Forest Fire And There Prevention In Bageshwar District

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Abstract :

Forests influence the climatic conditions of the entire globe. Forest fire is a major disaster in the study area, which keeps on repeating every year in summer, causing great loss to the ecosystem, flora, fauna, and economy, with the help of recent technology, the continuity of forest fire can be reduced. The forest in the study area is loaded with fuel in summer, which increases the risk of fire. Human activities are also equal partners along with natural causes in fire, which can be reduced successfully by taking appropriate steps.

Keywords : Forest fire, anthropogenic activities, management, techniques

Introduction:

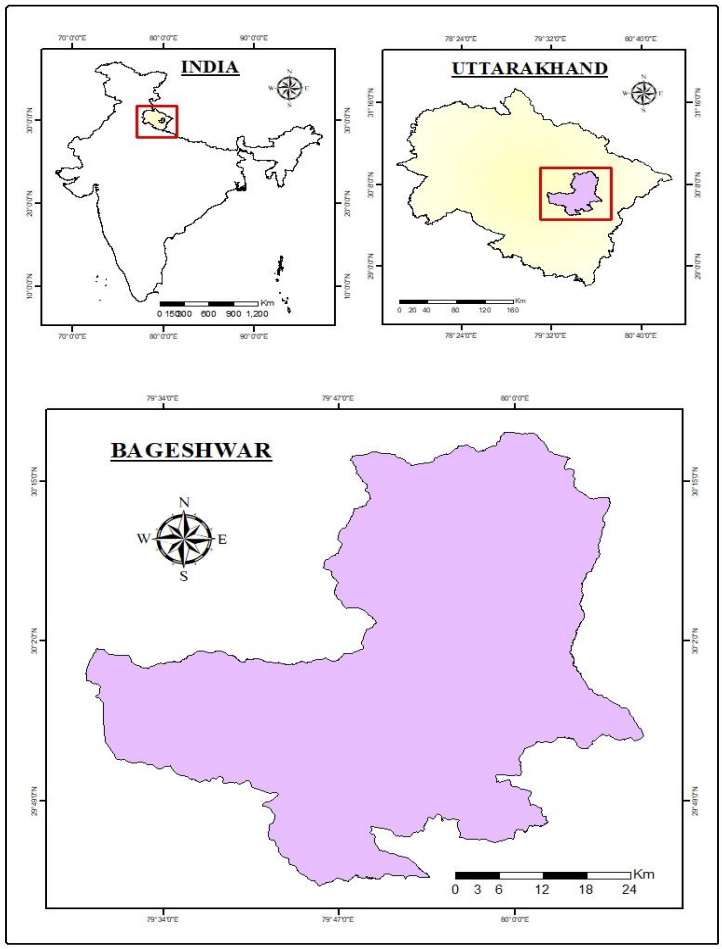
We are dependent on forests in some way or the other. From the air, we breathe to the wood we use. forests provide us with shelter, livelihoods, water, food, and fuel security. They also prevent soil erosion. trees present in the forests hold the soil particles strongly with the roots and prevent them from erosion. In the last years, rising temperatures, as well as human activities, are affecting the forests, the forest fire is a major cause of forest degradation. whether the fire is caused by natural reasons or anthropogenic, it plays an important role in the shaping of the entire forest. the observations in the past 20 years show that the increasing intensity and spread of forest fires in Asia were largely related to a rise in temperature and decline in precipitation in combination with increasing intensity of land use. (IPCC 2007)

If we talk about the forest fires in India, most of these fires are caused by human activities. some are intentional and some are non-intentional. forest survey of India has reported that 54.50 percent of forests in India are exposed to occasional fires, 7.49 percent to moderately frequent fires, and 2.40 percent too high incidence levels while 35.71 percent of India's forests have not to get been exposed to fires of any real significance. (www.forests.tn.gov.in) forest fire not only affects the forests but as its intensity increases, it also damages the animals and property to a great extent.

In the Himalayan region, forest fires are a big concern, especially every summer. A large forest area in the Himalayan region is affected by forest fires annually . Bageshwar district has a 1381 km square forest cover area which is 194 km square area under very dense forest, 883 km square area under moderately dense forest, and 304 km square under open forest. (ISFR 2011) fire affects these forests a lot in the summer time. It is necessary to take appropriate steps to control and prevent this forest fire which occurs every year.

