

Impact of A Natural Resource Disaster - Forest Fires in Uttarakhand

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Abstract

*Forest fires- which can be known as a natural resource disaster, is an uncontrolled fire occurring to destroy the natural resources and impacting the livelihood of the hilly areas like Uttarakhand. It thus results in a long time management process for the fighting crews to gain control over the situation. This could result in massive destruction. They not only pose threat to the forest wealth and lifecycle but also to the entire regime to fauna and flora by affecting the bio-diversity and the ecology and environment. It is particularly long lasting during summer when there is no rain for months; the forests become littered with dry senescent leaves and twinges, which could burst into flames ignited by the slightest spark. The forests of Uttarakhand have been burning continuously during the last decades and particularly in summers, with loss of vegetation cover of that region. Forest fire causes imbalances in nature and loss of income sources of the population. There is more attention needed on the Traditional as well as modern methods of fire prevention which can be achieved through public awareness and use of intensive techniques on the matter, particularly among those people who live close to or in forested areas. Forest fires can be divided into two categories: Natural, which are beyond the control and human based, which can be controlled. The incidences of forest fires have rapidly increased and have crippled high dependence over forests for food and basic amenities. The topmost reason for this failure is the piecemeal approach to the problem. Both the integrated approach and national focus are required for developing systematic forest fire management programs in the country. Important methods and new management techniques like coordination among policy makers, awareness to the community, strategic fire centers, funding, human resource development, fire research, fire management, and extension programs are lacking behind. The objective of this paper is to highlight the loss of wildlife, biodiversity and disturbance of ecosystem due to forest fires and identify the regions of Uttarakhand mostly affected due to forest fires with the corrective measures to be taken in future. **Keywords** - forest, fires, hilly areas, livelihood, flora, fauna, environment, techniques*

Reference to this paper should be made as follows:

Dr. Mastan Malothu,

*Impact of Bodhisattva
Philosophy on Indian
Society,*

RJPSSs 2017,
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pp.220- 228,

Online available at :
[http://anubooks.com/
?page_id=2012](http://anubooks.com/?page_id=2012)

Introduction

Uttarakhand being vulnerable to climate risks suffers a lot due to natural disasters and thus have shown a huge growth in annual temperature. Impacts are expected to range from great loss to ecosystem, flora and fauna to increase in forest fires. Forests are facing a number of anthropogenic (human impacts) and natural threats. Forest fires have become a major concern not only because of the added threat to biodiversity, deforestation and other natural systems but reduce fuel moisture and lower humidity near the surface, allowing the fires to spread more rapidly. Population of hilly areas socially, economically and environmentally depends on forests for their sustainable livelihood. Many indigenous and endangered species are adversely affected due to lack of hydration and dry weather in the Himalayan region like Uttarakhand Forest fires have naturally & adversely affected plant and animal communities. Another facet of forest fires may be dryness of the soil which highlighted the need of moisture retaining techniques. 3,185 hectares of land has been affected till now. According to the report of the Forest Fire Disaster Management in 2012, half of the India's forests were prone to fires while 43% were prone to occasional fires. (A source from Indian express (MAY, 3, 2016). Forest fires have been categorized into three types, ground fires, surface fire and crown fires. Ground fire is the one that burns the humus, surface fire burns only surface litter and undergrowth while crown fire advances a great speed from the fire in the ground. There are also social impacts due to forest fires like loss of livelihood, loss of agriculture and horticulture, loss of income due to lack of tourism & health hazards.



Source from <http://www.mapsofindia.com/maps/uttaranchal/uttarakhanddistrict-map.jpg>

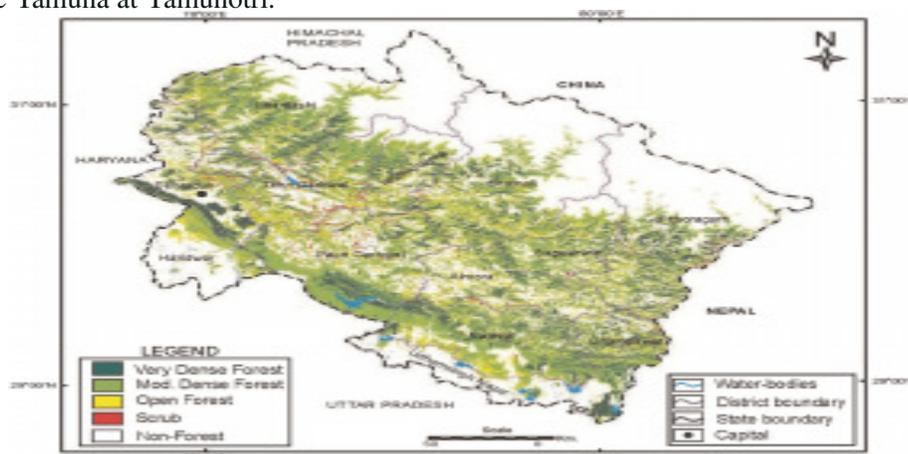
STUDY AREA-

Uttarakhand has a total geographic area of 53,483 km of which 86% is mountainous and 65% is covered by forest. . Out of the 13 districts of the State, 3 are plain districts and the remaining 10 are hill districts. Geographically the state can broadly be divided into three zones, namely—

