

Title of the Project:**Land Observation and Geo-Information Retrieval System****Submitted to:**

The Secretary
ICT Division
Ministry of Post Telecommunication and Information Technology
Government of the people republic of Bangladesh

Submitted by:

MD Mohammad Iqbal

Satellite Operation engineer

BRAC University

Contact: +8801753395676

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Satellite Operation engineer
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Letter of Transmittal

April 18, 2019

The Secretary
ICT Division
Ministry of Posts, Telecommunication and Information Technology
Government of the People's Republic of Bangladesh

Subject: Submission of Project Proposal for "Land Observation and Geo-Information Retrieval System"

Dear Sir

It's a great pleasure for Space and Rocket Center BD to get the opportunity to submit the project proposal that will be developed to increase the agricultural production of Bangladesh.

We have a very versatile team having the experience to work with Bangabandhu Satellite 1, BRAC Onnesha Nano Satellite and working with Bangladesh Space Research and Remote Sensing Organization (SPARRSO) in design, documentation, development and communication. Our greatest assets are our ability to work with different personalities and adapt to different situations that may come across a project. We are very enthusiastic to work with ICT Division, Ministry of Posts, Telecommunication and Information Technology since we have the credentials and the proof of concept that we have articulated in this project.

In the circumstances stated above, we will be very grateful to you if you consider our proposed project herewith and oblige thereby.

Regards



Md Mozammel Haque

Team Leader

Space and Rocket Center BD

1.1 Details of Applicant

Applicant Type	Organization
Name of the organization	Space and Rocket Center BD
Postal Address	12/5, Boshoti Housing, Mirpur, Dhaka
Registered Address	Domdoma, Loshkorghat, Feni
Contact Number	01785903362
E-mail	srcrbd@gmail.com



Figure : Trade License

2.1 Problem Statement

The project “Land observation and Geo-information retrieval system” is important in Bangladesh due to the gradual decrease in experience farmers. The farmers of Bangladesh are not technologically trained and thus the use of pesticides, fertilizers and monitoring of crop field is estimated based on experience not in analyzing data.

Bangladesh is prone to natural disaster and due to that the proper monitoring of agricultural field is necessary to estimate future production. This estimation requires real time data which can be collected from this system. Precision farming is a revolution in farming industry and day by day every country is giving emphasis in this form of technology. Bangladesh is mainly an agricultural country, automation and digitalization in agriculture sector will increase the production and development in this industry.

2.3 Target Population:

- Influencing new Educated generation in agricultural industry
- Bangladesh Space Research and Remote Sensing Organization
- Bangladesh Bureau of Statistics
- Bangladesh Agricultural Research Institute
- Bangladesh Rice Research Institute
- Mass Farmers

2.4 Objectives of the Project

The main objective of this project is to design a system which will perform in Geo-information retrieval operations for monitoring crops and disaster induced places using a low budget UAV which can be made using locally available equipment. Bangladesh quite frequently suffers in natural disasters like flood, cyclone, hurricanes etc. which naturally affects in the environment and human lives. Estimating the aftermath of the natural disasters helps the Government and the people to take necessary steps to overcome the damages. The amount of damages is still monitored through on filed visit which is time consuming and sometimes it is not possible to reach the disaster affected area on time due to unavailability of communication and transportation. Aerial monitoring using aerial vehicle can be useful sometimes but landing the vehicle is often a major problem experienced by the pilot. Therefore, one of the most efficient methods of those monitoring system is remote sensing using Land Observation Satellites. As the country does not own its own satellite the UAV based land monitoring and Geo-information retrieval system opens the door of a new method of land observation technique.

The UAV is a perfect choice because the system is solely made using the locally available electrical equipment and appliances. Therefore, any sort of technical difficulties can be easily overcome and repaired by the local technician. Another very important tool for remote sensing operations is the camera sensors. There are wide ranges of cameras present in the market which can receive multiple bands of electromagnetic spectrum. These frequency bands are received by the Land Observation Satellites (Landsat) for remote sensing for Geo-information retrieval operations. The cameras that are mounted in the UAV can also perform these operations for comparatively shorter area which is adequate for fulfilling the needs for UAV based monitoring systems. Moreover, the mission planning software operations is integrated with the UAV which allows the UAV to take high definition aerial image of any given area which does not require human control. During mission plan, the camera is triggered automatically through flight

controller board and a series of aerial images are taken. All the images are mosaicked together to get the overall image of the covered area. After completing the mission, it returns back to its home location and the whole process is automatic.

The image processing is done using specially designed custom-made software. processing. The camera used in this project can receive four spectral bands. The software can separate all the four bands and distinguish colors. Mainly soil, vegetation and water are separated and the area covered in each of those separated regions can be calculated. Thus, we can estimate amount of gross production in any area and can compare the harvest of crops with respect to time. If government wishes to estimate the amount of rice production this method can be used.

