



Strategies for Forest Fire Control and Management to Safeguard India's Ecosystems

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Forest fires are a major threat to world's forests



- **Increase in scale and duration** of forest fires around the world
- **Affects biodiversity**, ecosystem services, human well-being, livelihoods, and national economies
- **Anthropogenic factors** leads to most forest fires
- Important to **prevent and manage forest fires** and restore fire impacted lands
- Imperative to develop **comprehensive and long-term strategy** to prevent and combat forest fires

Annual area affected by forest fires

~100

Million
hectares

3%

World's
forests

13%

Increase in total forest fire alerts
between 2020 and 2019

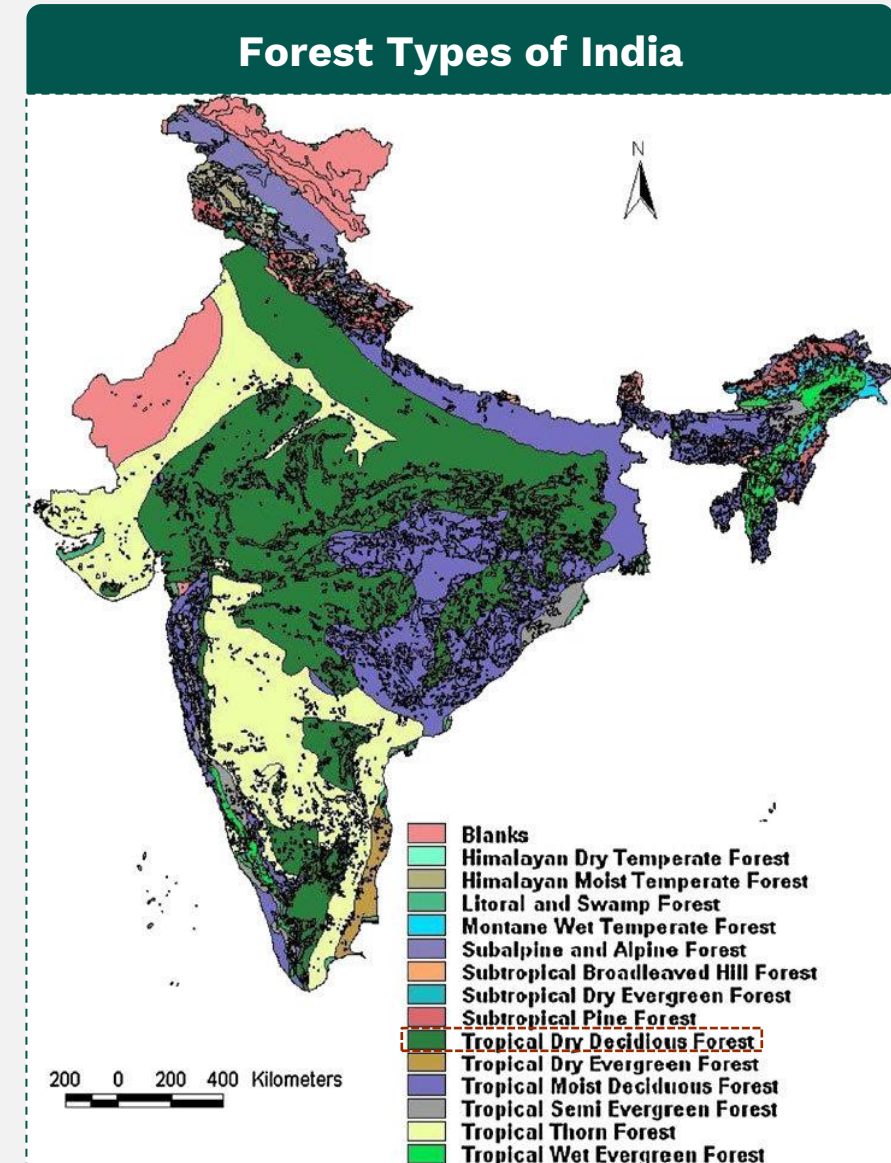




Forest Fires: The Indian Context



- Each year fires affects forests across India.
- Severe fires occurs in **deciduous and pine forests**
- Forest fire season **November to June**
- **1.7%** of tree cover loss in India between 2001 and 2021 due to forest fire

