

ZANZIBAR MAPPING INITIATIVE

KHADIJA ABDULLA ALI

UAV PILOT -LARGE SCALE MAPPING & 3D MODELING

ZMI TEAM



Zanzibar Mapping Initiative

- The largest mapping project in the world using **Unmanned Aerial Vehicles (UAV)** also known as drones.
- The main objective of the project is to **update aerial images of Zanzibar using drones** (mostly eBee)
- Improves the OpenStreetMap data of zanzibar

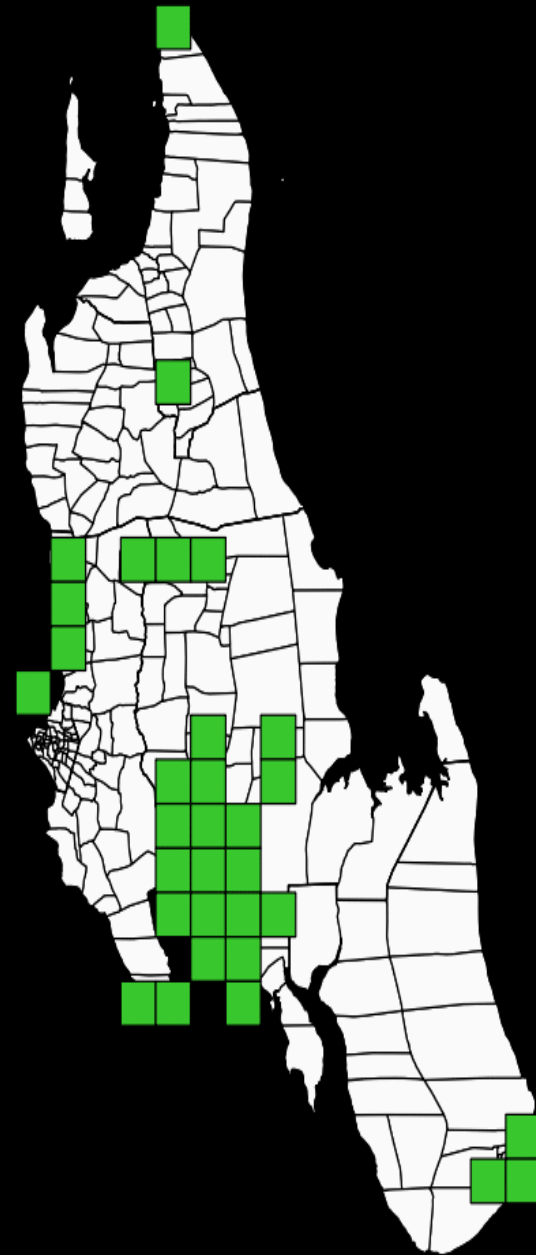


Mapping zones

- We use Zoning system

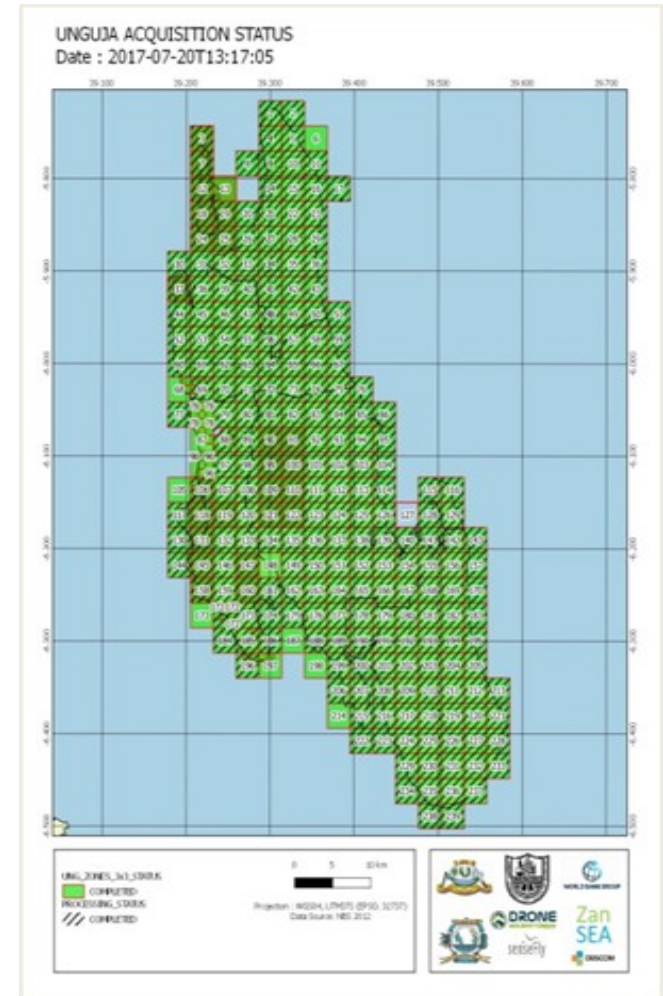
1 zone = 9 km²
zones

- 239 zones in UNGUJA (1200 km²)
- 182 zones in PEMBA (1100 km²)



UNGUJA AND PEMBA STATUS

- **2000 flights** = 1000 hours in the air
- **3000 hours** of processing time
- **200 days** in the field
- **20 TB** generated
- **100 football pitches** used as take off and landing sites
- **10,000 kids** in contact with drones
- Students: **800 students/days** in the field and lab



ZMI actors involved



ZanSEA

- WORLD BANK
- The State University of Zanzibar
- Sensefly
- Commission for Lands Zanzibar
- Drone Adventure
- STATOIL/ZANSEA
- COSTECH
- OBSCOM
- WeRobotics

