



The USE of Drone in Forest and Environmental Monitoring

By Teddy Segore



- **Charis UAS Overview**
- **Benefits of Drone in Remote Sensing**
- **Application of UAVs in Forestry Problem and Solution**
- **Application of UAVS in Wetland Monitoring**
- **Product and Process**
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CHARIS UAS OVERVIEW

Charis UAS is a leading and licensed drone company in Rwanda. We **specialize in understanding customer requirements, build and system integrate** the right **sensor, UAV and Data solution to deliver high quality service**. Our main mission is to provide rapid and high quality aerial Imagery to various industries to support intelligent decision making.



General Benefits Drones in Remote Sensing



Use Unmanned Aerial Systems to deliver **Rapid and High resolution maps, topographical survey, and aerial imagery** in order to:



Speed up Delivery of
Maps and
Topographical Surveys.
5X Faster than
Traditional Methods



Reduce cost and
save substantial
amount of money



Regular Monitoring and
communicate progress to
keep projects on track



Keep people Safe



Government Goal

- The Government of Rwanda aims at making **forestry one pillar of the economic development.**
- Vision 2020, which contains major targets that have been set by the government to be **achieved by year 2020, fixed 30%** as the target to be attained in terms of national forest cover.

***There is need therefore to monitor constantly reforestation achievements
in order to make sure that vision 2020 targets are met***



Application of UAVs in Forest Monitoring

- Develop a monitoring system by Mapping Forests and Biodiversity regularly
- Precision Forestry and Sustainable Forest Planning Management
- Mapping Canopy Gaps
- Measuring Forest Canopy Height and Attributes

Challenges in Monitoring



Monitoring regeneration can be:

- Labor Intensive
- Expensive
- This makes it hard to know whether conservation efforts have been successful
- Takes so much time to survey the areas
- Difficulty accessing certain areas for monitoring
- Difficulty knowing method that work or not



UAVs Solution: Automated Forest Monitoring System

- Costs effective
- Access difficult areas
- Fast assessment
- Cover large areas in a short amount of time
- Easily get more insight



Precision Forestry and Sustainable Forest Planning Management



Parameters such as canopy cover, number of trees, volume estimation, vitality or composition of stands are important parameters in forest planning and sustainable forest management

Drones equipped with specialized sensors such as multispectral camera can help:

- Health of the plants,
- Canopy covers
- Biomass volume
- Count trees automatically

Mapping Canopy Gaps



- Forest disturbances, especially those caused by wind and directly affect regeneration, biodiversity, and productivity of the stands. And mapping the forest canopy gaps can provide an accurate situation of these types of disturbances..

With Resolution of less than 5cm, drones are the best tools for this.



