

## **FORESTFIRE AND ITS MANAGEMENT IN DISTRICT BANDIPORA JAMMU AND KASHMIR**

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### **Abstract**

This paper presents the extent and magnitude of forest fires and adaptation responses to deepen our understanding of the dynamics of forest fires in District Bandipora. I used a narrative scoping review approach to narrate the present state of forest fires and resilient adaptation responses to guide the development of climate resilient adaptation pathways in the future. Forest fire presents significant threat to ecological integrity, human wellbeing, and global effort to fight climate change. Fire incidences are highest during and post dry winter months which quickly declines at the onset of monsoon. Adaptation and responding to ever growing size and frequency of forest fires are limited by lack of awareness, training on fire management, firefighting infrastructure, technology, and adequate policy and financial support. In addition, there is acute lack of scientific studies to understand forest fire dynamics in District Bandipora. Based on the forest fire literature we argue that policy makers and communities must quickly adopt policy strategies that support smart responses to forest fire management including allocating adequate funds to support capacity building and research. Such decision must be based on research into potentials for climate resilient pathways for adaptation response.

**Keywords: Forest Fire, Disaster, Management, Causes, Bandipora, Jammu & Kashmir**

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### **INTRODUCTION**

Uncontrolled blazes fueled by weather, wind, and dry underbrush, wildfires can burn acres of land—and consume everything in their paths—in mere minutes. On average, more than 100,000 wildfires, also called wildland fires or forest fires, clear 4 million to 5 million acres (1.6 million to 2 million hectares) of land in the U.S. every year. In recent years, wildfires have burned up to 9 million acres (3.6 million hectares) of land. A wildfire moves at speeds of up to 14 miles an hour (23 kilometers an hour), consuming everything—trees, brush, homes, even humans—in its path. Environmental historian Stephen J. Pyne, in his book entitled *Fire: A Brief History*, suggests that fire and flame can only exist on earth in the presence of the carbon based "living world". Our carbon based and flammable environment supplies all of the elements of chemistry for the creation of fire. I will review these elements in a moment. Fire is dependent on, cannot exist without, and must follow the biology of life. There are fire based ecosystems where flora and fauna have evolved and adapted to wildfire for survival. The absence of fire in these forest systems is a change that negatively affects the biome.

### **Objectives of the Study**

The main objectives of the present study are as the following

1. To analyze the nature and magnitude of forest fire in the study area.
2. To identify the causes and consequences of forest fire in the study area.
3. To suggest the suitable mitigation measures of forest fire in the study area.

**Database and Methodology**

Besides the field and personal observations the present study is based on secondary sources from which the data is collected. These secondary sources from which material was collected are books, journals, and internet. These study materials are collected from the department library and surfing the different journals, research papers from the internet.

The focus of present study is to analyze the forest fires and its management in district Bandipora

**Significance of the Study**

The present study relates to the forest fires and its management in district Bandipora. The main significance of the study is determine the main causes, consequences, nature, magnitude and management of forest fires in district Bandipora

Since ancient times forests have been integral parts of Indian society. Ancient literature of Hindu mythology like Puranas, Vedas, etc. have mentioned the significance of this natural resource for the community. Forests have not only proved significant for economic utility, but also influenced the social and economic life of the mankind, modified their views and provided new thoughts to poets and artists too. Number of different scriptures in the past have talked about these roles of forests. The Agni purana (Hindu scripture) while discussing the role of forests in human life goes so far as to say “That man who plant trees for the welfare of the public obtains obsolete bliss.” The Geeta (another Hindu scripture) mentions “Living beings survive on the food. Food is produced by rain, rain depends on forests. Therefore conservation of forests is necessary to keep it in a healthy state.”

**The Study Area**

Bandipora district is one of the 22 districts in Jammu and Kashmir State in northern India. This district was curved out from the erstwhile Baramulla district in 2007. The district has three diverse geographical, socio-cultural and economic zones. Thus the nature of hazards also varies. Lake shore region is prone to floods, the foothills are affected by landslides, flash floods, soil erosion and debris flow and high mountain experience avalanche and harsh winters. Earthquake and fire are constant hazards in these socio-economically vulnerable regions.

- **Political and administrative**

Bandipora is divided into three sub divisions -Sumbal, Bandipora and Gurez. The sub districts are further divided into seven tehsils.

| Districts | Tehsil  | Sub-divisions   |
|-----------|---|---|
| Bandipora | <ul style="list-style-type: none"> <li>• SUMBAL</li> </ul>    | <ul style="list-style-type: none"> <li>• SONAWARI</li> <li>• HAJIN</li> </ul>                   |
|           | <ul style="list-style-type: none"> <li>• BANDIPORA</li> </ul> | <ul style="list-style-type: none"> <li>• ALOOSA</li> <li>• AJAS</li> <li>• BANDIPORA</li> </ul> |

|  |   |   |
|--|---|---|
|  | <ul style="list-style-type: none"> <li>• GUREZ</li> </ul> | <ul style="list-style-type: none"> <li>• GUREZ</li> <li>• TULAIL</li> </ul> |
|--|---|---|

Bandipora has 123 revenue Villages, 24 Niyabat Circles, 35 PatwariHalqas, 5 Educational Zones, 4 Medical Blocks, 12 CD Blocks and 114 Panchayat Halqas.

### Literature Review

The origin of forest fire can be either natural or manmade. In certain countries at higher latitudes, lightning is the major cause of forest fire. However, in India, most of the forest fires have manmade origin, such as, cigarette or bidi stubs or left over embers (bahuguna and singh, 2002).

Flannigan et.al. (2000) reviewed the existing studies on climate change and forest fires by using two transient general circulation models (GCM's), namely the Hadley Centre and the Canadian GCM's, to estimate fire season severity in the middle of the next century. Ratios of 2\*CO<sub>2</sub> seasonal severity rating (SSR) over present day SSR were calculated for the means and maximums for North America. The results suggest that the SSR will increase by 10 -50% over most of North America; although, there are regions of little change or where the SSR's should translate into increased forest fire activity. Thus, forest fires could be viewed as an agent of change for US forests as the fire regime will respond rapidly to climate warming. This change in the fire regime has the potential to overshadow the direct effects of climate changes on species distribution and mitigation.

