



# Combating Forest Fire in Odisha

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## **PREFACE**

The state of Odisha is bestowed with natural resources with a wide range of flora and fauna. The recorded forest area is more than one third of the geographical area fulfilling the national objective. The tree cover analysis made by Forest Survey of India has shown positive trend with increase in tree cover over the State. This is a promising sign owing to the satisfactory forest management practices followed by the State despite facing the brunt of many a cyclone, flood and forest fire experienced in the past. The importance to address forest fire is felt on a priority basis owing to its effects on most ecosystems' flora and fauna. Forest fires can be characterized in terms of the cause of ignition, their physical properties, the combustible material present, and the effect of weather on the fire. They can cause damage to property and human life, except in those areas where it may induce growth and development of grass and, meadow for wider benefit of the wildlife. Forest fires mostly occur during the dry summer months when most of the State's deciduous forests shed their leaves. It is the mandatory task of a Forester to address this vital issue by checking fire occurrence through preventive measures like creating awareness programmes, involvement of VSS/EDCs, fire line creation etc. and protective measures like extinguishing forest fire. Recent technological interventions on location of forest fire occurrences received through satellite data from Forest Survey of India helps to plan and address mitigation programmes within a time frame. One of the easiest and effective ways of blowing leaf litter and creating fire lines to control further spread of forest fire is the use of air blowers. Adequate awareness programmes with dedicated man power and modern equipment will definitely help in addressing forest fire control in the State. This publication is an effort to document the existing system of combating forest fire for circulation among field staff and other organizations involved in saving the rich natural resources management of the State.

  
(S.C.Mishra)



**FOREST FIRE MAP OF ODISHA - 2017**

**LEGEND**

- LOCATION OF FIRE INCIDENT
- ▭ DIVISION BOUNDARY

PREPARED BY : FOREST IT & GEOMATICS CENTRE  
FOREST HEADQUARTERS, ODISHA  
BHUBANESWAR

● LOCATION OF FIRE INCIDENT  
 ▨ DIVISION BOUNDARY

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## Introduction

The forests of Odisha are well stocked, diverged, multi-storeyed and dense with rich bio-diversity. The forests are managed for sustainable use by providing a range of goods and services to a variety of stake holders at local and broader levels. The state forests are home to a large number of flora and fauna in different varieties of soil types and water regime which provide quality water as well as small wood, timber and non-timber forest products. They provide inputs to the agricultural economy, income to the impoverished and subsistence livelihood to all. An enabled and responsive Forest Department which empowers local communities and institutions collaborates for protection of forests from encroachment, poaching, illicit felling and fire.

### 1.1 Forest Area:

The total geographical area of the state is 1,55,707 Sq. Km. The recorded forest area is 58,136 Sq. Km including Notified Forest Blocks and Other Forest area under the control of Revenue Department and Private Individual. The state average per capita forest area is 0.139 Hectare in comparison to national average of 0.064 hectare which is a healthy sign on natural resource management and future development.

#### 1.1.1 Forest and Tree Cover:

*(Area in Sq. Km)*

Year	Very Dense	Moderately Dense	Open Forest	Total	Mangrove	Scrub	Outside Forest
2017	6,967	21,370	23,008	51,345	-	4,306	3,993
2015	7,023	21,470	21,861	50,354	-	4,499	3,986
2013	7,042	21,298	22,007	50,347	-	4,424	4,013
2011	7,060	21,366	20,477	48,903	-	4,734	4,301
2009	7,060	21,366	20,477	48,903	222	4,734	4,301

*(Based on the Indian State Forest Report published by the Forest Survey of India)*

The forest and tree cover in the state is 55,338 Sq.Kms. i.e. 35.54% of its geographical area against the country's percentage which is 6.90%. This is with reference to the State Forest Report 2017 based on the interpretation of satellite data pertaining to October- December 2015.

### 1.1.2 Legal Status on Govt. & Private Forest Area (Area in Sq. Km):

The Odisha Forest Act classifies forest areas into various categories by bestowing different legal status on them. The details are given below.

(In Sq. Km)

Reserved Forest	DPF/ PRF	UDPF	Other Forests/ Rev. Forest	Un-classed Forest	Total	Private Owned Forests	Deemed Forest (DLC Forest)
26,329.12	11,685.68	3838.78	16261.34	20.55	58136	12.29	2838.87

## 1.2 Administrative Setup:

The Forest Department field setup is headed by the Principal Chief Conservator of Forests who is the Head of the Forest Force.

	Territorial Circles	Territorial/ Wild Life Division	Territorial/ Wild Life Ranges	Territorial/ Wild Life Sections	Territorial/ Wild Life Beats
Number of Units	8	50*	283	1017	3683

\* Out of the total 50 Divisions, 37 are Territorial and 13 are Wildlife Divisions.

The state is divided into 283 (223 Forest (T) and 60 Wildlife) Ranges, 1017 (827 Forest and 190 Wildlife) sections and 3693 (3082 Forest and 601 Wildlife) beats. The average Forest Area per beat comes to 15.74 sq.kms, for a section 57.16 sq.kms and 206.88 sq.km for a Range, which is quite high from the management point of view.

## 1.3 Forest Type:

Forest types in Odisha are dry deciduous forests which cover approximately 50% of the total forest area and the moist deciduous forests cover around 30%. The rest 20% consists of various types of forests like semi-evergreen forests, the littoral forests and the tidal swamp forests. The dominating forest types are the dry and moist mixed Sal.

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## **Forest Fire Hazard & Vulnerability**

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### **2.1 Nature & Frequency:**

Forest fires usually occur during hot summer months when leaf shedding of deciduous forests occurs from February to June. The occurrence of forest fire is recorded on beat jurisdiction basis. It is observed that forest fire is repeated in many places during a particular year due to continuous leaf fall in the forests. The intensity of forest fire depends on the quantum of dry leaves on the forest floor, wind flow in the fire affected area, etc.

During the summer period, the atmospheric temperature increases making the forest floor more vulnerable because of dry leaves. Leaf shedding is a continuous process which makes field management difficult even though preliminary fire lines are maintained and adequate steps are taken for avoiding any fire occurrence. Despite efforts by the field staff, it is observed that forest fire is rampant in case of a dry spell of summer and gets aggravated if rainfall is poor in a particular year.

### **2.2 Legal provision under prevalent Laws:**

#### **a) As per Sec.27(3) under Orissa Forest Act 1972**

Any person sets fire to a Reserved Forest or who in a Reserved Forest – (a) “kindles, keeps or carries any fire or fells, girdles, lops or burns any tree or paint or strips off the bark or leaves from or otherwise damages the same or causes damages to any forest produce” shall be punishable with imprisonment for a term which shall not be less than three years but may extend to seven years and with fine which may extend to ten thousand rupees.

#### **b) The Orissa Forest (Fire Protection) Rules, 1979 envisages under rule 3(1) that**

- 1) No person shall set fire to any part of a reserved forest or a protected forest, and no person shall set fire in the vicinity of a reserved or protected forest so as to cause damage to any forest produce therein.
- 2) Except as such places, as may be notified locally by the Divisional Forest



Officer from time to time, no person shall kindle any fire or leave any fire burning upon any public or private road or path which adjoins or passes through a Reserved or protected forest.

- 3) No burning wood or fire brands for torches shall be carried within or along the boundaries of any reserved or protected forest between the period from the 1st November to 30th June of any year. Smoking shall also be prohibited during the aforesaid period within any reserved or protected forests save as authorized camping grounds.
- 4) No fire shall be lighted within or along the boundary of a reserved forest or a protected forest except in camping grounds notified as such by the Divisional Forest Officer. Persons using such grounds shall light fire in such a way as not to endanger the forest or any burning or shed, and shall extinguish all fire before they leave the place.

**c) Sec.27(2)(d) under Wildlife (Protection) Act, 1972 makes mandatory that**

Every person is bound “to extinguish any fire in such sanctuary of which he has knowledge or information and to prevent from spreading, by any lawful means in his power, any fire within the vicinity of such sanctuary of which he has knowledge or information.”

**d) Sec.51 (1) under Wildlife (Protection) Act, 1972 has made provisions that**

Any person who [contravenes any provision of this Act [ (except Chapter VA and Section 38J)] or any rule or order made there under or who commits a breach of any of the conditions of any license or permit granted under this Act, shall be guilty of an offence against this Act, and shall, on conviction, be punishable with imprisonment for a term which may extend to [three years] or with fine which may extend to [twenty-five thousand rupees] or with both.

## **2.3 Past History:**

Forest fire is a regular phenomenon in summer season throughout the state where the temperature increases during leaf shedding periods of deciduous natural forests and plantations. The ground staff are engaged for preventive measures by creation of fire lines and awareness programme among the people prior to summer season. They engage themselves along with the local people for extinguishing fire



and reporting the extent of damage including legal action against the culprit, if noticed. The measures undertaken for forest fire control is being augmented by receiving data from Forest Survey of India directly from MODIS satellite to the field units by registration of Mobile Numbers facilitating for a quick planning process to control forest fire. It is observed that there are forest fires recorded and reported by Forest Survey of India outside notified forest blocks which are also vulnerable leading to loss of tree growth. **Table-1** shows the Division wise reported Forest Fire as per interpretation of MODIS satellite data received from Forest Survey of India and action taken on ground by different Field Divisions during 2017.

