

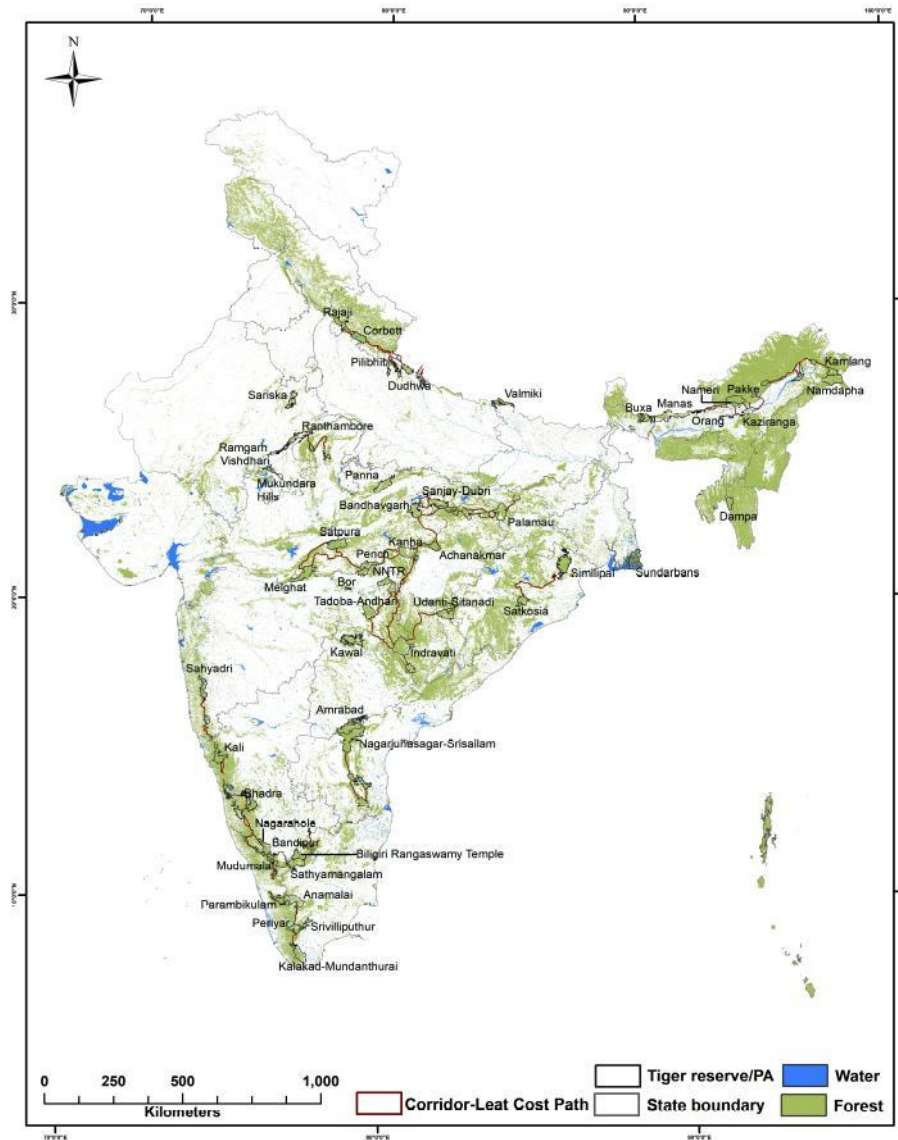
**FOREST FIRE MANAGEMENT**  
**IN**  
**PROTECTED AREAS**

Dr S.P Yadav

Director,  
Wildlife Institute of India

# INTRODUCTION

- 106 National Parks
- 564 Wildlife Sanctuaries
- 99 Conservation Reserves
- 218 Community Reserves
- 51 Tiger Reserves
- 18 Tiger Range States
- Protection under Wildlife Protection Act, 1972



# ROLE OF FIRE IN FOREST MANAGEMENT

- Integral part of forest environment
- Important role in shaping forest ecosystems and their management
- Eliminates excessive fuel buildup
- Facilitate regeneration of grass, herbs & saplings.
- Grassland management



