

OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS
(HOFF), RAJASTHAN, JAIPUR

No.: F.14(Meeting)2022/FP/PCCF/ 5717

Dated: 18/10/22

To,

Assistant Inspector General of Forests(FPD)
Ministry of Environment, Forest and Climate Change
(Forest Protection Division)
Indira Paryavaran Bhawan
Jor Bagh Road, Ali Ganj,
New Delhi, Government of India

Subject- Directions given in the 4th meeting of the Central Monitoring
Committee on Forest Fire- reg.

Ref.- Minutes of the 4th meeting of Central Monitoring Committee on
forest fire Ministry of Environment, Forest and Climate Change,
Govt. of India File no. 8/2/2020-FPD dated 09.03.2022.

Sir,

With reference to the captioned subject, the State Action Plan on Forest Fire
(SAPFF) prepared for the State of Rajasthan is submitted herewith for kind favor
and necessary action.

Enclosed: as above

Yours sincerely


(Uday Shankar)

Addl. Principal Chief Conservator of Forests
(Forest Protection), Rajasthan, Jaipur

Forest Fire Management Plan

COMPREHENSIVE FOREST FIRE ACTION PLAN FOR RAJASTHAN

Fire is one of the major destructive agents of the forests. Fire renders the trees prone to insect and fungal attack. It destroys young regeneration, resulting in loss of time in its establishment. The physical properties of the soil deteriorate through loss of humus and organic matter, thereby exposing soil to the desiccating influences of sun and wind. Forest fires are of four types viz. ground fire, surface fire, crown fire and sub-surface fire. In Rajasthan, most of the forest fires are ground fires, which tends to reduce the density of the stocking and destroy invaluable wildlife habitat.

Forest fire incidents often occur during the period from March to the onset of monsoon season when the grasses and shrubs get dried and leaf fall takes place from main tree species which are deciduous in nature. Some fires occur in winter months also, particularly when drought is prolonged. The incidences of fire are maximum in protected areas, plantations and closures wherein the grasses grow tall and dense.

Fire Prone Areas

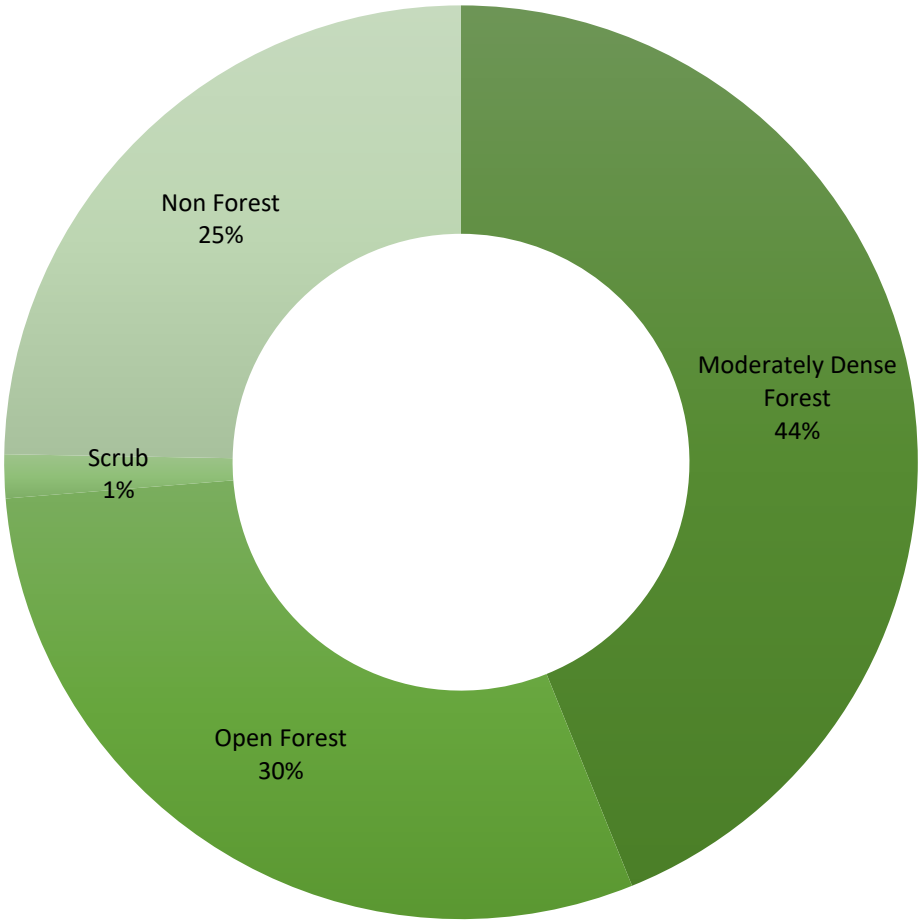
The fire prone area / vulnerable areas have been identified in each division based on occurrences of fire, fuel wood load aspect, wind and temperature gradient over a period of time. This data has been used for preparing strategy described in the Working Plan, Management Plan and Tiger Conservation Plans in the State. Rajasthan Forest Department, with the facility available at the IT Centre, has analyzed the historic MODIS/VIIRS fire data and mapped fire sensitive zones. By Spatio-Temporal analysis of last five years MODIS/VIIRS data, based on forest fire

incidents in forest areas of the State. The fire sensitive area has been identified in each division based on fire data received from FSI.

Area where fire has occurred for five consecutive years

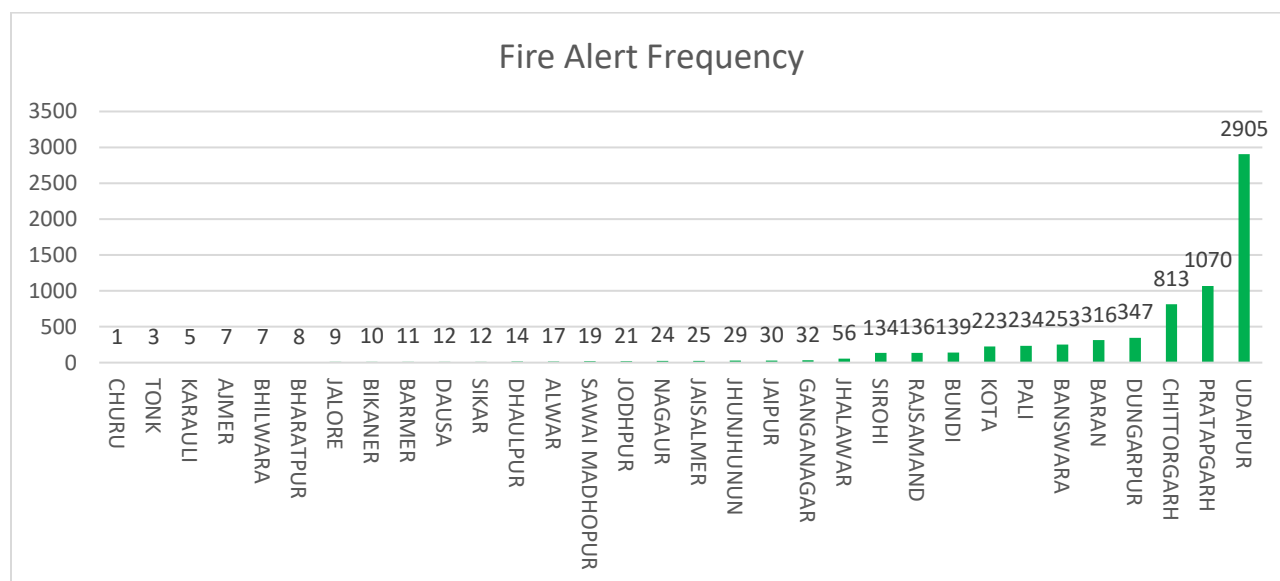
(The FSI density class data used for year 2013)

Fire Alerts in Differnt Density Classes



At the end of each fire season, annual forest fire damage assessment was done using Remote Sensing data and fire occurrence recurrence analysis carried out. The Forest divisions have during the years strengthened the fire protection measures with focus on areas where re-occurrences of fire have been observed over a period of time.

District wise forest fire incidences in last five years (2015-2019)



Management & Strategy to make the State free from Forest fire

LEGAL PROVISIONS

Legal provisions regarding forest fire are available under Sections 26, 33 and 79 of the Rajasthan Forest Act, 1953 and Sections 30, 35(8) and 51 of Wildlife Protection Act, 1972. These provisions need to be implemented strictly to discourage any incident of deliberate and intentional fires. VFPMCs/EDCs/Villagers who do not help forest officials in extinguishing the fire, may be seriously considered for curtailing their rights over forest areas.

PREPAREDNESS

Fire Fighting Drill: It is essential to keep forest protection staff alert and fully prepared during fire season. Firefighting exercise involving villagers should be organized every year in the month of December, January by the respective Deputy Conservator of Forests.

Fire Fighting unit: Every division should ensure that firefighting unit with all equipment is ready by December month of every year since fire season may start as early as January and may last upto July/ rains. Firefighting equipments should be distributed among all ranges as per requirement and must be kept in readiness and be available twenty-four hours.

Ground Patrolling: Fire watchers should be employed during fire season for regular patrolling, particularly for fire sensitive areas to assist forest staff in detecting and preventing forest fire.

People's involvement: Village Forest Protection and Management Committees/EDC of villagers residing along the periphery of forest constituted as per guidelines of Government of Rajasthan to assist the staff in cutting and maintenance of fire lines, construction of bridle paths, detection of fire, fire tracing, organizing firefighting squads and suppression of fire. Informers may be suitably rewarded from the secret service fund after due verification for providing assistance in prevention and control of forest fires.

Training: Training for prevention and control of forest fires should be imparted to the officers and staff. Training facilities being provided by the Government of India should be availed as far as possible.

Rules for Fire Protection Operations

1. The forest areas of each Division will be divided into three classes for the purposes of protection against fire according to the prescriptions of

sanctioned working plans or failing such prescriptions by executive orders of the Regional Chief Conservator of Forests.

2. The following are the Forests to be Completely Protected:

- Regeneration coupes;
- Young regenerated woods including felled coupes whilst closed to grazing.
 - Plantations and Nurseries.
- Such other areas as the Regional Chief Conservator of Forests may for special reasons direct (e.g. grass birs and areas under rotational grazing).
- All areas will be isolated by means of fire lines and cut guide lines and will be patrolled by watchers or other forest staff.
- Any fire occurring in them must be reported, whatever the area burnt or the date of occurrence may be. Every case of fire will also be properly investigated.
- National Parks and Wildlife Sanctuaries
- Such other areas as the Regional Chief Conservator of Forests may for special reasons direct.
 - All areas in this class will generally have natural boundaries such as roads, nalas or otherwise will be isolated from the surrounding country by means of fire lines and divided into convenient blocks by interior fire lines. No fresh fire lines will be cut, but all existing fire lines, roads, paths, suitable ridges, grass lands etc., will be burnt in successive stages as the grass dries sufficiently to be combustible, and the fire allowed to burn itself out.
 - As a supplementary measure the early burning of portions of areas of this class may be sanctioned by the Regional Chief Conservator of Forests. By early burning is meant a deliberate attempt to pass a slow fire early in the year through the

whole area under such treatment. The concerned authorities of other departments may be apprised in advance and their cooperation may be sought in dealing with any eventuality.

- Special steps should be taken to prevent fires in timber depots. Fire extinguishers and water should be kept ready for use in case of any eventuality. JFM Committees & Protection Committees should be actively involved in Prevention and control of forest fires. Other people living in and around the forest areas and getting benefits from the forests should also be actively involved.
- The communities and government staff should be regularly trained for prevention and control of forest fires.
- Efforts should be made to create public awareness against the ill effects of forest fires. A fire week could be celebrated to create mass awareness.

Fire Lines

Fire lines are of two kinds, exterior and interior. The responsibility for their upkeep rests with the Deputy Conservator of Forests. The following instructions should be carefully attended to by them in the performance of this duty:

It is an established principle in the construction of exterior fire lines that as far as practicable they should be within the limits of Government forest and that they should follow the boundary thereof. Occasions may sometimes arise when in order to secure efficiency, it is necessary to deviate from sinuous or difficult boundaries in favor of straight lines running through the government forests.

Interior fire lines are constructed within Government forests and are intended to restrict fires within limits, which have broken out in protected areas and cannot be controlled except by counter fire. These fire lines should follow the course of roads open to the public and the beds of rivers and streams which, in addition to other advantage themselves constitute natural efficient interior fire lines. Interior fire lines should, as far as possible, not be constructed along ridges, as the effect of wind is greatest there and water scarcest.

Fire lines should be so selected and laid out on the ground that they are not only be practicable, but easy to traverse them with ease. Steep gradients and rough terrain should be avoided as far as possible. Wherever practicable, fire lines should follow natural clearings such as open glades, the edge of cultivated plains, or the beds of wide ravines and streams. They should be located near water source as far as possible, or near the localities, where wells exist or near the spots from where water can be procured, and these should be marked on the fire maps.

- In completely fire-protected forests the following measures are prescribed:

The first consideration in the isolation of the forest from the surrounding country. This will be effected by clearing the exterior fire lines of all inflammable material of a width determined by local circumstances, ordinarily not less than 40 feet or more than 100 feet by the month of December where necessary two guidelines should be cut, one on either side of the area decided for cutting the fire line. The width of guidelines will depend on the height of the grass through which they run and they must be carefully cleared. This work must be completed by the end of December.

Exterior lines include coupe lines -which form the boundary between the areas. In adjoining areas, no fire lines should be cleared, but a guideline should be cut and burnt and the fire allowed to burn itself

out, under the supervision and control of a Forester, a Head Guard or at least the Beat Guard.

Interior fire lines should also be treated similarly, but usually they should be narrower than exterior lines.

- As the season advances the grass in the center of the fire lines will dry and should either be burnt standing or cut close to the ground over the whole width of the fire line. If the latter course is followed, the cut grass should be spread over the fire lines between the two guide lines and be burnt as it dries up.

Dry leaves and other dry material on fire lines must be collected from time to time and deposited along the edge of the fire lines; but the burning of such material on the fire lines after the onset of hot season is strictly prohibited.

Except with the express order of the Deputy Conservator of Forests and in the presence of the Range Officer or other subordinate authorized by the Deputy Conservator of Forests, no fire lines should be burnt after March 31st.

Generally, in protected areas no fire lines are cut. The fire is allowed to burn under control so as to interpose a wide burnt strip between the area and the surrounding country. The grass must be burnt as soon as it is sufficiently dry, and the operation must be carried out in phases. To control the operation, the Deputy Conservator of Forests should receive, from the December 1 or such earlier date as he may fix, a fortnightly report from the Range Officer concerned showing the progress made in burning. The date by which burning must be completed will be fixed by the Regional Chief Conservator of Forests and the progress report and the reasons for delays, if any, be sent to the RCCF by the Deputy Conservator of Forests a fortnight before the date so fixed. After such the date fixed date operations must cease except with the special sanction of the Regional Chief Conservator of Forests.

Existing fire lines should be utilised as far as possible. New fire lines should not be made without the sanction of the Regional Chief Conservator of Forests.

Fire Watchers or Fire Guards

It is the duty of Fire Watchers or Fire Guards constantly to patrol the fire lines in their beats, to keep them entirely free from inflammable material, to prevent carrying or kindling of fire within or in the vicinity of the protected area, to give immediately report of the occurrence of a fire to the beat guard, to collect assistance and aid in extinguishing any fire that may occur.

Fire Watchers must always be in their beats. Deputy Conservator of Forests should see that proper Machans for the Fire Watchers are made for sleeping during night and fair accommodation for cooking is provided at suitable places. Fire stations must be situated on elevated spots, so that the Fire Watchers may command a good view of the forest they are watching.

Responsibilities

The Range Officer is totally responsible for the efficient fire protection measures in his range.

Where forest areas of two adjoining ranges, the responsibility for efficient protection and clearing of the common fire line will rest with one of the Range Officers to be selected by the Divisional Forest Officer, the Regional Chief Conservator of Forests or two Regional Chief Conservator of Forests in consultation with each other based on the situation whether the two ranges belong to the same division, two different divisions of the same Circle or two different circles. These orders will be in writing and kept in the file of standing orders.