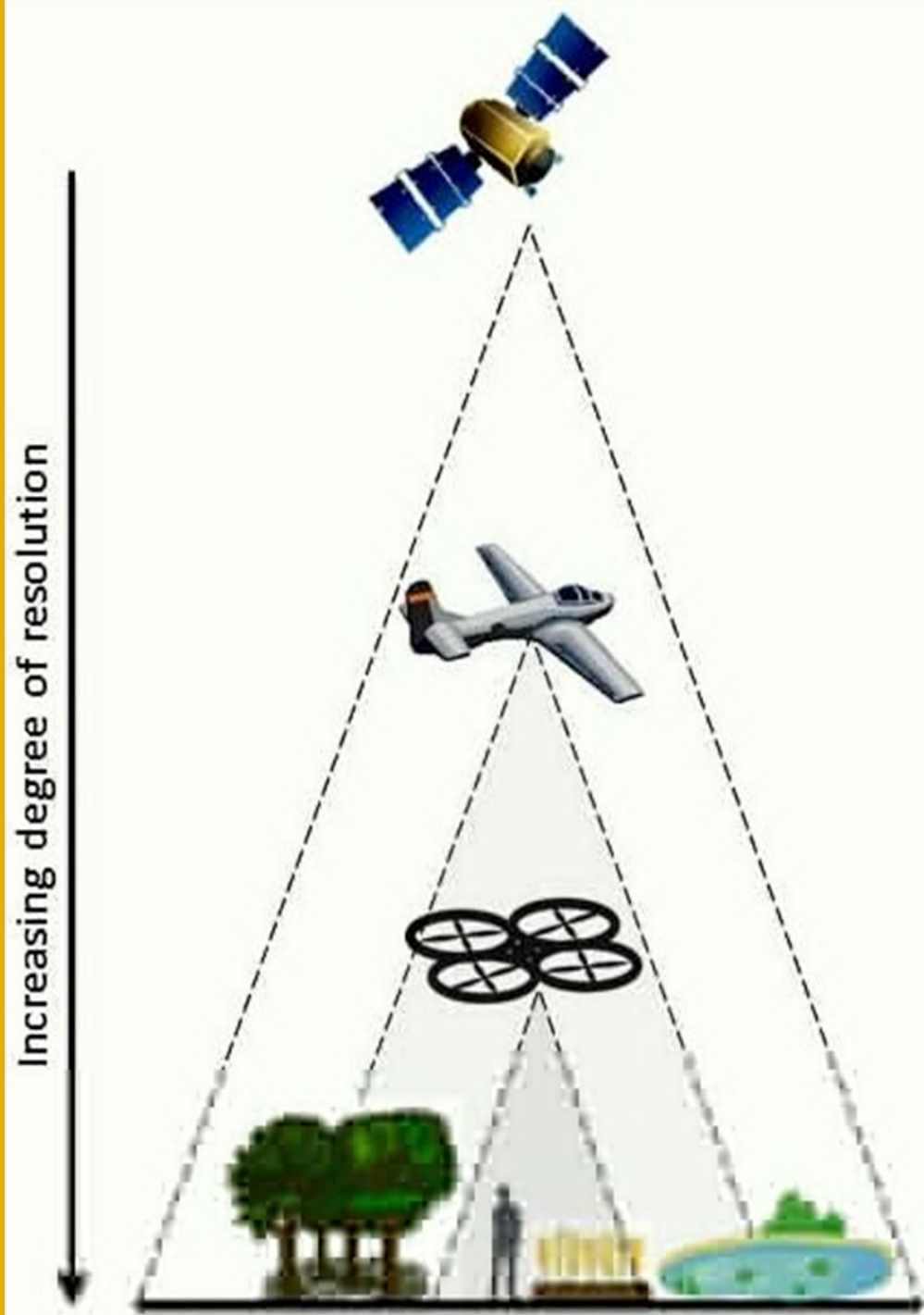


WeRobotics



**HOW
COULD IT
BE DONE?**

Increasing degree of resolution



LOCATE TAKE OFF AND LANDING SPOT

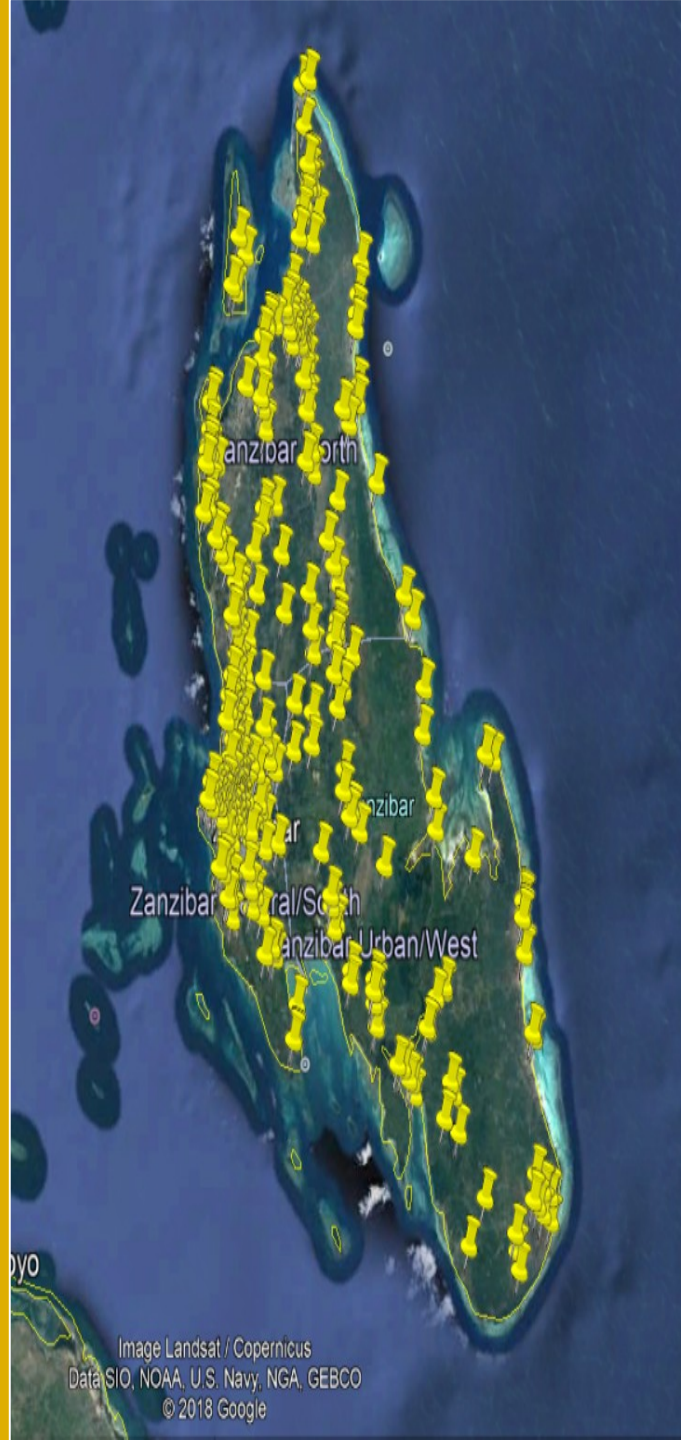


