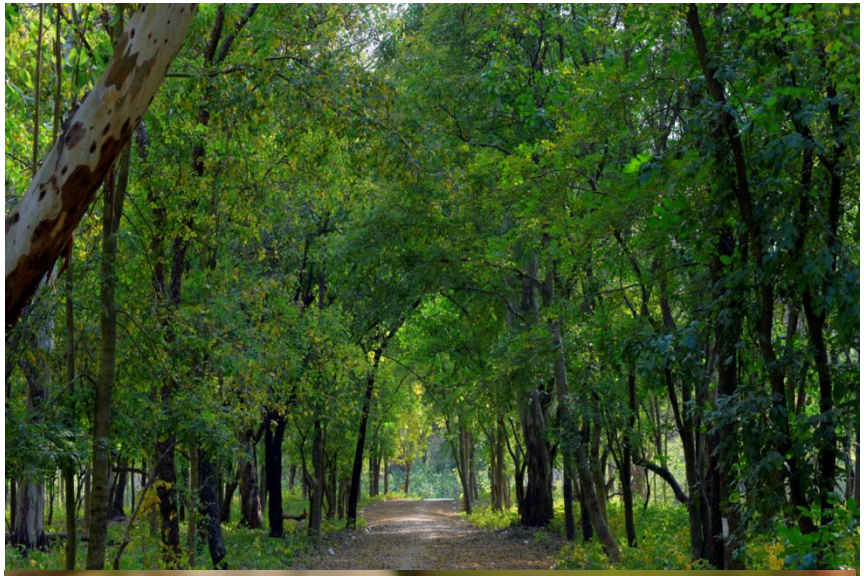
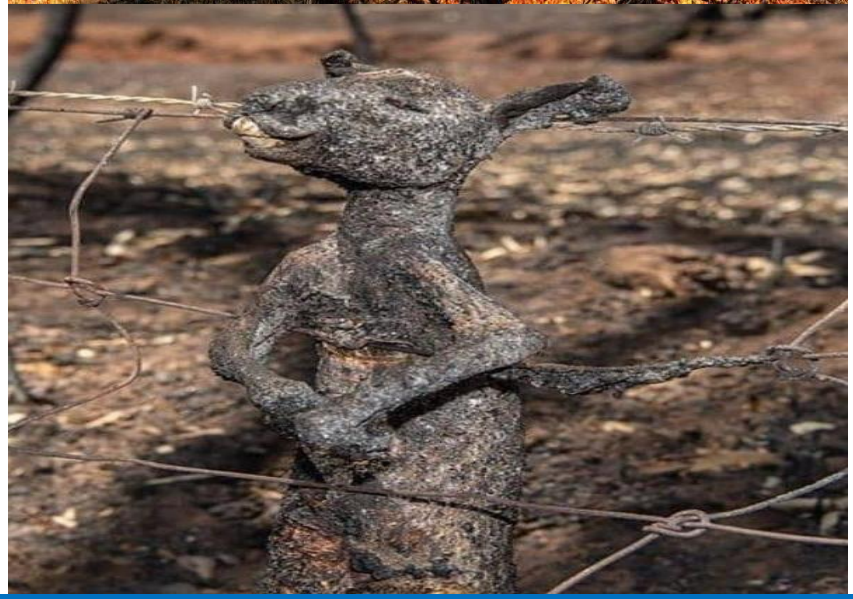
Dr. Abdul Qayum, IFS
qayum.iitk@gmail.com

Immediate Past!



Present…



Projects aims to go back to the glorious past!

BACKGROUND- Why present work?

- Forest fire destroys **millions of ha of world's forests** every year
- Fire is one among major threats for the world's forests
- Problem has compounded with drought, hot weather etc.

- Arunachal Pradesh, over 80 % forests are Himalayan biodiversity.
- Topographical and metrological factors Vs S**hifting cultivation**
- **Right Method → Right Time → Right Place**

(How, When & Where to intervene to mitigate fire linked disaster!)

Project OUTLINE

1. Lack of Public Participation
2. No distinction b/w Forest/Revenue Area
3. Too late to report (4 hr)
4. No prediction/forecasting
5. False Reporting

GIS MAPPING

→ Socio-economy

→ Climatic-Environmental

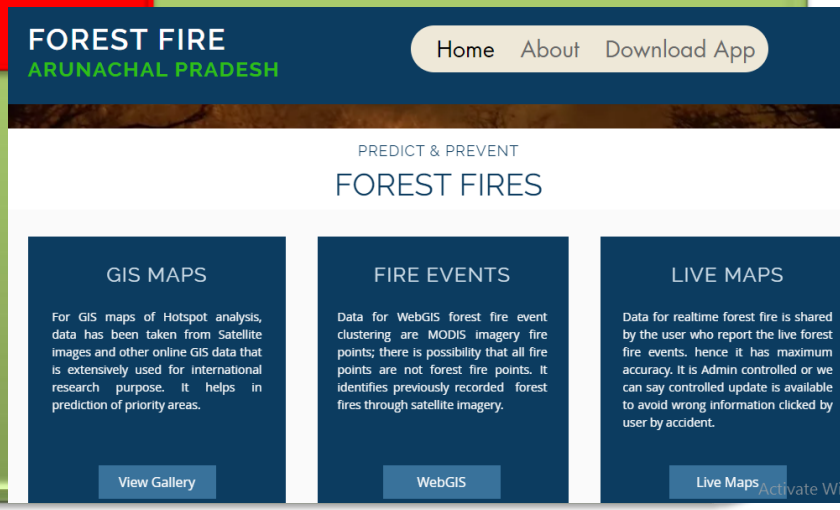
→ Geographical Factors

Limitations?