Study area:

Geographically district Bageshwar extends between 29^0 42' 40" N. to 30^0 18' 56" N. latitude and 79^0 28' E. to 80^0 09' 42" E. longitudes. The total area of the study region is 2246 $Km.^2$. The study area is situated in the Kumaon region of Uttarakhand state. District Bageshwar is spread in the area of altitude ranging from 800 m. to 6000 m. above sea level, but most of the population is settled in river valleys and northern highlands are less populated. The district has 6 Tehsils namely Bageshwar, Kapkot, Grur, Kanda, Kafligair, Dug nakuri, and 3 blocks Kapkot Bageshwar, and Grur.



Location map of the study area

Objective :

1. Identify the type of forest fire in the study area.
2. Knowing the cause of the forest fire in the study region.
3. Identify how to prevent the forest from fire.

Methodology:

In the study, both use primary and secondary data. Primary data is collected through field surveys and secondary data is collected from published and unpublished research material and different offices of the forest department.

Types of Forest Fire:

According to gill (1975) ground fire, surface fir, and crown fire are types of the forest fire.

Ground fire - Ground fire normally smolders or creeps slowly through the litter and humus layers. consuming all or most of the organic cover and exposing mineral soil or underlaying rock (Kimmins 1997) Ground fire sometimes called underground or subsurface fire, occur in deep accumulation of humus, peal, and similar dead vegetation that become dry enough to burn.

Surface fire- Bushes, logs, stumps, fallen leaves, needles, branches, or cons these work as fuel in the surface fire. it can be at a secondary smoldering stage of a forest fire. ground temperature can rise from 90 to 120 due to the surface fires in the forests. (Singh et all, 2008)

Crown fire - Crown fire burns trees at least 1 meter above the ground to the entire length to the top.(fs.usda.gov) These fires spread from crown to crowns branches, leaves, barks, stems, and shrubs. it is very difficult to manage and control. it can destroy the whole forest with a minimum time.

Forest Fire in District Bageshwar:

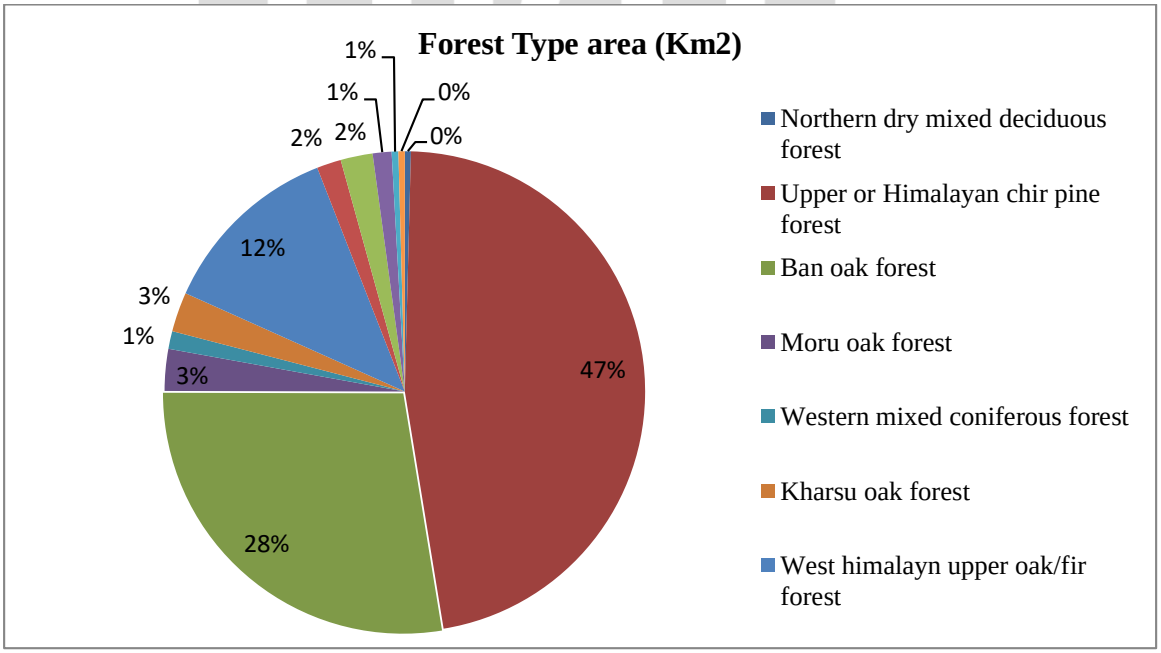
Indian forest ecosystems especially deciduous forests and grassland are subjected to fires every year. according to a forest survey of India, 54.50 percent of the forest in India are exposed to occasional fires, 7.49 percent to moderately frequent fires, and 2.40 percent to high incidence levels while 35.71 percent of India's forests have not yet been exposed to fires of any real significance.(Fsi.nic.in) The forest types are divided based on topography, vegetation, climate, soil, etc. (Champion and Seth