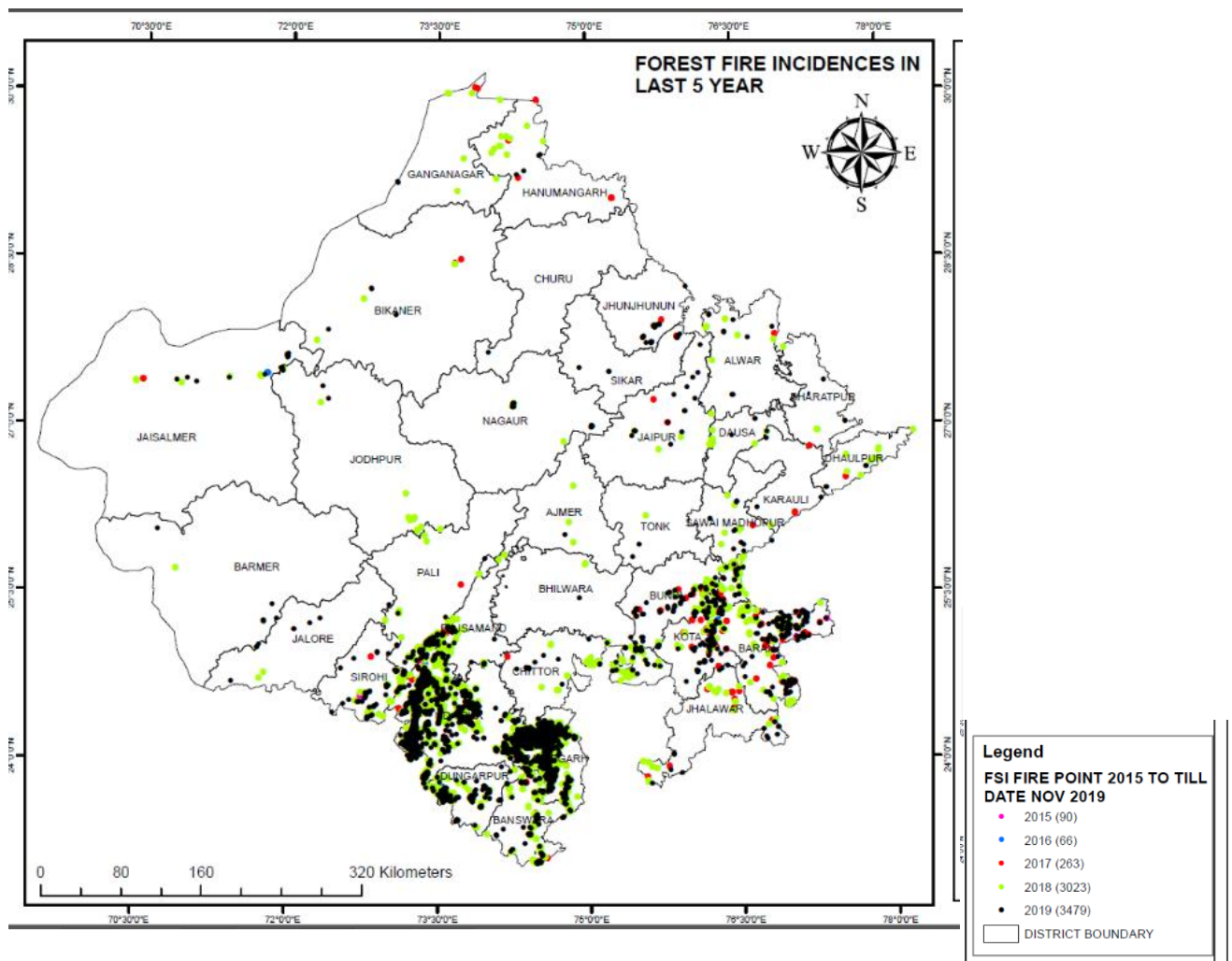
The Deputy Conservator of Forests is personally responsible for carrying out efficiently the fire protection measures in his division. He must satisfy himself that the exterior fire lines have been properly cleared and thoroughly burnt before any incidence of external fire, and at the same time ensure that all the interior fire lines are properly maintained. By continuous inspection, he must assure that the protection staff is efficient, and he must continue to attend to this work until the arrangements for the efficient protection of the forests from fire are completed. He must, during his tour, satisfy himself by constant enquiries that no fires in protected areas have gone unreported, and that the areas of reported fires have been accurately estimated. These checks require extensive and through personal inspection by him.

Section 79 of the Rajasthan Forest Act, 1953 provides that beneficiaries of forests are bound to help Forest/Police Officers in case of fire and failing in such case is punishable.

Forest Fire map

Rajasthan Forest Department, with the facility available at the IT Centre, has analyzed the historic MODIS/VIIRS fire data and mapped fire sensitive zones. By Spatio-Temporal analysis of 2015-2019 MODIS/VIIRS data, forest areas were classified into 4 fire sensitive zone for the whole State. In the state of Rajasthan, the most of the reported fire is of ground fire with negligible loss.

Figure Incidences of Fire in last Five Years (2015 to 2019)



Moderately Dense Forests are more prone to forest fire followed by Open Forests and Scrub Forests. It has been observed that 44 % of fire incidents were recorded in Moderately Dense Forests, 30 % in Open Forests and 1 % in Scrub forests and 25% in non-forest class. During the period 2012-2016, 3595 fire incidents were detected within geographical area of the State of Rajasthan.

Spatial Analysis

Forest Density Class Sensitive to Fire

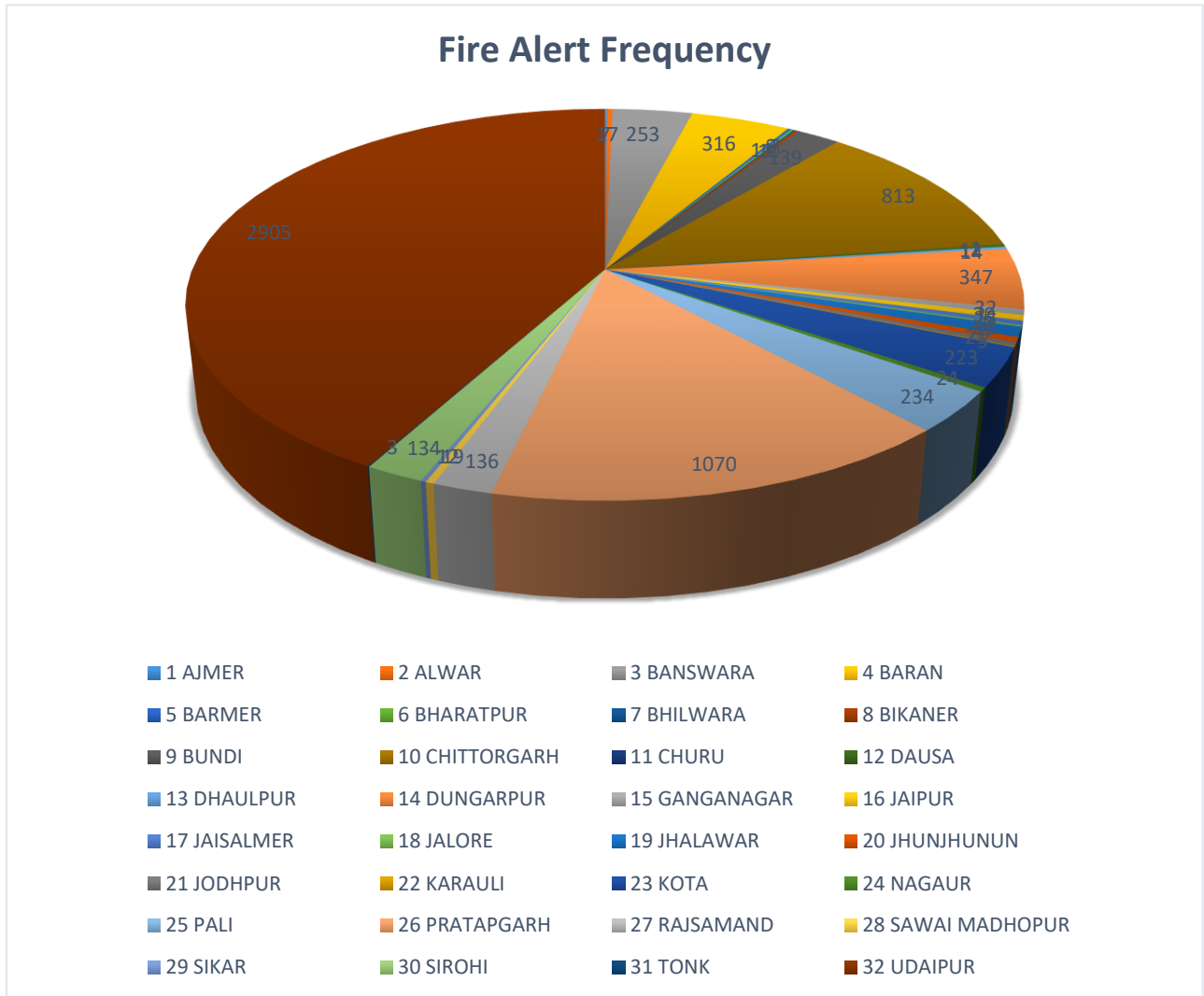
Forest Survey of India classified forest cover of the country into four canopy density classes: Very Dense Forest with canopy density more than 70%, Moderately Dense Forest with canopy density between 40-70%, Open Forest with canopy density between 10-40% and Scrub with canopy density below 10%.

The study reveals that Moderately Dense Forests are more prone to forest fire followed by Open Forests and Scrub Forests. It has been observed that 39.7% of fire incidents were recorded in Moderately Dense Forests, 47.4% in Open Forests and 12.9% in Scrub forests.

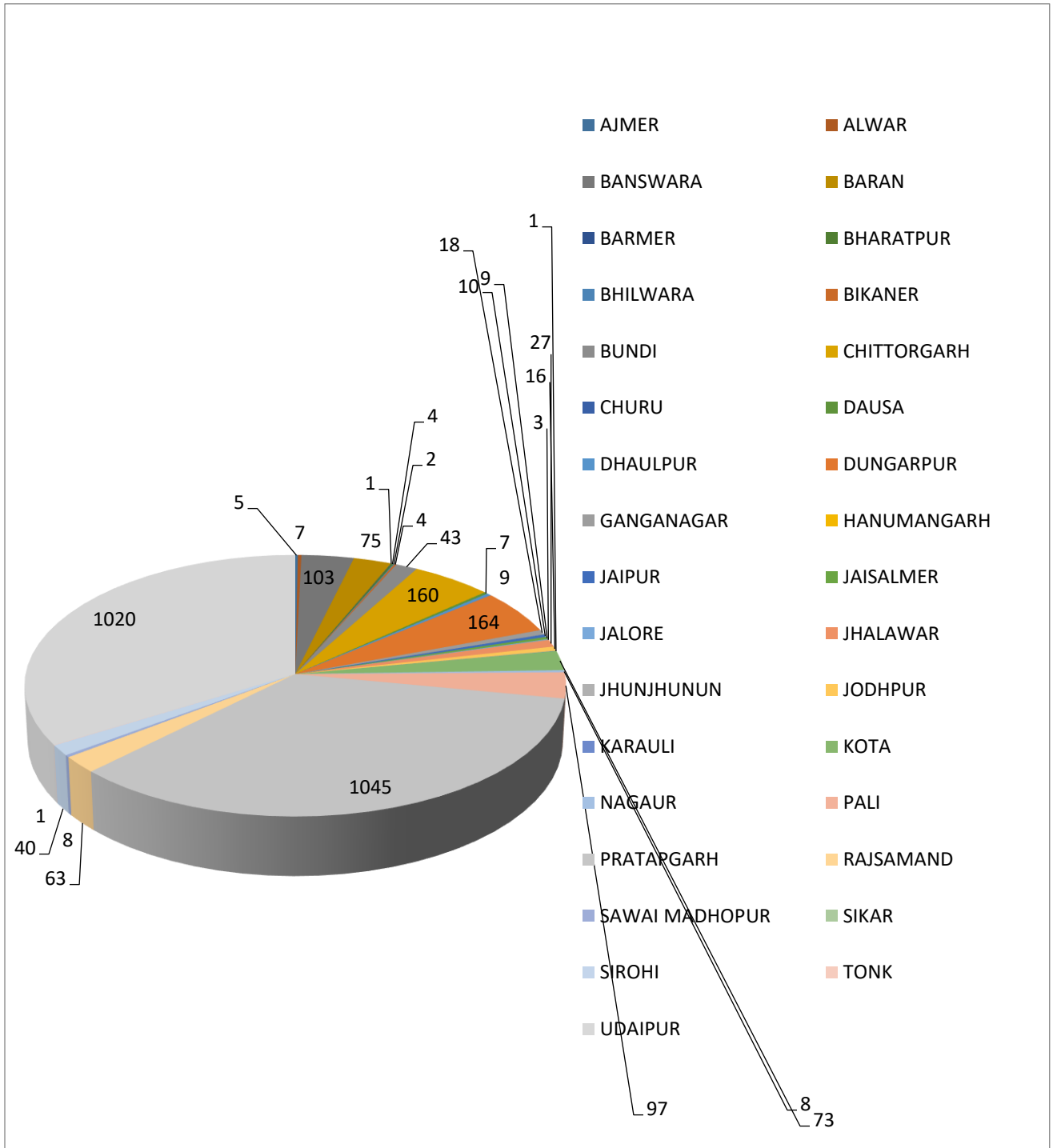
During the period 2014-2018, 3495 fire alerts incidents were found through FSI fire alert portal within geographical area of the State of Rajasthan.

Fire Sensitive (Fire Alerts Frequency) in various Districts

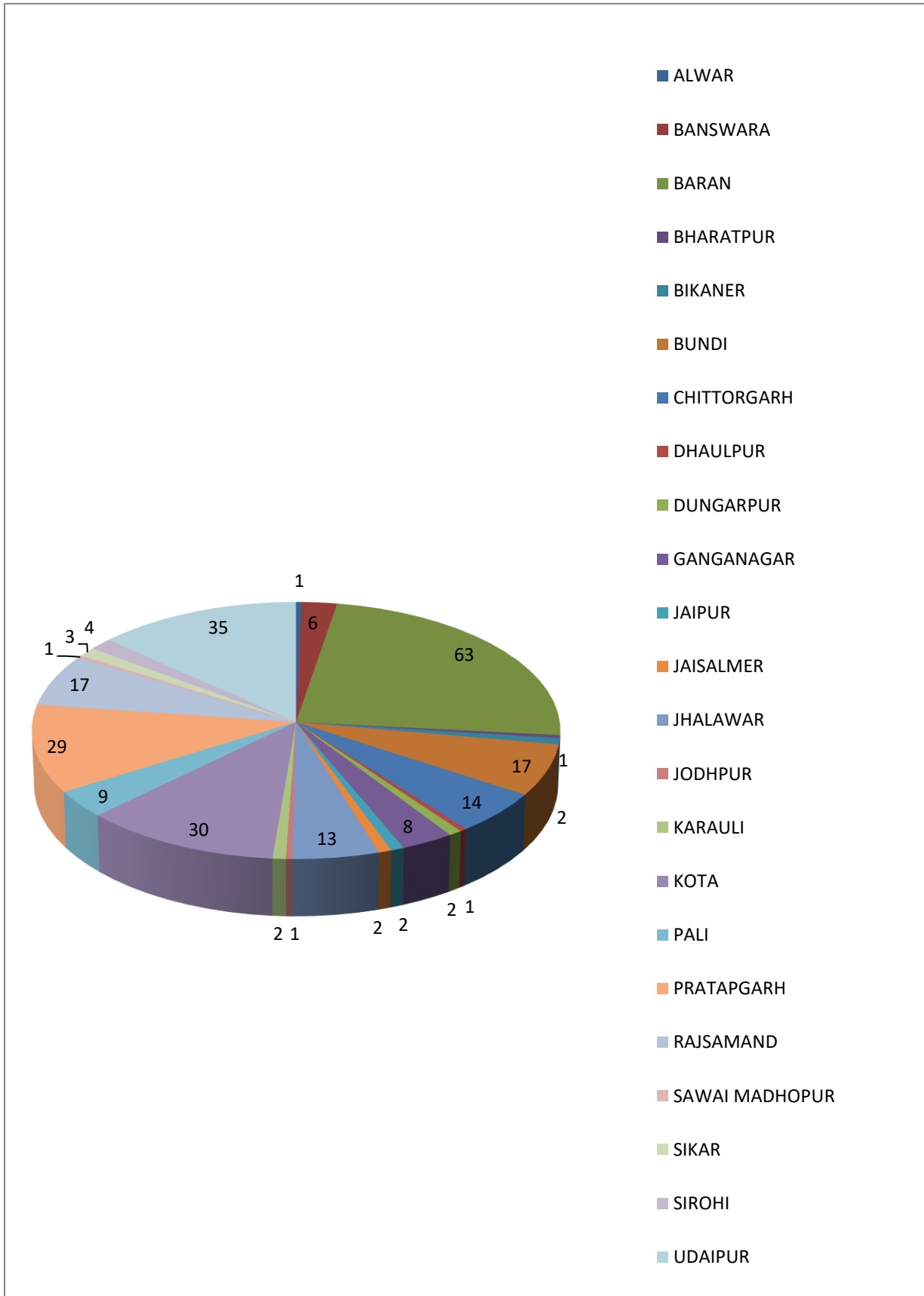
Year 2019



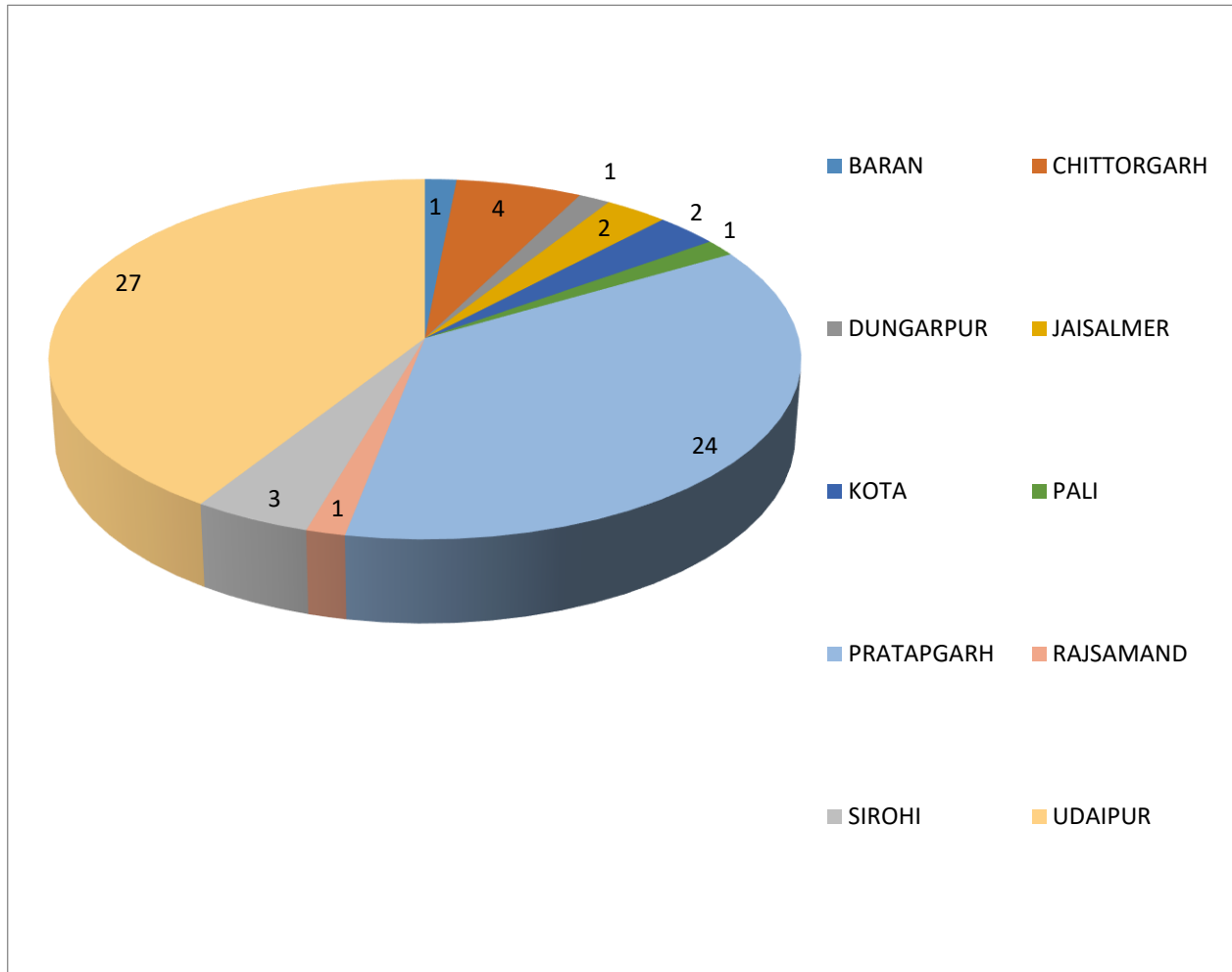
Year 2018(3023)