## **2.4 Vulnerability Mapping:**

### **2.4.1 Intensity Map:**

All the Forests of the State are highly vulnerable to Forest Fire, however, the forests of interior Western and Southern parts of Odisha are more vulnerable to forest fires as compared to those in the Eastern Coastal parts. This is because of a long dry spell with scanty rainfall in those areas. The frequency and intensity of forest fires has increased since 1990. As per records received on forest fire in different Divisions over the last five years, a vulnerability map has been prepared with respect to frequency and area affected in different beats and depicted for each Circle as High, Medium and Low Risk Zone (Map I to VIII).

### **2.4.2 Risk Analysis:**

Forest fires take place on the ground affecting the forest floor with fire spreading over the ground. Mostly regeneration is affected leading to future crop loss. In some cases the adjoining villages, if connected with the forest cover, are affected by forest fires due to spreading of the fire. Since the villagers are directly involved in prevention and protection activities of forest fire, the risk of fire hazard is greatly reduced even though there is a high risk factor. The Climatic condition influencing the atmospheric temperature, phenological behaviour of deciduous plants, crop composition etc changes the fire incidents during the fire season. A circle wise map on fire occurrence of different circles from February to June is placed as histogram (I to VIII) for a better understanding.

## Capacity Building Measures

Forest fire is a regular phenomenon in the state of Odisha. The field staffs of the department are well conversant with the traditional method of extinguishing the forest fire and also its prevention through fire line cutting. In modern day technology, it is essential to adopt mechanisms for immediate response through the quick action team to extinguish the fire using different tools and instruments. Also different tools for fire line cutting are to be used.

### 3.1 Capacity Building Training:

Capacity building programmes are taken up from the Community to the highest level as routine schedule analyzing the past experience to improve future programmes with modern technology. Equipments like the Air Blower has been adopted in the last two years as a preventive measure to create and maintain fire lines. Also as a protective measure, it is used to restrict the ongoing forest fire at a distance parallel to the forest fire by creating fire lines to counter the ongoing forest fire. Training to the field staff includes its use, risk involved, precaution to be taken etc. Modern gadgets like GPS PDA and Mobile App etc are used to strengthen further on, monitoring mechanism, which is also included in the training programme. The following training programme is undertaken for combating forest fire in the state.

Sl No.	Training Programmes on	Key Components/Topics	Target Audience
1	Awareness & Forest Fire sensitization	About Forest Fire, role of community, steps to be taken on identification of forest fire, future planning	VSS members, Temporary staff engaged for fire protection
2	Training on capacity building	Training for capacity building on prevention and protection of forest fire with different methodology and use of equipments.	Forest Guards, Forester & Forest Ranger
3	Strategic planning for prevention and protection of forest fire through consultative workshop	Evaluation of past documentation, shortfall in taking action for prevention, monitoring of fire protection measures and protection of forest fire, formulation of future strategies.	DFO and RCCF

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## **Prevention & Mitigation Measures**

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### **4.1 Forest Fire:**

Many forest fires start from natural causes such as LIGHTNING which set trees on fire. Periodic lightning induce fires which have been recorded throughout history of Odisha. However, rain extinguishes such fires without causing much damage. Majority of the forest fires are the result of human neglect. A casual throwing away of a smouldering bidi, cigarette butt or a spark from a picnicker's open hearth in a desiccated forest, causes a fire in summer. Such fires starts on the ground due to dry litter and then flames up due to strong winds, engulfing vast tracts of forest ashes thereby causing extensive damage.

The forests of Odisha are managed through well-prepared forest working plans. Fire prevention and control has always constituted an important component of the working plan. In some parts of Odisha, "Slash and Burn" method of Farming is used by the tribes of hilly areas, in which they cut down and burn small areas of the forest and use the cleared land for cultivation. This method of burning offers them not only the cheapest means to clear the forests, but also free fertilizers in the form of ash from the burnt vegetation on limited scale. But when it is indiscriminately practiced, as is being done at present, the damage can be irreversible. Sometimes the local people practise burning for collection of NTFP and also for good growth of Sabai grass which spreads to forest area. Mostly, the prescriptions relate to employing traditional practices like creation and maintenance of fire lines, fire tracks, and control burning, engaging firewatchers during the fire seasons etc. The villages situated in and around forest areas are also legally bound to assist the forest department staff in extinguishing the fires. These methods proved quite effective in controlling forest fires in the state, but gradually due to population pressure on forests and resultant conflicts and resource hunger, it has become difficult to check forest fires through these methods. More and more biotic pressure has increased the fire incidences resulting in poor regeneration of forest areas.

### **4.2 Preventive Measures:**

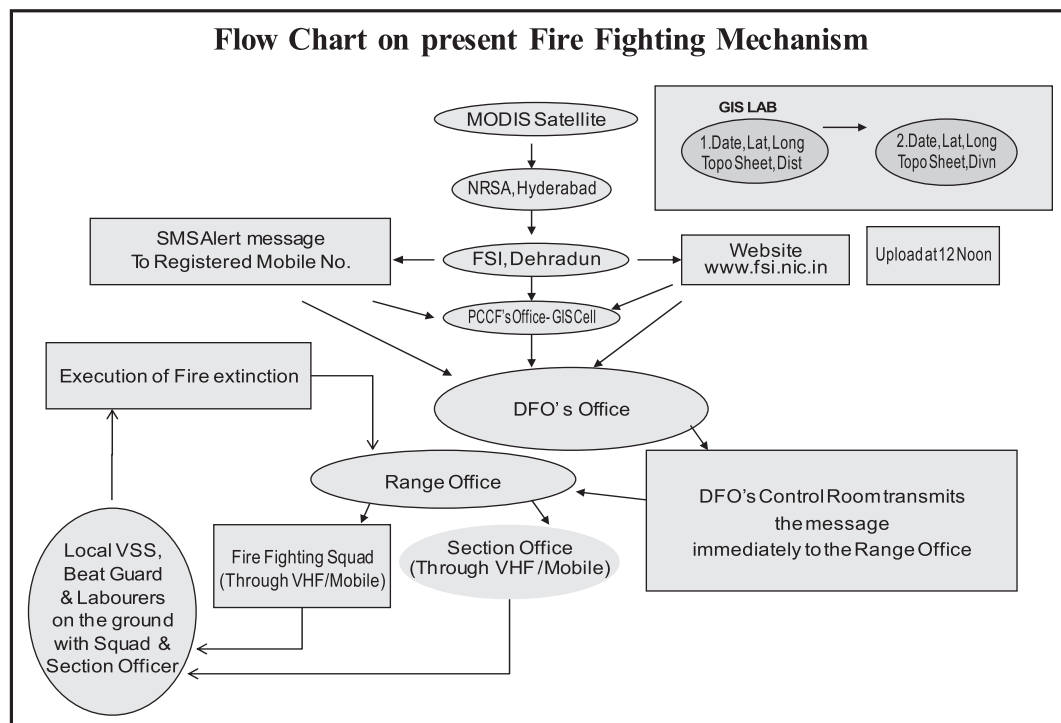
Forest fires are usually seasonal. They usually start in the dry season and can be prevented by adequate precautions. Since old times, forest fire was prevented



in the summer through removal of forest litter all along the forest. This was called “**Forest Fire line**”. This line prevents fire breaking into the forest from one compartment to another. Hence in Odisha, fire lines are created in the vulnerable areas of the forest and plantations inside forests to save them from forest fires. Generally, the fire spreads only if there is continuous supply of fuel (Dry vegetation) along its path. The best way to control a forest fire is, therefore, to prevent it from spreading, which is done by creating Fire Breaks in the shape of small clearings of ditches in the forest.

### 4.3 Mitigation Measures:

All the DFOs have been asked to make registration of the mobile phone numbers for fire alert along with the Range Officers so that a quick alert of FSI can be disseminated to field. The IT & GIS Cell of office of the PCCF, Odisha, Aranya Bhawan is facilitating the details of KMZ file relating to different divisions received from FSI to forest divisions with geo-coordinates upto Forest Block level for field inspection by ground staff. The field officials then take adequate measures for extinguishing the forest fire and report back to the higher authority. The flow chart of the total mechanism is furnished below:



#### 4.4 Inter-departmental coordination

The involvement of other departments is very much required which depends on the gravity and extent of fire reported. Also for the preventive measures on creating awareness among the people, it is required to co-ordinate with the Panchayat Raj, Revenue, Police, Fire Department and Health Department etc so that they will also be on alert during forest fire hazard. The details on the coordination with other departments and calendar plan for the activities are spelt out in Standard Operating Procedure being adopted by the State (**Annexure-I**).

#### 4.5 Incident Response Team:

A three tier mechanism is in operation for the control of forest fire. The first information received at State Control Room is transmitted to field units and division control room regularly on a daily basis. Then, the action taken by the dedicated fire squads and other support staff on the extent of damage is collected from divisions regularly for effective monitoring. The three levels mechanism is explained as below:

Sl No.	Level	Head of the IRT	Roles / Responsibilities
1	State	Protection & Sustainable Management Wing of Principal CCF, Odisha	<ul style="list-style-type: none"> <li>Coordinate with State Government and other line Departments.</li> <li>Ensure Reporting of the affected area and assess damage thereof.</li> <li>Plan and arrange necessary inputs for response measures.</li> <li>Manage the fund and maintain financial records</li> <li>Maintain an inventory of all related guidelines, procedures, action plans, district maps and Contact numbers.</li> </ul>
2	District/ Division	RCCFs & DFOs	<ul style="list-style-type: none"> <li>To coordinate with Directorate, District Authorities and line departments at District level.</li> <li>To prepare and activate division plan</li> <li>To manage the overall response activities in the field</li> <li>To mobilise resources for response measures</li> <li>To collect and record information for post incident analysis.</li> <li>Capacity Building</li> </ul>

Sl No.	Level	Head of the IRT	Roles / Responsibilities
3	Block/Range	DFOs	<ul style="list-style-type: none"> <li>To supervise collection of information and report to the higher authority.</li> <li>To prepare and activate plan at Range level</li> <li>To implement the plan</li> <li>To ensure availability of resources for response measures</li> <li>Capacity Building</li> </ul>

At present, 269 Forest Fire Squads consisting of 10 members in each squad are working in 216 Ranges wherein 53 Ranges are equipped with two squads depending on the Fire Intensity experience last year. All these squads are provided with vehicle and fire fighting equipments for immediate response to the fire points reported on a daily basis.