PREDICTIVE MODEL

← Mobile App

WebGIS Portal →



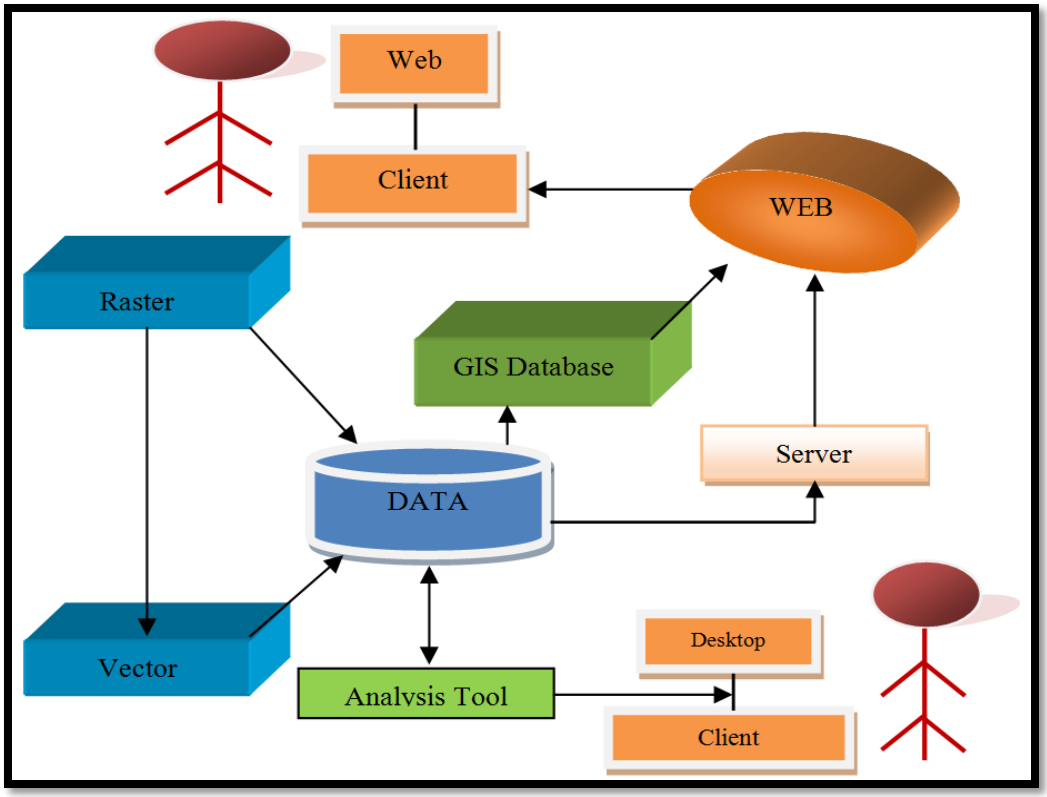
MAJOR OBJECTIVES

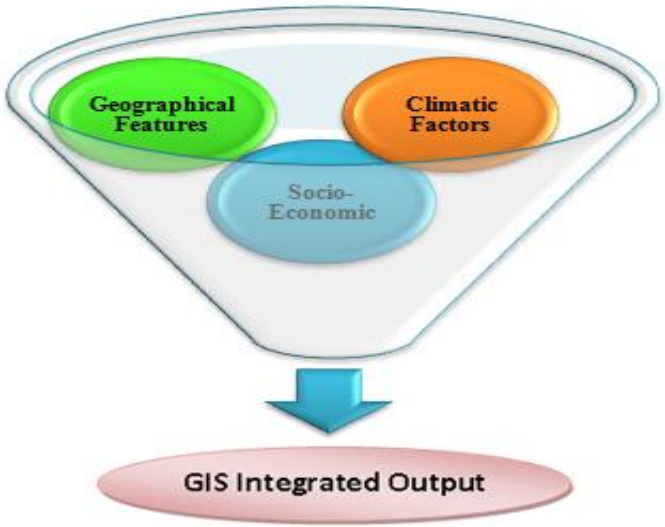
1. To integrate direct/indirect factors of forest fire to find initial hotspot & its correlation with FSI Data
2. To develop predictive model by integrating **Socio-economy, Climatic-Environmental, Geographical Factors & FSI** data to extract hotspots at **villages level**
3. **Strategic allocation** and optimal utilization of limited Govt. resources
4. To link model, Android App and web GIS portal **to refine the prediction** with citizen centric inputs
5. To have an **efficient information dissemination system** & to have real time updation of forest fire data

Integrated mapping: fire hotspot identification

- GIS is a **principal tool in fire mapping**, helps with **quick retrieval of information** and map generation to highlight hotspots of fire incidence.

Data used	Attributes	Rationale
MODIS	Forest fire detection	36 spectral bands
ASTER-DEM from USGS	Topography (elevation and slope)	30 m spatial resolution with with 95% CI
SPOT4	Vegetation	1 km resolution