1. UPPER HILLS — Uttarkashi, Chamoli, Rudraprayag, Pithoragarh and Bageshwar
2. MIDDLE HILLS — Tehri-Garhwal, Garhwal, Almora, and Champawat, the hill regions of Nainital and Chakrata tehsil of Dehradun
3. FOOTHILLS — the remaining area of Dehradun, Haridwar, Udham Singh Nagar and Nainital.

According to census of India, 2011, Uttarakhand has a population of 10,086,292 comprising 5,137,773 males and 4,948,519 females, with 69.77% of the population living in rural areas. <https://en.wikipedia.org/wiki/Uttarakhand>).

Most of the northern part of the state is covered by high Himalayan peaks and glaciers. In the first half of the nineteenth century, the expanding development of Indian roads, railways and other physical infrastructure was giving rise to concerns over indiscriminate logging, particularly in the Himalaya. Two of the most important rivers in Hinduism originate in the region, the Ganges at Gangotri and the Yamuna at Yamunotri.



Source from [https://www.researchgate.net/profile/Ps_Negi/publication/269984135/figure/fig2/AS:295183569702919@1447388655850/fig-4-](https://www.researchgate.net/profile/Ps_Negi/publication/269984135/figure/fig2/AS:295183569702919@1447388655850/fig-4-Forest-cover-in-Uttarakhand-State.png)

Forest-cover-in-Uttarakhand-State.png

District wise forest cover assessment 2011, Uttarakhand

Following is the table showing geographical and forest cover in Uttarakhand:

District	Geographic Area (sq. km.)	Forest Cover Assessment (in sq. km.)2011 (Revised) (State of Forest Report - 2011)				Proportion of Forest Cover to District Geographic Area (%)	Proportion of Forest Cover to State Total Geographic Area (%)	Proportion of Forest Cover to State Forest Cover (%)
		Very Dense Forest	Mod. Dense Forest	Open Forest	Total			
Almora	3139	222	928	427	1577	50.24	2.95	6.44
Bageshwar	2246	194	883	304	1381	61.49	2.58	5.64
Chamoli	8030	427	1586	682	2695	33.56	5.04	11.00
Champawat	1766	336	571	274	1181	66.87	2.21	4.82
Dehradun	3088	584	695	328	1607	52.04	3.00	6.56
Garhwal	5329	523	2094	672	3289	61.72	6.15	13.43
Hardwar	2360	26	353	240	619	26.23	1.16	2.53
Nainital	4251	601	1923	566	3090	72.69	5.78	12.61
Pithoragarh	7090	567	1115	412	2094	29.53	3.92	8.55
Rudraprayag	1984	246	5812	98	1125	56.70	2.10	4.59
Tehri Garhwal	6642	298	1232	617	2147	58.95	4.01	8.76
U.S. Nagar	2542	171	247	128	546	21.48	1.02	2.23
Uttarkashi	8016	567	1959	619	3145	39.23	5.88	12.84
Total	53483	4762	14167	5567	24496	45.80	45.80	

PROBLEM AND OBJECTIVE OF THE PROJECT-

As the problem was taking a huge coverage and creating livelihood scarcity and impacting majority, it was necessary to observe the reasons behind it. Thus, the research was taken place with the motive of finding the right solutions and major impacts of the incident. The objective of the study was to know the reason of increasing forest fires in the state resulting in natural resource disaster. The study also highlighted the loss of wildlife, biodiversity and disturbance of ecosystem. Especially the study made an attempt to identify the regions mostly affected due to forest fires, the reasons of forest fires and the corrective measures to be taken in future. Thus the objective behind the research was:

1. Fire prevailing in the state of Uttarakhand
2. Reasons behind the incident
3. Problems occurring due to the forest fires prevailing in the state.
4. Impact of the incident on flora and fauna
5. Solutions to the problem.

