Development of GIS Based Forest Management Information System in Punjab

(A Way Forward Towards Digital Era)

GIS Lab Punjab Forest Department

- Forest GIS lab has been established in the office of CF D&WP Circle during 2012-13 under the Development Scheme Titled : (Institutional Support for Planning Monitoring & Evaluation Cell of Punjab Forest Department), Lahore having, latest equipments , licensed software and technical experienced staff.
- The purpose of this setup is to develop a digital record of Forest Assets and regular Planning ,Monitoring and Evolution of Forests using Geo-Spatial Technologies

Project

DEVELOPMENT OF GIS BASED FOREST MANAGEMENT INFORMATION SYSTEM (FMIS) IN PUNJAB

- **Gestation Period : 36 Months (2016-17 to 2018-19)**
- **Total Allocated Budget : Rs. 75 million**

PROJECT OBJECTIVES

- Strengthening of forests monitoring by mapping through Remote Sensing (RS) and Geographic Information System (GIS) Techniques.
- Development of GIS based centralized forest data repository
- Development of Web GIS Based Forest Management Information System **(FMIS)** that will be useful for improved forest management and planning purpose.
- Establishment of GIS Nodes at Rawalpindi and Multan with strengthening of existing GIS Lab at Lahore.

Project Current Activities

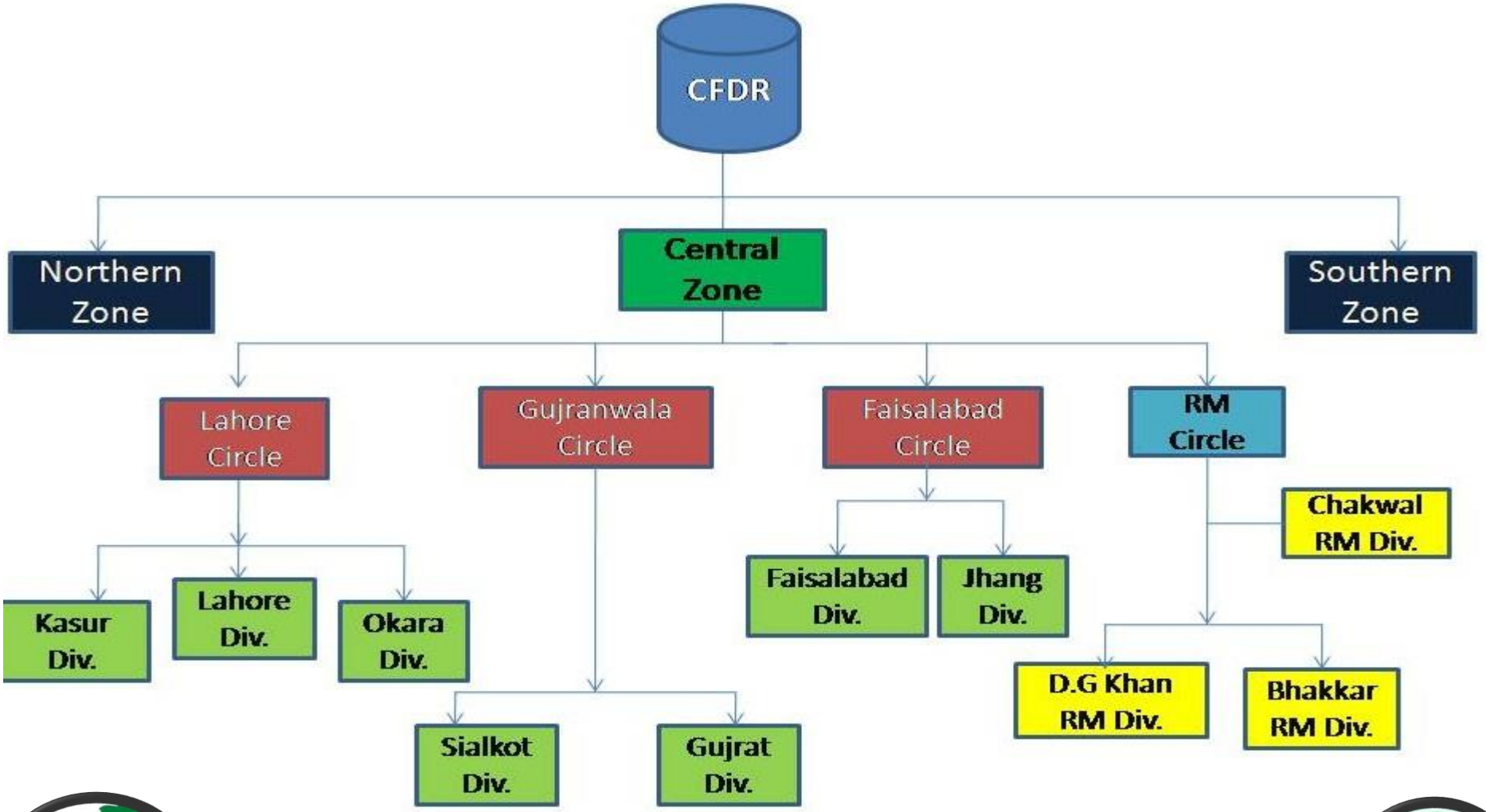
- Development of GIS Based Centralized Forest Data Repository (CFDR).
- Development of Web GIS Based Forest Management Information System (FMIS)
- Forest Monitoring & Evolution Though Drone Technology
- Rapid Mobile Data Collection System
- Establishment of GIS Nodes at Rawalpindi and Multan
- Capacity Building of Forest Field Formations and GIS Lab Staff Through Training
- R&D with Academia

DEVELOPMENT OF GIS BASED CENTRALIZED FOREST DATA REPOSITORY (CFDR)

With the era of Science and Technology its need an hour to develop an IT infrastructure which can secure forest assets as well as rapid data accessibility for better management of Forest Resources.

- The GIS Based Data Repository is under development and it will save forest land data at centralized platform ,which can be accessed easily at any time anywhere.
- Development of CFDR will maximize data integrity, minimize the data redundancy and quick access to records, resulting in better data preservation.
- CFDR initially will manage records of 1.6 millions Ac area of forest along with satellite imagery, available working plan data and revenue records.
- It will also provide digital data of forest of Punjab for education and research purpose to the Forest Academy Ghora Galli ,Forest School Bahawalpur, PFRI Gutwala and other research institutes in Punjab.

GIS BASED CENTRALIZED FOREST DATA REPOSITORY (CFDR)



Development of Web GIS Based Forest Management Information System (FMIS)

FMIS will integrate GIS functionality to forest management activities as operational planning and implementation, and operational control in and across administrative units of department.

- Web based FMIS will help Forest Field Staff to perform Web-based GIS Analysis, planning and retrieval of information within no time throughout Punjab.
- FMIS will also be helpful in reporting, planning about afforestation/regeneration according to available resources such as available irrigation water, plants available in forest and nurseries etc.
- It will be also helpful for rapid monitoring and evaluation activities as desired by Department.