Balch (2009) observed that "The synthesis is a prerequisite for adaptation to the apparent recent intensification of fire feedbacks, which have been exacerbated by climate change, rapid land cover transformation, and exotic species introductions" and further commented about "fires where we don't normally see fires," and pointed to the occurrence of bigger and more frequent fires from the western U.S to the tropics.

### Forest fire report from last ten years in the study area

Office of the Divisional Forest Officer Bandipora Forest Division Chitternar

**Forest Fire  
report of  
Bandipora  
Forest Division  
from last 10  
Years**

| Name of Division | Year | Date & time of occurrence |      | Date & Time of Extinguishing of fire |      | Block |  | Beat | Compt. No | Measures adopted to extinguish the fire | Details of Enquiry/Verification carried out |                         |
|------------------|------|---------------------------|------|--------------------------------------|------|-------|--|------|-----------|---|---|-------------------------|
|                  |      | Date                      | Time | Date                                 | Time |       |  |      |           |   | Extend of damage                            | Area engulfed (in Hacs) |
|                  |      |                           |      |                                      |      |       |  |      |           |   |   |                         |

| 1                | 2                | 3          | 4         | 5          | 6            | 7           | 8                      | 9   | 10  | 11  | 12              |
|------------------|------------------|------------|-----------|------------|--------------|-------------|------------------------|---|---|---|-----------------|
| Bandipora        | 2008-09          | 1/8/2008   | 9:00 a.m  | 1/8/2008   | 8:00 p.m     | Aloosa      | Aloosa                 | 10/Kh&11-a/Kh   | By beating & Making fire circles  | Grasses & Bushes Only                           | 1.00 Hac        |
|                  |                  | 9/3/2008   | 8:30 a.m  | 9/4/2008   | 4:00 p.m     | Aloosa      | Aloosa                 | 9/Kh&10/Kh  | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc             | Grasses Only                                    | 0.25 Hac        |
|                  |                  | 11/29/2008 | 6:30 p.m  | 11/30/2008 | 11:30 a.m    | Kudara      | Kudara                 | 114/Kh  | Clearing of inspection paths, creation of fire lines/rings, plugging of stumps with soil, rocks etc | Grasses, bushes and regenerated conifer 100 Nos | 2.00            |
|                  |                  | 12/17/2008 | 11:00 a.m | 12/18/2008 | 3:00 p.m.p.m | Bonakoot    | Bonakoot               | 83-a/Kh&83-b/Kh   | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc             | Grasses Only                                    | 0.25Hac         |
|                  | <b>Sub-toal:</b> |            |           |            |              |             |                        |   |   | <b>0</b>  | <b>3.50 Hac</b> |
|                  | 2009-10          | 11/25/2009 | 10:00 a.m | 11/25/2009 | 10:00 p.m    | Chandaji    | Chandaji               | 43/Kh&44/Kh   | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc             | Grasses Only                                    | 3.25 Hac        |
|                  |                  | 12/5/2009  | 11:30 a.m | 12/5/2009  | 3:30 p.m     | Aloosa      | Aloosa                 | 11-a/Kh   | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc             | Grasses Only                                    | 1.25 Hac        |
|                  |                  | 12/23/2009 | 10:30 a.m | 12/23/2009 | 6:30 p.m     | Mulkhuihama | Mulkhuihama            | 142/Kh&143/Kh   | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc             | Grasses Only                                    | 1.00 Hac        |
|                  | <b>Sub-toal:</b> |            |           |            |              |             |                        |   |   | <b>0</b>  | <b>5.50 Hac</b> |
|                  | 2010-11          | 9/24/2010  | 11:00 a.m | 9/24/2010  | 7:00 p.m.a.  | Ashtangoo   | Ashtangoo              | 7/Kh  | By beating & Making fire circles  | 40-50 Kail = 02 Nos                             | 1.40 Hac        |
|                  |                  | 9/26/2010  | 11:00 p.m | 9/27/2010  | 10:40 p.m    | Chandaji    | Chandaji               | 27/Kh&29/kh   | By using Soil, Beating, creating fire rings water to some extent etc.                               | Grasses & Bushes Only                           | 1.50 Hac        |
|                  |                  | 10/30/2010 | 10:00 a.m | 10/30/2010 | 4:30 p.m     | Arin        | Arin                   | 111/Kh & 112/Kh   | By using Soil, Beating, creating fire rings water to some extent etc.                               | Grasses & Bushes Only                           | 0.75 Hac        |
|                  |                  | 12/6/2010  | 5:00 p.m  | 12/7/2010  | 4:30 p.m     | Malangam    | Onagam                 | 22/Kh   | By using Soil, Beating, creating fire rings water to some extent etc.                               | Hallow Kail 03 Nos                              | 1.00 Hac        |
|                  | <b>Sub-toal:</b> |            |           |            |              |             |                        |   |   | <b>02 Kail</b>                                  | <b>4.65 Hac</b> |
|                  | 2011-12          | 1/27/2011  | 3:00 p.m  | 2801-2011  | 2:30 p.m     | Arin        | Arin                   | 110-a/Kh  | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc             | Grasses & Bushes Only                           | 1.00 Hac        |
|                  |                  | 1/20/2011  | 2:00 p.m  | 1/20/2011  | 9:30 p.m     | Tragbal     | Tragbal                | 87/Kh   | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc             | Grasses & Bushes Only                           | 0.25 Hac        |
| 1/25/2011        |                  | 3:00 p.m   | 26-012011 | 4:30 p.m   | Arin         | Arin        | 110-a/Kh               | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc       | Grasses & Bushes Only   | 1.20 Hac  |                 |
| 2011-12          | 3/29/2011        | 11:00 p.m  | 3/29/2011 | 4:00 p.m   | Aloosa       | Aloosa      | 10/Kh, 11-a/Kh&11-b/Kh | By beating & Making fire circles  | Grasses & Bushes Only   | 3.00 Hac  |                 |
|                  | 3/29/2011        | 2:00 p.m   | 3/31/2011 | 800 p.m    | Chitternarr  | Chitternarr | 108/kh                 | Fire beating, creation of fire lines, clearance of inspection paths and use of water and soil | Grasses & Bushes Only   | 1.25 Hac  |                 |
| <b>Sub-toal:</b> |                  |            |           |            |              |             |                        |   | <b>0</b>  | <b>6.70 Hac</b>                                 |                 |
| 2012-13          | 4/2/2012         | 6:00 a.m   | 4/2/2012  | 8:00 p.m   | Panar        | Panar       | 98/Kh                  | Fire beating, creation of fire lines, clearance of inspection paths and use of water and soil | Grasses Only  | 2.00 Hac  |                 |

