FOREST FIRE

Risk Zonation and Vulnerability Assessment
Forests of Jammu and Kashmir
2021

Study Under **CAMPA**
J&K Forest Department
Government of Jammu and Kashmir

(Jammu Office) Van Bhawan, Near Gumat Jammu, J&K – 180001- (Phone/Fax): 0191-2547276
(Srinagar Office) Forest Complex, Sheikh Bagh, Near Lal Chowk, Srinagar, J&K-190001 (Phone/Fax): 0194- 2455027

Executed by:
Department of Ecology, Environment & Remote Sensing
Government of Jammu and Kashmir

(Jammu Office) Paryawaran Bhawan, Gladeni, Transport Nagar, Narwal, Jammu, Tawi – 180006 (Phone/Fax): 0191-2474553
(Srinagar office) SDA Housing Colony Bemina, Srinagar-190018 (Phone/Fax): 0194-2494585 website: www.jkdears.com

An Poshi Teli,
Yeli Wan Poshe

Food will thrive only, till
the woods survive

-Nund Reshi

Forest Fire Risk Zonation & Vulnerability Assessment Forests of Jammu & Kashmir

Project Implementing Agency

Departmentof Ecology, Environment & Remote Sensing Government of Jammu & Kashmir

(Jammu Office) Paryawaran Bhawan, Gladni, Transport Nagar, Narwal, Jammu, Tawi – 180006 (Phone/Fax): 0191- 2474553

(Srinagar Office) SDA Housing Colony Bemina, Srinagar-190018 (Phone/Fax): 0194-2494585

Project Sponsoring Agency

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Department Of Ecology, Environment & Remote Sensing
Government of Jammu & Kashmir

Document title	Forest Fire Risk Zonation & Vulnerability Assessment
Report No.	DEERS/FOREST FIRE/2 of 2021
Publication date	November 2021
No. of pages	332
Author	Majid Farooq, PI.
Co-Authors	Muzamil Ahmad Rather, Geospatial Analyst, Sohieb Gazali, Geospatial Analyst
Originating unit	Department Of Ecology, Environment & Remote Sensing Jammu & Kashmir
Security classification	Unrestricted
Distribution statement	Officials, academicians and researchers
Abstract	This report is a follow up to the initial study which was undertaken in 2019-20 to map vulnerable areas based on actual fire incidences over the years 2012-2018. The study was carried out with the financial support from the CEO, CAMPA under CAMPA program. The present study on "Forest Fire Risk Zonation and Vulnerability Assessment" has been carried out based on the various factors responsible for forest fires, such as fuel, wind speed, slope, aspect, proximity to roads, proximity to infrastructure and ecological conditions. In this study, an attempt was made to model the forest fire risk zones based on various indicators as prescribed in the National Action Plan on Forest Fire (NAPFF). The study is a welcome step for crafting suitable management action plan to minimize incidents of forest fires and prevent damage to rich biodiversity of Jammu and Kashmir. The present study will help in strengthening forest fire prevention and management in Jammu and Kashmir and to give inputs to policy makers for preparation of State Action Plan on Forest Fire (SAPFF).
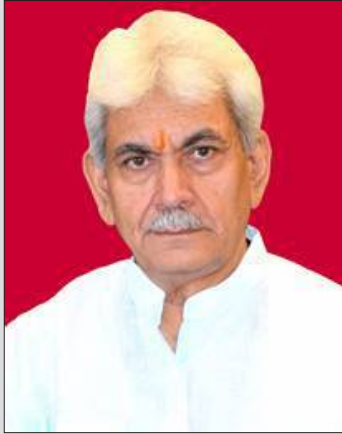
Manoj Sinha
Lieutenant Governor
Jammu & Kashmir.

MESSAGE

I am pleased to learn that the Department of Ecology Environment and Remote Sensing is bringing out the report on "Forest Fire Risk Zonation and Vulnerability Mapping", which is crucial to sustainable management of our precious forest resources.

Jammu and Kashmir is endowed with diverse forests that are an integral part of its ecology, cultural heritage and livelihood. The sustainable management of forest assets and their growth has always been a priority in J&K, which aims to bring two third of its geographical area under forest and tree cover.

Prevention and control of forest fires assumes an important place in management of forests. An uncontrolled forest fire invariably destroys life forms, productivity of ecosystem as well as endangers sustainability of forests. The use of geospatial information and technology to assess and map the vulnerability to forest fires is of utmost significance for scientific planning and management of forests.

The report on "Forest Fire Risk Zonation and Vulnerability Mapping" prepared by the Department of Ecology, Environment and Remote Sensing in collaboration with Forest Department will bolster the efforts of Forest Department to prevent and effectively manage forest fires in Jammu and Kashmir.

I am confident that this report will further strengthen the efforts of the Forest Department in advance planning and scientific management of forests of Jammu and Kashmir

(Manoj Sinha)

Arun Kumar Mehta, IAS
Chief Secretary
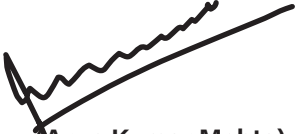**Government of Jammu & Kashmir**

MESSAGE

Forests play a very significant role in the well-being of mankind. They provide a whole range of ecosystem services, besides being a major source of timber, firewood, fodder and other forest produce to the forest dependent communities. During the course of evolution, forest fires have greatly influenced the biological communities. However, with changes in the global climate scenario, together with changed human-fire dynamics, forest fires have become a major threat to many forests and their biodiversity, besides having considerable impacts on the economy and the society.

The National Action Plan on Forest Fires has been formulated by Ministry of Environment, Forest and Climate Change to minimize forest fires by developing strategies for effective prevention and control of forest fires. The plan also aims to substantially reduce the vulnerabilities of forests across the diverse forest ecosystems against fire hazards, enhancing the capabilities of forestry personnel, local communities and institutions in dealing with forest fires, and speed up recovery after a fire event.

GIS based intervention for mapping of vulnerable forest areas based on actual fire incidences help in advance planning and management of such areas. The present report on "Forest Fire Risk Zonation and Vulnerability Assessment" based on the factors responsible for forest fires, such as fuel, proximity to infrastructure and ecological conditions is a welcome step in this direction.

I congratulate the J&K Forest Department to have taken this initiative in collaboration with Department of Ecology, Environment and Remote Sensing. The Forest Department must adopt the recommendations from this report for preparation of a comprehensive Action Plan on forest fire management in Jammu and Kashmir. I look forward to further progress being made in Jammu and Kashmir in terms of improving forest fire management.

(Arun Kumar Mehta)

Sanjeev Verma, IAS
Commissioner/Secretary to Govt.,
Forest, Environment & Ecology
Government of Jammu & Kashmir.

MESSAGE

Forests are nature's bounty to mankind and play a critical role in ensuring sustainable development. Forests are a centre piece for nurturing & conserving biodiversity; they are generating significant eco¬system services and economic resources. Vast forest resources of Jammu & Kashmir are priceless trea¬sures, that must be conserved for future generations.

Forests face tremendous anthropogenic pressures, as they render variety of services: on account of remov¬al of fuelwood, fodder, grazing. This pressure is further heightened by Forest Fires, that pose a grave threat to entire regime of flora, fauna and adversely impact the ecology of that area. Baneful impacts of forest fire do not remain confined to the damage only, but exceed far beyond and have socioeconomic implications also.

Forest fires are quite common in sub-tropical Jammu region. Their frequency has generally been low in Kashmir region. However, factors such as changes in precipitation patterns and rising temperatures are cre¬ating favourable conditions for higher incidents of forest fires in colder regions as well. Over the years, Jam-mu & Kashmir has witnessed an abnormal increase in the fire incidents across forest area. Changing climatic conditions and rising temperatures accentuate the vulnerability to forest fires, therefore, advance planning based on scientific studies can significantly contribute in preventing such events.

Report on "Forest Fire Risk Zonation & Vulnerability Assessment of Forests of Jammu & Kashmir" will cer¬tainly prove instructive for crafting suitable management action plan to minimize incidents of forest fires and prevent damage to rich biodiversity of Jammu and Kashmir.

I commend the efforts of Department of Ecology, Environment and Remote Sensing for conducting an insightful study for bringing out this publication. I am also sanguine that the J&K Forest Department will effectively harness this report, to further strengthen forest management in Jammu and Kashmir.

Sanjeev Verma

Dr. Mohit Gera, IFS
Pr. Chief Conservator of Forests
and Head of Forest Force
Jammu & Kashmir.

MESSAGE

Forests constitute the largest, most complex and important national resource mostly dominated by trees and home to around 80% of biodiversity. However, forests face tremendous pressure because of increasing population and demand for forest produce like fuelwood, fodder, grazing and other non-timber forest products. Along with other pressures, forest fires are the major cause of injury and loss to forests.

Prevention and control of forest fires assumes an important place in management of forests. As per Forest Survey of India's ISFR-2019 report, less than 4% of the forest area of Jammu and Kashmir is fire prone. However, the incidents of fire are on rise at national level due to changing climate, rise in temperatures and extended drought conditions. This calls for enhanced preparedness and advance planning for fire management in Jammu and Kashmir.

The Department has already carried out fire vulnerability mapping for each division of the UT as well as formulated strategies for effective prevention and control of forest fires. The next step in this direction is the risk zonation mapping of our forests for which Department of Ecology, Environment & Remote Sensing was approached. It is heartening to note that the study has been completed and the report on "Forest Fire Risk Zonation and Vulnerability Assessment of Jammu and Kashmir" is being published. This will certainly help the Forest Department for advance planning and effective fire management.

I take this opportunity to compliment the efforts of Scientists and staff of the Department of Ecology, Environment & Remote Sensing, who have contributed in making of this report. I take this opportunity to congratulate Dr. Neelu Gera, IFS PCCF/ Director, Department of Ecology, Environment & Remote Sensing and Sh. Majid Farooq, Scientist who have taken the pains to carry out this study and brought out this report.

Mohit Gera

PREFACE

Dr. Neelu Gera, IFS
PCCF/ Director, Ecology, Environment & Remote Sensing,
Government of Jammu & Kashmir.

Forests play a very significant role in the human wellbeing. They are vital for sustainable development and provide a whole range of ecosystem services. Although forest fires are an integral part of the functioning of numerous ecosystems, they are also one of the major forces that have short- and long-term influence on biological communities. However, with changes in the global climate scenario, together with changed human-fire dynamics, forest fires have become a major threat to many forests and their bio-diversity, besides having considerable impacts on the economy and society.

The National Action Plan on Forest Fires (NAPFF) has been formulated to minimize forest fires by developing strategies for effective control and management of forest fires. The NAPFF aims to substantially reduce the vulnerabilities of forests across the diverse forest ecosystems against fire hazards. A GIS based initial study was undertaken in 2019-20 to map vulnerable areas based on actual fire incidences over the years 2012-2018. The study gave an overview on the areas requiring immediate attention. As a follow-up, the present study was undertaken in 2020-21, to develop forest fire risk zonation, based on the factors responsible for forest fires, as suggested in NAPFF.

I thank the Forest department, especially CAMPA secretariat, to have entrusted this study to the Department of Ecology, Environment and Remote Sensing, which is not only the first of its kind in Jammu and Kashmir, but will also pave the way for effective management of forests. I look forward to more such collaborative projects to improve the quality of our forests.

I also congratulate and compliment the entire project team for its efforts in bringing out this report. I am sure that the study will play an important role in strengthening forest fire management and control in Jammu and Kashmir.

Neelu Gera

ACKNOWLEDGMENTS

Majid Farooq
Principal Investigator/ Scientist Forest Fire Mapping Project
Ecology Environment & Remote Sensing,
Government of Jammu & Kashmir.

In Jammu & Kashmir, forest fires are an annual and prevalent phenomenon particularly in Jammu Region. Most fires are witnessed during early springs, mid-summers and late autumn, when the forests become littered with dry ageing leaves and twigs besides annual migration by nomadic communities thereby increasing the probability of starting and spreading of fire. The analysis of spatial extent and distribution of forest fires is essential for sustainable forest management. Knowledge of cause, extent and impact of forest fires on ecosystems, and their link to the goods and services that people derive from forests is limited. Without a proper understanding of the causes and effects of fire it is not possible to strive for fire management that meets the livelihoods needs of forest-dependent communities while conserving forests and biodiversity.

This report was prepared by the Department of Ecology, Environment and Remote Sensing in response to a request for technical assistance from the Forest Department, J&K Government, to help strengthen forest fire prevention and management in Jammu and Kashmir and to give inputs to policy makers for preparation of State Action Plan on Forest Fire (SAPFF). In this study an attempt was made to model the forest fire risk zones based on various indicators as prescribed in the National Action Plan of Forest Fire (NAPFF). Actual forest fire incidence data was used to validate the results. I am very grateful for the support of Dr. Neelu Gera, IFS, PCCF/Director Ecology, Environment and Remote Sensing for continuous support, guidance constructive revisions. Her disposition to listen, discuss and render critical judgments helped me to produce this report in its present shape. The team would also like to thank Dr. Mohit Gera, IFS, PrCCF (HoFF) for his encouragement, support and for shaping this report in planning-oriented manner.

The team gratefully acknowledges Sh. Sarvesh Rai, APCCF, CEO, CAMPA for providing the financial support under CAMPA.

The report benefited greatly from meetings, workshops and discussions with participants organized by forest department from time to time. Con¬structive comments on the report were received during these interactions.

I would also like to acknowledge other colleagues, particularly Sh. Humayun Rashid and Dr. Tasneem Keng, for their suggestions and guidance.

The report was prepared by sheer dedication and hard work of my core teammates comprising of Muzamil Ahmad Rather and Sohieb Gaza-li. They deserve prime acclaim for working day and night with their endless determination in completing the project.

I hope that this document will serve the Forest Department and Disaster Management Department in focussed planning. We at Department of Ecology Environment and Remote Sensing, shall strive to improve upon the results and come up with more micro level analysis, with advancement in technology and accuracy of datasets.

Majid Farooq

CONTENTS

PROJECT TEAM

Overall Supervision and Guidance:
Dr. Neelu Gera, IFS
PCCF/ Director,
Ecology, Environment & Remote Sensing,
Government of Jammu & Kashmir.

Principal Investigator:
Mr Majid Farooq, Scientist

Technical Team:
Mr Muzamil Ahmad Rather, Geospatial Analyst.
Mr Shoieb Gazali, Geospatial Analyst.

EXECUTIVE SUMMARY

Forest fires have been recognized globally as one of the most serious environmental hazards causing huge damage to forest fauna, flora and soils, besides disturbance to eco-logical balance. Standing trees, shrubs and grasses are destroyed on a large scale and natural regeneration annihilated by such fires. The important factors which get influenced by forest fires include soil nutrient availability, plant community development and biological diversity. Forest fires can have large impacts on economy, human population and environment. The fire incidences are greatly affected by weather patterns and land use practices. Forest fires can be intentional as well as unintentional. Un-extinguished camp-fires of trekkers, un-extinguished bidis, matchsticks and cigarette butts, burning of agricultural residues near forest areas, etc., can cause forest fires due to human carelessness. Lightening and rolling stones may cause natural fires.

The National Forest policy outlines the strategy on the incidence of forest fires and reports it to be high in the country. The policy emphasis that special precautions should be taken during the fire season, along with adoption of improved and modern management practices to deal with forest fires. The Jammu and Kashmir Forest policy also focuses on the management aspects of forest fires and enslisting it as an important aspect of forest protection. Recognizing the need to revamp forest fire management in the country, the Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India has launched the National Action Plan on Forest Fires, NAPFF, 2018. Main objectives of the action plan is to reduce the incidences of fires and to reduce the vulnerability of forests against fire hazards across the diverse forest ecosystems in the country, enhancing the capabilities of institutions in fighting fires, and accelerating the recovery after a fire incidence. Forest fire risk zonation and vulnerability assessment is very crucial information required by planners and decision makers for assessing the fire vulnerability of the area, so that advance protective and remedial measures are taken to minimize the economic and biodiversity loses.

Risk factors identified and included in NAPFF:

- Fuels such as litter, grass, fallen trees and branches.
- Proximity to infrastructure, property, and other assets, including roads, habitation and other buildings, agricultural lands, transmission lines, and railways.
- Topography, including slope, aspect, elevation, terrain ruggedness and other characteristics.
- Social indicators, including local dependence on forests for livelihoods, poverty and traditional land use practices.
- Historic fire occurrence and patterns may be used to identify areas that are most prone to fire.
- Areas of special ecological or cultural importance, including protected areas, historic sites, designated heritage sites, temples, pilgrimage routes, etc.
- Special ecological conditions, temperature, wind etc.

Components of systematic strategic planning under NAPFF:

- Fire risk zonation and mapping
- Preventing forest fires
- Increasing the resilience of forests to fires
- Forest Fire preparedness
- Fire suppression
- Post Fire management
- Coordination with other agencies
- Centre of Excellence for Forest Fires
- Mobilization of financial resources

Geoinformatics in Forest Fire Management

Geoinformatics technology has a great potential in forest fire mapping monitoring and management. This technology can be effectively used for mapping active and burnt areas as well as for forest fire prone area mapping (fire risk zonation and vulnerability). The increased availability of satellite data has helped in better management, analysis and utilization of data. A new generation of satellite sensors are now available which have advanced capabilities to help in corridor mapping, deforestation, landscape fragmentation, carrying capacity and forest fire risk zonation.

   The forest fire is a serious challenge that requires the understanding of parameters like Land Use Land Cover (LULC), wind, slope, aspect, roads and settlements of the area etc. A comprehensive methodology, which incorporates the use of satellite data, digital elevation data, field data, secondary ancillary data and geospatial tools was required to be used. In the present study, a combination of the Multi-Criteria Evaluation (MCE) and Analytical Hierarchy Process (AHP) methods in GIS environment were used for carrying out forest fire risk zonation and vulnerability analysis.

   In the present study, six important parameters, viz., Land use, Wind speed, Proximity to Settlements, Proximity to Roads, Slope & Aspect, influencing the occurrence of a forest fire, were used. For assigning weights to each parameter, AHP method was used which help in analyzing the inter-linkages of parameters and help to evaluate pairwise comparisons while relying on the judgments of experts to derive priority scales. A pair-wise comparison matrix was created for determining the factor weights for each parameter in AHP method. The data of all the six parameters were ordered in GIS environment, grouping the values of each parameter in a fixed number of classes. The classes within each parameter were associated against each other in a matrix to arise a corresponding weight for each class. Based on AHP method intensity scale values ranging from (1 -9) and their corresponding relevance were used. Higher scale values were assigned to cells which are more vulnerable to fire and lower values were given to cells which are less vulnerable to fire. Cells representing areas of water bodies and non forest were restricted. Highest weight of 25% were given to parameters LULC and wind speed, followed by a weight of 15% to parameters proximity to settlements and proximity to roads. The least weight of 10% were given to parameters slope and aspect. The final result forest fire vulnerability map was accomplished using a ModelBuilder.

Intensity of importance scale used in AHP along with definitions

Intensity of importance	Definition	Explanation	Other scales
1	Equal importance	Two elements contribute equally to the objective	2,4,6,8 can be used to express intermediate values, 1.1, 1.2, etc. for elements that are very close in importance
3	Moderate importance	Experience and judgment slightly favor one element over another	
5	Strong Importance	Experience and judgment strongly favor one element over another	
7	Very strong importance	One element is favored very strongly over another, its dominance is demonstrated in practice	
9	Extreme importance	The evidence favoring one element over another is of the highest possible order of affirmation	

Overall methodology adopted

| LULC | Slope & Aspect | Road & Settlement | Wind Distribution |

↓ ↓ ↓ ↓

Processing

Analytical Hierarchy Process ← **Weightage based on Literature survey**

Weighted Overlay Analysis

Forest Fire Vulnerability Map
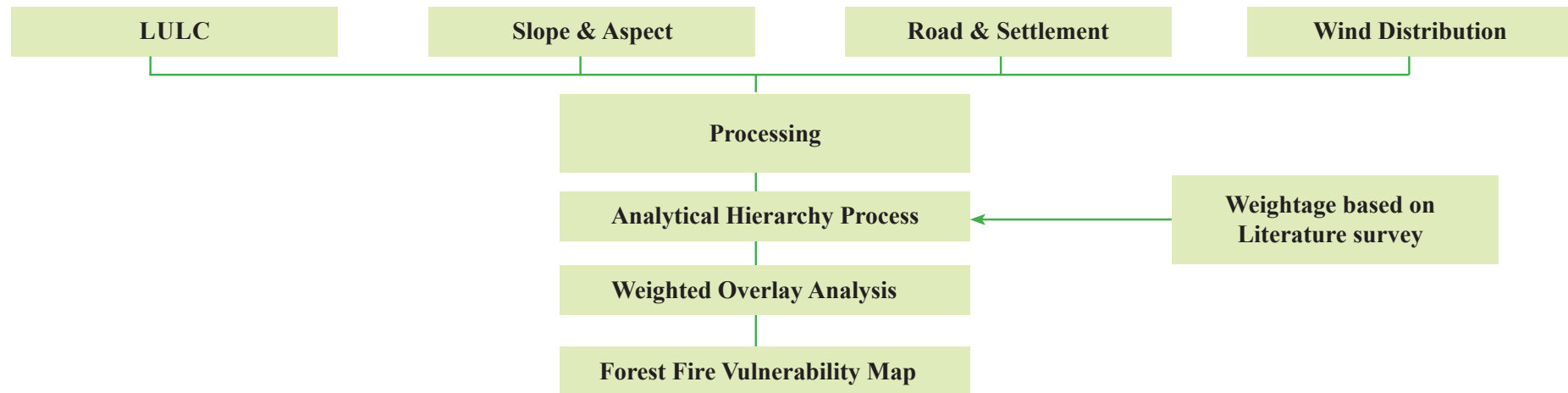
Datasets used

Dataset Name	Source
LULC data	SIS DP Phase I Project (Originally generated from a merged data product 2.5m (Cartosat ortho 2.5m and LISS IV ortho 5.8m).
Average wind speed data (spatial resolution of 250 meters)	Downloaded in grid format from the Global Wind Atlas portal
Road and Settlement layers	SIS DP Phase I Project (Originally generated from a merged data product 2.5m (Cartosat ortho 2.5m and LISS IV ortho 5.8m)
ALOS (Advanced Land Observing satellite)-PALSAR (Phased Array type L-Band Synthetic Aperture Radar) DEM (Digital Elevation Model) with a spatial resolution of 12.5 m	Downloaded from the Alaska Satellite Facility (ASF) Distributed Archive Center
Point Data pertaing to actual forest fire incidences	Jammu & Kashmir Forest Department (year 2002-2018)
Forest Management Boundary comprising of Divisions, Ranges, and Compartments	PI Division, J&K Forest Department, rectified and updated before used for the analysis

Disclaimer

The digital (Forest Management Boundaries) database in the shapefile format comprising of 30 Divisions, 102 Ranges, and 6646 Compartments used for the analysis have been provided by Forest Department of J&K. The number, area figures and boundary limits of these Forest Management Boundaries may or may not vary with the database pertaining to same Forest Management Boundaries from other souces.

Forest fire risk assessment parameters used

LULC Classes	Scale Value
Non-Forest	Restricted
Water	Restricted
Forest	9
Scrub	8
Grazing & Grassland	3
Weightage	25 %.

Road zones	Scale Value
(0-100 m):	9
(100-200 m):	8
(200-300m):	7
(300-400m):	6
(>4000m):	1
Weightage	15 %.

Wind speed	Scale Value
Class 5	9
Class 4	8
Class 3	6
Class 2	4
Class 1	3
Weightage	25 %.

Slope Class	Scale Value
0 –15° (Flat):	3
15 – 30° (Gentle):	8
30- 45° (Medium slope):	6
45 - 60° (Steep slopes):	4
>60° (Very Steep slopes):	9
Weightage	10 %.

Settlement zones	Scale Value
(0-500 m):	9
(500-1000m):	7
(1000-1500m):	5
(1500-2000m):	3
(>2000m):	1
Weightage	15 %.

Aspect Class	Scale Value
(Flat & N):	2
(NE & E):	6
(S, SE & SW):	9
(NW):	1
(W):	2
Weightage	10 %.

Collective impact of Land use, Wind speed, Proximity to Settlements, Proximity to Roads, Slope & Aspect

Forest fire vulnerability of an area is influenced by a combined impact of factors like land use, slope and aspect. In order to find the combined contribution of the factors towards the fire vulnerability, all the layers included in the present study were integrated to find the overall fire risk zonation and vulnerability of the study area. All the layers were assessed for forest fire vulnerability of the study area and each class of all the different layers included were assigned a scale value and final weights to each layer as per AHP analysis results. Generated division wise each vulnerability map have been classified into four vulnerability zones, viz., high, medium, low and unlikely. High vulnerability zone represents the areas (Compartments) that are highly vulnerable to fires and needs immediate attention for planning to minimize the damage.

Forest Fire Risk Zonation and Vulnerabilty of Forests of Jammu and Kashmir

The study area was entire Jammu and Kashmir with geographical co-ordinates ranging from 32°16'28.955"N - 34°49'31.149"N latitude and 73°44'59.017"E - 76°46'20.057"E longitude. A total of 102 forest ranges of 30 forest divisions of the UT of Jammu & Kashmir have been assessed for forest fire vulnerability under this project. The forest fire risk zonation & vulnerability assessment of Jammu & Kashmir forests, maps and catagorize the compartments of Jammu & Kashmir Forest divisions into four vulnerability classes (unlikely, Low, Medium & High), which shall contribute to achieve the better planning and management in order to reduce the forest fire incidents and thereby the loss to rich Biodiversity of the UT of Jammu & Kashmir. The project is going to lay foundation for utilization of information on forest fire vulnerability of the compartments for evolving effective planning and management strategies. The department shall have facilities for managing spatial databases relating forest fire vulnerability of forest of Jammu & Kashmir, developing Spatial Decision.

Total	Jammu Province	Kashmir Province	Total
Forest Divisions	18	12	30
Forest Ranges	55	47	102
Forest Compartments	4505	2141	6646

Thematic layers generated and used as inputs

- Land Use Land Cover
- Aspect• Proximity to Road
- Wind
- Proximity to Settlements
- Slope

Risk Zonation and Vulerability of Forests Compartments

Division Name	Unlikely vulnerability		Low vulnerability		Medium vulnerability		High vulnerability	
	No of compartments	Area (Sq Kms)	No of compartments	Area (Sq Kms)	No of compartments	Area (Sq Kms)	No of compartments	Area (Sq Kms)
Jammu Province								
Basoli	44	123.61	0	0	93	321.05	2	10.54
Batote	32	43.22	11	16.58	113	207.05	51	69.33
Bhadarwah	40	95.37	157	351.81	154	284.22	105	135.67
Bilawar	22	93.47	19	53.02	45	160.71	13	30.43
Doda	21	21.75	169	345.23	109	214.91	19	112.14
Jammu	20	80.37	7	24.87	97	553.44	23	114.54
Kathua	10	40.62	30	53.53	67	199.68	16	55.56
Kishtwar	70	719.24	27	96.23	66	449.04	32	421.05
Mahore	40	157.43	165	626.58	36	106.79	14	31.1
Marwah	42	1328.18	0	0	167	1036.35	126	370.95
Nowshera	18	37.9	63	154.64	203	380.92	60	387.26
Poonch	93	333.05	80	144.98	169	342.68	65	97.9
Rajouri	153	435.58	40	60.38	128	244.23	67	124.88
Ramban	2	3.08	117	394.48	33	98.26	1	2.89
Ramnagar	20	39.45	52	114.54	85	187.12	24	45.82
Reasi	3	5.4	34	80.94	91	339.33	60	139.93
Samba	62	149.25	5	7.07	58	109.52	94	164.43
Udhampur	18	103.62	80	191.09	193	292.95	60	78.16
Total	710	3810.59	1056	2715.97	1907	5528.25	832	2392.58

Kashmir Province								
Anantnag	50	630.2	52	485.07	162	1153.78	31	1597.61
Bandipora	77	1586.68	54	436.7	114	314.81	19	58.89
JV	39	133.01	95	299.06	39	91.2	3	13.45
Kamraj	62	158.71	101	239.19	167	455.87	14	37.49
Khemil	56	225.37	11	23.01	70	450.42	36	78
Kulgam	21	226.93	29	98.79	30	92.85	6	18.51
Langate	29	129.76	0	0	112	181.34	53	59.21
Lidder	51	959.24	0	0	149	649.84	3	2.99
Pir Panjal	18	211.03	37	114.08	30	70.17	3	4.47
Shopian	25	380.24	28	84.67	35	89.88	1	1.67
Sindh	24	838.69	42	116.91	71	309.65	3	3.65
Tangmarg	22	166.59	9	23.02	44	102.09	14	17.69
Total	474	5646.45	458	1920.5	1023	3961.9	186	1893.63

Jammu & Kashmir	Unlikely vulnerability		Low vulnerability		Medium vulnerability		High vulnerability	
	No of compartments	Area (Sq Kms)	No of compartments	Area (Sq Kms)	No of compartments	Area (Sq Kms)	No of compartments	Area (Sq Kms)
Jammu & Kashmir								
Total	1184	9457.04	1514	4636.47	2930	9490.15	1018	4286.21

FOREST FIRE VULNERABILITY MAP OF JAMMU & KASHMIR

LEGEND

Vulnerability Classes

- Unlikely
- Low
- Medium
- High
- Forest Division Boundary
- Jammu & Kashmir

1:1, 271,000

0   5   10   20 Kms

Executed by
Department of Ecology, Environment & Remote Sensing
J & K Government.
SDA Colony Bemina Srinagar Kashmir - 190018 (Summer)
Paryavaran Bhawan Transport Nagar Gladni Jammu - 180006 (Winter)

Funded By
J&K Forest Department
Forest Complex, Sheikh Bagh,
Near Lal Chowk, Srinagar, J&K - 190001
Van Bhawan, Near Gumat, Jammu, J&K - 180001

FOREST FIRE
An Introduction

Forest fires have been recognized globally as one of the most serious environmental hazards responsible for causing huge damage to forest fauna and flora, besides damage to soil and disturbance to ecological balance. The important factors which get influenced by forest fires include soil nutrient availability, plant community development and biological diversity. Forest fires can have large impacts on economy, human population and environment. The fire incidence is greatly affected by weather pattern and land use practices. By emitting ash and invisible gases like carbon monoxide, carbon dioxide and small quantities of nitrogen oxides, to atmosphere forest fires contributes to air pollution and reduces the visibility in an area. In tropical regions, the number of forest fire incidents is high in summer due to higher levels of water stress. The increased temperature and drought periods act as accelerating factors for forest fires. The severity and spread of forest fires is dependent on factors like state and nature of fuel (proportion of live or dead vegetation, species type, density and moisture content), physical environment (weather condi-

tions and topography) and causal factors (human and natural related). Land use has been credited as one of the major factors in the regions where population is put at risk due to fires. The increase in the frequency of wildfire globally is related to climate change because of the sensitivity of particular area to the changes in climate. Research findings on wildfire vulnerability hold global warming responsible for increase in frequency of wildfire. Historical records of fires present an increase in the annual number of fires from 1970 onwards. Climatic models also indicate that wildfires will likely lengthen and intensify fire season as there are changes in the temperature, humidity and timing of precipitation.

