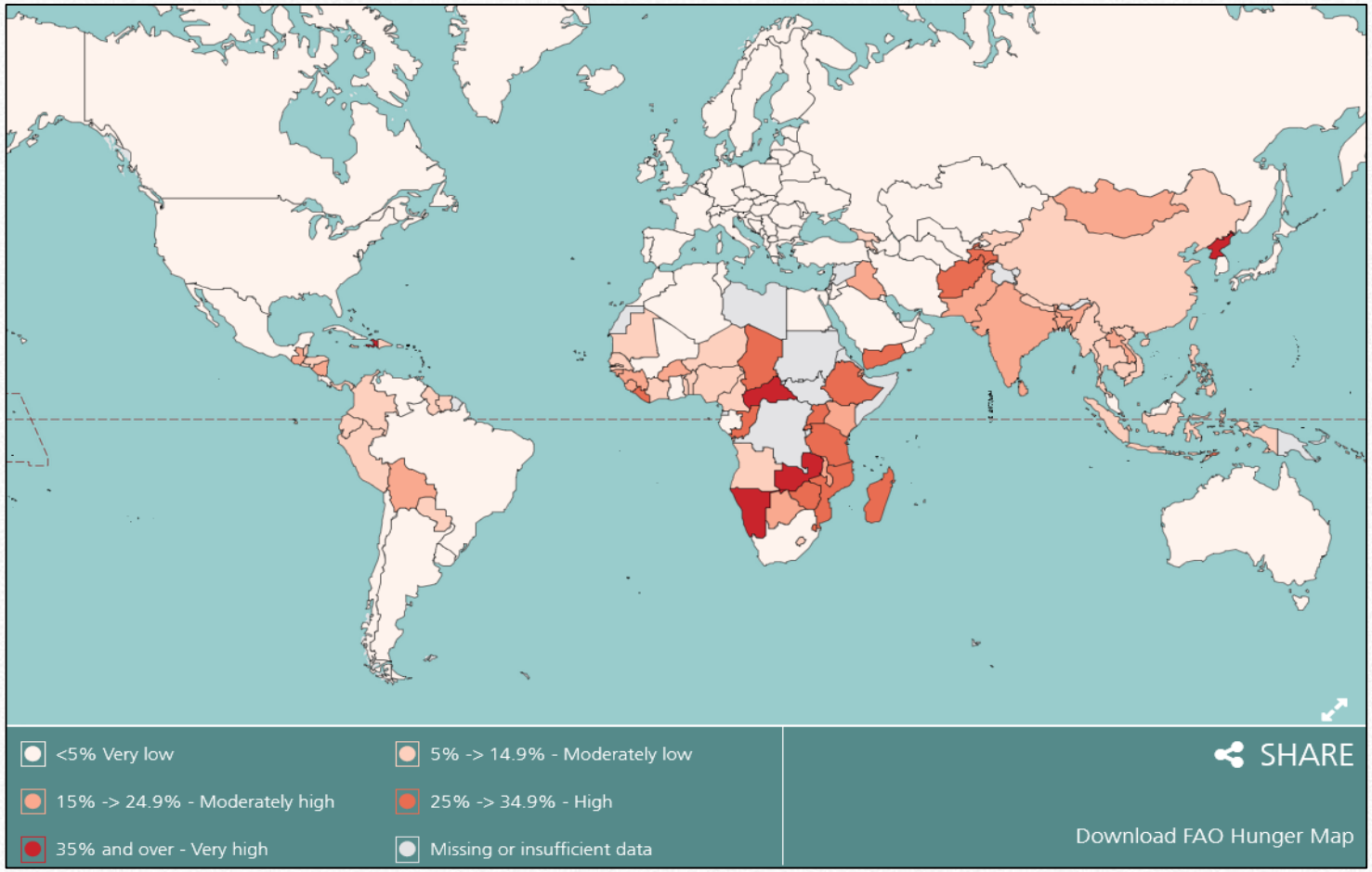
01. Food Availability
"Supply side" of food security determined by level of food production, stock levels, and net trade.