|  |         |                   |           |            |           |                   |                   |                           |   |                             |                 |
|--|---------|-------------------|-----------|------------|-----------|-------------------|-------------------|---------------------------|---|-----------------------------|-----------------|
|  |         | 12/6/2012         | 12:30 p.m | 12/6/2012  | 8:00 p.m  | Chitternar        | Chitternar        | 112/Kh                    | Beating & creation of fire circles around fire by inflammable materials                 | Grasses Only                | 0.50 Hac        |
|  |         | <b>Sub-total:</b> |           |            |           |                   |                   |                           |   | <b>0</b>                    | <b>2.50 Hac</b> |
|  |         | 10/3/2013         | 8:30 a.m  | 10/4/2013  | 4:00 p.m  | Aloosa            | Aloosa            | 11-a/Kh                   | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc | Grasses Only                | 0.25 Hac        |
|  |         | 11/17/2013        | 11:00 a.m | 11/18/2013 | 10:00 p.m | Mulkhuihama       | Mulkhuihama       | 142/Kh & 143/Kh           | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc | Grasses Only                | 0.125 Hac       |
|  |         | 11/17/2013        | 7:15 a.m  | 11/18/2013 | 2:15 p.m  | Aloosa            | Aloosa            | 11/Kh                     | Creation/clearing of fire lines/fire rings and other fire fighting operations           | Grasses & Small bushes Only | 0.15 Hac        |
|  |         | 11/18/2013        | 10:15 a.m | 11/18/2013 | 8:35 p.m  | S C Unit Khayar   | S C Unit Khayar   | 83-a/Kh                   | Creation/clearing of fire lines/fire rings and other fire fighting operations           | Grasses & Bushes Only       | 0.15 Hac        |
|  | 2013-14 | 11/27/2013        | 12:30 p.m | 11/28/2013 | 8:40 p.m  | Malangam          | Malangam          | 21-c/Kh                   | By beating & making fire circles  | Grasses & Bushes Only       | 0.20 Hac        |
|  |         | 11/29/2013        | 10:15 a.m | 11/29/2013 | 8:30 p.m  | Bonakoot          | Bonakoot          | 83-b/Kh                   | Creation/clearing of fire lines/fire rings and other fire fighting operations           | Grasses & Bushes Only       | 0.15 Hac        |
|  |         | 12/7/2013         | 11:30 a.m | 11/8/2013  | 3:30 p.m  | Bonakoot          | Bonakoot          | 82-a,b/Kh                 | Creation/clearing of fire lines/fire rings and other fire fighting operations           | Grasses & Bushes Only       | 0.20 Hac        |
|  |         | 12/13/2013        | 7:00 p.m  | 12/14/2013 | 5:30 p.m  | Malangam          | Malangam          | 21/Kh                     | By beating & making fire circles  | Grasses & Bushes Only       | 0.10 Hac        |
|  |         | 12/16/2013        | 8:00 a.m  | 12/16/2013 | 5:40 p.m  | Aloosa            | Aloosa            | 11-a/Kh                   | By beating & making fire circles  | Grasses & Bushes Only       | 0.075 Hac       |
|  |         | 12/17/2013        | 11:15 a.m | 12/18/2013 | 12:30 p.m | Bonakoot          | Bonakoot          | 83-a/Kh                   | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc | Grasses Only                | 0.10 Hac        |
|  |         | <b>Sub-tota</b>   |           |            |           |                   |                   |                           |   | <b>0</b>                    | <b>1.50 Hac</b> |
|  | 2014-15 | 1/2/2015          | 09:00 a.m | 1/3/2015   | 6:20 p.m  | Ashtangoo         | Ashtangoo         | 9/Kh                      | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc | Grasses & Bushes Only       | 0.50            |
|  |         | 1/2/2015          | 11:00 a.m | 1/3/2015   | 8:35 p.m  | Chitternar        | Chitternar        | 104/Kh                    | By beating & Making fire circles  | Grasses & Bushes Only       | 0.50            |
|  |         | 1/3/2015          | 10:00 a.m | 1/4/2015   | 4:20 p.m  | Arin              | Arin              | 113-a/Kh                  | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc | Grasses & Bushes Only       | 1.00            |
|  |         | 1/7/2015          | 7:00 a.m  | 1/9/2015   | 12:35 p.m | Arin              | Arin              | 112/Kh & 113/Kh           | By beating & Making fire circles  | 50-60=01 No Kail            | 2.00            |
|  | 2014-15 | 1/7/2015          | 3:00 p.m  | 1/9/2015   | 6:30 p.m  | Aloosa            | Aloosa            | 10/Kh, 11-a/Kh & 11-b/Kh  | By beating & Making fire circles  | Grasses & Bushes Only       | 3.00            |
|  |         | 1/7/2015          | 7:45 a.m  | 1/8/2015   | 6:30 p.m  | Pannar/Chitternar | Pannar/Ahamsharif | 101-a/Kh, 103/Kh & 104/Kh | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc | Grasses & Bushes Only       | 1.50            |
|  |         | 1/7/2015          | 9:30 a.m  | 1/7/2015   | 3:00 p.m  | Bonakoot          | Bonkoot           | 82-a/Kh & 82-c/Kh         | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc | Grasses & Bushes Only       | 0.08            |