# TYPES OF FOREST FIRE



**Ground**



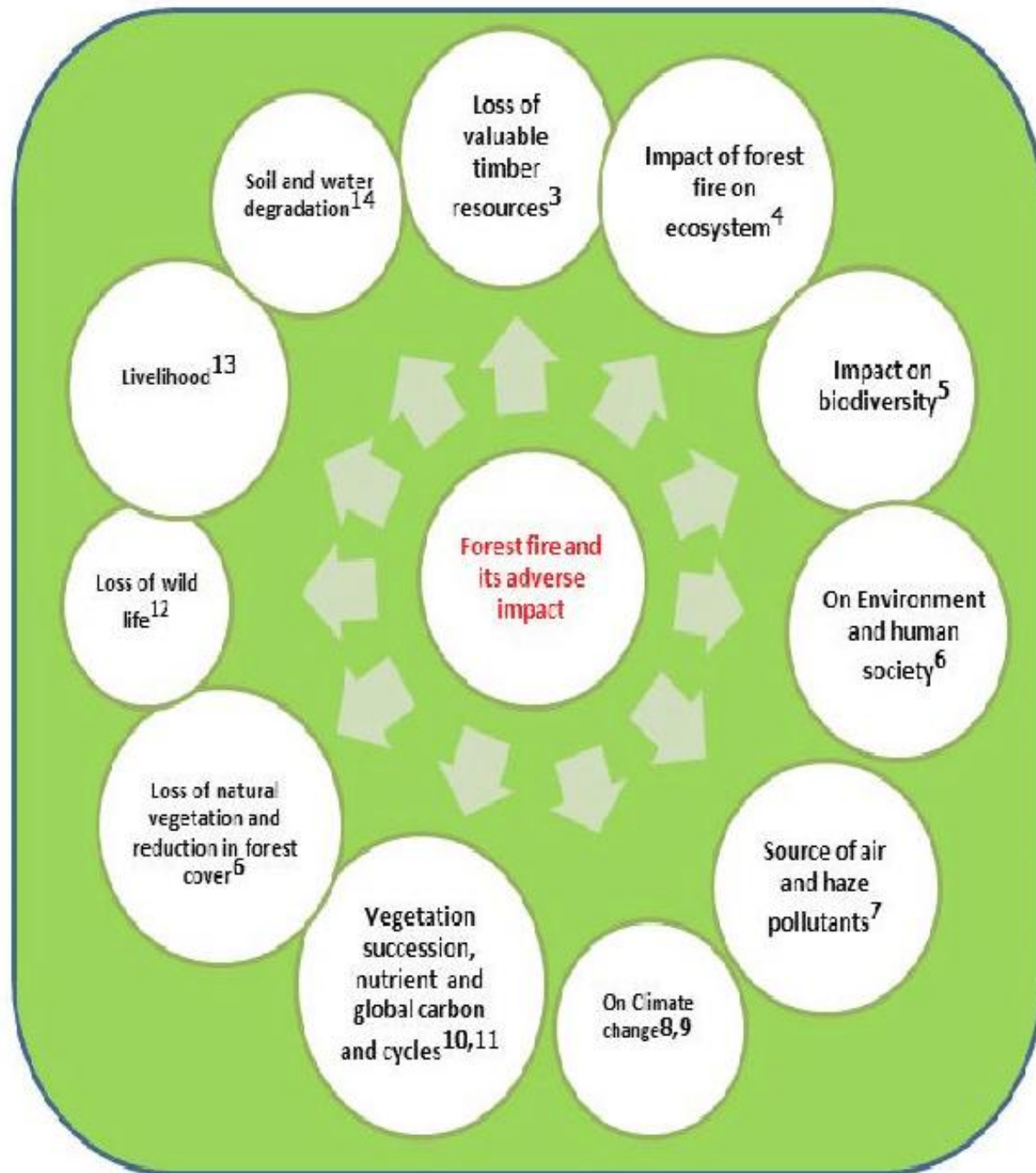
**Surface**



**Crown**

Source: <https://twitter.com/ONforestfires>

# IMPACTS OF FOREST FIRE



(Source: Firoz Ahmad and Laxmi Goparaju, 2017)