1968, Ram et al.,2004). According to the Atlas: Forest types of India (2011) prepared by the forest survey of India(FSI), There are mainly 12 types of forest in the study region.

Types of Forest in Bageshwar District

Sr. No.	Forest type	Area(Km^2)
01	Northern dry mixed deciduous forest	5.62
02	Upper or Himalayan chir pine forest	650.66
03	Banj oak forest	382.25
04	Moru oak forest	38.88
05	Western mixed coniferous forest	16.53
06	Kharsu oak forest	36.87
07	West Himalayan upper oak/fir forest	170.99
08	Moist temperate deciduous forest	22.64
09	West Himalayan sub-alpine birch/fir forest	29.85
10	Deciduous sub-alpine scrub	17.52
11	Birch/rhododendron scrub forest	6.24
12	Dry alpine scrub	5.93

Source: Atlas: Forest Types of India prepared by FSI, 2011

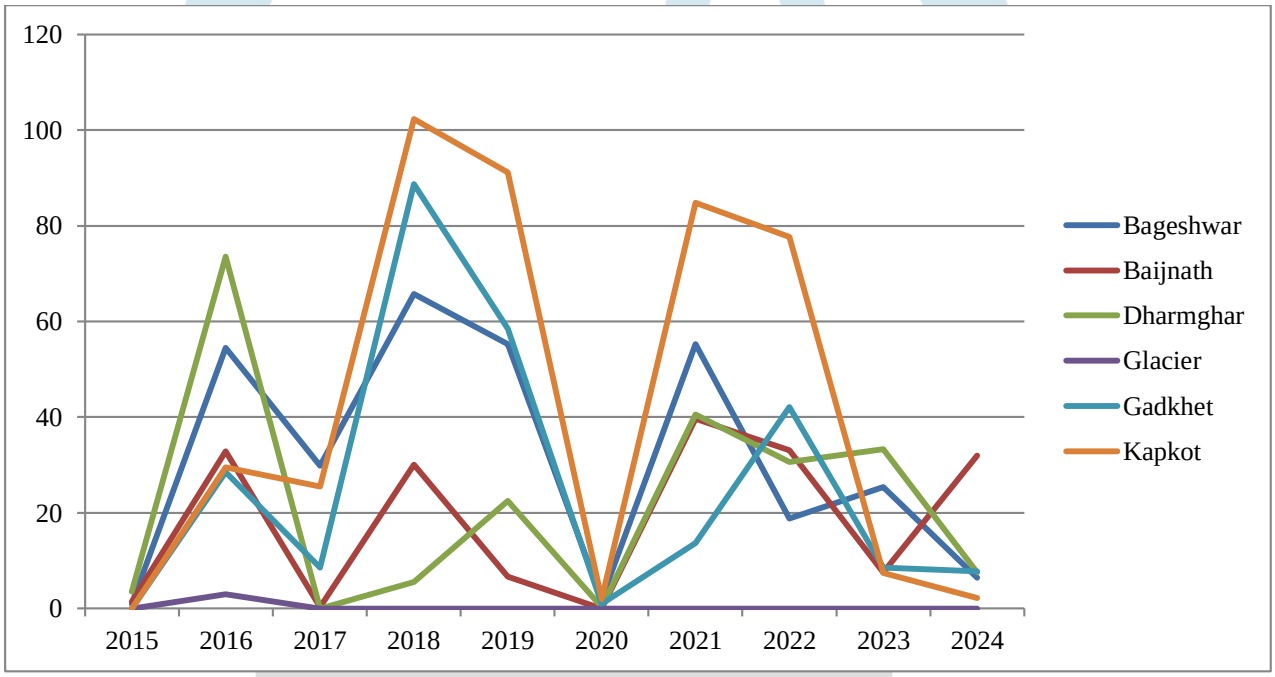


It is clear from the above table that the area study of upper and Himalayan Chir pine forest is the highest in the region. Every year huge amount of pine needle shedding is seen during the spring season from march onwards to June. Chir pine drops its dried needles and cones in large quantities. Chir pine acts as fuel during this period and the possibility of fire increases due to hot weather. The forest department of Bageshwar has divided the entire district's forests into six ranges. The loss of forests that occurred during the last 10 years on the basis of these ranges has been shown in the following table.