Image Landsat / Copernicus
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2018 Google

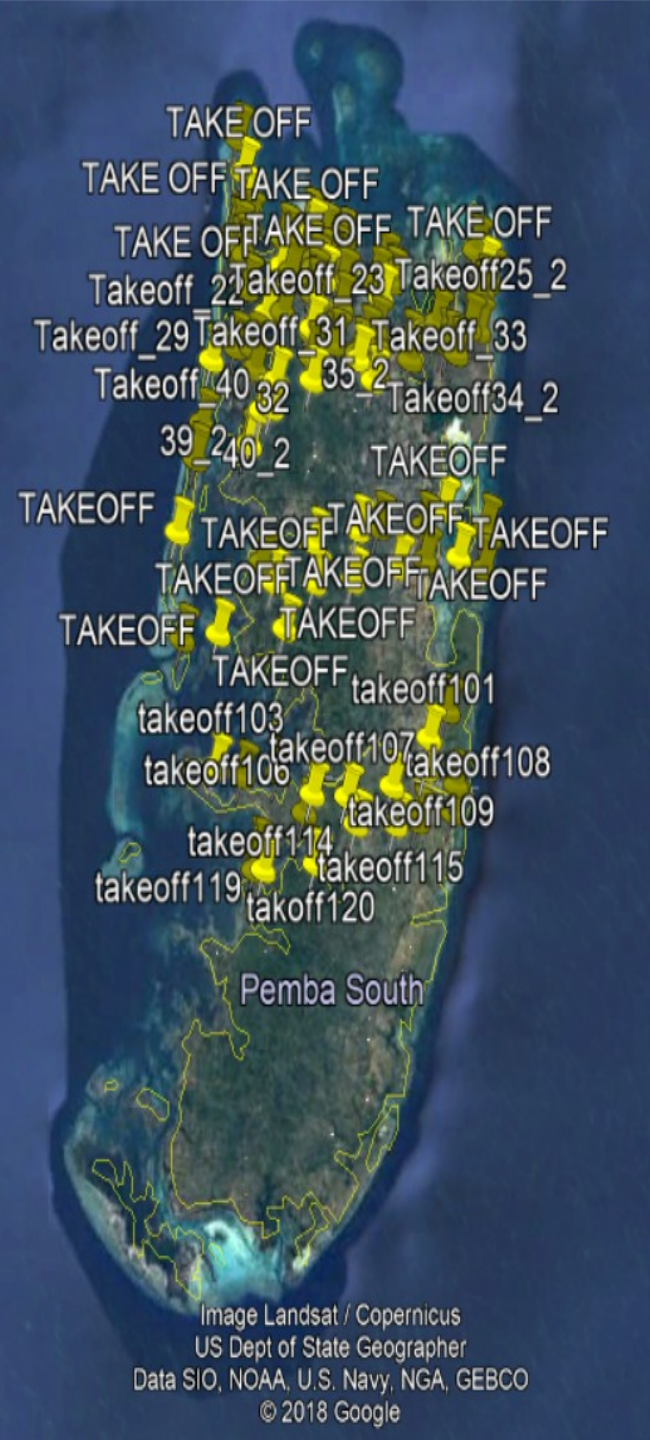
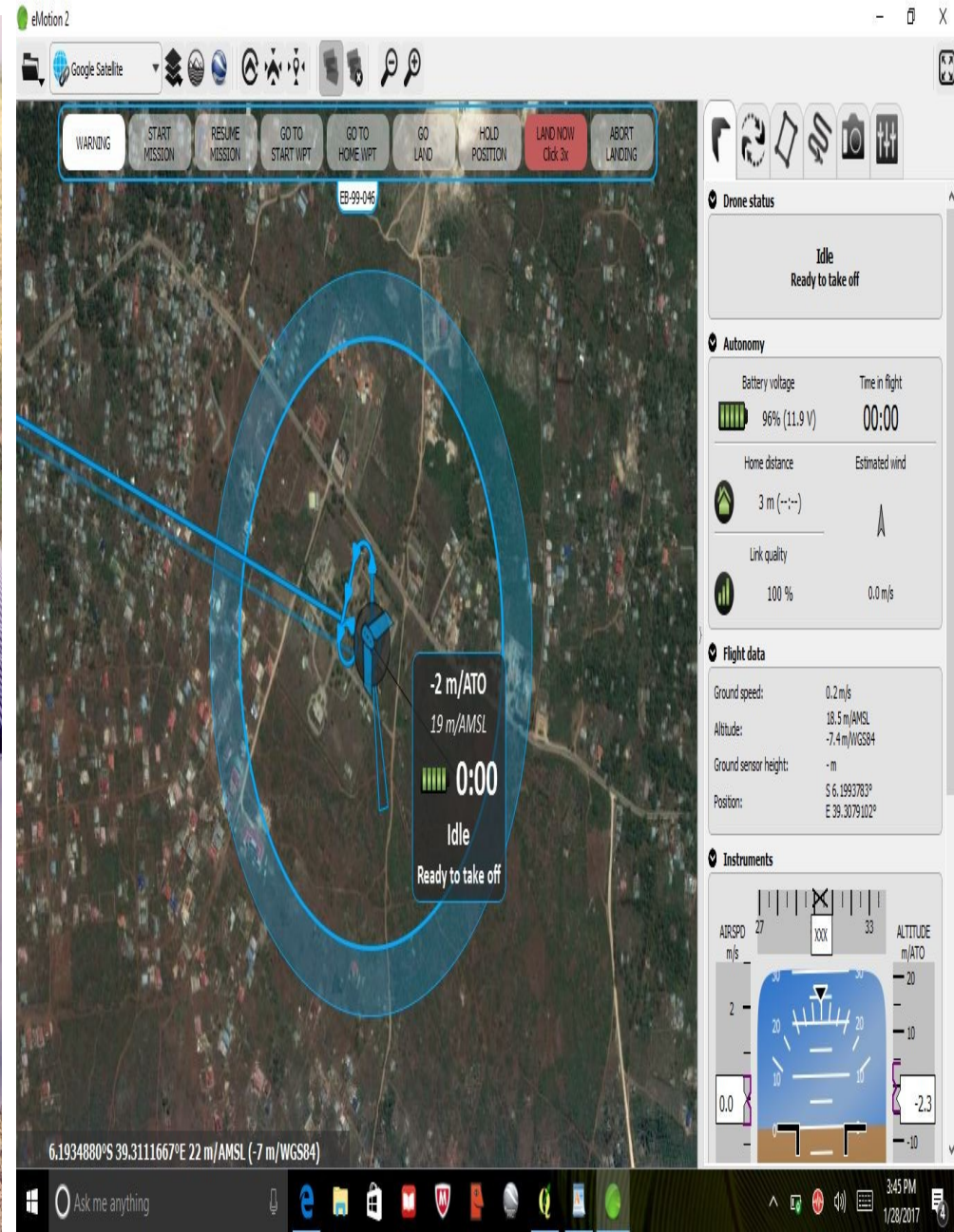