- Work is **union of 8+1 odd parameters**

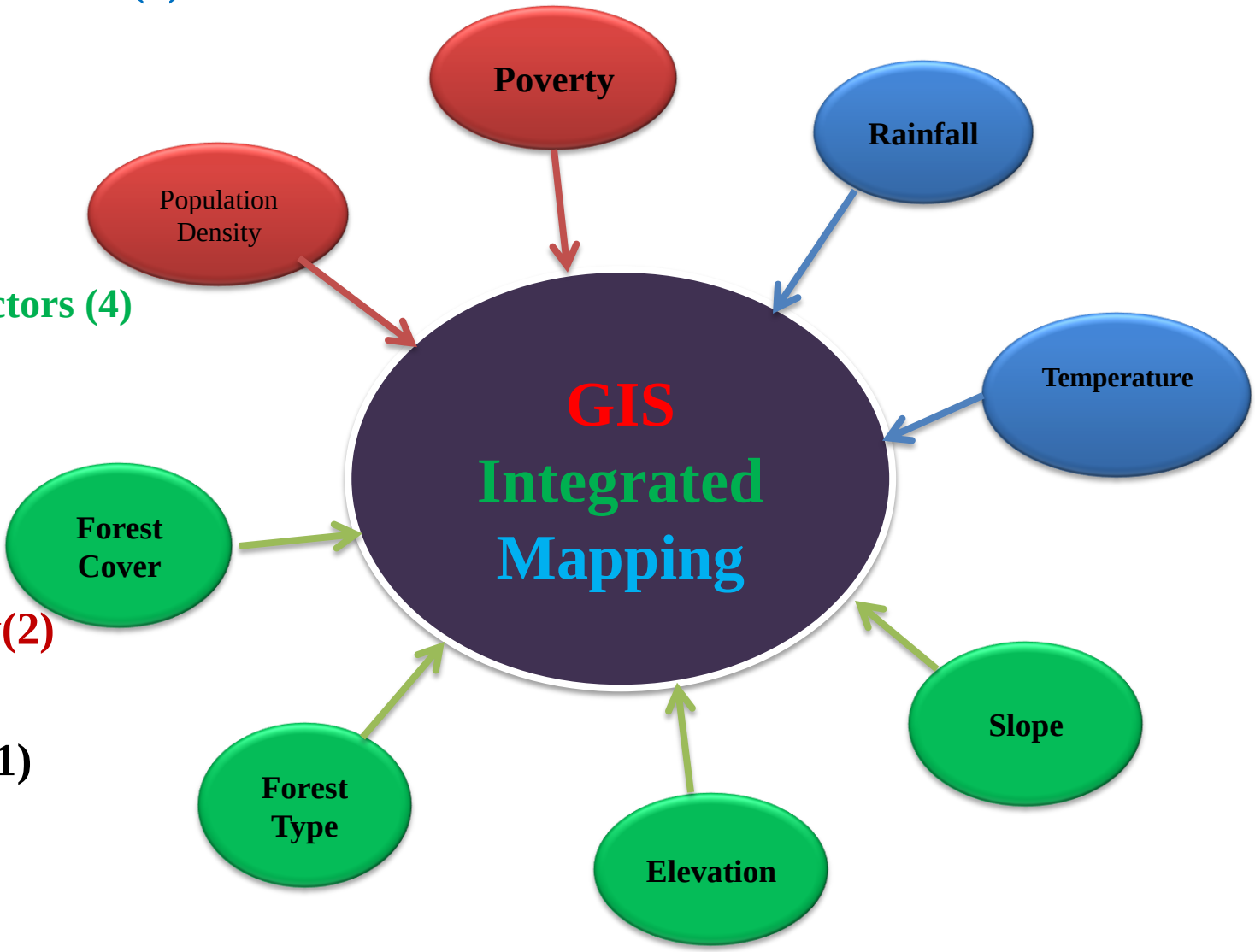
Integrated mapping: COMPONENTS

1. Climatic-Env Factors (2)

2. Geographical Factors (4)

3. Socio-Economy(2)

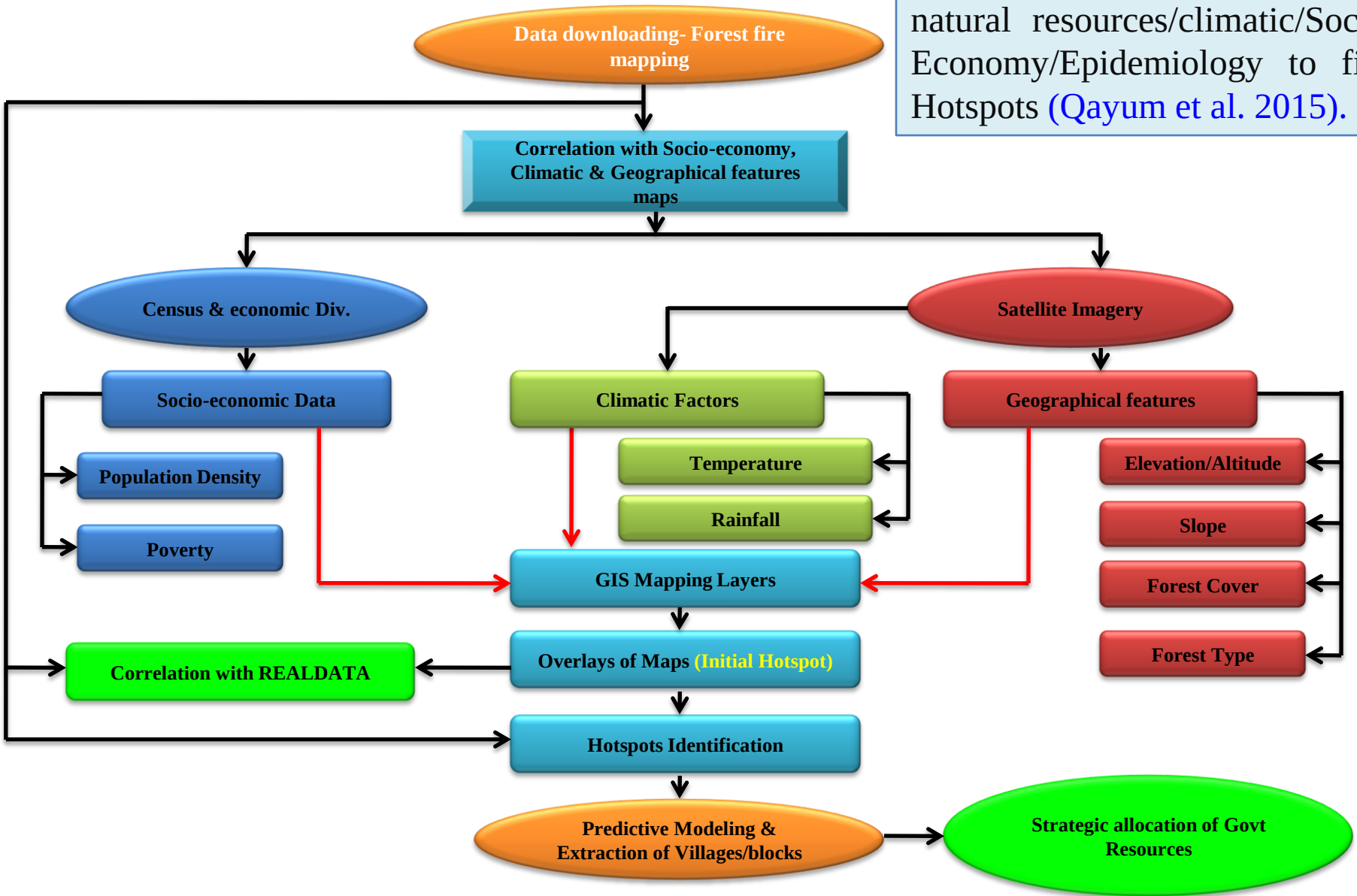
4. FSI Fire Data (1)



Methodology: Forest Fire Hotspot Identification

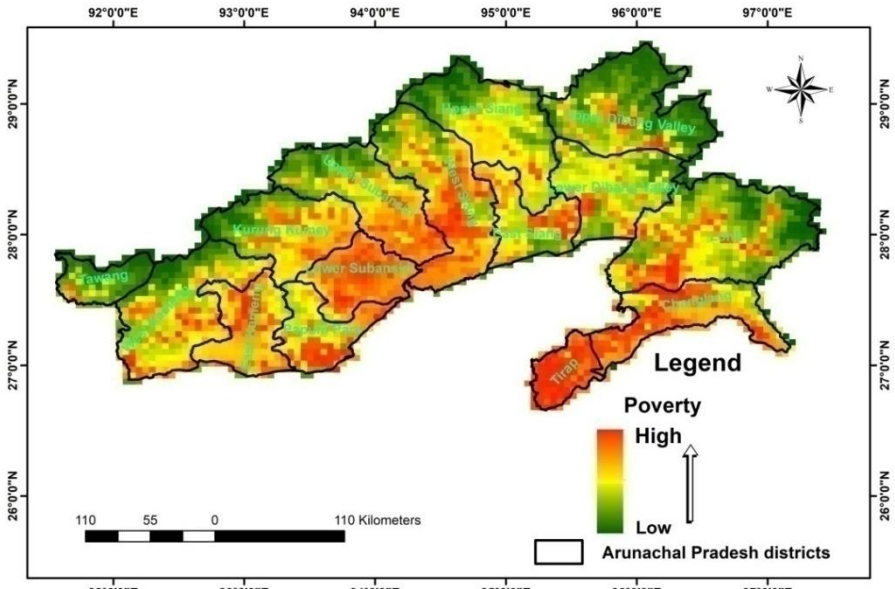
Schematic flowchart for PREDICTIVE MODELING

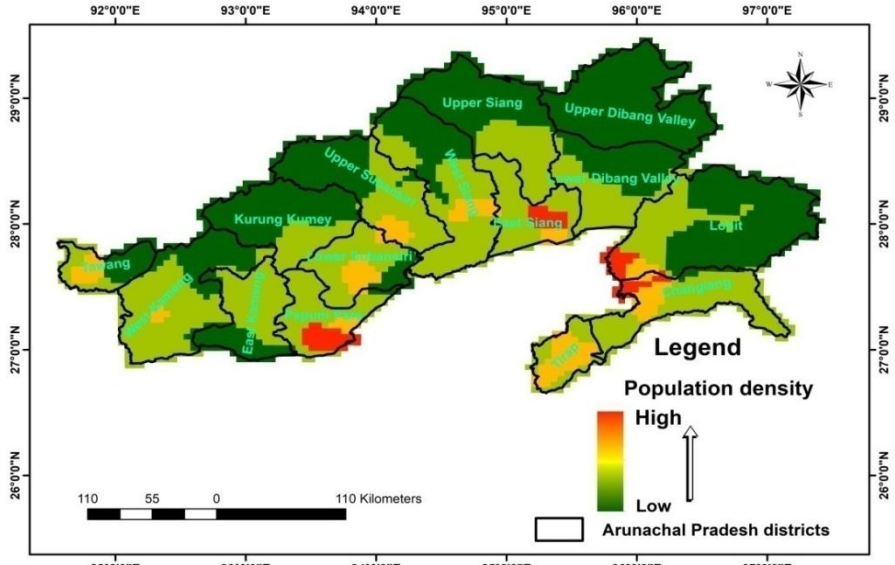
ArcGIS 10.1 was used to map natural resources/climatic/Socio-Economy/Epidemiology to find Hotspots (Qayum et al. 2015).