PUNJAB FOREST MANAGEMENT INFORMATION SYSTEM (FMIS)

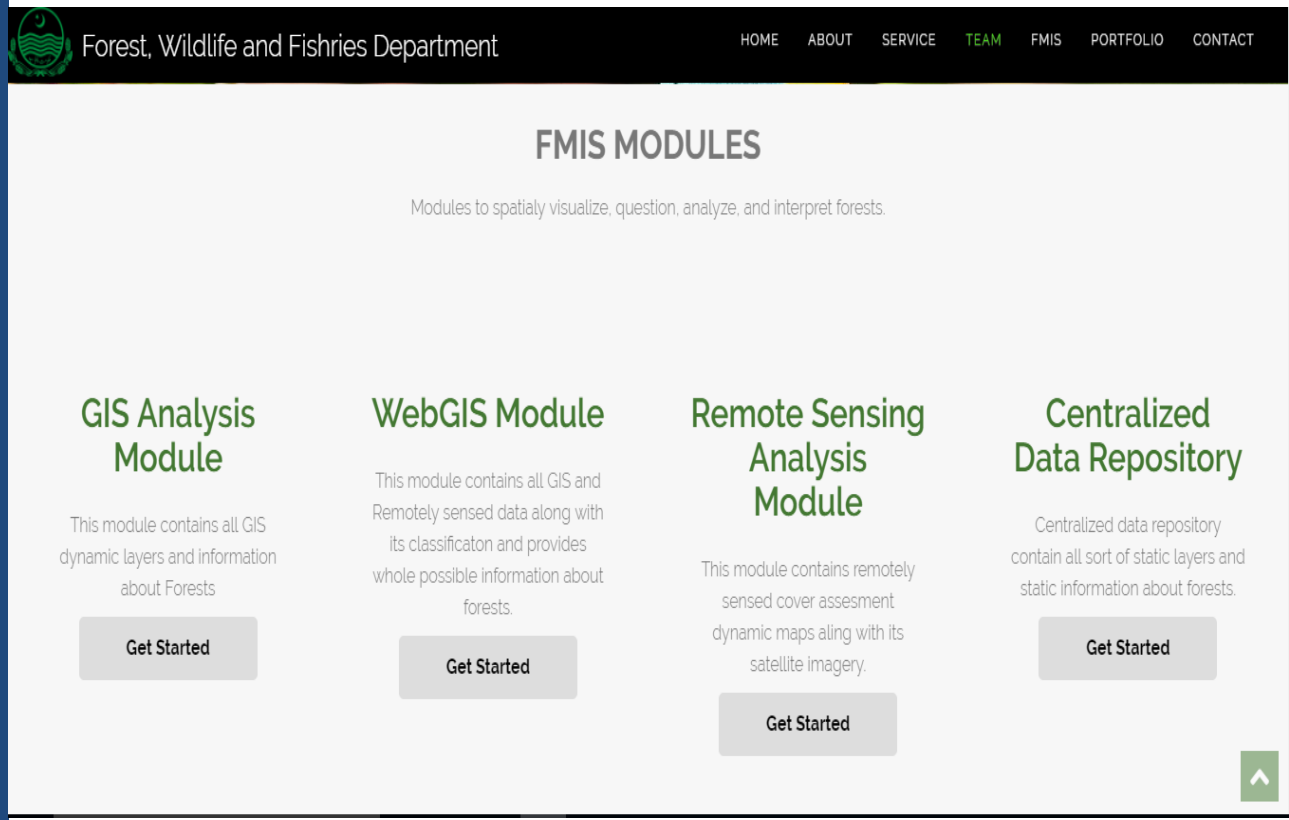
FMIS Website

Home Page

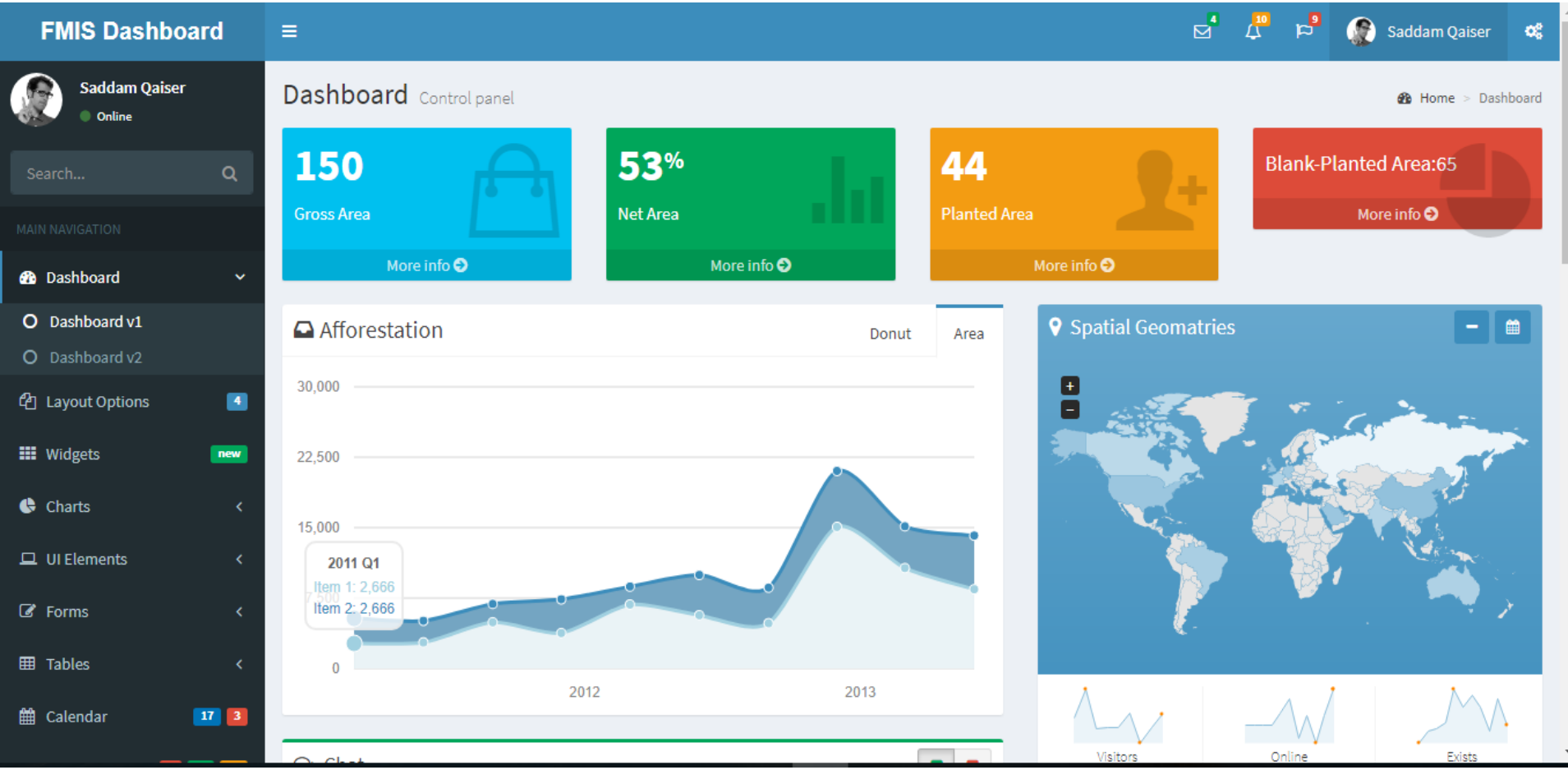
PUNJAB FOREST MANAGEMENT INFORMATION SYSTEM (FMIS)