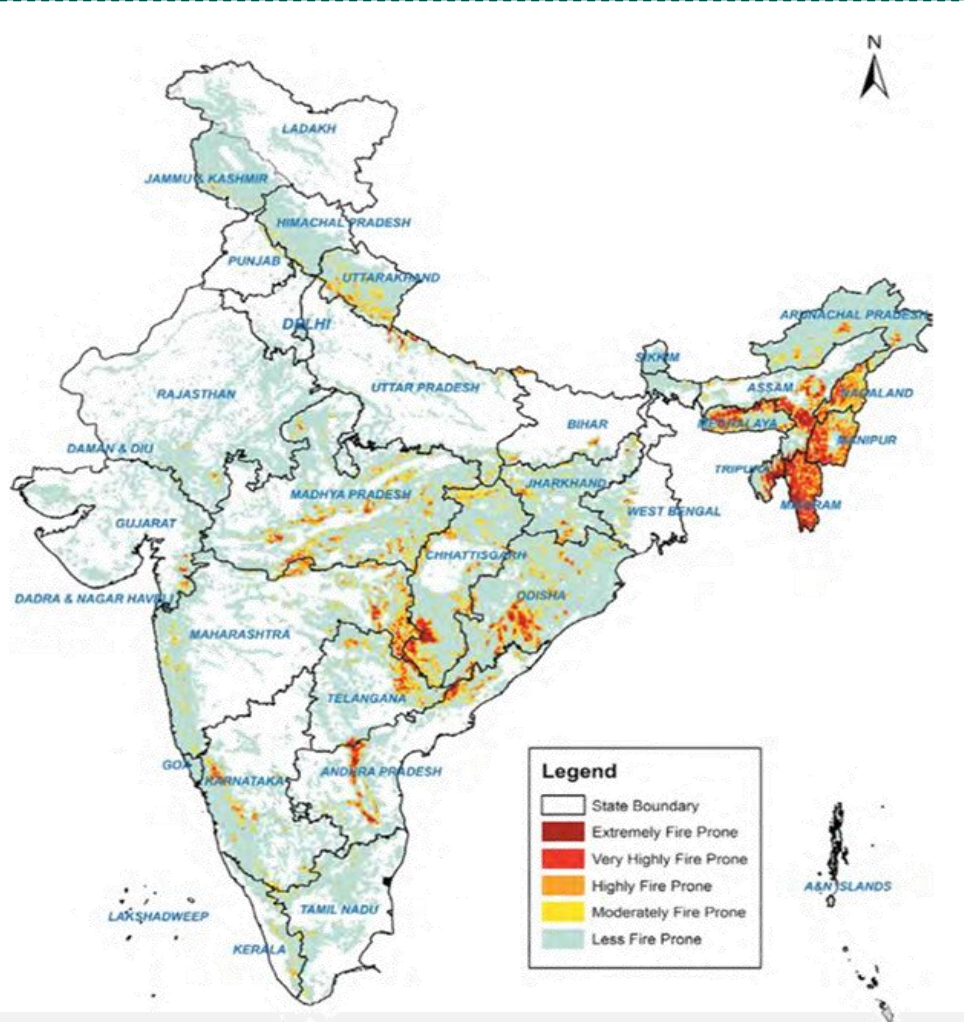




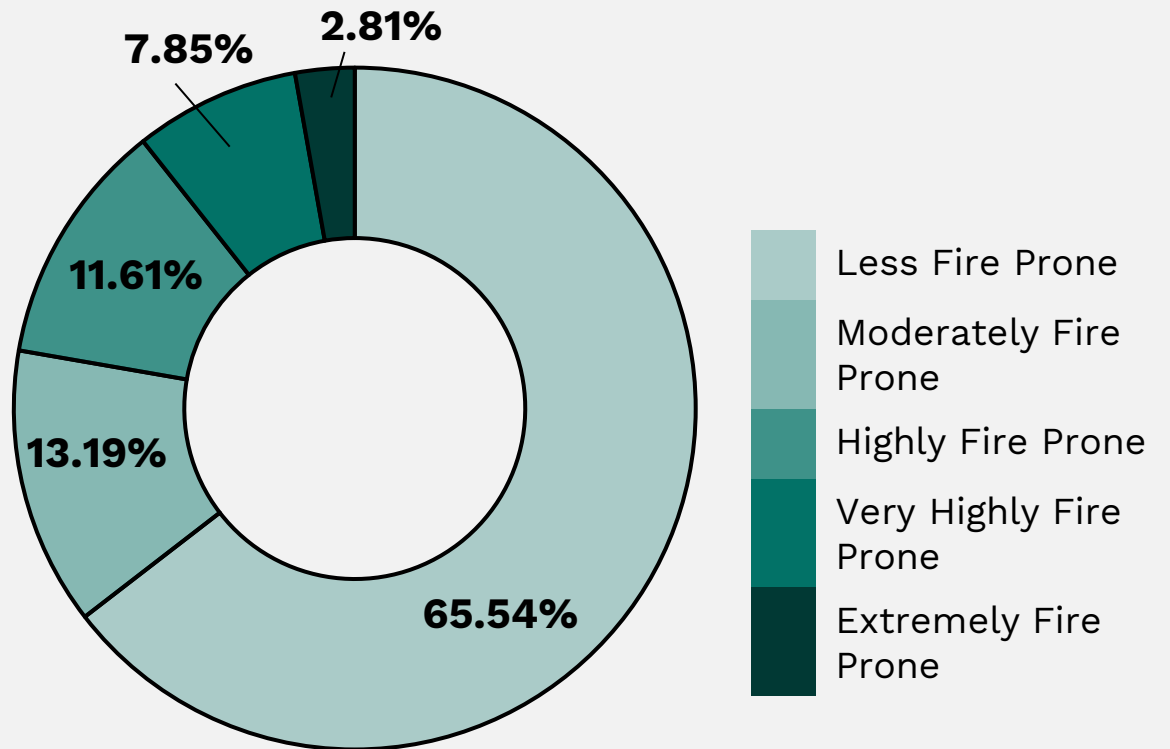
More than 22% of India's Forest Cover is highly prone to fire