02. Food Access
Economic and physical access, including policy focus on incomes, expenditure, markets, and prices in achieving food security.

03. Food Use/Utilization
Sufficient energy and nutrient intake, including attention to good care and feeding practices, food preparation, diet diversity, etc.

04. Food Sustainability
Adequate access to nutritious food at all times, including focus on weather conditions, political stability, and economic factors.

Food Security: Scale and Scope



Developing Countries

Of 795 million hungry people, 780 million live in developing countries.

Smallholder Farmers

More than 80% of the food in Asia and Sub-Saharan Africa is produced by smallholders.

Food Security: Global Efforts

Recent global efforts to combat food insecurity

Millennium Development Goals

Target 1.C: Halve, between 1990 and 2015, the proportion of people who suffer from hunger

Zero Hunger Challenge

End hunger, eliminate all forms of malnutrition, and build inclusive and sustainable food systems

Sustainable Development Goals

Goal 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture

02. Role of Science, Technology, and Innovation in Addressing Food Security

Food Availability: Food Gap

Science, technology, and innovation can play a critical role in producing more food

70%

Food Gap

FAO (2006) identified a "food gap" close to 70 per cent between the crop calories available in 2006 and the expected calorie demand in 2050

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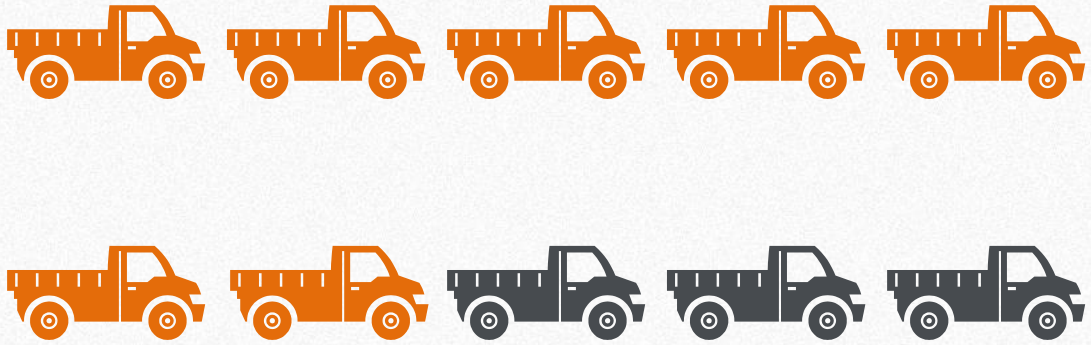
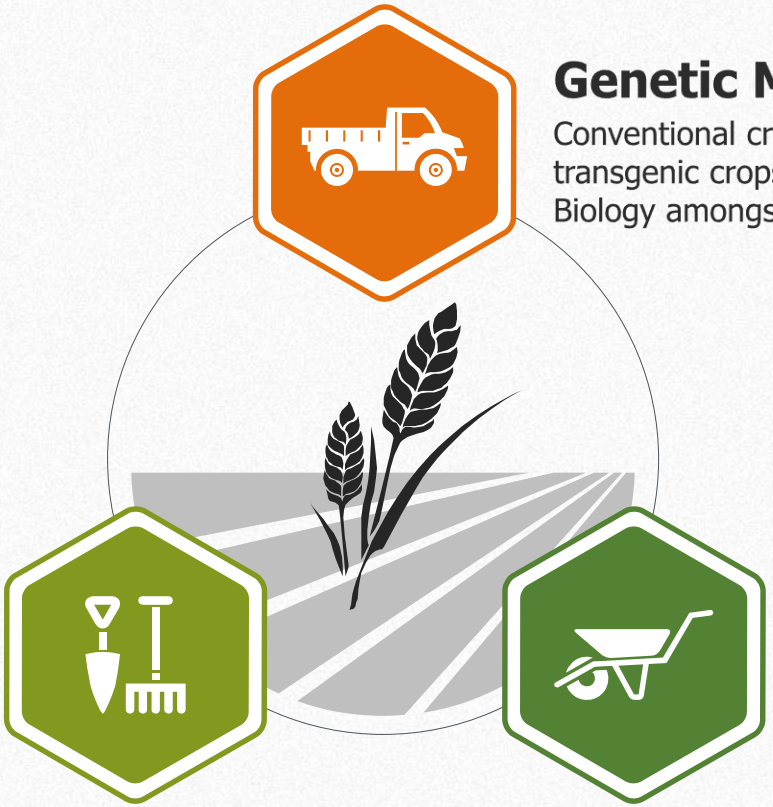