FMIS Website

FMIS Modules

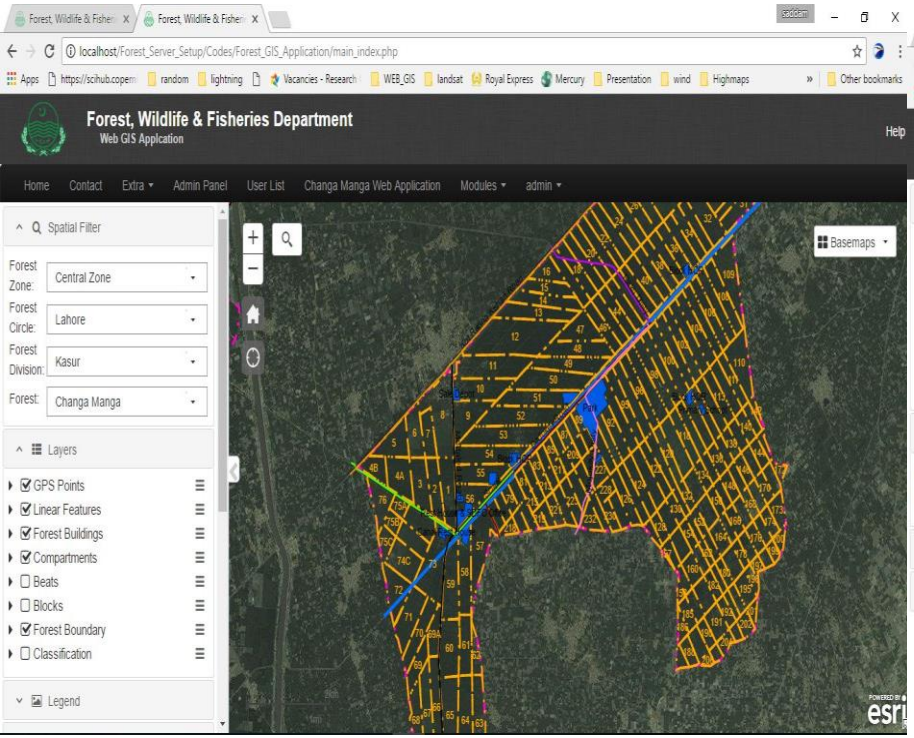


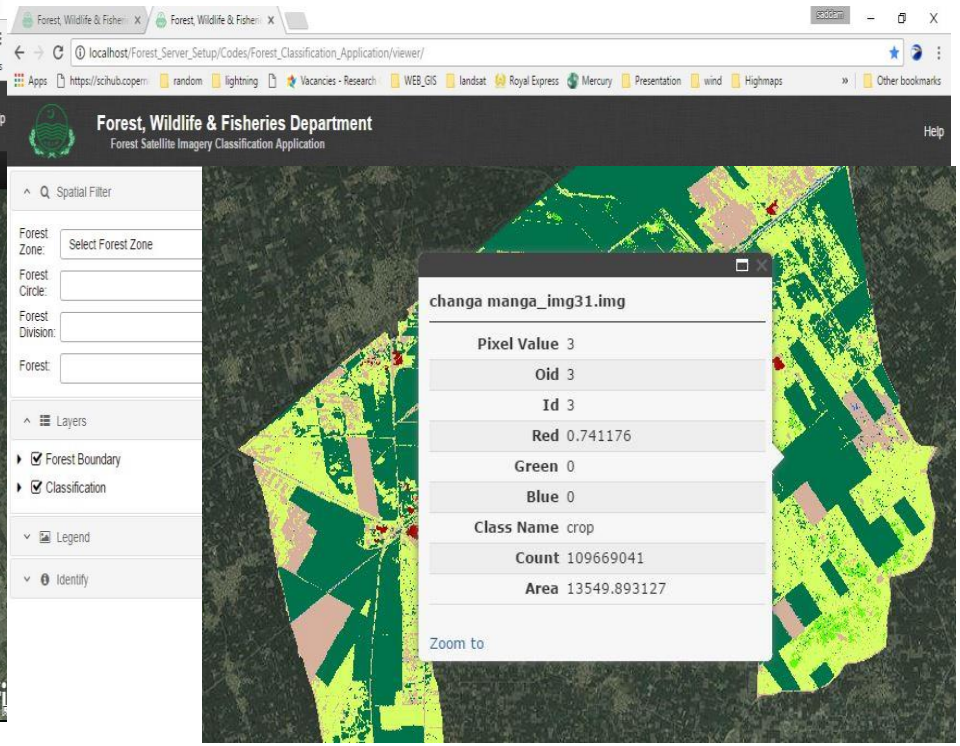
PUNJAB FOREST MANAGEMENT INFORMATION SYSTEM (FMIS) DASHBOARD



GIS LAB PUNJAB FOREST

PUNJAB FOREST MANAGEMENT INFORMATION SYSTEM (FMIS) DASHBOARD





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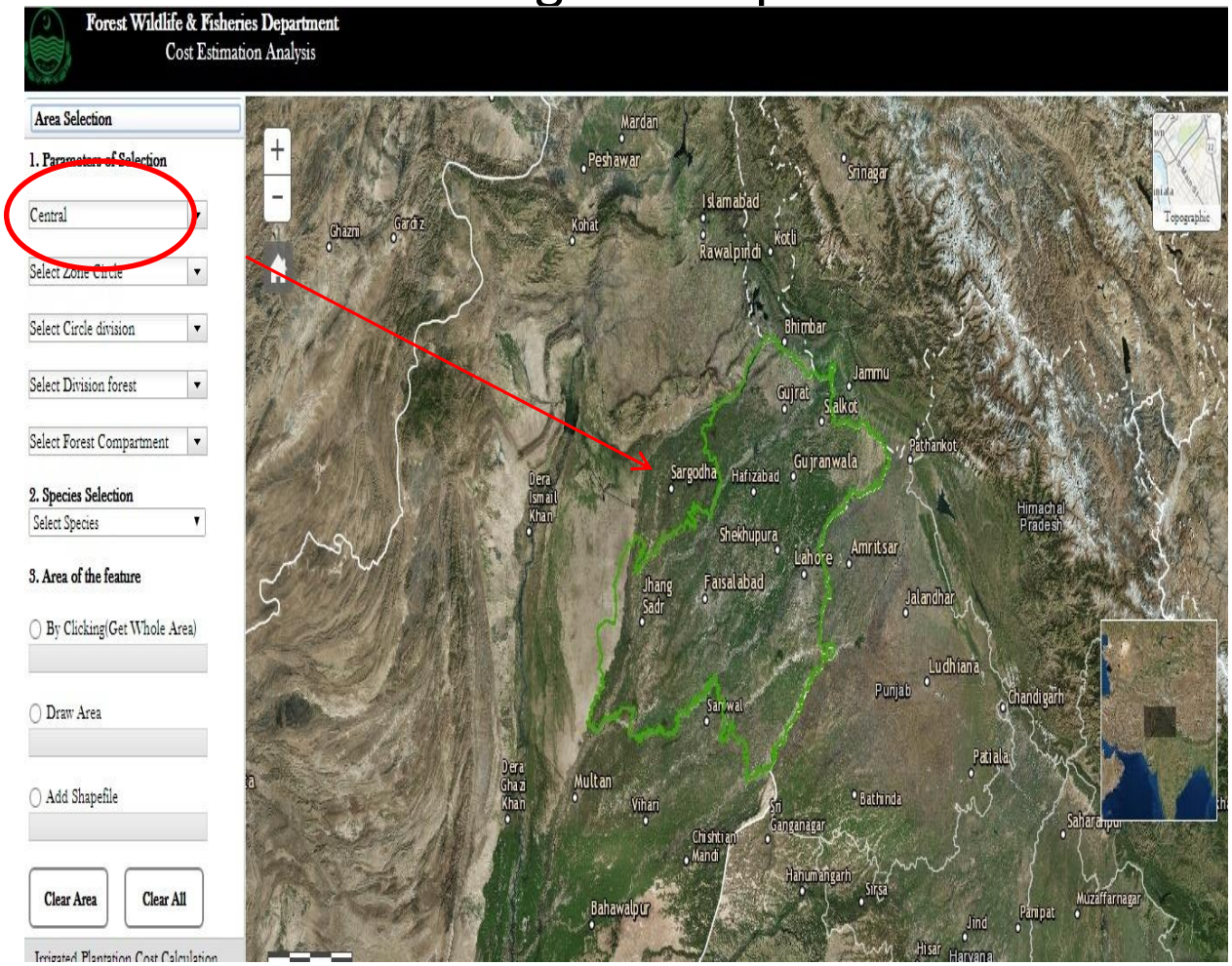
PUNJAB FOREST MANAGEMENT INFORMATION SYSTEM (FMIS) PLANNING MODULE