Fire prone classes



Forest Cover of India under different fire prone classes

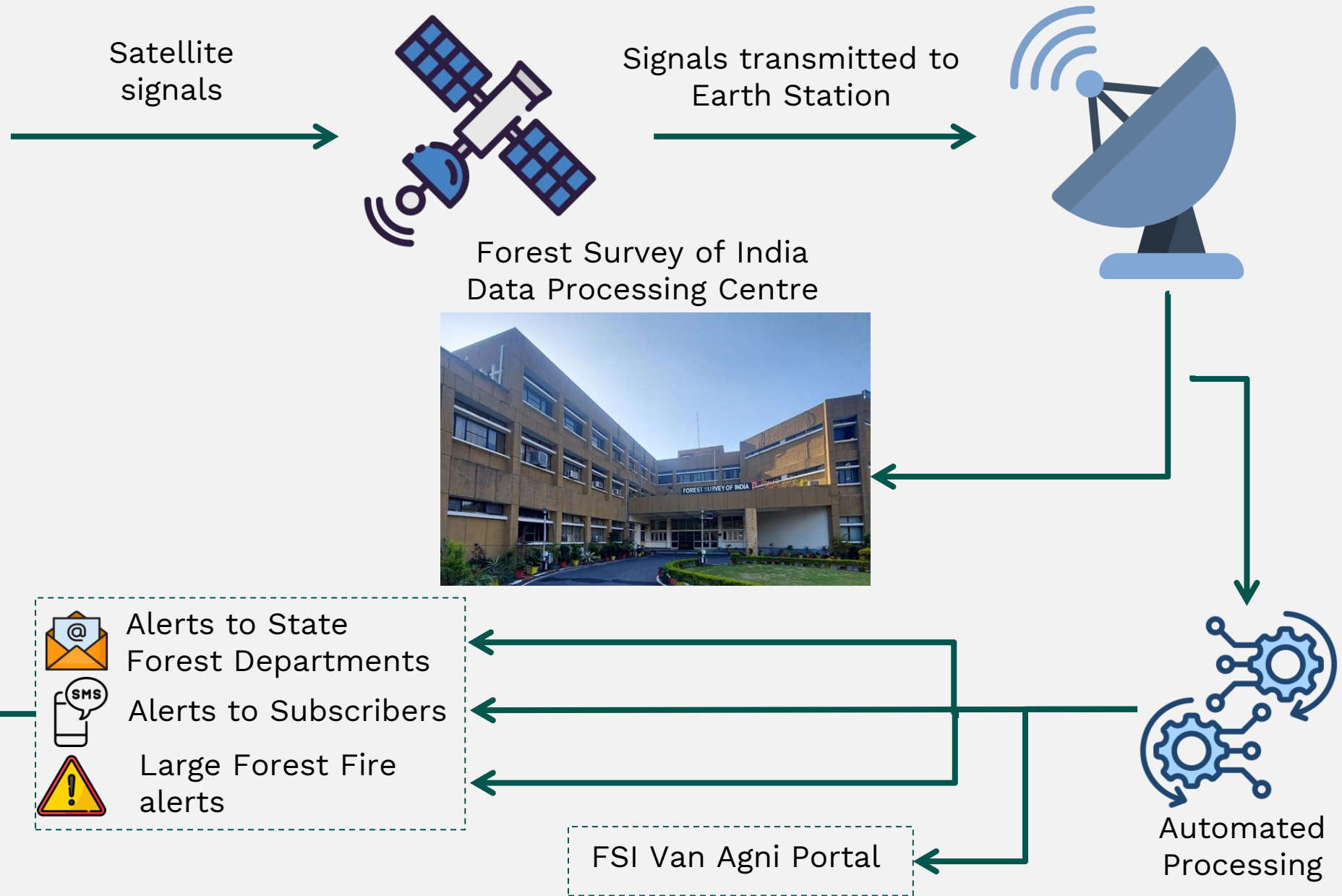




Near Real Time Forest Fire Monitoring



Forest Fire Control and Mitigation





Forest Survey of India (FSI)