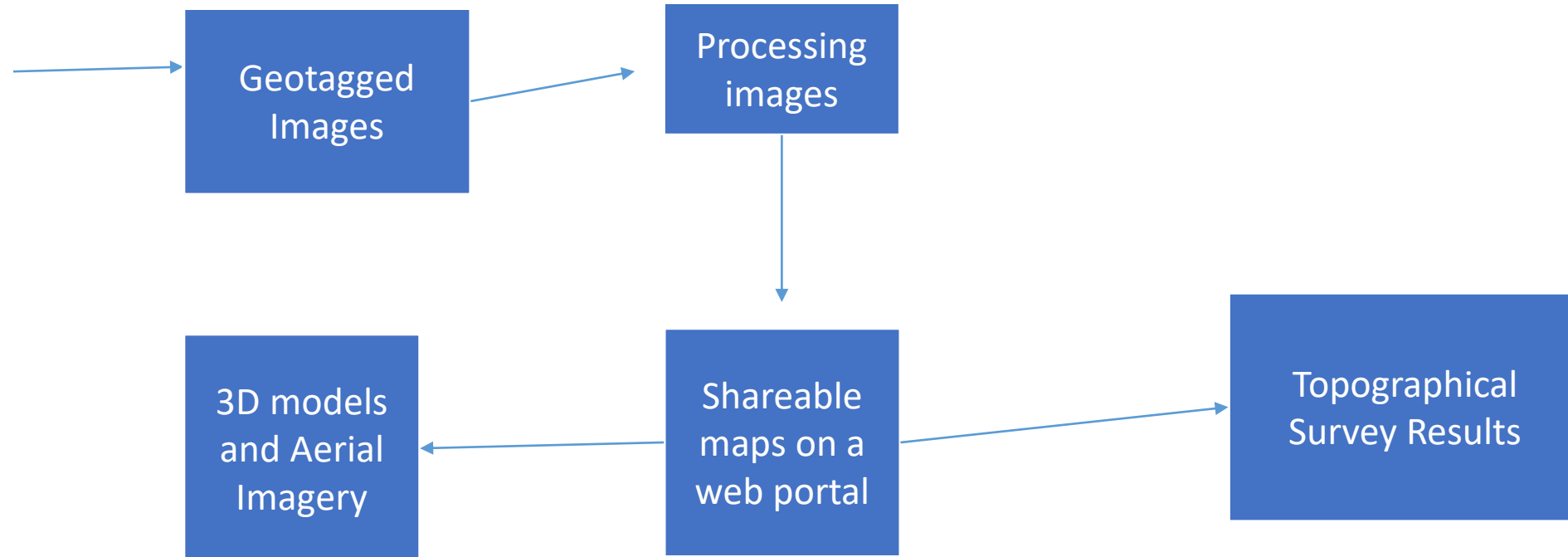
Measuring Forest Canopy Height and Attributes



- With High Resolution Maps, and spatial resolution of less than 5cm/pixel, Accurate canopy height can be determined



Product and Process



Wetland Mapping and Monitoring

- Together with REMA, Charis is Mapping Kigali Wetlands buffer ZONE
- In Order to Protect wetland and reduce the impact of Human Activities around it





Other Project Executed

Many projects such as:

- ✓ ***Tour du Rwanda (cyclist Race)***
- ✓ ***Government spokesperson for AU meeting***
- ✓ ***National Geographic documentary***
- ✓ ***Mining***
- ✓ ***Much more....***



Some of our Existing Clients



— UNIVERSITY OF —
Global Health
— EQUITY —



TEAM



Eric R.

CEO & Founder

He has vast experience in Electrical Engineering, R&D, and UAVs as he deployed the first Unmanned Aerial Vehicle in Rwanda. He also gave extensive presentations all over the country about UAV designs and its various applications. He is considered as the pioneer of UAVs and their application in human development in Rwanda. Eric holds both a Masters and Bachelor of Science in Electrical Engineering from the University of Minnesota-Twin Cities.



Teddy S.

Technical Director/Certified Pilot

He is the first and only internationally certified drone pilot in Rwanda. He has been certified and trained from the EUROUSC organization in Europe. He has extensive experience in flying, troubleshooting, maintaining and repairing multirotor. He is currently undergoing training in UAV photogrammetry and precision farming. He holds a Bachelors degree in Electrical Engineering from Kigali Institute of Technology (K.I.S.T).



Rutayisire J.B.

Quality & Safety Advisor

With More than 40 Years of experience in The Aviation Sector, Jean Bosco brings invaluable Expertise to Charis; He started his career in Aircraft Maintenance and Airspace Radio Navigation, From there he became a IATA certified Quality, Safety and Security Management Officer. He holds Multiple Certificates among Which IOA- Auditor Training Course, Aircraft Accident Investigation. We are Honored To Have Him in Our Team.



Mammy I.

Managing Director

A resourceful professional with extensive experience in project management, Monitoring and Evaluation as well as in project communication. Having a background in science, she has been a great asset in sharing her knowledge. She holds a Bachelors degree in Applied Life Sciences from Midrand University in Johannesburg, South Africa.



*Thank
you*



Contact: info@charisuas.com