Forest fires can be intentional as well as unintentional, most of them being human induced. Unextinguished campfires of trekkers, unextinguished bidis, matchsticks and cigarette butts, burning of agricultural residues near to forest areas, etc., are some causes of unintentional fires which are caused due to human carelessness. Lighting and rolling stones may cause of natural fires.

1.2. FOREST FIRES PERSPECTIVE IN FOREST POLICIES AND PLANS

1.2.1. NATIONAL FOREST POLICY

The National Forest Policy 1988 aims at bringing 33% of the geographical area of the country under forest and tree cover. The National Forest policy also outlines the strategy on the incidence of forest fires and reports it to be high in the country. Standing trees and fodder are destroyed on a large scale and natural regeneration annihilated by such fires. Special precautions should be taken during the fire season. Improved and modern management practices should be adopted to deal with forest fires.

1.2.2. J&K FOREST POLICY

J&K Forest policy also focuses on the management aspects of forest fires and enslisting it as an important aspect of forest protection. Proper equipment and trained manpower is envisaged to provide for effective management of forest fires in vulnerable areas. Involvement of local communities in prevention and control of forest fires is also emphasized.

1.2.3. NATIONAL ACTION PLAN ON FOREST FIRES, 2018

Recognizing the need to revamp forest fire management in the country, the Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India has come up with the National Action Plan on Forest Fires (NAPFF), 2018. Main objectives of the action plan is to reduce the incidences of fires by informing, enabling and empowering forest fringe communities and incentivizing them to work in tandem with the State Forest Departments (SFDs). The plan also aims to reduce the vulnerability of forests against fire hazards across the diverse forest ecosystems in the country, enhancing the capabilities of institutions in fighting fires, and accelerating the recovery after a fire incidence.

The NAPFF stresses on scientific basis for identifying areas of priority for management interventions, allocating resources to priority areas, and monitoring the effectiveness of measures to reduce or control fire risk.

Risk factors identified and included in NAPFF:

- Fuels such as litter, grass, fallen trees and branches.
- Proximity to infrastructure, property, and other assets, including roads, habitation and other buildings, agricultural lands, transmission lines, and railways.
- Topography, including slope, aspect, elevation, terrain ruggedness and other characteristics.
- Social indicators, including local dependence on forests for livelihoods, poverty and traditional land use practices.
- Historic fire occurrence and patterns may be used to identify areas that are most prone to fire.
- Areas of special ecological or cultural importance, including protected areas, historic sites, designated heritage sites, temples, pilgrimage routes, etc.
- Special ecological conditions, temperature, wind etc.

Components of systematic strategic planning under NAPFF:

- Fire risk zonation and mapping
- Preventing forest fires
- Increasing the resilience of forests to fires
- Forest Fire preparedness
- Fire Suppression
- Post Fire management
- Coordination with other agencies
- Centre of Excellence for Forest Fires
- Mobilization of financial resources

Major impacts of forest fire

Forest and Wildlife	Ecological	Others
Damage to vegetation cover	Curtailment of natural succession and regeneration	Destruction of Infrastructure
Loss of natural regeneration	Adverse effect on the livelihood of local People	Cultural and Recreational damages
Loss of valuable timber resources	Loss of carbon sink and addition of GHGs	Respiratory diseases
Loss of biodiversity and invasion of weeds	Affecting plant biomass, structure and shape	
Affecting plant phenology	Change in micro-climate	
Affecting forage nutrient level	Degradation of catchment areas	
Reduction of forest cover	Effecting availability of minerals and nutrient recycling	
Patterns of resource availability	Affecting population of microorganisms	
Altered pattern of vegetation distribution	Increase in soil erosion with loss of vegetation	
Loss of wildlife habitat with Possibility of mortality	Changed rates of evaporation and transpiration	
	Changed rates of permeability sub-surface flow	

Forest fires have direct and indirect pollution effects on waters due to the harmful chemicals formed by fires first going into the atmosphere later to the waters by precipitation or sedimentation. Ash, scales and small plant pieces can cause direct surface pollution in nearby waters. Indirectly, the pollution can spread longer distances by the wind polluting distant waters. Water used for fire-fighting can wash other fire extinguishing chemicals into the neighbouring surface waters, polluting rivers and lakes in the vicinity. Those chemicals that are neutral in soil and only change the chemical composition ratio but are otherwise inactive, can be activated in water by a series of chemical reactions, causing dangerous pollution on much larger territories e.g., alongside a river. These pollutants can endanger or even exterminate water and soil.

Source: (J&K ENVIS CENTRE Department of Ecology, Environment and Remote Sensing)

2 Geoinformatics in Forest Fire Mapping

Monitoring and mapping of forest fires is more feasible with Geoinformatics technology, a tool for managing, analyzing, and depicting statistical and geographic data. The increased availability of satellite data has helped in better understanding of fires globally. Advanced Very High-Resolution Radiometer (AVHRR), Moderate Resolution Imaging Spectroradiometer (MODIS), and Indian Remote Sensing Satellite Advanced Wide Field Sensor (IRS AWiFS) are some sources of data which are used for active forest fire detection. The Advanced Very High-Resolution Radiometer (AVHRR) fire data was studied to characterize global patterns of fire seasonality and their relationship with climate. Recently, data is being used from new generation of satellite sensors, with advanced capabilities of fire monitoring, which helps in identification of burned area and fire hotspots at a regional or global scale. Information of vital nature can be generated on habitat loss, habitat evaluation, species habitat suitability, corridor mapping, deforestation, landscape fragmentation, carrying capacity and forest fire risk zonation in the protected areas using Geoinformatics technology. Remotely sensed data provides the synoptic view and can be used to determine the presence and distribution of areas affected by fires within a protected area. GPS is readily used in land surveys to note the precise coordinates of boundaries of areas affected during a forest fire. Because the precise measurement of these positions is one of the fundamental elements of land surveying, GPS has become a valuable tool as it provides a higher degree of accuracy over a large area than other conventional methods of surveying. Surveyors have traditionally relied on landmarks that can be destroyed or moved over time. GPS uses exact coordinates rather than relational landmarks. Data collected through GPS technology can be very helpful to organizations in guiding conservation planning efforts and prioritizing protection efforts. GPS points can be taken at photo points in the field and then the photos can be uploaded as a point layer of forest fire locations into the GIS database. Geoinformatics technology has a great potential in forest fire mapping, monitoring and management. This technology can be effectively used for mapping active and burnt areas as well as for forest fire prone area mapping (fire risk / vulnerability zonation).

2.1 Methodology

Forest fire is a serious challenge, that requires understanding of certain parameters like lulc, wind, slope, aspect, roads and human settlements of the area etc. Forest fire risk zonation and vulnerability assessment is very crucial information required by planners and decision makers for assessing the risk and vulnerability of the area, so that advance protective and remedial measures are taken to minimize the economic and biodiversity loses, it was important to use a comprehensive methodology, which incorporates the use of satellite data, digital elevation data, field data, secondary ancillary data and geospatial tools. In the present study a combination of the Multi-Criteria Evaluation (MCE) and Analytical Hierarchy Process (AHP) methods in GIS environment were used for carrying out forest fire risk zonation and vulnerability analysis. The broad (overall) methodology acquired in the present study to achieve the research objective is given below (figure.1).

   In the present study six parameters which have influences on the occurrence of a forest fire were used viz figure 1. For assigning weights to each parameter, AHP method was used which help in analysing the inter-linkages of parameters and help to evaluate pairwise comparisons while relying on the judgments of experts to derive priority scales. A pair-wise comparison matrix was created for determining the factor weights for each parameter in AHP method. The data of all the six parameters mentioned above were ordered in GIS environment, grouping the values of each parameter in a fixed number of classes. The classes within each parameter were associated against each other in a matrix to arise a corresponding weight for each class. For example, the slope of an area is an important factor which governs forest fires. In the upslope areas fire moves most quickly where as in downslope areas fire moves least quickly. Also, in steeper slopes, the rate of fire spread might rise, since flames are angled closer to the surface of the ground and wind effects can supply the process of heat convection for the fire produced. Therefore, using the process described above, the slope angle (the factor) is first divided into a number of classes such as those indicating gentle slope, medium slope, and steep slope. Each class is then compared against the other classes in the set by assigning them a severity level (score) in AHP. The scores and their corresponding relevance are given in Table 1. Based on AHP method scale values ranging from (1 -9) were used. Higher scale values were assigned to cells which are more vulnerable to fire and lower values were given to cells which are less vulnerable to fire. Cells representing areas of water bodies and non forest were restricted. Final weights and scale values to different classes of each parameter are given in the Table 2. Highest weight of 25% were given to parameters lulc and wind speed each, followed by a weight of 15% to parameters proximity to settlements and proximity to roads each. The least weight of 10% were given to parameters slope and aspect each. In the present study the various parameters which were used include land use, wind speed, slope, aspect, roads and settlement (Figure 2 to Figure 7).
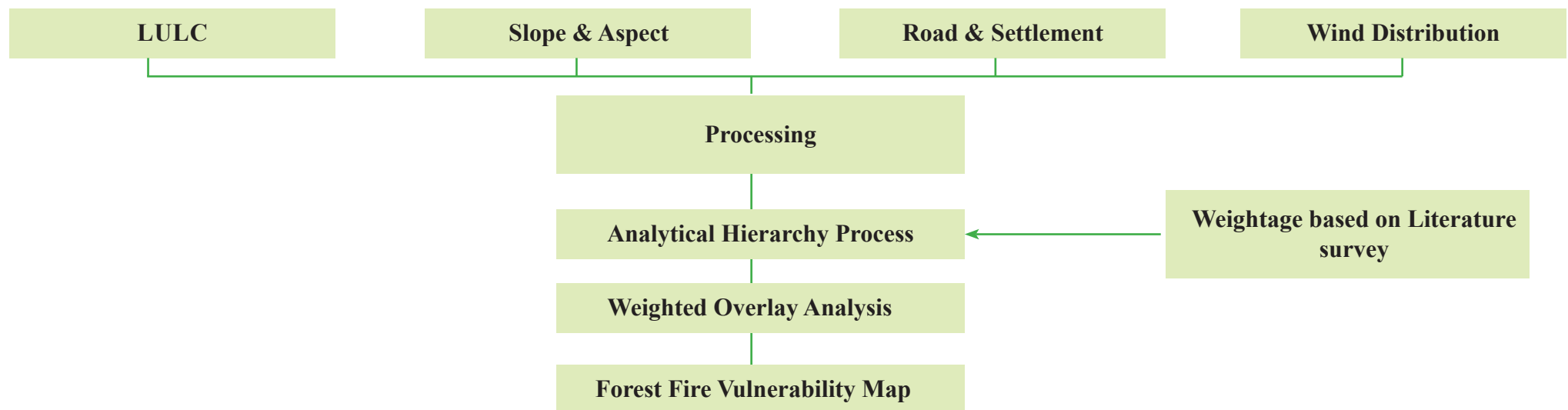
Fig 01: Broad methodology used to assess forest fire risk zonation and vulnerability
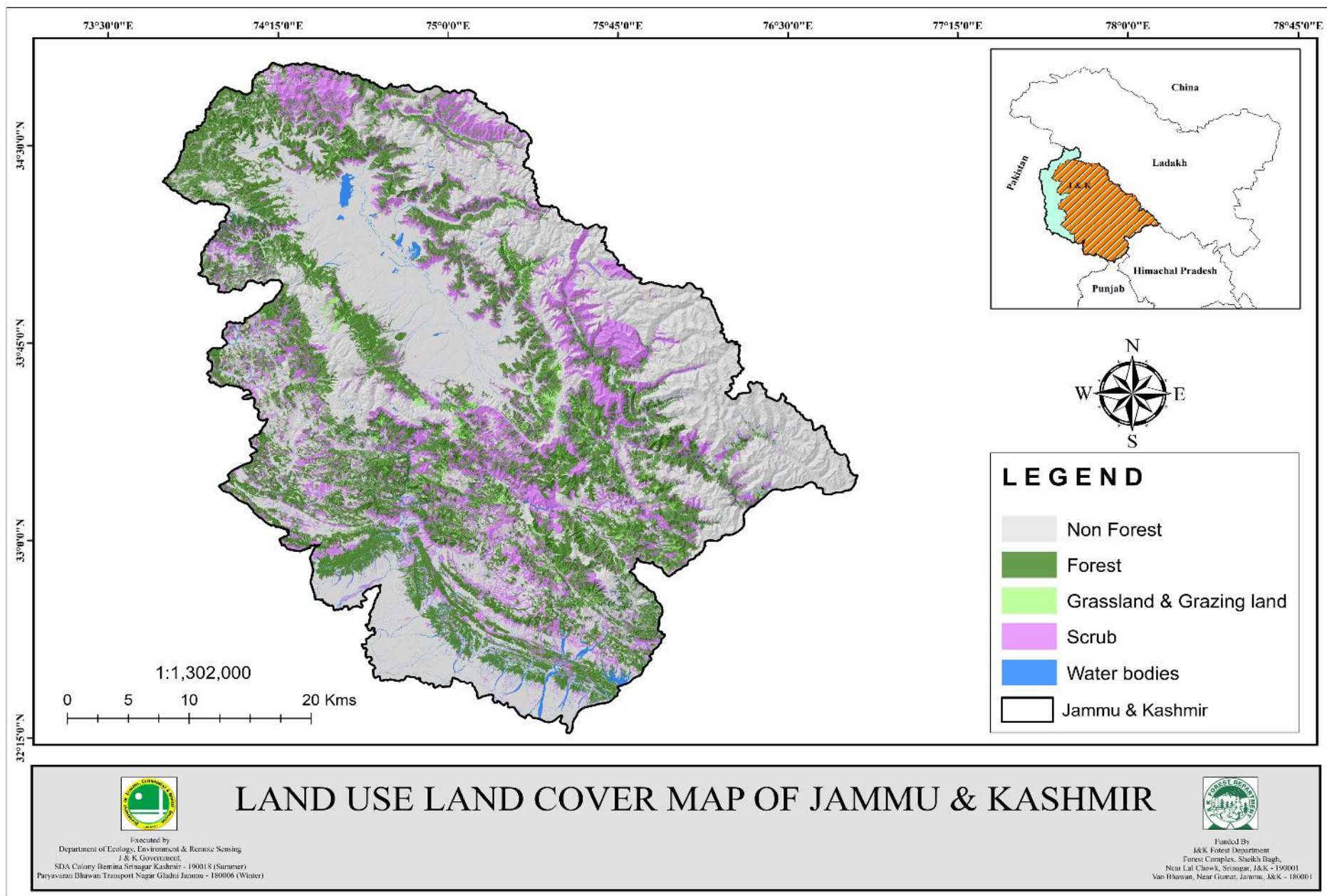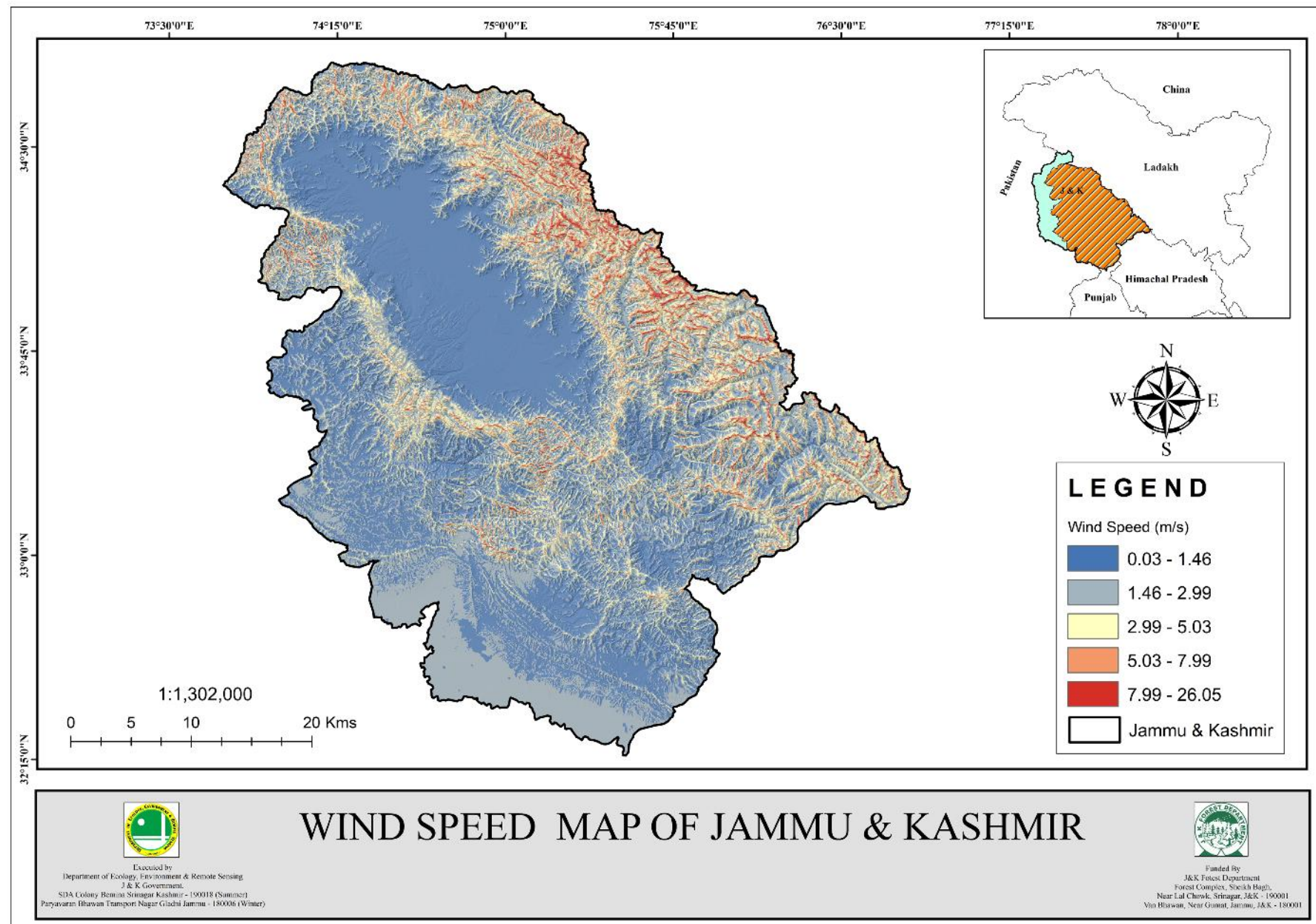
Fig. 02: Land Use Land Cover Map of Jammu & Kashmir

Fig. 03: Wind Speed Map of Jammu & Kashmir

FOREST FIRE RISK ZONATION & VULNERABILITY
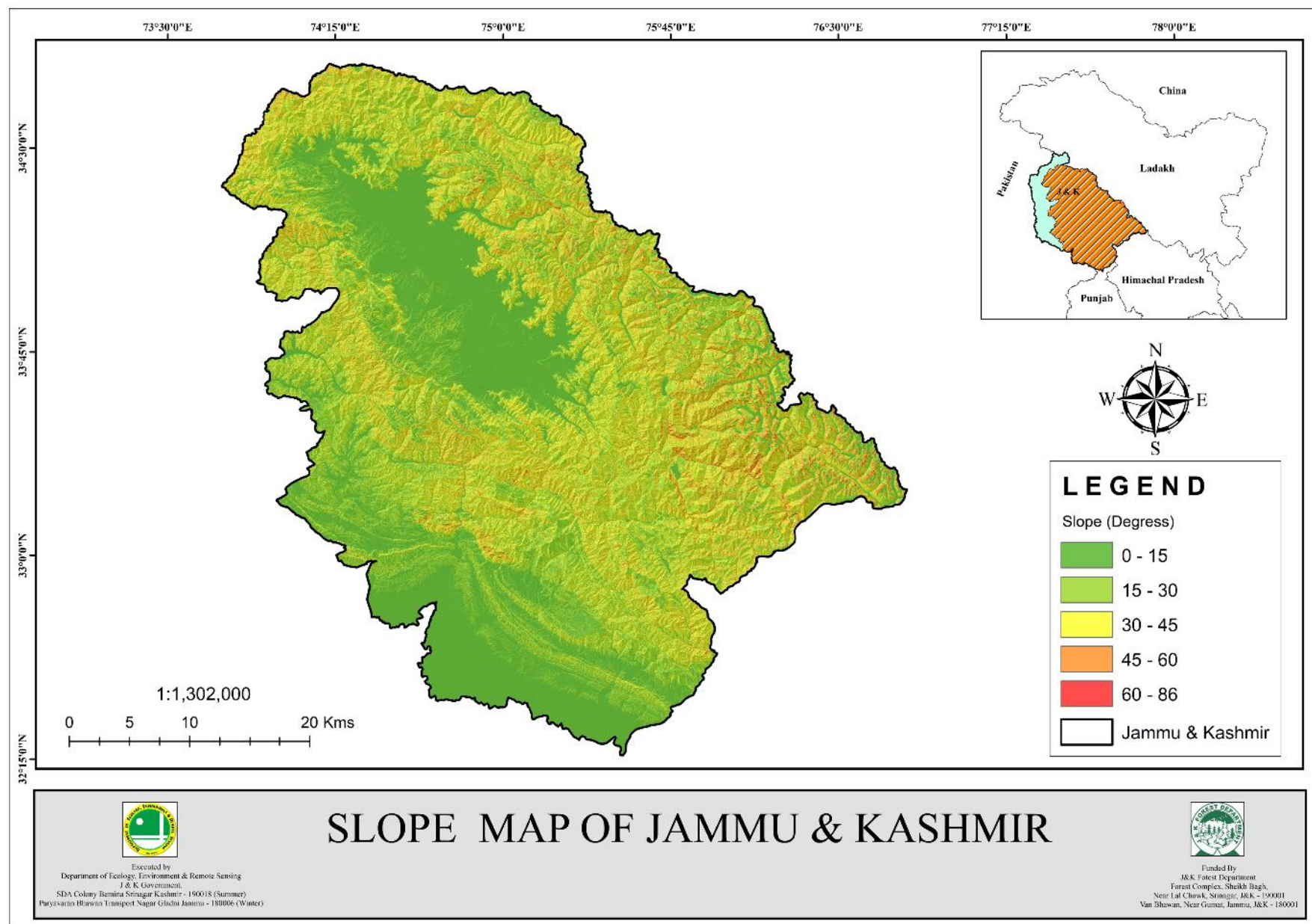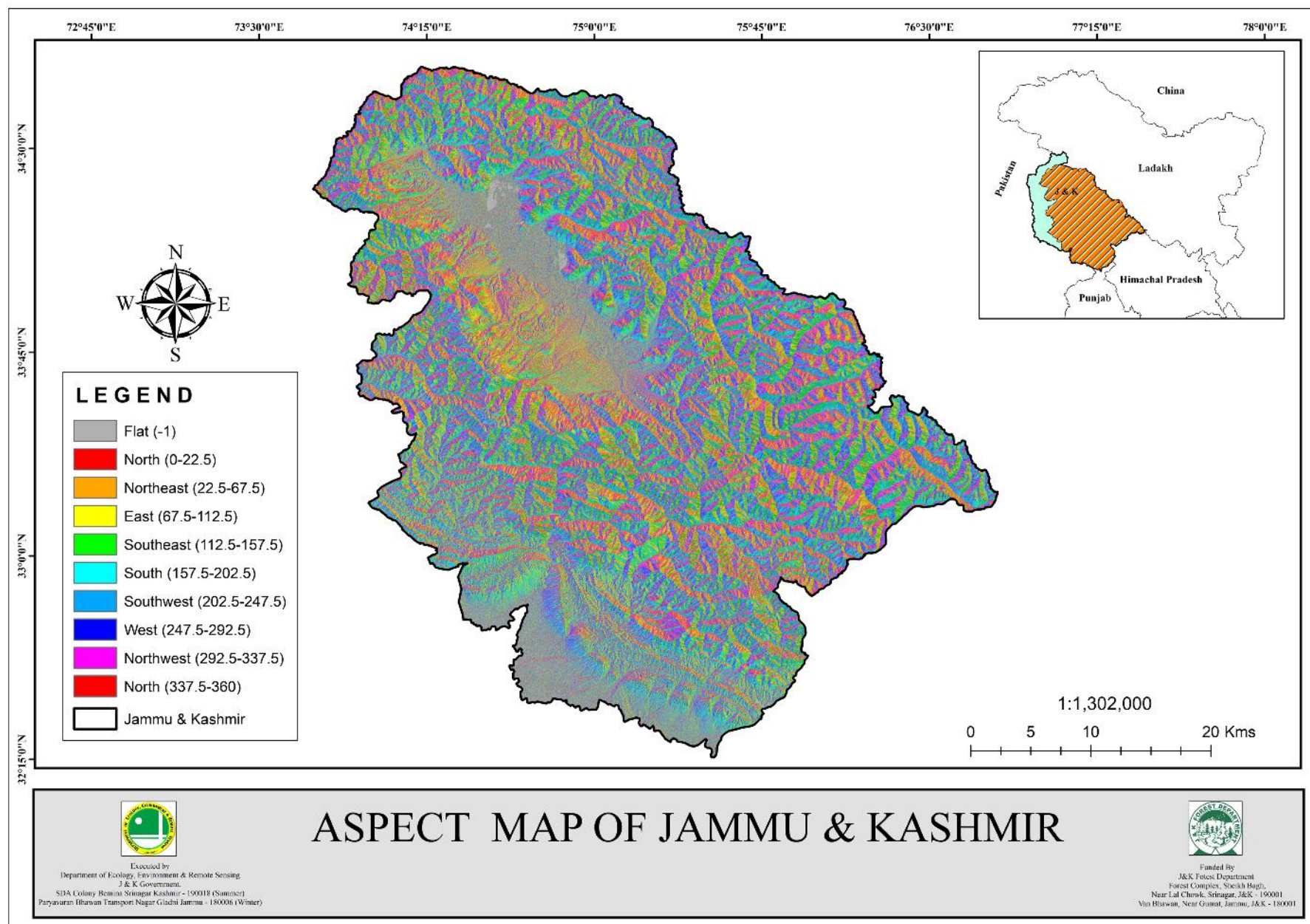ASSESSMENT FORESTS OF JAMMU & KASHMIR