Organization under the Ministry of Environment and Forests & Climate Change, involved in

- Forest Fire Monitoring
- Forest Cover Mapping
- Forest Inventory

FSI's role in Forest Fire Management

- Remote sensing and communication technology
- Near Real-Time Forest Fire Monitoring
- Large Forest Fire Monitoring
- Forest Fire alerts
- Early Warning Alert based on Forest Fire Danger Rating System



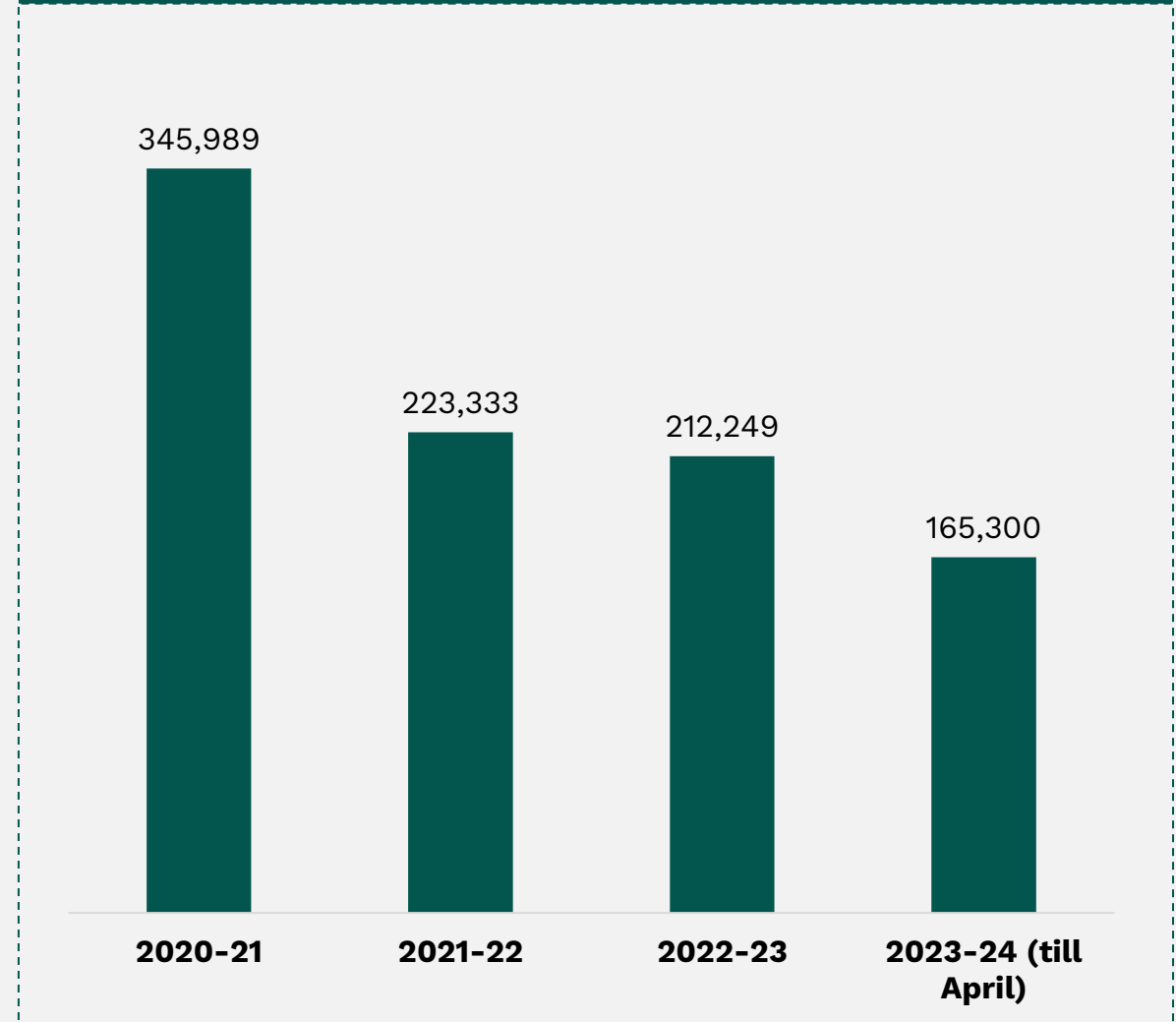


Forest fire alert dissemination



- **FSI** disseminates forest fire alerts
- **214,000** registered users
- 3 types of alerts are generated
 1. **Pre-Fire Alerts** (5 km x 5 km) grids every Thursday
 2. **Near Real Time forest fire alerts** (1 km x 1 km)
 3. **Large Forest Fire Alerts** (375 x 375 m) grid
- **Large forest fire** – fire that burn over 40 ha area