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*Mohmad Yaseen Najar*

|                  |            |            |            |            |                  |                   |                    |   |   |                                       |       |
|------------------|------------|------------|------------|------------|------------------|-------------------|--------------------|---|---|---------------------------------------|-------|
|                  | 1/8/2015   | 9:00 a.m   | 1/8/2015   | 7:30 p.m   | Ashtangoo/Aloosa | Ashtangoo/Aloosa  | 7/Kh, 9/Kh & 10/Kh | By beating & Making fire circles  | Grasses & Bushes Only   | 0.03                                  |       |
|                  | 1/9/2015   | 2:00 p.m   | 1/10/2015  | 6:00 p.m   | Tragbal          | Tragbal           | 87/Kh              | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc | Grasses & Bushes Only   | 1.00                                  |       |
|                  | 12/26/2015 | 11:30 a.m  | 12/27/2015 | 3:00 p.m   | Bonakoot         | Bonakoot          | 82-b/Kh            | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc | Grasses & Bushes Only   | 2.00                                  |       |
| <b>Sub-total</b> |            |            |            |            |                  |                   |                    |   | <b>01 No Kail</b>   | <b>11.61</b>                          |       |
| 2015-16          |            |            | 0          | 0          | 0                | 0                 | 0                  | 0   | 0   | 0.00                                  |       |
| <b>Sub-total</b> |            |            |            |            |                  |                   |                    |   | <b>Nil</b>  | <b>0.00</b>                           |       |
| Bandipora        | 2016-17    | 9/29/2016  | 10:00 a.m  | 9/29/2016  | 7:00 p.m         | Chitternar        | Chitternar         | 108/Kh  | By beating & making fire rings  | Grasses Only                          | 1.00  |
|                  |            | 10/4/2016  | 4:00 p.m   | 10/4/2016  | 10:45 p.m        | Malangam          | Onagam             | 22/Kh   | By beating & making fire rings  | Grasses Only                          | 1.00  |
|                  |            | 10/12/2016 | 4:15 p.m   | 10/13/2016 | 12:10 a.m        | Malangam          | Quil               | 21-c/Kh   | By beating & making fire rings  | Grasses Only                          | 1.50  |
|                  |            | 10/17/2016 | 1:30 p.m   | 10/19/2016 | 7:00 a.m         | Arin              | Arin               | 110-b/Kh  | By beating & Making fire circles  | 40-50 Kail = 03 Nos, 50-60 Kail=01 No | 2.00  |
|                  |            | 10/18/2016 | 2:30 p.m   | 10/18/2016 | 7:00 p.m         | Bonakoot          | Bonakoot           | 82-b/kh   | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc | Grasses Only                          | 1.50  |
|                  |            | 10/18/2016 | 1:00 p.m   | 10/18/2016 | 5:00 p.m         | Bonakoot          | Bonakoot           | 85-b/Kh   | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc | Grasses Only                          | 0.50  |
|                  |            | 10/22/2016 | 1:00 p.m   | 10/25/2016 | 9:00 p.m         | Panar             | Panar              | 99/Kh & 100/Kh  | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc | Grasses Only                          | 0.40  |
|                  |            | 10/25/2016 | 4:00 p.m   | 10/25/2016 | 11:00 p.m        | Ashtango          | Ashtango           | 9/Kh  | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc | Grasses Only                          | 2.00  |
| Bandipora        | 2016-17    | 10/26/2016 | 2:00 p.m   | 10/29/2016 | 2:30 p.m         | Chandaji          | Chandaji           | 41/Kh   | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc | Grasses Only                          | 1.00  |
|                  |            | 10/28/2016 | 6:30 p.m   | 10/29/2016 | 4:00 p.m         | Aragam            | Aragam             | 145/Kh  | Beatings, clearance of inspection paths & formation of firelines                        | Grasses Only                          | 0.25  |
|                  |            | 11/4/2016  | 3:00 p.m   | 11/5/2016  | 11:00 p.m        | Chandaji          | Chandaji           | 43/Kh   | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc | Grasses Only                          | 1.50  |
|                  |            | 11/4/2016  | 3:00 p.m   | 11/5/2016  | 11:00 p.m        | Chandaji          | Chandaji           | 44/Kh   | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc | Grasses Only                          | 2.00  |
|                  |            | 11/7/2016  | 8:00 p.m   | 11/8/2016  | 1:00 a.m         | S C unit Khayar A | Unit A             | CAMPA Closure   | Clearance of Inspection Paths, Creation of fire rings, plugging of stumps with soil etc | 90% Planting                          | 11.00 |