Fig. 04: Slope Map of Jammu & Kashmir

Fig. 05: Aspect Map of Jammu & Kashmir
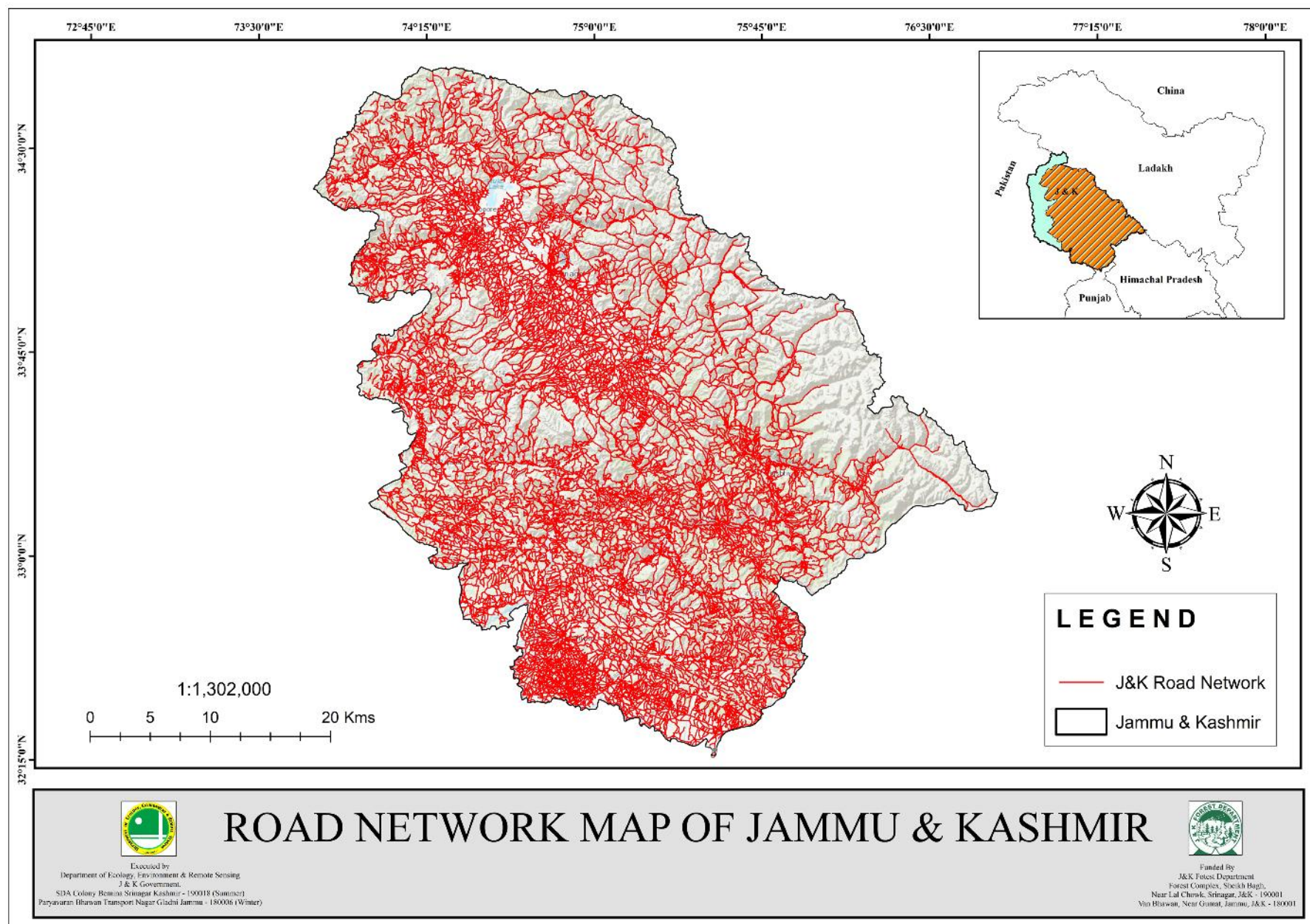
Fig. 06: Road Network Map of Jammu & Kashmir

Fig. 07: Settlement Map of Jammu & Kashmir
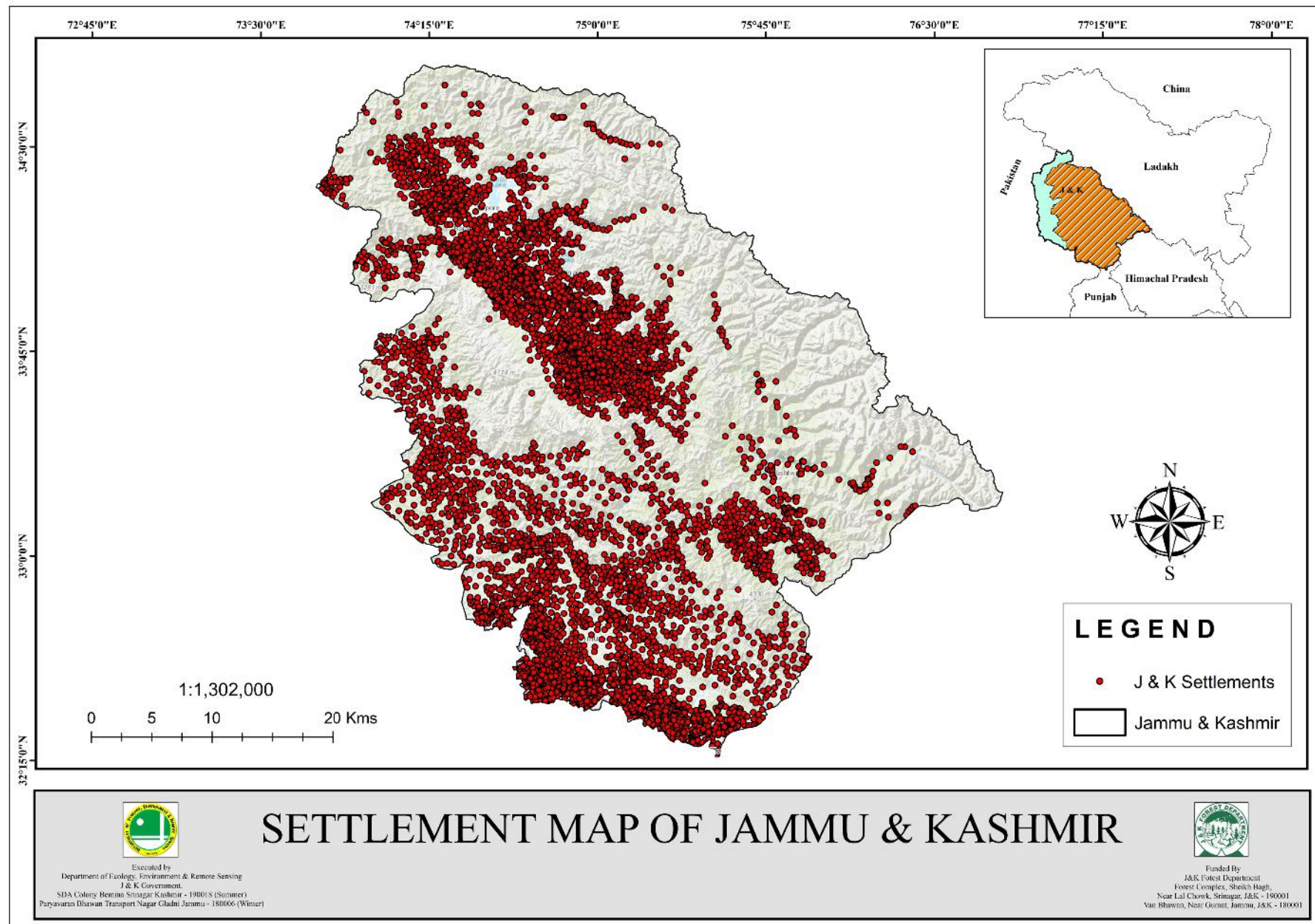
FOREST FIRE RISK ZONATION & VULNERABILITY
ASSESSMENT FORESTS OF JAMMU & KASHMIR

Table1: Intensity of importance scale used in AHP along with definitions

Intensity of importance	Definition	Explanation	Other scales
1	Equal importance	Two elements contribute equally to the objective	2,4,6,8 can be used to express intermediate values, 1.1, 1.2, etc. for elements that are very close in importance
3	Moderate importance	Experience and judgment slightly favor one element over another	
5	Strong Importance	Experience and judgment strongly favor one element over another	
7	Very strong importance	One element is favored very strongly over another, its dominance is demonstrated in practice	
9	Extreme importance	The evidence favoring one element over another is of the highest possible order of affirmation	

2.2 Weighted overlay analysis

In the weighted overlay analysis, each class of the final raster thematic layers (land use, wind speed, slope, aspect, roads and settlement) was assigned a scale value (Table 2) on a common measurement scale. Higher scale values were assigned to cells which are more vulnerable to fire and lower values were given to cells which are less vulnerable to fire. Cells representing areas of non forest areas and water bodies were restricted. Finally, based on the AHP results weights (percentage of influence) were given to each of thematic layers according to their vulnerability to fire in order to get the final fire vulnerability map of study area. The present methodology is a knowledge driven modeling in which understanding of scientific knowledge of a phenomenon is converted in numerical value. The present methodology of multi criteria analysis (knowledge-driven modeling) has been often used by various researchers from time to time for sustainable planning and management studies.

   The final result of forest fire risk zonation and vulnerability map was accomplished using a ModelBuilder (figure 8, A & B) an application which is very useful for constructing and executing simple workflows. Models are workflows that string together sequences of geoprocessing tools, feeding the output of one tool into another tool as input.

Table 2: Weights & scale values for each thematic layer

| S. No	Raster layer	Classes		weights	scale value
1.	LULC	Non-Forest		25%	Restricted
		Forest			9
		Grassland & Grazingland			3
		Scrub			8
		Water			Restricted
2.	Wind Distribution	Class 1	Low Value	25%	3
		Class 2			4
		Class 3			6
		Class 4			8
		Class 5	High Value		9
3.	Aspect	Flat & North		10%	2
		North East & East			6
		South, South East & South West			9
		West			1
		North West			2
4.	Slope (degrees)	0 -15		10%	3
		15-30			4
		30-45			6
		45-60			8
		>60			9
5.	Proximity to Settlements (m)	0-500		15%	9
		500-1000			7
		1000-1500			5
		1500-2000			3
		>2000			1
6.	Proximity to Roads (m)	0-100		15%	9
		100-200			8
		200-300			7
		300-400			6
		>400			1
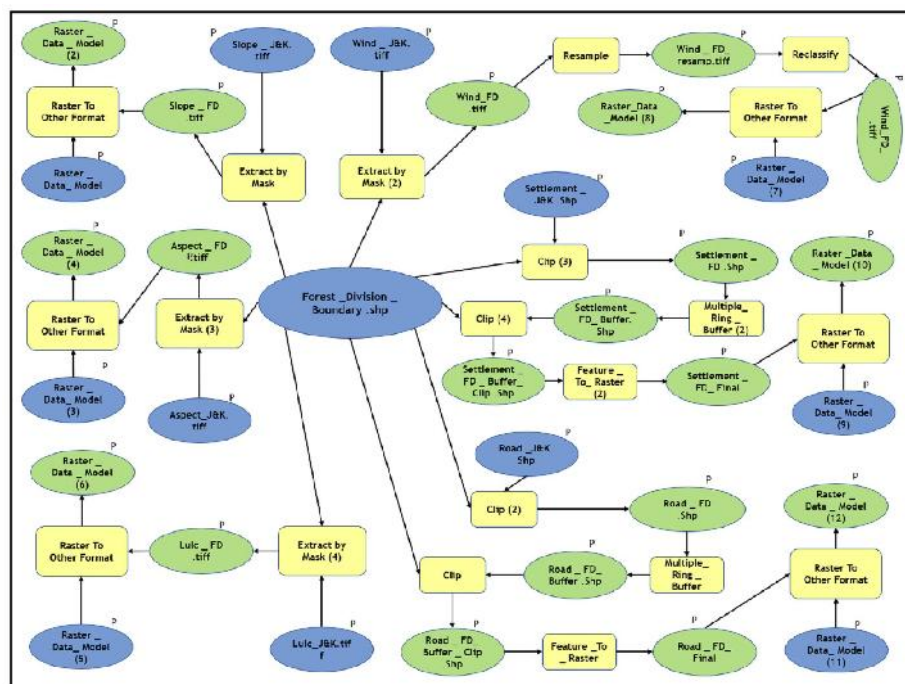
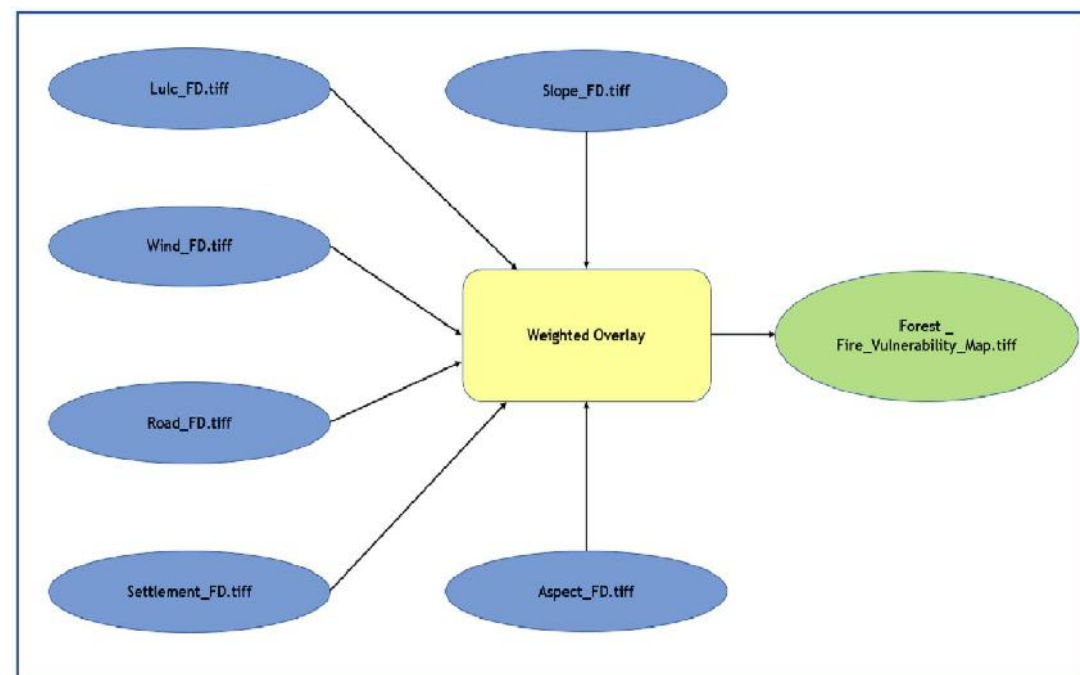Fig. 08: Workflow in a Model Builder (A)

Fig. 08: Workflow in a Model Builder (B)

2.3 Datasets

The datasets used in the present study comprises of the following

(1) Lulc data from SIS DP Phase I Project (Originally generated from a merged data product 2.5m (Cartosat ortho 2.5m and LISS IV ortho 5.8m).

(2) Average wind speed data with a spatial resolution of 250 meter was downloaded in grid format from the Global Wind Atlas portal.

(3) Road and Settlement layers from SIS DP Phase I Project (Originally generated from a merged data product 2.5m (Cartosat ortho 2.5m and LISS IV ortho 5.8m)

(4) ALOS (Advanced Land Observing satellite)-PALSAR (Phased Array type L-Band Synthetic Aperture Radar) DEM (Digital Elevation Model) with a spatial resolution of 12.5 m, downloaded from the Alaska Satellite Facility (ASF) Distributed Archive Center. The

ALOS PALSAR DEM was used to generate topographical parameters. The DEM quality can influence the accuracy of terrain measures including slope and aspect. The performance of models that use slope and aspect as inputs is dependent on the accuracy of slope and aspect measures. The DEM resolution is one of the important factors which influence the topographical and hydrological parameters. The topographical data created from fine resolution DEMs (ALOS PALSAR 12.5m resolution) are expected to give greater amounts of details as compared to coarse resolution DEMs including such as SRTM 90m resolution. As a result, PALSAR DEM was preferred over ASTER and SRTM DEMs for present study.

(5) Point Data pertaing to actual forest fire incidences was obtained from Jammu & Kashmir Forest Department (year 2002-2018).

(6) Forest Management Boundary comprising of Divisions, Ranges, and Compartments were obtained from PI Division, J&K Forest Department, which were rectified and updated before used for the analysis.

2.4 Study Area

Jammu and Kashmir holds a key position in Indian ecological and geographical context, due to its strategic location in the Himalayan region, as well being home to magnificent flora and fauna. The climatic conditions and landscape pattern of the area renders it as a unique context, harbouring natural resources, tourism destinations as well as potential regions for scientific explorations. The geographic location of Jammu and Kashmir (figure 9) varies from 32°16'28.955"N - 34°49'31.149"N latitude and 73°44'59.017"E - 76°46'20.057"E longitude. It shares boundary with Punjab & Himachal Pradesh in the South, Pakistan in the west and Ladakh in the East. The recorded forest area of Jammu & Kashmir is 20,230 sq.km. The forests of Jammu and Kashmir are of great quality and value. They play an important role in preserving the ecosystems of the region and for the economy of the area. In order to conserve, protect and manage the forests of Jammu and Kashmir, it is important to employ modern scientific technology for fire protection, habitat management, soil and water conservation etc.
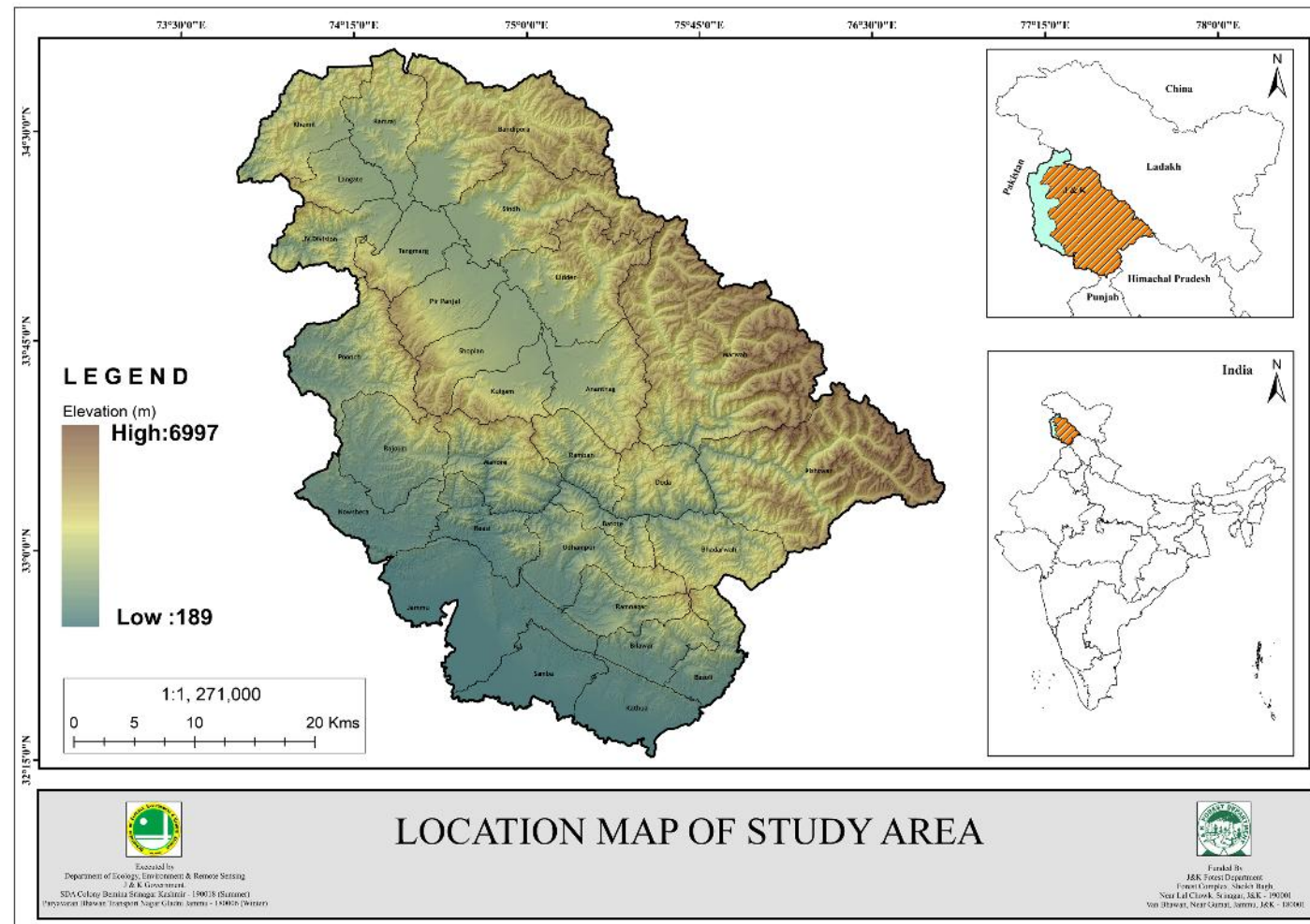
Fig. 09: Location Map of Study Area

RESULTS & DISCUSSIONS

3.1 Forest fire risk assessment parameters

In the present study forest fire vulnerability analysis was carried out for each forest division of Jammu & Kashmir based on the following forest fire risk parameters.

Land use: Land cover can be defined as the assemblage of abiotic and biotic components on the earth's surface. Land cover is what covers the earth's surface and land use defines how land is being utilized by human beings. Although land use and land cover are sometimes used interchangeably. Land use is one of the important parameters which affects the existence and spread of fire. The dense forest areas are more susceptible to fire those of moist and sparse areas. The different land use classes identified in the study area are forest, non forest (built up, agriculture and barren rocky, scrub, grazing & grassland, and water bodies. The highest scale value of 9 was given to forest being highly vulnerable to fire, followed by 8 to scrub. The least scale value of 3 was given to grazing & grassland, being least vulnerable to fire. The land use classes non forest (built up, agriculture and barren rocky etc) and water were restricted. Based on the AHP analysis the land use parameter was given an overall weightage of 25 %.

Lulc Classes	Scale Value
Non-Forest	Restricted
Water	Restricted
Forest	9
Scrub	8
Grazing & grassland	3
Weightage	25 %.

Wind Speed: Wind has a great control on the occurrence and spread of forest fires. Fires display rapid spread in a direction transverse to the synoptic winds. The study area has been grouped into five different zones of wind speed. In the present study high scale value of 9 was given to class 5 with high wind speed as this area is highly prone to forest fires where as low scale value of 3 was given to class 1 with low wind speed being least prone to forest fires. Classes 2, 3 and 4 were assigned the scale values of 4, 6 and 8 respectively. In the present study the parameter (wind speed) was given an overall Weightage of 25 % as per AHP Analysis.

Wind speed	Scale Value
Class 5	9
Class 4	8
Class 3	6
Class 2	4
Class 1	3
Weightage	25 %.

Proximity to Settlements: Proximity to settlements is also among one of the significant parameters which is required to be considered for forest fire vulnerability analysis. The population living in the vicinity of forests can play a positive as well as the negative role towards forest fires. Human population living within the forest area (Tribal community) and on the periphery is often a source of forest fire threat. They may cause forest fire intentionally or unintentionally. The present study area was divided into five zones depending on the distance from the settlements. Zone near to settlements experience more threats of forest fires as compared to zones which are further from settlements. Higher scale values were given to zones close to settlements being highly vulnerable to forest fires where as low scale values were assigned to zones situated further from settlements being least vulnerable to forest fires. The highest scale value of 9 was given to (0-500m) zone, followed by 7 to zone (500-1000m). The least scale value of 1 was given to zone (>2000m). Scale value of 5 and 3 were assigned to zones (1000-1500m) and (1500-2000m) respectively. In the present study the parameter (Proximity to settlements) was given an overall weightage of 15%.

Settlement zones	Scale Value
(0-500 m):	9
(500-1000m):	7
(1000-1500m):	5
(1500-2000m):	3
(>2000m):	1
Weightage	15 %.

Proximity to Roads: Roads inside the forest area are used to travel to a specific destination. Roads within the forest area are useful in fire suppression as fire fighter response team can travel in time to control and suppress the forest fire in time, also acts as barriers for the spread of fires, so that damage caused by fires can be minimized. Roads in forests are areas where influence of human activity is involved are an important parameter. Accessibility of humans in areas near to roads are prone to fires due to human activities like carelessly thrown burning cigarette butts or match sticks etc and the vehicular movement creates air flow which helps in spread of fire in

Road zones	Scale Value
(0-100 m):	9
(100-200 m):	8
(200-300m):	7
(300-400m):	6
(>4000m):	1
Weightage	15 %.

areas near to roads. Depending upon the distance from roads the study area has been grouped into five zones. High scale values were given to zones close to roads as these zones are highly prone to forest fires where as low scale values were assigned to zones situated further from settlements being least prone to forest fires. The highest scale value of 9 was given to (0-100m) zone, followed by 8 to zone (100-200m). The least scale value of 1 was given to zone (> 400m). Scale value of 7 and 6 were given to zones (200-300m) and (300-400m) respectively. In the present study the parameter (distance from roads) was given an overall Weightage of 15 %.

Slope: The measurement of steepness of terrain is known as slope. It is the ratio of vertical rise to horizontal distance which is expressed in degrees of an angle or percentage. A high slope directs the steep inclination. For the present study slope information was derived using Palsar DEM. The slope is one of the essential parameters that affect the speed of fire spread. On steep slopes forest fires always spread faster. This approach of high vulnerability to high slope range class and low vulnerability to low slope range

Slope Class	Scale Value
$0 - 15^O$ (Flat):	3
$15 - 30^O$ (Gentle):	8
$30 - 45^O$ (Medium slope):	6
$45 - 60^O$ (Steep slopes):	4
$>60^O$ (Very Steep slopes):	9
Weightage	10 %.

class is widely adopted by researchers of this field. The resulting five slope classes were generated using Palsar DEM in the present study $0 - 15^O$ (Flat), $15 - 30^O$ (Gentle), $30 - 45^O$ (Medium slope), $45 - 60^O$ (Steep slopes) and $>60^O$ (Very Steep slopes). The slope parameter in the present study was given a weightage of 10 % as per the AHP analysis. The highest scale value 9 was given to ($>60^O$) slope class with high vulnerability to forest fires and the lowest scale value 3 was given to ($0 - 15^O$) slope class with least vulnerability to forest fires. Scale value of 8, 6 and 4 were assigned to ($45 - 60^O$), ($30 - 45^O$) and ($15 - 30^O$) respectively.

Aspect: Aspect is defined as the direction of maximum slope. It identifies the down slope direction of maximum rate of change in value from each cell to its neighboring cells. The values of each cell indicate the compass direction that the surface faces at that location. It is measured clockwise in degrees from 0 (due north) to 360 (again due north) to become a full circle. Flat areas having no down slope direction are having a value of -1. Aspect is an important influencing factor for fire ignition and spread. It gives relationship of terrain with sunlight and wind. The south facing slopes experience higher temperatures due to excess time of sunlight, strong

winds and low humidity making the south facing slopes more vulnerable to forest fires. Higher temperature leads to dryness of vegetation which makes the area prone to fires. Also east facing aspects experience more ultraviolet and direct sunlight than the west aspects (Anderson 1982). The north facing slopes experience lower temperatures due to less time of sunlight making the north facing slopes least vulnerable to forest fires. The present study area was classified into

Aspect Class	Scale Value
(Flat & N):	2
(NE & E):	6
(S, SE & SW):	9
(NW):	1
(W):	2
Weightage	10 %.

five aspect classes (1. Flat & North 2. Northeast & East 3. Southeast, South & Southwest 4. Northwest 5. West). The highest scale value of 9 was given to Class 3 aspect direction as it highly vulnerable to forest fires, followed by 6 to Class 2 aspect direction. Class 1, Class 4 and Class 5 aspect directions were given scale values of 2, 1 and 2. In the present study the overall weightage given to aspect parameter is 10% based on AHP analysis.

Collective impact of Land use, Wind speed, Proximity to Settlements, Proximity to Roads, Slope & Aspect: Forest fire vulnerability of an area is influenced by a combined impact of factors li1ke land use, slope and aspect. In order to find the combined contribution of the factors towards the fire vulnerability, all the layers included in the present study were integrated to find the overall fire vulnerability of the study area. All the layers were assessed for forest fire vulnerability of the study area and each class of all the different layers included were assigned a scale value and final weights to each layer as per AHP analysis results. Classes which are more vulnerable to fire were given high scale value and classes which are less vulnerable were given lower scale values. Final weights (percentage of influence) were given to each of thematic layers according to their vulnerability to fire in order to get the final fire vulnerability map of study area. Generated division wise each vulnerability map have been classified into four vulnerability zones. The High vulnerability zone represents the areas (Compartments) that are highly vulnerable to fires and needs immediate attention for planning to minimize the damage. The medium vulnerability zone represents the areas medium vulnerable to fires and the low vulnerability zone represents areas which are least vulnerable. The unlikely vulnerability zone representes areas which are unlikely to catch fires.