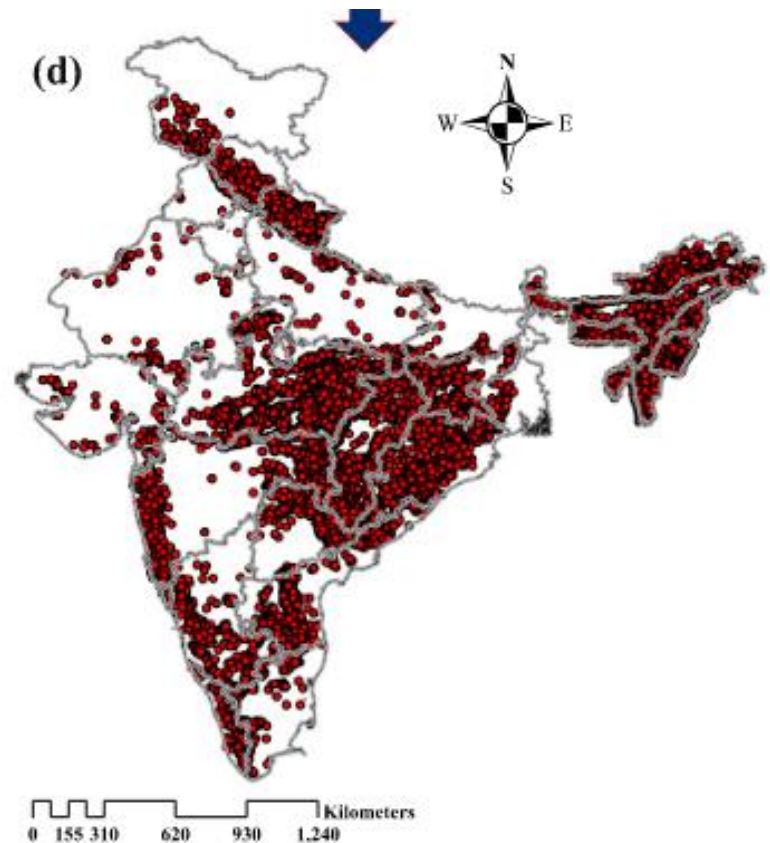
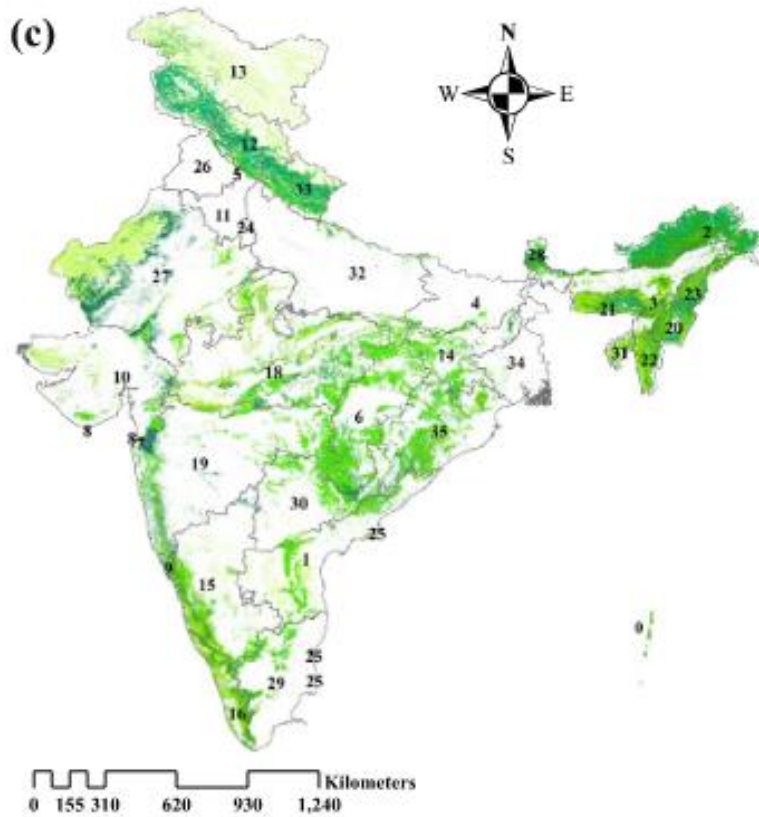
Fire Event in Bandipur Tiger Reserve, Karnataka -2019













Fire Event in Mudumalai Tiger Reserve, Tamil Nadu-2019








### Forest Types

-  Mosaic natural vegetation
-  Evergreen needleleaved
-  Mosaic tree and shrub
-  Grassland