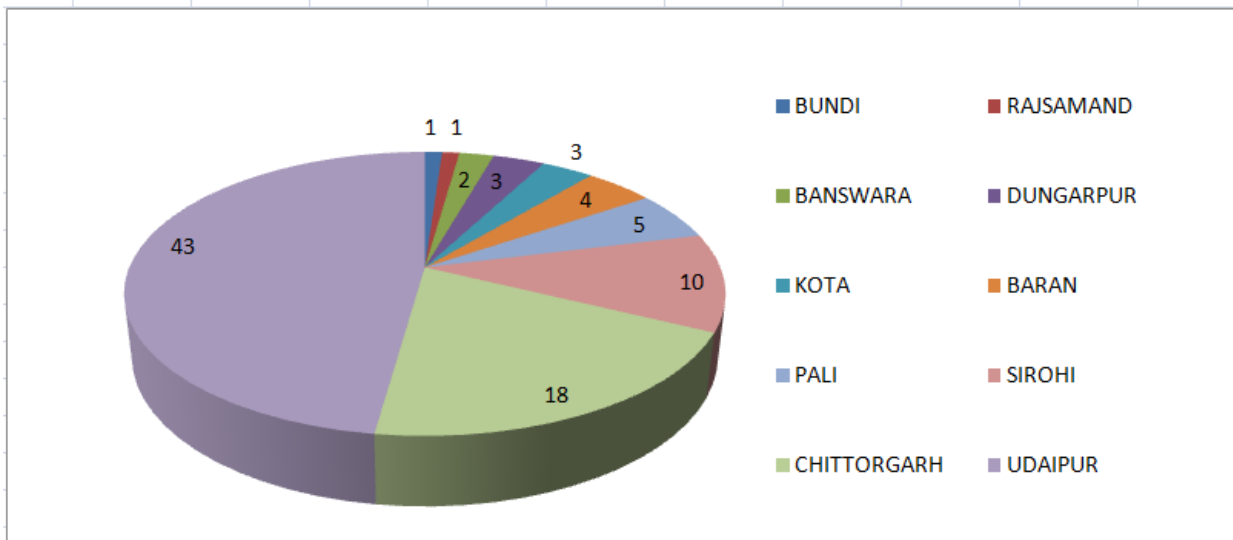
Year 2017(263)



Year 2016(66)



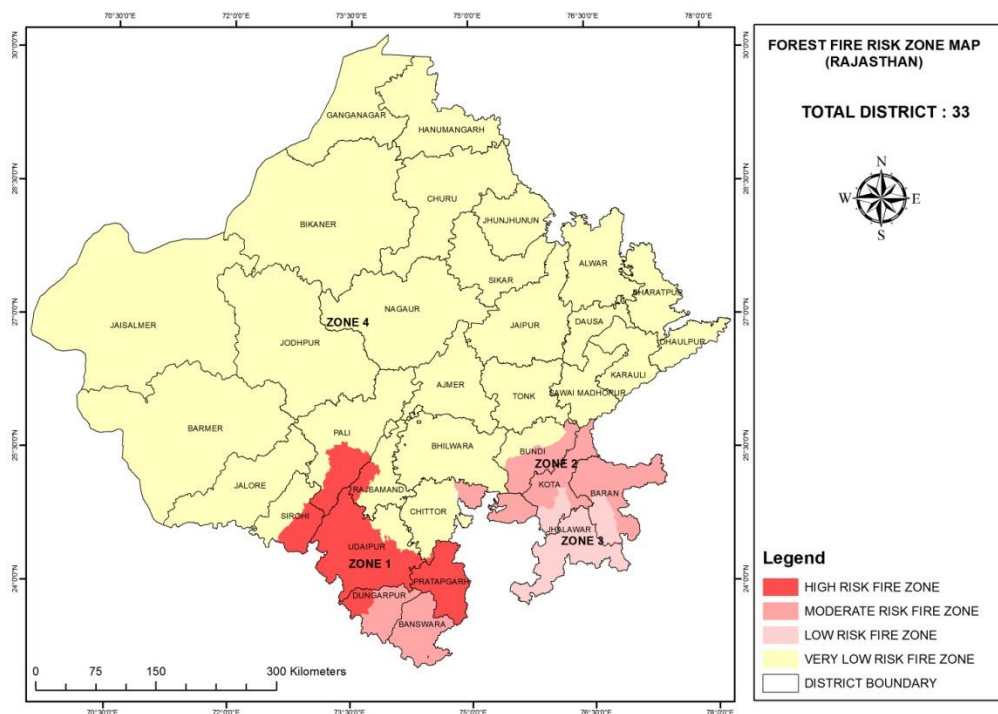
Year 2015(90)



Forest Fire Sensitive Zone of Rajasthan

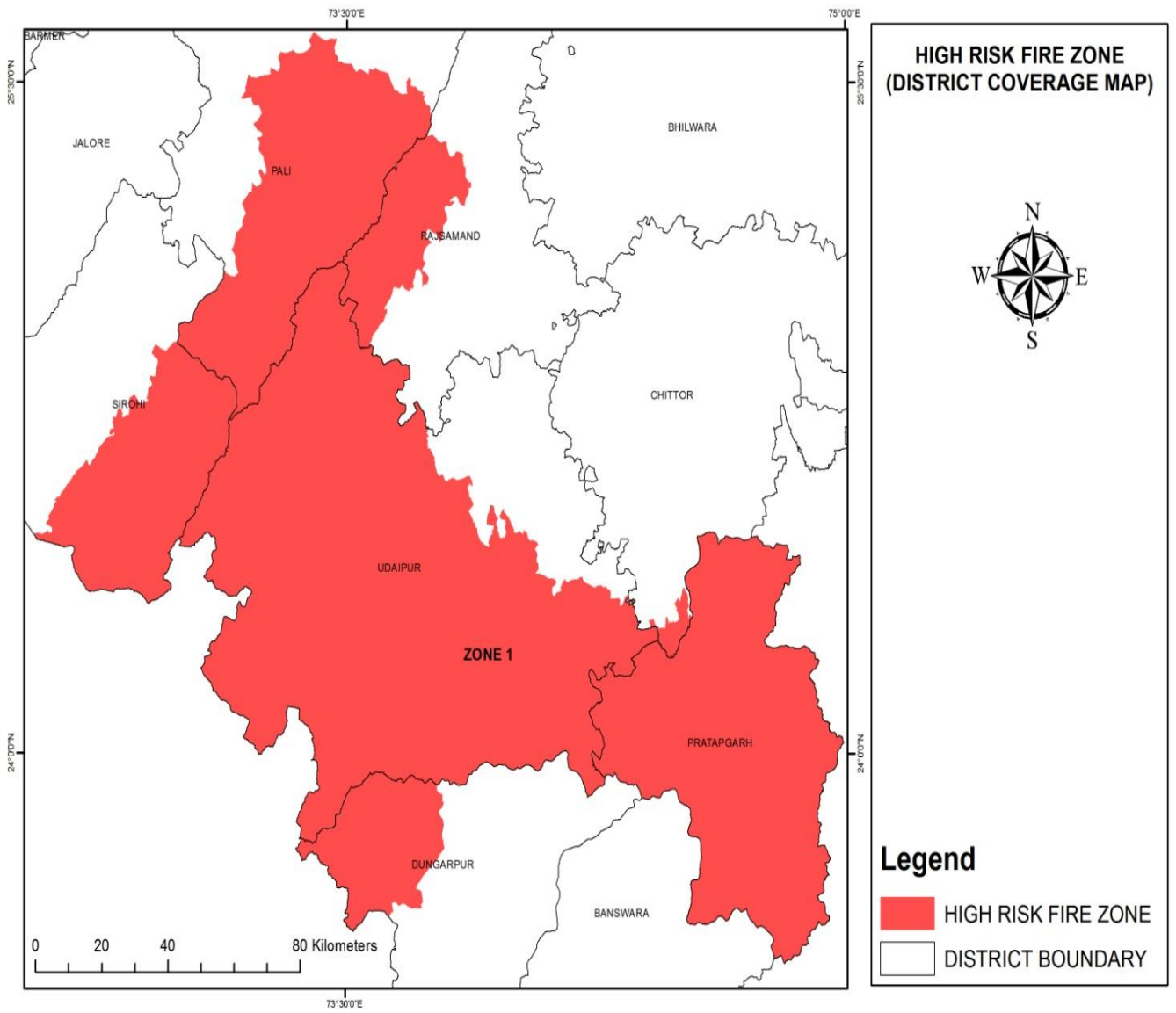
As shown above the sensitivity of forest fire varies significantly within the state. The Southern part of Rajasthan is more fire sensitive whereas the north and western part of state is very less sensitive for the point of view of forest fire. Due to the purpose of management the state is divided into four forest fire risk zone as below. A map showing all the four zone in the state is given as following map.

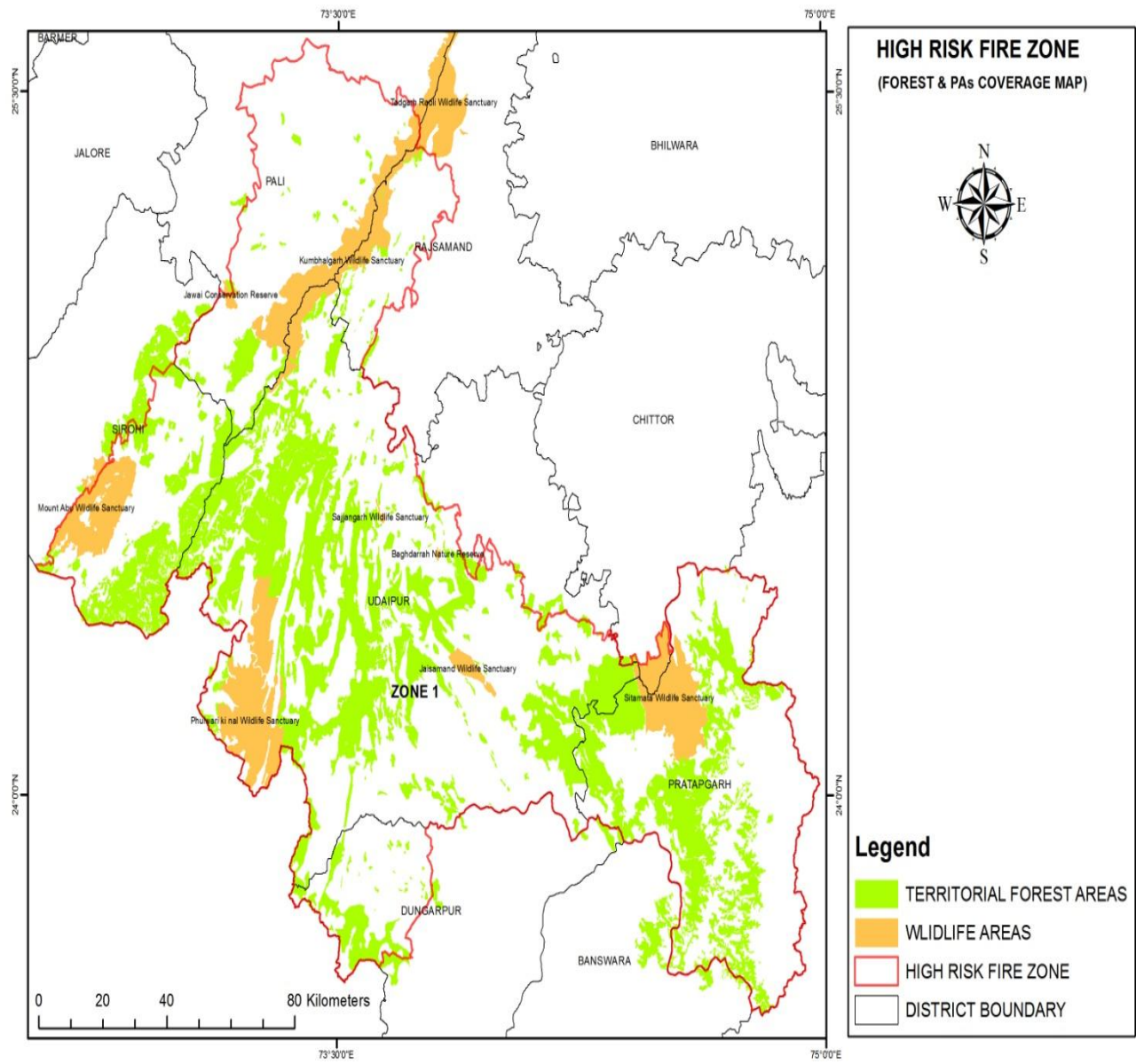
1. High risk forest fire zone
2. Moderate risk forest fire zone
3. Low forest risk fire zone
4. Very low risk forest fire zone