Table 3: Number of Compartments, area & percentage under different vulnerability classes.

Jammu Province

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Basoli Forest Division	Bani	Unlikely	38	112.01	41.79
		Low	0	0.00	0.00
		Medium	41	147.33	54.97
		High	1	8.68	3.24
		Total	80	268.03	100.00
	Basoli	Unlikely	2	1.99	2.32
		Low	0	0.00	0.00
		Medium	29	81.79	95.51
		High	1	1.86	2.17
		Total	32	85.63	100.00
	Mahanpur	Unlikely	4	9.61	9.47
		Low	0	0.00	0.00
		Medium	23	91.93	90.53
		High	0	0.00	0.00
		Total	27	101.54	100.00
Batote Forest Division	Batote	Unlikely	20	24.74	25.64
		Low	7	8.79	9.11
		Medium	29	47.81	49.56
		High	11	15.14	15.69
		Total	67	96.48	100.00
	Gandhri	Unlikely	5	7.61	10.01
		Low	2	4.46	5.86
		Medium	28	37.54	49.40
		High	20	26.39	34.73
		Total	55	76.00	100.00
	Marmat	Unlikely	7	10.87	6.66
		Low	2	3.33	2.04
		Medium	56	121.70	74.59
		High	20	27.25	16.70
		Total	85	163.15	100.00

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Bhadarwah Forest Division	Bhalesh	Unlikely	9	42.04	11.56
		Low	63	187.17	51.46
		Medium	43	116.03	31.90
		High	12	18.50	5.09
		Total	127	363.73	100.00
	Chiralla	Unlikely	9	6.75	4.30
		Low	39	53.53	34.07
		Medium	39	57.07	36.32
		High	35	39.77	25.31
		Total	122	157.12	100.00
	Kellar	Unlikely	11	17.04	10.46
		Low	27	53.85	33.03
		Medium	29	48.55	29.79
		High	32	43.56	26.72
		Total	99	163.00	100.00
	Neeru	Unlikely	11	29.54	16.13
		Low	28	57.26	31.25
		Medium	43	62.57	34.15
		High	26	33.84	18.47
		Total	108	183.20	100.00
Billawar Forest Division	Bilawar	Unlikely	5	12.04	8.93
		Low	6	24.23	17.98
		Medium	14	74.33	55.17
		High	8	24.13	17.91
		Total	33	134.72	100.00
	Malhar	Unlikely	16	80.04	69.39
		Low	0	0.00	0.00
		Medium	6	31.78	27.56
		High	3	3.52	3.05
		Total	25	115.34	100.00
	Ramkote	Unlikely	1	1.39	1.58
		Low	13	28.79	32.89
		Medium	25	54.60	62.36
		High	2	2.78	3.17
		Total	41	87.56	100.00

Division	Range	Risk	Count	Area	%
Doda Forest Division	Kuntwara	Unlikely	1	1.53	0.81
		Low	13	28.88	15.27
		Medium	30	64.17	33.93
		High	6	94.58	50.00
		Total	50	189.15	100.00
	Siraj	Unlikely	7	1.97	0.69
		Low	72	155.06	54.32
		Medium	58	119.32	41.80
		High	7	9.10	3.19
		Total	144	285.45	100.00
	Thakrai	Unlikely	13	18.25	8.32
		Low	84	161.29	73.51
		Medium	21	31.42	14.32
		High	6	8.46	3.86
		Total	124	219.43	100.00
Jammu Forest Division	Bahu	Unlikely	12	14.73	17.19
		Low	5	11.77	13.73
		Medium	31	53.62	62.54
		High	5	5.61	6.54
		Total	53	85.73	100.00
	Jammu	Unlikely	2	4.86	3.56
		Low	0	0.00	0.00
		Medium	19	118.75	86.86
		High	2	13.09	9.58
		Total	23	136.71	100.00
	Jindrah	Unlikely	2	14.97	8.43
		Low	1	3.57	2.01
		Medium	21	140.59	79.16
		High	5	18.47	10.40
		Total	29	177.61	100.00
	Kalidhar	Unlikely	4	45.81	12.27
		Low	1	9.53	2.55
		Medium	26	240.48	64.44
		High	11	77.37	20.73
		Total	42	373.19	100.00

Division	Range	Risk	Count	Area	%
Kathua Forest Division	Jasrota	Unlikely	5	8.76	6.99
		Low	25	34.90	27.85
		Medium	46	69.67	55.58
		High	8	12.01	9.58
		Total	84	125.35	100.00
	Kathua	Unlikely	5	31.86	14.22
		Low	5	18.63	8.31
		Medium	21	130.01	58.03
		High	8	43.55	19.44
		Total	39	224.05	100.00
Kishtwar Forest Division	Kishtwar	Unlikely	20	190.70	44.02
		Low	20	48.92	11.29
		Medium	34	138.36	31.94
		High	19	55.26	12.76
		Total	93	433.24	100.00
	Nagseni	Unlikely	16	153.95	23.39
		Low	1	3.69	0.56
		Medium	14	171.49	26.05
		High	6	329.13	50.00
		Total	37	658.26	100.00
	Paddar	Unlikely	34	374.59	63.06
		Low	6	43.62	7.34
		Medium	18	139.19	23.43
		High	7	36.66	6.17
		Total	67	594.06	100.00
Mahore Forest Division	Gool	Unlikely	29	34.04	19.95
		Low	34	97.41	57.09
		Medium	13	33.89	19.86
		High	3	5.29	3.10
		Total	79	170.62	100.00
	Gulabgarh	Unlikely	7	111.97	23.58
		Low	60	328.69	69.22
		Medium	9	34.18	7.20
		High	0	0.00	0.00
		Total	76	474.85	100.00
	Mahore	Unlikely	4	11.42	4.13
		Low	71	200.48	72.53
		Medium	14	38.72	14.01
		High	11	25.81	9.34
		Total	100	276.43	100.00

Marwah Forest Division	Dachhan	Unlikely	19	942.92	76.59
		Low	0	0.00	0.00
		Medium	44	208.84	16.96
		High	22	79.43	6.45
		Total	85	1231.19	100.00
	Marwah	Unlikely	13	312.85	29.62
		Low	0	0.00	0.00
		Medium	53	613.44	58.07
		High	19	130.09	12.31
		Total	85	1056.38	100.00
	Udil	Unlikely	10	72.41	16.17
		Low	0	0.00	0.00
		Medium	70	214.07	47.79
		High	85	161.43	36.04
		Total	165	447.92	100.00
Nowshera Forest Division	Lambri	Unlikely	3	4.11	2.00
		Low	10	12.75	6.21
		Medium	45	85.78	41.79
		High	13	102.63	50.00
		Total	71	205.26	100.00
	Lambri A	Unlikely	1	1.74	2.27
		Low	6	11.67	15.20
		Medium	20	41.05	53.45
		High	9	22.33	29.08
		Total	36	76.80	100.00
	Nowshera	Unlikely	5	15.17	3.42
		Low	30	105.11	23.72
		Medium	48	101.24	22.85
		High	12	221.52	50.00
		Total	95	443.04	100.00
	Sunderbani	Unlikely	9	16.88	7.16
		Low	17	25.11	10.66
		Medium	90	152.85	64.87
		High	26	40.78	17.31
		Total	142	235.62	100.00

Poonch Forest Division	Haveli	Unlikely	38	137.82	36.96
		Low	38	74.34	19.94
		Medium	78	128.40	34.44
		High	26	32.32	8.67
		Total	180	372.88	100.00
	Mendhar	Unlikely	22	17.64	17.02
		Low	24	22.16	21.37
		Medium	38	42.54	41.04
		High	23	21.33	20.56
		Total	107	103.67	100.00
	Surankote	Unlikely	33	177.59	40.17
		Low	18	48.48	10.97
		Medium	53	171.74	38.85
		High	16	44.25	10.01
		Total	120	442.06	100.00
Rajouri Forest Division	Kalakote	Unlikely	32	89.79	31.76
		Low	12	21.31	7.54
		Medium	52	113.51	40.15
		High	31	58.08	20.55
		Total	127	282.69	100.00
	Kandi	Unlikely	59	154.95	60.57
		Low	15	21.12	8.26
		Medium	33	55.87	21.84
		High	17	23.90	9.34
		Total	124	255.85	100.00
	Rajouri	Unlikely	62	190.84	58.44
		Low	13	17.95	5.50
		Medium	43	74.85	22.92
		High	19	42.90	13.14
		Total	137	326.54	100.00
Ramban Forest Division	Banihal	Unlikely	2	3.08	1.23
		Low	62	213.46	85.12
		Medium	7	31.34	12.50
		High	1	2.89	1.15
		Total	72	250.77	100.00
	Ramban	Unlikely	0	0.00	0.00
		Low	55	181.02	73.01
		Medium	26	66.92	26.99
		High	0	0.00	0.00
		Total	81	247.94	100.00

Division	Range	Risk	Count	Area	%
Ramnagar Forest Division	Basantgarh	Unlikely	9	28.92	14.01
		Low	19	47.88	23.20
		Medium	38	85.08	41.23
		High	23	44.49	21.56
		Total	89	206.38	100.00
	Ramnagar North	Unlikely	7	3.89	3.63
		Low	19	43.18	40.37
		Medium	25	58.58	54.75
		High	1	1.33	1.25
		Total	52	106.98	100.00
	Ramnagar South	Unlikely	4	6.64	7.95
		Low	14	33.48	40.06
		Medium	22	43.46	52.00
		High	0	0.00	0.00
		Total	40	83.58	100.00
Reasi Forest Division	Katra	Unlikely	2	3.54	2.55
		Low	6	15.99	11.51
		Medium	27	107.19	77.13
		High	9	12.25	8.81
		Total	44	138.96	100.00
	Reasi	Unlikely	0	0.00	0.00
		Low	19	30.36	20.10
		Medium	31	65.96	43.67
		High	23	54.72	36.23
		Total	73	151.04	100.00
	Thakrakot	Unlikely	1	1.86	0.68
		Low	9	34.59	12.58
		Medium	43	166.18	60.22
		High	28	72.96	26.53
		Total	81	275.59	100.00

Division	Range	Risk	Count	Area	%
Samba Forest Division	Purmandal Range	Unlikely	9	26.20	16.06
		Low	3	4.60	2.82
		Medium	37	68.57	42.03
		High	32	63.78	39.09
		Total	81	163.15	100.00
	Mahargarh Range	Unlikely	27	50.18	52.16
		Low	1	1.57	1.63
		Medium	8	12.03	12.50
		High	19	32.43	33.71
		Total	55	96.21	100.00
	Samba Range	Unlikely	26	72.87	42.64
		Low	1	0.90	0.53
		Medium	13	28.92	16.92
		High	43	68.22	39.92
		Total	83	170.91	100.00
Udhampur Forest Division	Dudu Range	Unlikely	7	69.68	20.38
		Low	43	127.94	37.42
		Medium	82	122.79	35.92
		High	20	21.47	6.28
		Total	152	341.88	100.00
	Pancheri Range	Unlikely	3	7.49	4.85
		Low	16	37.51	24.27
		Medium	52	92.67	59.96
		High	12	16.90	10.93
		Total	83	154.56	100.00
	Udhampur Range	Unlikely	8	26.45	15.71
		Low	21	25.64	15.23
		Medium	59	77.49	46.02
		High	28	38.79	23.04
		Total	116	168.37	100.00

Kashmir Province					
Anantnag Forest Division	Daksum	Unlikely	18	96.06	24.50
		Low	19	51.12	13.04
		Medium	73	226.54	57.78
		High	10	18.40	4.69
		Total	120	392.11	100.00
	Kokernag	Unlikely	1	6.96	10.37
		Low	5	9.98	14.87
		Medium	23	49.34	73.49
		High	1	0.85	1.27
		Total	30	67.14	100.00
	Kuthar	Unlikely	11	350.85	11.33
		Low	16	390.27	12.60
		Medium	33	806.82	26.06
		High	6	1547.94	50.00
		Total	66	3095.89	100.00
	Qazigund	Unlikely	15	26.80	54.04
		Low	4	18.00	36.29
		Medium	1	4.79	9.66
		High	NA	NA	NA
		Total	20	49.60	100.00
	Verinag	Unlikely	19	171.54	60.41
		Low	8	15.70	5.52
		Medium	32	66.29	23.34
		High	14	30.42	10.71
		Total	73	283.96	100.00

Bandipora Forest Division	Ajas	Unlikely	9	118.80	53.64
		Low	9	25.47	11.50
		Medium	22	70.91	32.02
		High	4	6.25	2.82
		Total	44	221.45	100.00
	Gurez	Unlikely	52	1273.16	70.93
		Low	20	333.12	18.56
		Medium	30	118.47	10.50
		High	NA	NA	NA
		Total	102	1794.75	100.00
	Kuihama	Unlikely	16	194.72	43.18
		Low	25	78.11	17.32
		Medium	62	125.43	27.81
		High	15	52.64	11.67
		Total	118	450.92	100.00
	Ningli	Unlikely	NA	NA	NA
		Low	NA	NA	NA
		Medium	NA	NA	NA
		High	NA	NA	NA
		Total	NA	NA	NA
JV (Jhelum Valley) Forest Division	Baramulla	Unlikely	7	6.35	0.14
		Low	22	6.04	0.13
		Medium	5	23.17	0.51
		High	0	9.28	0.20
		Total	34	44.86	100.00
	Boniyar	Unlikely	14	63.24	31.74
		Low	30	97.51	48.93
		Medium	16	34.33	17.23
		High	3	4.17	2.09
		Total	63	199.26	100.00
	Dobgah	Unlikely	2	3.42	14.58
		Low	6	13.95	59.41
		Medium	5	6.10	25.99
		High	0	0	0
		Total	13	23.49	100.00
	Kathai	Unlikely	5	37.32	25.05
		Low	15	106.73	71.64
		Medium	2	4.92	3.30
		High	0	0	0
		Total	22	148.98	100.00
	Uri	Unlikely	14	32.21	23.90
		Low	22	74.83	55.52
		Medium	11	22.68	16.82
		High	0	0	0
		Total	51	134.77	100.00

FOREST FIRE RISK ZONATION & VULNERABILITY ASSESSMENT FORESTS OF JAMMU & KASHMIR

Division	Area	Risk	Count	Value	Percent
Kamraj Forest Division	Kandi	Unlikely	6	31.97	56.26
		Low	3	5.08	8.93
		Medium	8	18.26	32.13
		High	1	1.52	2.66
		Total	18	56.82	100.00
	Kupwara	Unlikely	13	22.01	20.35
		Low	13	24.78	22.91
		Medium	35	61.17	56.55
		High	1	0.19	0.18
		Total	62	108.17	100.00
	Matchil	Unlikely	1	4.02	1.24
		Low	23	77.05	23.84
		Medium	54	219.24	67.90
		High	5	22.54	6.98
		Total	83	322.85	100.00
	North Lolab	Unlikely	3	2.96	1.47
		Low	33	87.40	43.31
		Medium	38	102.30	50.70
		High	4	9.09	4.50
		Total	78	201.77	100.00
	South Lolab	Unlikely	9	13.31	11.35
		Low	29	44.88	38.28
		Medium	32	54.90	46.82
		High	3	4.15	3.54
		Total	73	117.26	100.00
Khemil Forest Division	Karnah	Unlikely	1	13.24	8.77
		Low	NA	NA	NA
		Medium	11	98.50	65.24
		High	10	39.22	25.98
		Total	22	150.96	100.00
	Keran	Unlikely	5	27.05	10.42
		Low	0	NA	NA
		Medium	15	230.92	89.01
		High	4	1.45	0.55
		Total	24	259.42	100.00
	Naihari	Unlikely	25	36.32	40.53
		Low	NA	NA	NA
		Medium	17	29.76	33.21
		High	15	23.52	26.25
		Total	57	89.60	100.00
	Ramhal	Unlikely	25	148.75	53.73
		Low	11	23.01	8.31
		Medium	27	91.24	32.92
		High	7	13.81	4.98
		Total	70	276.83	100.00

Division	Area	Risk	Count	Value	Percent
Kulgam Forest Division	DH-Pora/ Damal Hanji-pora	Unlikely	6	23.48	20.56
		Low	14	52.84	46.26
		Medium	11	30.57	26.76
		High	3	7.34	6.42
		Total	34	114.23	100.00
	Kulgam	Unlikely	5	5.30	1.56
		Low	2	2.94	0.87
		Medium	10	24.82	7.33
		High	1	0.83	0.24
		Total	18	33.89	10.00
	Vishau	Unlikely	10	198.15	68.57
		Low	13	43.01	14.89
		Medium	9	37.46	12.96
		High	2	10.34	3.58
		Total	34	288.96	100.00
Langate Forest Division	Magam	Unlikely	6	6.38	21.94
		Low	0	0.00	0.00
		Medium	17	19.38	66.68
		High	2	3.31	11.40
		Total	25	29.08	100.00
	Marwar	Unlikely	4	79.17	47.70
		Low	0	0.00	0.00
		Medium	43	65.22	39.30
		High	23	21.57	13.00
		Total	70	165.96	100.01
	Rafiabad	Unlikely	10	31.58	35.00
		Low	0	0.00	0.00
		Medium	15	43.71	48.44
		High	12	14.95	16.56
		Total	37	90.23	100.00
	Rajwar	Unlikely	9	12.63	14.85
		Low	0	0.00	0.00
		Medium	37	53.03	62.36
		High	16	19.38	22.79
		Total	62	85.04	100.00
Lidder Forest Division	Mattan	Unlikely	3	3.63	2.69
		Low	0	0.00	0.00
		Medium	43	128.44	95.10
		High	3	2.99	2.21
		Total	49	135.06	100.00
	Pahalgam	Unlikely	42	542.22	67.52
		Low	0	0.00	0.00
		Medium	63	260.83	32.48
		High	0	0.00	0.00
		Total	105	803.05	100.00
	Tral	Unlikely	6	413.39	61.34
		Low	0	NA	NA
		Medium	43	260.57	38.66
		High	0	NA	NA
		Total	49	673.97	100.00

Division	Sub-division	Category			
Pirpanjal Forest Division	Budgam	Unlikely	NA	NA	NA
		Low	NA	NA	NA
		Medium	NA	NA	NA
		High	NA	NA	NA
		Total	NA	NA	NA
	Doodganga	Unlikely	7	83.98	51.67
		Low	14	42.69	26.27
		Medium	14	31.38	19.31
		High	3	4.47	2.75
		Total	38	162.53	100.00
	Raithan	Unlikely	2	58.86	51.03
		Low	13	42.25	36.62
		Medium	7	14.25	12.36
		High	0	0.00	0.00
		Total	22	115.36	100.00
	Sukhnag	Unlikely	4	112.80	67.76
		Low	10	29.14	17.51
		Medium	9	24.54	14.74
		High	0	0.00	0.00
		Total	23	166.49	100.00
Shopian Forest Division	Kakapora	Unlikely	NA	NA	NA
		Low	NA	NA	NA
		Medium	NA	NA	NA
		High	NA	NA	NA
		Total	NA	NA	NA
	Romushi	Unlikely	13	71.67	39.29
		Low	16	53.34	29.24
		Medium	21	55.72	30.55
		High	1	1.67	0.92
		Total	51	182.40	100.00
	Shopian	Unlikely	12	308.57	82.49
		Low	12	31.33	8.38
		Medium	14	34.16	9.13
		High	0	0.00	0.00
		Total	38	374.07	100.00
Sindh Forest Division	Harran Shalbugh	Unlikely	0	0.00	0.00
		Low	0	0.00	0.00
		Medium	2	31.24	100.02
		High	0	0.00	0.00
		Total	2	31.24	100.00
	Manasbal	Unlikely	3	249.09	60.10
		Low	13	36.37	8.77
		Medium	33	129.03	31.13
		High	NA	NA	NA
		Total	49	414.49	100.00
	Sindh	Unlikely	19	583.60	72.82
		Low	27	74.23	9.26
		Medium	34	139.98	17.47
		High	3	3.65	0.46
		Total	83	801.45	100.00
	Urban	Unlikely	2	6.00	27.64
		Low	2	6.31	29.06
		Medium	2	9.40	43.31
		High	0	0.00	0.00
		Total	6	21.71	100.00
Tangmarg Forest Division	Gulmarg	Unlikely	22	166.59	60.91
		Low	4	9.39	3.43
		Medium	35	83.26	30.44
		High	11	14.27	5.22
		Total	72	273.50	100.00
	Pattan	Unlikely	0	NA	NA
		Low	5	13.63	37.99
		Medium	9	18.83	52.48
		High	3	3.42	9.54
		Total	17	35.89	100.00
	SPSP/ Shri Pratab Singh Pora	Unlikely	NA	NA	NA
		Low	NA	NA	NA
		Medium	NA	NA	NA
		High	NA	NA	NA
		Total	NA	NA	NA

JAMMU PROVINCE

3.2 FOREST DIVISIONS OF JAMMU PROVINCE.

Forest Divisions of Jammu Province lies between latitude 32°16'19.746"N - 34°12'59.8"N and longitude 73°57'11.293"E -76°46'54.51"E . The altitude of the Forest Divisions of Jammu Province ranges from 189 – 6997 m above mean sea level. The Jammu Province comprises of 18 divisions (Basoli, Batote, Bhadarwah, Bilawar, Doda, Jammu, Kathua, Kishtwar, Mahore, Marwah, Nowshera, Poonch, Rajouri, Ramban, Ramnagar, Reasi, Samba and Udhampur. The total area (on GIS platform) of 55 ranges of 18 divisions Jammu Province is 26045.16 km2. The figure below shows the Forest fire vulnerability map of Forest Divisions of Jammu Province. The final vulnerability class to a particular compartment was assigned based on the majority of the pixels of vulnerability map of that compartment.
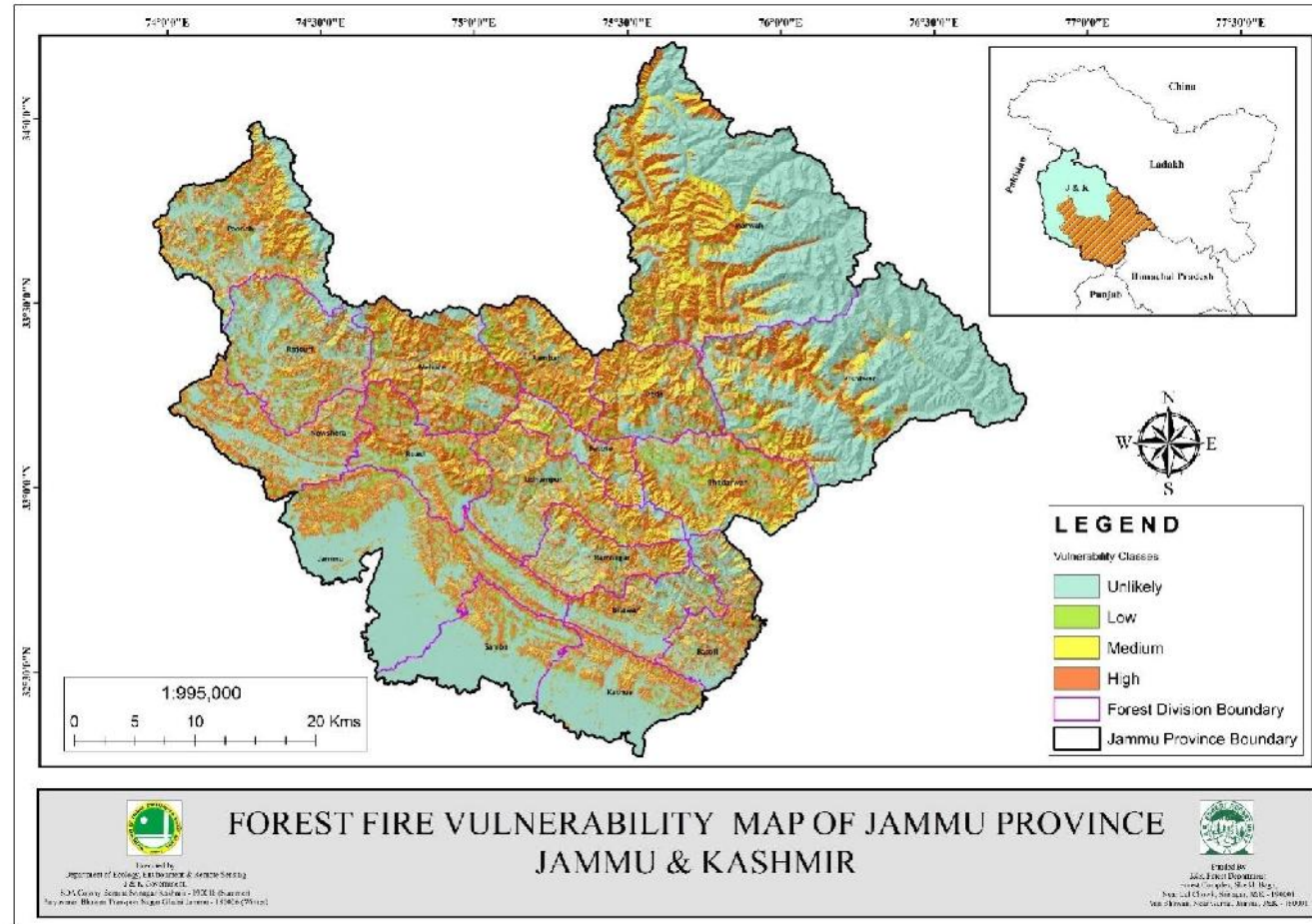
Fig. 10: Forest Fire Vulnerability Map of Jammu Province Jammu & Kashmir

Table.4. Compartments of Forest Divisions of Jammu Province under Different Vulnerability Classes.

Division Name	Unlikely vulnerability		Low vulnerability		Medium vulnerability		High vulnerability	
	No of compartments	Area (Sq Kms)	No of compartments	Area (Sq Kms)	No of compartments	Area (Sq Kms)	No of compartments	Area (Sq Kms)
Basoli	44	123.61	0	0	93	321.05	2	10.54
Batote	32	43.22	11	16.58	113	207.05	51	69.33
Bhadarwah	40	95.37	157	351.81	154	284.22	105	135.67
Bilawar	22	93.47	19	53.02	45	160.71	13	30.43
Doda	21	21.75	169	345.23	109	214.91	19	112.14
Jammu	20	80.37	7	24.87	97	553.44	23	114.54
Kathua	10	40.62	30	53.53	67	199.68	16	55.56
Kishtwar	70	719.24	27	96.23	66	449.04	32	421.05
Mahore	40	157.43	165	626.58	36	106.79	14	31.1
Marwah	42	1328.18	0	0	167	1036.35	126	370.95
Nowshera	18	37.9	63	154.64	203	380.92	60	387.26
Poonch	93	333.05	80	144.98	169	342.68	65	97.9
Rajouri	153	435.58	40	60.38	128	244.23	67	124.88
Ramban	2	3.08	117	394.48	33	98.26	1	2.89
Ramnagar	20	39.45	52	114.54	85	187.12	24	45.82
Reasi	3	5.4	34	80.94	91	339.33	60	139.93
Samba	62	149.25	5	7.07	58	109.52	94	164.43
Udhampur	18	103.62	80	191.09	193	292.95	60	78.16
Total	**710**	**3810.59**	**1056**	**2715.97**	**1907**	**5528.25**	**832**	**2392.58**

**Forest Division   Area
Jammu Province**

Vulnerability Classes	Area(Sq Kms)
Unlikely:	3810.59
Low:	2715.97
Medium:	5528.58
High:	2392.58
Total	**14447.39**

Percentage

Compartments
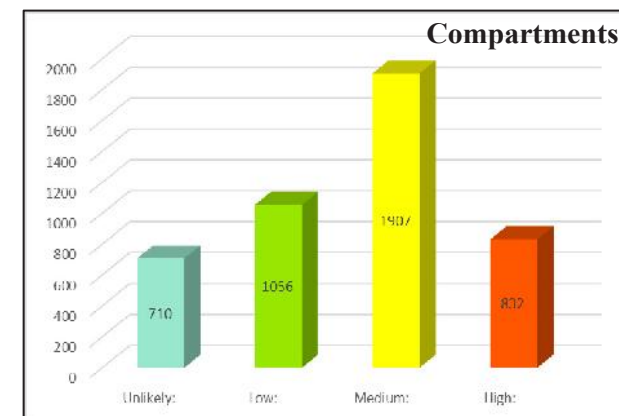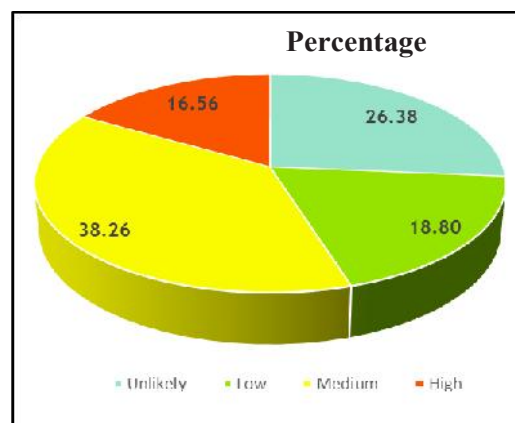
3.2.1 BASOLI FOREST DIVISION.