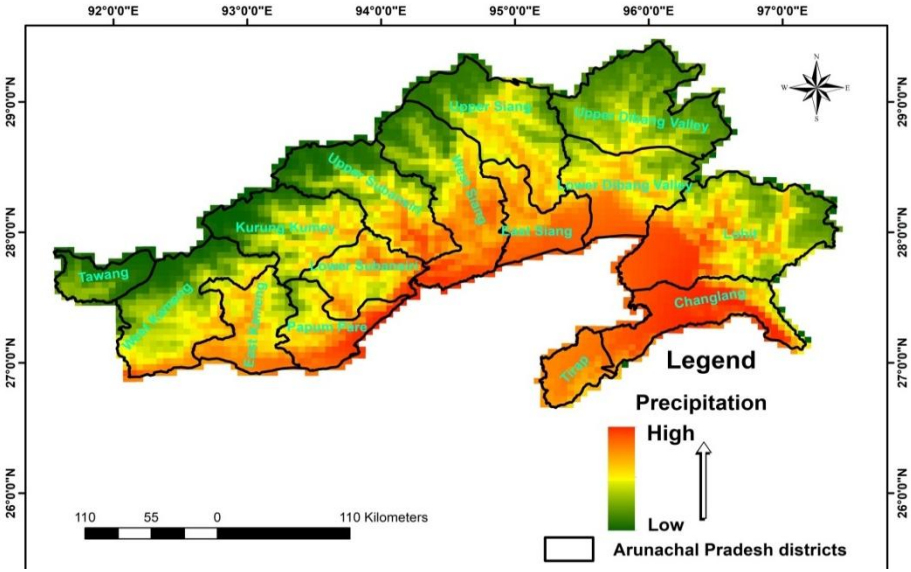
RESULTS: Integrated Mapping

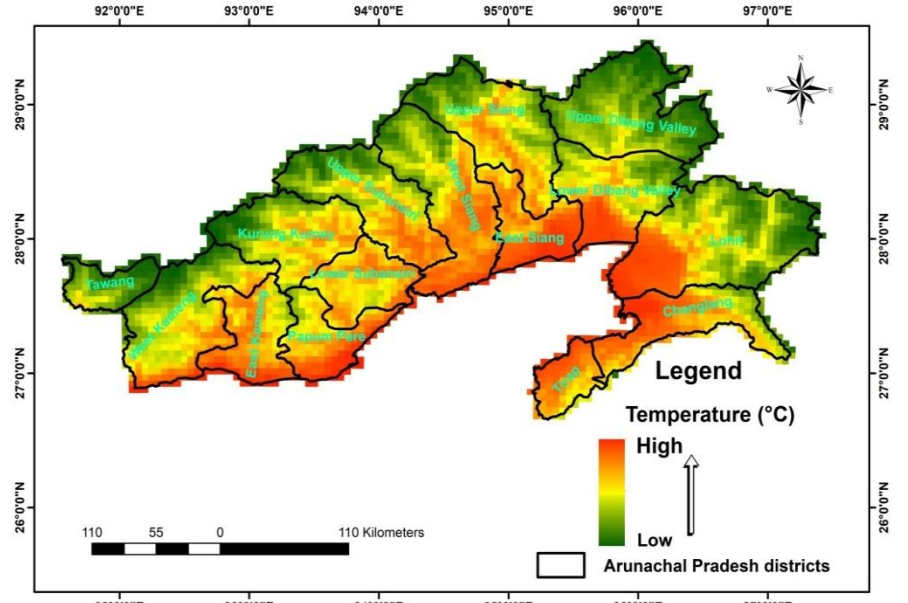
Socio-Economy



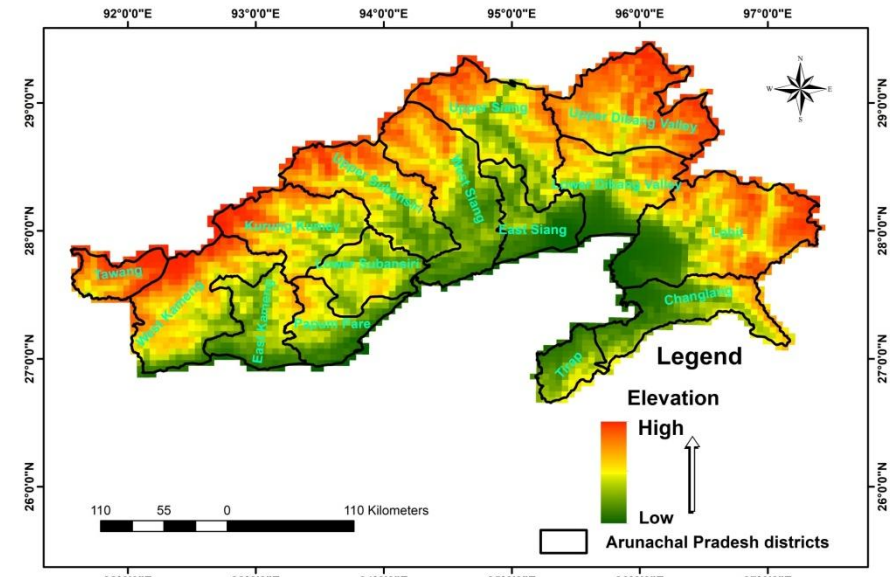


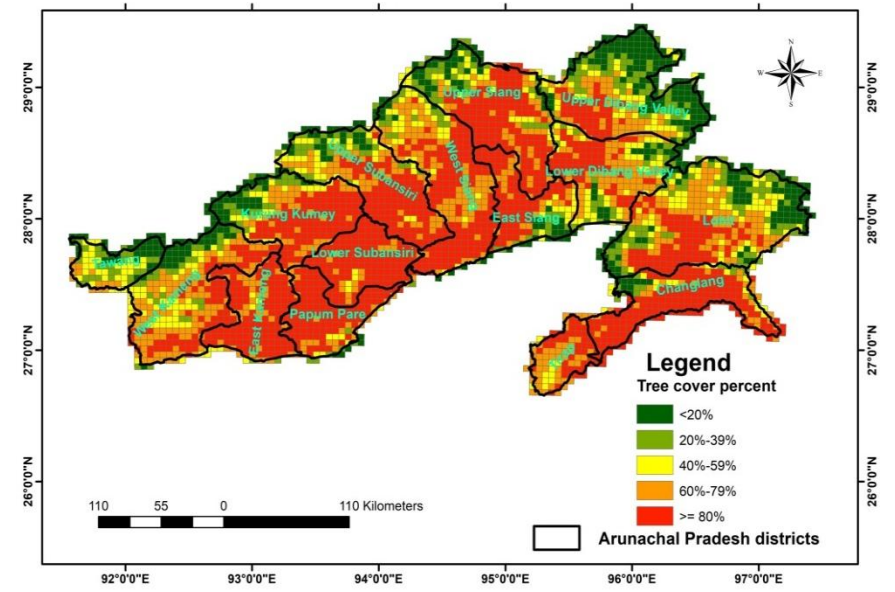
Climatic-Environmental



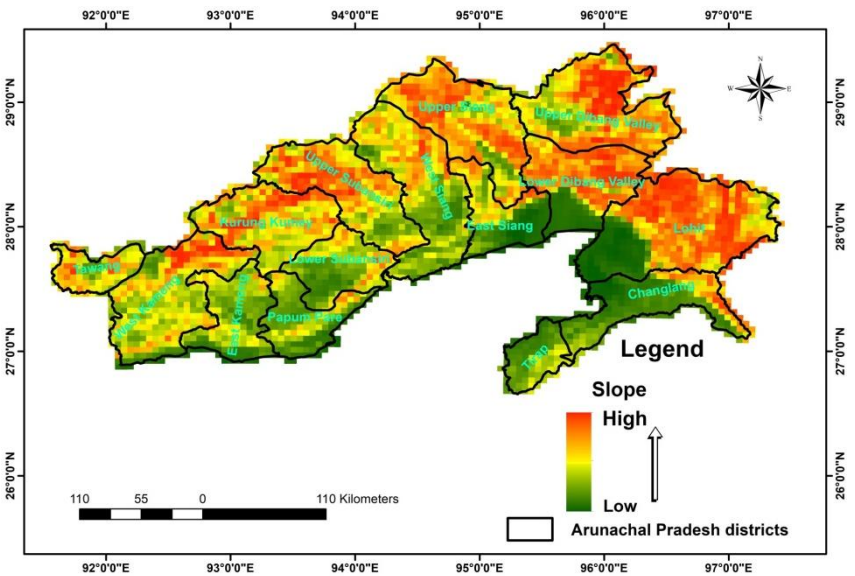


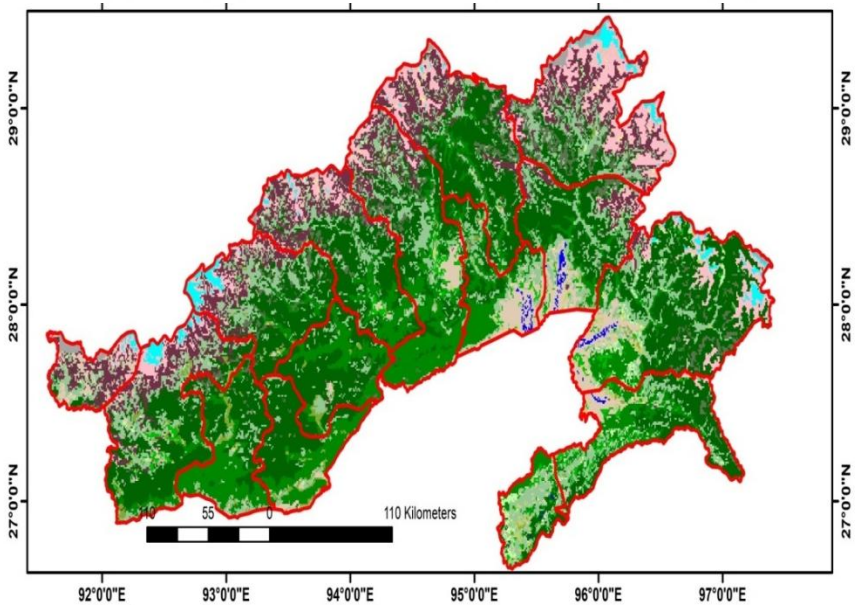