FMIS Planning Module

Cost and Estimation Dashboard

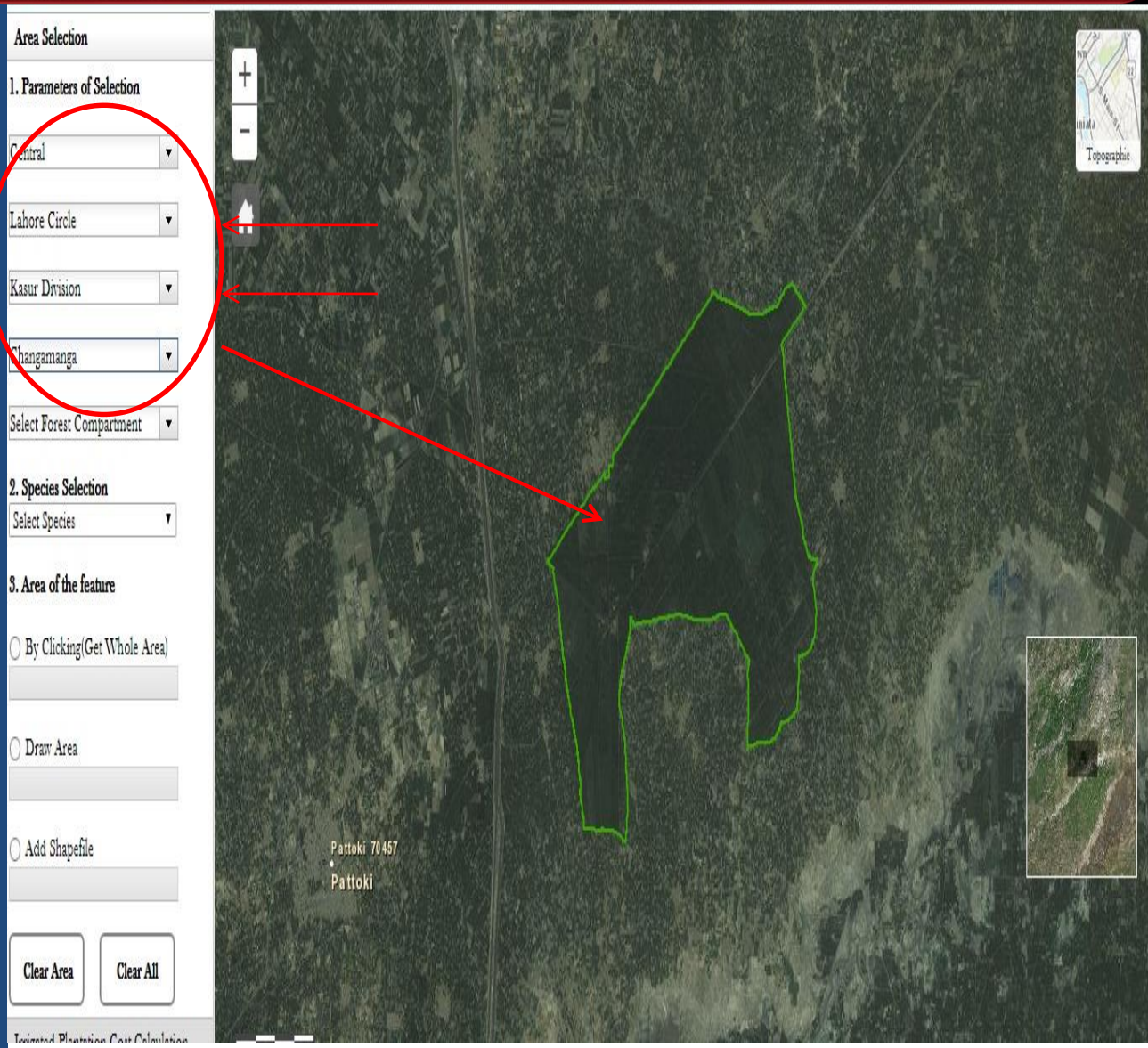
Area Selection though nested cascading filtering technique



PUNJAB FOREST MANAGEMENT INFORMATION SYSTEM (FMIS) PLANNING MODULE

FMIS Planning Module

Cost and Estimation Dashboard



PUNJAB FOREST MANAGEMENT INFORMATION SYSTEM (FMIS) PLANNING MODULE

FMIS Planning Module

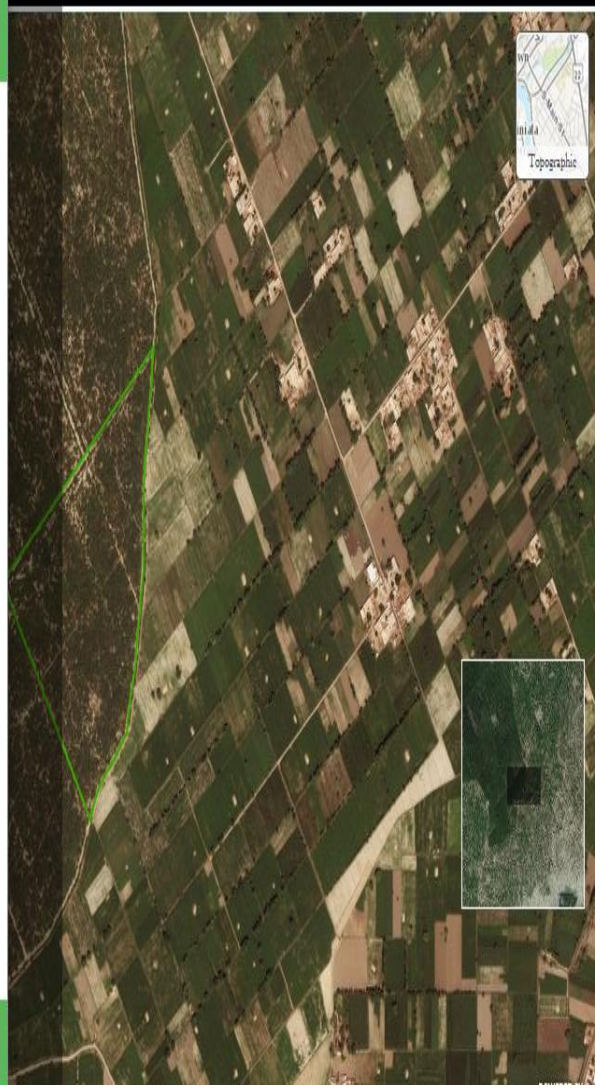
Cost and Estimation Dashboard

Cost calculation form of Irrigated Plantation

BREAK-UP FOR AFFORESTRATION IN IRRIGATED PLANTATION @ RS :425/- DAILY WAGES

SR.NO	PARTICULAR	COOLY DAYS	AMOUNT(RS.)
1.	Jungle Clearance/Kana Mesquite Stubbing	207.60	88230
2.	Debris Collection and Burning	62.28	26469
3.	Extraction of Mudhies	83.04	35292
4.	Ploughing & leveling with private buldozer/tractor	311.40	132345
5.	Lay Out & dag bailing	41.52	17646
6.	Earth work(main Branches, khals,bunds,trenches,passels etc)5000/Cft	519.00	220575
7.	Making of slots 726 Nos	30.10	12792
8.	Cost of plant including carriage (726-110 =836 No.)Rs.10/-each	408.35	173548
9.	Planting including restocking 15% 836 No.(726-110)Plants @ Rs.4/- each	163.38	69436
10.	Irrigation 25times @1/2 CD per irrigation	259.50	110287
11.	Weeding 1 time	207.60	88230
12.	Re-Stubbing of Kana/Mesquite	103.80	44115
13.	Spray/Insecticide/Unforseen	15632	15632
	Total Cost		**1034597.00**