2.5 Output of the Project

- Supplement farmers with agricultural data
- Help to grow automation on farming
- Efficient farming
- Implementing scientific method on farming

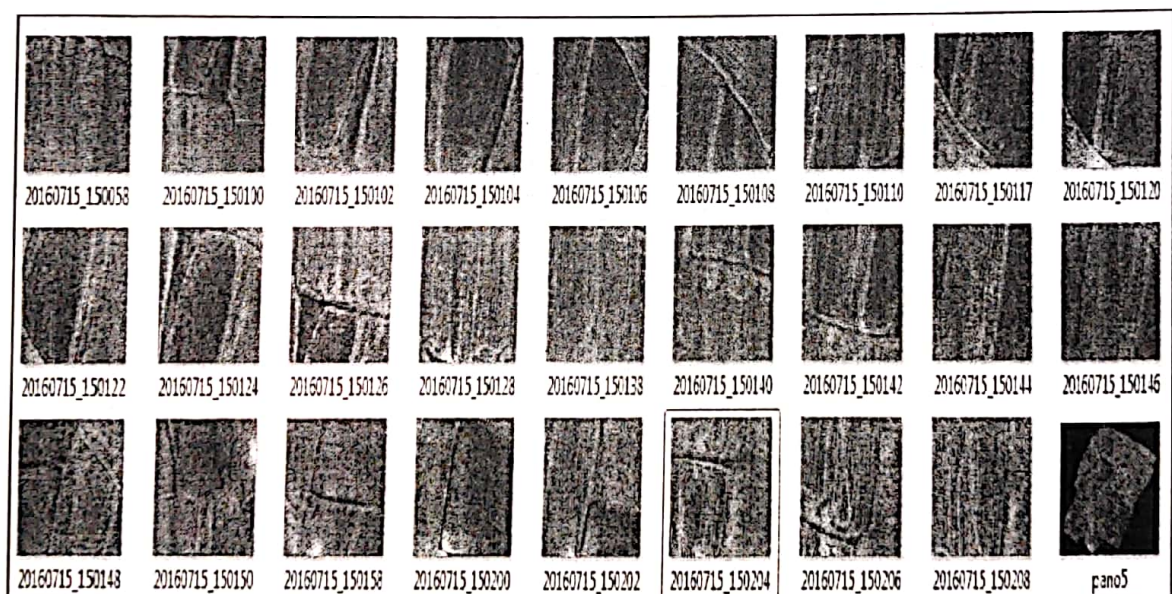


Figure: Sample Data Collection

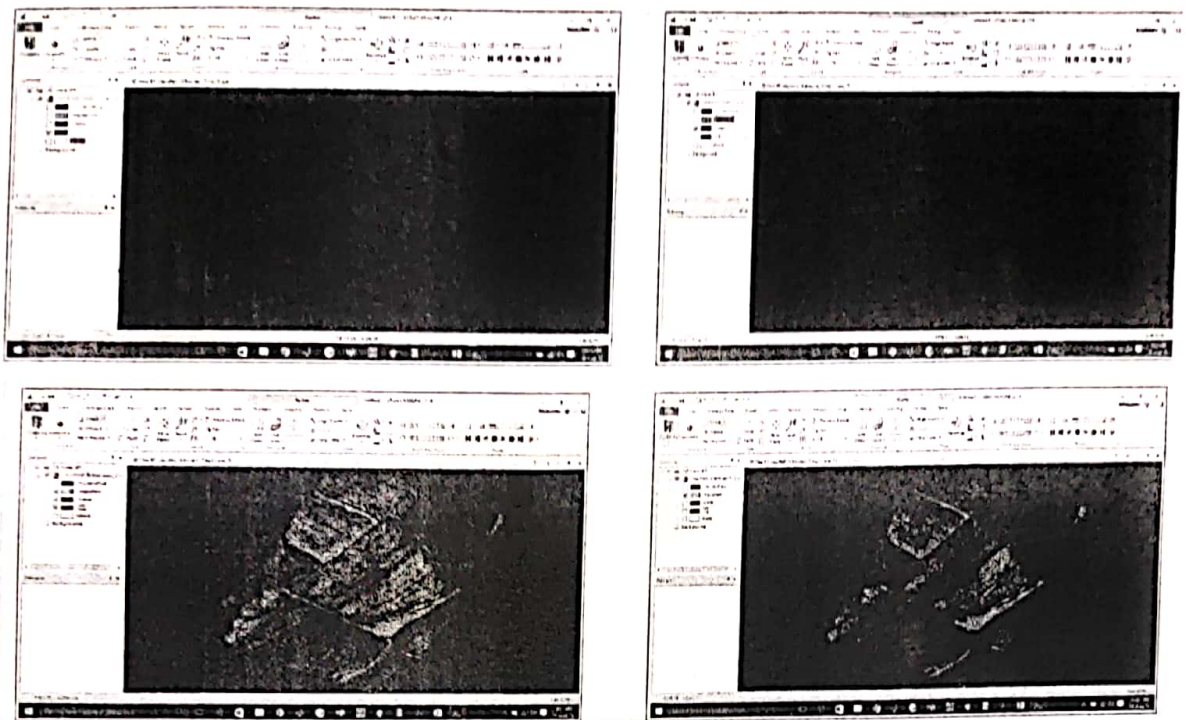


Figure: Sample Processed Data & Different Element Detection

2.6 Work Plan

Figured out and scheduled below:

Schedule of project	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Planning and Requirement Analysis												
Prioritizing Requirements												
Designing Architecture												
Developing Project												
Testing												
Review & Retune												
Deployment												

Figure: Proposed Project Plan

2.7 Innovative & Creative Aspects of the Project

- The drone fully customized in Bangladesh based on our local needs.
- Efficient building process makes it low cost against available drones.
- We build our own software for data processing that was almost crore in taka for this facility.
- It brings automation on farming.
- It drives efficiency on farming.
- Decision making is easier for farmers

2.8 Expected Results of the Project for Target Group

- Required fertilizer can be calculated by this drone so efficient use of fertilizer will be there that has direct impact on environment.
- Productivity will be increased.

2.9 Opportunity of Income Generation

- Selling service to farmers community
- Selling full system to individual who are related in research and statistics for real time data

2.10 Sustainability of the Project

- The data will be useful for future big data analysis
- The precision agriculture is a new technology, it will be useful for upcoming generation who are working in the relevant field

2.11 Expected Benefits for Mass People

- Food security will be increased.
- New sector for employment.
- Reduced agricultural production cost for farmer

2.12 Monitoring & Reporting

Project management introduces a tactical technique for establishing sufficient controls over a project to assure that the project stays on track towards the achievement of its objectives. This is confirmed by monitoring that is the systematic and continuous collection, analysis and use of information for control and decision making.

The table below illustrates some examples:

Monitoring Level	Regularity
Which activities are under progress and what progress has been completed?	Weekly
At what rate are means being utilized & expenses incurred relating to progress in implementation?	Monthly
Are the expected results being attained?	Quarterly