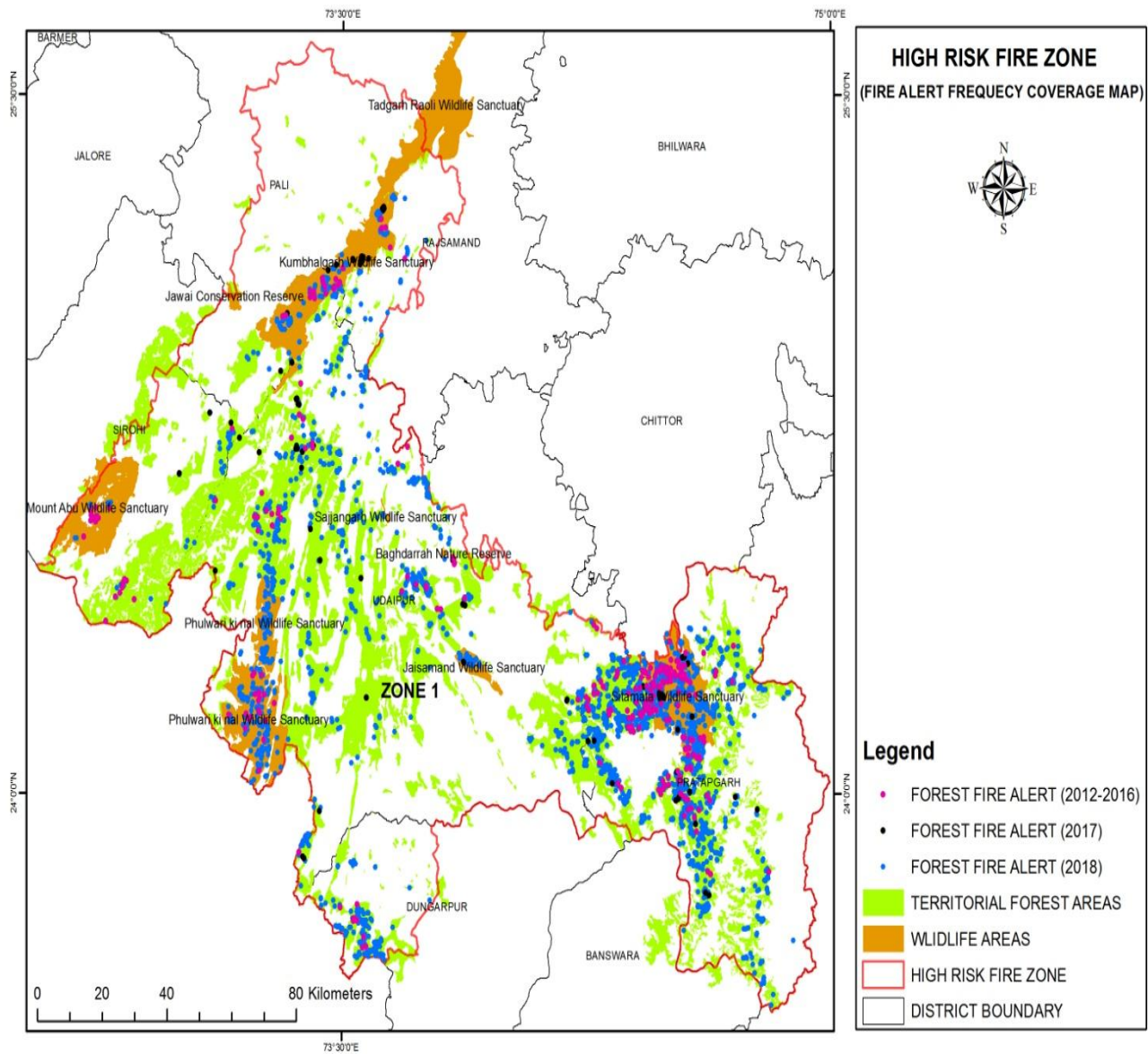


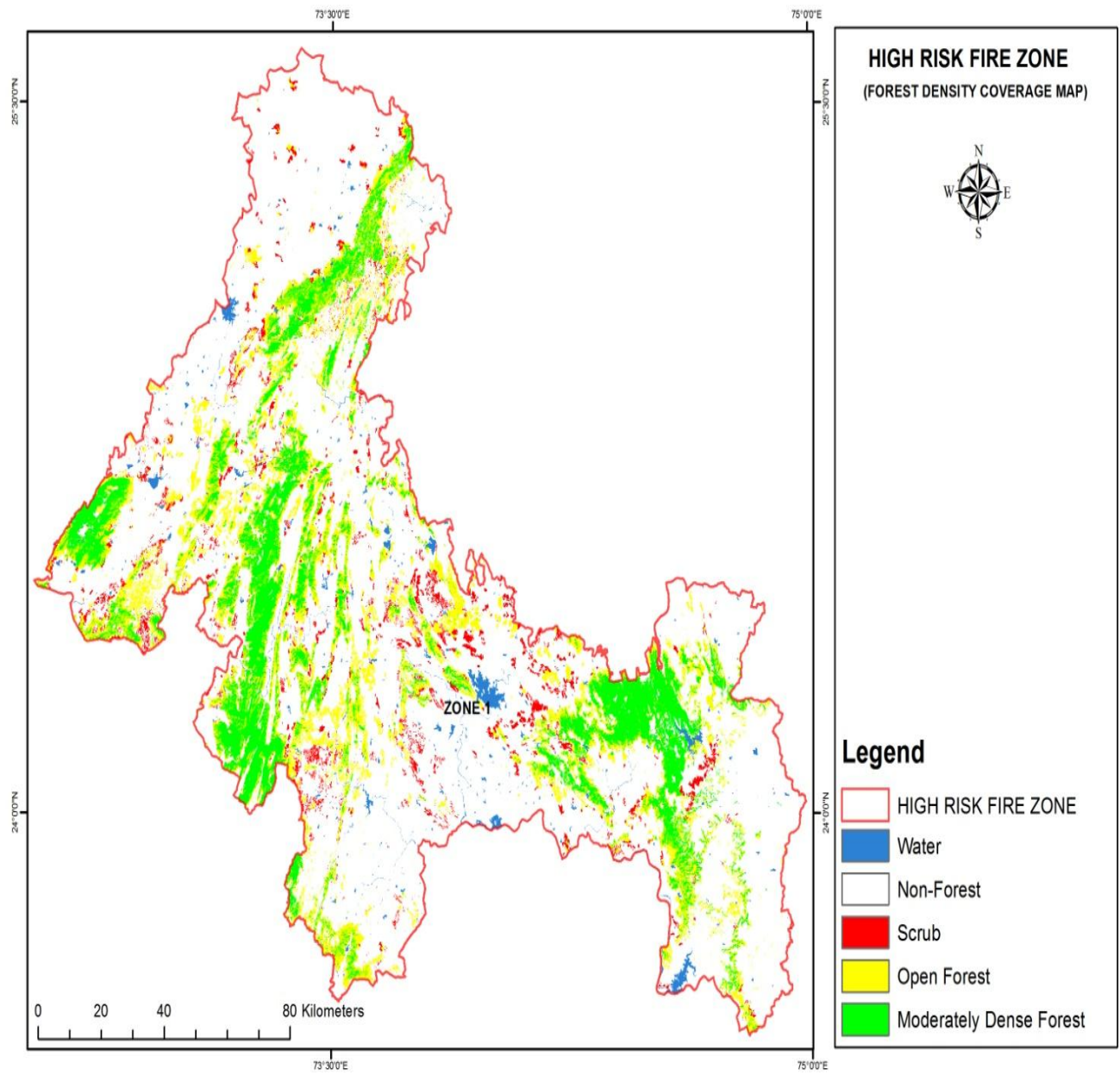
The zonation of the forest fire risks has been based on various datasets such as frequency of forest fire alerts over past 7 years, spread of forests and protected areas, forest cover, forest vegetation, field information and the administrative boundaries within the districts. Using this datasets various maps of each zone has been composed which named as District coverage map, Forests & PAs coverage map, Forest Density coverage map, Forest vegetation coverage map, Fire alerts frequency coverage map (last 5 years) and Administrative map (Divisions & Ranges).

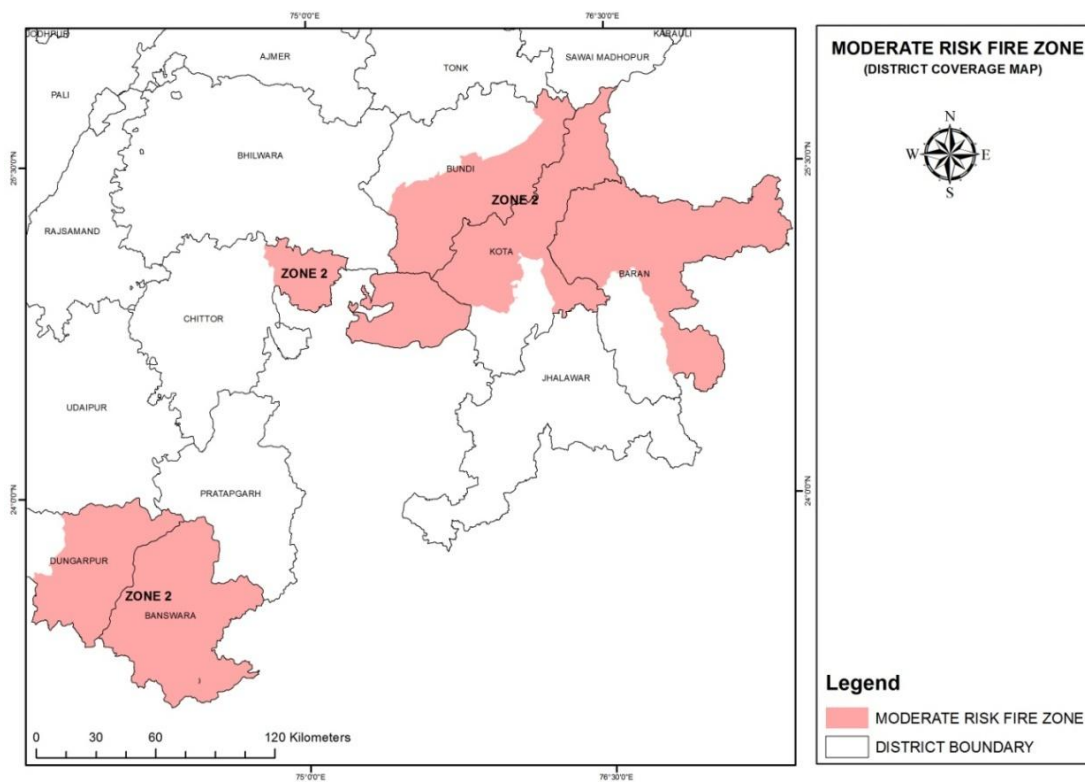
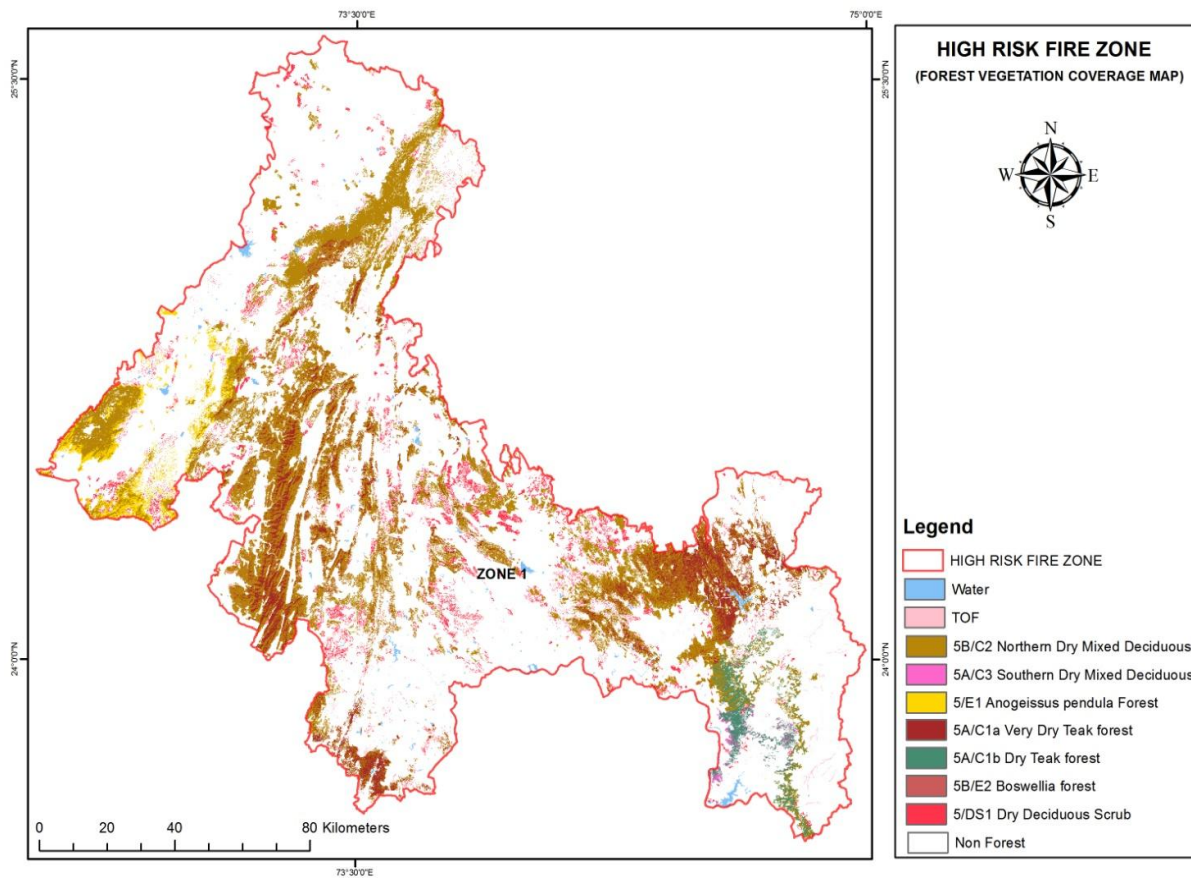
- 1. High risk forest fire zone:** This zone is spreaded in six disticts partially or whole covering Udaipur(Part), Pratapgarh (whole), Dungarpur(Part), Sirohi(Part), Rajsamand(Part) and Pali(Part). This zone comprises about 0.64 million ha. under territorial forests along with Wild Life Sanctuaries as Mt. Abu WLS, Phulwari ki Nal WLS, Sitamata WLS, Kumbhalgarh WLS, Jaisamand WLS and Sajjangarh WLS. In this way this zone has regional territory with CCF Udaipur, CCF Jodhpur and CCF WL Udaipur mostly.