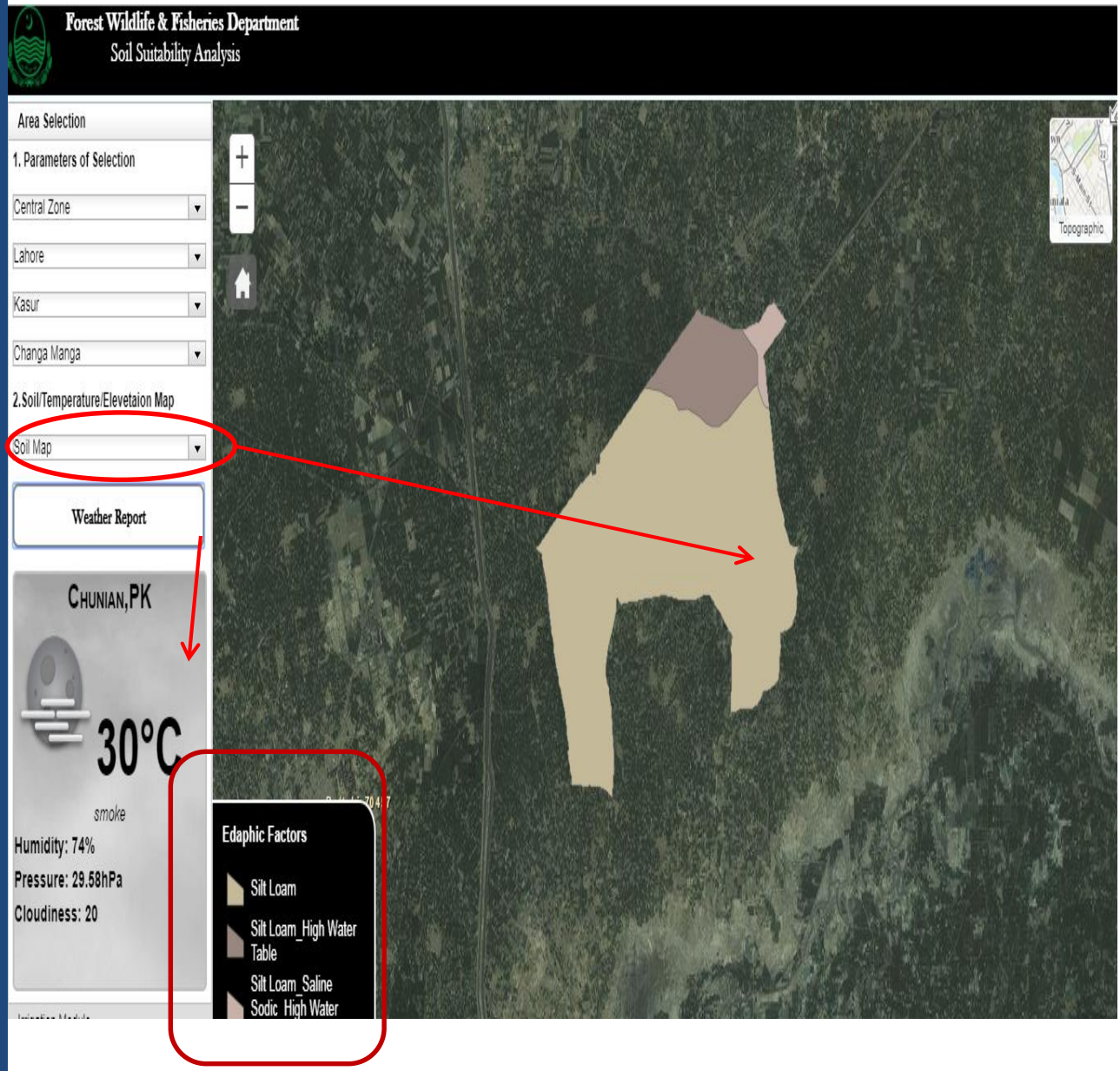
Note:The rates and Charges are schedule of rates for forest works and operation,1947. Print Close



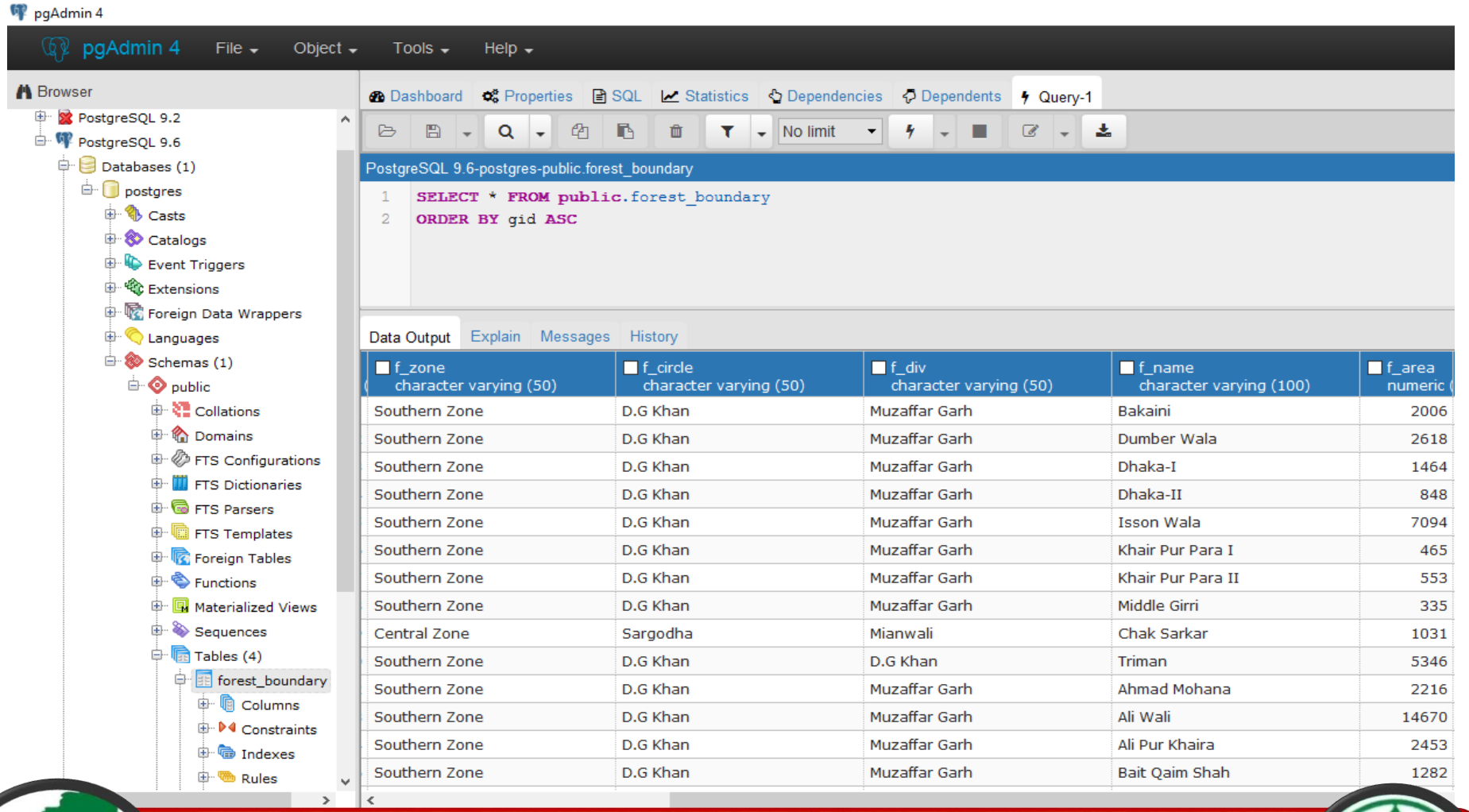
FMIS Planning Module

Soil Suitability Analysis Dashboard

Soil Map Of Changa Manga Forest



GIS BASED CENTRALIZED FOREST DATA REPOSITORY (CFDR)



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Southern Zone	D.G Khan	Muzaffar Garh	Bakaini	2006
Southern Zone	D.G Khan	Muzaffar Garh	Dumber Wala	2618
Southern Zone	D.G Khan	Muzaffar Garh	Dhaka-I	1464
Southern Zone	D.G Khan	Muzaffar Garh	Dhaka-II	848
Southern Zone	D.G Khan	Muzaffar Garh	Isson Wala	7094
Southern Zone	D.G Khan	Muzaffar Garh	Khair Pur Para I	465
Southern Zone	D.G Khan	Muzaffar Garh	Khair Pur Para II	553
Southern Zone	D.G Khan	Muzaffar Garh	Middle Girri	335
Central Zone	Sargodha	Mianwali	Chak Sarkar	1031
Southern Zone	D.G Khan	D.G Khan	Triman	5346
Southern Zone	D.G Khan	Muzaffar Garh	Ahmad Mohana	2216
Southern Zone	D.G Khan	Muzaffar Garh	Ali Wali	14670
Southern Zone	D.G Khan	Muzaffar Garh	Ali Pur Khaira	2453
Southern Zone	D.G Khan	Muzaffar Garh	Bait Qaim Shah	1282

GIS PUNJAB FOREST DEPARTMENT

GIS LAB PUNJAB FOREST

GIS BASED CENTRALIZED FOREST DATA REPOSITORY (CFDR)

