



4IRTA

DEMONSTRATION PROJECT

Application of UAV, IoT, Blockchain and AI to Agriculture in Nigeria

NOVEMBER, 2023



Background

The Nigerian agricultural sector significantly contributes to the country's economy, employing over 35% of the workforce¹ and accounting for over 20% of Nigeria's GDP². However, the sector faces some challenges, such as low productivity, limited adoption of technology and climate change.

The use of Four Industrial Relation (4IR) technologies, such as Unmanned Aerial Vehicles (UAVs), Internet of Things (IoT), Artificial Intelligence (AI) and Blockchain, has the potential to revolutionise the Nigerian agricultural sector³. These technologies, amongst others, can be used to improve crop yields, monitor soil health, detect pests and diseases, and manage logistics⁴.

Objective

Identify, demonstrate and mainstream applicable market-ready innovation that leverages 4IR technologies (UAVs, IoT, AI and Blockchain) to enhance the productivity and sustainability of the Nigerian agricultural sector



¹Statista (2023)

²Statista (2023)

³Rejeb, A., Abdollahi, A., Rejeb, K., & Treiblmaier, H. (2022). Drones in agriculture: A review and bibliometric analysis. *Computers and electronics in agriculture*, 198, 107017.

⁴Wakchaure, M., Patle, B. K., & Mahindrakar, A. K. (2023). Application of AI techniques and robotics in agriculture: A review. *Artificial Intelligence in the Life Sciences*, 100057



FMAFS
FEDERAL MINISTRY OF AGRICULTURE
AND FOOD SECURITY

4IRTA



Scope of Work

This intervention will fund demonstration projects focused, but not limited to, the application of UAV, IoT, AI and Blockchain in crop production, fishery, livestock and forestry.

Here below are examples of applications of 4IR technologies in Agriculture

Crop Production

UAVs, IoT and AI are being used to collect data on crop health, water stress, and nutrient deficiencies. This data can then be used to optimise irrigation and fertiliser applications.

Fishery

IoT and AI sensors are being used to monitor water quality and fish health. This data can then be used to improve fish farming practices.

Forestry

UAVs and AI are being used to assess forest health and detect deforestation. This data can then be used to develop sustainable forestry management practices.

Livestock

IoT and AI sensors are being used to track animal locations, monitor animal health, and optimise grazing practices. This data can then be used to improve livestock productivity.

Blockchains are being used for crop insurance, to create secure and tamper-proof land title records, and to improve the efficiency and transparency of agricultural supply chains, amongst others.

Beneficiaries and Funding

The project will provide funding of **N10,000,000** to each of the 10 beneficiaries. Beneficiaries will be selected based on their proposals for using UAV, IoT and/or AI to improve agricultural productivity and sustainability in Nigeria. In addition, the Ministry of Agriculture will support in identifying pilot farms and paths to scale and sustainability.

Application Process

Applications for the project are now open (27th November). Applications must be submitted online <https://4irta.nitda.gov.ng> by the closing date of two weeks (11th December)



Evaluation Criteria

Applications will be evaluated based on the following criteria:

Innovation

The project should showcase an innovative use of UAV, IoT, AI and/or Blockchain to improve agricultural productivity and sustainability in Nigeria.

Impact

The project should potentially generate significant economic and social benefits for Nigerian farmers.

Feasibility

The project should be technically feasible and have a clear plan for scaling or wider implementation.

Sustainability

The project should be sustainable and have a plan for long-term success.



Timeline

The project is expected to be completed within 6 - 9 months

Expected Outcomes

Achieve the demonstration of the contribution of technology in the following outcomes:

- Increased crop yield
- Improved soil health
- Reduced pest and disease outbreak
- Improved water use efficiency
- Enhanced livestock productivity
- Increased farmer incomes
- Improved food security



Conclusion

This intervention is to demonstrate the application of UAV, IoT, AI and Blockchain to Agriculture in Nigeria and to mainstream the potentials to revolutionise the Nigerian agricultural sector and improve the livelihoods of millions of Nigerians.