To what extent are these results serving the project purpose?	Half-yearly

2.13 Associate Risk & Risk Management

Although accidental are unforeseen and unplanned, there are methods which can make events more predictable. The more predictable an event, the less risk is involved since the occurrence can be prevented or mitigated; or, at minimum, expenses can be estimated and budgeted. It is this process to make loss more predictable that is at the core of insurance programs. This project is well planned and there are a few manageable risks which are mentioned below:

- Leakage of project information during the development phase
- Less marketing and failure to expedite this platform for use
- Risk of being too complex to use

All the risk factors mentioned above will easily be handled as a group of technical experts will develop this project and will continuously work for the improvement of the project performance.

2.14 Poverty Relevance

This project is directly related to poverty alleviation rather has indirect impact on this.

2.15 Return Value for money

As it is a software-based project, the maintenance cost of the hardware is less.

2.16 Benefit for Underprivileged Women

After training, the simplicity usability of the project will motivate the enthusiastic underprivileged women to operate the system.

2.17 Benefit for Disabled Person

There are approximately 16 million disabled people in Bangladesh. The disabled people need to be taken special care so that they feel good & safe, and have a better Bangladesh to live in. After training, the project can be operated by many disable person.

3.1 Source of Budget:

Fund is required for successful completion of the project. The source of expected fund is identified below:

Sl. No.	Source	Total (BDT)
1.	Space and Rocket Center BD	4,00,000
2.	ICT Ministry	18,00,000
3.	Other Sources	None
Grand Total		22,00,000/-

3.2 Required Budget with Breakdowns:

Particulars	Per Unit	No. of Unit Required	Cost
1. R & D	6 Month	-	17,50,000/-
2. Multi Spectral Sensor	1 unit		4,50,000/-
Total			22,00,000/-

4.1 Team Information

This project will be completed by a visionary team comprising technical experts with remarkable working experience in IT/ITES sector.

Sl. No.	Name of officials	Proposed Position for this project	Educational Qualification
1	Md Mozammel Haque	Project Leader	B.SC in EEE, BRAC University
2	Sanando Jagati Chyan	Project Partner	B.SC in EEE, BRAC University
3	Aynul Huda	Project Partner	B.SC in EEE, BRAC University
4	Bijoy Talukder	Project Partner	B.SC in EEE, BRAC University