Forest fire affected area (he.) in Bageshwar District 2015-2024

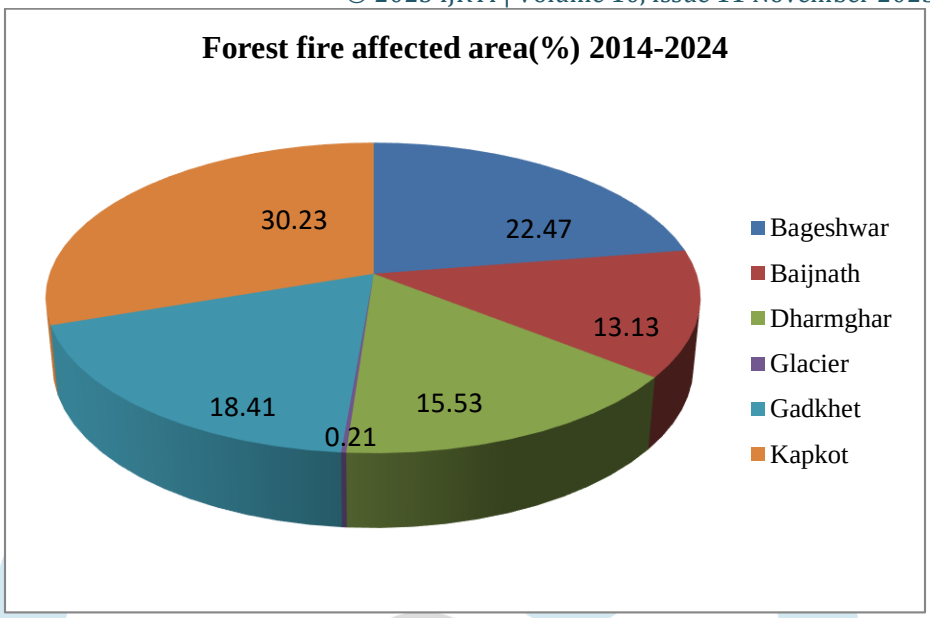
Range/ Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Bageshwar	01	54.5	29.8	65.75	55.25	02	55.25	18.82	25.35	6.36
Baijnath	1.45	32.85	0.25	30	6.67	-	39.68	33.11	7.5	32
Dharmghar	3.5	73.5	-	5.5	22.5	0.25	40.5	30.6	33.25	7.5
Glacier	-	3	-	-	-	-	-	-	-	-
Gadkhet	-	28.5	8.55	88.7	58.5	01	13.7	42.05	8.5	7.8
Kapkot	-	29.5	25.5	102.3	91.15	02	84.85	77.7	7.4	2.21