#### 4.6 Role of NGOs and Voluntary Organizations:

The Forests of Odisha are supported with different Vana Surakshya Samiti and Eco-Development Committees who play a vital role in prevention and protection of forest fire. However, at the District level, few voluntary organizations / NGOs come forward to assist the field officials for prevention and protection of forest fire.

#### 4.7 Present System on Forest Fire Control:

On Receiving Warning	Response time	Loss Analysis
<ul style="list-style-type: none"> <li>Disseminate the alert to all concerned as per reports received from Forest Survey of India by State Control Room</li> <li>At District level transmission of information to different Ranges through telephones / VHF network/Sms alert by Division Control Room</li> <li>Transmission of message to different field units for immediate action to extinguish the fire by Range officer/Fire Fighting Squad</li> </ul>	<ul style="list-style-type: none"> <li>Within an hour of occurrence through satellite data and communicated to mobile telephones.</li> <li>Within one hour of transmission of message to different field units by different Ranges.</li> <li>Immediate action by field units to extinguish forest fire.</li> </ul>	<ul style="list-style-type: none"> <li>Assessment of damages on regeneration.</li> <li>Assessment of damages on wildlife</li> <li>Assessment of damages on timber and other MFPs.</li> <li>Investigation on the offences resulting to forest fire.</li> </ul>



#### 4.8 Reporting formats for damage assessment and others:

The daily reporting on the damage caused by forest fire is received from different divisions as per the fire alert disseminated and forwarded to DFOs on receipt of same from Forest Survey of India. The authenticity is verified at field with the report received on the extent of damage as below:

Sl. No	Date & Time	Lat.	Long	State	District	Circle	Division	Range	Block	Beat	Area Affected on forest fire
Provided by the State Control Room to Division Control Room & Field Units											Reported by DFO & Field Units

#### 4.9 Risk Reduction through developmental programmes

Different programmes are taken up under various schemes for expanding and enhancing the forest fire risk reduction as below:

1. A large no. of water bodies are created all over the forest blocks in the state which will be useful for making availability of water.
2. Adequate afforestation measures are taken up to supplement the recovery plan in cases where regeneration has been affected and the forest area has become barren.
3. Regular salvage of timber and firewood is carried out which is useful for reducing forest fire.
4. Subsidiary Silvicultural Operations are taken up to remove the dead, drying trees, creepers which restrict the spreading of forest fire.
5. Vehicular access is augmented for immediate action in case where measures are required to extinguish forest fire.
6. The VHF network and mobile communication is strengthened for law and order, protection purpose which also help in forest fire control during hot summer months.
7. Forest Development Agencies are actively involved in mobilizing the VSS and EDC through different schemes under Green India Mission programme.

## Technology Updation

Risks can be minimized by taking a phased approach that gives beneficial returns at each step & tangible results quickly with enhanced efficiency, better decision making and greater use of tested solutions across the department.

### 5.1 Present Practices:

Thematic Area	Best Practice	Technology Intervention	Opportunity for replication
Forest Fire Occurrence	Satellite Imaginary	Geospatial Analysis	The analysis at State Hqrs is augmented with linkage between field staff, division & state control room

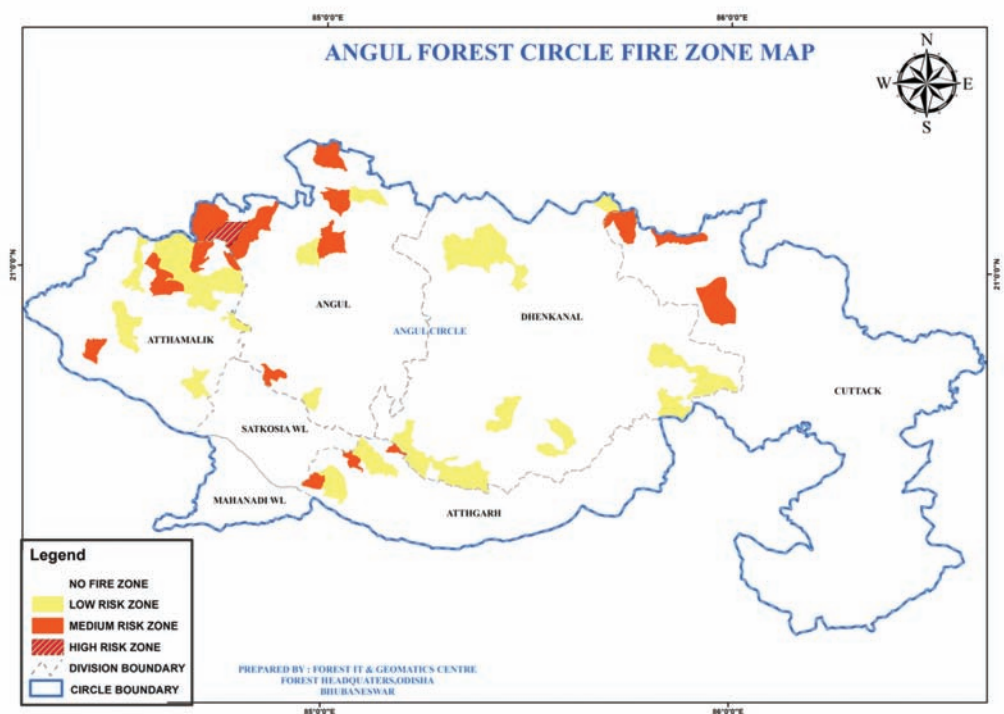
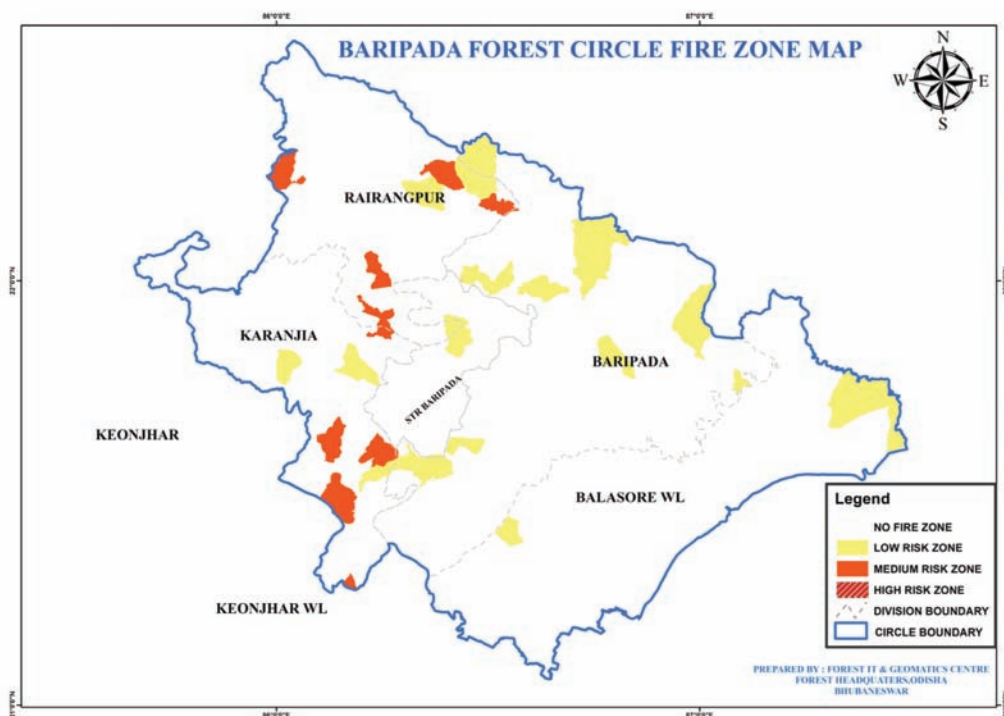
### 5.2 Best Practices & innovation in the Department:

Technology Needs	Current State of Technology	Prioritization	Collaborating Institute
Geospatial Analysis	Satellite Imagary data interpreting	Authentication of occurrence & verification of damage area	GIS cell and FSI