Basoli Forest Division lies between latitude 32°27'12.224"N - 32°53'29.351"N and longitude 75°34'43.228"E - 75°55'59.492"E. The altitude of the Basoli Forest Division ranges from 413 m – 4243 m above mean sea level. It is situated on the right bank of River Ravi in the Shiwalik hills. The division comprises of three territorial ranges (Bani, Basoli and Mahanpur). The total area (on GIS platform) of 139 Compartments of three territorial ranges is 455.02 km^2. *Source: (Working Circle Plan J & K Forest Department 2015-2016 to 2025-26).*
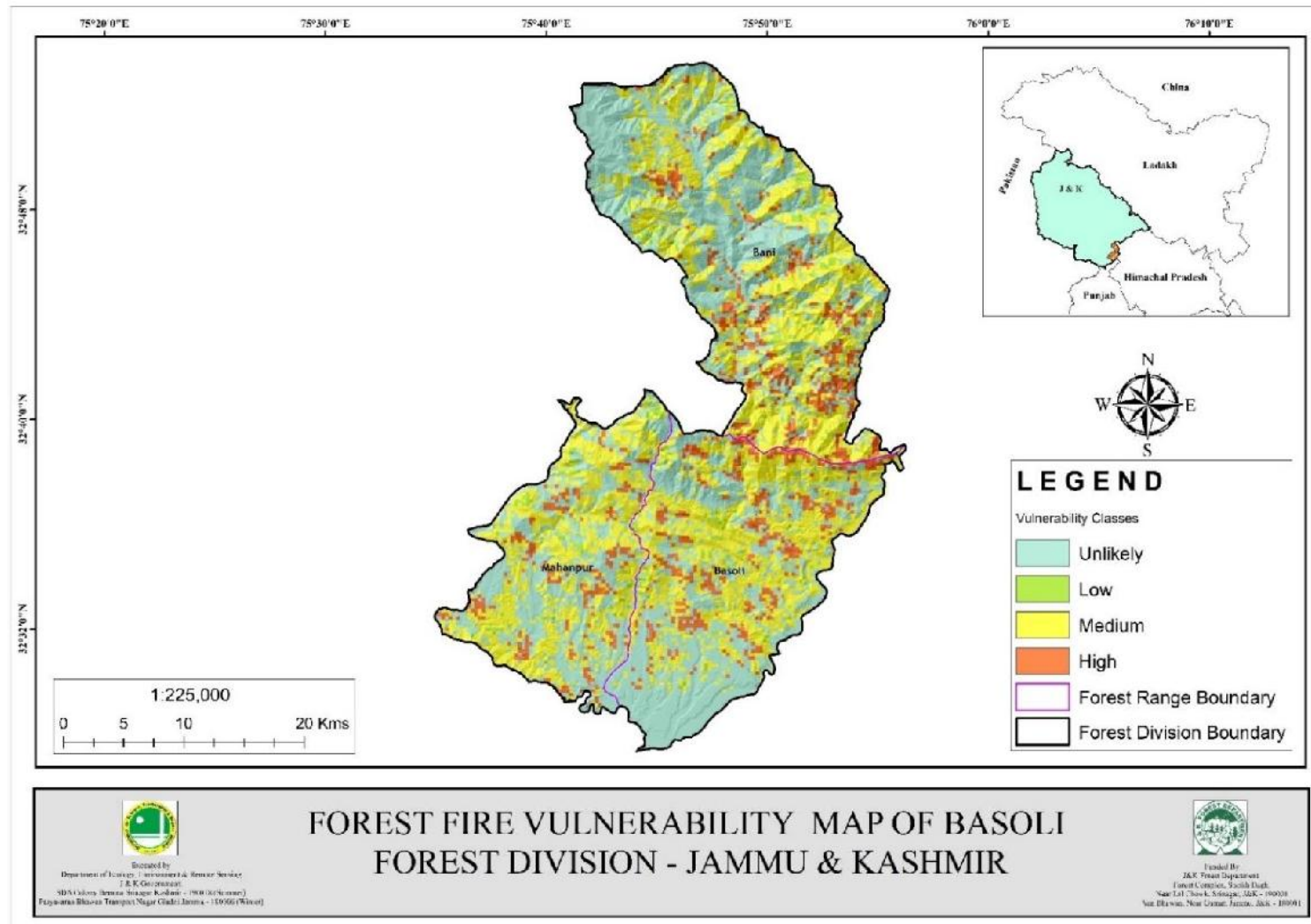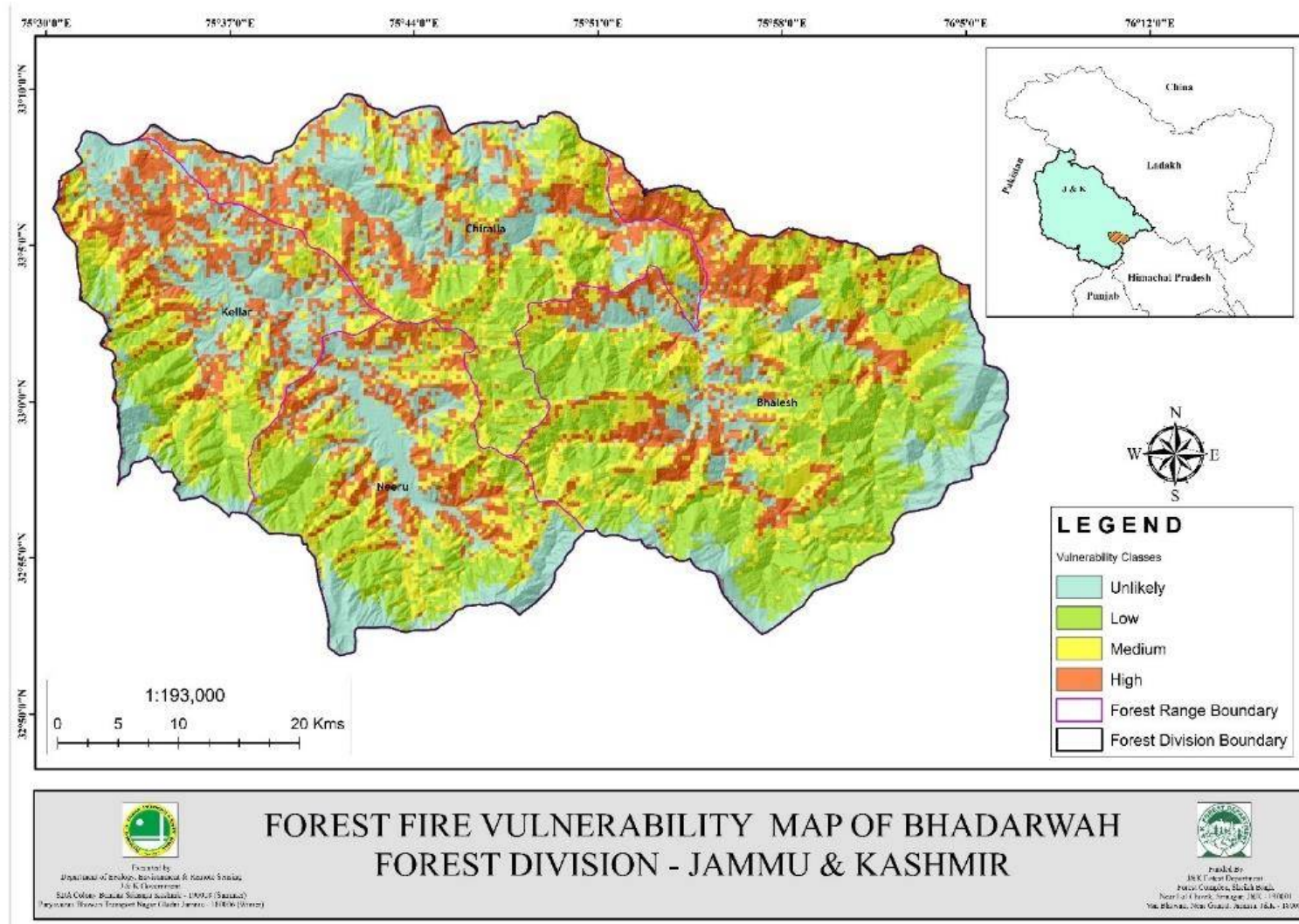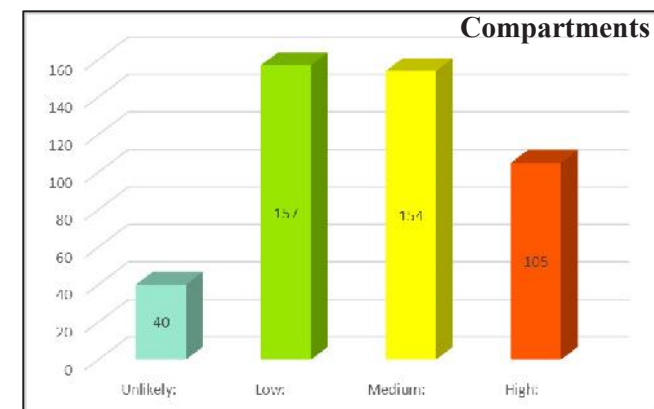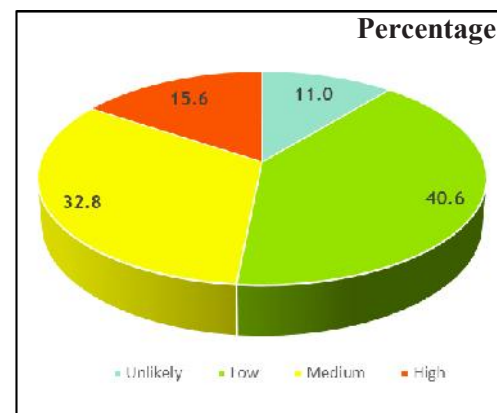

Fig. 11: Forest Fire Vulnerability Map of Basoli Forest Division Jammu & Kashmir

Table.5. Compartments of Basoli Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Basoli Forest Division	Bani	Unlikely	38	112.01	41.79
		Low	0	0.00	0.00
		Medium	41	147.33	54.97
		High	1	8.68	3.24
		Total	**80**	**268.03**	**100.00**
	Basoli	Unlikely	2	1.99	2.32
		Low	0	0.00	0.00
		Medium	29	81.79	95.51
		High	1	1.86	2.17
		Total	**32**	**85.63**	**100.00**
	Mahanpur	Unlikely	4	9.61	9.47
		Low	0	0.00	0.00
		Medium	23	91.93	90.53
		High	0	0.00	0.00
		Total	**27**	**101.54**	**100.00**

Area

Basoli Forest Division

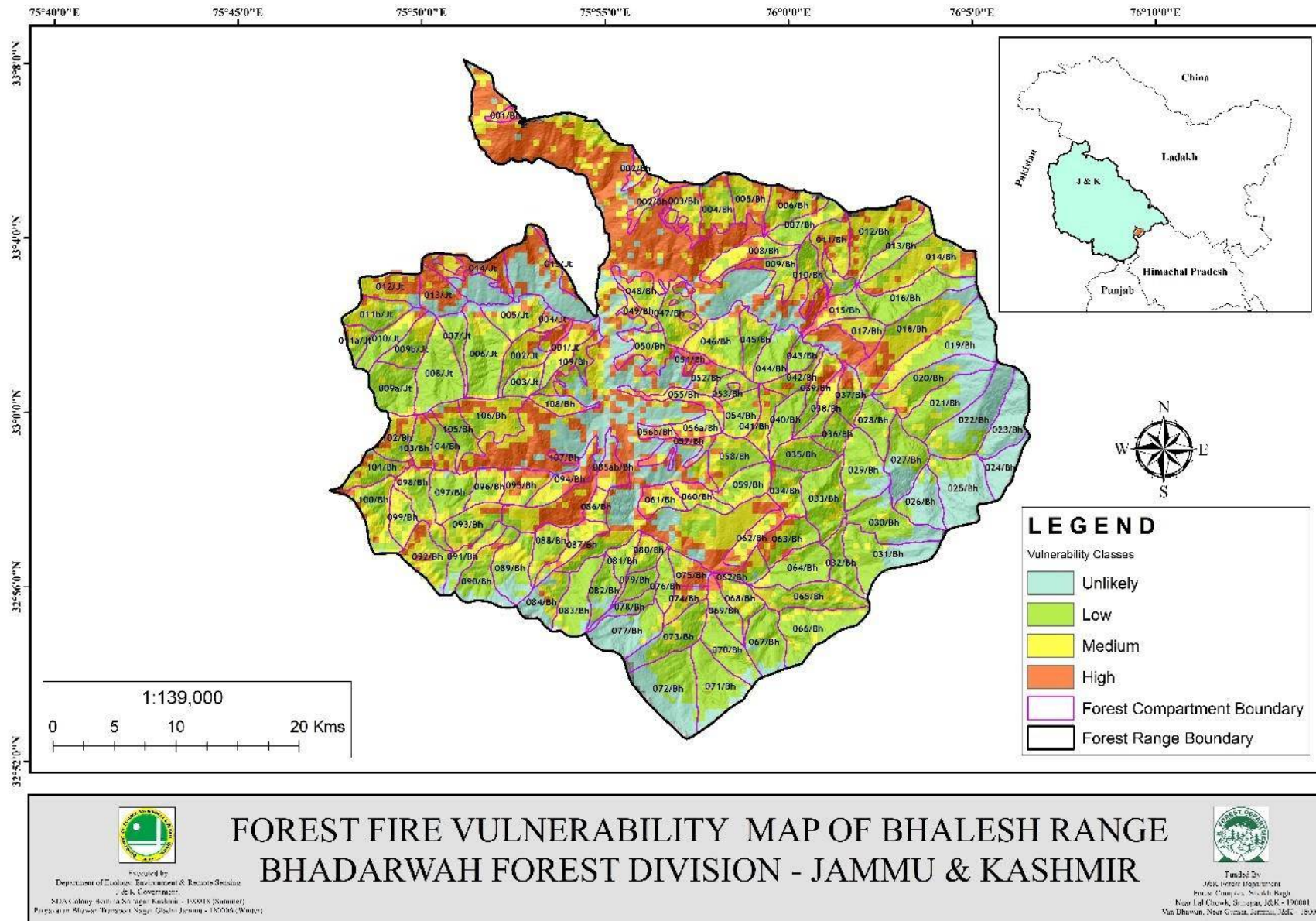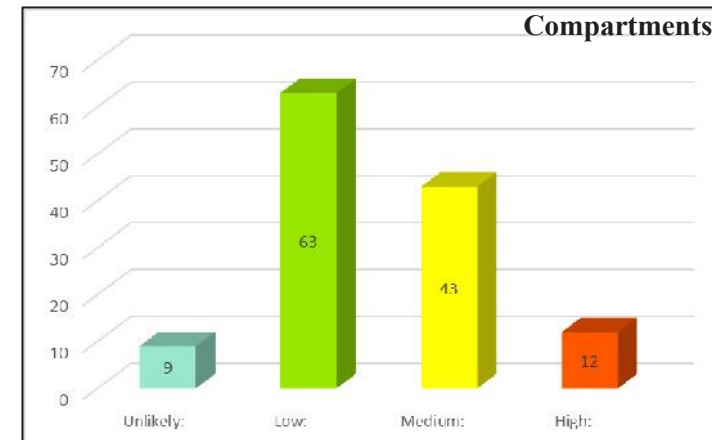| Vulnerability Classes	Area(Sq Kms)
Unlikely:	123.61
Low:	0.00
Medium:	321.05
High:	10.54
Total	**455.02**

Percentage
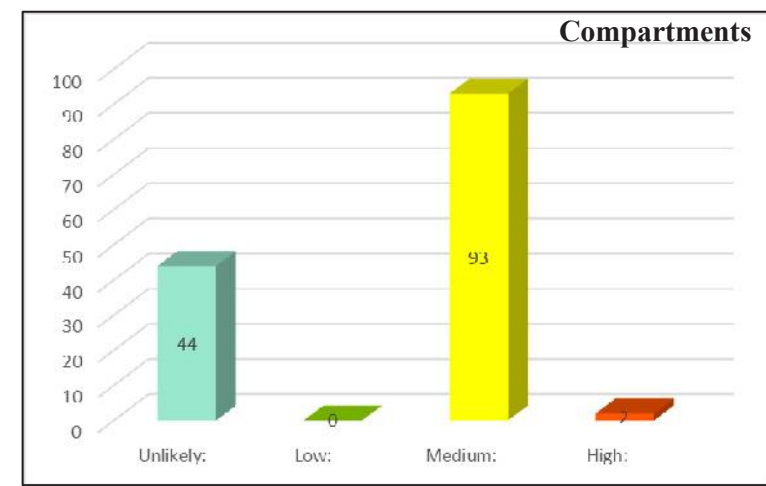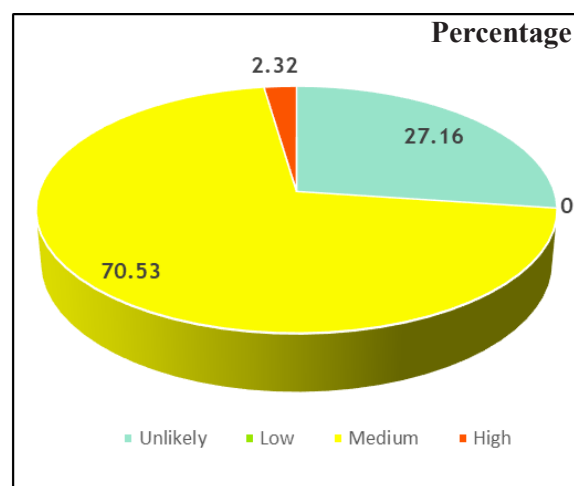
Compartments
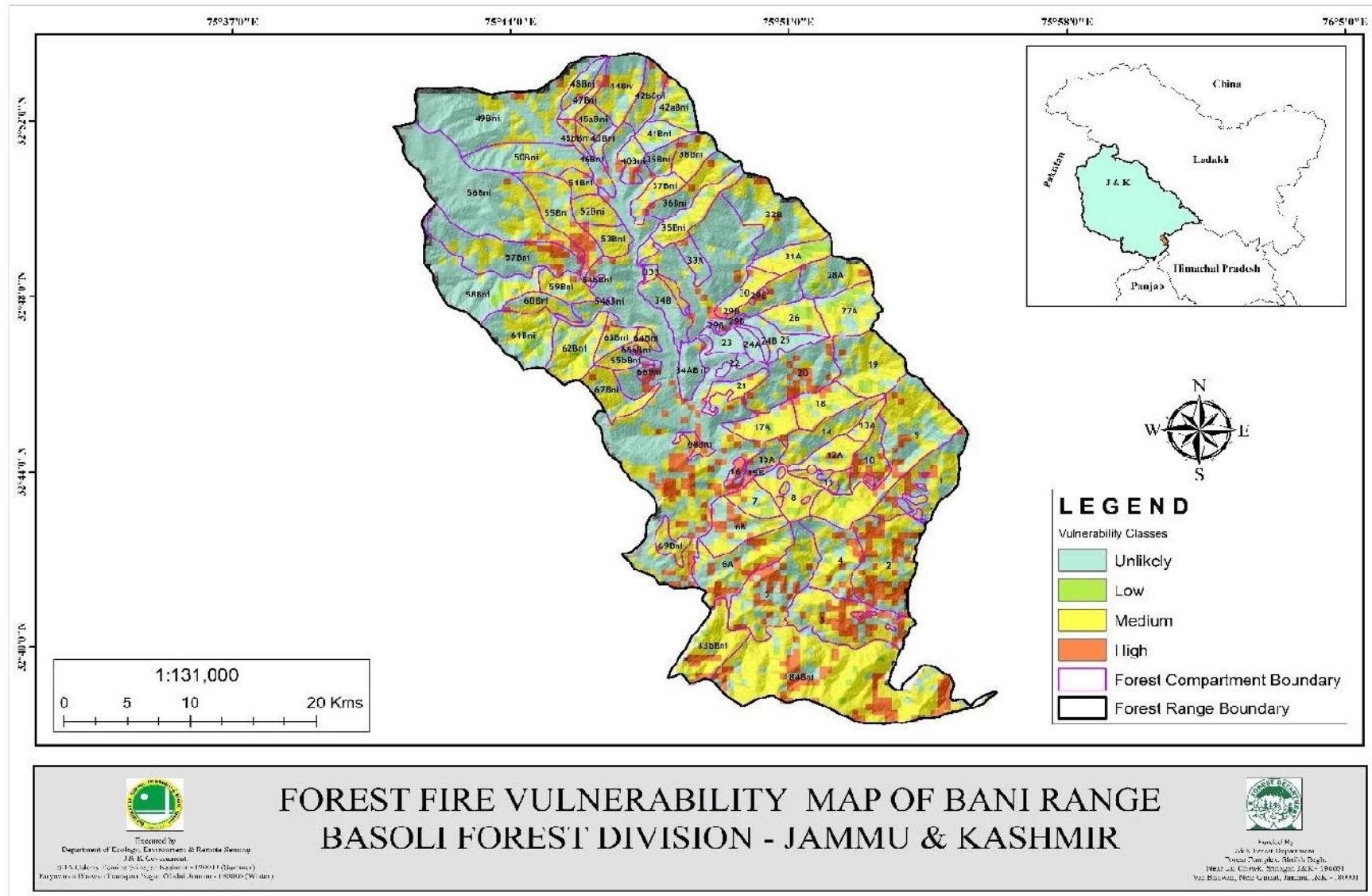
3.2.1.1 Bani Range

Fig. 12: Forest Fire Vulnerability Map of Bani Range Basoli Forest Division Jammu & Kashmir

Table.6. Compartments of Bani Range Basoli Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Bani	Unlikely	5,57Bni,56Bni,50Bni,42aBni,40Bni,41Bni,39Bni,36Bni,33A,32B,28A,25,24B,24A,23,2,29B,20,15B,16,6B,43Bni,46Bni,47Bni,49Bn,48Bni,54aBni,54bBni,58Bni,61Bni,65bBni,65aBni,66Bni,68Bni,34ABni,34B& 15A	38	112.01	41.79
	Low	None	0	0.00	0.00
	Medium	4,3,84Bni,83bBni,55Bni,42bBni,38Bni,37Bni,33B,35Bni,31A,27A,26,30,18,17A,19,9,13A,14,21,7,6A,44Bni,45aBni,45bBni,51Bni,52Bni,53Bni,59Bni,60Bni,62Bni,63Bni,64Bni,67Bni,69Bni,8,11,12A,10 & 1	41	147.33	54.97
	High	2	1	8.68	3.24
Total			**80**	**268.03**	**100.00**

Area

Bani Range

Vulnerability Classes	Area(Sq Kms)
Unlikely:	112.01
Low:	0.00
Medium:	147.33
High:	8.68
Total	**268.03**

Percentage
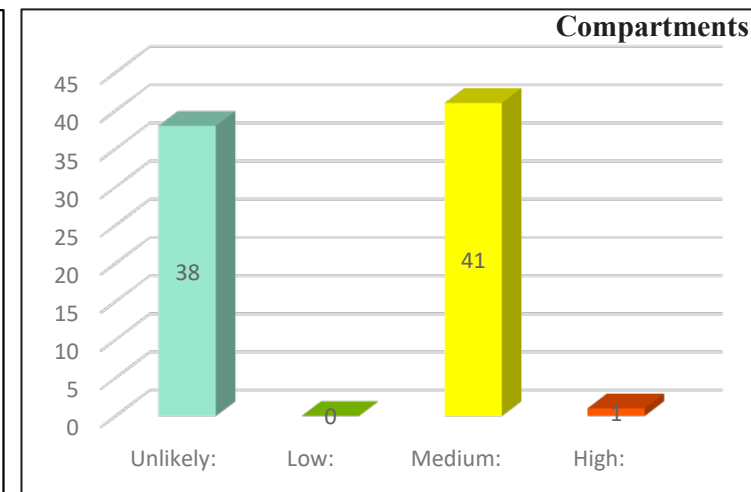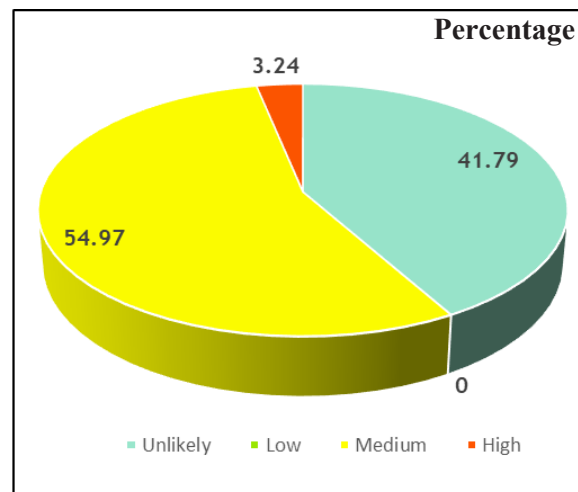
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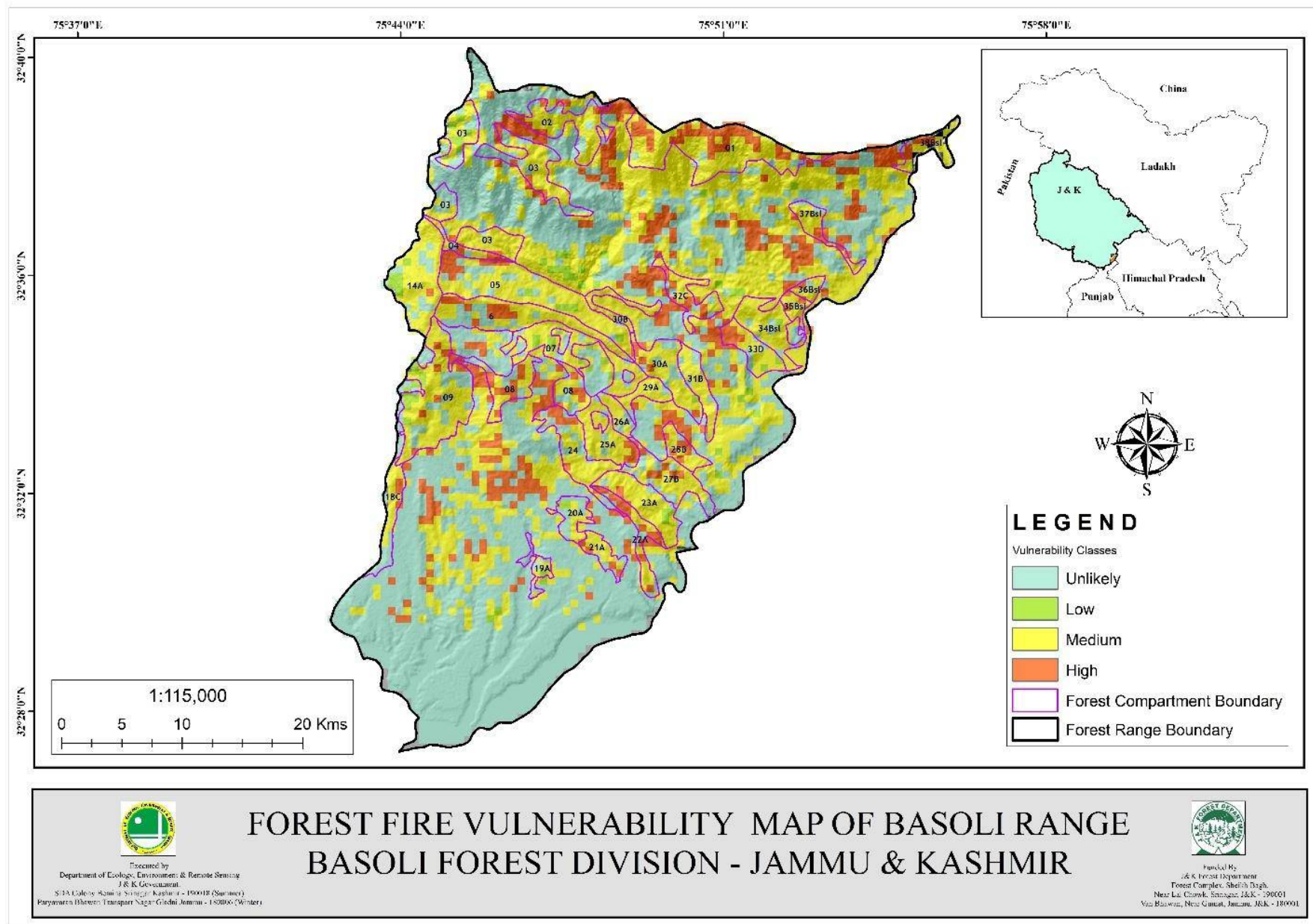
3.2.1.2 Basoli Range