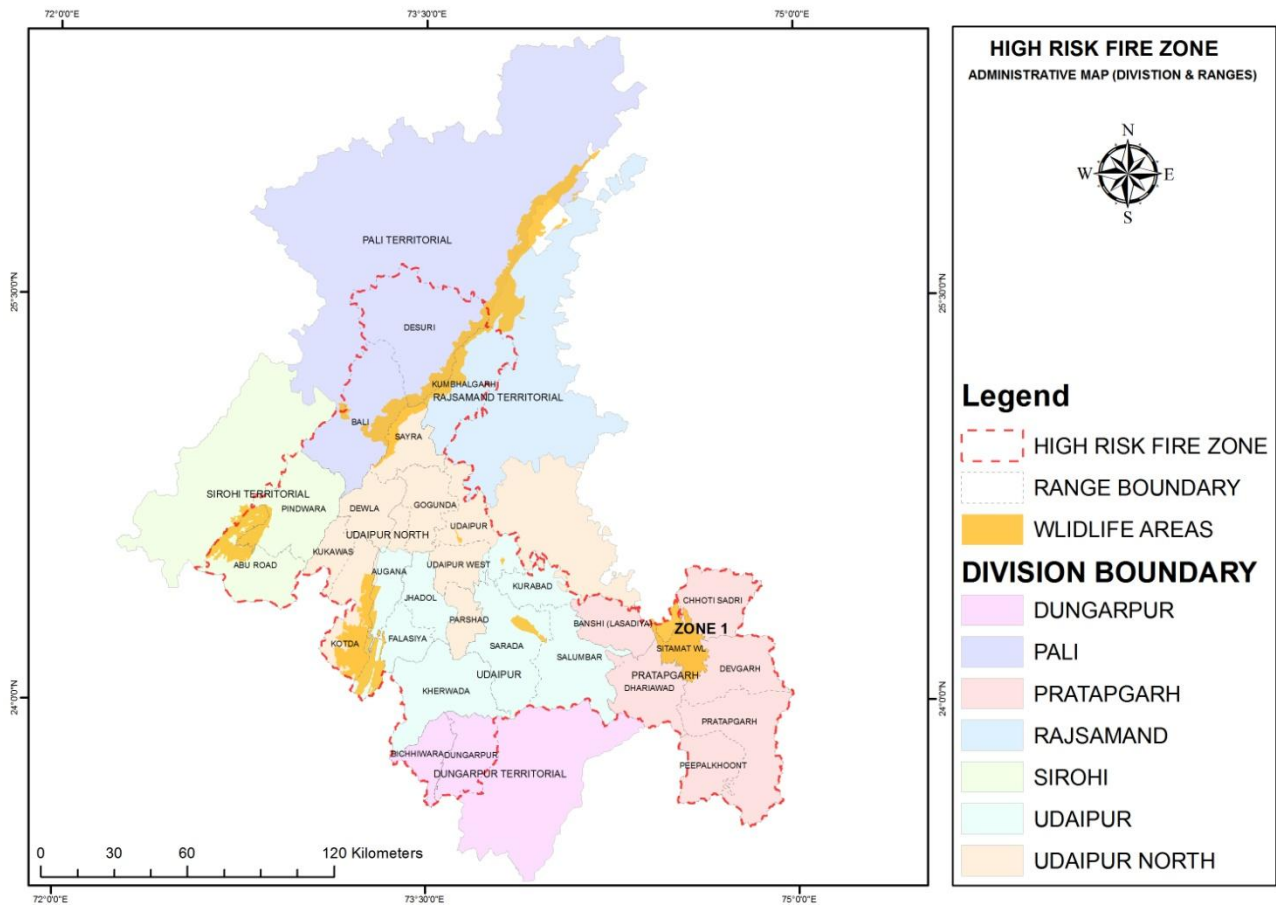




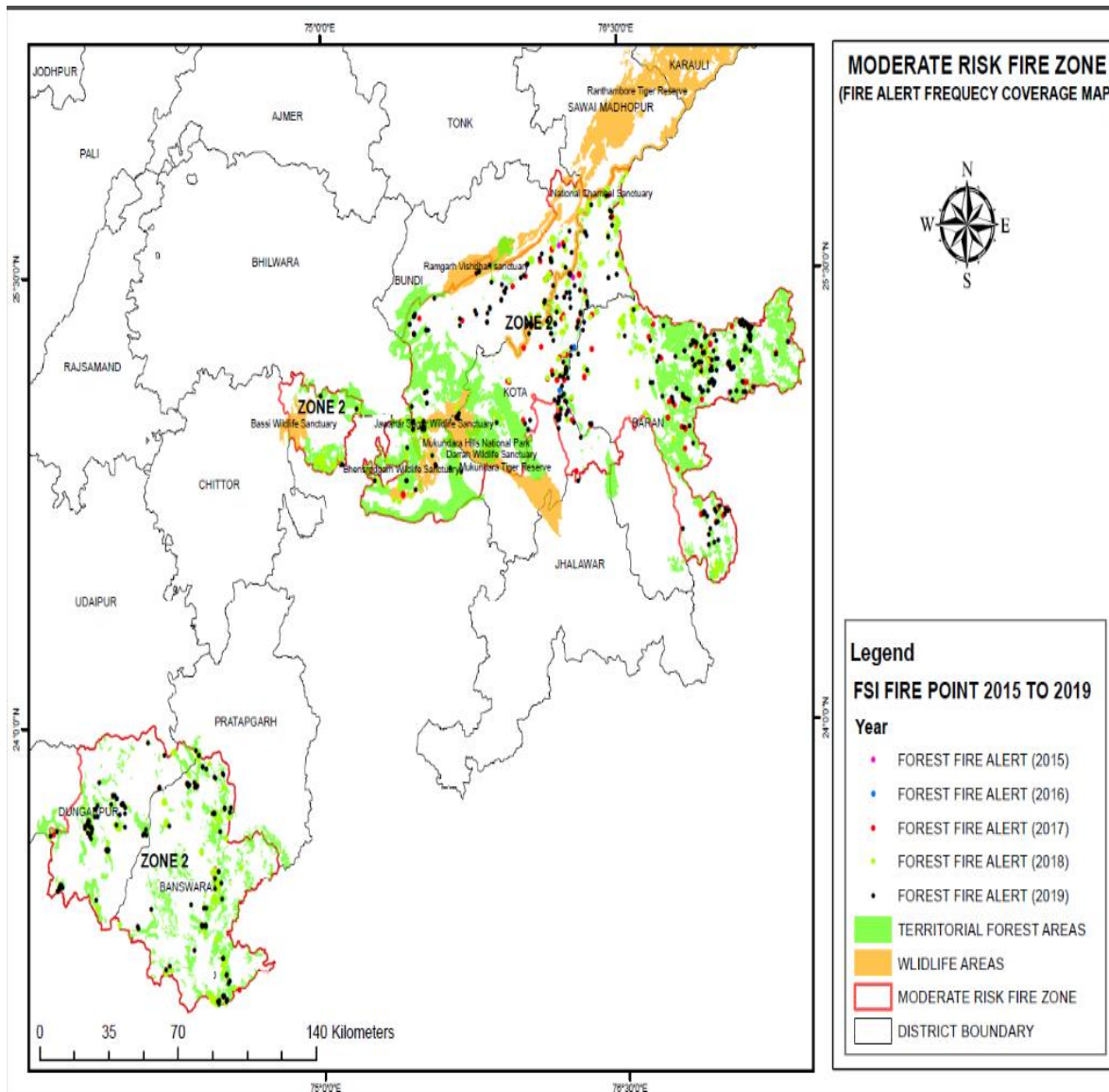


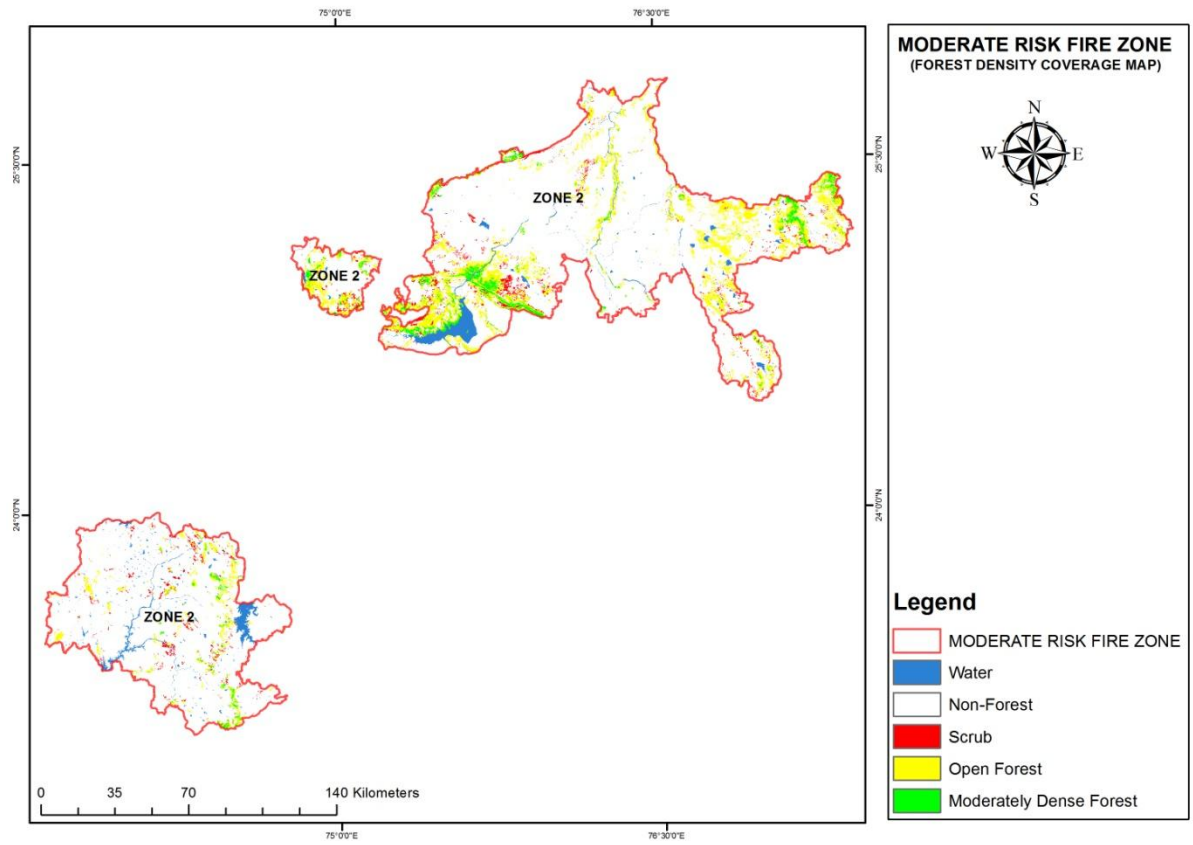


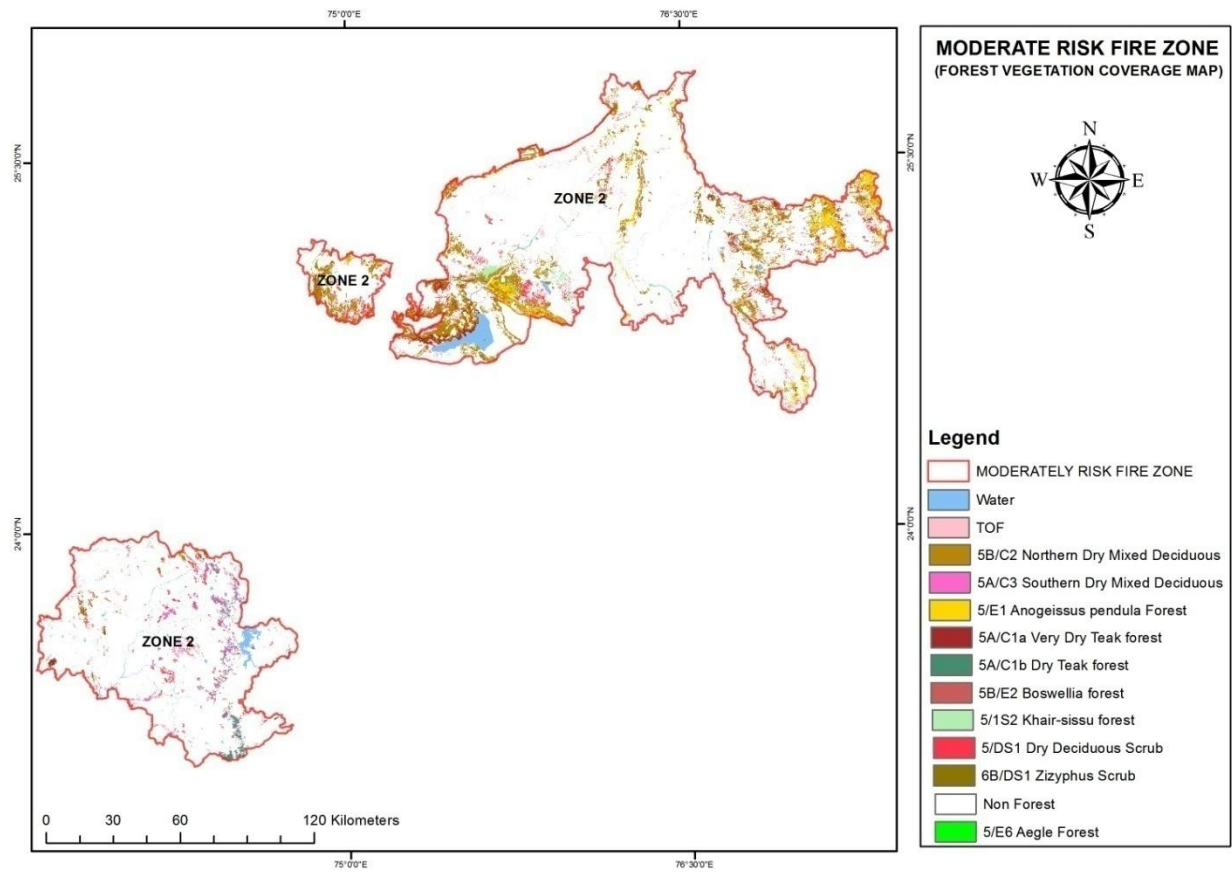


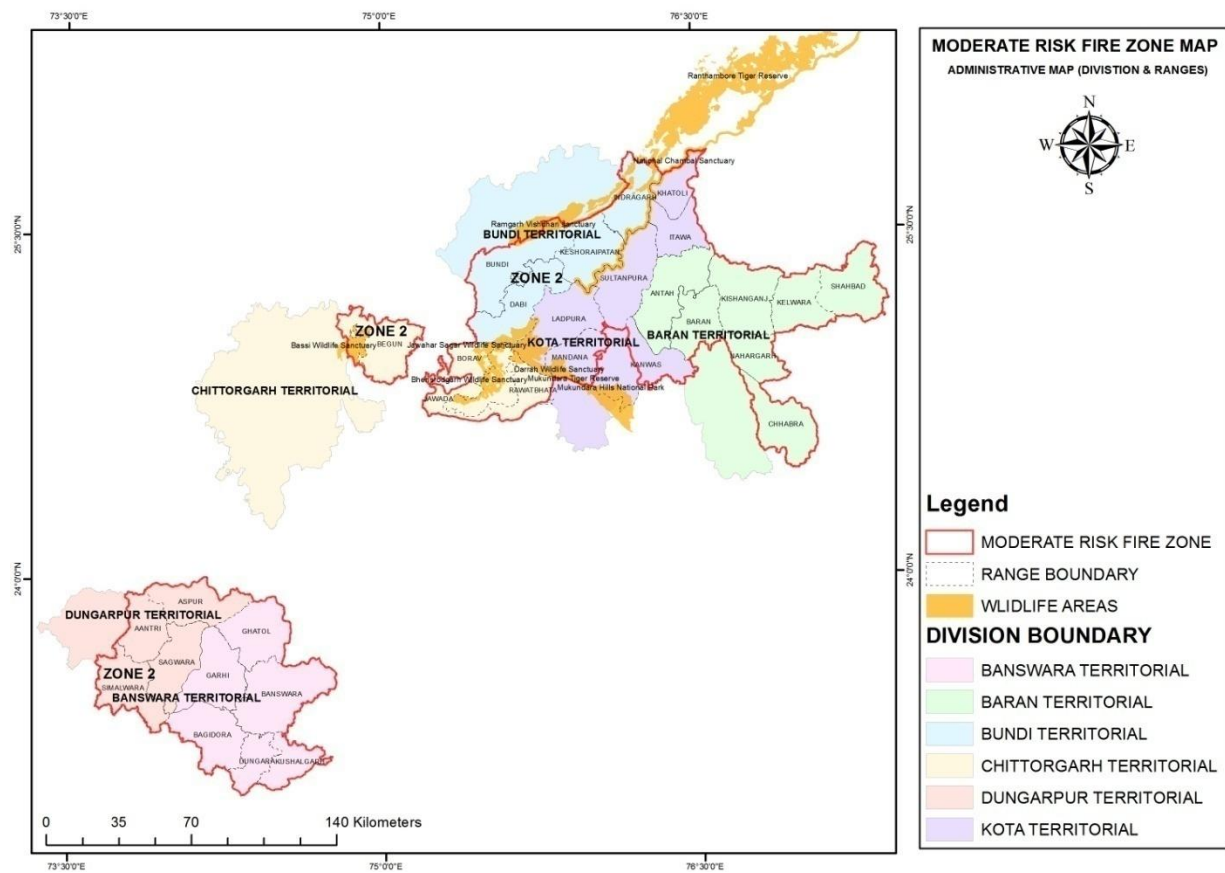


2. Moderate risk forest fire zone: This zone is spreaded in five disticts partially or whole covering Dungarpur(Part), Chittorgarh (whole), Banswara(whole), Kota (Part) and Baran(Part). and This zone comprises about 0.61 million ha. under territorial forests along with Wild Life Sanctuaries as Bassi WLS, Bhainsrodgarh WLS, Darrah WLS, Jawahar Sagar WLS, part of Ramgarh Vishdhari WLS, part of Mukundara Hill Tiger Reserve and part of Ranthambhore Tiger Reserve. In this way this zone has regional territory with CCF Udaipur, CCF Kota, CCF WL RTR and CCF WL Kota mostly.