Source: Forest Department Bageshwar

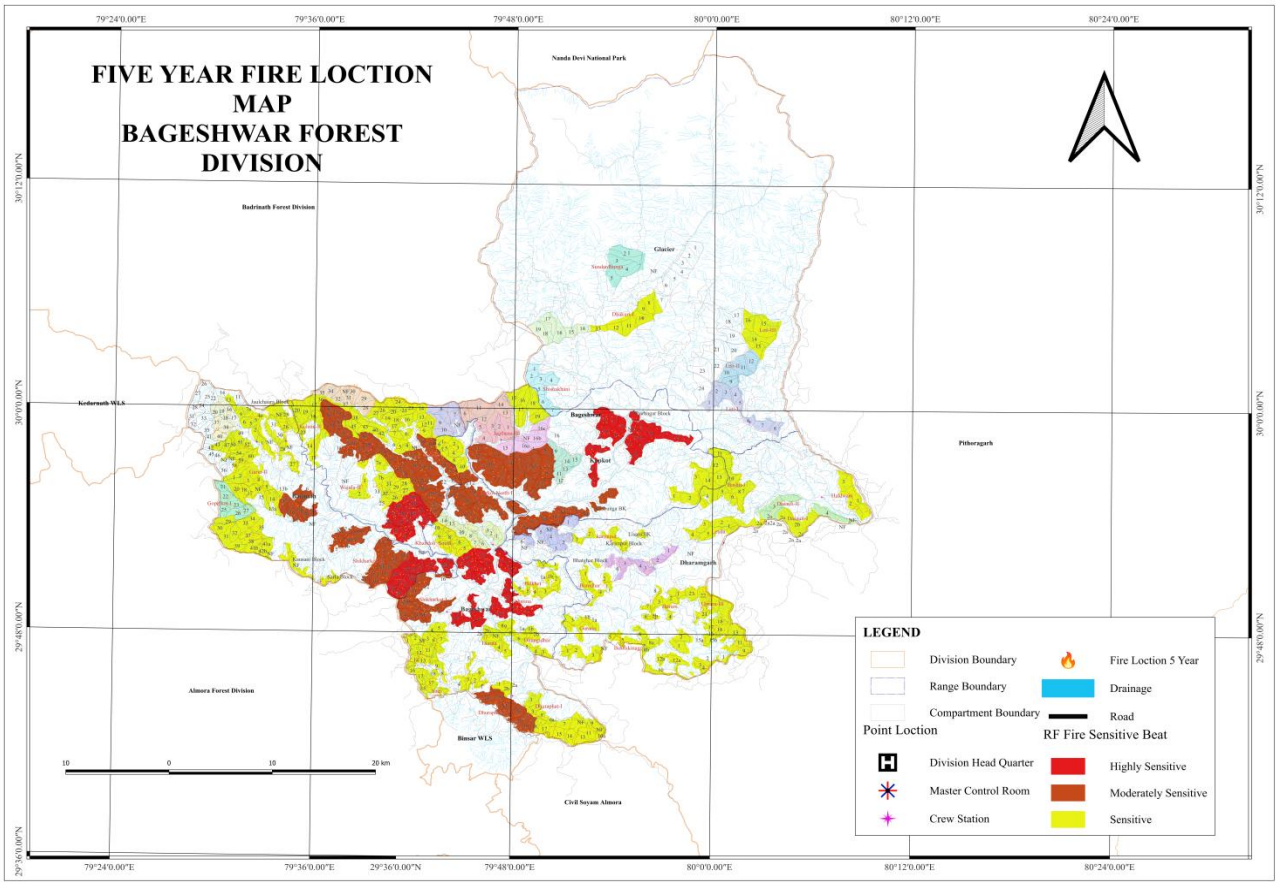


Result and discussion-

Forest fire is coming out as a major disaster in the Himalayan region. the above table shows the affected area of forest fires in the Bageshwar district between 2015 and 2024. Between 2015 and 2024, the maximum fire damage across all ranges occurred in 2018, which is 20.91 percent of the total loss in the decade, after this, similar figure was seen in 2019 and 2021 which was 16.74 percent, and the least damage occurred in 2024, which is 0.41 percent.



The most affected area in ranges is Bageshwar range where 22.47 percent of the affected forest area has been lost during this time period. Only Glacier range, which has lost 0.21 percent hectares of forest in the last decade in 2016 alone, and in this range, there have been less fire incident, because most of this range is covered with glaciers. Generally, the month of march to June is called fire season because in the middle of march to June the dry leaves of the Chir pine are the highest fall which acts as fuel. also at this time in rural areas, women remove the leaves in the forests so that green grass can be available in the rainy season, sometimes there is a fire to remove the leaves and this fire destroys the forests many times. most of the areas were affected during April in the study area due to excessive heat and fuel. In January, February, July, August, and September, between 2015 to 2024 the area is not affected by the forest fire in any way. in which, January and February are the winter season and at this time there is the effect of a western disturbance in the study area, and the months of July, August, and September are rainy seasons, due to which the possibility of forest fire is reduced.



Source : Forest Department, Bageshwar

Cause of the Forest Fire in the study region :

The cause of forest fire can be divided into two parts first anthropogenic and second natural. the incident of forest fire is also seen generally in the region due to anthropogenic reasons, in which sometimes intentional fire is set by humans, about 80 percent of the forest fire occurrences in India are due to human activities like shifting cultivation and collection of forest produce(Singh et al.,2008)

To get fodder - In the middle of march to June, the local people deliberately set fire in the forests so that the fallen leaves on the ground get burnt and the grass can grow, because due to the fall of the leaves, they become together on the ground, due to which the grass cannot grow and this fire destroys a very large area.