Fig. 13: Forest Fire Vulnerability Map of Basoli Range Basoli Forest Division Jammu & Kashmir

Table.7. Compartments of Basoli Range Basoli Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Basoli	Unlikely	20A and19A	2	1.99	2.32
	Low	None	0	0.00	0.00
	Medium	6,3,38Bsl,37Bsl,36Bsl,35Bsl,34Bsl,33D,31B,30A,30B, 32C,1,2,5,4,7,8,9,18C,23A,24,25A,29A,26A,28B,27B, 14A & 21A	29	81.79	95.51
	High	22A	1	1.86	2.17
Total			32	85.63	100.00

Area

Basoli Range

Vulnerability Classes	Area(Sq Kms)
Unlikely:	1.99
Low:	0.00
Medium:	81.79
High:	1.86
Total	**85.63**

Percentage
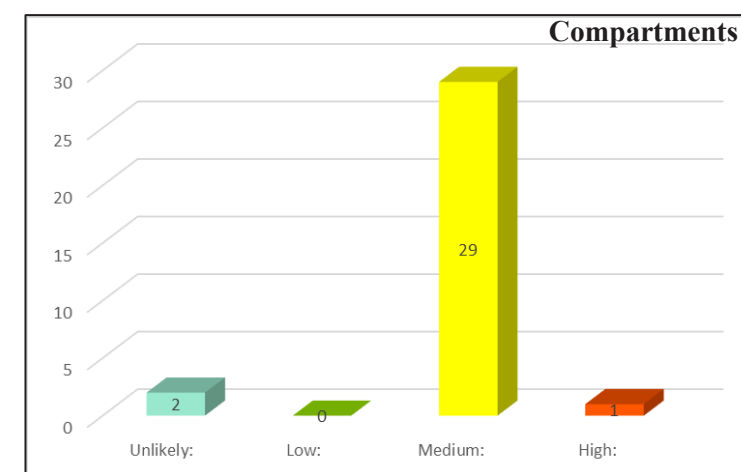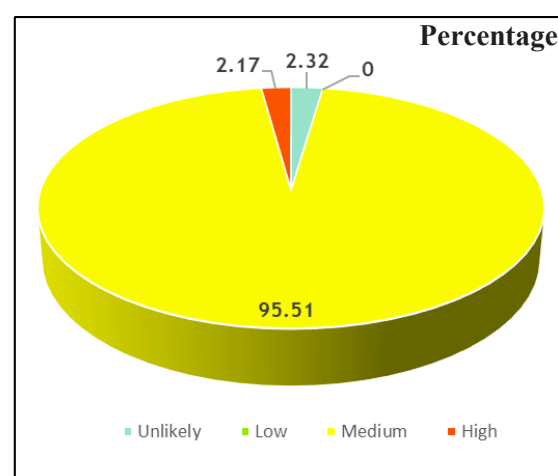
Compartments

3.2.1.3 Mahanpur Range
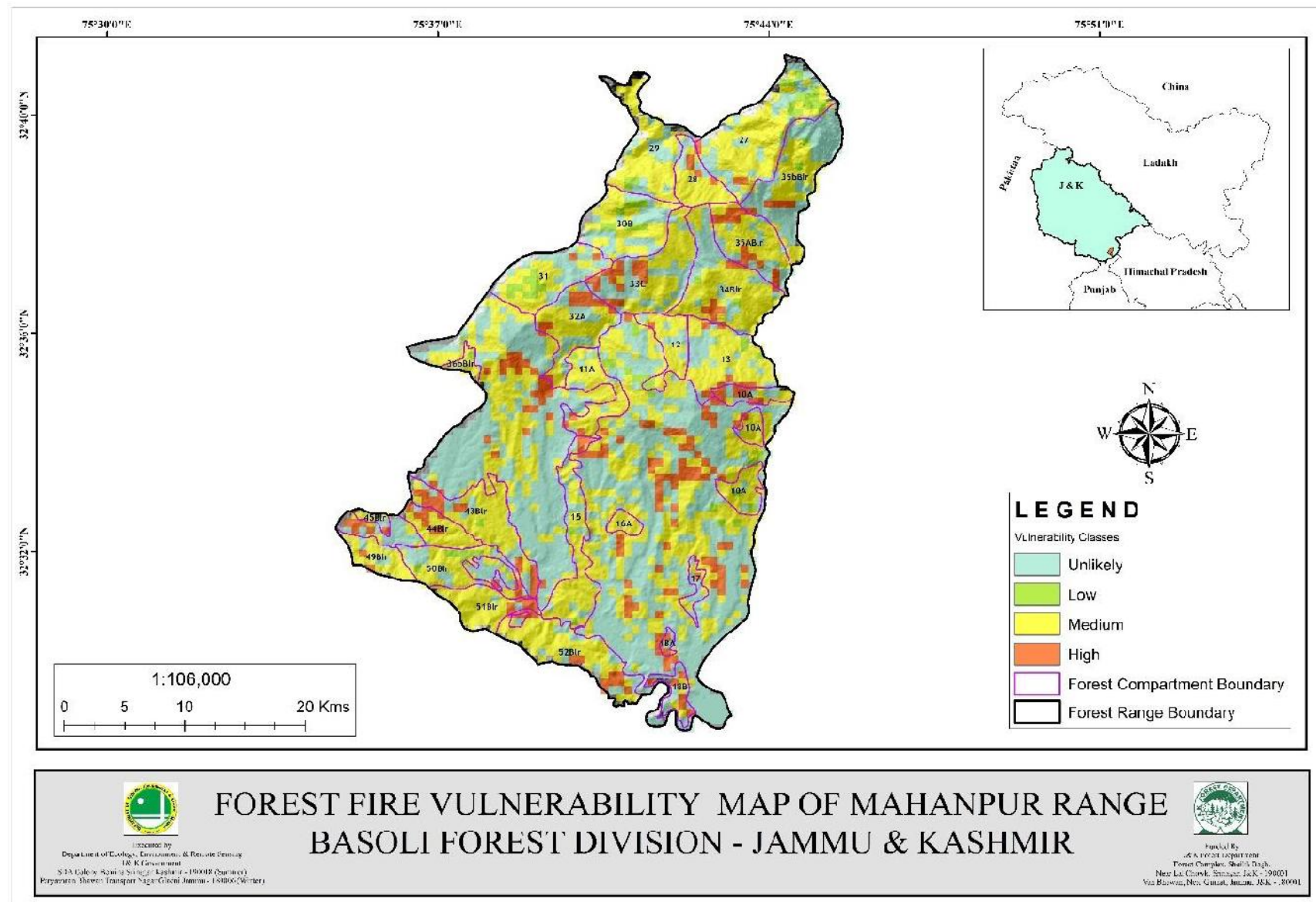
Fig. 14: Forest Fire Vulnerability Map of Mahanpur Range Basoli Forest Division Jammu & Kashmir

FOREST FIRE RISK ZONATION & VULNERABILITY
ASSESSMENT FORESTS OF JAMMU & KASHMIR

Table.8. Compartments of Mahanpur Range Basoli Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Mahanpur	Unlikely	35bBlr,17,18B & 18A	4	9.61	9.47
	Low	None	0	0.00	0.00
	Medium	52Blr,51Blr,50Blr,49Blr,43Blr,44Blr,45Blr,36bBlr,31,32A,33C,30B,28,29,27,34Blr,35ABlr,15,16A,10A,13,11A & 12	23	91.93	90.53
	High	None	0	0.00	0.00
Total			27	101.54	100.00

Area

Mahanpur Range

Vulnerability Classes	Area(Sq Kms)
Unlikely:	9.61
Low:	0.00
Medium:	91.93
High:	0.00
Total	**101.54**

Percentage

0   9.47   0

90.53

■ Unlikely   ■ Low   ■ Medium   ■ High

Compartments

4   0   23   0

Unlikely: Low: Medium: High:
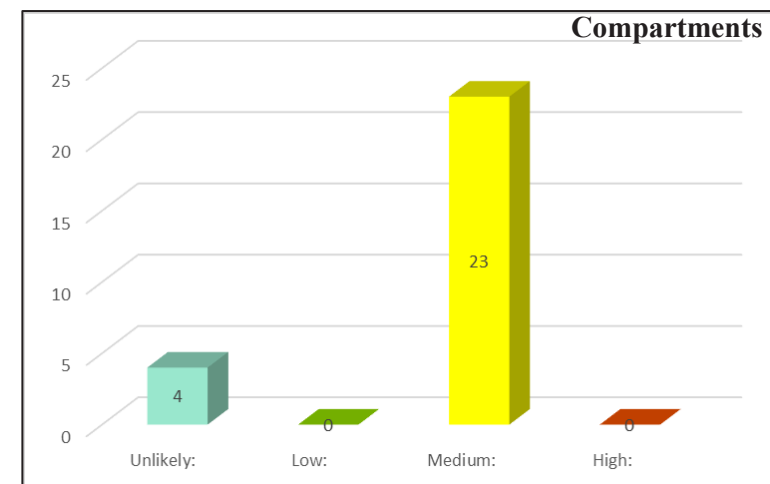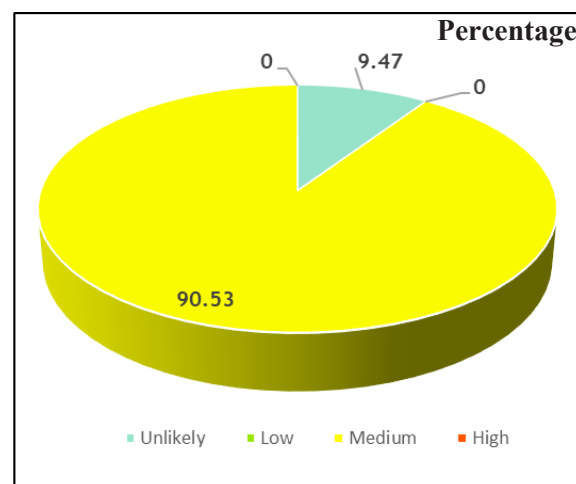
3.2.2 BATOTE FOREST DIVISION.

Batote Forest Division lies between 32°57'1.902"N - 33°16'8.057"N latitude and 75°5'54.933"E - 75°32'40.912"E longitude. The elevation of Batote forest Division varies from 515 m - 3839 m above mean sea level. The division comprises of three territorial ranges (Batote, Gandhri, and Marmat). The total area (on GIS platform) of 207 Compartments of three territorial ranges is 335.63 km².
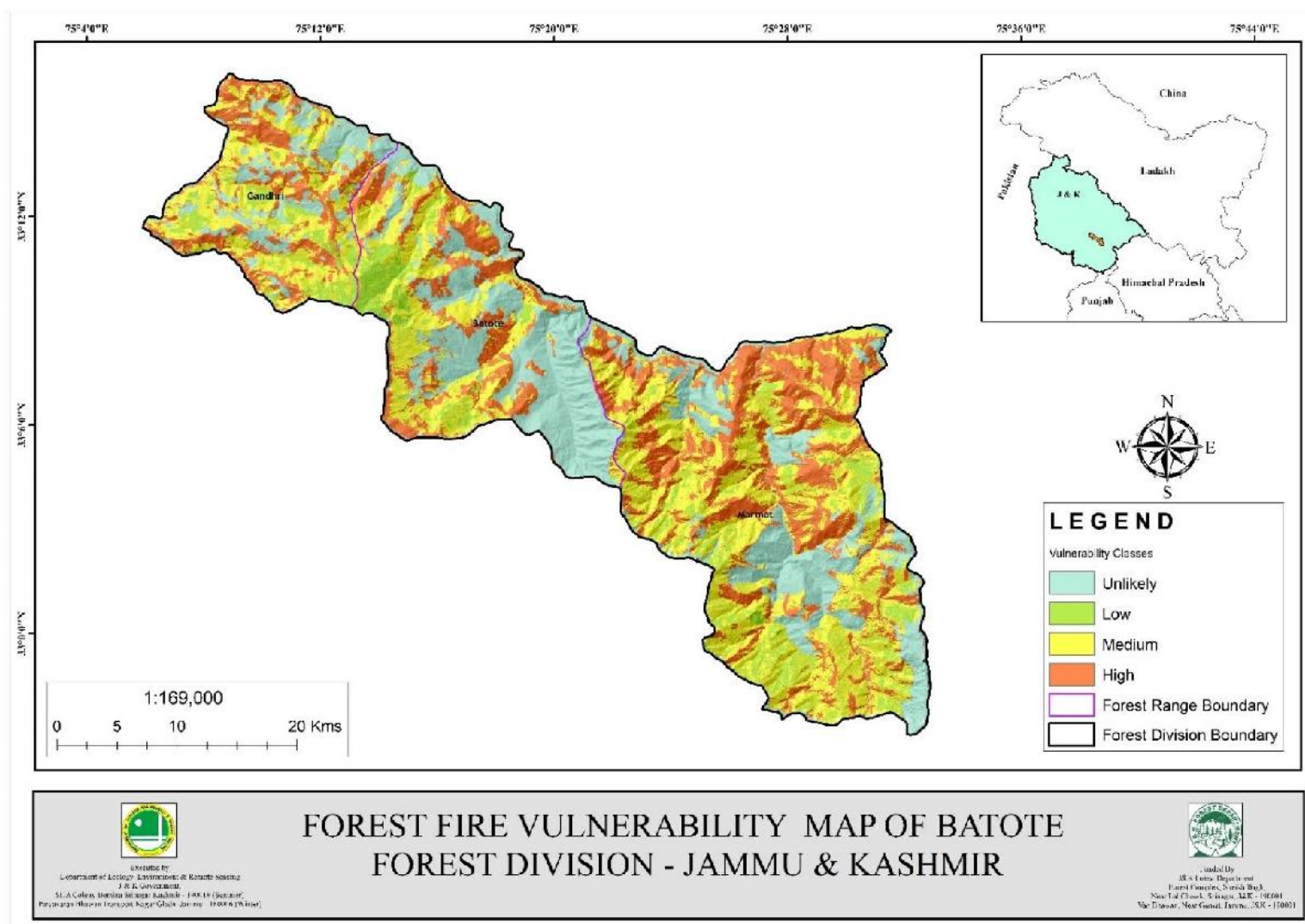
Fig. 15: Forest Fire Vulnerability Map of Batote Forest Division Jammu & Kashmir

Table.9. Compartments of Batote Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Batote Forest Division	Batote	Unlikely	20	24.74	25.64
		Low	7	8.79	9.11
		Medium	29	47.81	49.56
		High	11	15.14	15.69
		Total	**67**	**96.48**	**100.00**
	Gandhri	Unlikely	5	7.61	10.01
		Low	2	4.46	5.86
		Medium	28	37.54	49.40
		High	20	26.39	34.73
		Total	**55**	**76.00**	**100.00**
	Marmat	Unlikely	7	10.87	6.66
		Low	2	3.33	2.04
		Medium	56	121.70	74.59
		High	20	27.25	16.70
		Total	**85**	**163.15**	**100.00**

Area

Batote Forest Division

Vulnerability Classes	Area(Sq Kms)
Unlikely:	43.22
Low:	16.58
Medium:	207.05
High:	68.78
Total	**335.63**

Percentage
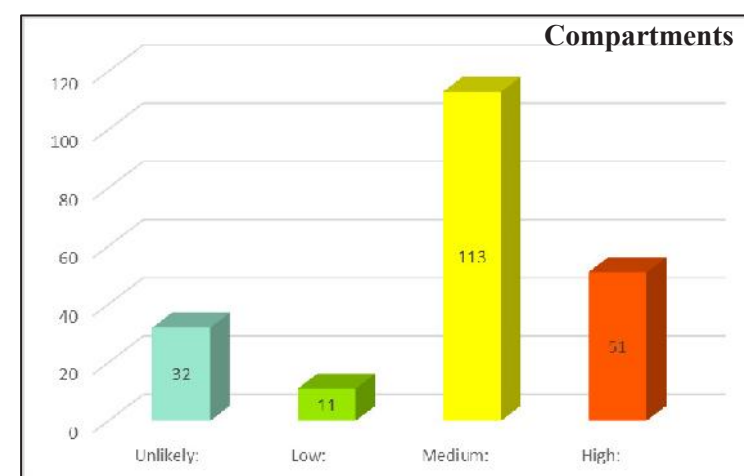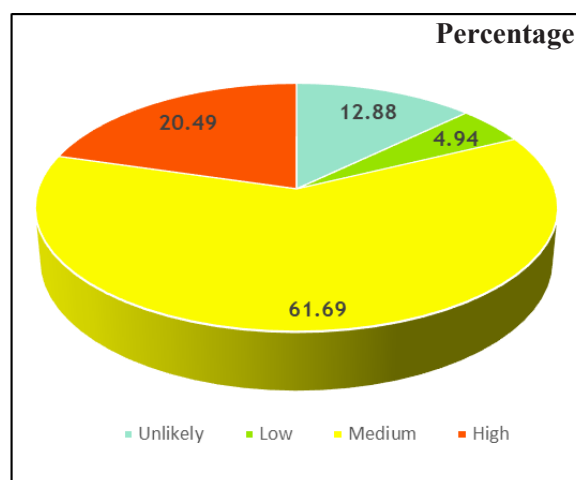
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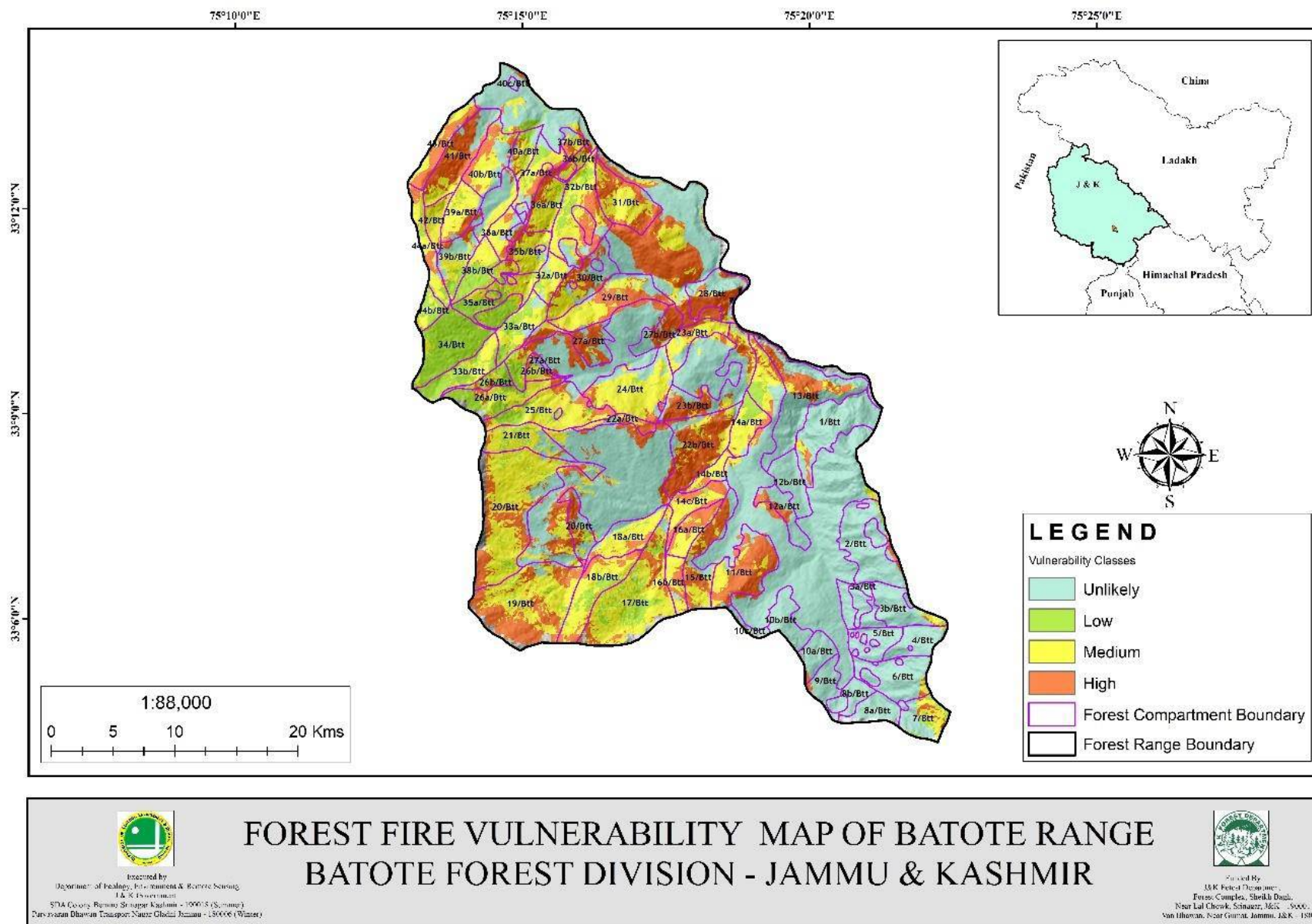
3.2.2.1 Batote Range

Fig. 16: Forest Fire Vulnerability Map of Batote Range Batote Forest Division Jammu & Kashmir

Table.10. Compartments of Batote Range Batote Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Batote	Unlikely	007/Btt,004/Btt,005/Btt,003a/Btt,003b/Btt,001/Btt,002/Btt,010b/Btt,030/Btt,023b/Btt,013/Btt,012b/Btt,008a/Btt,009/Btt,006/Btt,008b/Btt,010a/Btt,010c/Btt,012a/Btt & 040c/Btt	20	24.74	25.64
	Low	034/Btt,038b/Btt,035a/Btt,033b/Btt,026a/Btt,026b/Btt & 044b/Btt	7	8.79	9.11
	Medium	014c/Btt,017/Btt,018a/Btt,018b/Btt,039b/Btt,036a/Btt,032b/Btt,029/Btt,025/Btt,024/Btt,044a/Btt,040b/Btt,042/Btt,037a/Btt,036b/Btt,031/Btt,020/Btt,019/Btt,014a/Btt,014b/Btt,016b/Btt,023a/Btt,021/Btt,033a/Btt,035b/Btt,040a/Btt,039a/Btt,038a/Btt,03 & 2a/Btt	29	47.81	49.56
	High	015/Btt,016a/Btt,028/Btt,043/Btt,041/Btt,011/Btt,027a/Btt,027b/Btt,022b/Btt,022a/Btt & 037b/Btt	11	15.14	15.69
	Total		**67**	**96.48**	**100.00**

Area

Batote Range

Vulnerability Classes	Area(Sq Kms)
Unlikely:	24.74
Low:	8.79
Medium:	47.81
High:	15.14
Total	**96.48**

Percentage

Unlikely Low Medium High
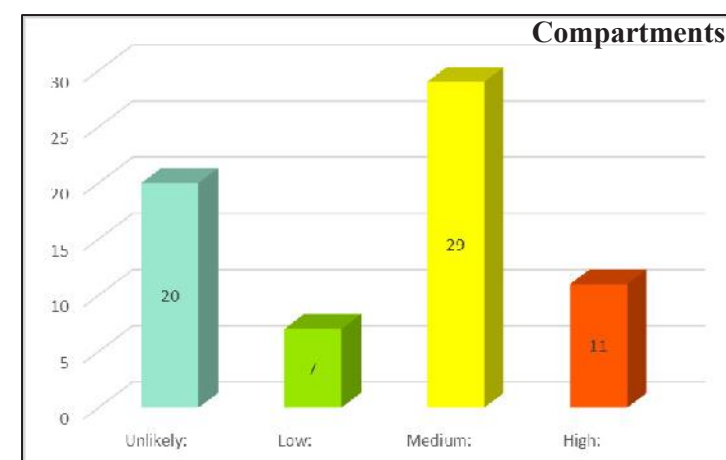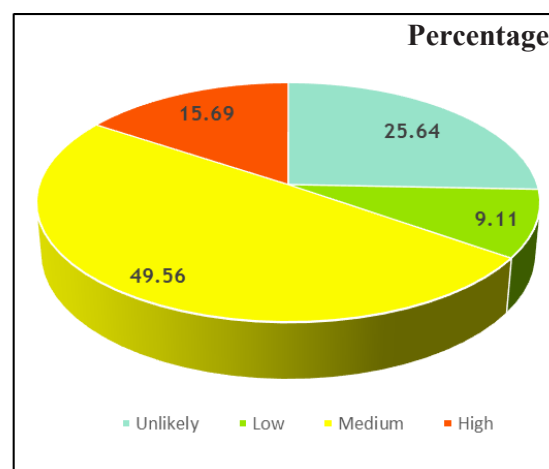
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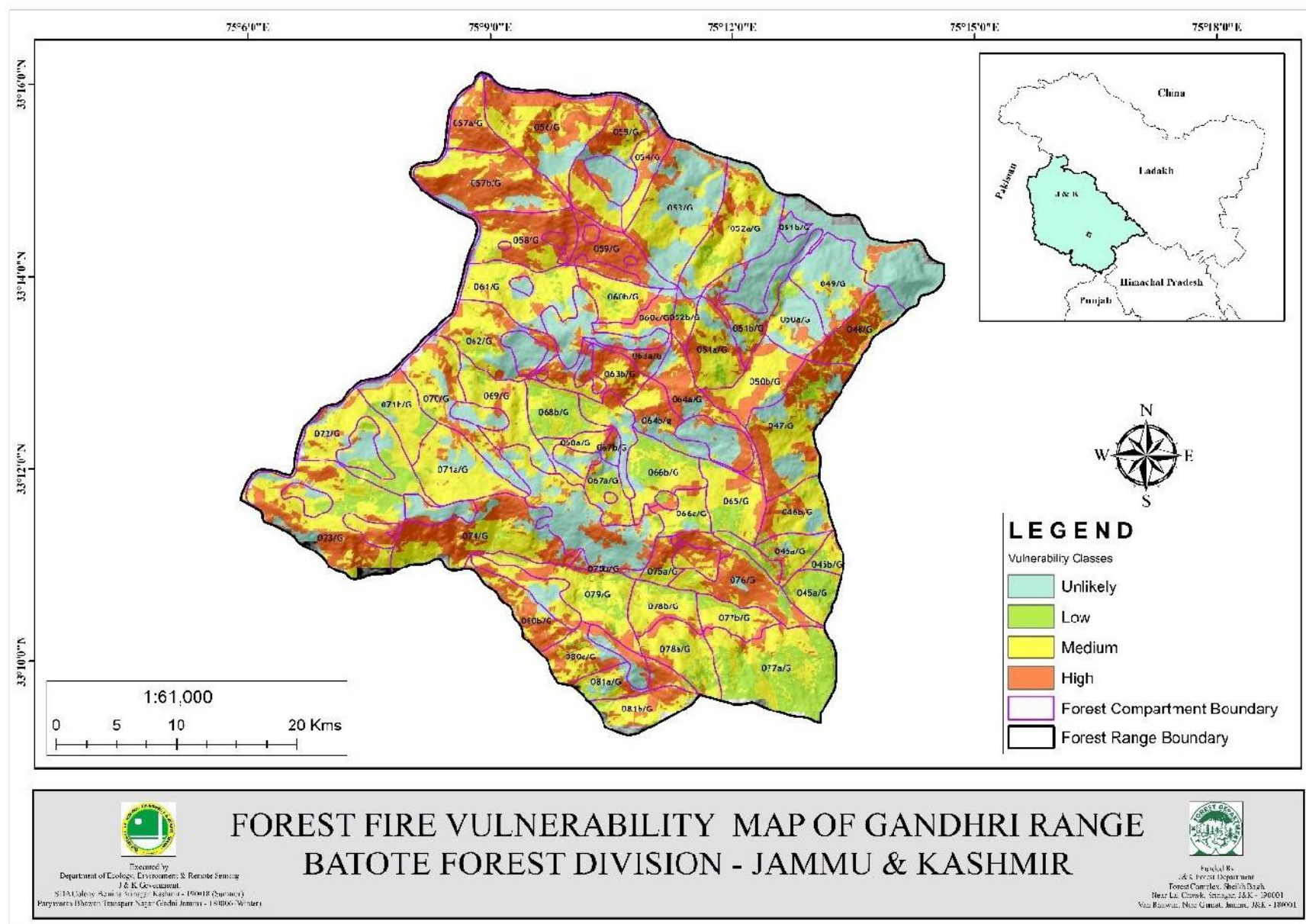
3.2.2.2 Gandhri Range