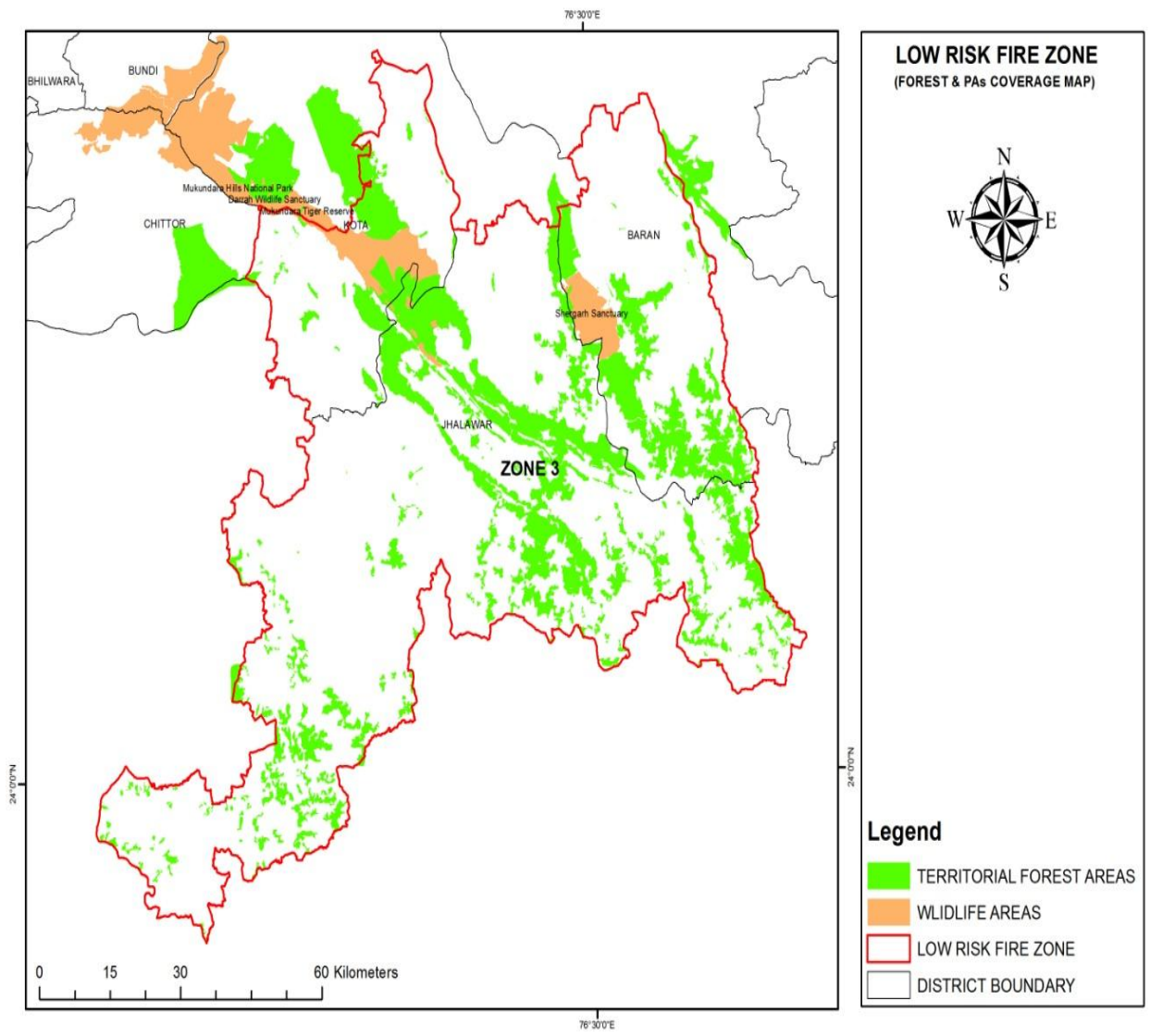


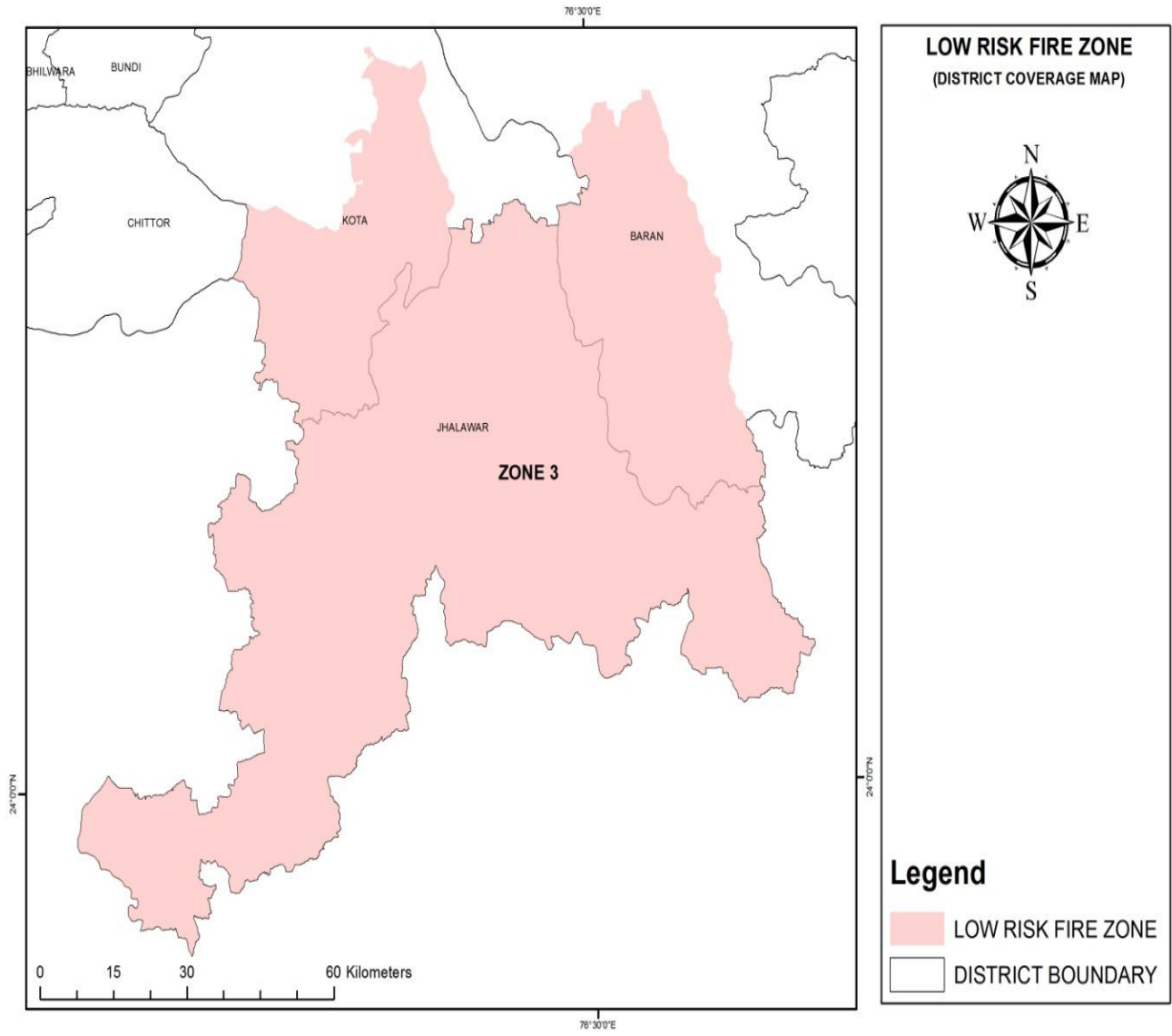


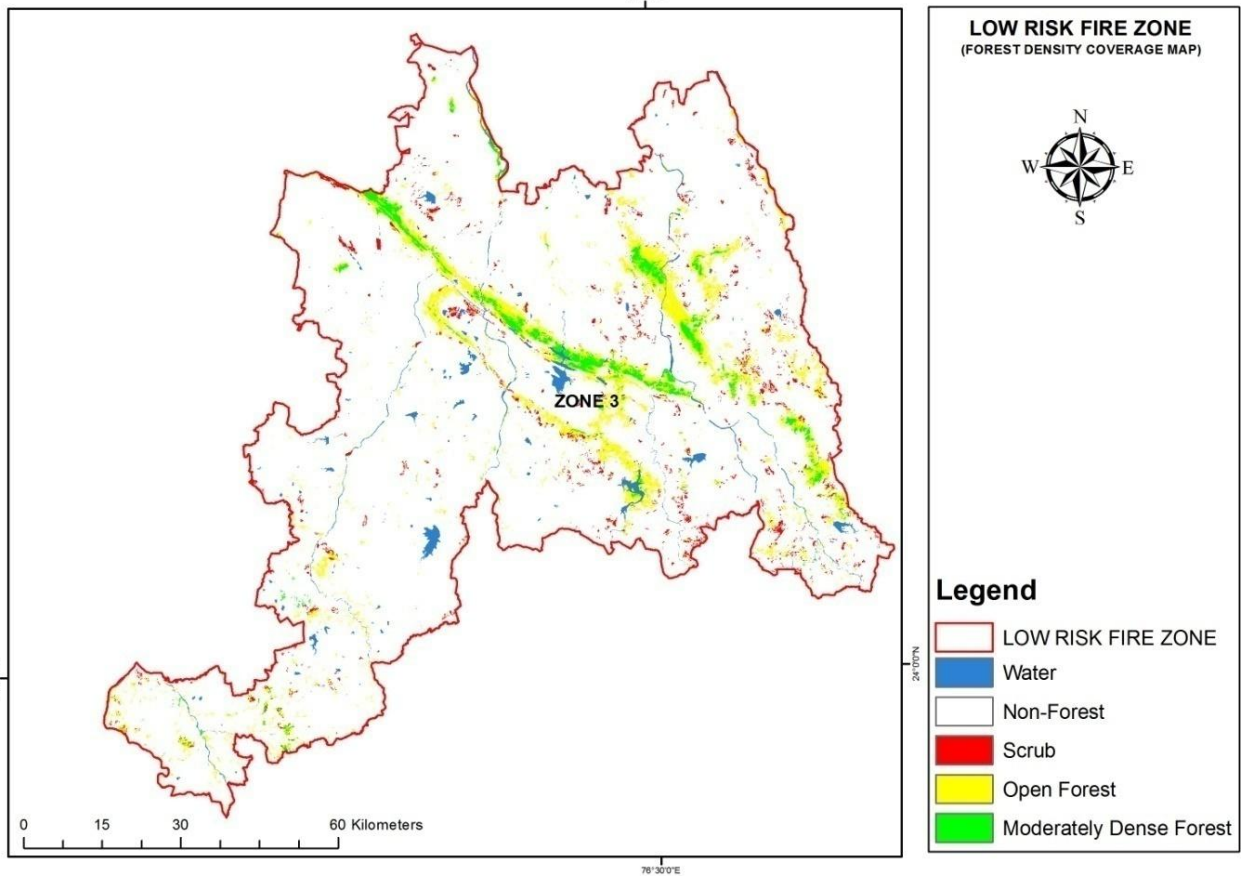
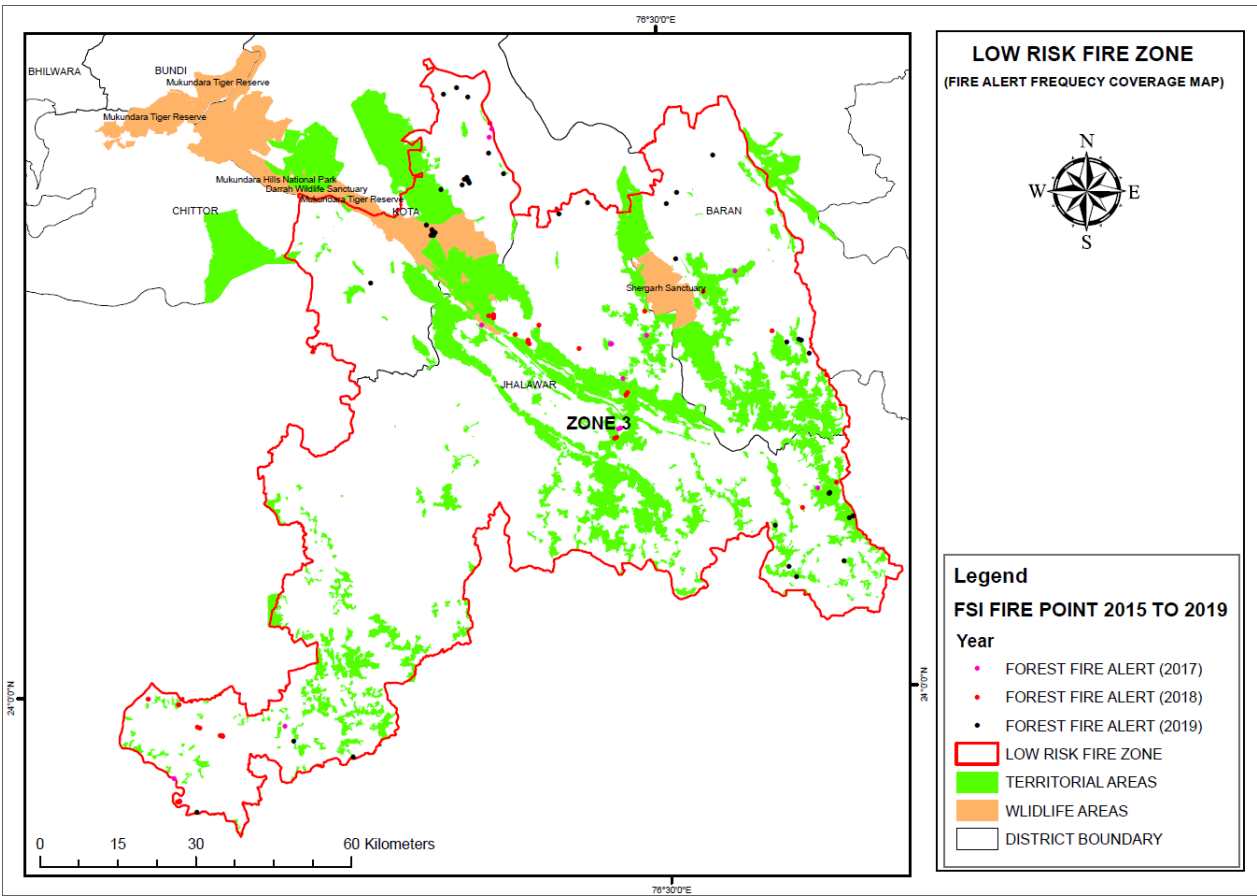


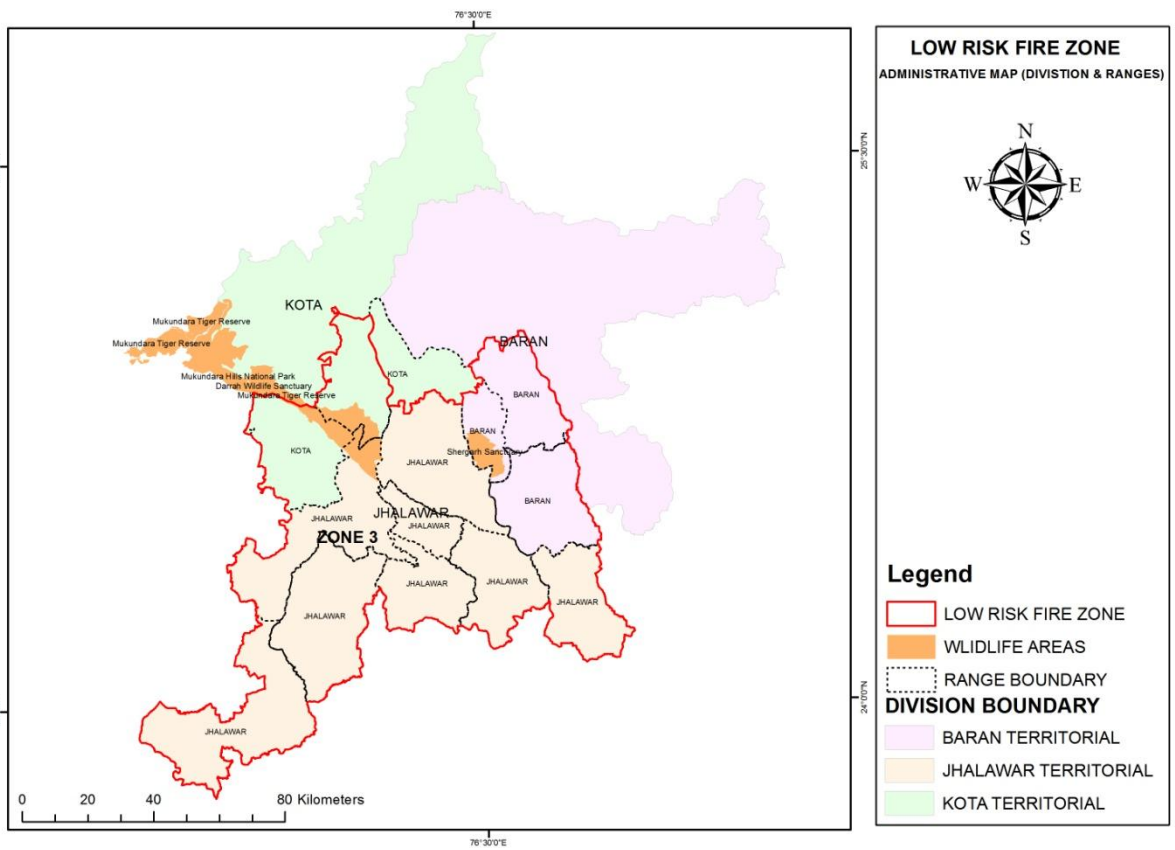
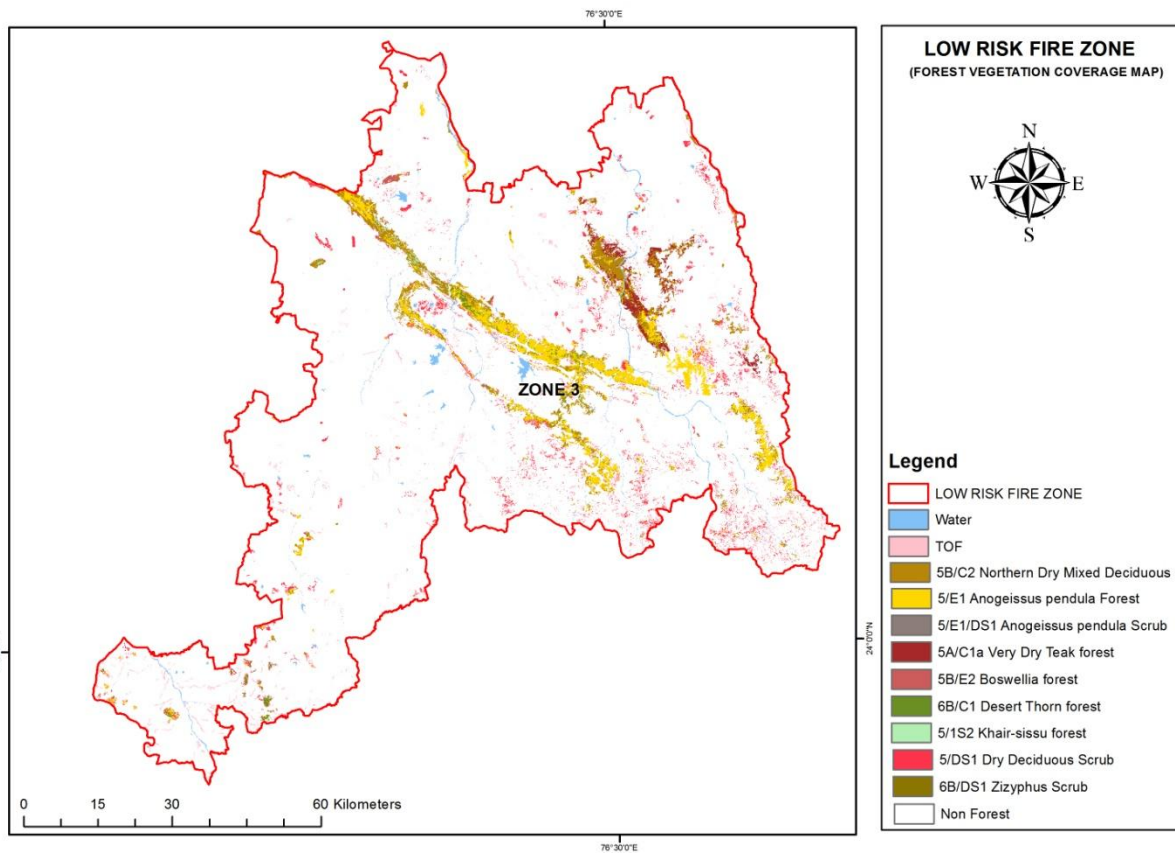