Image Landsat / Copernicus
US Dept of State Geographer
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
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Planning mission area using eMotion



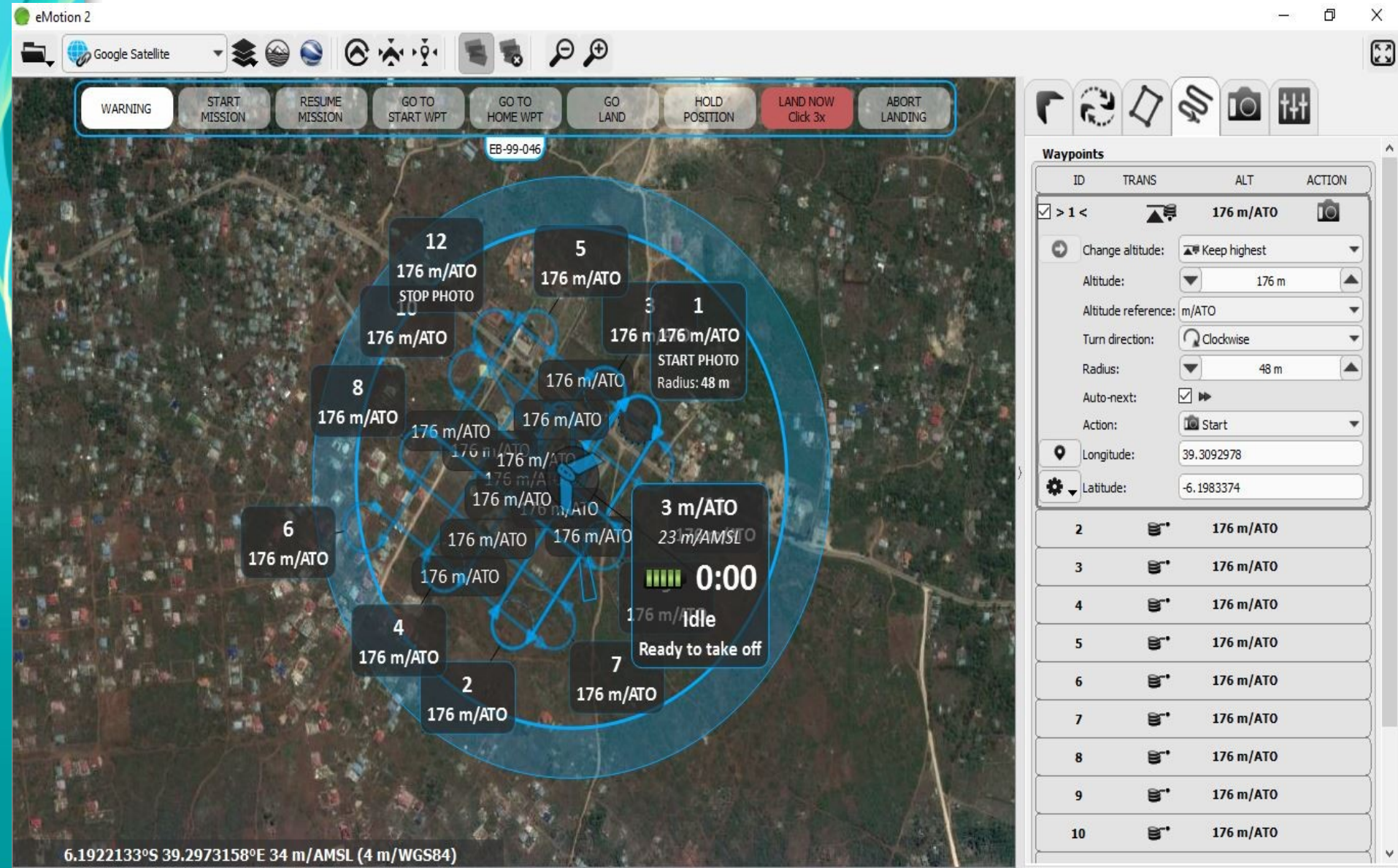
Launching drone



Operation - Pilot



Mapping

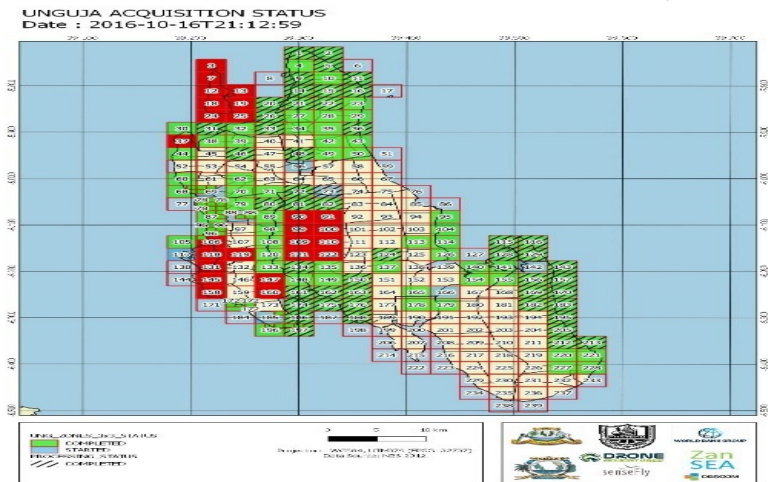
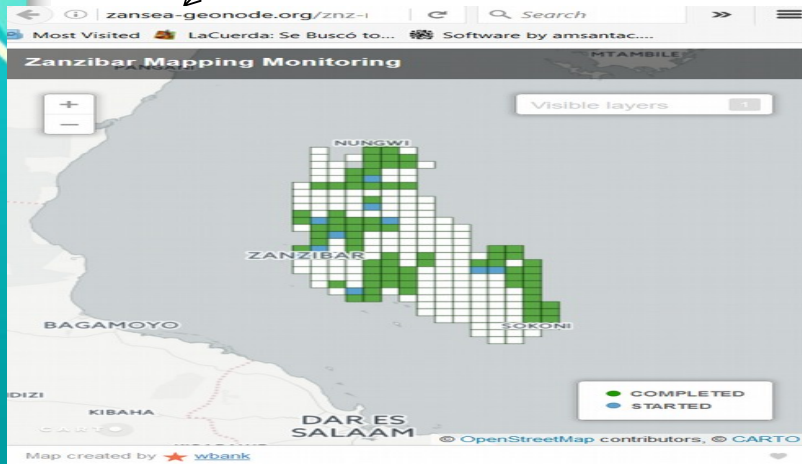


RECORD DATA IN THE SHEET

UNG_ZONES_3x3.xlsx


zone_ID	PRIORITY	RTK	MAPPING STATUS	9	DATE START	DATE OF COMPLETION	FIELD TEAM	BACK UP HARD DRIVE	QC_TRANSFER	PROCESSING COMPUTER
111	High Priority 2									
112	High Priority 2									
113	High Priority 2		COMPLETED		2016-10-15	2016-10-15	KHAIRAAT			
114	Medium Priority 2.5/7		COMPLETED		2016-09-26	2016-09-26	CUMULUS			
115	Medium Priority 2.5/7		COMPLETED	4	2016-09-26	2016-09-28	Yussuf, Khairaat, Raya	BACKUP_06	VALIDATED	1
116	Medium Priority 2.5/7		COMPLETED	2	2016-09-26	2016-09-28	Yussuf, Khairaat, Raya	BACKUP_06	VALIDATED	2
117	High Priority 2	3	STARTED				Ana J.	BACKUP_01		
118	High Priority 2	3	COMPLETED					BACKUP_01	TO BE INVES	1
119	High Priority 2	3								
120	High Priority 2		COMPLETED	7	2016-09-26	2016-09-26	Hassan		VALIDATED	
121	High Priority 2		COMPLETED	10	2016-08-29	2016-08-29	HASSAN, RASHID, KHAIRAAT7 YU	BACKUP_01	VALIDATED	