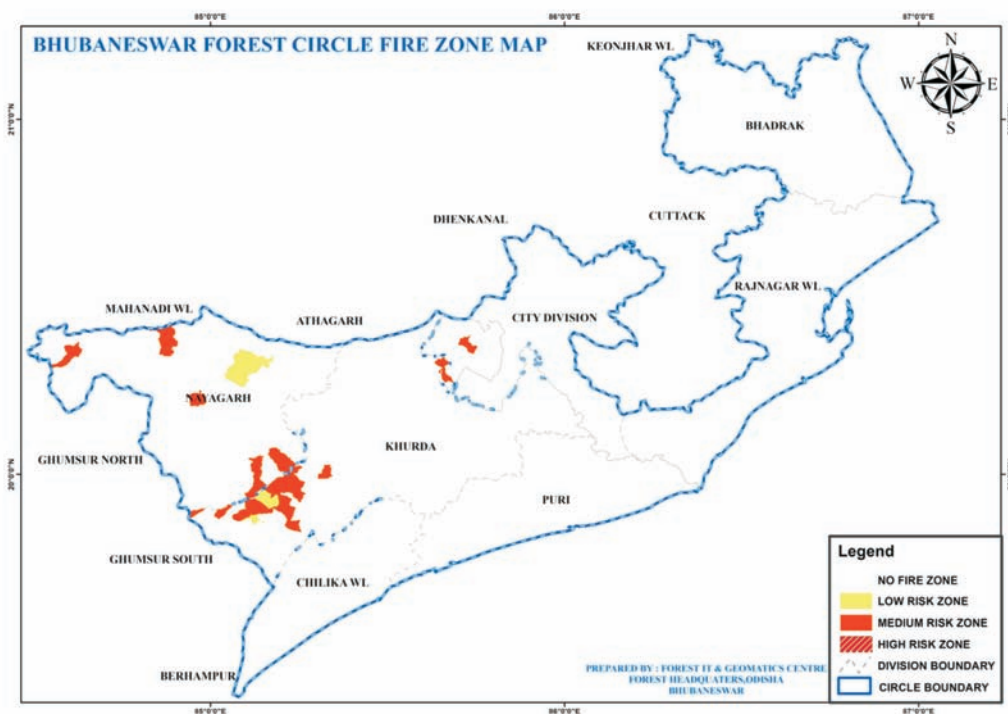
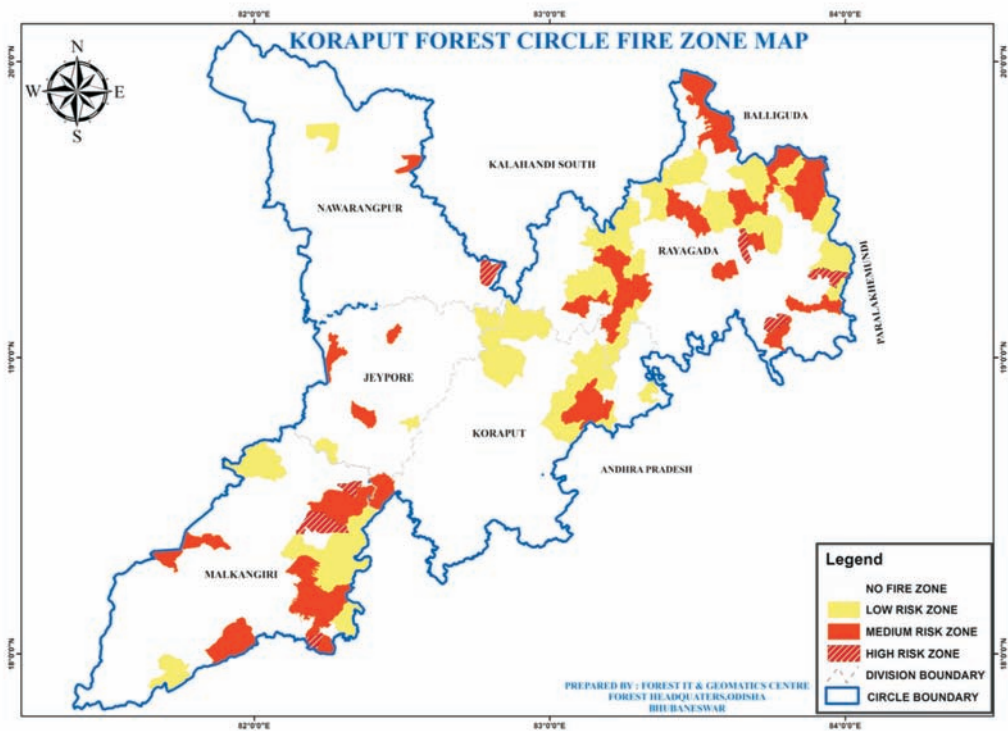
### 5.3 Future Plan:

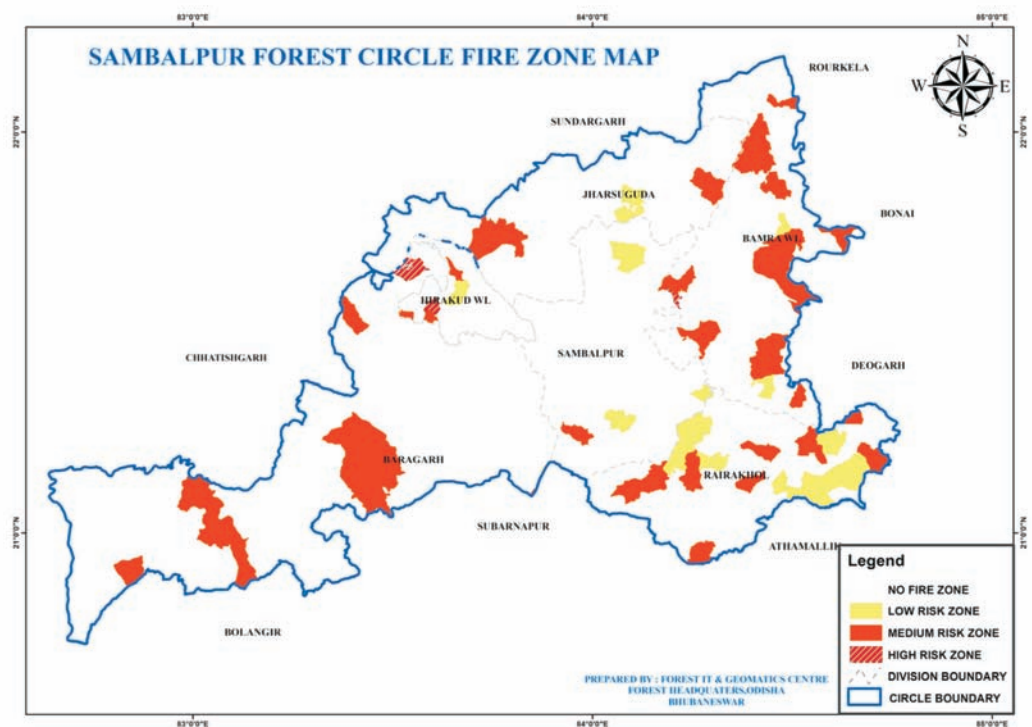
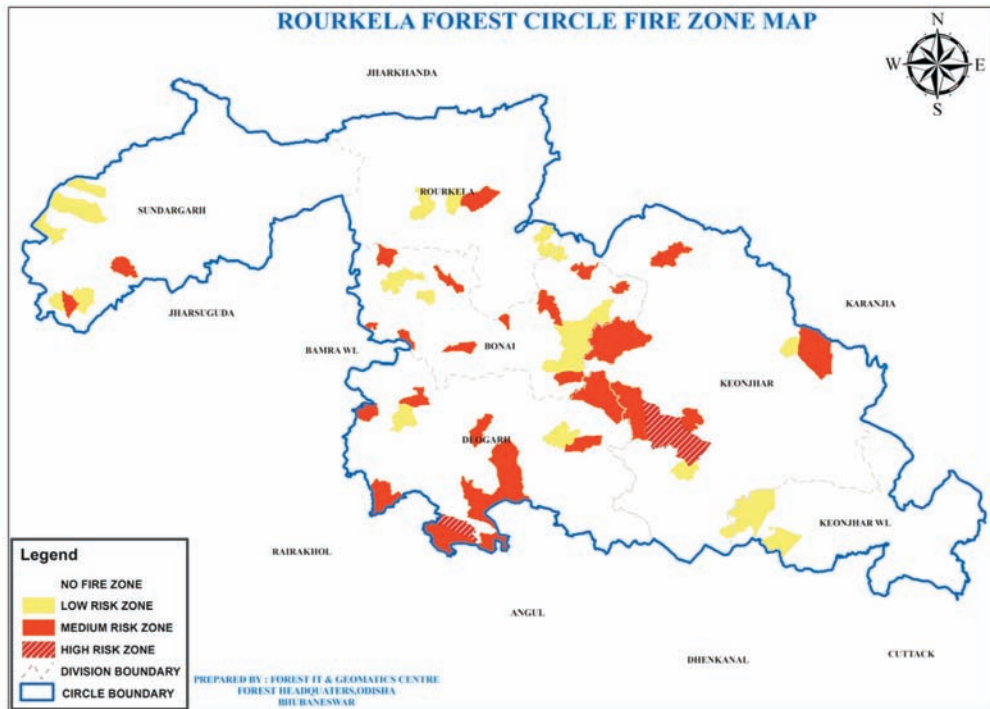
The recorded forest fire received from Forest Survey of India and other Forest Fire noticed on the ground are monitored on a daily basis along with the action taken to combat forest fire. A present development is made by the GIS Cell of the State Forest Headquarters regarding development of forestry application in android version to be useful for all field units. The earlier mechanism of transmitting forest block and beat level information from the geo coordinates provided by FSI will be dispensed with. The field units on their GPS PDA device or mobile phone will be able to locate the fire points received from FSI along with the map and direction