LITERATURE REVIEW-

The Himalayan region is one of the most fragile ecosystems in the world due to its inherent tectonic and geographical characteristics (Valdiya, 1983) .As per

the Forest Survey of India data, almost 50% of India's forest areas are fire prone because of high temperature and less rainfall. There is a great loss to timber resources and depletion of carbon sinks. It has also resulted in wiping of communities of insects, birds, reptiles and mammals. Forest fires are causing natural resource disaster to the ecological system, wildlife and economic wealth. With the increasing cases of fires, there is a great change in micro climate of the area that is making the environment unhealthy to live-in. It has also been found that most of the forest fires are anthropogenic in nature. There is a need in fast actions from government, stakeholder groups, private sector and most importantly from the community. According to India State of Forest Report, 6.17% of Indian forests are subjected to severe damage due to fires. I believe, government need to remove the imbalances and should ban pine. It is also important to recharge the stream of water resources and remove the past techniques with the latest one. There is also a need of a development template for hilly areas.

MATERIAL AND RESEARCH METHODOLOGY-

- For the material of the study, secondary data was used. The data collected from ENVIS, a centre on forestry, forest research institute dehradun (<http://www.frienvis.nic.in/WriteReadData/UserFiles/image/Fire/Forest-fire-incidents.jpg>) was used.
- Forest fire initial points were collected from the Uttarakhand Forest Department website -(<http://forest.uk.gov.in/contents/view/6/27/75-forest-fire-info>).
- Articles in newspaper were used as a source to interpret the conditions of the fire prone forest areas in uttarakhand.

IMPACT OF FOREST FIRES IN THE STATE:

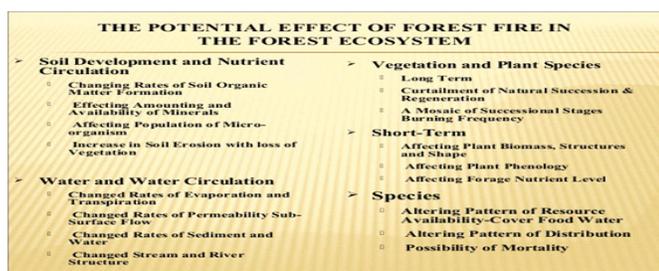
The forest fires have devoured more than 3000 hectares of land till now which may result into devastating effects in glaciers melting. The fires are having a negative impact on the increasing temperature and the monsoon cycle of the state. Also, the dark carbon dust emitted by the fires is leading to melting of glaciers. The most affected districts were Pauri Garhwal, Dehradun, Nainital, Pitoraghar, Bageshwar and Chamoli. Especially in 2016, forest fires were noted mainly in pine forests; in the slope of the sub- Himalayan region and nearly 1,600 fires incidents were detected during this period. The damage to biodiversity with loss of flora, fauna, bird and animal species specially was significantly higher. The moisture reduction during summer reason impacted on bushes and woods which caused a decrease in humidity level. The longer effects results into reducing soil productivity which will adversely affect density, creatures from microbes to mega fauna, insect colonization which

will affect the ecological system as well. It has been also observed that within three years maximum re-occurrence was found in the same areas. This has also affected the ambient air of the region. The main losses were: loss of timber resources, wildlife habitat, reduction of forests cover, increase in temperature, loss of natural vegetation and soil erosion. The population is adversely dependent on the forests for their livelihood and income earnings majorly. Forest based activities provide income mainly to the informal sector and to the rural non-farm employment. However, the risk of forest fires due to climate change has impacted their sources of income. Mainly the tribal communities fetch their income sources from forests like edible fruits and vegetables, medicinal and mainly for building their houses. It also tends to create huge supply and demand of the forest products which are necessary to human existence.

FOREST	DEMAND (MT)	SUSTAINABLE	SUPPLY PRODUCTS
FIREWOOD	228	128	100
FODDER (green and dry)	1594	741	853
TIMBER	55	41	14

Source: Aggarwal et al, 2009

With limited forest cover, the supply of forest products does not match the demand and hence there is a substantial gap (see Table). This gap leads to over-exploitation of the forest. There has been different estimates of the demand and supply of major forest products. The estimates by TERI (Aggarwal et al, 2009) put the demand-supply gap for fuel wood; fodder and timber at 100, 853 and 14 million tons respectively. Thus the economy of the informal sector which is majorly dependent upon forests can face huge negative impact if the situation continues.



[* File contains invalid data | In-line.JPG *]

<https://image.slidesharecdn.com/forestfire-threattoecologicalsecurity-47slidespptbhutan-130216050356-phpapp02/95/forest-fire-threat-to-ecological-security-47-slidesppt-bhutan-11-638.jpg?cb=1360991256>