|           |         |            |            |            |            |                      |                 |                            |   |  |                   |       |
|-----------|---------|------------|------------|------------|------------|----------------------|-----------------|----------------------------|---|--|-------------------|-------|
|           |         | 11/7/2016  | 8:00 p.m   | 11/8/2016  | 1:00 a.m   | S C unit<br>Khayar A | Unit A          | State<br>Sector<br>Closure | Clearance of<br>Inspection Paths,<br>Creation of fire rings,<br>plugging of stumps<br>with soil etc             | Grasses Only   | 5.00              |       |
|           |         | 11/13/2016 | 6:00 p.m   | 11/14/2016 | 2:30 p.m   | Mulkhuih<br>ama      | Mulkhuih<br>ama | 144/Kh                     | Clearance of<br>Inspection Paths,<br>Creation of fire rings,<br>plugging of stumps<br>with soil etc             | Grasses Only   | 1.00              |       |
|           |         | 11/23/2016 | 5:00 p.m   | 11/24/2016 | 4:00 p.m   | Kudara               | Kudara          | 114/Kh                     | Clearance of<br>Inspection Paths,<br>Creation of fire rings,<br>plugging of stumps<br>with soil etc             | Grasses Only   | 1.00              |       |
|           |         | 11/29/2016 | 6:30 p.m   | 11/30/2016 | 11: 30 a.m | Kudara               | Kudara          | 114/Kh                     | Clearing of inspection<br>paths, creation of fire<br>lines/rings, plugging of<br>stumps with soil, rocks<br>etc | Grasses, bushes<br>and regenerated<br>conifer 100 Nos            | 2.00              |       |
|           |         | 12/18/2016 | 6:00 p.m   | 12/19/2016 | 1:00 p.m   | Aragam               | Aragam          | 145/Kh                     | Creation/clearing of<br>fire lines/fire rings<br>and other fire fighting<br>operations                          | Grasses Only   | 2.00              |       |
|           |         | 12/21/2016 | 12:00 p.m  | 12/21/2016 | 08:00 p.m  | Mulkhuih<br>ama      | Mulkhuih<br>ama | 144/Kh                     | Creation/Clearing of<br>fire lines, rings,<br>plugging of stumps<br>with soil etc                               | Grasses Only   | 0.25              |       |
|           |         | 12/21/2016 | 03:00 a. m | 12/26/2016 | 8:00 p.m   | Tragbal              | Tragbal         | 81/Kh                      | Clearance of<br>Inspection Paths,<br>Creation of fire rings,<br>plugging of stumps<br>with soil etc             | 40-50 Kail=04<br>Nos, 50-60<br>Kail=03 Nos &<br>60-70 Kail=01 No | 12.00             |       |
|           |         | Sub-total  |            |            |            |                      |                 |                            |   |  | 12<br>Nos<br>Kail | 48.90 |
|           | 2017-18 | 9/20/2017  | 12:00 Noon | 9/20/2017  | 9:00 a.m   | Ashtango<br>o        | Ashtango<br>o   | 7/Kh                       | Beating & creation of fire<br>circles around fire by<br>removing inflammable<br>materials                       | Grasses Only   | 0.40              |       |
| Bandipora | 2017-18 | 9/27/2017  | 1:00 p.m   | 9/28/2017  | 10:00 a.m  | Chandaji             | Chandaji        | 27/Kh &<br>29/kh           | Beating & creation of fire<br>circles around fire by<br>inflammable materials                                   | Grasses Only   | 1.25              |       |
|           |         | 9/30/2017  | 9:30 a.m   | 9/30/2017  | 4:30 p.m   | Aloosa               | Binlipora       | 11-b/Kh                    | Beating & creation of fire<br>circles around fire by<br>inflammable materials                                   | Grasses Only   | 0.10              |       |
|           |         | 10/9/2017  | 1:00 p.m   | 10/10/2017 | 11:00 a.m  | Arin                 | Arin            | 112/Kh                     | Beating & creation of fire<br>circles around fire by<br>inflammable materials                                   | Grasses Only   | 0.50              |       |
|           |         | 10/30/2017 | 11:00 a.m  | 10/30/2017 | 4:00 p.m   | Bonakoot             | Bonakoot        | 85-b/Kh                    | Beating & creation of fire<br>circles around fire by<br>inflammable materials                                   | Grasses Only   | 1.00              |       |
|           |         | 12/2/2017  | 5:15 p.m   | 12/3/2017  | 4:30 p.m   | Arin                 | Arin            | 111/Kh &<br>112/Kh         | Beating & creation of fire<br>circles around fire by<br>inflammable materials                                   | Grasses Only   | 1.00              |       |
|           |         | 12/4/2017  | 1:30 p.m   | 12/4/2017  | 5:00 p.m   | Chitterna<br>r       | Chitterna<br>r  | 112/Kh                     | Beating & creation of fire<br>circles around fire by<br>inflammable materials                                   | Grasses Only   | 0.50              |       |
|           |         | 1/27/2018  | 3:30 p.m   | 1/29/2018  | 2:30 p.m   | Arin                 | Arin            | 110-a/Kh                   | Fire beating, creation of<br>fire lines, clearance of<br>inspection paths and use of<br>water and soil          | Grasses &<br>Bushes Only   | 50.00             |       |

## Volumes 3 No. 3 (2023)

### FORESTFIRE AND ITS MANAGEMENT IN DISTRICT BANDIPORA JAMMU AND KASHMIR

*Mohmad Yaseen Najar*

|                    |  |           |          |           |          |                |                |          |  |  |               |
|--------------------|--|-----------|----------|-----------|----------|----------------|----------------|----------|--|--|---------------|
|                    |  | 3/25/2018 | 6:00 p.m | 3/25/2018 | 9:30 p.m | Chitterna<br>r | Chitterna<br>r | 109/Kh   | By using Soil, Beating,<br>creating fire rings water to<br>some extent etc.                            | Grasses &<br>Bushes Only               | 0.50          |
|                    |  | 3/25/2018 | 6:00 p.m | 3/26/2018 | 2:30 p.m | Arin           | Arin           | 110-a/Kh | By using Soil, Beating,<br>creating fire rings water to<br>some extent etc.                            | Grasses &<br>Bushes Only               | 0.75          |
|                    |  | 3/29/2018 | 4:00 p.m | 3/31/2018 | 5:00 p.m | Chitterna<br>r | Chitterna<br>r | 109/Kh   | Fire beating, creation of<br>fire lines, clearance of<br>inspection paths and use of<br>water and soil | Kail poles 15<br>Nos                   | 30.00         |
|                    |  | 3/29/2018 | 4:00 p.m | 3/31/2018 | 5:00 p.m | Chitterna<br>r | Chitterna<br>r | 108/kh   | Fire beating, creation of<br>fire lines, clearance of<br>inspection paths and use of<br>water and soil | Kail 50-60 = 03<br>Nos Hallow<br>Burnt | 40.00         |
| <b>Sub-total:-</b> |  |           |          |           |          |                |                |          |  | <b>0</b>                               | <b>126.00</b> |

Forest Fire report of  
Bandipora Forest Division for  
the year 2018-19 (Ending  
March-2019)

| Name of<br>Division | Year                           | Date & time of<br>occurrence |  | Date & Time of<br>Extinguishing of<br>fire |  | Block | Beat | Compt<br>. No | Measures adopted to<br>extinguish the fire | Details of<br>Enquiry/Verification<br>carried out |                            |      |
|---------------------|--------------------------------|------------------------------|--|--|--|-------|------|---------------|--|---|----------------------------|------|
|                     |                                | Date                         |  | Date                                       |  |       |      |               |  | Extend<br>of<br>damage                            | Area engulfed<br>(in Hacs) |      |
| 1                   | 2                              | 3                            |  | 5  |  | 7     | 8    | 9             | 10   |   | 11                         | 12   |
| Bandipora           | 2018-19<br>(Ending<br>03/2019) | ....                         |  | ...  |  | ...   | ...  | ...           | ....                                       |   | ....                       | .... |
|                     |                                | 0                            |  | 0  |  | 0     | 0    | 0             | 0  |   | 0                          | 0    |