RESULTS: Geographic Features





Forest Cover

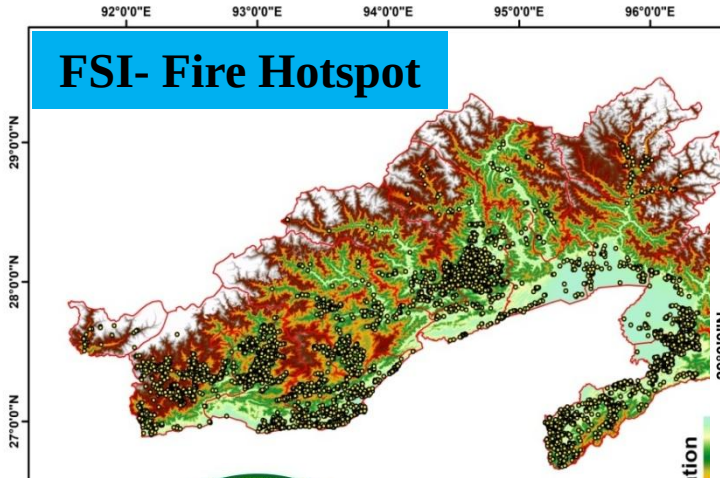


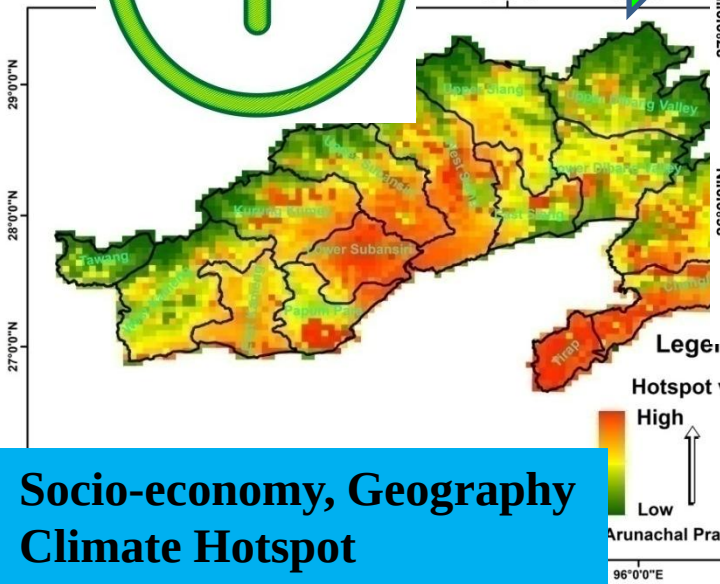


Forest Type

RESULTS: Hotspots

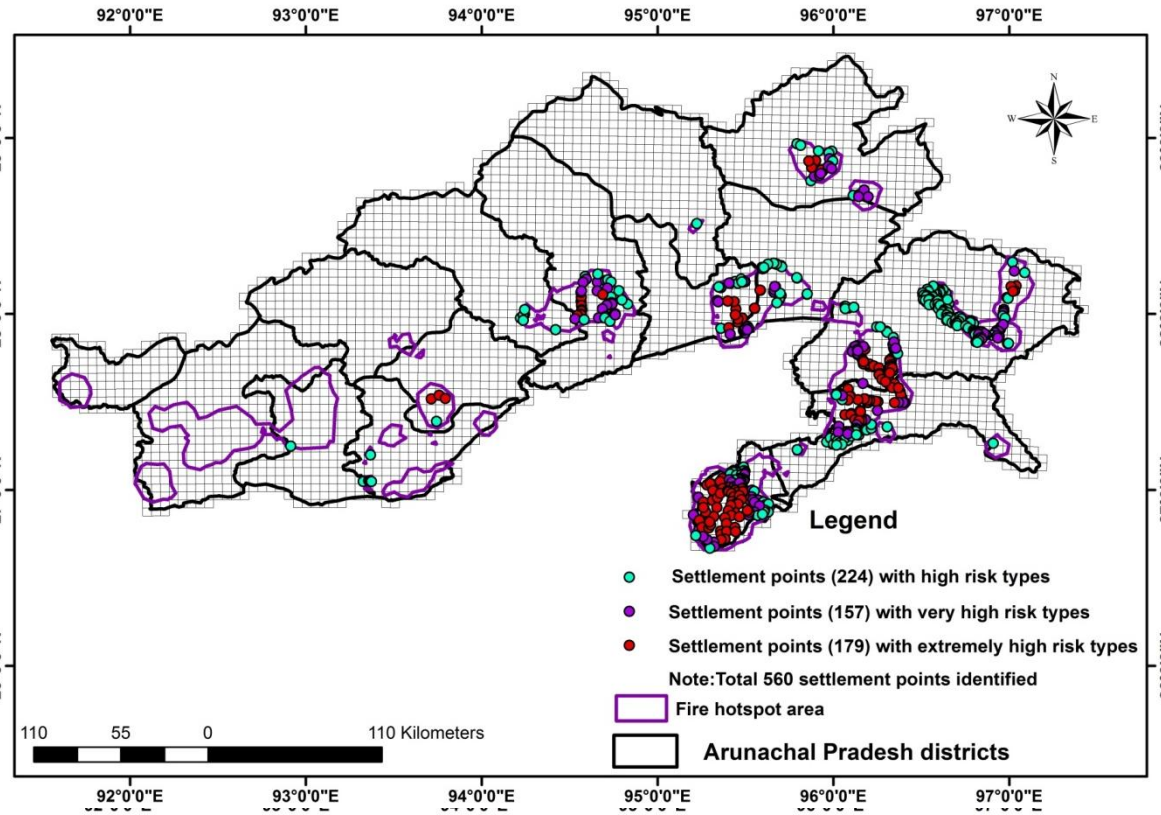
FSI- Fire Hotspot





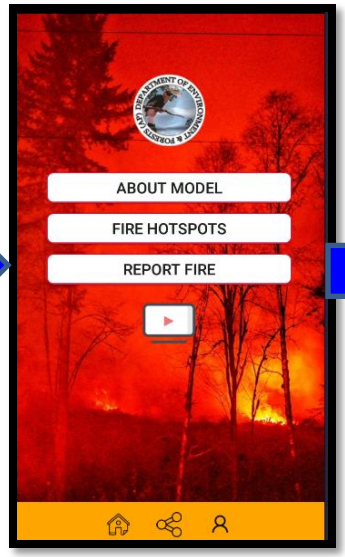
Socio-economy, Geography Climate Hotspot