# Fire Vulnerability Map

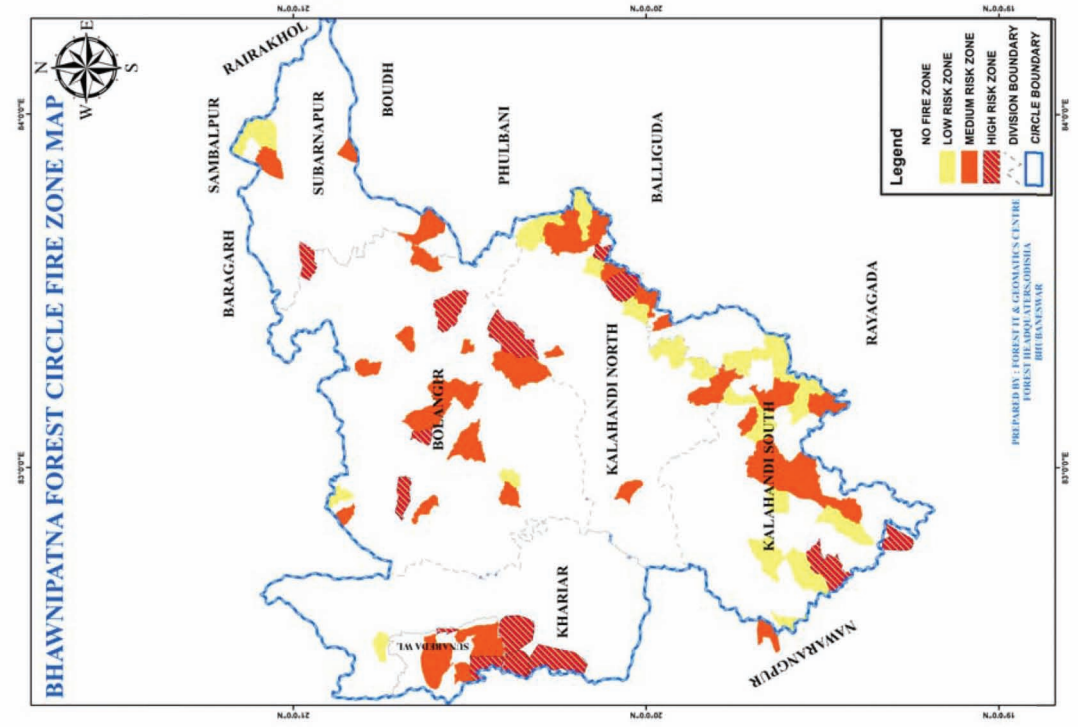
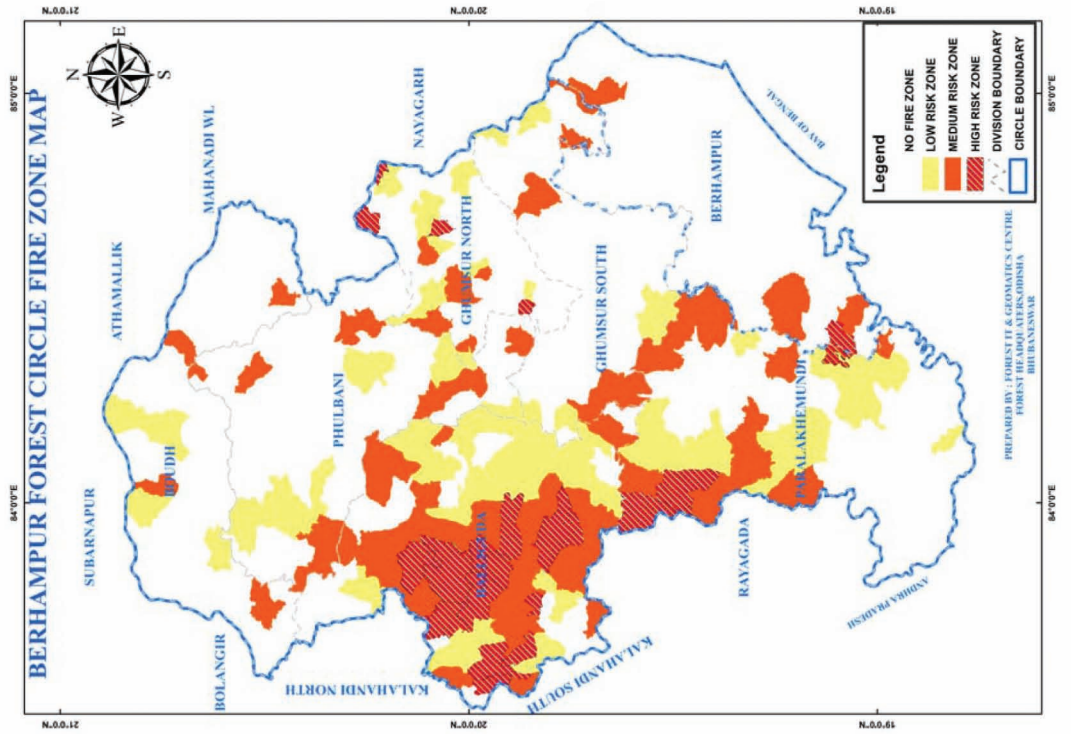