122	High Priority 2		COMPLETED	10	2016-08-17	2016-08-18	HASSAN, KHAIRAAT, DEO, RAMA	BACKUP_01	VALIDATED	
123	High Priority 2		COMPLETED	10	2016-08-17	2016-08-18	HASSAN, KHAIRAAT, DEO, RAMA	BACKUP_01	VALIDATED	
124	High Priority 2		COMPLETED	10	2016-08-17	2016-08-18	HASSAN, KHAIRAAT, DEO, RAMA	BACKUP_01	VALIDATED	
125	High Priority 2		COMPLETED	10	2016-08-17	2016-08-18	HASSAN, KHAIRAAT, DEO, RAMA	BACKUP_01	VALIDATED	
126	Medium Priority 2.5/7		COMPLETED		2016-10-15		CUMULUS			
127	High Priority 2									
128	High Priority 2		COMPLETED	6	2016-09-27	2016-09-27	Yussuf, Khairaat, Raya	BACKUP_06	VALIDATED	2

Google Spreadsheet



Interactive Map synchronized with Spreadsheet

Communications


**SUZA DRONE TEAM**
ASHA, DAUD, Daud, David, David, Deo World, Environment, Ibrahim, Jame...

Ok 08:19

Twahiri Student Drone Team
@James
We are forodhani garden, 08:34

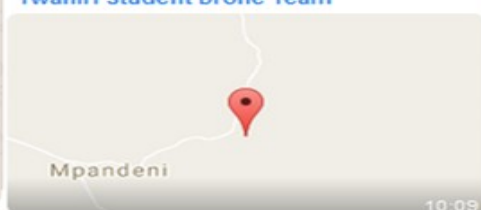
W r waiting for u here 08:35

Khadija Suza Drone Team



08:35

Twahiri Student Drone Team



10:09


Great. in the middle of zones : 14 15 21 22 !!
Watoto around ? 10:11 ✓

Twahiri Student Drone Team
We are at Mwanguo uwanja wa baridi 10:19

Yussuf Team where are you ? 10:22 ✓


@Office Team : please scan all logsheets and
save them in the drive with proper name. 10:29 ✓


