Initial Framework of “National Forest Fire Management Project”

Ministry of Environment, Forest and Climate Change
Government of India
Initial Risk Management Framework

- Forest fire management includes process of planning, preventing, controlling fire and fighting fires to protect people, property and forest resources.

- The objective of this framework is to minimize forest fires by informing, enabling and empowering forest fringe communities and incentivizing them to work in tandem with the State forest departments.

- The framework intends to substantially reduce the vulnerability of forests across the diverse forest ecosystems in the country against fire hazards.
Central Monitoring Committee on Forest Fire

- **Central Monitoring Committee (CMC):** In compliance of the direction of the Hon’ble National Green Tribunal, New Delhi this Ministry has constituted a Central Monitoring Committee (CMC) under the Chairmanship of Secretary (EF&CC) vide notification dated 04.06.2019 to monitor the implementation of the National Action Plan on Forest fire. Principal Chief Conservator of Forests of all States and Union Territories are members of this Committee.

- **Constitution:** Secretary, MoEF&CC - Chairman
  
  - Members: DGF&SS, ADG(FC), ADG(WL),
  
  - Representative of CPCB, WII, NDMA, ICFRE, FSI and NRSC
  
  - PCCFS of all the States &UTs
  
  - IGF(FPD) - Member Secretary

- **Mandate of CMC:** To monitor implementation of National Action Plan on Forest Fires and address all issues arising out of forest fires.
NATIONAL ACTION PLAN ON FOREST FIRE

- Fire risk zonation and mapping
- Preventing forest fires
- Increasing the resilience of forests to fires
- Forest fire preparedness
- Fire Suppression
- Post fire management
- Coordination with other agencies
- Centre of excellence for forest fires
- Mobilization of financial resources
The Ministry supports the efforts of the States/UTs in prevention and control of forest fire by providing financial assistance for various forest fires prevention and management measures such as:

- Creation and Maintenance of Fire lines
- Fire Fighting Equipment
- Water Harvesting Structure
- Engagement of fire watchers
- Training and pre-fire season workshops
- Incentivizing villages / JFMCs for protection against forest fire
- Procurement of fire fighting equipment
- Awareness creation

Forest Fire Prevention & Management Scheme (FFPM)

**FFPM Cycle**

1. **Prevention**
2. **Detection**
3. **Suppression**
4. **Post-fire management**

**Detected FFFSM**
- Timely detection of forest fires
- Effective response and intervention

**Forest Fire Prevention & Management Scheme (FFPMS)**
- Comprehensive approach
- Enhanced collaboration

**FFPMS**
- Focus on multi-stakeholder engagement
- Strengthened institutional framework
FOREST FIRE MONITORING PROCESS

- Pre-fire alert (one week advance based on forest fire danger area).
- Near real time forest fire danger monitoring. (MODIS & SNPP- VIIRS)
- Large forest fire monitoring.
**System Tools**  |  **System Process Components**
--- | ---
- Maps (Vegetation, Topography, assets, road, ignition distribution etc.)
- Fire behavior prediction tools
- Cultural & social context of fire
- Ecological response to fire  | **ANALYSIS OF THE FIRE PROBLEM**
2. Fire on (Intensity spread rate duration)
3. Assets (Value Vulnerability)