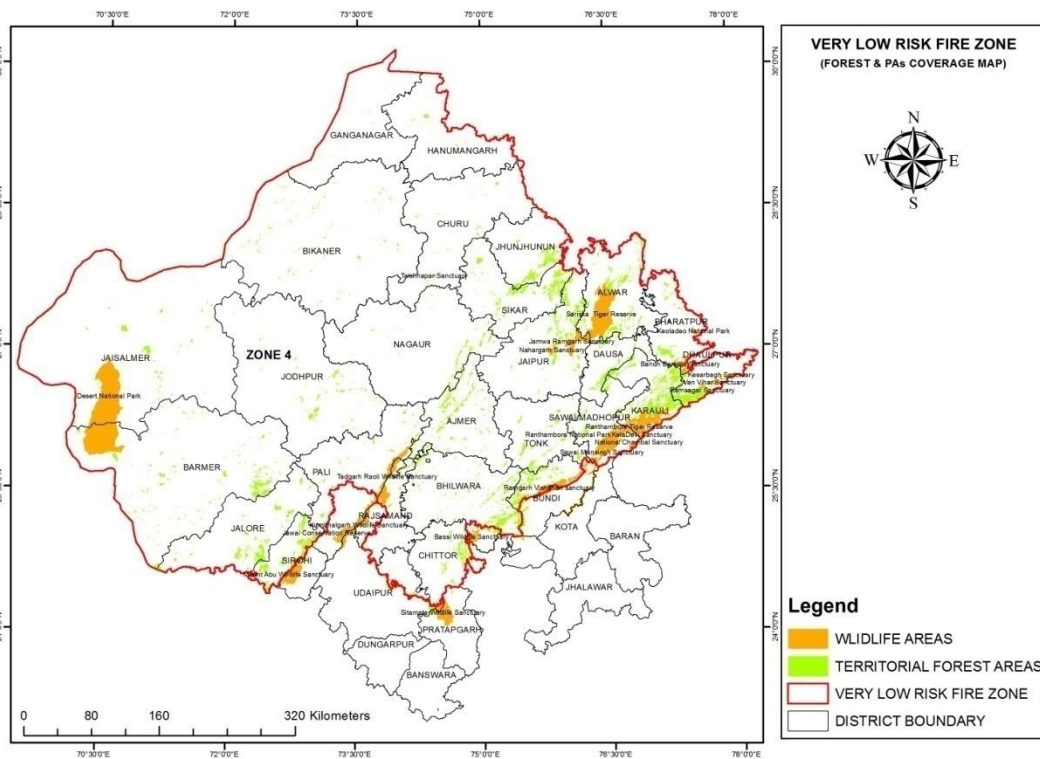
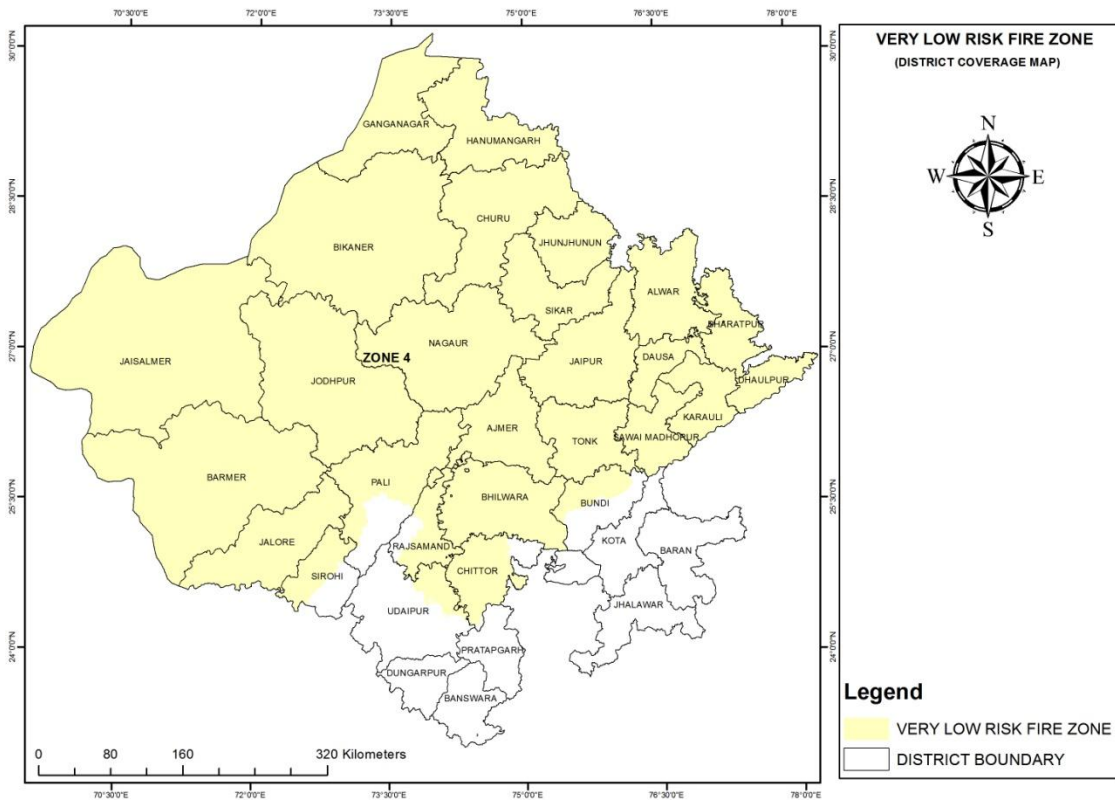
3. Low forest risk fire zone: This zone is also spreaded in three disticts partially or whole covering Jhalawar(whole), kota (part) and Baran (Part). This zone comprises about 0.23 million ha. under territorial forests along with Wild Life Sanctuaries as Darrah WLS, Shergarh WLS and part of Mukundara Hill Tiger Reserve. In this way this zone has regional territory with CCF Kota and CCF WL Kota mostly.

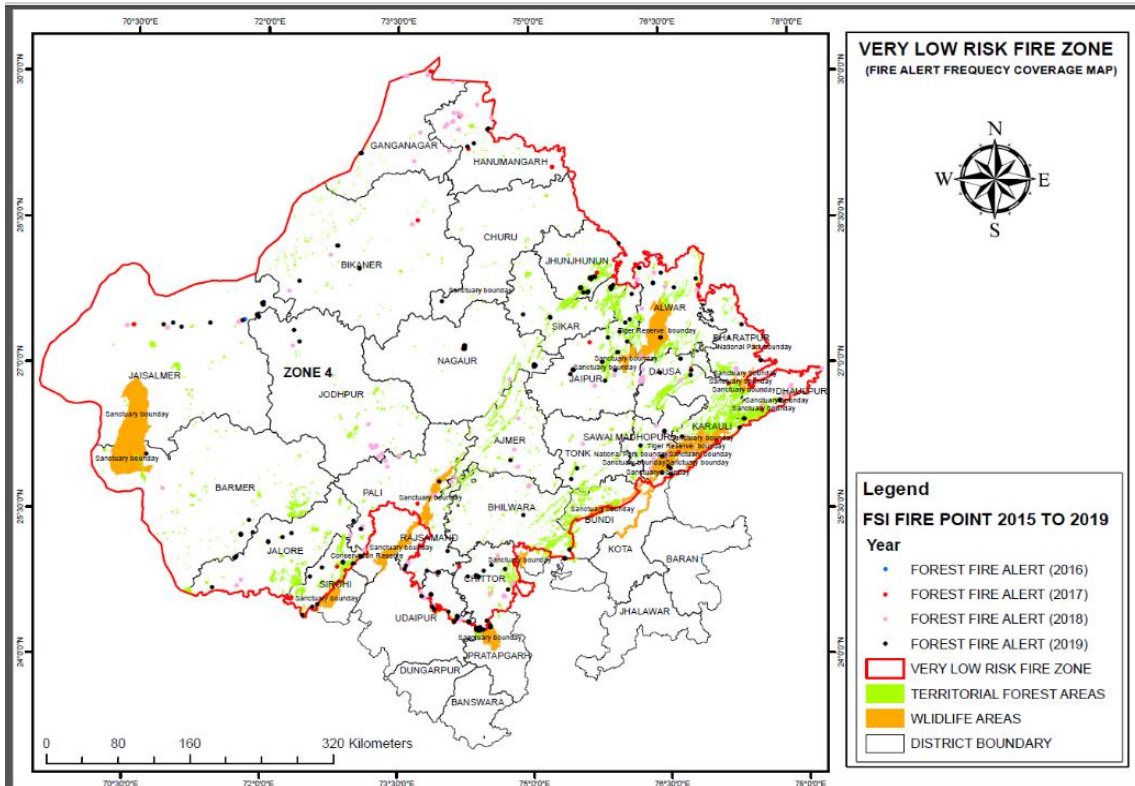


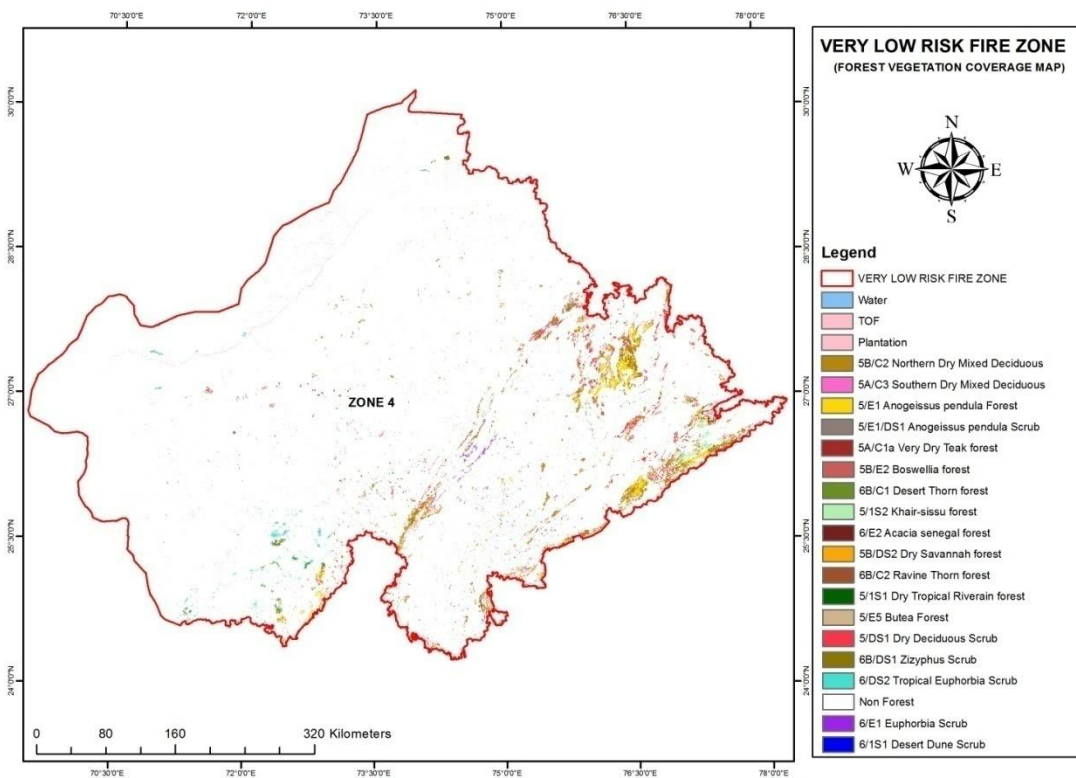
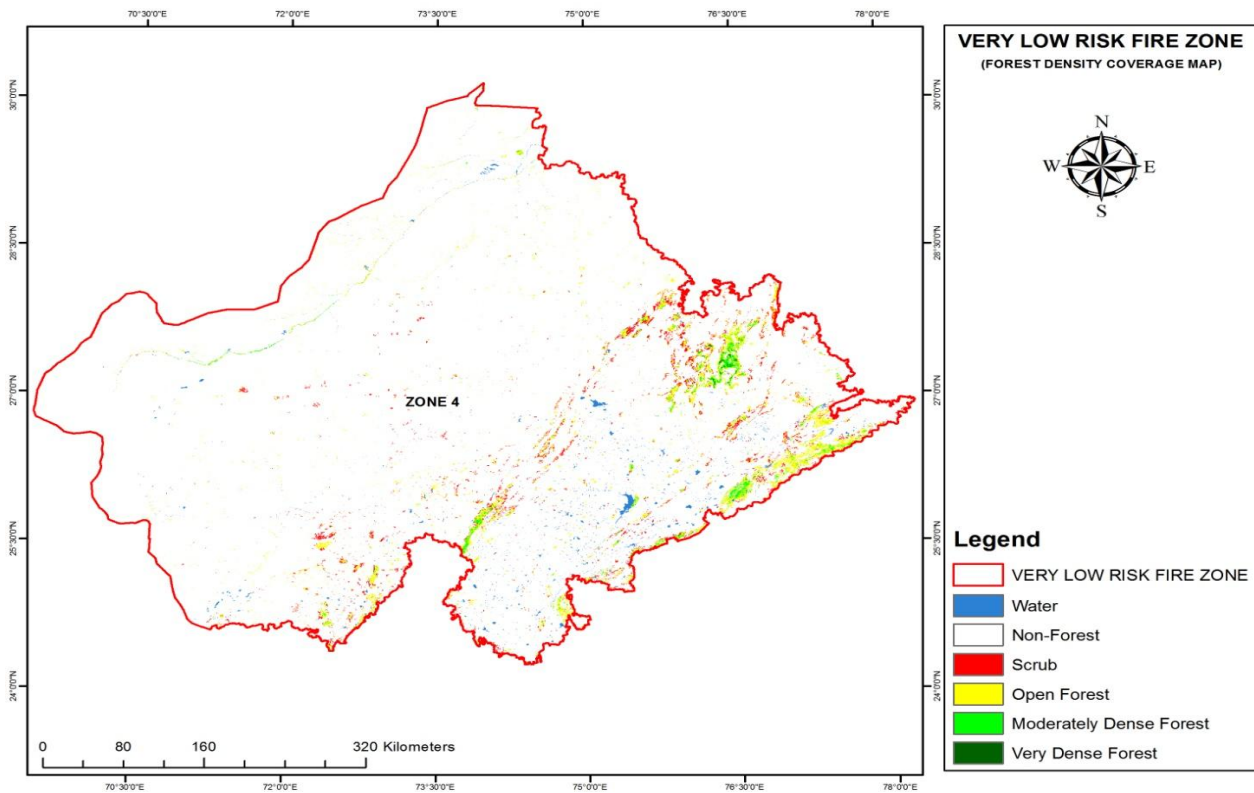




