Food and Agriculture Organization of the United Nations

DRONE MAPPING TECHNOLOGY

for enhanced disaster risk reduction & management in the agriculture sector

A joint initiative of the
Food and Agriculture Organization of the United Nations
and the Department of Agriculture, Philippines

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Obtaining time-critical and reliable data is becoming more vital for the agriculture sector in the Philippines as the country increasingly experiences the impacts of climate change, which in recent years have manifested in the form of more intense typhoons, flooding and drought.

The Food and Agriculture Organization of the United Nations (FAO) and the Department of Agriculture (DA) have jointly initiated the use of drones to support disaster response and risk reduction efforts in the agriculture sector.

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Drone missions support:

Disaster preparedness and response
Accelerates the pre- and post-disaster assessment process

Immediate and long-term planning and evidence-based decision-making
Generates accurate and near real-time information that can feed into early warning systems, farm-level advisories, national and local plans

Environmental monitoring
Can be flown and landed in coastal and forest areas

Identification of agriculture infrastructure support projects and common service facilities, especially for underserved, under productive and remote areas
Data called 3D point clouds generated from drone missions will allow technical specialists to produce digital surface models and digital terrain models. When used with other datasets, these can help agricultural engineers determine the most suitable type of infrastructure for a specific location

The use modern technologies such as
way we prepare for and respond to di
vulnerable farmers and fishers a

The application of drone technology for agriculture has several advantages compared to conventional satellite imagery

- ✓ It can minimize errors arising from water vapor and aerosols (atmospheric effects)
- ✓ It can be deployed even under cloud cover
- ✓ It can be deployed faster for pre- and post-disaster assessments
- ✓ It can be deployed to assess remote areas that may be inaccessible after disasters

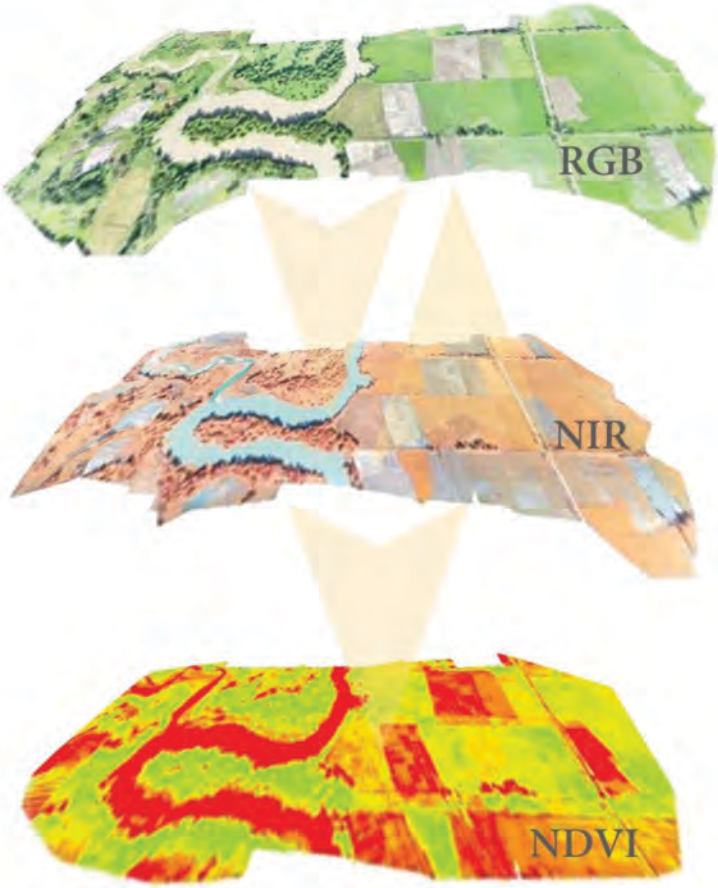
Drones can also complement modern satellite technologies by allowing rapid data gathering in areas with cloud cover or by helping validate findings from initial satellite imagery analysis.

TECHNICAL SPECIFICATIONS

- **Drones used under this initiative are mission-critical and are custom-made with research-grade photogrammetry and navigation equipment**
- **Built to withstand rigorous risk and damage assessment work**
- **Entirely modular to allow quick replacement of parts that are locally available**
- **Redundant battery array to allow safe landing if one of the batteries fail mid-flight**

drones can significantly enhance the sasters that affect the livelihoods of nd the country's food security.

Imagery generated from drone missions



The drones are equipped with multi-camera systems that enable the capture of **RGB (visible)** and **NIR (near-infrared)** images simultaneously.

Normalized Difference Vegetation Index (NDVI) is used to determine vegetation health, including that of rice, corn and other crops. It is generated by combining visible and near-infrared light reflected by vegetation.

QUICK FACTS

WHO FLIES THE DRONES?

Drone operations teams consist of DA and FAO technical specialists, including agronomists, agricultural engineers, mapping and IT specialists and data science experts who have undergone an intensive course with lectures, simulation exercises, actual flying and mission planning. The training programme also covers principles of professional use through safe, lawful, and ethical means.

HOW CAN THE USE OF A DRONE REDUCE TURNAROUD TIME OF DISASTER ASSESSMENTS?

A fixed-wing drone is capable of mapping up to 200 hectares per 30-minute flight. This significantly accelerates the data-gathering process, which traditionally takes several days or weeks.

HOW ACCURATE IS THE DATA GENERATED FROM DRONE MISSIONS?

With a ground resolution of up to 3 centimetres, drone-derived images deliver enough information to support risk analysis and near real-time damage assessments. Experts can also determine the health status of crops and make evidence-based recommendations on where and what types of intervention are needed.

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