Forest Fire report of  
Bandipora Forest Division for  
the year 2019-20 (As on  
ending April-2019)

| Name of<br>Division | Year    | Date & time of<br>occurrence |          | Date & Time of<br>Extinguishing of<br>fire |              | Block  | Beat   | Compt<br>. No | Measures adopted to<br>extinguish the fire  | Details of<br>Enquiry/Verification<br>carried out |                             |          |
|---------------------|---------|------------------------------|----------|--|--------------|--------|--------|---------------|---|---|-----------------------------|----------|
|                     |         | Date                         | Time     | Date                                       | Time         |        |        |               |   | Extend<br>of<br>damage                            | Area engulfed<br>(in Hacs)  |          |
| 1                   | 2       | 3                            | 4        | 5  | 6            | 7      | 8      | 9             | 10  |   | 11                          | 12       |
| Bandipora           | 2019-20 | 4/23/2019                    | 5:00 p.m | 4/23/2019                                  | 11.00<br>p.m | Aragam | Aragam | 145/K<br>h    | By using Soil, Beating,<br>creating fire rings ,<br>Clearing paths etc.Beat<br>Staff, Aragam,<br>Mulkhuihama, RO Ajas&<br>DFO Bandipora<br>participated in<br>extinguishingthe fire |   | Grasses<br>&Bushe<br>s only | 1.00 Hac |
|                     |         | <b>Total</b>                 |          |  |              |        |        |               |   |   |                             | .....    |



Forest Fire report of  
Bandipora Forest Division for  
the year 2019-20 (As on 22-  
09-2019)

| Name of Division | Year    | Date & time of occurrence |          | Date & Time of Extinguishing of fire |           | Block     | Beat      | Compt . No | Measures adopted to extinguish the fire  | Cause of fire | Type of Fire (Crown, Ground, creeping etc) |                         | Details of Enquiry/Verification carried out |                |
|------------------|---------|---------------------------|----------|--------------------------------------|-----------|-----------|-----------|------------|--|---------------|--|-------------------------|---|----------------|
|                  |         | Date                      | Time     | Date                                 | Time      |           |           |            |  |               | Extend of damage                           | Area engulfed (in Hacs) |   |                |
| 1                | 2       | 3                         | 4        | 5                                    | 6         | 7         | 8         | 9          | 10   |               |  | 11                      | 12  |                |
| Bandipora        | 2019-20 | 4/23/2019                 | 5:00 p.m | 4/23/2019                            | 11:00 p.m | Aragam    | Aragam    | 145/Kh     | By using Soil, Beating, creating fire rings , Clearing paths etc.Beat Staff, Aragam, Mulkhuihama, RO Ajas& DFO Bandipora participated in extinguishingthe fire | Natural       | Ground                                     | Grasses & Bushes only   | 1.0 Hac                                     |                |
|                  |         | 9/11/2019                 | 5:30 P.m | 9/12/2019                            | 3:00 p.m  | Kanzalwan | Bagtore   | 69/KG      | By Beating, creating fire rings , Clearing paths etc.Beat Staff, local residents and RO Gurez participated in extinguishingthe fire                            | Natural       | Ground                                     | Grasses & Bushes only   | 1.5Hac                                      |                |
|                  |         | 9/11/2019                 | 6:00 p.m | 9/11/2019                            | 11:30 p.m | Kanzalwan | Kanzalwan | 42/KG      | By Beating, creating fire rings , Clearing paths etc.Beat Staff, local residents and RO Gurez participated in extinguishingthe fire                            | Natural       | Ground                                     | Grasses & Bushes only   | 0.6 Hac                                     |                |
|                  |         | 9/12/2019                 | 2:00 p.m | 9/13/2019                            | 1:00 p.m  | Dawar     | Dawar     | 57/KG      | By Beating, creating fire rings , Clearing paths etc.Beat Staff, local residents and RO Gurez participated in extinguishingthe fire                            | Natural       | Ground                                     | Grasses & Bushes only   | 1.0 Hac                                     |                |
|                  |         | <b>Total</b>              |          |                                      |           |           |           |            |  |               |  |                         | .....                                       | <b>4.1 Hac</b> |

NO:-  
DFO/Bpr/Estt/  
2019/  
Dt:- 25  
/10/2019.

Divisional  
Forest Officer  
Bandipora  
Forest Division  
Chittarnar

### World Forest Scenario

At present the world's total forest area is just over 4 billion hectares, which corresponds to an average of 0.6 hectares per capita (global forest resources assessment 2010). This forest cover is not uniformly distributed throughout the land mass. As per state of world's report 2011, Europe is the richest in forest cover of the world. In term of percentage of land under forest cover, South America is on the top, having nearly half of its land mass under forest and in term of per capita forest area, Oceania stands the first.

Table – 1: Forest area by region wise 2011

| Country/area | Forest area (1000 ha) | % of land area | Area per 1000 people | 1900-2000 (1000 | % | 2000-2010 (1000 | % |
|--------------|-----------------------|----------------|----------------------|-----------------|---|-----------------|---|
|              |                       |                |                      |                 |   |                 |   |

|                           |         |    |      | ha)   |      | ha)   |      |
|---------------------------|---------|----|------|-------|------|-------|------|
| Africa                    | 674419  | 23 | 683  | -4067 | -0.6 | -3414 | -0.5 |
| Asia                      | 592512  | 19 | 145  | -595  | -0.1 | 2235  | 0.4  |
| Europe                    | 1005001 | 45 | 1371 | 877   | 0.1  | 676   | 0.1  |
| Caribbean                 | 6933    | 30 | 166  | 53    | 0.9  | 50    | 0.7  |
| North and central America | 705393  | 33 | 1315 | -289  | 0    | -10   | 0    |
| South America             | 864351  | 49 | 2246 | -4213 | -0.5 | -3997 | -0.5 |
| Oceania                   | 191384  | 23 | 5478 | -36   | 0    | -700  | -4   |
| Total world               | 4033060 | 31 | 597  | -8323 | -0.2 | -5211 | -0.1 |

Source : state of the world forests report, 2011; FAO.