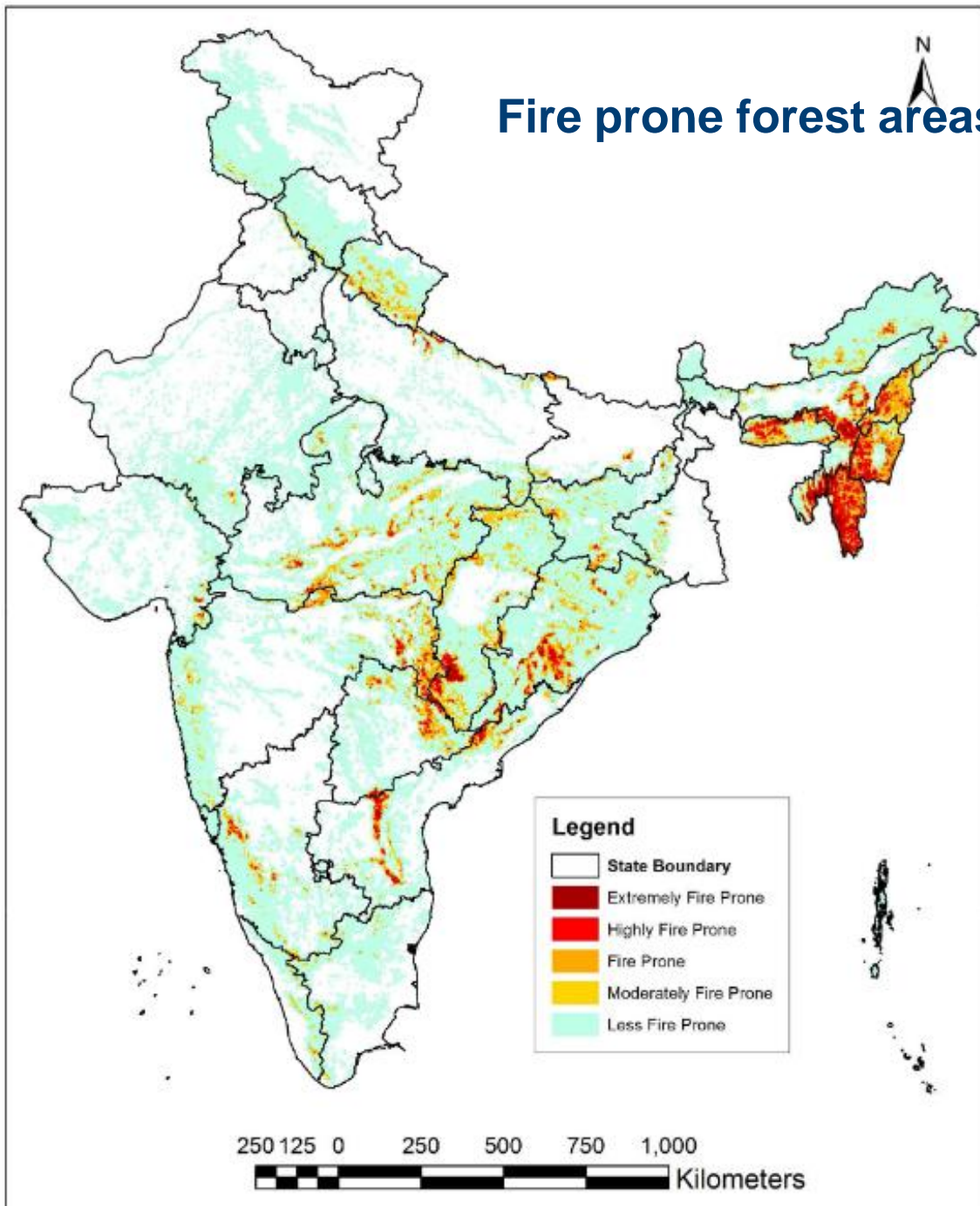
-  Evergreen broadleaved
-  Deciduous needleleaved
-  Mosaic herbaceous cover
-  Sparse vegetation

-  Deciduous broadleaved
-  Mixed leaf type
-  Shrubland





# Fire prone forest areas



(Source: FSI Technical Information Series, Vol, No 1, 2019)

# TECHNIQUES USED FOR SUPPRESSING FOREST FIRES

- Manual beatings or smothering
- Use of fire in control / counter fire
- Creation of fire lines
- Surface clearing
- Dousing.



Source: <https://india.mongabay.com/2020/01/most-forest-fires-in-india-on-account-of-human-activity/>





Managing Forest Fire through Control burning



# Forest Fire Alert System - FSI



(Source: FSI Technical Information Series, Vol, No 2, 2019)

## Fire hot spots in Tiger Reserve

Sensor \ Year	2019	2020	2021	2022 **
MODIS	2,779	1,553	3,936	2,434
VIIRS	18,838	10,227	29,387	17,067

MODIS	Moderate Resolution Imaging Spectroradiometer
VIIRS	Visible Infrared Imaging Radiometer Suite

\*\* Till April, 2022 data



# NTCA Support For Forest Fire Prevention

- Funding support for following fire prevention related activities:
  - Construction of watch tower
  - Creation and maintenance of fire lines and fire breaks
  - Maintenance of road network
  - Engaging fire watchers
  - Procurement of logistics
- Fire audit protocol for Tiger Reserves