Fig. 17: Forest Fire Vulnerability Map of Gandhri Range Batote Forest Division Jammu & Kashmir

Table.11. Compartments of Gandhri Range Batote Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Gandhri	Unlikely	053/G,049/G,050a/G,051b/G & 067b/G	5	7.61	10.01
	Low	077a/G & 068b/G	2	4.46	5.86
	Medium	078a/G,078b/G,079/G,062/G,061/G,060b/G,055/G,052a/G,050b/G,045a/G,073/G,065/G,072/G,071b/G,069/G,071a/G,046b/G,066b/G,045b/G,046a/G,051a/G,067a/G,066a/G,068a/G,054/G,081b/G,070/G & 077b/G	28	37.54	49.40
	High	081a/G,080b/G,057a/G,057b/G,058/G,059/G,064a/G,063b/G,056/G,052b/G,047/G,048/G,074/G,076/G,075a/G,080a/G,064b/g,063a/G,075b/G & 060a/G	20	26.39	34.73
Total			**55**	**76.00**	**100.00**

Area	
Gandhri Range	
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	7.61
Low:	4.46
Medium:	37.54
High:	26.39
Total	**76.00**

Percentage
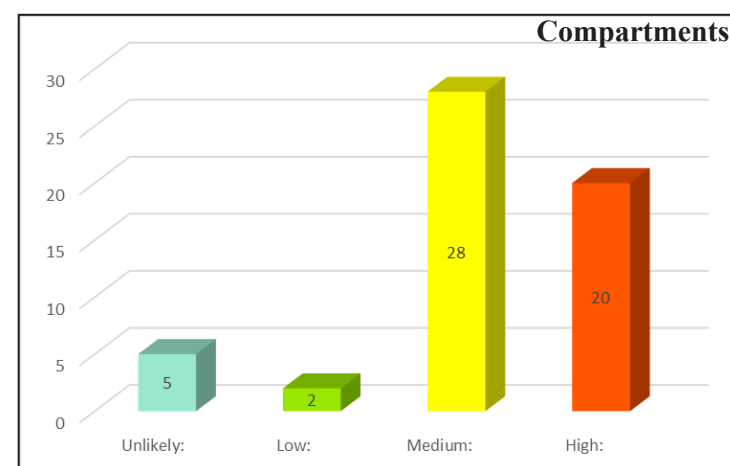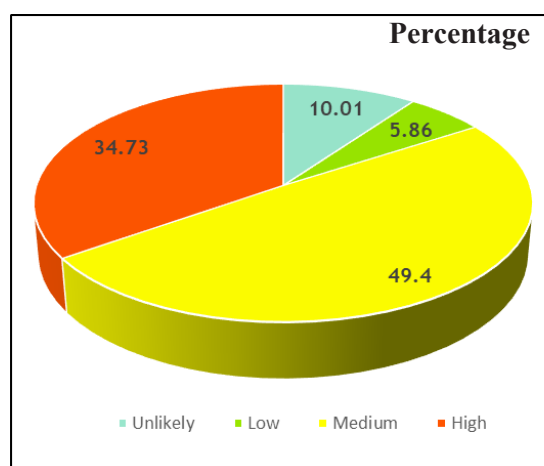
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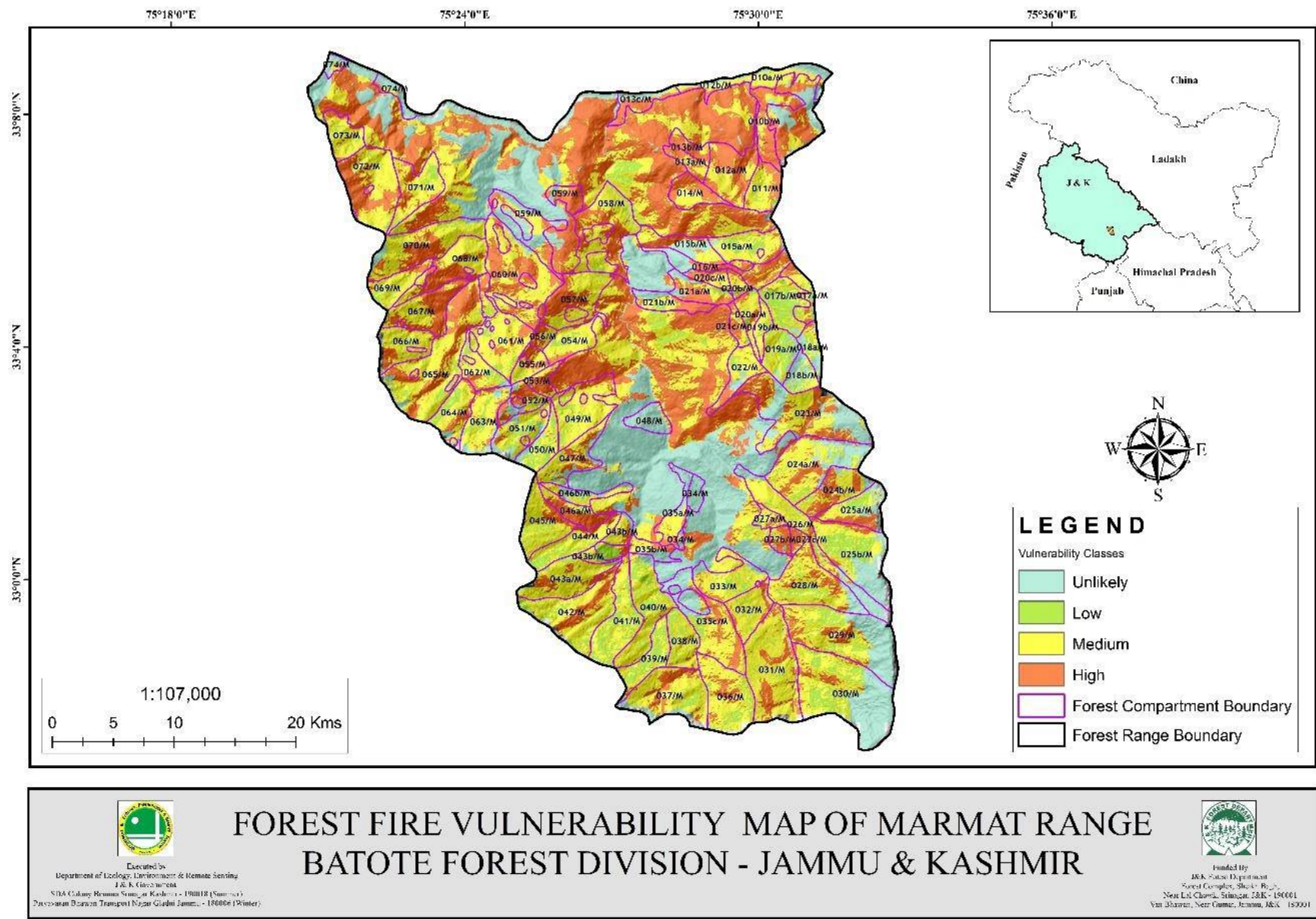
3.2.2.3 Marmat Range

Fig. 18: Forest Fire Vulnerability Map of Marmat Range Batote Forest Division Jammu & Kashmir

Table.12. Compartments of Marmat Range Batote Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Marmat	Unlikely	030/M,018b/M,018a/M,048/M,074/M,034/M & 035b/M	7	10.87	6.66
	Low	017b/M & 039/M	2	3.33	2.04
	Medium	073/M,072/M,071/M,066/M,070/M,069/M,068/M,065/M,064/M,063/M,062/M,061/M,029/M,028/M,027a/M,026/M,025a/M,025b/M,024b/M,024a/M,019a/M,020b/M,020a/M,022/M,015a/M,015b/M,011/M,010a/M,012b/M,037/M,038/M,040/M,041/M,044/M,045/M,046b/M,047/M,050/M,055/M,054/M,057/M,058/M,031/M,036/M,032/M,033/M,035a/M,043a/M,035c/M,042/M,051/M,049/M,060/M,043b/M,017a/M & 019b/M	56	121.70	74.59
	High	067/M,023/M,020c/M,021c/M,021b/M,021a/M,016/M,010b/M,013c/M,014/M,012a/M,013a/M,013b/M,046a/M,053/M,056/M,059/M,052/M,027b/M & 027c/M	20	27.25	16.70
Total			85	163.15	100.00

Area

Marmat Range

Vulnerability Classes	Area(Sq Kms)
Unlikely:	10.87
Low:	3.33
Medium:	121.70
High:	27.25
Total	**163.15**

Percentage

Compartments
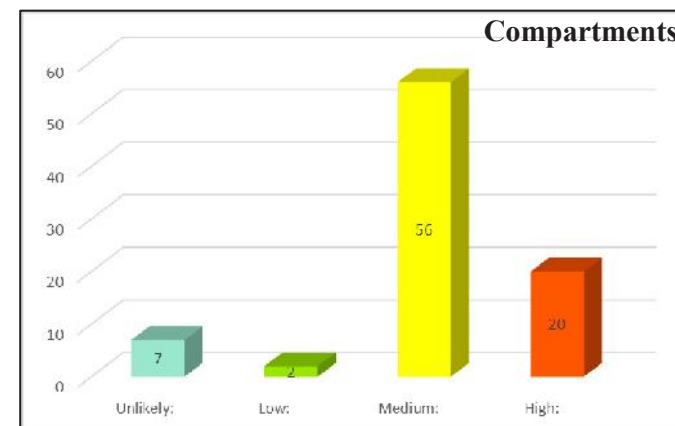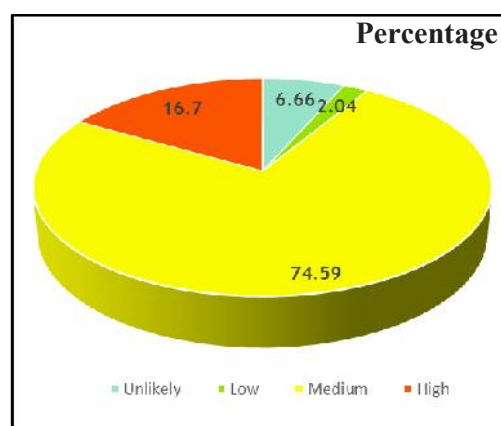
3.2.3 BHADERWAH FOREST DIVISION.

Bhadarwah forest division lies between latitude 33°9'50.309"N - 32°51'49.95"N and longitude 76°6'34.785"E - 75°30'9.845"E. The Altitude of the area varies from 775 m - 4362 m above mean sea level. The division comprises of four territorial ranges (Bhalesh, Chiralla, Kellar and Neeru). The total area (on GIS platform) of 456 Compartments of four territorial ranges is 867.07 km^2.

Fig. 19: Forest Fire Vulnerability Map of Bhadarwah Forest Division Jammu & Kashmir

Table.13. Compartments of Bhadarwah Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Bhadarwah Forest Division	Bhalesh	Unlikely	9	42.04	11.56
		Low	63	187.17	51.46
		Medium	43	116.03	31.90
		High	12	18.50	5.09
		Total	**127**	**363.73**	**100.00**
	Chiralla	Unlikely	9	6.75	4.30
		Low	39	53.53	34.07
		Medium	39	57.07	36.32
		High	35	39.77	25.31
		Total	**122**	**157.12**	**100.00**
	Kellar	Unlikely	11	17.04	10.46
		Low	27	53.85	33.03
		Medium	29	48.55	29.79
		High	32	43.56	26.72
		Total	**99**	**163.00**	**100.00**
	Neeru	Unlikely	11	29.54	16.13
		Low	28	57.26	31.25
		Medium	43	62.57	34.15
		High	26	33.84	18.47
		Total	**108**	**183.20**	**100.00**

Bhadarwah Forest Division	Area
Vulnerability Classes	Area(Sq Kms)
Unlikely:	95.37
Low:	351.81
Medium:	284.22
High:	135.67
Total	**867.07**

Percentage

Compartments

3.2.3.1 Bhalesh Range

Fig. 20: Forest Fire Vulnerability Map of Bhalesh Range Bhadarwah Forest Division Jammu & Kashmir

FOREST FIRE RISK ZONATION & VULNERABILITY ASSESSMENT FORESTS OF JAMMU & KASHMIR

Table.14. Compartments of Bhalesh Range Bhadarwah Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Bhalesh	Unlikely	084/Bh,077/Bh,072/Bh,019/Bh,023/Bh,025/Bh,024/Bh,026/Bh,022/Bh	9	42.04	11.56
	Low	067/Bh,090/Bh,104/Bh,011a/Jt,010/Jt,009a/Jt,008/Jt,007/Jt,006/Jt,003/Jt, 105/Bh,103/Bh,101/Bh,098/Bh,097/Bh,088/Bh,089/Bh,091/Bh,083/Bh,082/Bh,081/Bh,078/Bh,080/Bh,079/Bh,076/Bh,073/Bh,071/Bh,070/Bh,069/Bh,066/Bh,065/Bh,031/Bh,027/Bh,029/Bh,028/Bh,030/Bh,021/Bh,016/Bh,020/Bh,007/Bh,010/Bh,013/Bh,015/Bh,032/Bh,033/Bh,064/Bh,063/Bh,058/Bh,059/Bh,034/Bh,038/Bh,039/Bh,037/Bh,036/Bh,035/Bh,040/Bh,054/Bh,053/Bh,052/Bh,043/Bh,044/Bh,045/Bh & 009b/Jt	63	187.17	51.46
	Medium	003/Bh,004/Bh,005/Bh,006/Bh,011b/Jt,095/Bh,092/Bh,005/Jt,004/Jt,002/Jt,001/Jt,108/Bh,109/Bh,106/Bh,102/Bh,100/Bh,099/Bh,094/Bh,096/Bh,086/Bh,087/Bh,093/Bh,074/Bh,068/Bh,018/Bh,008/Bh,009/Bh,011/Bh,012/Bh,014/Bh,017/Bh,062/Bh,061/Bh,060/Bh,056a/Bh,047/Bh,042/Bh,041/Bh,055/Bh,050/Bh,049/Bh,046/Bh & 048/Bh	43	116.03	31.90
	High	001/Bh,002/Bh,015/Jt,013/Jt,012/Jt,107/Bh,085ab/Bh,075/Bh,057/Bh,051/Bh,014/Jt& 056b/Bh	12	18.50	5.09
Total			127	363.73	100.00

Bhalesh Range — Area

Vulnerability Classes	Area(Sq Kms)
Unlikely:	42.04
Low:	187.17
Medium:	116.03
High:	18.05
Total	363.73

Percentage
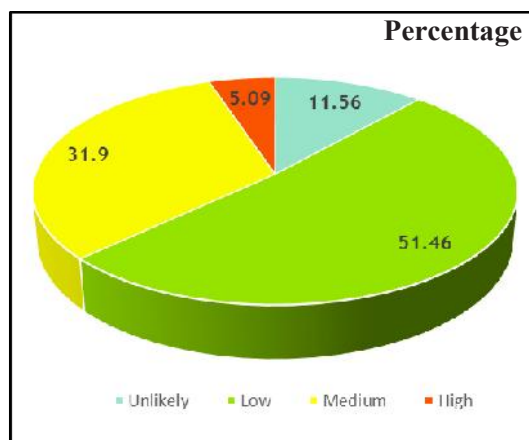
Compartments

3.2.3.2 Chiralla Range
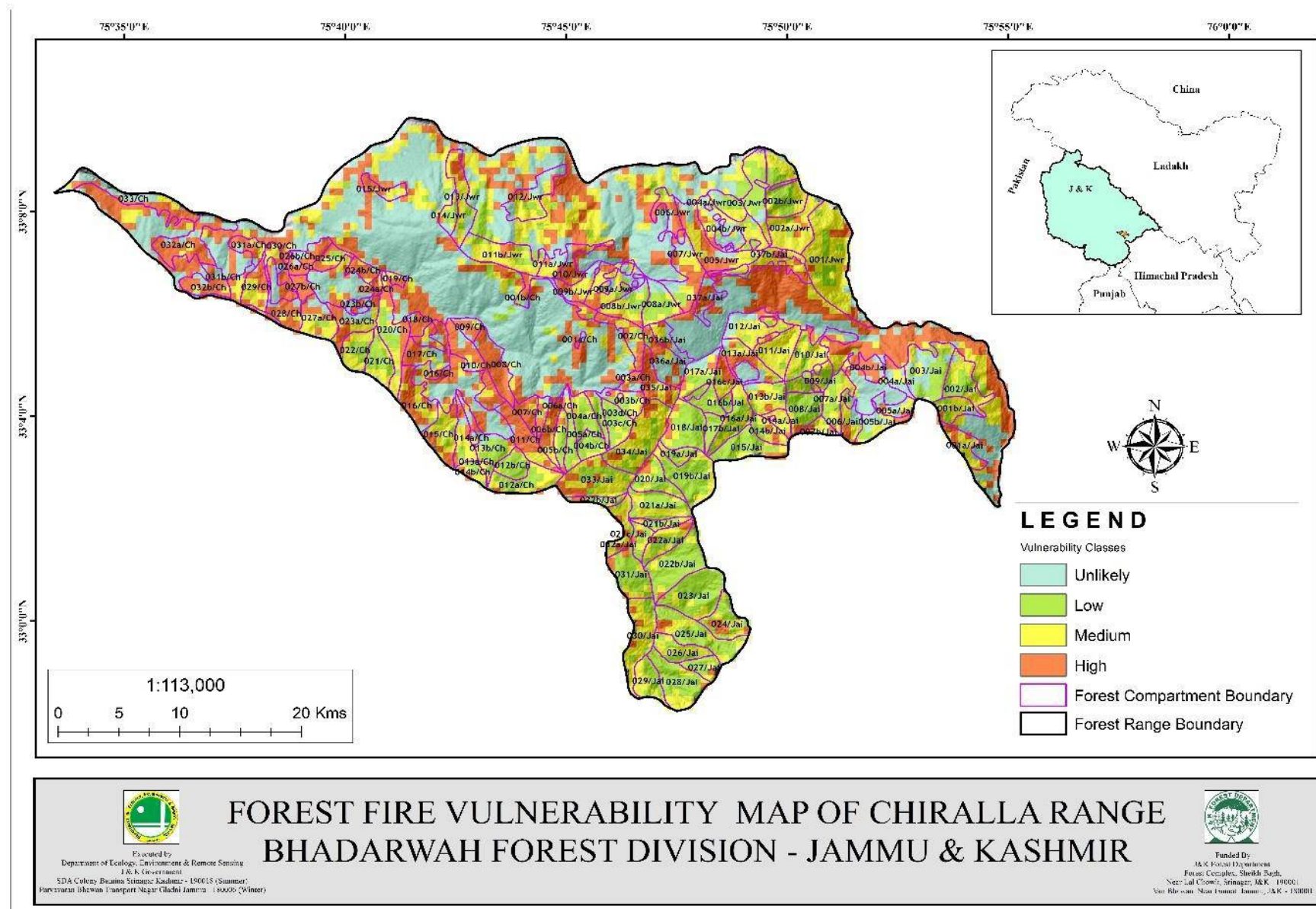
Fig. 21: Forest Fire Vulnerability Map of Chiralla Range Bhadarwah Forest Division Jammu & Kashmir

Table.15. Compartments of Chiralla Range Bhadarwah Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area (Sq Kms)	Percentage
Chiralla	Unlikely	036a/Jai,036b/Jai,001a/Ch,005b/Jai,005a/Jai,037a/Jai,023b/Ch,004a/Jai & 011a/Jwr	9	6.75	4.30
	Low	029/Jai,028/Jai,027/Jai,026/Jai,025/Jai,024/Jai,023/Jai,022b/Jai,021c/Jai,021a/Jai,020/Jai,019b/Jai,018/Jai,017a/Jai,016a/Jai,015/Jai,031/Jai,021/Ch,013b/Ch,003c/Ch,004a/Ch,005a/Ch,003/Jai,021b/Jai,004b/Ch,003/Jwr,008a/Jwr,014/Jwr,003d/Ch,008/Jai,032b/Jai,005b/Ch,017b/Jai,016b/Jai,009/Jai,012b/Ch,022a/Jai,019a/Jai & 004a/Jwr	39	53.53	34.07
	Medium	007a/Jai,011/Jai,030/Jai,032a/Jai,033/Jai,034/Jai,012a/Ch,015/Ch,022/Ch,027a/Ch,030/Ch,014a/Ch,013/Jwr,001/Jwr,037b/Jai,002b/Jwr,004b/Jwr,008b/Jwr,012/Jwr,003b/Ch,011b/Jwr,009a/Jwr,002/Jai,001a/Jai,013b/Jai,014b/Jai,006/Jai,010/Jai,012/Jai,013a/Jai,001b/Jai,002a/Jwr,009b/Jwr,013a/Ch,014b/Ch,024a/Ch,031b/Ch,007b/Jai & 014a/Jai	39	57.07	36.32
	High	035/Jai,032a/Ch,010/Ch,011/Ch,017/Ch,020/Ch,016/Ch,023a/Ch,027b/Ch,026a/Ch,026b/Ch,028/Ch,031a/Ch,006b/Ch,009/Ch,008/Ch,002/Ch,001b/Ch,005/Jwr,007/Jwr,015/Jwr,003a/Ch,018/Ch,019/Ch,025/Ch,024b/Ch,010/Jwr,006/Jwr,007/Ch,033/Ch,029/Ch,004b/Jai,016c/Jai,006a/Ch & 032b/Ch	35	39.77	25.31
Total			122	157.12	100.00

Chiralla Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	6.75
Low:	53.53
Medium:	57.07
High:	39.77
Total	**157.12**

Percentage
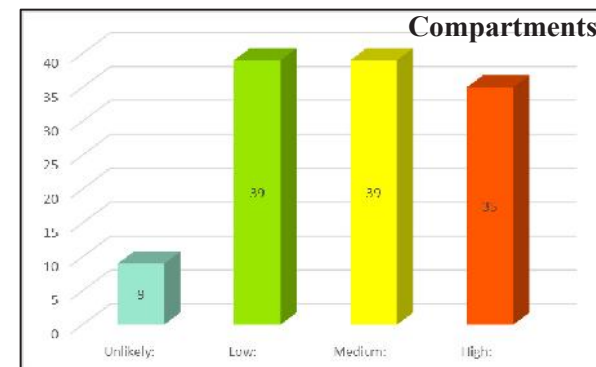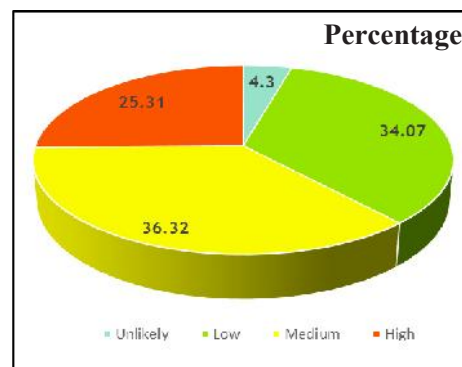
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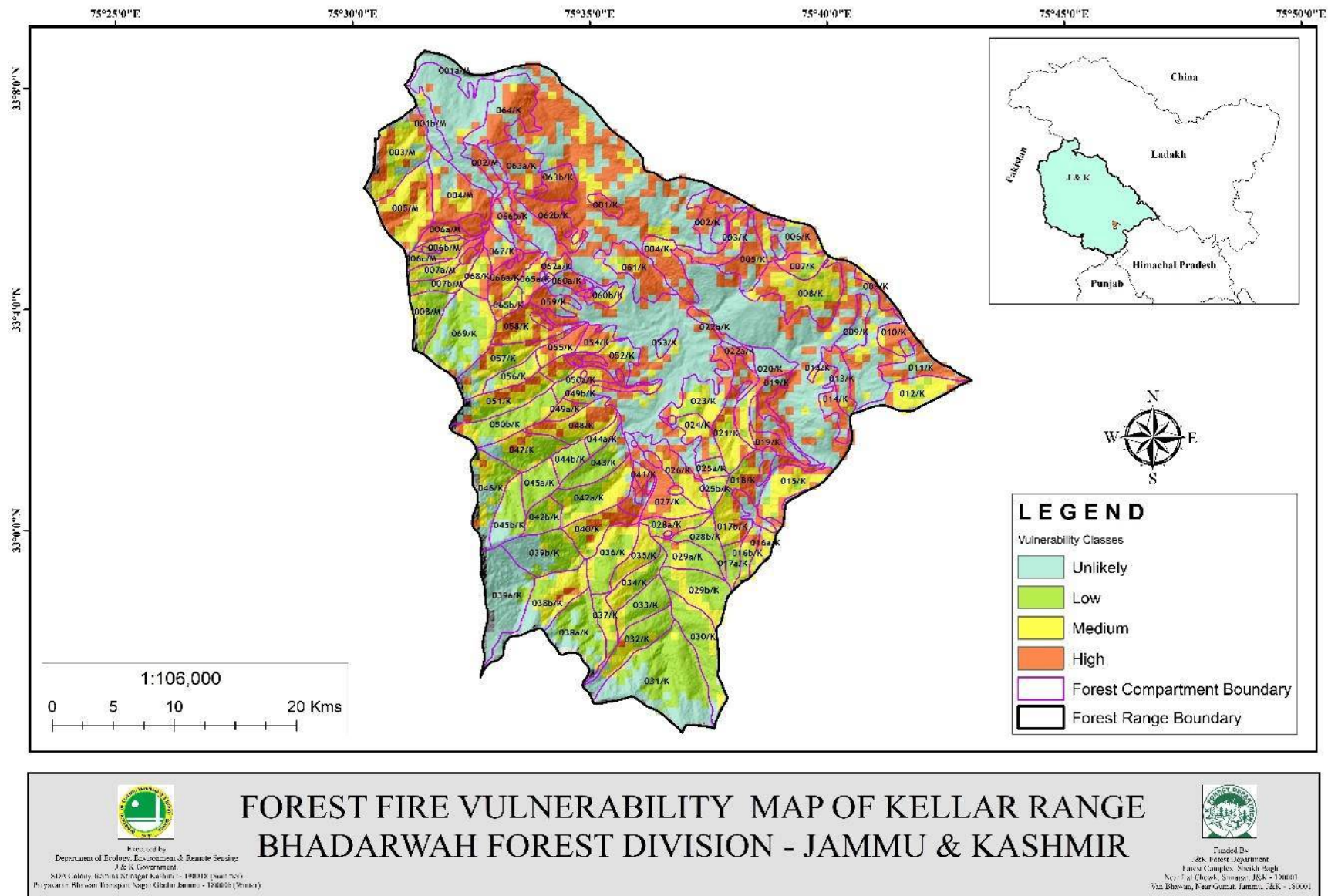
3.2.3.3 Kellar Range

Fig. 22: Forest Fire Vulnerability Map of Kellar Range Bhadarwah Forest Division Jammu & Kashmir

Table.16. Compartments of Keller Range Bhadarwah Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Kellar	Unlikely	020/K,039a/K,060a/K,001a/M,003/K,013/K,023/K,053/K,009/K,039 b/K & 001b/M	11	17.04	10.46
	Low	030/K,029b/K,028b/K,031/K,032/K,033/K,034/K,036/K,038a/K,045 a/K,042a/K,043/K,044b/K,050b/K,047/K,046/K,056/K,008/M,069/K, 025a/K,029a/K,025b/K,050a/K,045b/K,044a/K,017a/K & 042b/K	27	53.85	33.03
	Medium	024/K,015/K,016b/K,026/K,007b/M,035/K,038b/K,037/K,040/K,049 b/K,048/K,052/K,051/K,057/K,003/M,005/M,006b/M,068/K,012/K,0 08/K,021/K,006c/M,007a/M,028a/K,049a/K,065b/K,016a/K,017b/K & 060b/K	29	48.55	29.79
	High	018/K,027/K,041/K,054/K,055/K,065a/K,058/K,004/M,067/K,002/M ,064/K,062b/K,061/K,059/K,066a/K,001/K,011/K,014/K,010/K,002/ K,004/K,007/K,006/K,005/K,022b/K,006a/M,019/K,062a/K,063b/K, 063a/K,022a/K & 066b/K	32	43.56	26.72
		Total	**99**	**163.00**	**100.00**

Kellar Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	17.04
Low:	53.85
Medium:	48.55
High:	43.56
Total	**163.00**