- Fire use laws/ regulation
- Planning controls
- Education programs
- Ecological fire training
- Fire use education  | **RISK REDUCTION – PREVENTION**
1. Ignition Reduction Strategies
   - regulate fire use, educate fire users, technology improvement, development planning control.
2. Impact Mitigation Strategies
   - Fuel reduction
   - Reduce assets vulnerability
3. Fire uses Strategies
   - Ecosystem Maintenance
   - Fire regime restoration
<table>
<thead>
<tr>
<th>System Tools</th>
<th>System Process Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Climate, weather monitoring and prediction</td>
<td><strong>READINESS PREPAREDNESS TO FIGHT FIRES</strong></td>
</tr>
<tr>
<td>• Fire danger rating</td>
<td>1. Strategies</td>
</tr>
<tr>
<td>• Detection/ suppression &amp; Communications resources</td>
<td>- Early warning/ Predictive systems</td>
</tr>
<tr>
<td>• Fire training system and tools</td>
<td>- Community warning mechanism</td>
</tr>
<tr>
<td></td>
<td>- Detection and Response infrastructure</td>
</tr>
<tr>
<td></td>
<td>- Communications system</td>
</tr>
<tr>
<td></td>
<td>- Component fire control staff</td>
</tr>
<tr>
<td>• Response mobilization plans</td>
<td><strong>RESPONSE- FIRE FIGHTING OPERATIONS</strong></td>
</tr>
<tr>
<td>• Operational responsibility &amp; procedures</td>
<td>1. Detection and reporting</td>
</tr>
<tr>
<td>• Strategic information access tools</td>
<td>2. First response</td>
</tr>
<tr>
<td>• Operational management system</td>
<td>3. Containment and control</td>
</tr>
<tr>
<td></td>
<td>4. Mop up and patrol</td>
</tr>
<tr>
<td></td>
<td>5. Command and control</td>
</tr>
<tr>
<td>• Damage assessment tools</td>
<td><strong>RECOVERY POST FIRE</strong></td>
</tr>
<tr>
<td>• Recovery assistance plans</td>
<td>1. Community welfare assistance</td>
</tr>
<tr>
<td></td>
<td>2. Economic loss reduction( salvage logging and replanting, infrastructure repair)</td>
</tr>
<tr>
<td></td>
<td>3. Environment repair</td>
</tr>
</tbody>
</table>
Grid Based Pre-warning Alert System

- Grid 5km X 5km
- Forest cover
- Temperature data
- Relative humanity

Forest Type Map - Vulnerable Forest types

Drought

Intersect

Mask out
- Rainfall area
- Fire point Data to identify grids that are already depleted of fuels.

- Knowledge base decision on the basis of forest cover density & forest/ Admin Boundary
  - Selection of pre warning alert grid

Pre- warning email Alert (KML format)

Sources: FSI, Forest fire pre warning by FSI

Ministry of Environment, Forest and Climate Change
Government of India

Grids are not to scale
Fire Prone Forest Area in India

Total Fire prone forest area is 35.46% (7,13,789.03 sq km) of the forest cover (as per ISFR 2021)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Category</th>
<th>Forest cover (in sq km)</th>
<th>% of Total forest cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Extremely Fire Prone</td>
<td>20,074.47</td>
<td>2.81</td>
</tr>
<tr>
<td>2</td>
<td>Very Highly Fire Prone</td>
<td>56,049.35</td>
<td>7.85</td>
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<tr>
<td>3</td>
<td>Highly Fire Prone</td>
<td>82,900.17</td>
<td>11.61</td>
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<tr>
<td>4</td>
<td>Moderately Fire Prone</td>
<td>94,126.68</td>
<td>13.19</td>
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<tr>
<td>5</td>
<td>Less Fire Prone</td>
<td>4,60,638.36</td>
<td>64.54</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>7,13,789.03</td>
<td>100.00</td>
</tr>
</tbody>
</table>
INITIATIVES

- To Collaborate on developing fire fighting infrastructures, communication systems
- Development of modern fire fighting equipment tools
- Development of Drones for surveillance in forest prone areas
- Establishment of water sprinkler towers, watch towers, check dams water reservoirs
- Specialized vehicles for fire fighting operations
- Creation, Maintenance and monitoring of fire lines
- Mapping of Fuel load, control burning
- Capacity Building of Communities
- Convergence with NDMA, MHA, NDRF, SFD and COMMUNITIES
North-East as the Most Vulnerable / Prone to Forest fire

- Forest in the North East region and central India was found to be the most vulnerable.
- One of the major reasons for forest fire in NE region is slash and burn (Jhum Cultivation).