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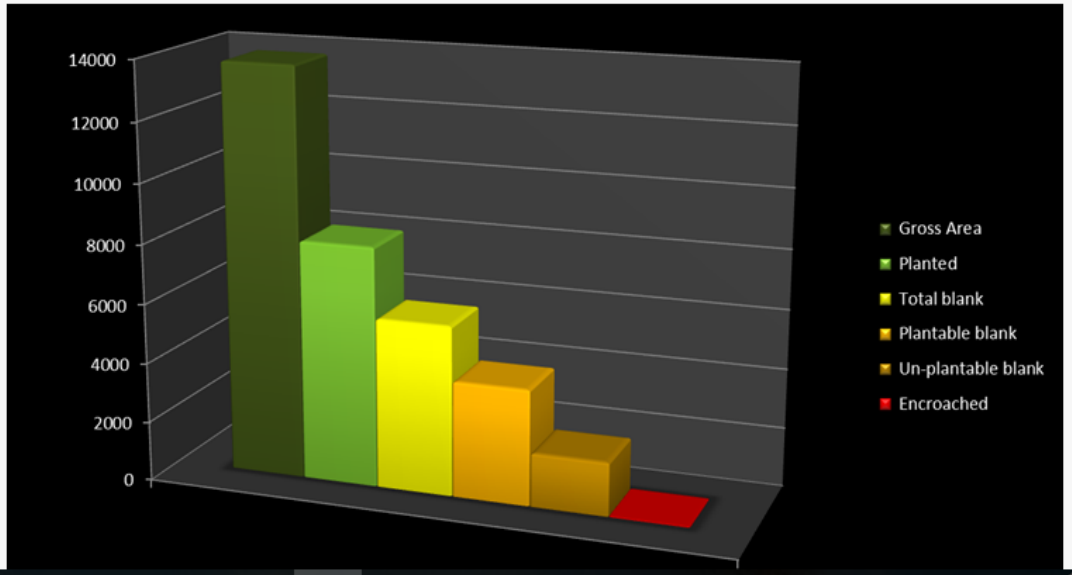
Apps | https://scihub.copern | random | lightning | Vacancies - Research | WEB_GIS | landsat | Royal Express | Mercury | Presentation | wind | Highmaps | Other bookmarks

- Central Zone
- Lahore Circle
- Kasur Forest Division
- Lahore Forest Division
- Okara Forest Division
- Faisalabad Circle
- Faisalabad Forest Division
- Jhang Forest Division
- Gujranwala Circle
- Gujrat Forest Division
- Gujranwala Forest Division
- Sialkot Forest Division
- Range Management Circle
- Northern Zone

Kasur Forest Division

Name of Forest	Provincial/ District	Area (Acres)					
		Gross Area	Planted	Total blank	Plantable blank	Un-plantable blank	Encroach
Changa Manga Plantation.	Provincial	12510.15	8010	4500	2946	1554	0
Rakh Bhunike	Provincial	99	10	89	66	0.5	22.5
Rakh Deosial	Provincial	1173	50	1123	879	244	0
otal Reserved Forest		13782.15	8070	5712	3891	1798.5	22.5
ution of Kasur Forest Division		13782.15	8070	5712	3891	1798.5	22.5



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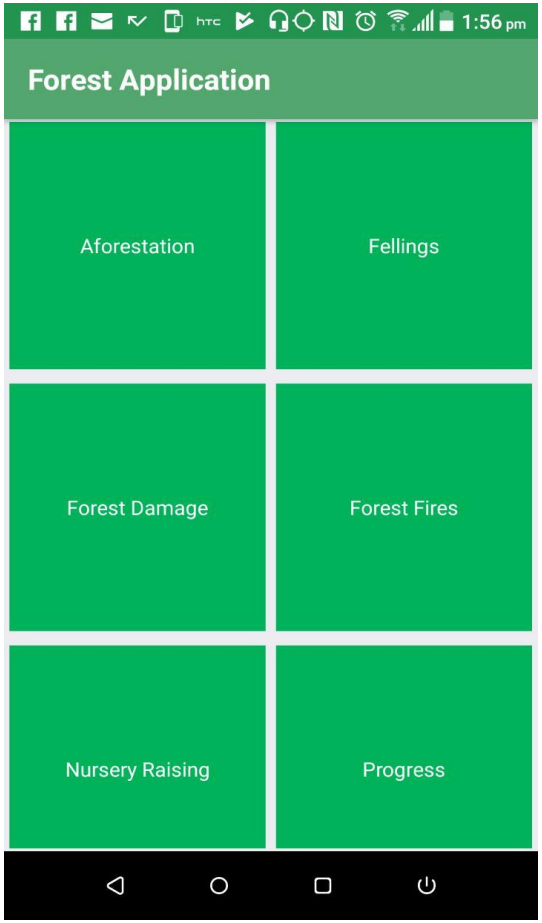
GIS LAB PUNJAB FOREST