To drive away wild animals- In the Himalayan region, most of the villages settled around the forests people do mixed farming in the rural areas, in which they also keep animals. in the forest, the bushes give shelter to many dangerous wild animals and these wild animals threaten the domestic animals, therefore, the local people would set fire to the forests, so that the wild animals would go away and their pets would be safe.

Locals and tourist activities- The villagers depend in many ways on the forests, from here they get fodder and wood for making food. when the villagers go to the forests for work, they cook food by lighting a fire, and many times the fire spreads throughout the forest due to the fire being kept burning. sometimes even after leaving a burning beedi, cigarette, it takes the swell of fire. the same work is also done by the tourist, who while camping in the forests, burning the stove, etc., and using bidi, cigarettes cause a fire in the forests.

Road construction- It has been seen many times that during the construction of roads, the fire is used to smelt the asphalt and the food is prepared by the worker in the middle of the forest, workers move ahead during construction and ignore the fire and this fire destroys the entire flourishing forest.

Lightening- It is commonly seen that there is less fire in forests due to natural reasons, in which lightening is the main reason for the fire, but this lightening mostly happens during the time of the rainy season, which does not cause much damage in case of fire because the fire is extinguished by rain and the ground and trees remain wet, by which reducing the chance of fire.

Collision of stones- Sparks are generated by the collision of stones which causes forest fires, this mostly happens in summer as the temperature is high at this time and fuel is also high in quantity in the forests.

Volcanic process- In some areas the volcanic process also destroys the entire forest at a time, but no such process has been in the study area.

Prevention And Suggestion :

For a very long time, forest fires are affecting the ecosystem, biodiversity, soil fertility, etc., in which the animals living here along with the forests have also been affected. this fire also participates in global warming and climate change, due to global warming, where the temperature increases, it encourages more fire.

Planning and preparation: To reduce forest fire monitoring of the area is necessary, the most fire-prone areas should be marked by the government. before the fire season, fuel should be removed from the forests with the help of the forest department and local people. this fuel can be used to make manure, including the fallen leaves are spread by villagers under the fallen leaves are spread by the villagers under the animals, which are used for manure, it is necessary to make the local people aware of the importance of forests so that they contribute to keeping the forests safe as well as give appropriate training to extinguish the fire. the government should be adopted modern fire fighting techniques such as radio acoustic sound systems for early detection and doppler radar.

During forest fire: Some actions can be taken during a forest fire, which can reduce the damage caused by fire. do the most effective work during a fire because they are closest to the fire. during the fire the locals should start removing the fuel line as soon as possible so that the fire does not spread further and also inform the forest department to get proper help on time, if the locals and the government work together during the fire, then the damage can be reduced.

Post forest fire: Forest fires cause loss of plants as well as animals, with the help of monitoring and mapping, planning can be done by collecting information about the forest area, so that there is no fire in that area again and tree plantation should be done in the affected area as well as more attention should be paid to planting trees like Banj, Oak, etc., if the person giving information about forest fire to the forest department and who helps in extinguishing the fire is given a prize, then the local people will give special participation to stop the forest fire.

Conclusion :

Fire is affected by the moisture of the ground surface, the moisture of the fuel, the weather, the temperature, and the speed and direction of the wind, all these natural and man-made actions give a formidable form to the fire. In the study area, the maximum area affected by the forest fire in 2019 was 67.75 hectares and in 2013 the least area was damaged by the forest fire. most of the forest fire incidents have been seen in the area during summer and it occurs between march and June but in the year 2020 it was seen from October to December, one of the main reasons for this that due to the corona epidemic at this time, many people are

back in the villages, for a long time, due to the emptying of the village, the bushes flourished and to clear the bushes of the forests in the village, these people were setting fire to the forests so that the bushes would be cleared soon. there are many areas in the study region where the incidents of forest fire keep repeating, which has caused a lot of damage to the biodiversity of that area, so those areas need more attention, it is necessary to adopt the given suggestions to reduce the impact of forest fires in the area, with the help of local people along with the forest department, the government needs to take action to make a plan to reduce forest fires.

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