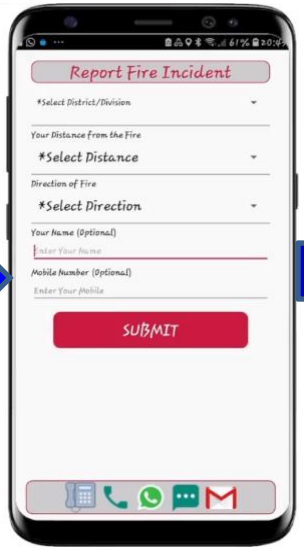
560villages/settlement unit out of 5258

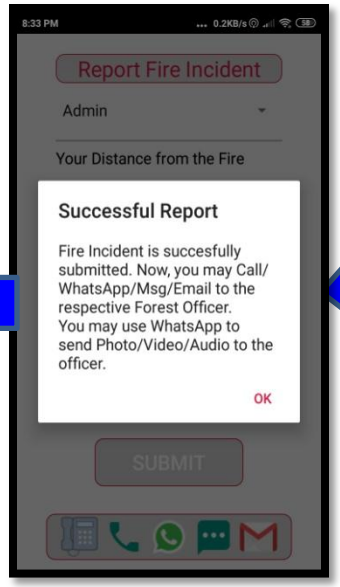


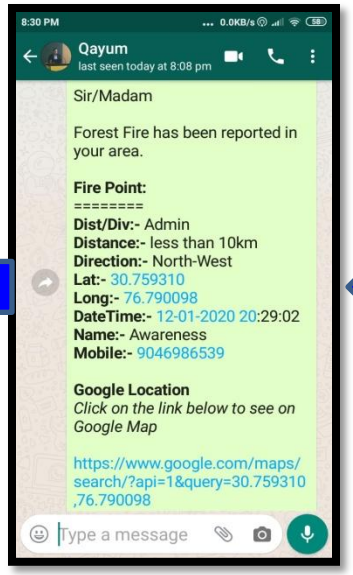
Information Dissemination System

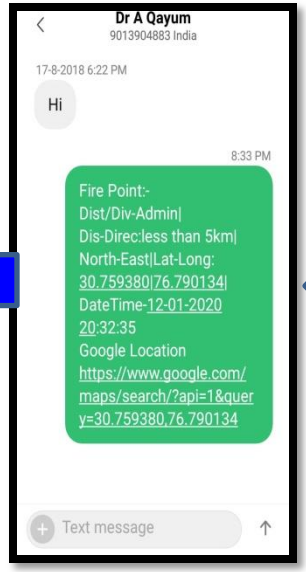
→ Mobile App (**eForestFire**)- Offline Mode & User Friendly

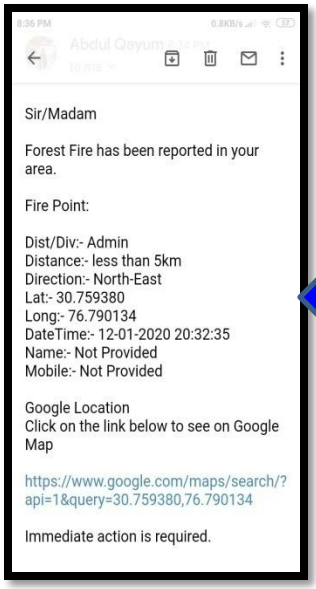








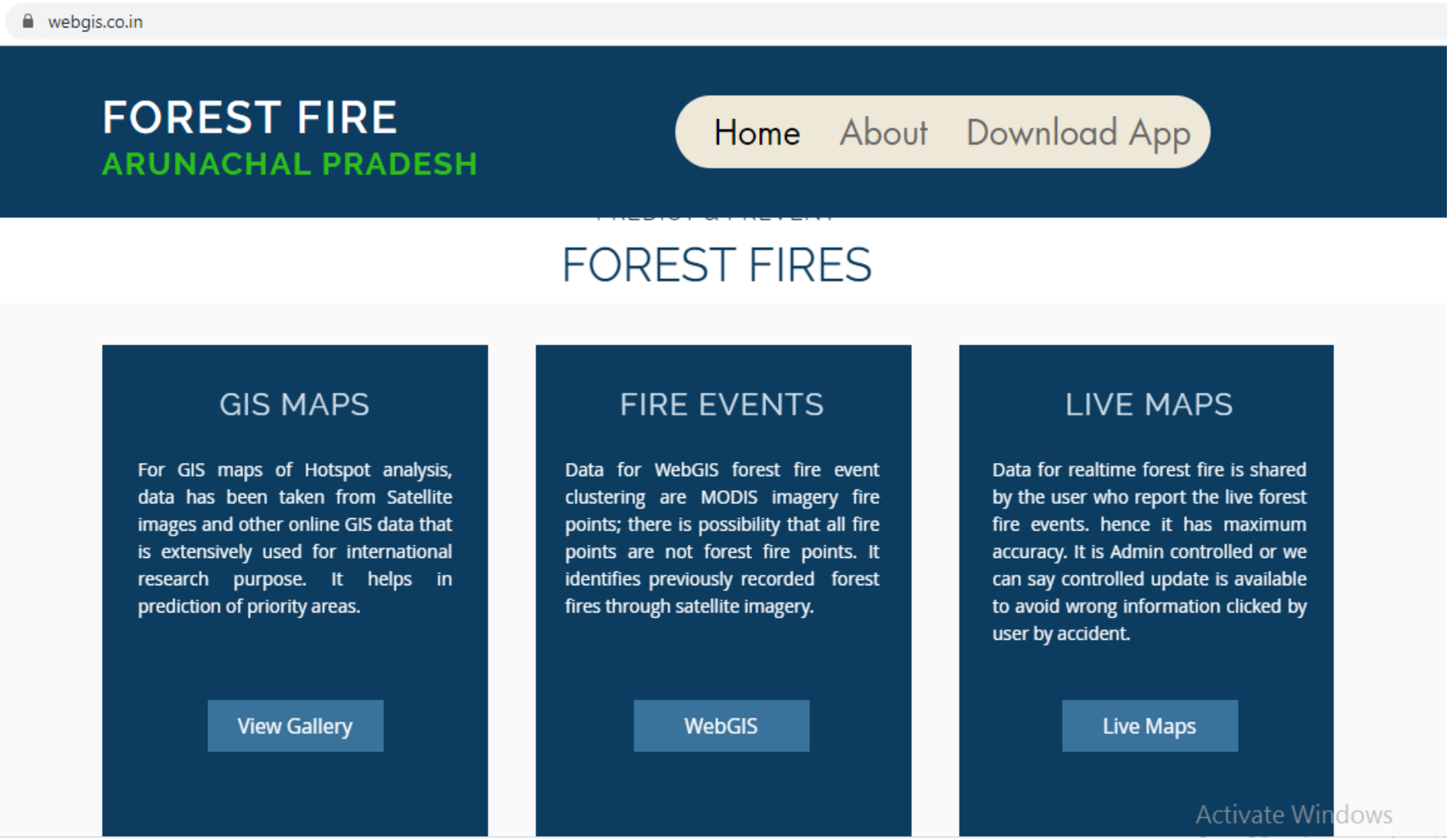




Web GIS Portal

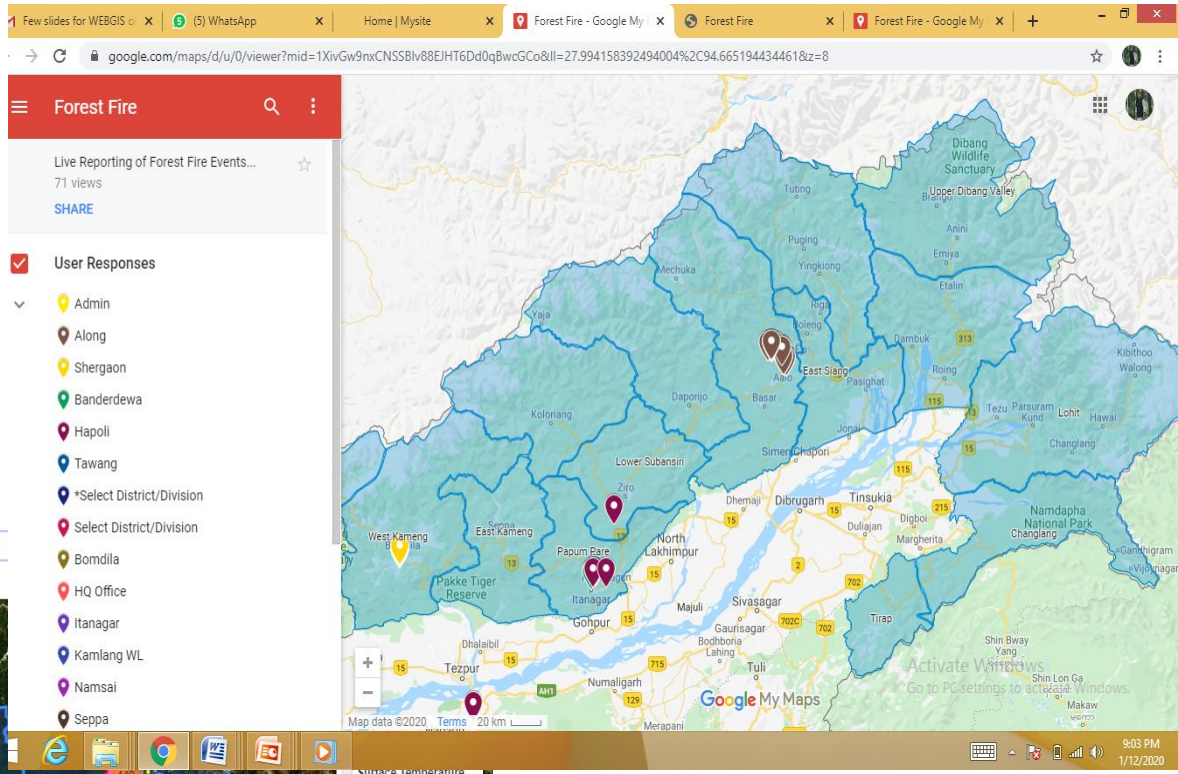
- For Real time updation
- Bird's eye view of state forest fire