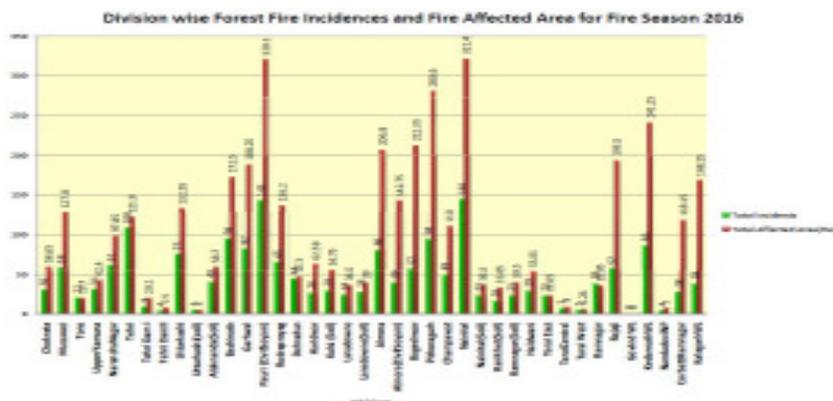
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Summary of District-wise Fire Incidents Reported Till 05-06-16

Circle	Incident No. In RF	Incident No. In Civil Soyam / Van Panchayat	Total Incidents	Affected RF Area (Ha)	Affected Civil Soyam / Van Panchayat Area (Ha)	Total Affected Area (Ha)	Plantation Affected Area (Ha)	Leesa ghao Affected	Evaluation of Losses (In Rs.)
Dehradun	175	25	200	316.75	58.65	375.40	0.00	460	320,250.00
Hariwar	52	0	52	132.58	0.00	132.58	12.50	0	66,663.00
Chamoli	109	112	221	251.85	222.60	474.45	1.00	0	566,000.00
Pauri	179	223	402	537.65	494.10	1,031.75	39.50	0	898,975.00
Tehri	165	82	247	248.70	101.75	350.45	3.50	0	222,625.00
Uttarkashi	127	45	172	167.80	72.50	240.30	28.50	0	260,125.00
Rudrapur	39	43	82	68.70	91.00	159.70	2.00	0	221,050.00
Almora	117	78	195	331.90	194.25	526.15	12.00	0	694,825.00
Pithoragarh	43	54	97	125.00	163.60	288.60	0.00	0	372,650.00
Bageshwar	33	27	60	108.90	106.43	215.35	0.00	0	321,025.00
Champawat	33	26	59	67.01	52.00	119.01	0.00	0	130,755.00
Nainital	239	27	266	451.26	43.60	494.86	3.05	0	545,930.00
Udham Singh Nagar	16	0	16	14.75	0.00	14.75	1.40	0	9,000.00
Grand Total	1327	742	2069	2,822.85	1,699.59	4,423.35	103.45	460	4,629,825.00

http://www.frienviis.nic.in/WriteReadData/UserFiles/file/data/Division_wise_Affected_area_graph_fire_incidences.pdf



http://www.frienviis.nic.in/WriteReadData/UserFiles/file/data/Division_wise_Affected_area_graph_fire_incidences.pdf

A local issue with global impact (forest fires) will continue to adversely increase its effects with the rising temperature and global warming. The wildlife reserves have been extremely affected like Corbat Tiger Reserve and Kalagarh Tiger Reserve. Fires completely destroy the ecosystem & biodiversity and have long-term impacts. This was also the impact of rising of temperature from 4 to 5 degrees higher than the average temperature during the summer season. Taking severity into consideration, Environment minister have also initiated trial runs for pre-fire alert system that will issue warning via SMS about possible outbreaks. These fires are creating ecological misbalance and disaster in the state. Mostly, incidents

were reported in Pauri Garhwal, Nainital and Teri Garhwal. There is a need of proper assessment and guidance for better management of forest resources. The draft of national forest policy exclaims the levy of green tax for ecologically responsible behavior and supplementing financial resources to tell about forestry woes. They should enhance forestry sector so that the objectives can be achieved. Taxes like green tax, carbon tax and environmental cess should be levied on certain products. Also the policy exclaims to use state-of-the-art policy to minimize damage as well as pollution to the forests. The government should establish National Board on Forest fires and its preventions. Invention of new disaster management courses for local residents of the hilly areas should persist for dealing with any further emergency. Also, National schemes in lieu with MNREGA should be implemented with new administration towards fires in forest areas with a lot emphasis on the wage employment program for tribal community of the forest areas. Local regulations should be checked regarding permit requirements and burning restrictions. Policy framework should be designed in a way that should clearly define steps and precautions taken to combat forest fires and role of forestry department and local residents during the span of emergency.

Some measures can be-

1. Chir pines spread out in the Himalayan region needed to be cut down as they are not good for bio-diversity and results in forest fires
2. Local communities needed to be trained and equipped to deal with the situation.
3. More use of effective and modern techniques.
4. Oxygen level must be suppressed
5. Construction of watch towers.
6. Monitoring and patrolling of preventive measures.
7. Effective utilization of fuel load.
8. Restoration of Unique Vegetation and Eco system.
9. Plantation of indigenous broad-leaved and moisture consuming species.

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