Number of Forest Fires Detected by FSI across Nov-June

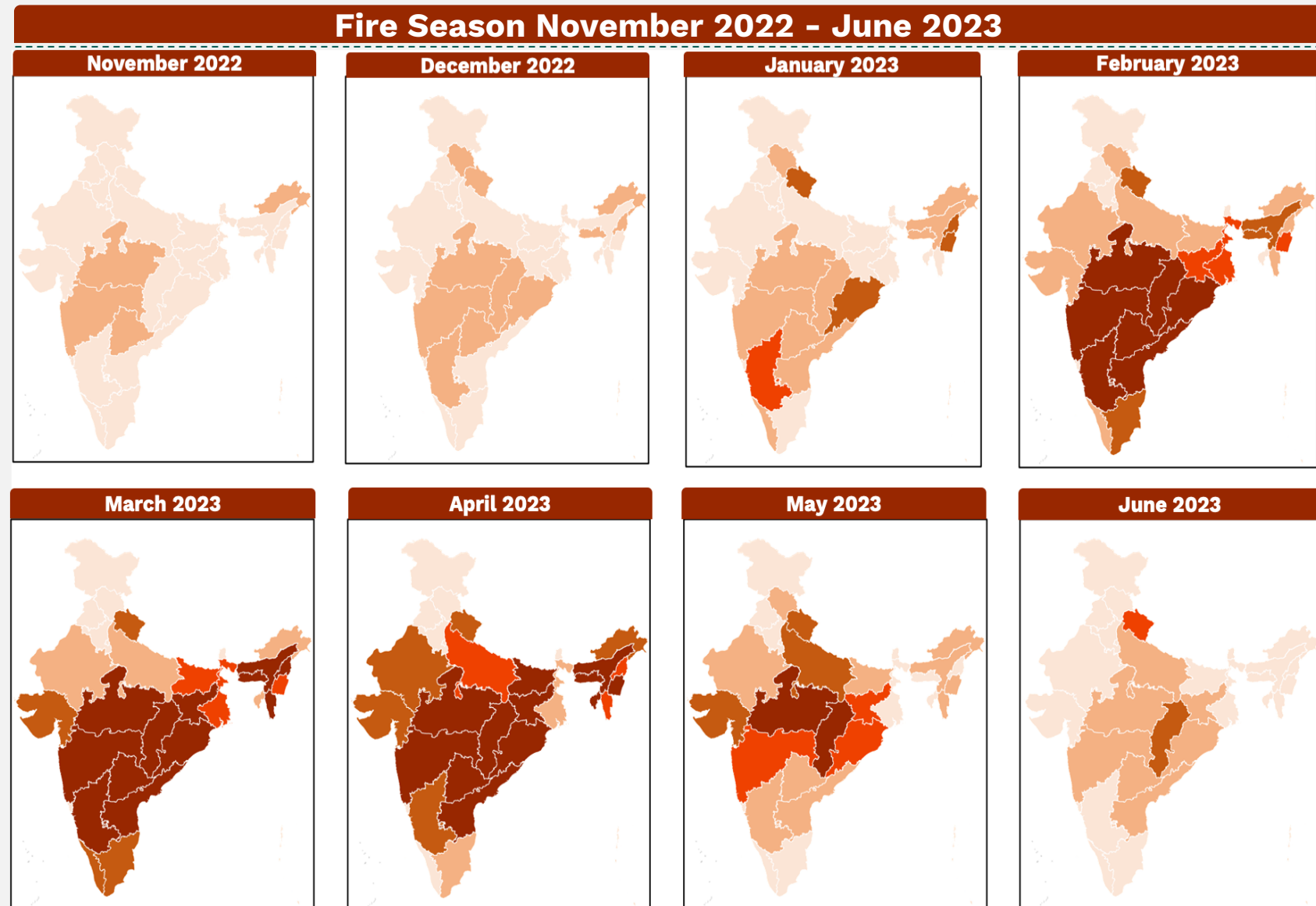
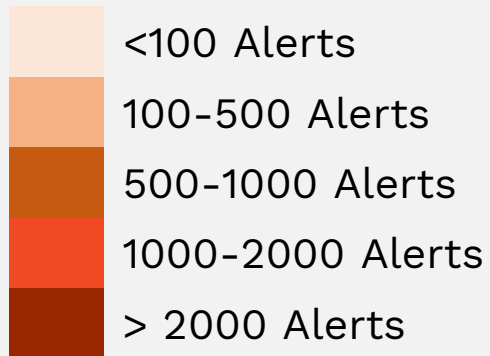