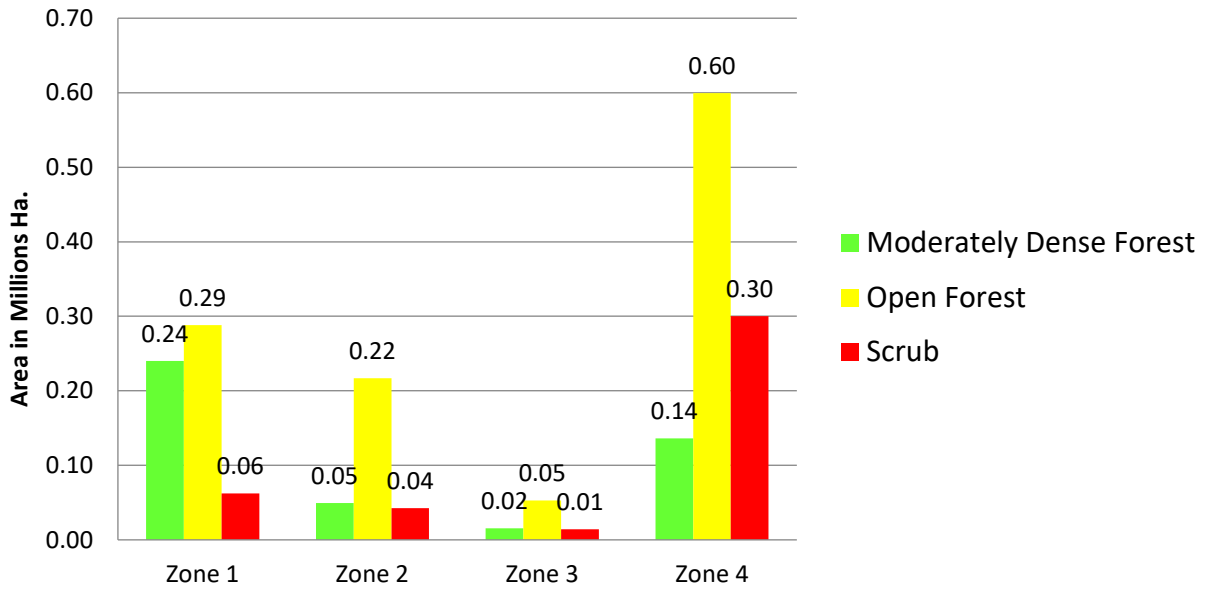




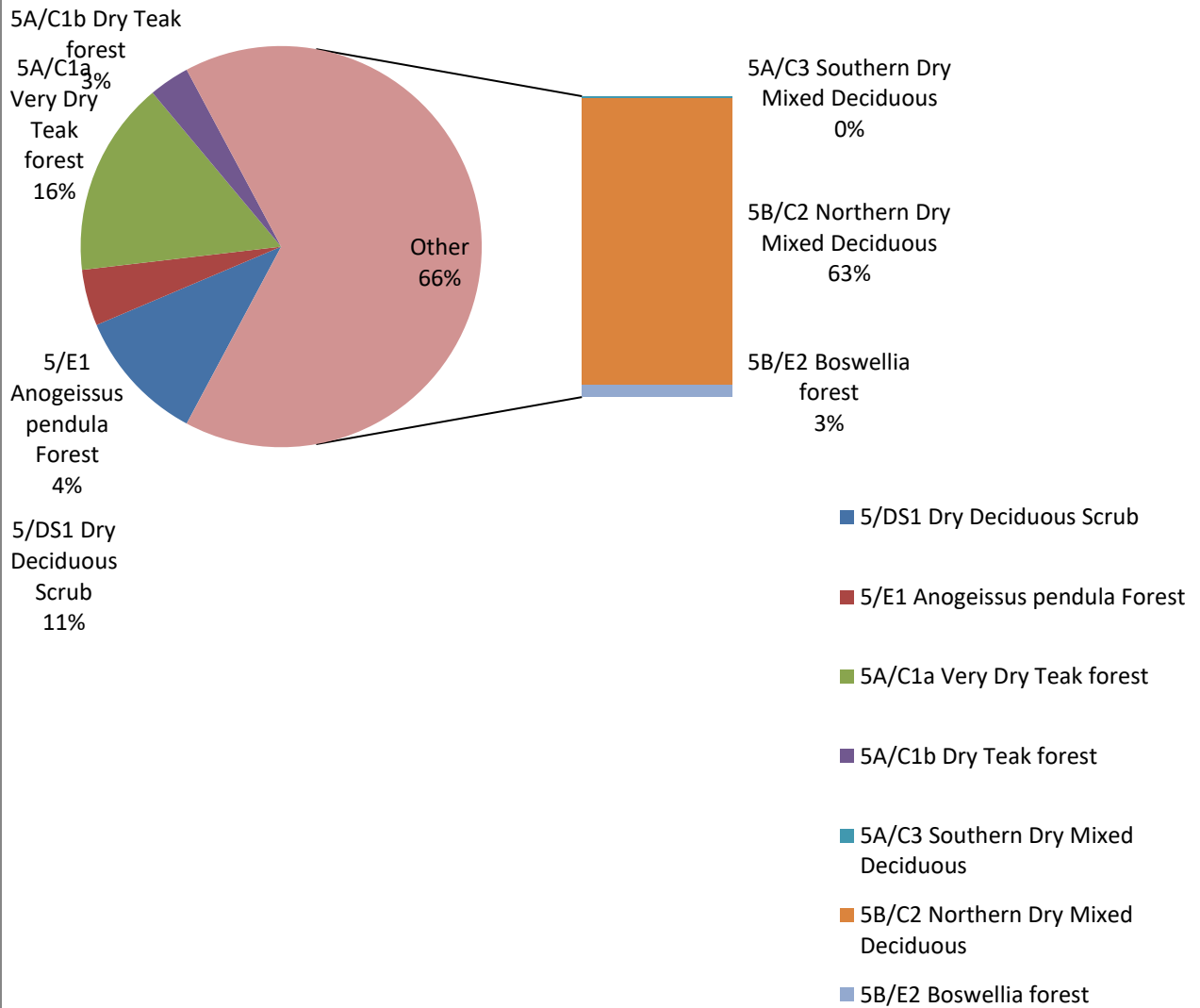




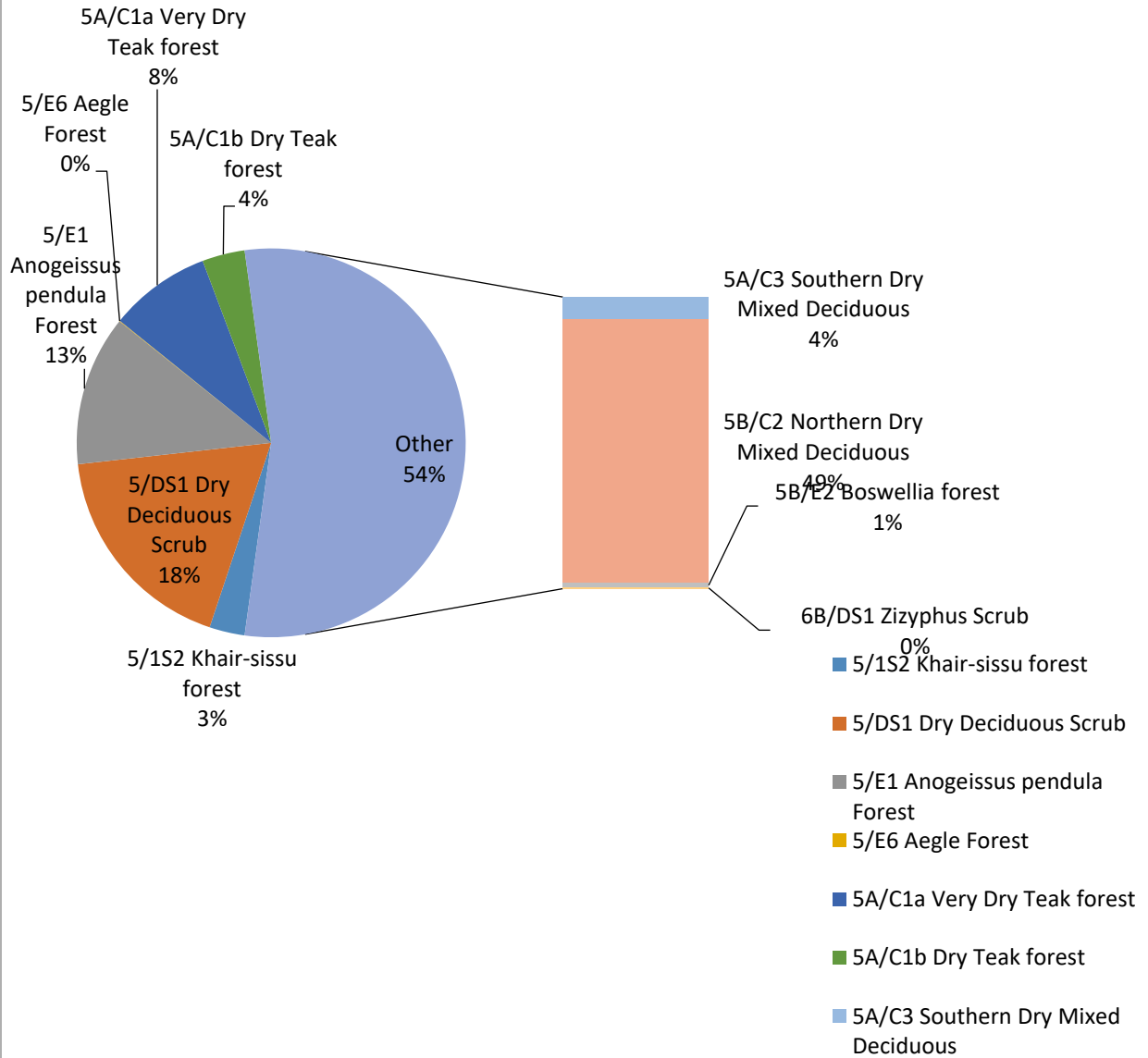
Zone wise Forest Density (Based on FSI Data 2013)



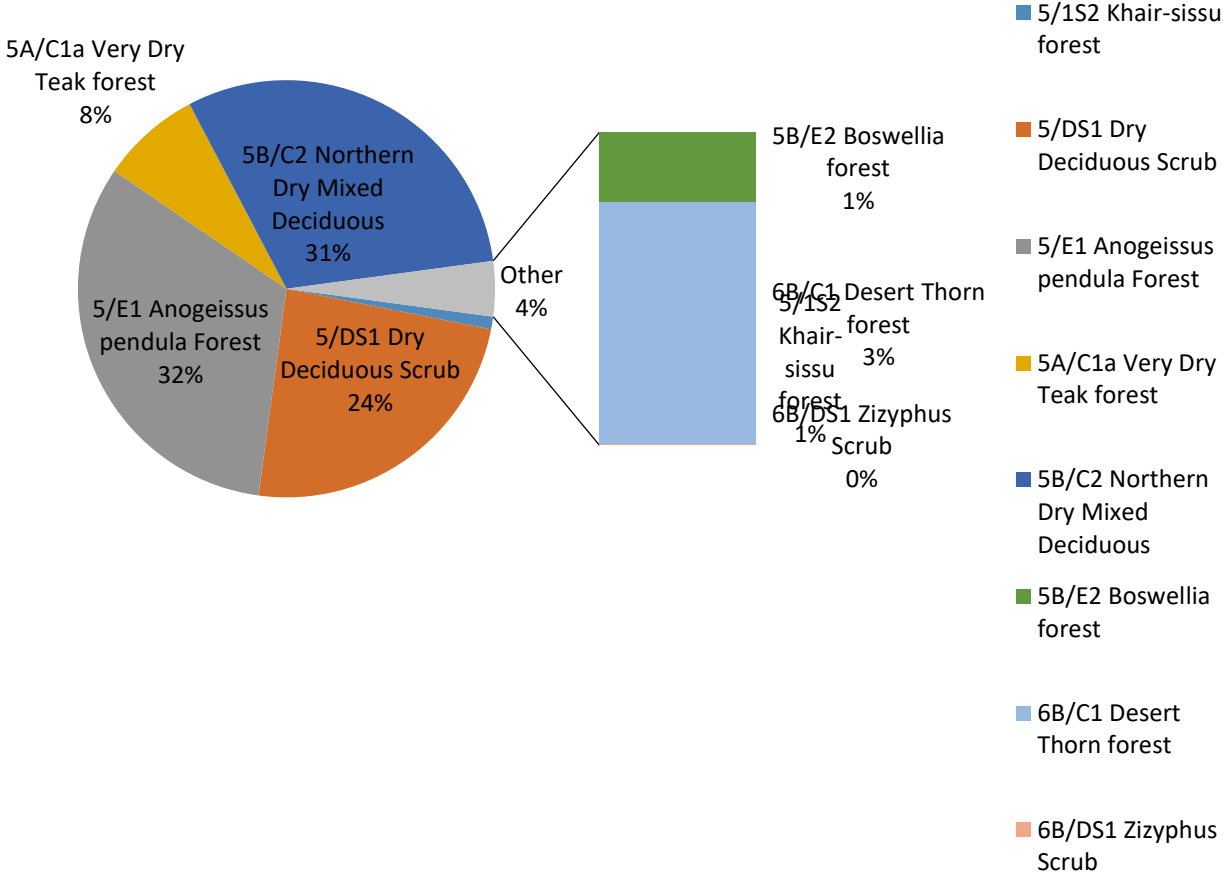
Forest Vegetation in High Risk Zone



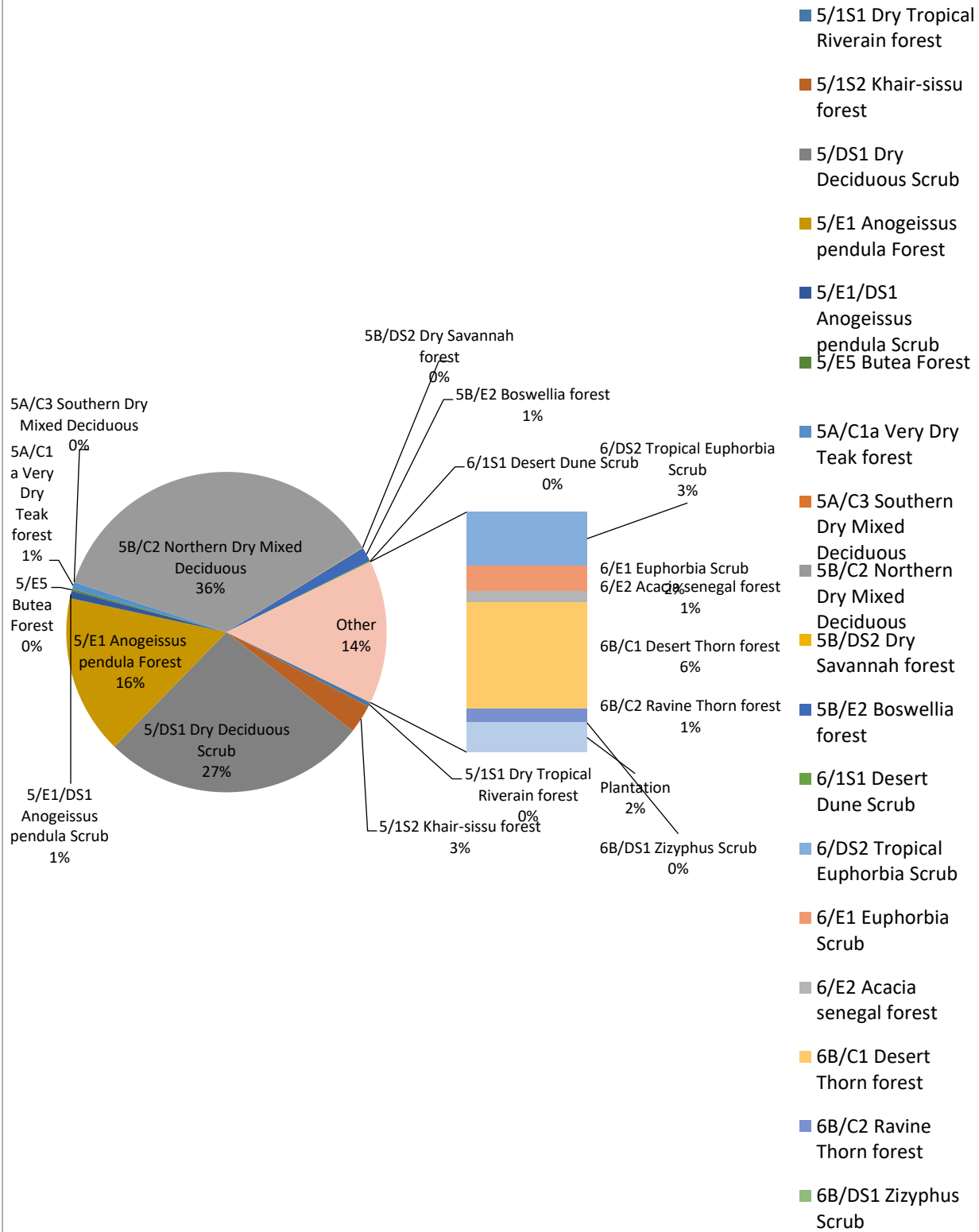
Forest Vegetation in Moderate Risk Zone



Forest Vegetation in Low Risk Zone



Forest Vegetation in Very Low Risk Zone



STRATEGY FOR FIRE CONTROL / PREVENTION AND MITIGATION

In India although most of the forest fires are attributable to anthropogenic reasons, but fire instances both accidental and deliberated have to be dealt with adequate measures. Forest fire prevention includes measure like creation of new firelines, maintenance of old fire lines, construction of watch towers etc. Use of adequate equipments enhances the efficiency of staff in times of need. Management intervention for increasing resilience to forest fires can be achieved by planning water conservation structure which aim at moisture retention for longer time after rains.

The capacity of community organization in prevention or control of forest fires will be enhance by periodical training and capacity building programmes. Training and workshops before the fire season can sensitize the local communities who are often the first to spot fire and alert the forest department.

Training will be provided to field officers seasonal fire watchers and community volunteers involved in firefighting so that all the fighters understands the basic principal of forest fire management and use the most effective suppression techniques at their disposal and know when retreat is necessary 3 officers underwent Training at FRI/FSI Dehradun in November, 2019.

Further pointed training programs for Forest Guards, Foresters, Range officers and ACFs shall be organized.

The physical and financial allotment done in the State of Rajasthan under centrally sponsored scheme of Forest Fire Prevention and Management is enclosed at Annexure 'A'.

Based on the above strategy the physical and financial outlay for forest fire action plan for the period 2018-19 to 2022-23 is enclosed at Annexure 'B'.

PROPOSAL

Part- I

Given the frequency in extent for forest fire it is important that staff & officers are repeatedly trained in the various aspects of managing/ controlling forest fire. The Forest Research Institute, Dehradun is ideal organization to impart training which would include both classroom as well as hands on inputs on forest fire control. Discussions with Director ICFRE Dehradun have revealed that FRI can undertake training of Officers and staff in batches of 20 each.

It is hereby proposed that two modules –one for Forest Guard/ Asst. Forester and Forester and other for Range Forest Officers and ACFs shall be organized, ideally in FRI, Dehradun.

As indicated by FRI, the approximate expenses per batch of 20 staffs shall be RS. 2 Lakhs. Similarly, the expenses for training of 20 Officers is Rs. 6 Lakhs.

In first phase (2020-21) we would want to train 80 staff members (4 Batches) @ Rs. 2 Lakh per Batch of 20 = Rs. 8 Lakhs.

Similarly, in first phase for training one batch of 20 officers (1 batch) @ Rs. 6 Lakh per batch = Rs. 6 Lakh.

Approximate Expenditure for Training of staff (In Rs. Lakhs)

No. of staff members	Forest Guard/ Asst. Forester/ Forester Training (20 Members in Each Batch)			Total
	Phase- I (4 Batches)	Phase- II (4 Batches)	Phase- III (4 Batches)	
240 (12 Batches)	8.00	8.00	8.00	24.00

Approximate Expenditure for Training of officers (In Rs. Lakhs)

No. of Officers	Officers (Range forest Officers/ ACFs/ DCFs)			Total
	Phase- I (1 Batch)	Phase- II (1 Batch)	Phase- III (1 Batch)	
60 (3 Batches)	6.00	6.00	6.00	18.00

Total approximate expenses for training of Staff and Officers is **Rs. 42 Lakhs.**

Part-II

Fire Fighting unit: Firefighting equipments must be included in the kit and distributed in each range of division. Firefighting equipments which are as follows:

S. No.	Name of equipment	Quantity	Number of Ranges/ Divisions	Total Quantity	Rate (in Rs.)	Amount (In Rs.)
1	Fire protective shoes	4 pair	110	440	3550	1562000
2	Fire Gloves	4 pair	110	440	395	173800
3	Helmet with head lamp	2	110	220	524	115280
4	Fire Protective Helmets	4	110	440	826	363440
5	Padded jacket	4	110	440	900	396000
6	Mesh Grill Helmet	1	110	110	1100	121000
7	First aid kit	1	110	110	400	44000
8	Torches	5	110	550	400	220000
9	1 Liter water bottles	5	110	550	700	385000
10	Haversacks	1	110	110	959	105490
11	Battery/ Petrol operated sprayers	1	110	110	7000	770000
12	Water Sprayer	1	110	110	24000	2640000
13	Fire pumps set	1/ Division	17	17	108400	1842800
14	Fire Hose 30 mtr	2	110	220	6379	1403380
15	Water can	4	110	440	100	44000
16	Fire beaters	4	110	440	450	198000
17	Brush Cutter	4	110	440	700	308000
18	Punja/ Rake	4	110	440	105	46200
19	Shovel	4	110	440	360	158400
20	Fire Hook	4	110	440	160	70400
21	Falcon lopping shears	4	110	440	2000	880000

22	Power Chain Saw	1/ Division	17	17	20000	340000
23	Portable Tanks	1	110	110	1000	110000
24	CO2 type fire Extinguisher	1	110	110	4840	532400
25	6 Kg powder based firefighting Extinguisher	1	110	110	2000	220000
26	Fire Axes	4	110	440	448	197120
27	Masks	4	17	68	9400	639200
28	Water tanker with compressor	1/ Division	17	17	626850	10656450
29	Wire bound Plastic pipes (30Mtr.)	1/ Division	17	17	2310	39270
30	Binocular	1	110	110	20000	2200000
Total						Rs. 26781630

All procurement shall be as per GF&AR and RTPP Rules.