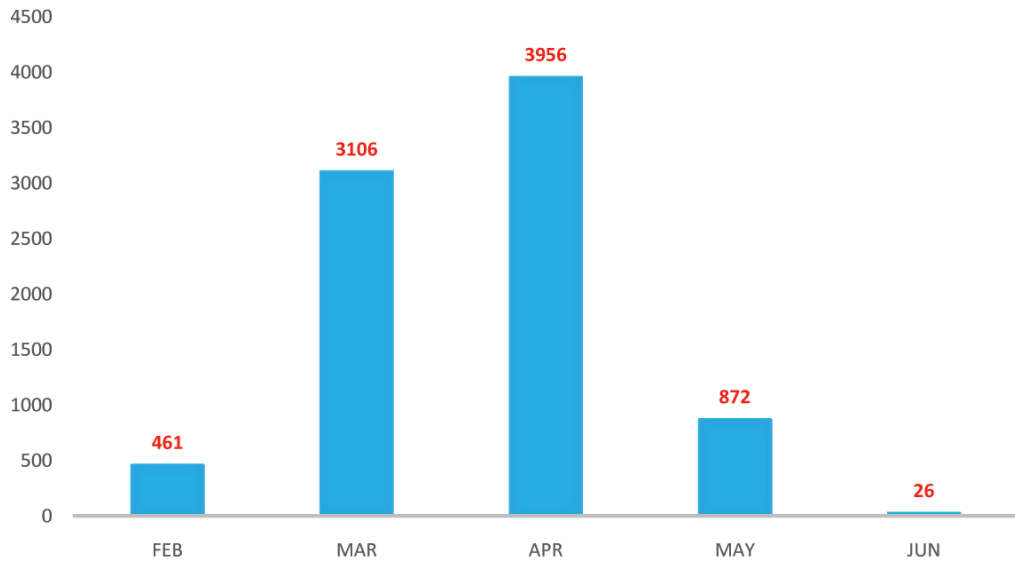




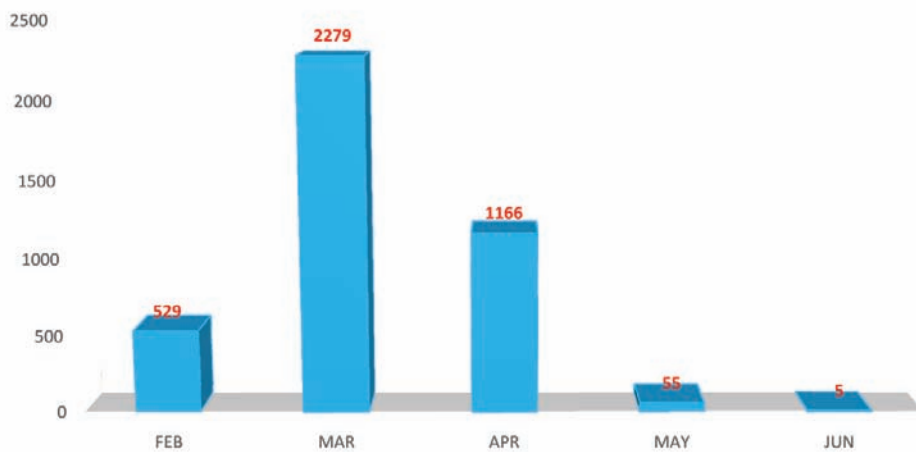


## Circle wise Fire Occurance

### BERHAMPUR CIRCLE- 2017

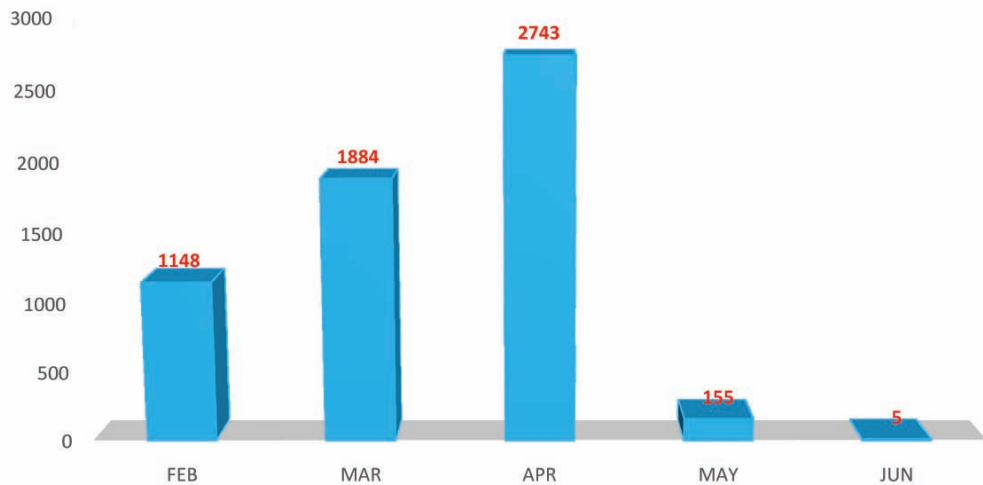


### SAMBALPUR CIRCLE- 2017

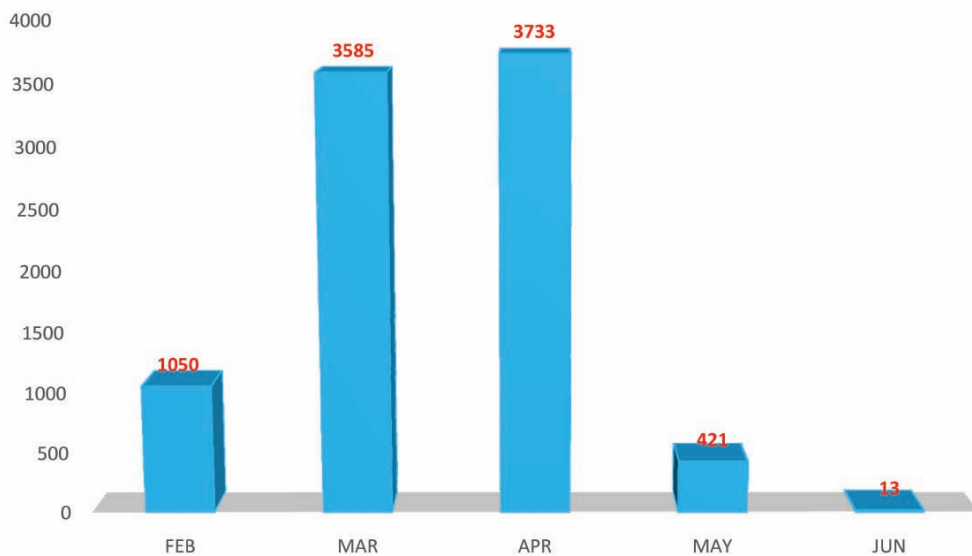




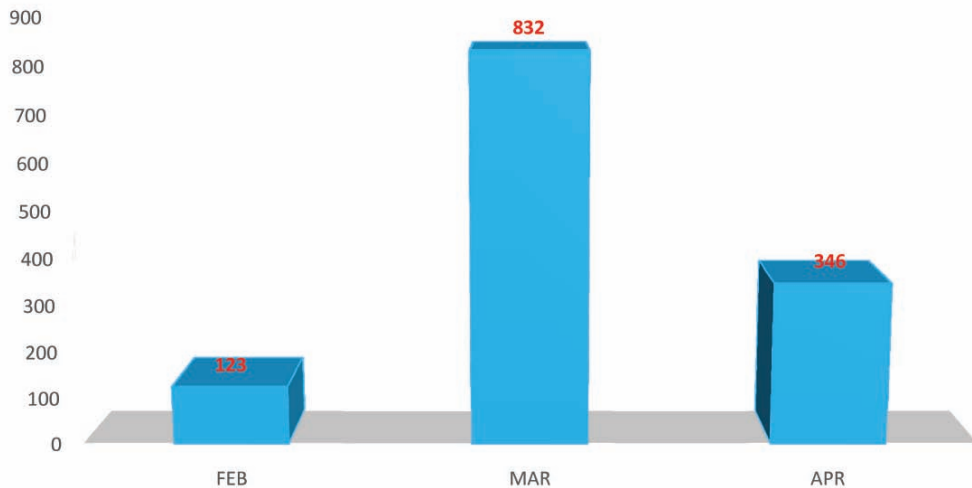
## BHAWANIPATNA CIRCLE- 2017



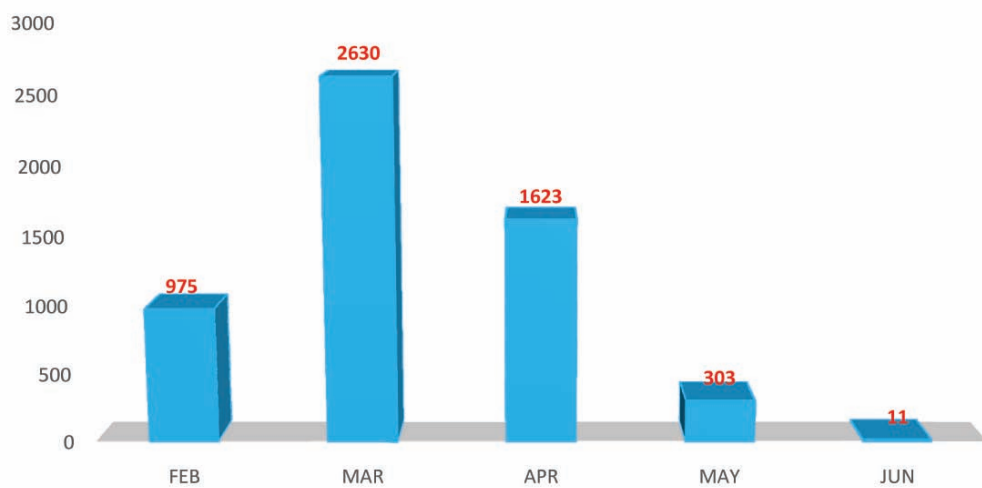
## KORAPUT CIRCLE- 2017



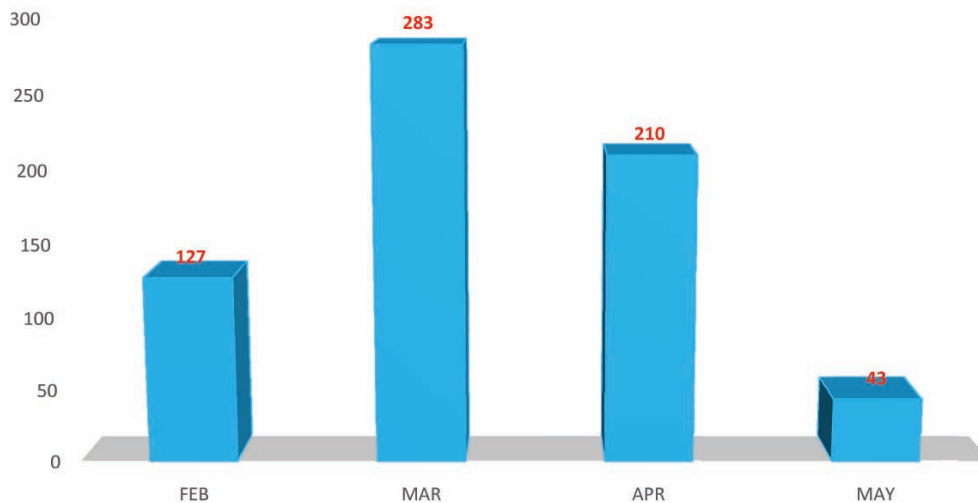
## BARIPADA CIRCLE- 2017



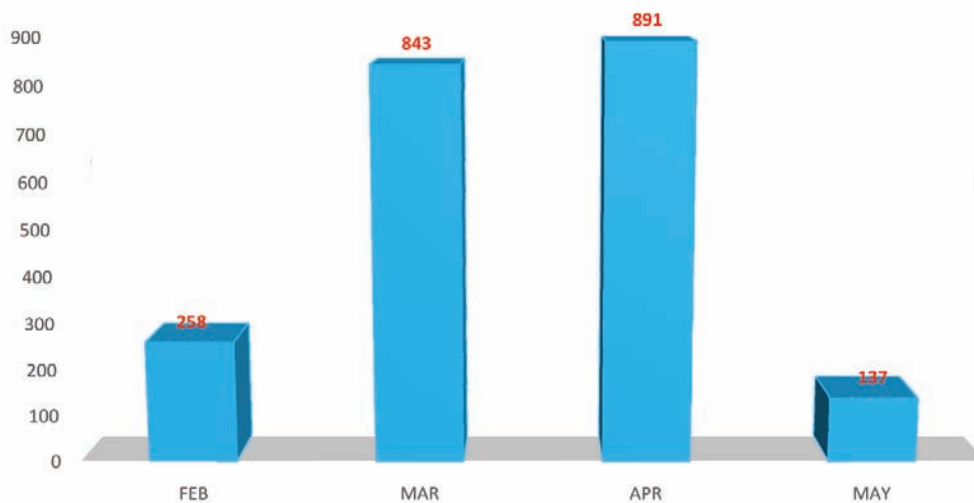
## ROURKELA CIRCLE- 2017



## BHUBANESWAR CIRCLE- 2017



## ANGUL CIRCLE- 2017



under his jurisdiction directly. The verification report will be made available either through GPS PDA or through mobile App after due action is taken on the ground. Besides FSI fire points, other fire points not recorded by the FSI but noticed by the field units have also to be recorded along with the field verification report. All the data relating to fire occurrence and action taken are to be uploaded for information of higher authority and FSI. The present development of forest fire application are also useful at the division level, circle level and the State level to know the fire points and action taken by the field units on a daily basis.





**GOVERNMENT OF ODISHA  
PRINCIPAL CHIEF CONSERVATOR OF FORESTS  
ODISHA**

**STANDARD OPERATING PROCEDURE TO PREVENT  
FOREST FIRE**

**1. Introduction:**

Forest fire, whatever be the source & affected area, causes extensive damage to flora and fauna side by side generate heat and smoke causing pollution to local environment. In Odisha, forest fire occurs starting from the month of February to June. But number of incidence increases during the month of March & April. Though there are working plan prescriptions as well as several executive instructions on the subject, no systematic approach and effective management practices with accountability has been devised for prevention of forest fire so far. Hence a comprehensive Standard Operating Procedure (SOP) to prevent forest fire is required for field level officers to resolve the problem at source.