Monthly progression of forest fire in India



Fire Season peaks February to May

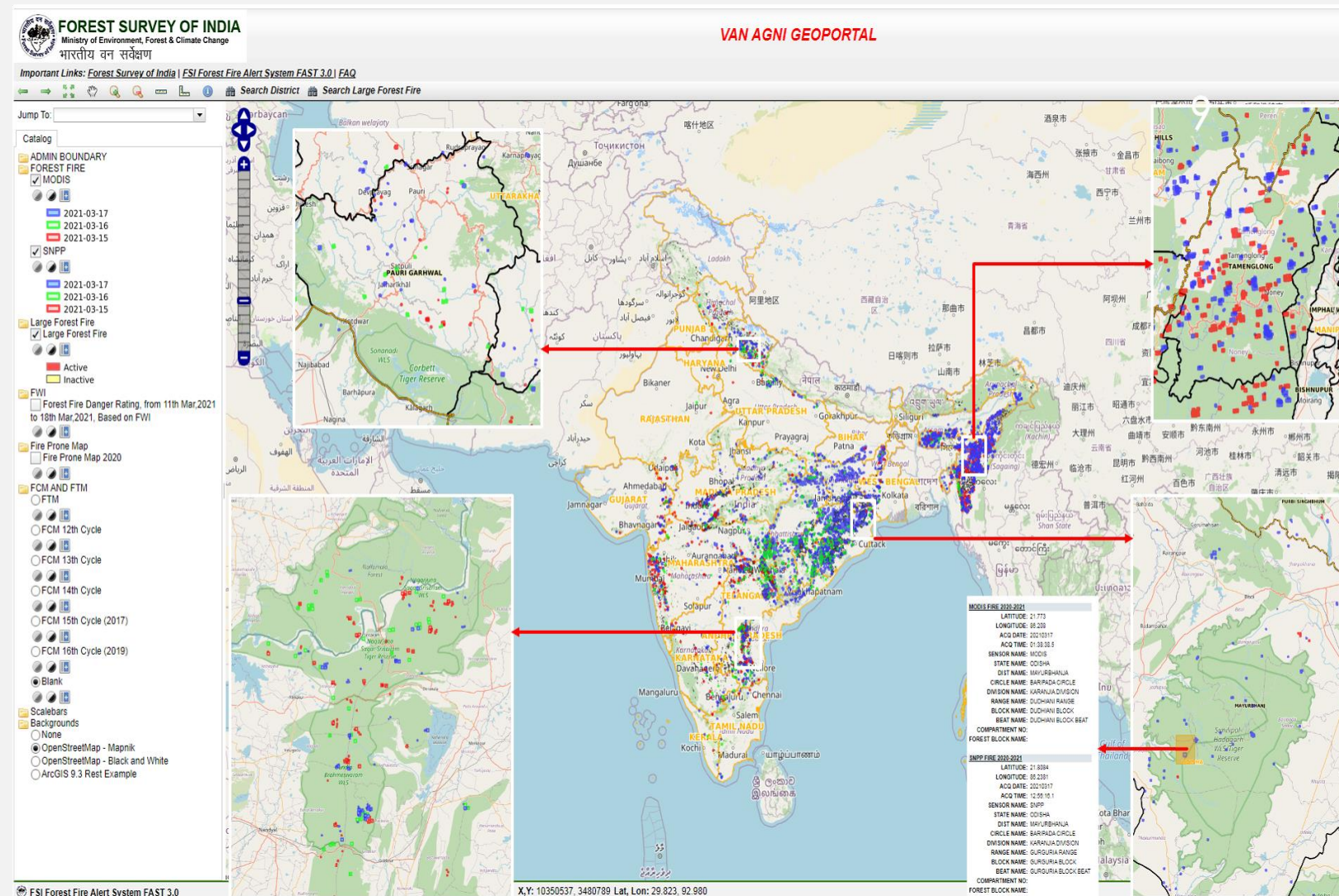




Van Agni Portal for detection of forest fires



- Web Portal for dissemination of **forest fire alerts**
- Provides **accurate geolocation data** on forest fires
- **Monitor** large forest fires
- **Provide approximate area/ pixels on the spread of large fires**





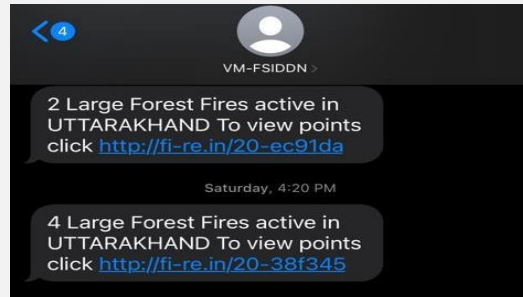
Forest Fire Prevention & Management



Central and State Governments provides **financial assistance** to forest department for **preparedness, response and control** of forest fire.