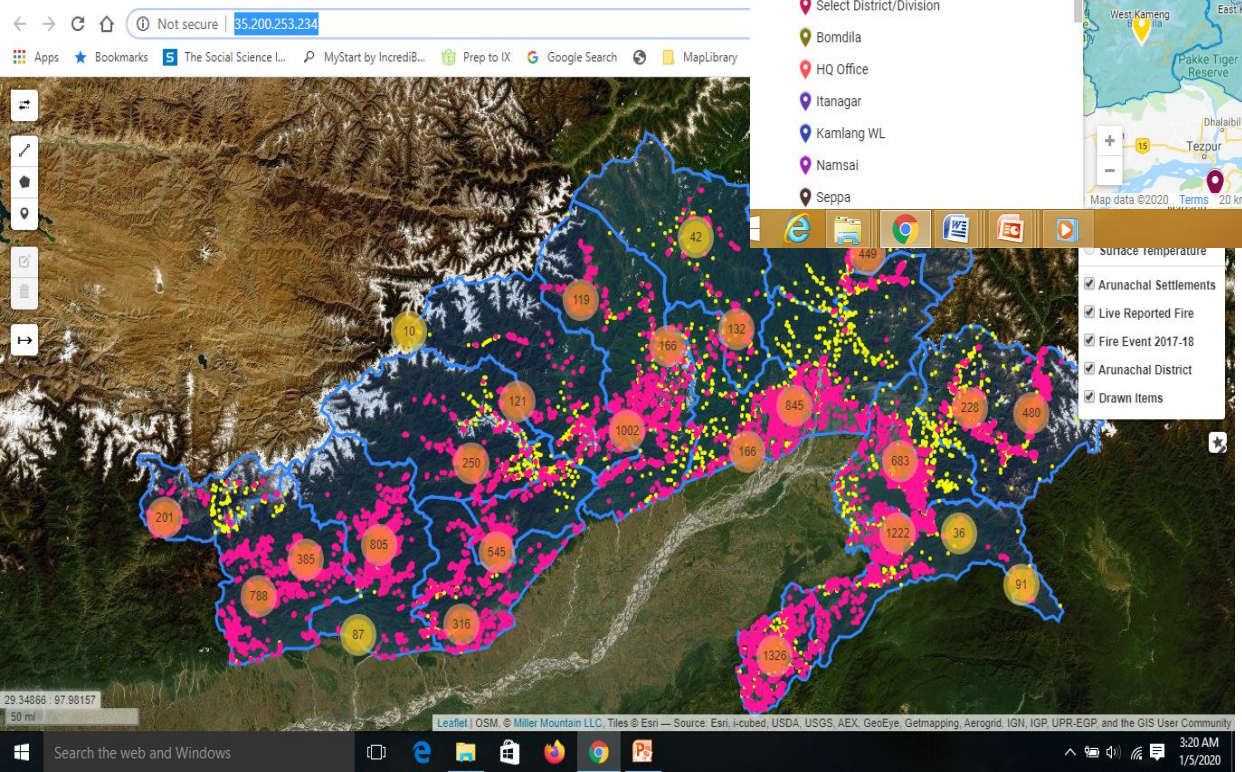
https://www.webgis.co.in/



Web GIS Portal

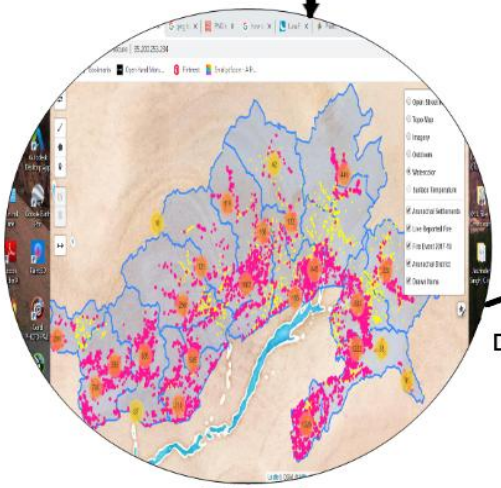
- Different Thematic Layers
- Live Maps
- Fire Data History





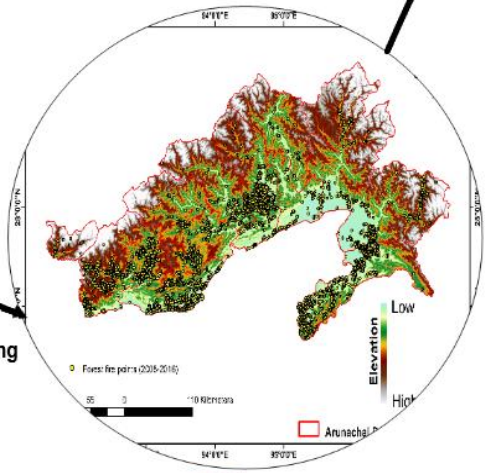
Real Time Updation of Database linked to the project