Group info
Created 8/2/2016 at 22:51





Subject
SUZA DRONE TEAM


Participants 25 OF 256


 Add participant


**Twahiri Student Drone Team**
Ubora wa Jambo ni Wastani wake!!

**YUSSUF SAID Y...** Group Admin
May Allah always pour love and ...

**+255 621 097 832**
Time out 📴

**+255 622 425 556**
Wallah i belong to you

**+255 713 006 890**
يقول الله منا ومنكم صالح الأعمال

**+255 777 428 075**

Community engagement

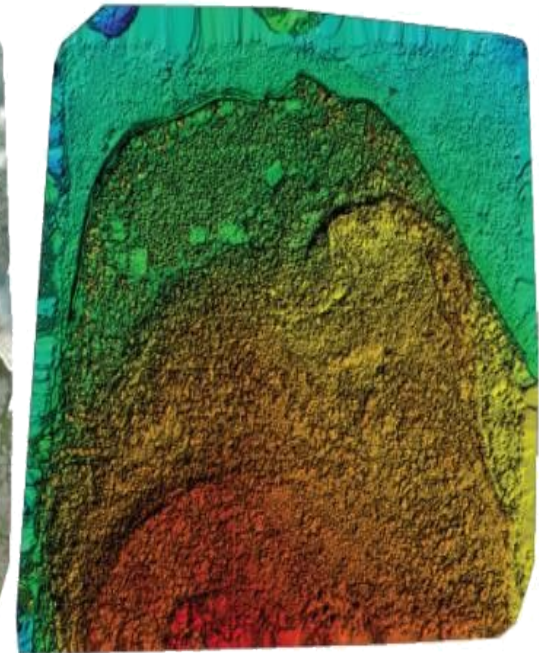
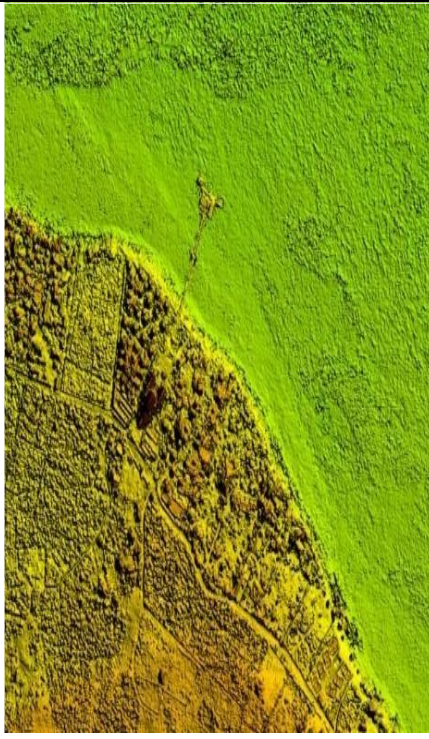