**2. Objectives**

The main objective of SOP is to deal with the problem of forest fire step by step at different level with coordination of government institutions and community participation. Besides, it is a management practice tool which is helpful for field staff to reduce the occurrence and minimise the impact of fire thereby reducing threat to forest resource and micro eco-system. It will also ensure precise planning and implementation of forest fire control measures.

### 3. Strategies

The control on incidence of forest fire will be strategized in an effective and speedy manner by responsible staff with active participation of VSSs and local inhabitants. The active participation of VSS and EDC members with incentive mechanism for villagers will be devised. The SOP will clearly indicate the responsibility of each level of field staffs. This SOP shall be followed as per provision stipulated in the Odisha Forest (Fire) protection Rules, 1979.

This Standard Operating Procedure (SOP) endows with the basic steps which needs to be taken at field level for dealing with fire preventive measures, information collection & maintenance of records, tackling ablaze area, and post fire operations. Applicability of this SOP covers the forest area under management of Forest Department.

### 4. Responsibilities:

#### AT DIVISION LEVEL

The Divisional Forest Officer / In-charge of the Forest Division will be responsible for following works:

- i) Organising Coordination meetings with District level fire officers, DFO Kenduleaves, DM, OFDC and other concerned departments.
- ii) Preparation of fire prevention & reclamation Plan and supervise the implementation of the approved plan.
- iii) Action for filling of vacant positions in fire risk forest Beats & Sections before onset of fire season.
- iv) Procurement of fire fighting equipments and tools required for strengthening the base level.
- v) Notification of prohibited activities and display on conspicuous place for public as per section 3(2) of Orissa Forest (Fire Protection) Rules, 1979.
- vi) 24 X7 fire prevention control room at division headquarters in charge of an officer of Deputy Ranger/ Forester rank with staffs and equipments. Ensure Registration of official Mobile no with FSI website (<http://www.fsi.org.in>) for getting fire alert message and set up effective two way communication network. Contact number of control room should be displayed at Beat, Section and Range offices.

- vii) Make Incentive provision for VSS & public informants.
- viii) Monitor & review fire control operation on weekly basis in the Division.
- ix) Ensure timely submission of fire occurrence report.

### **AT RANGE LEVEL**

The Range Officer / Incharge of the Range will be responsible for following works:

- i) Monitor and supervise the works like maintenance of fire line, selection of fire fighting squads members well in advance of the fire season.
- ii) Repair to forest roads, maintenance of boundary & compartment lines, select site to set up camps, construction of Machans and decide on fire fighting squad members well in advance of fire season
- iii) Organising monthly meetings of VSS during fire season, organise public awareness programmes, proper display of sign boards / banners on proper places. He must have regular interaction with VSSs.
- iv) Deploy staff and squad members on strategic points with specific duty and chalk out their movement to cover fire sensitive forest areas.
- v) Organising mock drill training for Forester, Forest Guard , Squad and VSS members with assistance of fire service personnel for effective fire control. Maintain Duty Register and log Book for fire squads and staff.
- vi) Conduct enquiry into each fire affected forest area, assess the loss, verify the action taken by the staff to control fire and submit report
- vii) Recommend names of VSS, informants and squad members for incentives and awards.

### **AT SECTION LEVEL**

The Section Forester /Section in charge will be responsible for the following works:

- i) Prepare detail map showing fire prone area, route chart to those sites and available water sources
- ii) Execution and supervision of fire control measure works (maintenance and creation of Fire Line, compartment and boundary line) in fire prone areas well in advance.

- iii) Organising VSS meetings on regular basis and encourage members to take appropriate steps for control of fire as a Convenor.
- iv) Safe custody of fire fighting equipments and kits from range office.
- v) Receiving fire alert messages from VSS, range office & division control room on a day to day basis, ensure entry into a register and pass on to Beat Guard.
- vi) Arrange labour, hire of vehicle and provide logistic support to fire fighting squads.
- vii) Action taken report with details of area fire affected with GPS survey and damage to flora and fauna (photographs) to be submitted within 48 hours.
- viii) Keeping close contact with local Fire Service Station for information and technical guidance.
- ix) Expeditionary steps to initiate legal action against culprits with due procedure and adequate evidence.
- x) Ensure all equipments required for fire fighting have been supplied to all Forest Guards, VSS members, fire fighting squads and are in working condition.

#### **AT BEAT LEVEL**

Beat Forest Guard / In charge of the Beat will be responsible for following works:

- i) Well acquainted with area, map, topography , routes and fire risk areas of his jurisdiction.
- ii) Make regular patrolling in forest areas and interaction with locals. He will provide his mobile no. to local ward member/ Sarpanch/ Important local villagers and request them for providing the information about forest fire promptly.
- iii) Receive messages from control room, range office, section forester and VSS on fire occurrence, record in log book / register.
- iv) Submit weekly report ensuring forest area not affected by fire due to his effort.



- v) Submit the area affected by forest fire on daily basis to Section Forester and Range Officer.
- vi) Make frequent night halts in interior pockets of his jurisdiction.

## **5. Preparedness before the onset of the fire season**

- (a)
  - i. Range Officer will ensure clearance of the fire lines in all the vulnerable forests in the range. DFO will ensure the completion of the fire line maintenance and will report to the RCCF/PCCF before onset of fire seasons.
  - ii. Supply of the fire maps clearly showing the fire prone sites to all beat guards, section foresters and range officers will be ensured by the DFO.
  - iii. Range Officer will ensure proper deployment of fire fighting squad and its members in strategic vulnerable locations within and outside forest area in such a way that they reach the fire spot within minimum time gap.
  - iv. Before onset of fire season, Range Officer will convene a meeting of all the VSS in his jurisdiction and analyse and discuss the success and failure of efforts in previous years to extinguish forest fire. He will decide the strategy after due consultation with VSS members, Foresters, Forest Guards and squad members for current year. Range Officer will also apprise the VSS members about incentive scheme for checking forest fire by villagers.
  - v. Updation of Phone/ mobile nos. and email IDs of all Range officers, section foresters, beat guards, Fire fighting squads and VSS presidents etc. will be done by the control room of the DFO and a copy will be supplied to each Range officer who will supply a copy to each Forester and Forest Guard.
  - vi. Procurement and supply of Fire fighting equipments, safety kits, communication devices, transportation and other logistic supports.
- (b) The Divisional Forest Officer shall procure required quantity of fire fighting equipments and safety kits for each range. Safety kits will include first aid medicines, mask, hat, water bottle, torch with batteries besides other necessary items.
- (c) DFO will organize necessary training programme on use and maintenance of equipments at the site and also ensure mock drills are conducted. After stock

entry, required equipments and safety kits would be supplied to each Range Officer who will further supply to the section Foresters and beat Guards.

- (d) ***Specific Use of Blowers-*** It is observed that fire lines maintained to obstruct spread of fire, get covered by fallen dry leaves and it is of no use in fire season. Besides maintaining the fire lines on a regular basis, blower can also be used for regular clearing of fire lines. This is a machine operated device and is a very effective equipment for making fire line by blowing out the fallen leaves on forest floor thereby creating a barrier to the ground fire. Blower is also helpful at the time of fire suppression operation.
- (e) Equipments for communication such as VHF sets, walkie talkie, mobile phones would be procured / repaired and supplied to all concerned well before the onset of the fire season. A set of mobile would also be provided to the leader of each fire fighting squad / VSS president and to the team leaders of the local youths for making quick communication without loss of time.
- (f) It will be the duty of each section forester to ensure that all equipments provided to fire fighting squad, VSS members and Forest Guard are in working condition.

## **6. Operation after occurrence of the forest fire**

- a. The DFO & RO after receiving the information on occurrence of forest fire from various sources (Modis satellite data, own staff local informer, TV news , Print Medias etc), will record the same in the Log Register through control room of the division and will ensure its immediate transmission to the concerned Range officers, Section Foresters and beat Guards who will also record the same in their Log Registers and start action without loss of time.
- b. The concerned Section Forester and Beat Guards who are key persons in controlling and suppressing a forest fire, will rush to the spot fully equipped with team of manpower, fire fighting squads / VSS members/ villagers whatever will be necessary.
- c. Local fire stations will also be informed by Range Officer and ensure that they reach with water tanker in accessible forest areas. Their services will be properly utilized to extinguish fire.
- d. Range officers have to ensure that prior arrangement for providing mode of transportation to vulnerable fire sites has been made and will review at Range, Section and Beat level. **Necessary emergency fund should also be made**

**as per provision particularly at Forest Guard level to tackle the problems in an effective manner.**

- e. For every two persons in fire fighting team, one blower has to be made available. Blower would be used to make fire line at least 1.5 mt. away from the periphery of fire area. Second team will join with the team and take up additional works as per requirements on the site.
- f. In case of multiple fire sites at the same time in a beat, section or Range area, the local man power would be utilised along with the divisional squads deputed in other Section and Ranges.
- g. In case of burning of dry trees, solid logs, branches, where fire usually last for long period, local fire station may be called with water tank to extinguish the fire.
- h. At all the sites, arrangement of sufficient drinking water & first-Aid would be made available.
- i. The Section Forester / Forest Guard will personally ensure complete suppression of fire at site. They will assess the damage on the spot with GPS reading, enquire the cause of fire and furnish detail report to Range officer within 24 hour of the occurrence. But, message on fire and action taken information would be passed to Range office and control room at the end of the operation through VHF / mobile phone.
- j. Information on Fire in VSS forest area would also be responded promptly. The section forester will lead the team with assistance of VSS members.