GeoJSON File



Web Portal

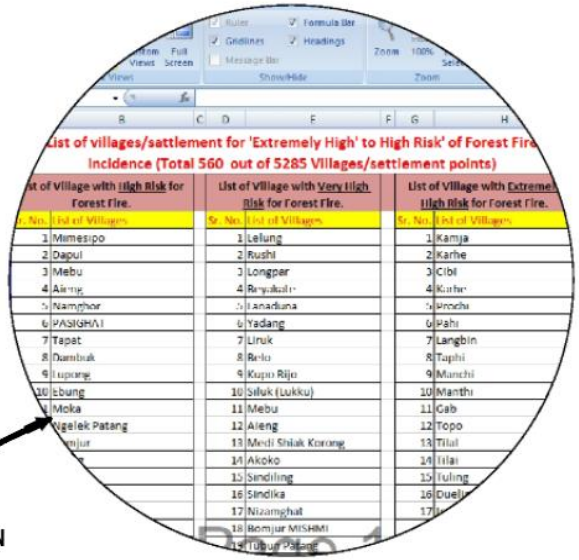
Data Refining



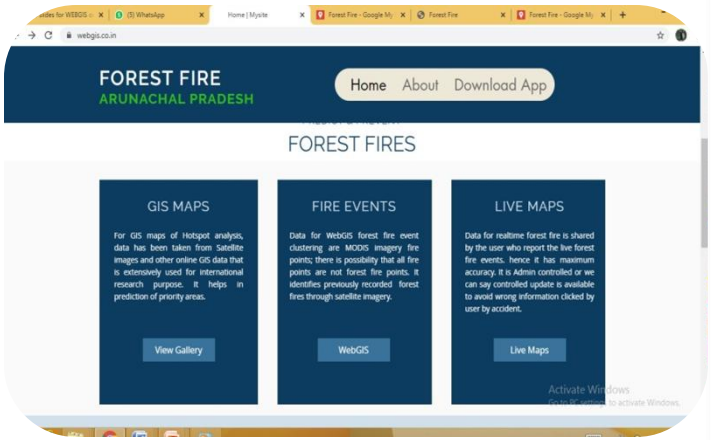
GIS Mapping

Fire Hotspots

PREDICTION

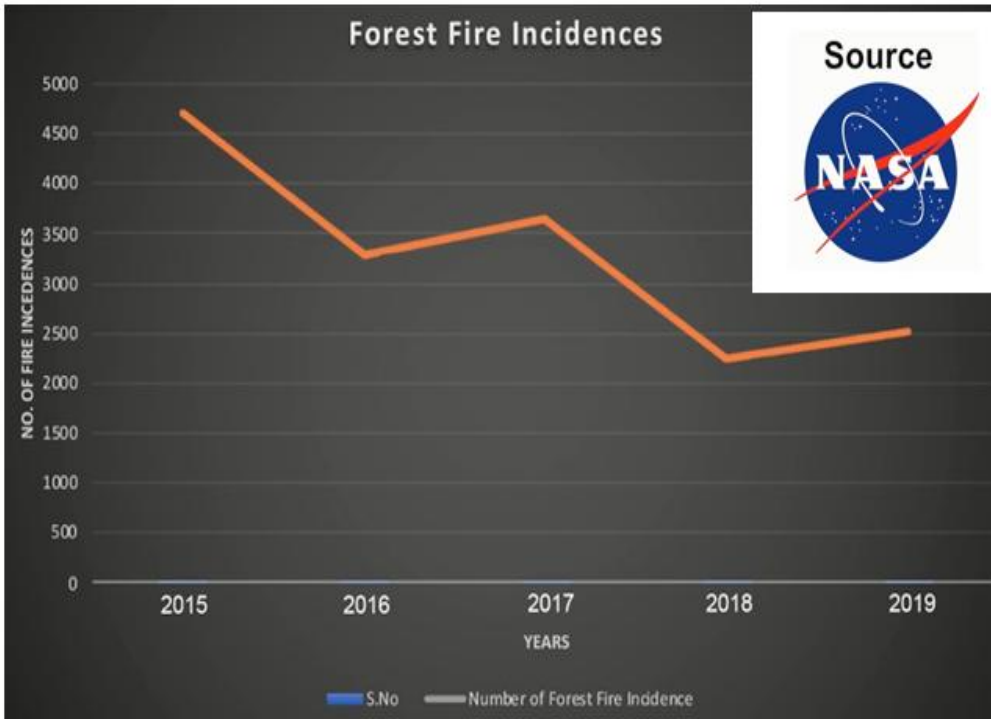


Villages with High Risk of Forest Fire



Benefits & Outcome

- As per report from NASA, Forest fire Incidences were **31 % less i**n comparison of period before the start of project



Gmail — Abdul Qayum <qayum.iitk@gmail.com>

Fw: NASA FIRMS: Your Download Request for 2019

1 message

firoz ahmad <adfiroz@yahoo.com> 9 December 2019 at 16:12
Reply-To: firoz ahmad <adfiroz@yahoo.com>
To: Abdul Qayum <qayum.iitk@gmail.com>

----- Forwarded message -----
From: NASA FIRMS <noreply@modaps.eosdis.nasa.gov>
To: "adfiroz@yahoo.com" <adfiroz@yahoo.com>
Sent: Saturday, 7 December 2019, 11:40:56 GMT+3
Subject: NASA FIRMS: Your Download Request

Greetings!

This is to confirm your recent request for NASA FIRMS Archive Download request. The details of your request are as follows:

Download Id(s): 90956 90957
Data Source: MODIS C6 & VIIRS
Area of Interest: India
Date Range: 2019-01-01 to 2019-12-07
Data Format: .shp
Request Time: 2019-12-07 08:40:54

Once we process your request, we will send you an email with instructions on how to download the data. You can check the status of your request at any time with the NASA FIRMS Archive Download.

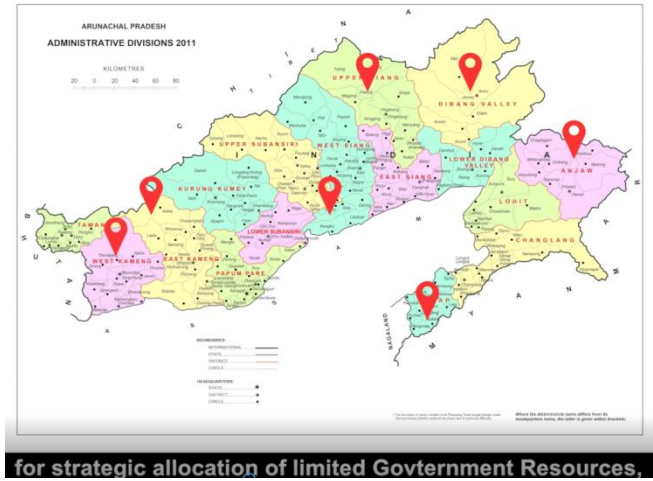
Submitted an incorrect request? Visit the archive download to view your current requests and then click on 'Delete this request?' link for this request. *Please note that once your request starts processing, you cannot cancel it.*"

If you have any questions or comments, please contact us at support@earthdata.nasa.gov.

Thank you,
NASA FIRMS Team

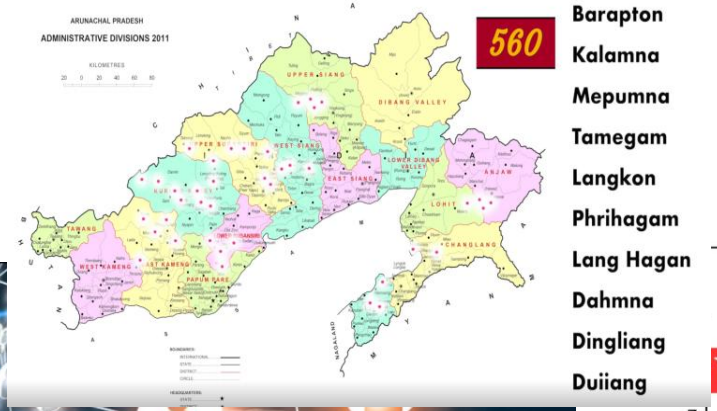
Benefits & Outcome

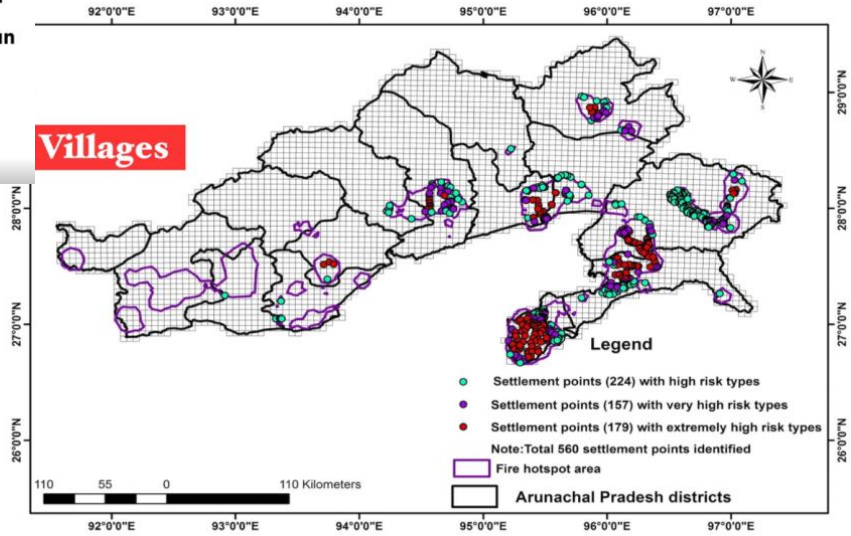
- Right **DECISION**, at right **TIME** & right **PLACE**
- **Strategic Allocation** of Govt resources
- **Efficiency** gone up due to Citizen centric approach
- Speedy **Service Delivery** and **Cost Minimization**
- Meaningful **People Participation- eGovernance**



Benefits & Outcome

- Emphasis upon **Preventive Mechanism: Early Warning System**
- Hit on '**Jhum Cultivation**' practices
- Predicts list of **560 priority villages**
- Saved tremendous loss to **bio-diversity flora-fauna, human life & public property**





Blaze or Flame we lose so much,
But our lives remain the same.

We must learn from what is broken,
Predict, Prevent & Grow Again.

eForestFire

Himalayan Forest Fire Prediction

Project ID - NAeG/19-20/00110

National Awards for eGovernance

THANK YOU