

Forum: Youth Assembly Third Committee

Issue: Using AI for the Enhancement of Agricultural Practices (SDG12)

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Introduction

In modern times, populations continue to grow as does the demand for food, emphasizing the need for innovative solutions to continuous agricultural practices while minimizing environmental impacts. Addressing the matter at hand, Sustainable Development Goal 12 (SDG12), established by the United Nations in 2015, aims at promoting sustainable consumption and production; precisely, Goal 12.2 concerns the responsible management of natural resources. In this sense, Artificial Intelligence (AI) emerged as a transformative tool with the potential of performing sustainable agricultural practices and achieving the purposes that SDG12 sets out. Current AI technology such as weather forecasting, pests' detection, and soil and crop health monitoring systems can not only observe the conditions in which crops can optimally grow in but also document information on the crops' growth, alleviating the farming process and improving efficiency. Utilizing such measures is sure to enhance current agricultural practices and induce sustainable development.

Definition of Key Terms

Artificial Intelligence (AI): Technology that imitates human intelligence through an algorithm that processes data and applies it to make decisions and perform certain tasks.

Agriculture: The practice of cultivating soil, growing crops, and raising animals for food and products essential for human life and survival.

Sustainability: In the environmental context, sustainability is the ability to conservatively use natural resources while taking into account the long-term consequences of the ways in which resources are used.

Background Information

The use of AI in agriculture plays a critical role in fulfilling Sustainable Development Goal 12 (SDG 12), which focuses on promoting sustainable consumption and production patterns. For instance, Different AI technologies-drones, sensors, and data analytics-offer innovative resolutions to optimize the management of crops while reducing environmental impacts. Key initiatives, such as the Food and Agriculture Organization's (FAO) Digital Agriculture initiative, International Fund for Agricultural Development's (IFAD) climate-smart agriculture projects, and IBM's Watson Decision Platform for Agriculture, have emphasized the benefits of AI in sustainable agricultural practices especially in less developed regions. Still, these AI advancements are difficult to implement due to challenges such as limited access to technology and scalability. For that reason, investment and collaboration between governments, tech companies, and international organizations are essential to overcoming these barriers and ensuring that AI can contribute to more sustainable, efficient, and resilient agricultural systems globally.

Major Parties Involved

The United States of America: USA is rapidly advancing in the technological aspect and adopting artificial intelligence in agriculture. Greeneye technology, John Deere, and similar large companies have already implemented AI into their work and it's evident that this trend will continue to expand in the US.

China: Results from the World Bank and the National Bureau of Statistics, in 2016, show that China's cultivated land area occupied a great proportion in comparison to the rest of the world; however, due to serious effects of natural disasters, the agricultural sector is of poor quality. For

that reason, China's motivation to utilize AI is evident as it is one of the leading countries in AI development.

India: World Economic Forum's Centre for the Fourth Industrial Revolution India collaborated with India's Union Ministry of Agriculture and the state of Telangana to launch the AI for Agriculture Innovation (AI4AI) in August of 2020. As Indian farms suffer unexpected price fluctuations, AI blockchains and such are being used to balance the profit made from agriculture.

Timeline of Key Events

Date	Description of Event
2015	The 2030 Agenda for Sustainable Development Goals (SDG) was adopted by all United Nations member states. It included SDG12: Responsible Consumption and Production, which emphasizes reducing waste, promoting sustainable resource use, and encouraging circular economies. The rise of artificial intelligence in technology proved to enhance agricultural practices; therefore, SDG further promoted the development of AI in the agricultural sector.
1996	A research team from the Institute of Electrical and Electronics Engineers (IEEE) designed AURORA, an autonomous mobile robot to substitute difficult and harmful human labor and exposure to pesticides inside greenhouses. Employed with sensors and operation devices, the robot served the purpose of combining autonomous navigation and shared human control.

<p>June 3rd to 14th 1992</p>	<p>The United Nations Conference on Environment and Development (UNCED), also known as the Earth Summit, established the Agenda 21, which outlined sustainable development goals for the 21st century. Chapter 14 (Promoting sustainable agriculture and rural development) of the document identified agriculture as a key sector for achieving sustainable development and emphasized the need for action to be taken.</p>
<p>1980s</p>	<p>Japan was the first to utilize artificial intelligence in agricultural practices as they first developed a robot that sprays pesticides onto the fields.</p>

Previous Attempts to Resolve this Issue

Certain technologies using AI have emerged and provide solutions towards more sustainable agricultural practices, four of which are the following:

1- Precision Agriculture with GIS and GPS: The advent of Geographic Information Systems (GIS), Global Positioning Systems (GPS), and remote sensing technologies in the 1990s allowed for the collection of spatial data on crop health, soil conditions, and environmental factors, increasing efficiency and improving productivity. However, their success was often limited by high costs and the need for specialized knowledge to analyze the data effectively as AI was not yet an omnipresent tool, but it was quickly making its way into the agricultural sector.

2- AI in Crop and Pest Monitoring: With the rise of machine learning and computer vision, different kinds of AI-driven systems were developed by both researchers and companies that can analyze images from drones, satellites, and sensors to detect diseases, pests, and nutrient deficiencies at an early stage to allow precision application of pest control and thus reduce crop loss.

3- Autonomous Tractors and Robots for Precision Farming: Companies such as John Deere, CNH Industrial, and Naïo Technologies started focusing their development on AI-driven autonomous tractors and robots for harvesting, which had sensors, cameras, and AI algorithms to carry out planting, weeding, and harvesting with minimum human intervention.

4- Climate-Smart Agriculture: AI-designed models predict changing weather patterns, optimize planting schedules, and assist in crop selection based on future climate conditions. This is the latest kind of AI development in the agriculture sector and indeed the most promising type as it advances cost-effective and sustainable practices.

Possible Solutions to Resolve this Issue

1- AI Services:

Rather than each company or organization starting their own AI technologies and programs, subscription based models can be used to reduce upfront costs and allow for less developed countries to utilize AI in agriculture.

2- Climate Adaptive Seed Varieties:

AI tools can be programmed to predict and create the optimal hybrid seed varieties through genetic modification by assessing local climate data and soil conditions.

3- Bio-Robots for Precision Pest Control:

Small, AI-controlled bio-robots will be designed to target and eliminate specific pests or weeds without harming other plants or wildlife using biodegradable materials.

4- AI-Driven Crop Demand and Supply Platform:

An AI-powered platform that integrates real-time data from farms and market trends to track crop availability and predict demand would certainly provide great benefit. It can optimize supply chain logistics and provide price and stock alerts, ensuring efficient resource allocation, reducing waste, and balancing both supply and demand sustainably.

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