## **7. Evaluation and Reporting**

- a. On complete suppression of fire, the section forester will make a detail report on the incidence within 48 hours.
- b. The Range Officer, if feels necessary, may conduct further enquiry otherwise send the report with his comment to the Divisional Forest Officer within 48 hours.
- c. At Division level, after scrutiny the consolidated report will be sent forward (to RCCF and PCCF level) within 3 days.
- d. Compiled information from DFO would reach to Forest Head quarters (PCCF Office) fortnightly for each Division without fail.

- e. Complete information of a fire season would compiled and analysed. Site wise source of fire and frequency of occurrence would be kept on record. The period for highest and lowest number of occurrence can be evaluated.
- f. Such field level basic information would be taken into consideration while preparing division fire prevention management plan.
- g. Post fire operation shall be taken up. Soil and Moisture Conservation measures would be given priority in affected areas. Besides, Gap plantation would be taken up to bring vegetation cover in original condition.

**Model Fire Protection and Reclamation Plan and Month wise work programme for prevention of Forest Fire are enclosed in Annexure 1 and 2 respectively.**



## **MODEL FIRE PREVENTION AND RECLAMATION PLAN**

1. Introduction
2. Aim and objectives
3. Description of Area
  - a) General
  - b) Climate
  - c) Topography
  - d) Fire fuels
  - e) Land use
  - f) Water availability
  - g) Infrastructures and access to supports
4. Forest Fire
  - Forest fire History
  - Fire Risk, Hazard and threat
  - Summary of forest fire potential issues
5. Fire mitigation strategies
  - Hazard Management
  - Access and strategic fire breaks
  - Public education and community awareness
  - No Fire Zone
  - Assessment of fire management strategies
6. Fund requirement for Forest Fire Management-
  - Assessment of Fund for fire line creation
  - Incentives to informers.

- Strengthening of beat infrastructure for fire reporting.
- Cash in hand required for the Forest Guard to take steps for extinguishing the fire.
- Cost of Equipments / Blowers etc.
- Contingencies

## **APPENDIX**

- Maps
- Works programme
- Guidelines, specifications & minimum standards and a month wise work programme for prevention of forest fires are enclosed in Annexure- 1 and 2 respectively .chart for

## MONTH WISE WORK PROGRAMME FOR PREVENTION OF FOREST FIRE

Month	Work items	Action at			
		Beat Level	Section Level	Range Level	Division Level
August-September	Coordination meeting with Deputy Fire Officer, DM, OFDC, DFO KL and VSS representatives			Y	Y
	Preparation of Fire prevention and reclamation Plan	Y	Y	Y	Y
	Finalisation and Submission of Plan			Y	Y
October	Discussion and recommendation of Plan by RCCF				Y
	Approval of the Plan by PCCF				Y
November-December	Analysis and rationalisation to requirement of VHF, fire control equipments and procurement.		Y	Y	Y
	Fire line creation , maintenance and completion of field works	Y	Y	Y	Y
	Construction of Machhans and selection of camp sites		Y	Y	
	Awareness & Training		Y	Y	Y
January	Selection of Fire fighting squads drawing youths from fire risk forest villages		Y	Y	
	Maintenance of Forest roads and verification of approach routes to vulnerable forest areas and villages	Y	Y	Y	Y
	Locating Labour potential	Y	Y		
	Fire Prevention Control Room				Y
February - June	Foot patrolling to vulnerable areas	Y	Y	Y	Y
	Maintenance and creation of Fire line by blower	Y	Y		
	Collection of information of forest fire and action thereof	Y	Y	Y	Y
	Receive fire alert information, Registration and action taken thereof	Y	Y	Y	Y
	Implementation of reclamation works in burned areas (S&MC)	Y	Y	Y	Y
	Monitoring fire fighting works		Y	Y	Y
July	Analysis and submission of final report on forest fire		Y	Y	Y
	Suggestive measures for improvement in practices	Y	Y	Y	Y

( Table-1)

## DIVISIONWISE FIRE OCCURENCES IN FOREST AREAS DURING FIRE SEASON 2017

Sl No.	Name of Division	Fire Points reported by FSI outside forest block	Area affected in Hectare	Fire Points reported by FSI inside notified forest block	Area affected in Hectare	Total Fire Points	Total fire Area affected in Hectare
1	Angul	352	54.35	439	425.38	791	479.73
2	Athamallik	100	12.26	510	72.93	491	85.19
3	Athgarh	63	3.00	34	34.90	97	37.90
4	Balasore WL	6	2.00	12	20.10	11	22.10
5	Balliguda	799	122.63	2401	653.24	3200	775.87
6	Bamra WL	489	2.64	439	127.82	928	130.46
7	Baragarh	327	19.35	376	176.80	703	196.15
8	Baripada	135	12.04	200	68.99	335	81.03
9	Berhampur	28	4.52	164	72.73	192	77.25
10	Bhadrak WL	3				3	0.00
11	Bonai	99	66.00	1108	884.18	1207	950.18
12	Boudh	350	48.60	658	336.78	1008	385.38
13	Bolangir	110	51.20	631	431.87	741	483.07
14	Chandaka WL	8	1.24	29	12.64	37	13.88
15	Chilika WL	0	0.00	0	0.00	0	0.00
16	City	1		1	2.00	2	2.00
17	Cuttack	24		111	43.37	135	43.37
18	Deogarh	985	3.68	122	26.09	1107	29.77
19	Dhenkanal	212	60.52	121	347.14	333	407.66
20	Ghumsur North	208		128	99.90	336	99.90
21	Ghumsur South	92	38.02	538	336.03	630	374.05
22	Hirakud WL	25		201	143.01	226	143.01
23	Jeypore	391	37.41	244	134.07	635	171.48
24	Jharsuguda	227	50.00	268	1038.80	495	1088.80

Sl No.	Name of Division	Fire Points reported by FSI outside forest block	Area affected in Hectare	Fire Points reported by FSI inside notified forest block	Area affected in Hectare	Total Fire Points	Total fire Area affected in Hectare
25	Kalahandi North	893	9.55	605	118.22	1498	127.77
26	Kalahandi South	1098	134.60	818	915.83	1916	1050.43
27	Karanjia	90		151	63.62	241	63.62
28	Keonjhar	321	35.23	978	310.85	1299	346.08
29	Keonjhar WL	88	32.00	181	109.22	269	141.22
30	Khariar	732		118	134.70	850	134.70
31	Khurda	25	48.00	105	96.32	130	144.32
32	Koraput	1319		88	10.32	1407	10.32
33	Mahanadi WL	24	2.00	179	40.18	203	42.18
34	Malkangiri	1445	48.78	702	399.57	2147	448.35
35	Nawarangpur	650	60.69	276	102.84	926	163.53
36	Nayagarh	57	74.71	428	1031.27	485	1105.98
37	Parlakhemundi	1496	18.78	412	19.17	1908	37.95
38	Phulbani	341	44.02	806	738.38	1147	782.40
39	Puri WL			2	0.27	2	0.27
40	Rairakhol	690	30.10	293	506.35	983	536.45
41	Rairangpur	92	5.33	410	132.00	502	137.33
42	Rajnagar WL	4		0	0.00	4	0.00
43	Rayagada	2034	66.19	1653	517.45	3687	583.64
44	Rourkela	60	66.66	363	420.90	362	487.56
45	Sambalpur	106	78.60	593	422.95	699	501.55
46	Subarnapur	128	34.30	149	260.40	277	294.70
47	Satkosia WL	2		77	26.55	79	26.55
48	STR Baripada	28		184	33.02	212	33.02
49	Sunabeda WL	217	13.10	436	484.90	653	498.00
50	Sundargarh	391	107.29	907	237.66	1298	344.95
	<b>TOTAL</b>	<b>17365</b>	<b>1499.39</b>	<b>19649</b>	<b>12621.70</b>	<b>36827</b>	<b>14121.10</b>



## Forest Fire at a Glance



*Temporary machan for fire fighting squad*



*Fire fighting in day hour*



*Fireline clearance around forest boundary*



*Fire fighting in night hour*





*Publicity for fire prevention and control*



*Awareness meeting with VSS members*



*Fireline preparation*

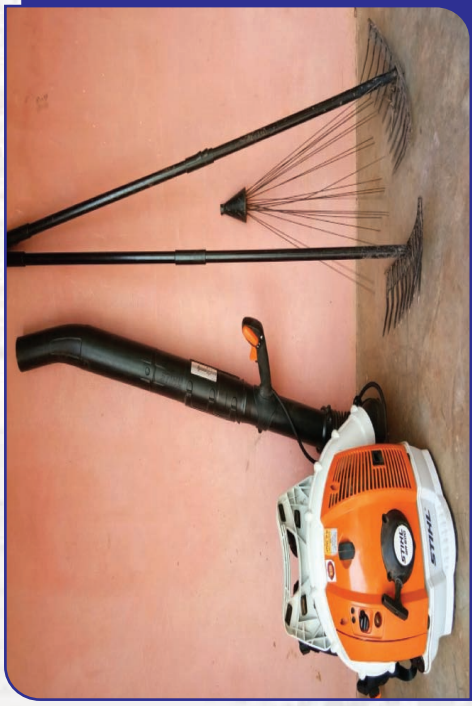


*Control burning along fireline*





*Fireline clearance along the forest road*



*Fire fighting equipments*



*Air blower for fireline creation*



*Air blower for countering forest fire*





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