Community engagement

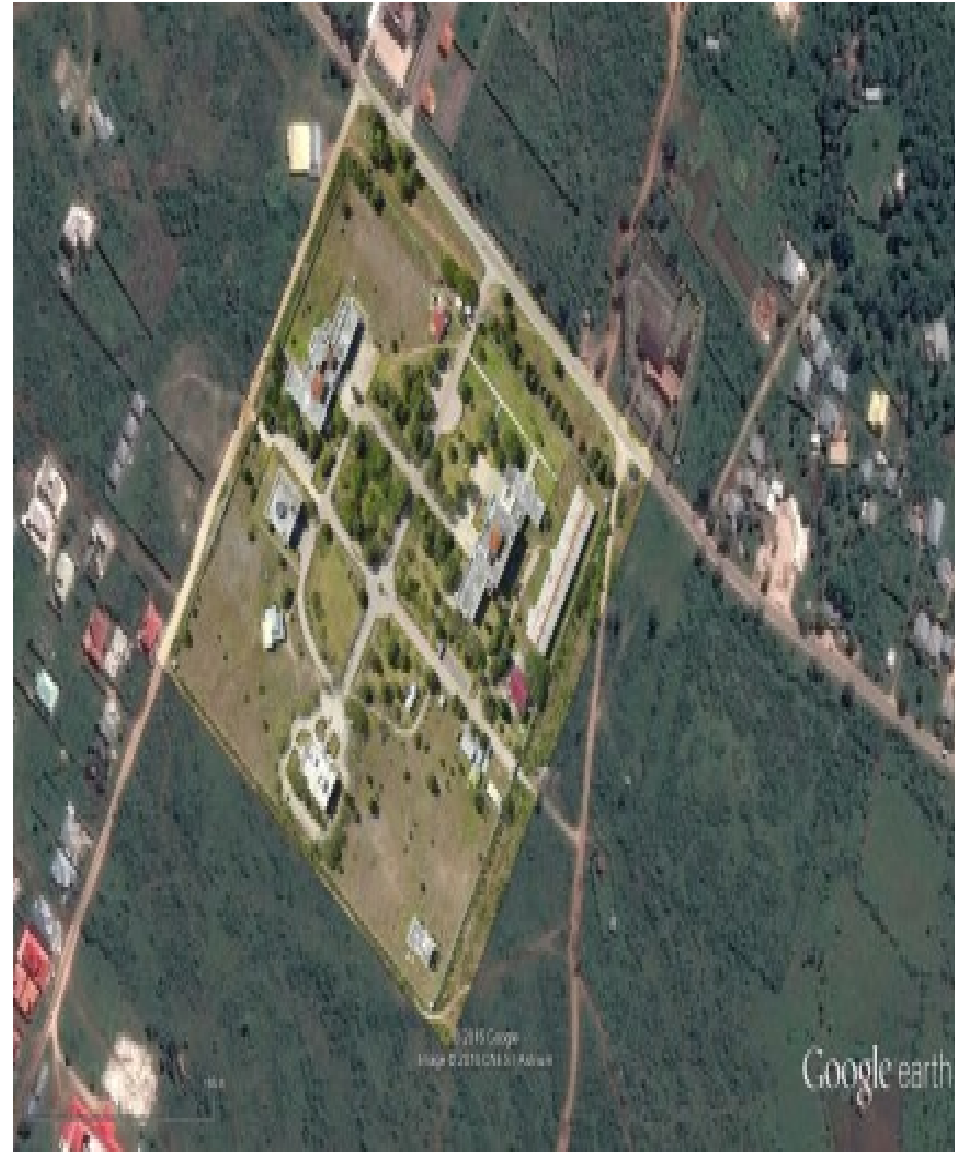
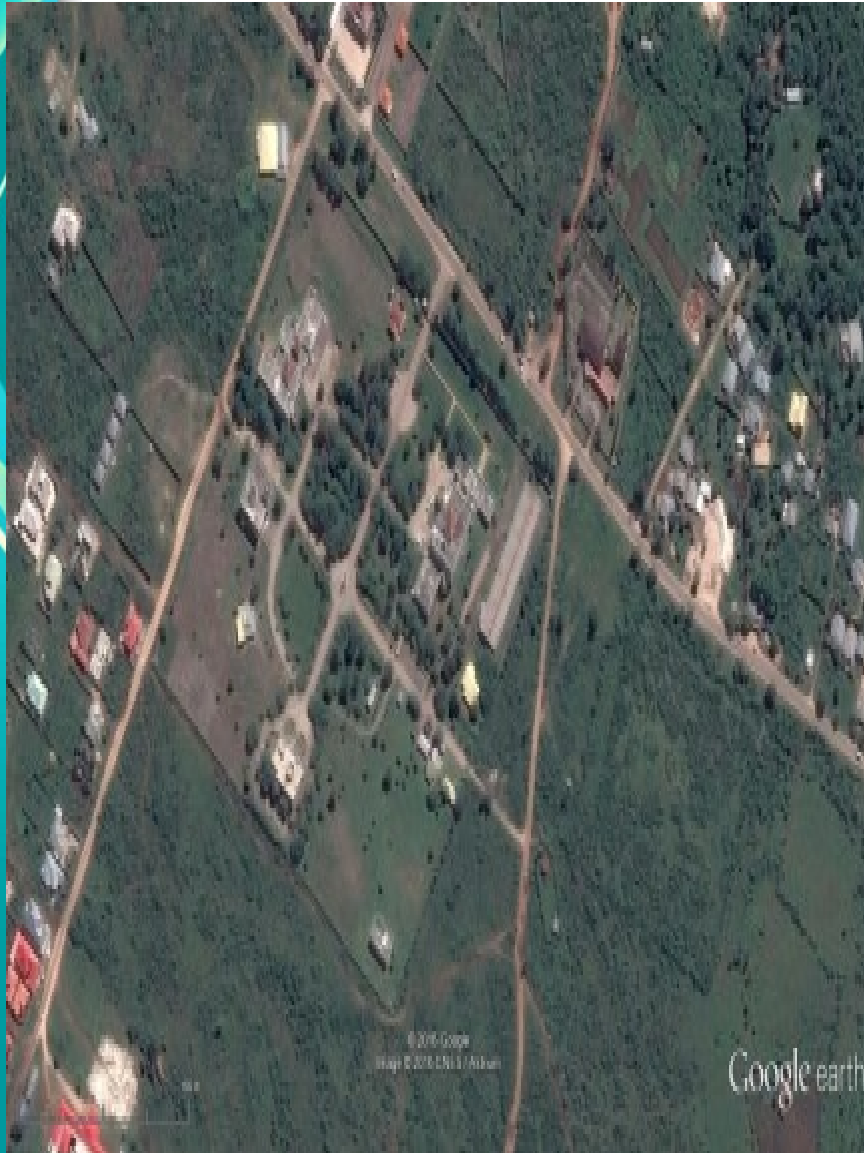


WHAT IS GENERATED ?