- Mizoram
- Manipur
- Madhya Pradesh
- Andra Pradesh
- Chhattisgarh
- Nagaland
- Tripura
- Assam
- Meghalaya
- Arunachal Pradesh
- Odisha
Top 20 Districts according to number of forest fire detected by FSI using SNPP-VIIRS sensors (This includes large, Continuous and repeated forest fires)

<table>
<thead>
<tr>
<th>S.L.No</th>
<th>District</th>
<th>State</th>
<th>Nov 2020-June 2021 (No of Forest fire alerts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gadchiroli</td>
<td>Maharastra</td>
<td>10,577</td>
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<td>2</td>
<td>Kandhamal</td>
<td>Odisha</td>
<td>6,156</td>
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<tr>
<td>3</td>
<td>Bijapur</td>
<td>Chhattisgarh</td>
<td>5,499</td>
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<tr>
<td>4</td>
<td>Karbi Anglong</td>
<td>Assam</td>
<td>4,881</td>
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<tr>
<td>5</td>
<td>Kadapa</td>
<td>Andhra Pradesh</td>
<td>4,872</td>
</tr>
<tr>
<td>6</td>
<td>West Singhbhum</td>
<td>Jharkhand</td>
<td>4,553</td>
</tr>
<tr>
<td>7</td>
<td>Pauri Garhwal</td>
<td>Uttarakhand</td>
<td>4,512</td>
</tr>
<tr>
<td>8</td>
<td>East Nimar</td>
<td>Madhya Pradesh</td>
<td>4,210</td>
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<tr>
<td>9</td>
<td>Mayurbhanj</td>
<td>Odisha</td>
<td>4,073</td>
</tr>
<tr>
<td>10</td>
<td>Sundargarh</td>
<td>Odisha</td>
<td>3,940</td>
</tr>
<tr>
<td>S.L.No</td>
<td>District</td>
<td>State</td>
<td>Nov 2020-June 2021 (No of Forest fire alerts)</td>
</tr>
<tr>
<td>--------</td>
<td>----------------</td>
<td>----------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>11</td>
<td>Nainital</td>
<td>Uttarakhand</td>
<td>3,802</td>
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<tr>
<td>12</td>
<td>Raisen</td>
<td>Madhya Pradesh</td>
<td>3,713</td>
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<tr>
<td>13</td>
<td>Kalanhandi</td>
<td>Odisha</td>
<td>3,555</td>
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<td>14</td>
<td>Chhindwara</td>
<td>Madhya Pradesh</td>
<td>3,535</td>
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<td>15</td>
<td>Narayanpur</td>
<td>Chhattisgarh</td>
<td>3,510</td>
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<td>16</td>
<td>Bhupalpally</td>
<td>Telangana</td>
<td>3,477</td>
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<td>17</td>
<td>Aizawl</td>
<td>Mizoram</td>
<td>3,336</td>
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<td>18</td>
<td>Kendujhar</td>
<td>Odisha</td>
<td>3,194</td>
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<td>19</td>
<td>Dima Hasao</td>
<td>Assam</td>
<td>3,188</td>
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<tr>
<td>20</td>
<td>Rayagada</td>
<td>Odisha</td>
<td>3,172</td>
</tr>
</tbody>
</table>
Important Strategies For building excellence in fighting forest fire

- Consultative workshop will be organized at State & district level, where the local people, stakeholders and forest officials should come up with an idea based on their ground experience during forest fire incidents.

- After the workshop all the Ideas and valuable inputs shared by the States / district will be evaluated to enhance the technique on forest fire fighting strategies.

- Based on the Input SOP (Standard Operating Procedure) will be created for PAN INDIA.

- Forest fire to be considered as disaster and to be added in NDMA Act.

- DMP is finalized with the help of NIDM.
Dissemination of forest fire information flow in MoEF&CC

- **States & Districts**
- **Forest Survey of India (FSI)**
  - SMS Alerts to State
  - Early forest fire warning information conveyed to the states from Control Room (MoEF&CC)
- **MoEF&CC (Control Room & nodal office)**
  - Status of affected area by forest fire report from state
  - Information is disseminated from MoEF&CC to PMO through MHA, if the fire is above 5x5 sq km
- **Ministry of Home Affairs (MHA)**
Traditional Methods used in dousing forest fire (Fire beater)

Modernized methods used in dousing forest fire (Blower)
Helicopter (IAF-Mi 17 V5) used in dousing fire incident in Sariska Rajasthan 29th March 2022
Forest fire prevention and management should be rapid, safe & effective.
“Prevention is better than Cure”

Thank you