Fire Fighting Tools



Communication & Information Technology



Creation & Maintenance of fire lines



Engagement of fire watchers



Water harvesting and storage tanks



Strengthening forest infrastructure



Incentives to local Community



Community mobilization & Awareness generation



Forest Fire Prevention & Management

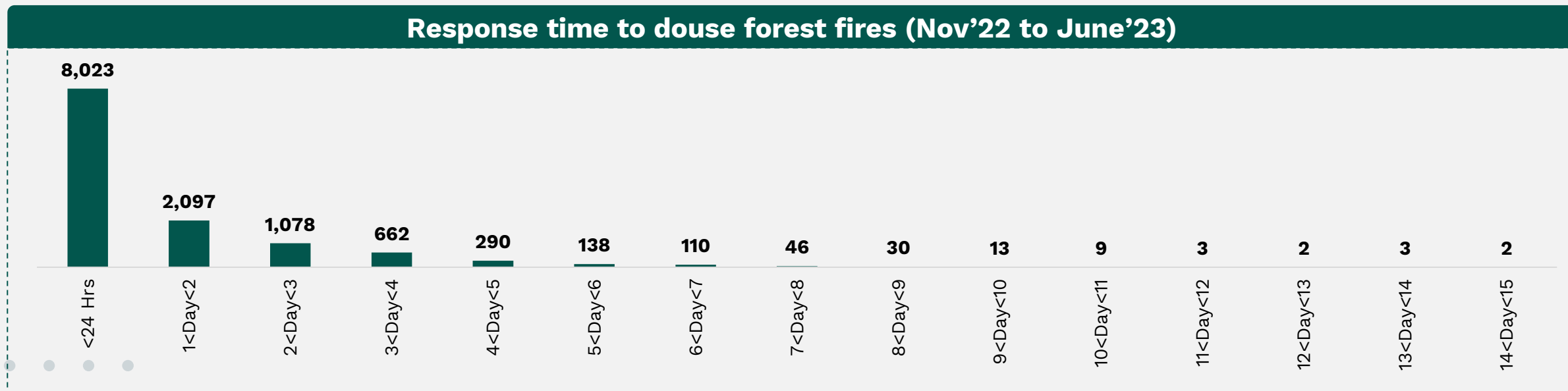
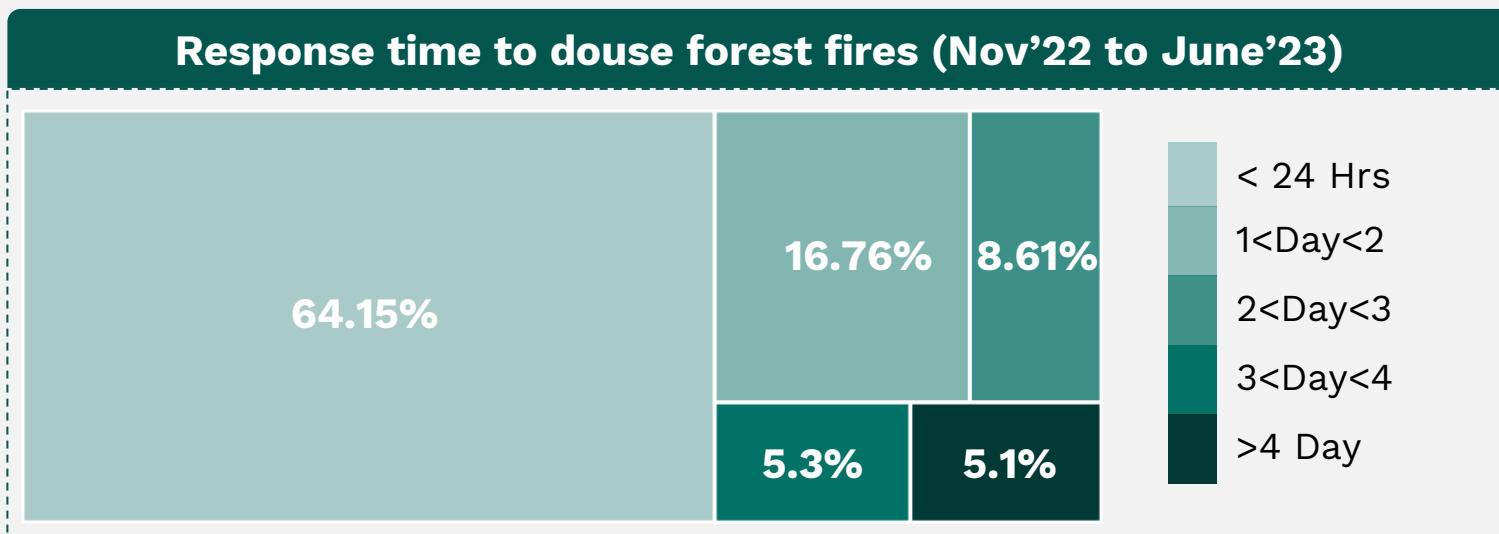