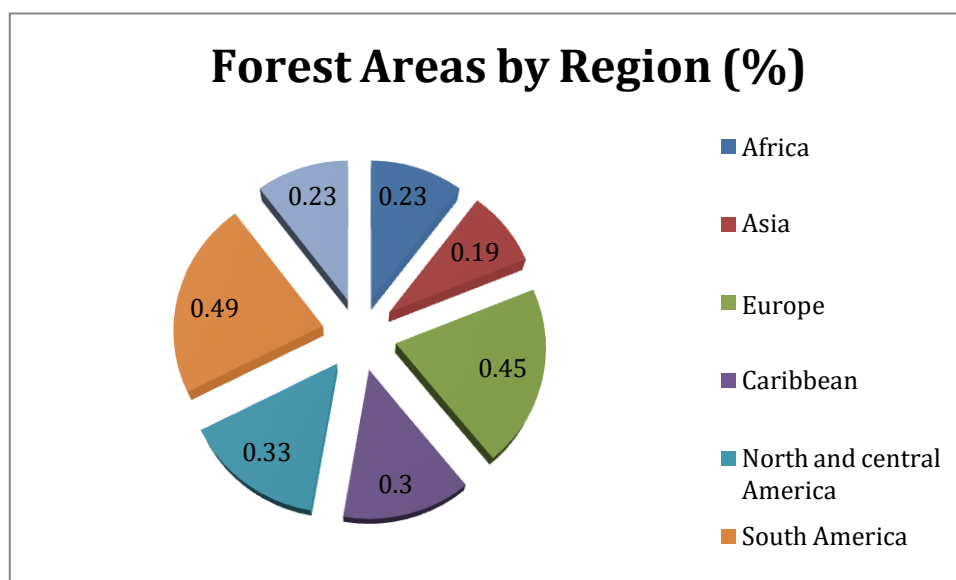


Fig.-1: Forest Areas by Region

by (%)

Distribution of the forest cover over globe is dependent on many factors, mainly geographical characteristics i.e altitude, geology/ soil type and climate. Climatic conditions i.e the temperature and the rainfall are strategic factors in determining the forest distribution. Based on the two factors four types of forests have been identified globally i.e tropical, subtropical, temperate and boreal forests, which are further sub grouped into thirteen sub types.

**Jammu and Kashmir Forest Scenario:-**

Jammu and Kashmir State is a forest rich State having 20,230sq km of forest i.e.about 10% of its geographical area. If Ladakh region is excluded which does not have significant expanse of natural forests, the proportion of natural forests in the state area increases to 47%. Per capita forests and tree cover in the state is about 0.15 ha which almost double the national average of 0.07 is ha. The forests in Kashmir region mostly fall in dry temperate class. These forests are predominantly having conifers comprising of Deodar, Kail and Fir. The distribution of these species varies with altitude.

These forests are not normally vulnerable to forest fires as they are predominately having evergreen species and lush green ground cover. The vulnerability increases during the autumn season if it remains dry for long period. During summer season hurricanes sometimes cause immense damage to forests. Pest attack also takes place at times in summer months in respect of few species where there is mono culture. Flush floods in forest areas are also common which cause immense damage to forests and at times block the connectivity between the villages.

The forest cover of the State as per 2011 assessment presents position as under:-

| Very dense forest | Moderately dense forest | Open Forest    | Scrub          | Non Forest     | Total          |
|-------------------|-------------------------|----------------|----------------|----------------|----------------|
| Area in sq. km    | Area in sq. km          | Area in sq. km | Area in sq. km | Area in sq. km | Area in sq. km |
| 4140              | 8760                    | 9639           | 2105           | 197592         | 222236         |

District – wise forest cover of Jammu and Kashmir  
(area in sq. km)

| District    | Geographical area | 2013 Assessment   |                         |             |       | Per cent of GA | Change | scrub |
|-------------|-------------------|-------------------|-------------------------|-------------|-------|----------------|--------|-------|
|             |                   | Very dense forest | Moderately dense forest | Open forest | Total |                |        |       |
| Anantnag    | 3984              | 196               | 664                     | 578         | 1438  | 36.09          | 0      | 23    |
| Baramulla   | 4588              | 425               | 286                     | 446         | 1157  | 25.22          | 0      | 86    |
| Budgam      | 1371              | 99                | 69                      | 52          | 220   | 16.05          | 0      | 8     |
| Doda        | 11691             | 619               | 1689                    | 1659        | 3967  | 33.93          | 0      | 5     |
| Jammu       | 3097              | 0                 | 210                     | 672         | 882   | 28.48          | 0      | 43    |
| Kargil      | 14037             | 0                 | 3                       | 21          | 24    | 0.17           | 0      | 19    |
| Kathua      | 2651              | 112               | 672                     | 615         | 1399  | 52.77          | 1      | 12    |
| Kupwara     | 2379              | 472               | 366                     | 322         | 1160  | 48.76          | 0      | 3     |
| Leh         | 45110             | 0                 | 48                      | 57          | 105   | 0.23           | 0      | 6     |
| Outside LOC | 120848            | 1326              | 2472                    | 2687        | 6485  | 5.37           | 2      | 1810  |
| Poonch      | 1674              | 187               | 300                     | 242         | 729   | 43.55          | 0      | 9     |
| Pulwama     | 1398              | 110               | 106                     | 78          | 294   | 21.03          | 0      | 10    |
| Rajouri     | 2630              | 49                | 439                     | 752         | 1240  | 47.15          | 0      | 8     |
| Srinagar    | 2228              | 196               | 307                     | 249         | 752   | 33.75          | 0      | 16    |
| Udhampur    | 4550              | 349               | 1129                    | 1208        | 2689  | 59.03          | -3     | 47    |
| Grand total | 222236            | 4140              | 8760                    | 9638        | 22538 | 10.14          | -1     | 2105  |

More than 56% area of the State is under Glacier / permanent snow and naturally not available for Agriculture and tree planting. Out of the remaining area more than 74% is either under forest or not available for use. Approximately 3 % area is available for pasture and grazing. Though density of human population is concentrated in the lower portion of State in the valley yet sizable population lives in the mountainous tracks surrounding it. The people living in this high altitude track mainly sustain through rearing of their livestock. Stall feeding is not common. During summer months the livestock permanently remains in the high altitude grazing lands locally called as 'Bahaks. Because of the movement of this sizeable population through the forests and dependence on them accidental damages in the shape of forest fires are common. These fires during summer months do not have any impact because of lush green environment and soothing temperatures. However these accidental fires become disastrous during dry months of autumn and sometime early winter. This is the main issue before the Forest Department and reason for drawing up of this plan.