Food Availability: Innovations



Genetic Modification

Conventional cross-breeding, transgenic crops, and synthetic Biology amongst other methods.

Improved Soil Fertility

Nitrogen fixation, technologies for creating biological fertilizers, and precision agriculture.

Irrigation Technologies

Renewable energy-powered irrigation pumps, rainfall storage systems, planting technologies for increased water efficiency, and "big data."

Food Access

Food Loss and Waste

One key aspect of accessing food is minimizing food losses during production, storage and transport, and food waste.

New technologies

Harvest and post-harvest technologies for storage, handling, refrigeration, transport, and processing.

Local capacity-building

Investing in local talent to fabricate and repair post-harvest technologies can improve affordability and availability.

Links to International Markets

Improving capabilities of smallholder farmers to produce for international markets can contribute to productive trade.

Food Use/Utilization

1 billion people

Insufficient calories and nutrients

Only 3 billion people have sufficient and not excessive calories and sufficient nutrients. Undernutrition can lead to hidden hunger, wasting, and stunting, with irreversible damage to individuals and society.

Biofortification

40 countries, 10 million people

Biofortification has emerged as an effective approach for combating malnutrition. The orange-fleshed sweet potato developed at the International Potato Center has been recently recognized by the World Food Prize.

Food Stability

Climate Change Adaptation/Mitigation

Carbon sequestration, locally adapted breeding for drought and heat tolerant varieties

Precision Agriculture

Big Data and the Internet of Things (IoT) for decision support and index-based insurance

Early Warning Systems

Satellite and meteorological data for adaptation to changing climate and environment