Monitoring the response and control of forest fires



- **Response and control of forest fire** by field staff; participation of local communities
- **Response time** taken **to douse forest fires being monitored**





Community participation crucial for forest fire management and control



- Livelihoods of local communities **intricately linked with forest ecosystems**
- Forest-dependent communities are **actively involved** to prevent and manage forest fires
- Joint Forest Management Committees and Eco Development Committees



Pine needles collected for reducing fuel load.
Collected Pine needles converted into handicrafts



Preventing forest fires through harvesting Mahua flowers in nets



Overcoming challenges restoring forest fire affected areas

Major Challenges

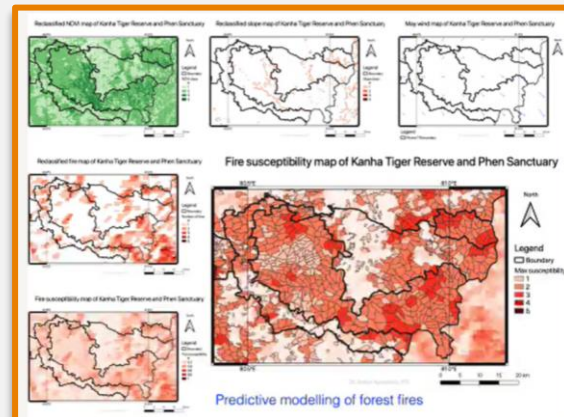
- Assessing **baseline conditions**
- **Conflict of interest** among stakeholders
- **Long term commitment** in terms of effort and funding
- Scaling up of projects due to **high costs in restoration**

Possible approaches to land restoration of forest fire affect areas

Ecosystem based approaches for restoration of Forest fire affected landscapes



Use of Technology forest fire monitoring, response & restoration



Community involvement in forest fire response

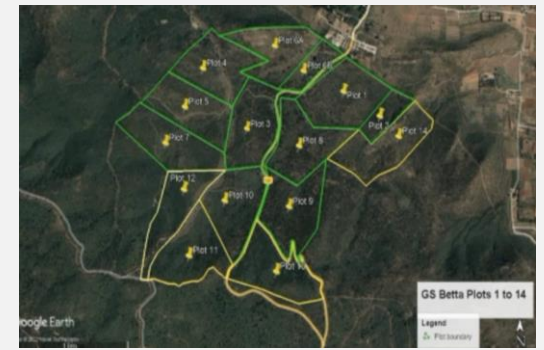
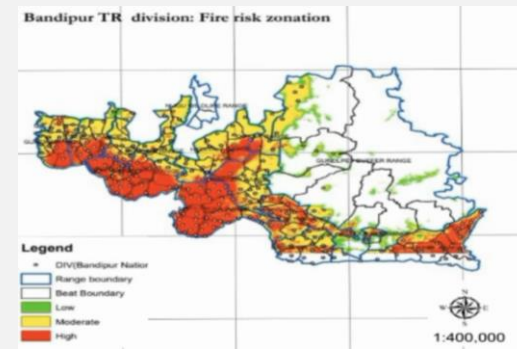




Eco restoration of forest fire affected landscapes in Southern India; Case Study



- Bandipur Tiger Reserve in southern India is **highly fire prone**.
- Eco restoration of fire affected areas initiated in 2019
- **Invasive species** like *Lantana camara* removed
- Restoration through **planting of native grass, bamboo, trees** and other palatable species
- Subsequent years **removed primary and secondary weeds** like Chromolaena and Parthenium.
- Efforts continued for 4 years led **to restoration of native species**



Fire risk area and selected plots at Bandipur



Removal of weeds manually and with elephants



Afforestation and maintenance of fire affected area



**United
Nations**



Thank You