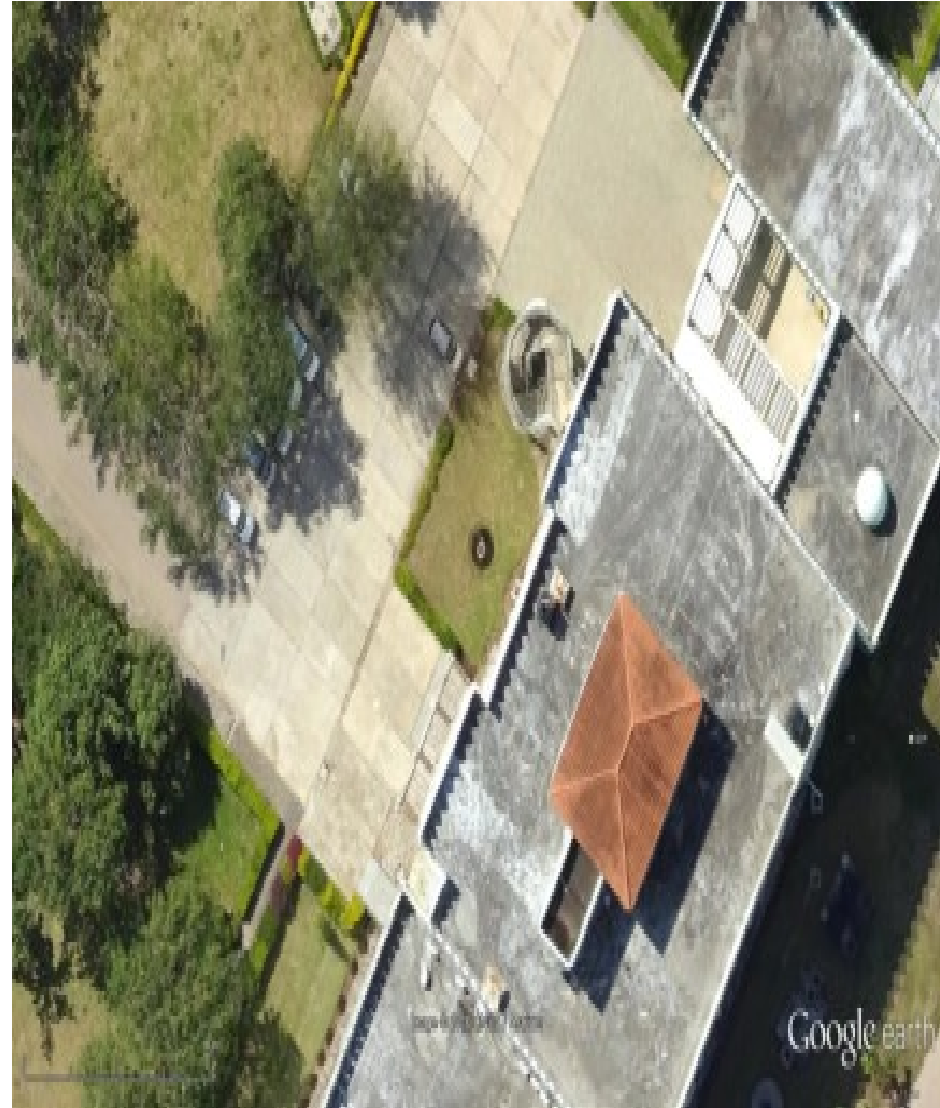
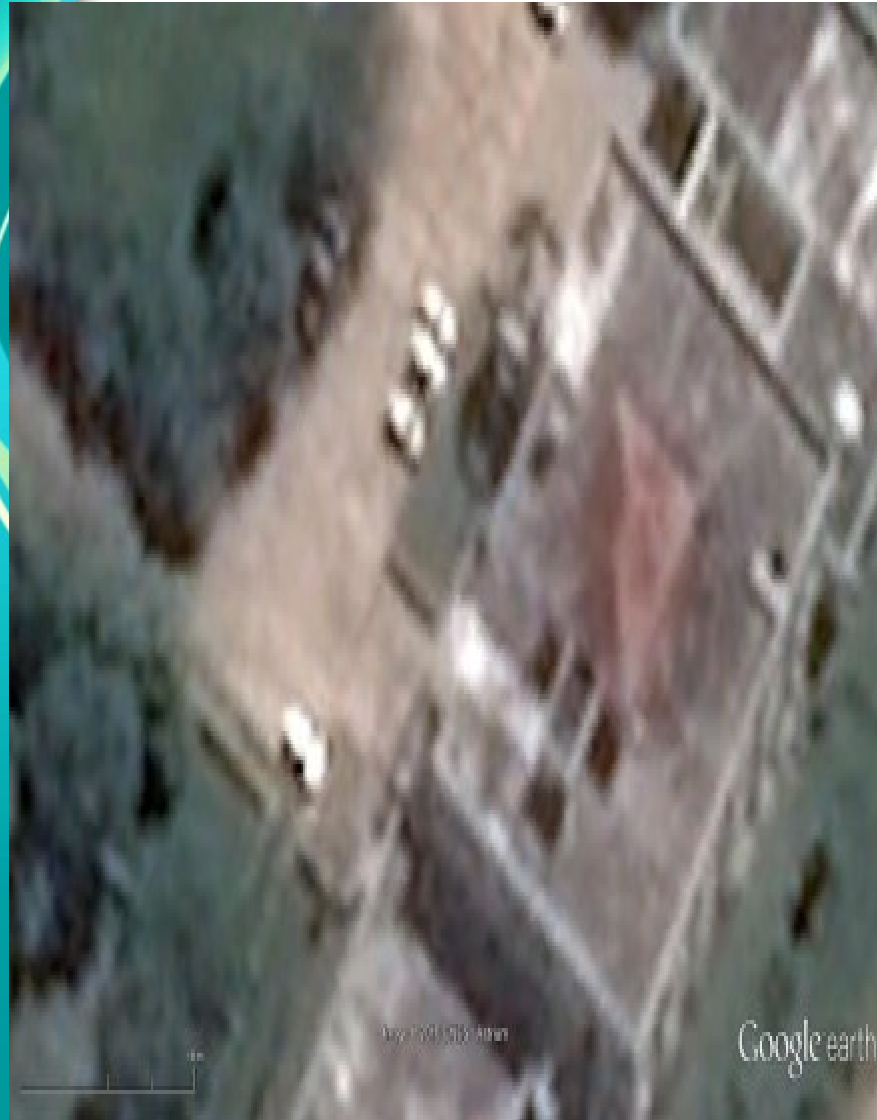
- Orthomosaic RGB natural colour at 7CM
- DSM = Digital surface model
- 3D model



GoogleEarth VS ZMI Drone imagery



GoogleEarth VS ZMI Drone imagery



AFTER PROCESS IMAGES USING Pix4D

Coastal
management: sand,
corals.



**Human-use :
tourism activity
along the coast**



Socio- Economic Features



An aerial photograph showing a dense mangrove forest. A light-colored sandy path or clearing runs diagonally from the top center towards the bottom right. To the left of the path, the mangrove trees are partially submerged in shallow, turquoise-colored water. The forest is composed of numerous small, rounded green trees. The overall scene is a coastal environment.

Coastal environment of Mangroves

City planning and Land Management





LIFE BEHIND ZMI

WeRobotics AND DISASTER RELIEF

- Mapping with WeRobotic , Kagera - Tanzania in earthquake-affected areas using UAV Technologies in October 2016.
- magnitude 5.9 earthquake occurred.
- We aimed to create the most up to date imagery that would show us damage to the infrastructure of the town.



VISITS AND COLLABORATIONS




Statoil



LIFE AFTER ZM

- Most of the students who participated are now Drone Pilots in some of the most exciting drone projects in Tanzania:
 - Agriculture
 - Drone Cargo delivery
 - Drone trainers
- There is now a **Flying Lab** in Zanzibar
- A PhD is started on **Drones for Environment Monitoring**
- Under water drones are now in our hands





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THANK YOU