Source: <https://telanganatoday.com>







Download: [https://ntca.gov.in/assets/uploads/Reports/Others/Forest Fire%20 Audit Protocol-NTCA.pdf](https://ntca.gov.in/assets/uploads/Reports/Others/Forest_Fire%20Audit_Protocol-NTCA.pdf)

# Framework & Indicators

## Framework

## Indicators

### Prevention and preparedness (11 indicators)

- Fire lines
- Road side cleaning
- Controlled burning
- Early warning and fire alert system
- Financial resources
- Firefighting infrastructures
- Water availability
- Ecological assessment and restoration
- Mapping and sensitivity analysis
- Capacity building of forest staff
- Awareness raising

### Detection (3 indicators)

- Satellite and technology based detection systems
- Ground level detection by staff

### Suppression (4 indicators)

- Infrastructures for ground level detection
- Human resource deployment
- Fire control room
- Involvement of local communities
- Coordination with other relevant agencies

### Post-fire management, analysis and monitoring (2 indicators)

- Collection of data and record keeping mechanism
- Ecological assessment and restoration

# Assessment Criteria for Each Indicators

## A PREVENTION AND PREPAREDNESS

### 1. FIRE LINES

Poor	Fair	Good	Very good
Cleaning and maintenance of fire lines not done	Upto half of the fire lines prescribed in TCP appropriately cleaned and maintained	Majority (51-80%) of fire lines prescribed in TCP appropriately cleaned and maintained	Majority (51-80%) of fire lines prescribed in TCP appropriately cleaned and maintained

\*Score: Poor: 2.5; Fair: 5; Good: 7.5; Very Good: 10.

The percentage extent of fire lines to be determined based on their length (km) approved in the TCP and length (km) for which cleaning and maintenance have been achieved. In case of poor and fair categories, the reason(s) behind it may need to be furnished as Remarks.



# Framework wise Audit Score

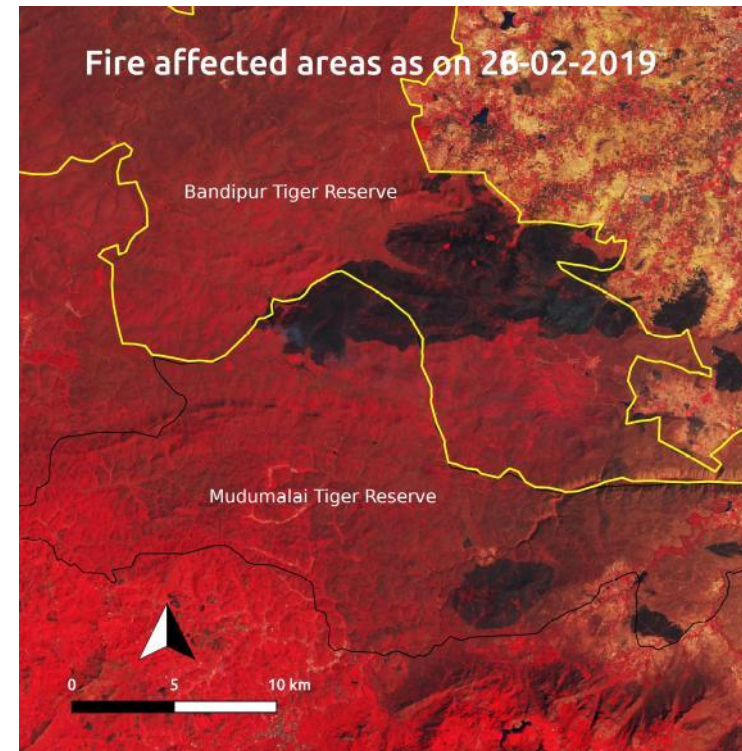
Framework	Number of indicator (a)	Maximum score per indicator (b)	Total (c) (c= a x b)	Score secured for the framework (d)	% age of score for the framework (d/c) x 100	Overall Audit Score and % age (e)(e = ? d/200) x 100
Prevention and preparedness	11	10	110			
Detection	03	10	30			
Suppression	04	10	40			
Post-fire management, analysis and monitoring	02	10	20			
Total	20		200			

## Score

**Poor** -  $\leq 40\%$  , **Fair** – 41-59%, **Good** – 60-74%, **Very Good** - $\geq 75\%$

# FOREST FIRE – NATIONAL DISASTER

- Declare forest fire as disaster
- Section 2 (d) of The Disaster Management Act, 2005 defines disaster
- Formulation of policy & guidelines for forest fire management
- Funding support for disaster management to the affected states



# Thank you