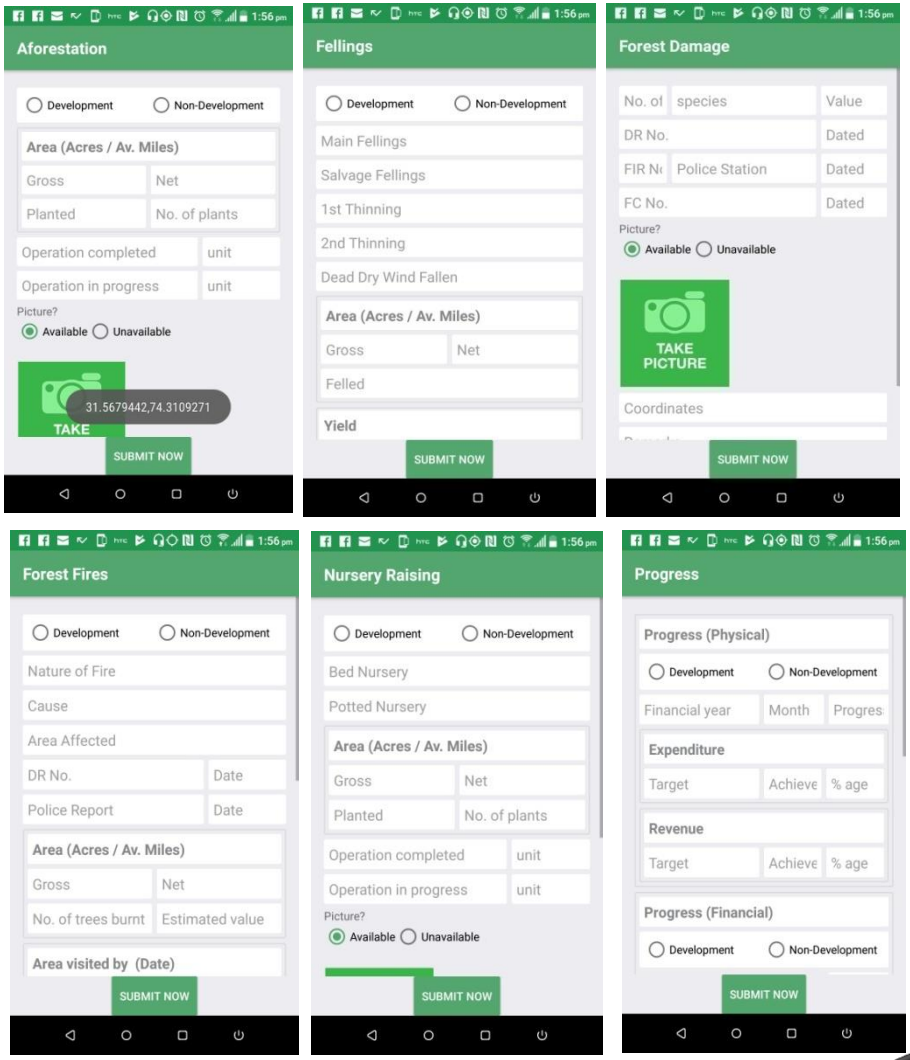
RAPID FIELD DATA COLLECTION SYSTEM

FMIS Android Application for Field Data Collection



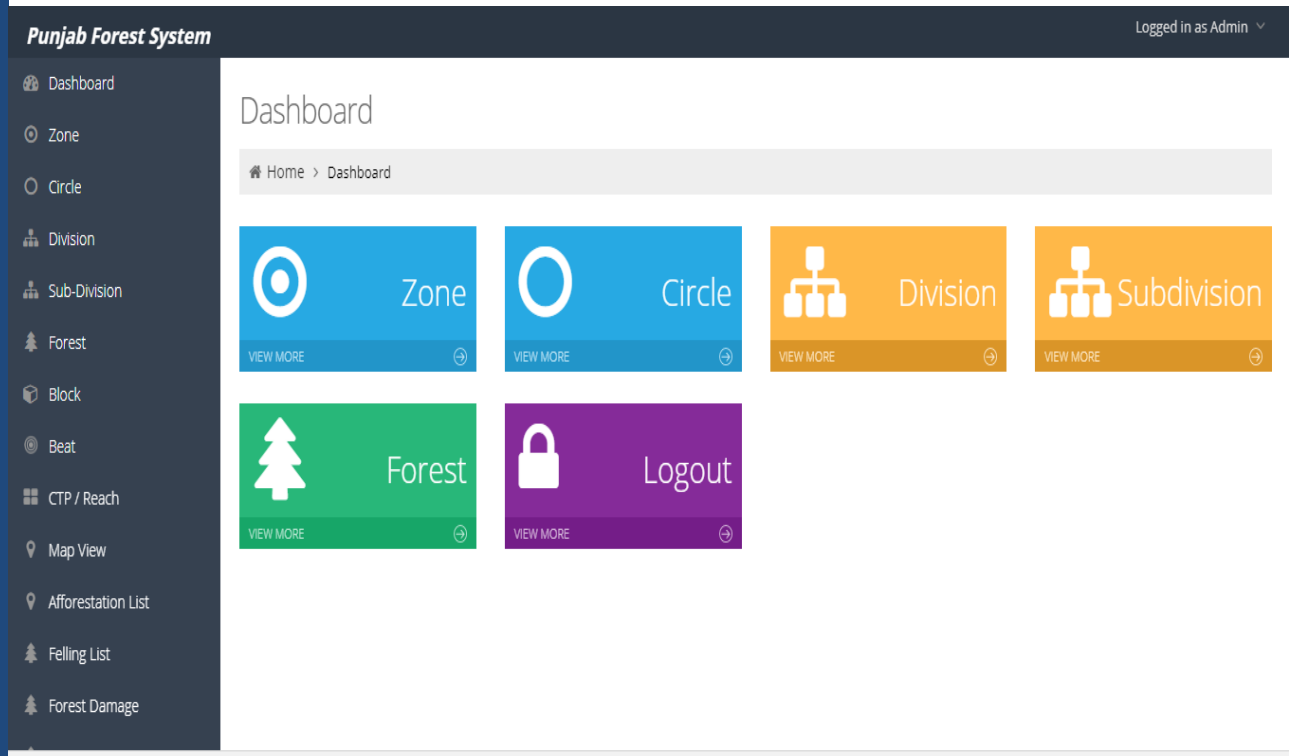
FMIS Android Application for Field Data Collection at user end

Data Entry Forms under Each Module



FMIS Android Application Dashboard at Administration end

For Field Data Monitoring and Data Retrieval



EBEE SENSEFLY DRONE FOR PUNJAB FOREST DEPARTMENT

EBEE SENSEFLY DRONE SPECIFICATIONS

- Origin : Switzerland
- Flight Duration : 40 mints Aprox
- Area Coverage : 300-500 Acres per flight
- Resolution : 3 cm
- Auto Pilot : Yes
- Manual Flight : Yes
- Flight Planning Module
- DSM Generation: Yes

EBEE SENSORS

Sequoia Sensor

- Four 12 MP spectral cameras (Red, Green, Red Edge and NIR)
- One 16 MP with RGB
- 64 GB built-in storage
- GPS
- 32 GB SD card

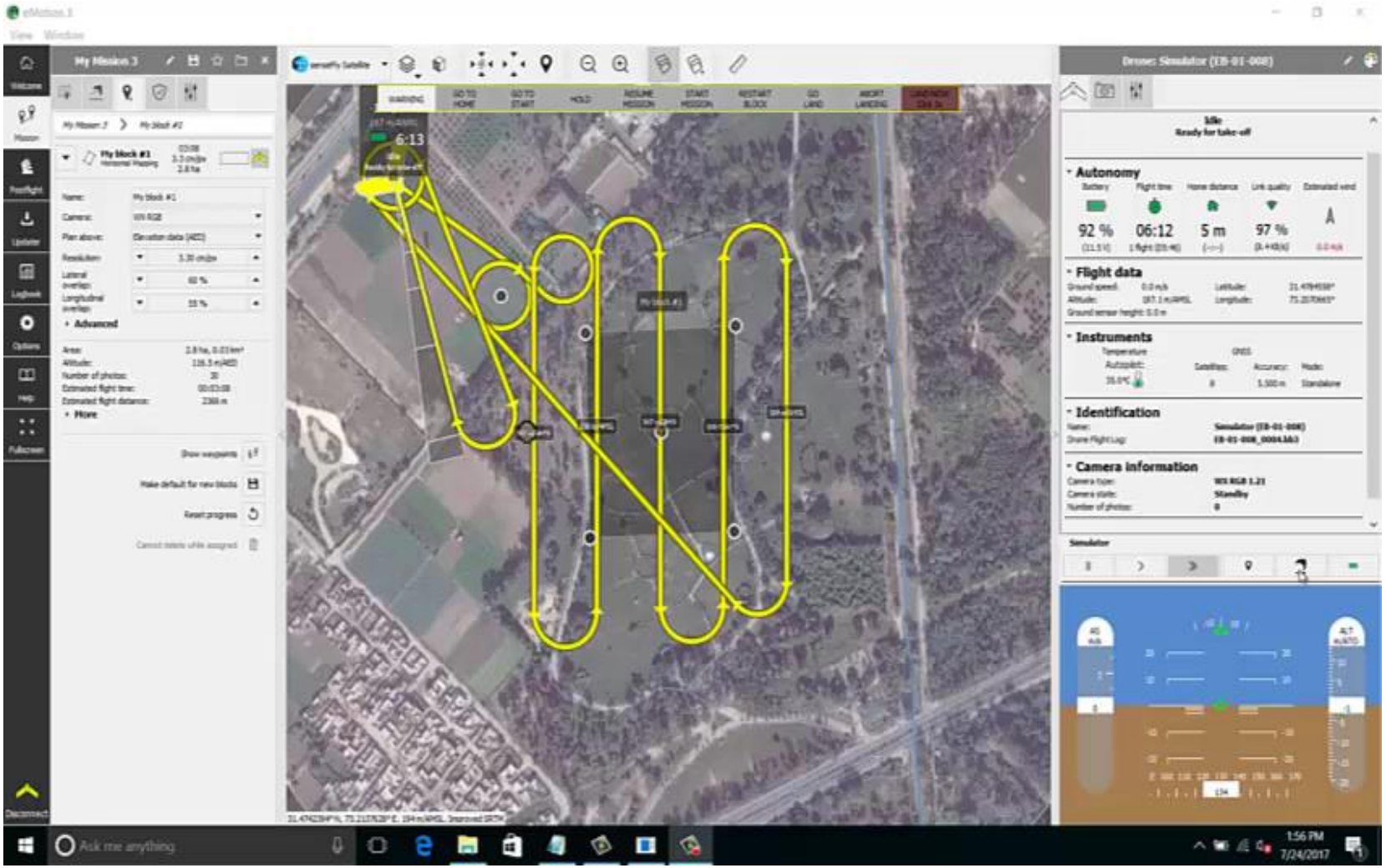
RGB Sensor

- Resolution : 18.2 MP
- Ground resolution at 100 m (328 ft) : 2.75 cm (1 in) / pixe
- Image format JPEG