#### **Forest disasters**

The valuable forests of the State are to be shielded against the dangers which either can completely destroy them or at least damage them to such extent that they may no more remain able to perform the functions and confer benefits which they are expected to give. This is what can be termed as Forest Protection. Protection requires efforts as well as financial backup. As regards the causes of the forest damages they are immense. The important one is that of forest fire.

#### **Consequences of Forest Fires:**

Forest fires sometimes cause colossal damages to the forest unless they are mild and controlled in time. The damages caused are:-

- i. Damage to trees
- ii. Damage to regeneration
- iii. Damage to soil
- iv. Damage to productive capacity of the forest
- v. Damage to protective capacity of the forest
- vi. Damage to wild animals
- vii. Damage to the recreational and scenic value of forests

These damages are result of the nature of the fires and time taken to restrict and extinguish the same.

#### **District Forest Fire Management Committee**

The Control Rooms already established at Divisional level will remain operative for firefighting measures. However for real time monitoring of situation and mobilizing all available resources at District level, the committees will have to be constituted as was discussed in detail in the meeting taken by the Divisional Commissioner, Kashmir. The constitution of the committees will be as under:-

|   |                  |
|---|------------------|
| District Level Committee                | Chairman         |
| District Dev. Commissioner              | Member Secretary |
| DFO Territorial                         | Member           |
| Superintendent of Police                | Member           |
| Deputy Director Forest Protection Force | Member           |
| Wildlife Warden                         | Member           |
| DFO Social Forestry                     | Member           |
| District Soil Conservation Officer      | Member           |

The Committee shall monitor and coordinate the forest fire, prevention and control in the District and shall meet once in a month to take steps required for effective management of prevention of forest fire incidents. The committee will work in coordination with the District Disaster Management Committees.

**Mitigation measures:**

Protection against damage by fire

Fires are most destructive elements. They can destroy all the life forms, because serious soil erosion, kill all micro-organisms and destroy the ecosystem that had been built up over a long period of time. The protection against the fire damage requires to be carefully devised and executed. The methods that can be both preventive and remedial are briefly given in the action plan drawn as under:-

**i. Direct preventive measures**

The measures to be adopted are:-

a) Organization and detailing of staff for fire control rooms:

Control rooms have already been established in all Divisions at Divisional Headquarters. What is required is connectivity by providing wireless sets / cell phones, mobility facilities (some pickup Vans) and proper gear for the staff to save themselves from any injury while extinguishing fires, first aid kits for emergencies and tools for carrying out the fire control operations.

b) Hazard reduction: Forest fires can be prevented by reducing or limiting the exposure of forests to fire risks. This may be achieved by creating fire lines and maintaining them in the subsequent years.

**ii. Remedial measures:**

These refer to measures which are to be taken to extinguish them when they break out in spite of the preventive measures. The action has to be quick. The delay can be avoided by quick detection, quick communication of occurrence of fire and quick action to suppress it.

a. Detection:

For quick detection there should be provision of engaging local fire watchers during the fire season for ground patrolling. There have to be facilities of communication to send information to the Range / Divisional Headquarters for mobilizing staff and labour. Again the transport facilities should be handy for moving the staff and the labour to the site

b. Quick action for suppression of fire

For quick action sufficient labour force and staff is required to be deployed. Arrangement of tools, food, water and lighting should be there as the process of fire extinguishing sometimes

may take days together. The arrangement of transportation of men and material should be available.

#### **Methods of fire extinguishing**

Since large occurrence of fires is not there in the region except during the prolonged dry season as such conventional methods of fire extinguishing are in vogue at present which are :-

- i. by water
- ii. by earth
- iii. by beating iv. by counter firing.

Extinguishing of fires by throwing water is only possible in plain area where water is readily available. Extinguishing of fire by throwing soil on it is a time consuming operation and the only and the best way to extinguish all surface fires is to beat them out with brooms, branches etc. counter firing is required where area of the fire is to be restricted to a small portion and then controlling it. For all such operations fire is to be restricted first to some area and for that fire traces are to be created by removal of inflammable material, cutting the branches and clearing the strip of sufficient width. The distance of fire trace from the advancing fire will be governed by:

- a) Speed of advancing fire
- b) Labour force available
- c) Length of fire trace
- d) Topography

#### **Safety measures in fire fighting**

Unsafe and careless fire-fighting strategy can be hazardous or even fatal to the men at the fire front. The safeguards to be taken are:

- a) Wear non synthetic fire proof clothing to protect it from heat
- b) Use head gear and goggles from radiant heat, sparks etc.
- c) Use footwear preferably leather boots
- d) Carry enough water to guard against desiccation by heat
- e) Carry first aid kit for emergencies
- f) To plan for escape route in case of danger
- g) To maintain communication between fire fighters

#### **Fire-fighting tools**

With the advancement in fire control measures the tools are also likely to go on changing however, the common tools of use are:

- a) Peg type fire rakes
- b) Adjustable sticks
- c) Nail type fire rakes
- d) Fire beaters
- e) Brooms
- f) Fire pathal
- g) Water bottles
- h) Haversacks
- i) Adjustable head lamps
- j) Torches

- k) Spades
- l) Pick axes
- m) Power chain saws
- n) Axes

### **Conclusion and suggestions**

Forest cover in India despite its richness in flora and fauna, is very less, when compared to its total population. This natural resource is under tremendous pressure due to various factors. Fire is one of the major causes of injury and loss to forest wealth. As in most of the cases the reasons behind forest fire are human induced and the frequency and subsequent damage due to forest fire are on the rise. Due to population growth and various other factors, the forest fire situation in India has become grim. Moreover, country's forests are under constant threat from forest fires that causes much loss to forest wealth and environment. Though small scale controlled forest fire is necessary for good forest growth, yet the uncontrolled large forest fire are very damaging and have long lasting and disastrous impact on forest. The main responsibility of forest fire management lies with the State Forest Department. The Minister of Environment & Forests, Government of India is the nodal ministry for forest fires.

People's participation, creating awareness among citizens can play a significant role in prevention and control of forest fires. Advertisement through local media like radio, television, pamphlets, signboards, newspapers, panchayats, etc. may be very effective in this regard. Teaching people how to control forest fire may be effective tool of forest fire management techniques. Special emphasis should be laid on the research, training, and development.

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