New/Converging Technologies

Potential profound impacts on the future of food

Synthetic Biology

CRISPR/Cas9

Big Data and IoT

Precision Agriculture

Artificial Intelligence

"Robot" farmers

Tissue Engineering

Lab-grown livestock

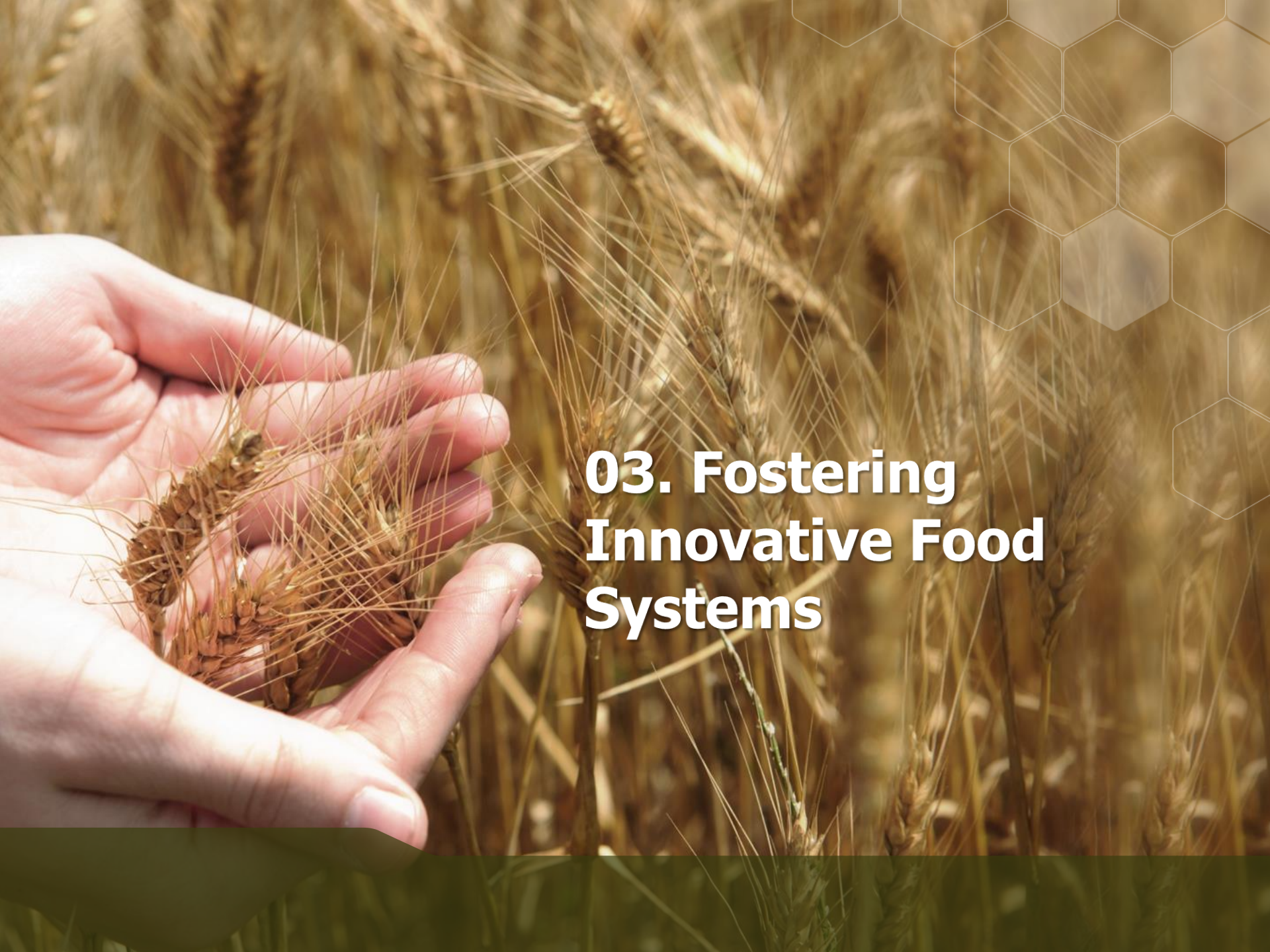
3D Printing

3D printed food

Drones

Hyperspectral imaging

Need for Global Technology Assessment and Foresight Mechanisms



03. Fostering Innovative Food Systems

Innovative Food System

Ecosystem and supporting mechanisms for agricultural innovation

04. Policy Issues and Conclusion

Policy Issues

Potential Topics for Discussion

Agricultural R&D and Innovation

How to increase agricultural R&D and support agricultural innovation?

Enabling Environment

How to strengthen infrastructure, policy framework and inter-sectoral links?

Sustainable Production

How to support environmental sustainability and agro-ecological practices?

Access to Technology and Extension Services

How to make tech, data, and services accessible to smallholders and particularly women?

Human Capacity

How to create knowledge base and pool of experts?

International Cooperation

How to harness "knowledge aid" to support agricultural innovative capacity-building?

UN Technology Assessment

ATAS XII

Advanced Technology Assessment System

THE ROLE OF PUBLICLY FUNDED RESEARCH AND PUBLICLY OWNED TECHNOLOGIES IN THE TRANSFER AND DIFFUSION OF ENVIRONMENTALLY SOUND TECHNOLOGIES

UNITED NATIONS
New York and Geneva, 2000

Thank you

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