DRONE FLIGHT PLANNING AND IMAGE PROCESSING SOFTWARES

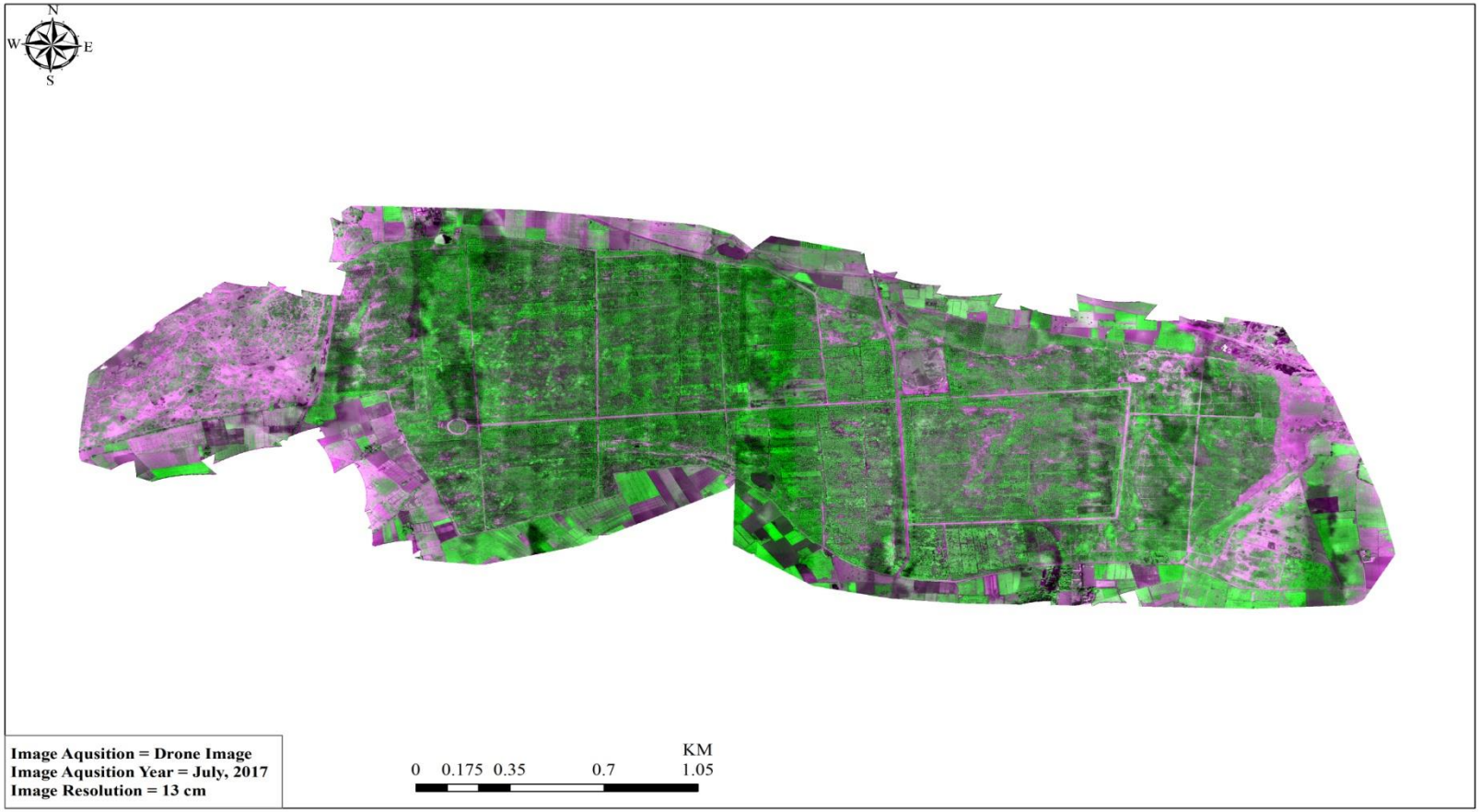
- Flight planning & control software : eMotion
- Image processing software: Pix4Dmapper Pro

DRONE FLIGHT PLANNING AND DATA ACQUISITION



MONITORING THROUGH DRONE

SHAHDARA DRONE IMAGE
LAHORE FOREST DIVISION



MONITORING THROUGH DRONE

SHAHDARA DRONE IMAGE
LAHORE FOREST DIVISION

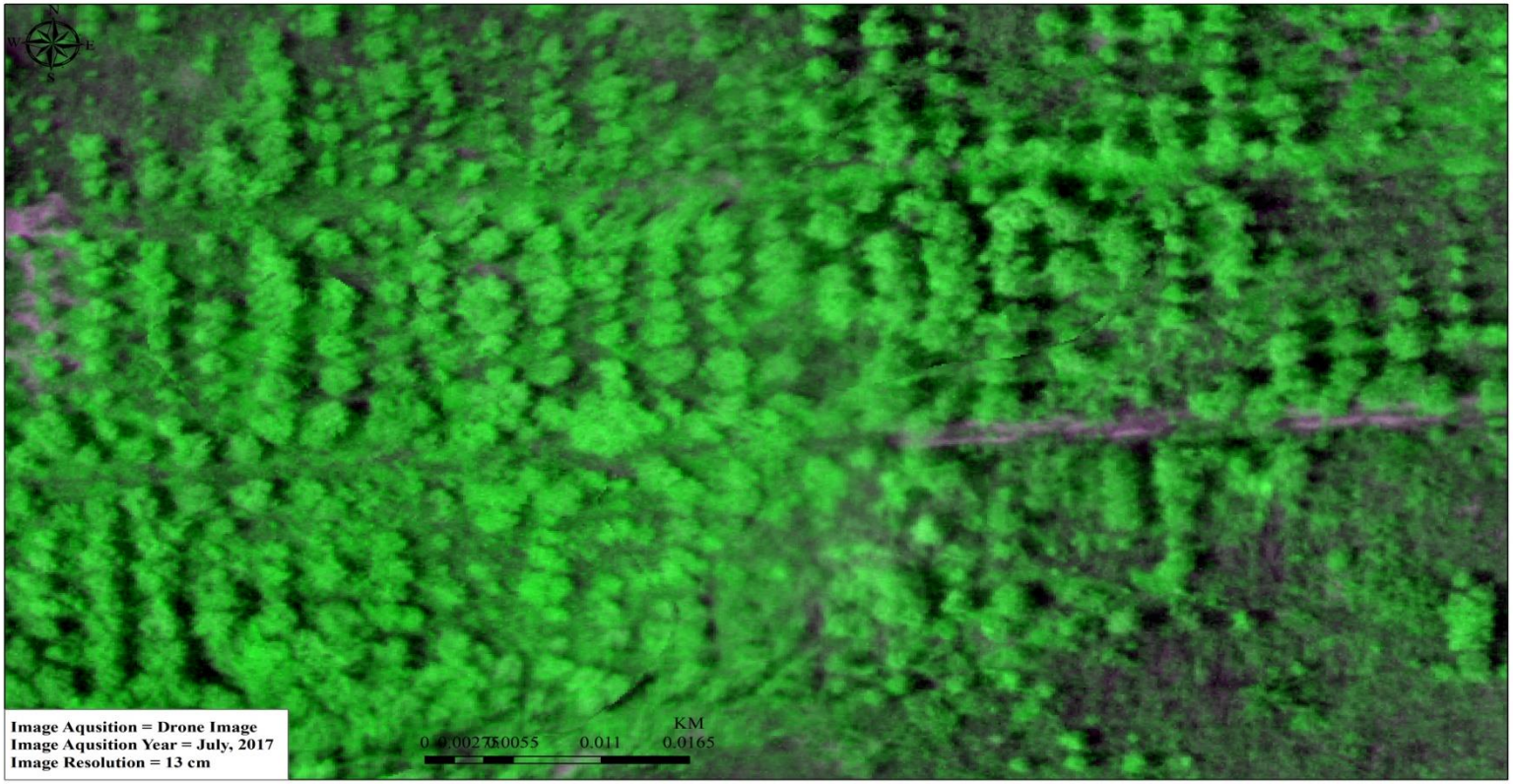


IMAGE RESULT

THANK YOU