Percentage
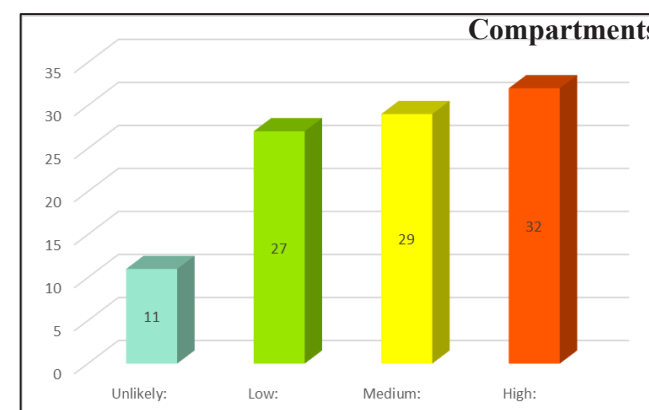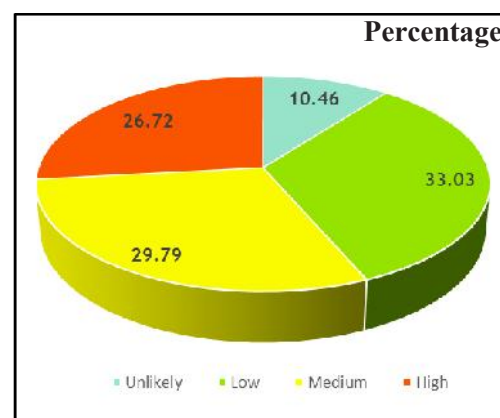
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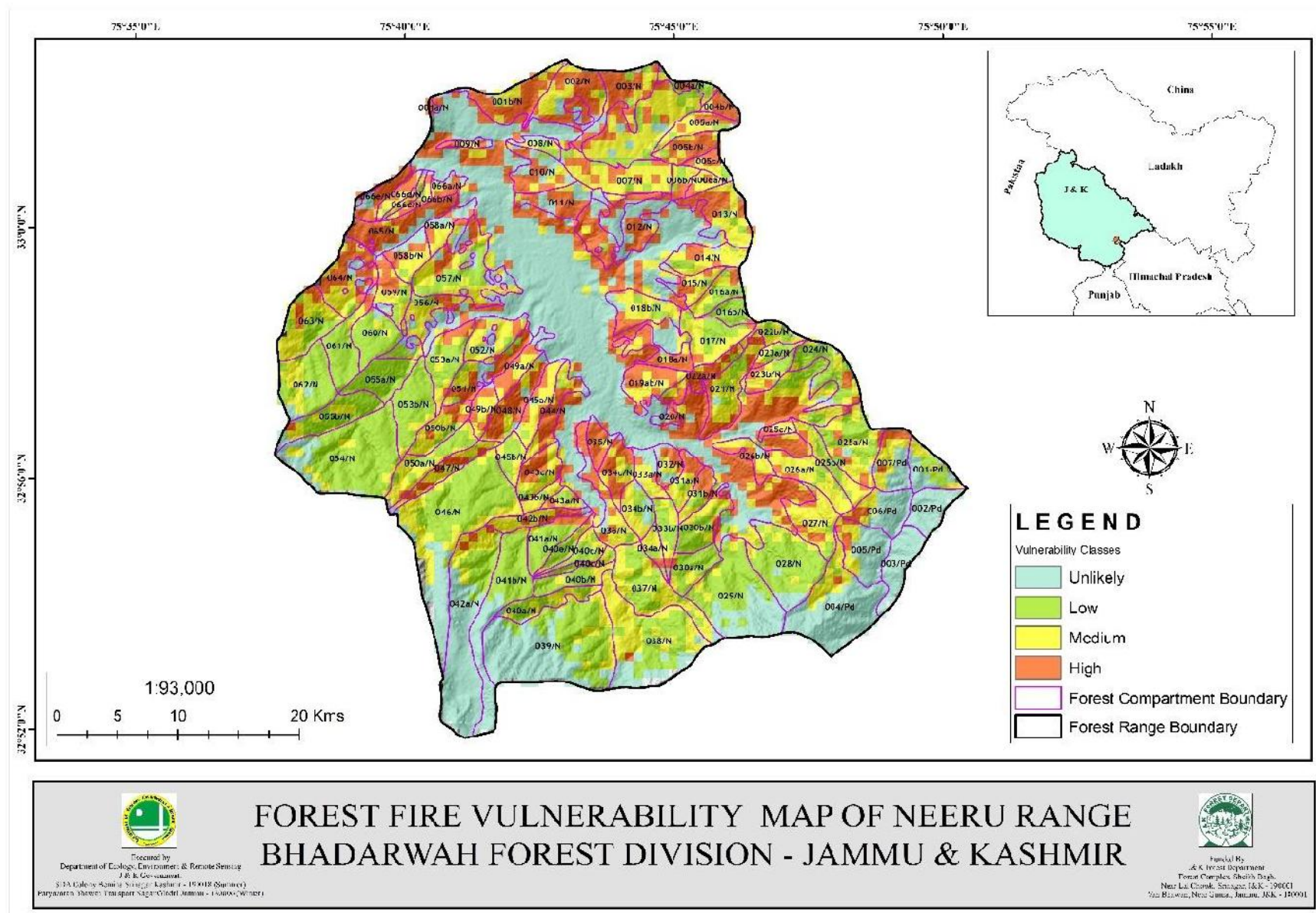
3.2.3.4 Neeru Range

Fig. 23: Forest Fire Vulnerability Map of Neeru Range Bhadarwah Forest Division Jammu & Kashmir

Table.17. Compartments of Neeru Range Bhadarwah Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Neeru	Unlikely	007/Pd,042a/N,039/N,002/Pd,003/Pd,004/Pd,005/Pd,006/Pd,001/Pd ,001a/N & 058a/N	11	29.54	16.13
	Low	030a/N,024/N,062/N,061/N,060/N,055a/N,055b/N,053a/N,053b/N, 054/N,046/N,041b/N,040d/N,025a/N,029/N,033b/N,028/N,016a/N, 016b/N,023a/N,004a/N,040e/N,040c/N,040b/N,040a/N,030b/N,041 a/N & 066c/N	28	57.26	31.25
	Medium	023b/N,063/N,058b/N,059/N,057/N,056/N,052/N,049a/N,050b/N,0 47/N,043c/N,045a/N,038/N,036/N,037/N,031a/N,034b/N,033a/N,0 27/N,026a/N,018b/N,017/N,015/N,014/N,013/N,006b/N,007/N,008/ N,005a/N,006a/N,034a/N,049b/N,043a/N,043b/N,045b/N,050a/N,0 25b/N,026b/N,021/N,022b/N,025c/N,042b/N & 066d/N	43	62.57	34.15
	High	012/N,009/N,066e/N,064/N,065/N,051/N,048/N,044/N,035/N,020/ N,022a/N,019ab/N,018a/N,001b/N,002/N,005b/N,010/N,011/N,004 b/N,005c/N,034c/N,003/N,032/N,031b/N,066a/N & 066b/N	26	33.84	18.47
		Total	**108**	**183.20**	**100.00**

Neeru Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	29.54
Low:	57.26
Medium:	62.57
High:	33.84
Total	**183.20**
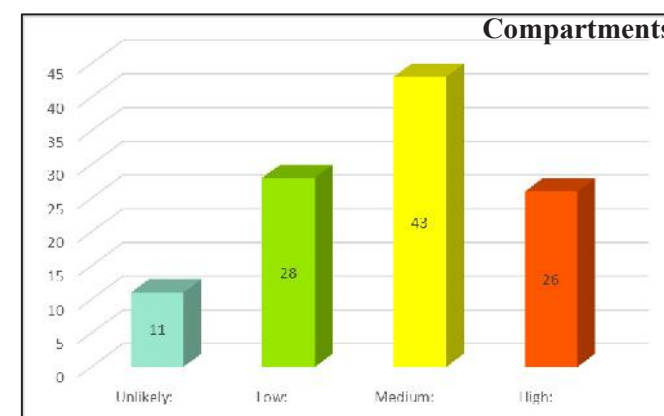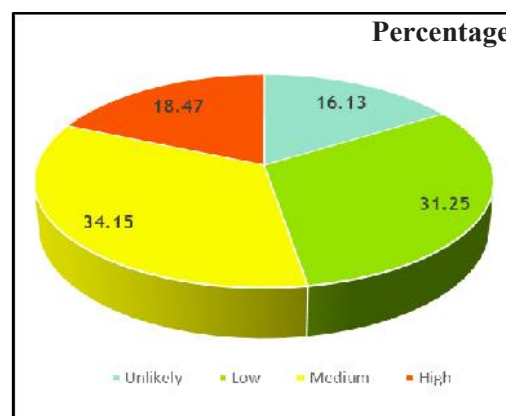
3.2.4 BILAWAR FOREST DIVISION.

Bilawar forest division lies between latitudes 32°31'43.553"N - 32°50'23.105"N and longitude 75°17'20.103"E - 75°48'52.552"E. The elevation of the area varies from 459 m – 4010 m above mean sea level. The division comprises of three ranges viz Bilawar, Malhar and Ramkote. The total area (on GIS platform) of 99 Compartments of three territorial ranges is 337.63 km^2.
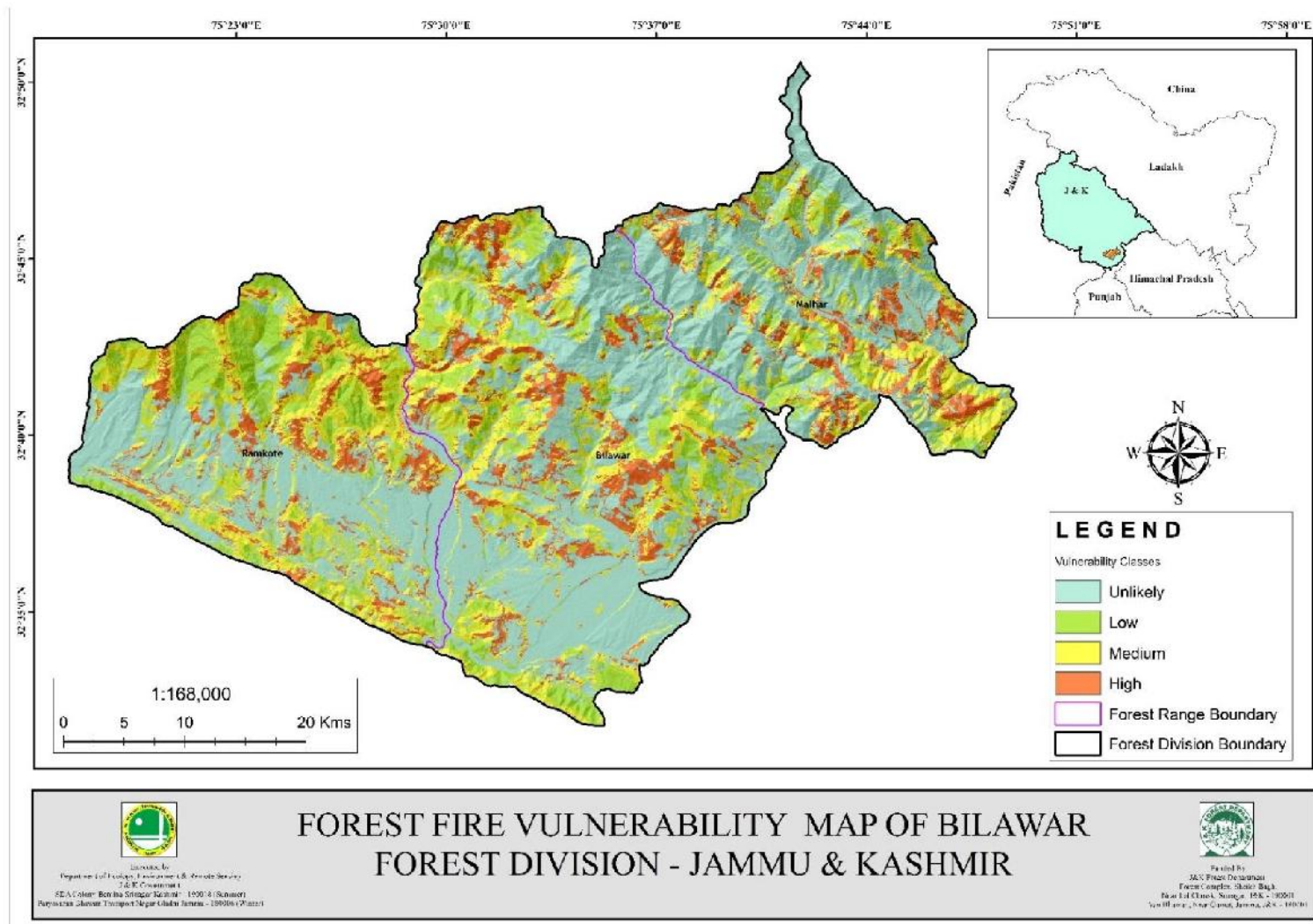
Fig. 24: Forest Fire Vulnerability Map of Bilawar Forest Division Jammu & Kashmir

FOREST FIRE RISK ZONATION & VULNERABILITY ASSESSMENT FORESTS OF JAMMU & KASHMIR

Table.18. Compartments of Bilawar Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Bilawar Forest Division	Bilawar	Unlikely	5	12.04	8.93
		Low	6	24.23	17.98
		Medium	14	74.33	55.17
		High	8	24.13	17.91
		Total	**33**	**134.72**	**100.00**
	Malhar	Unlikely	16	80.04	69.39
		Low	0	0.00	0.00
		Medium	6	31.78	27.56
		High	3	3.52	3.05
		Total	**25**	**115.34**	**100.00**
	Ramkote	Unlikely	1	1.39	1.58
		Low	13	28.79	32.89
		Medium	25	54.60	62.36
		High	2	2.78	3.17
		Total	**41**	**87.56**	**100.00**

Area	
Bilawar Forest Division	
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	93.47
Low:	53.02
Medium:	160.71
High:	30.43
Total	**337.63**
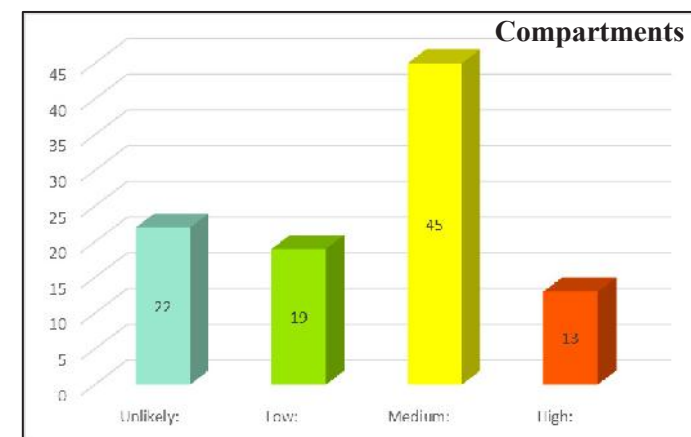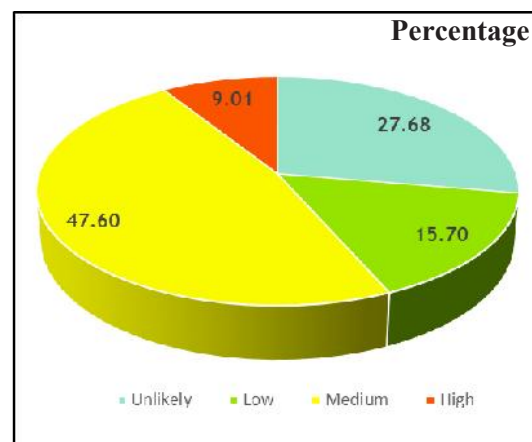
3.2.4.1 Bilawar Range
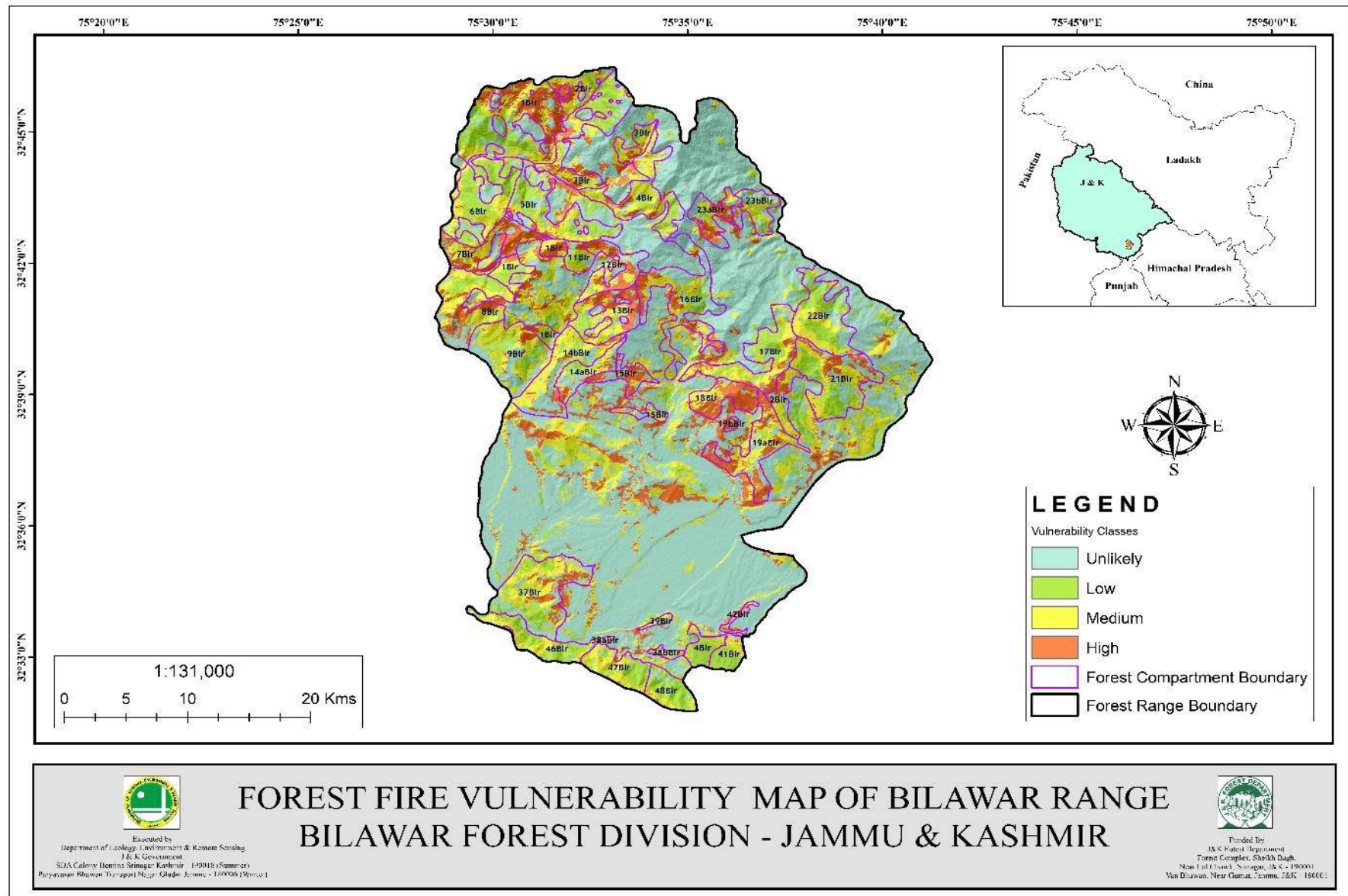
Fig. 25: Forest Fire Vulnerability Map of Bilawar Range Bilawar Forest Division Jammu & Kashmir

Table.19. Compartments of Bilawar Range Bilawar Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Bilawar	Unlikely	42Blr,38aBlr,14aBlr,16Blr & 23bBlr	5	12.04	8.93
	Low	48Blr,41Blr,46Blr,22Blr,6Blr & 5Blr	6	24.23	17.98
	Medium	38bBlr,4Blr,47Blr,39Blr,37Blr,21Blr,2Blr,17Blr,11Blr,8Blr,9Blr ,14bBlr,1Blr & 3Blr	14	74.33	55.17
	High	19aBlr,18Blr,7Blr,12Blr,13Blr,23aBlr,19bBlr & 15Blr	8	24.13	17.91
Total			33	134.72	100.00

Area

Bilawar Range

Vulnerability Classes	Area(Sq Kms)
Unlikely:	12.04
Low:	24.23
Medium:	74.33
High:	24.10
Total	**134.72**

Percentage

Compartments

.
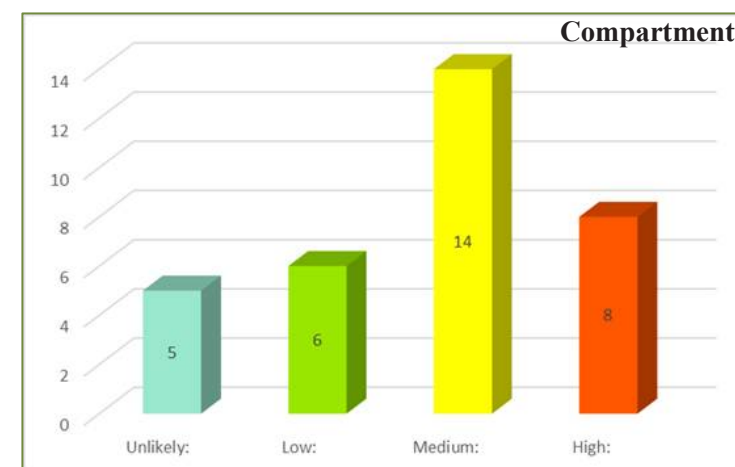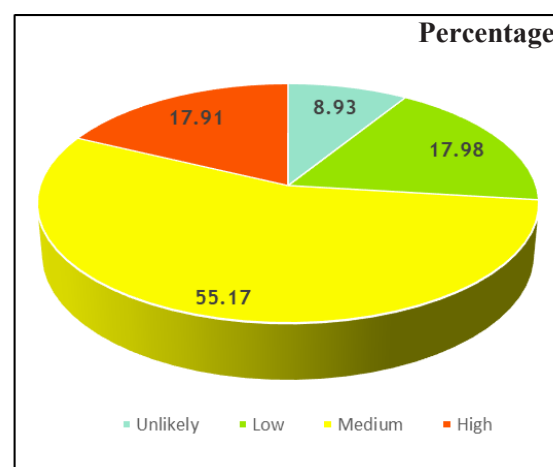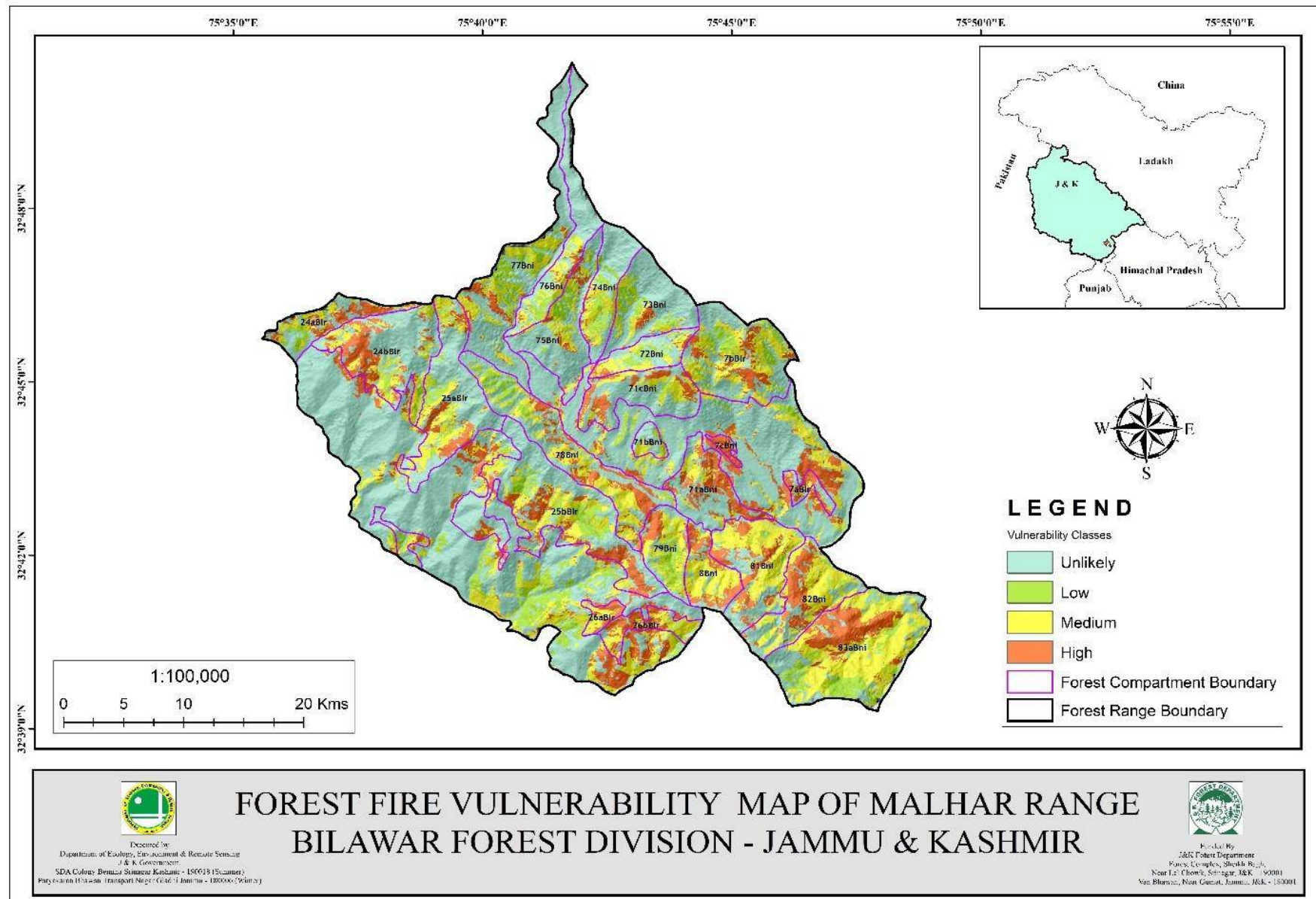
3.2.4.2 Malhar Range

Fig. 26: Forest Fire Vulnerability Map of Malhar Range Bilawar Forest Division Jammu & Kashmir

Table.20. Compartments of Malhar Range Bilawar Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Malhar	Unlikely	24aBlr,24bBlr,25aBlr,25bBlr,78Bni, 77Bni,71bBni,72Bni,73Bni,74Bni,75Bni,76Bni,71cBni,7bBlr & 71aBni	16	80.04	69.39
	Low	None	0	0.00	0.00
	Medium	26aBlr,83aBni,79Bni,8Bni,82Bni & 81Bni	6	31.78	27.56
	High	26bBlr,7aBlr &7cBni	3	3.52	3.05
Total			25	115.34	100.00

Area	
Malhar Range	
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	80.04
Low:	0.00
Medium:	31.78
High:	3.52
Total	**115.34**
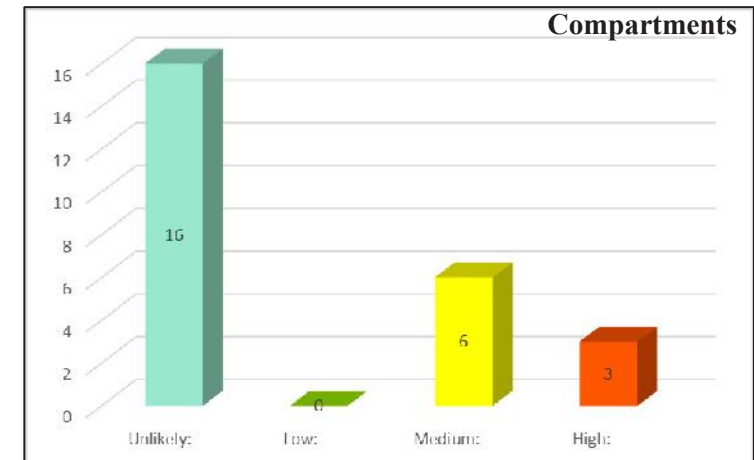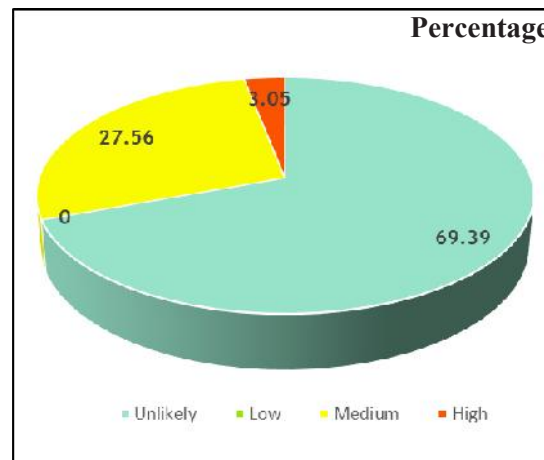
3.2.4.3 Ramkote Range
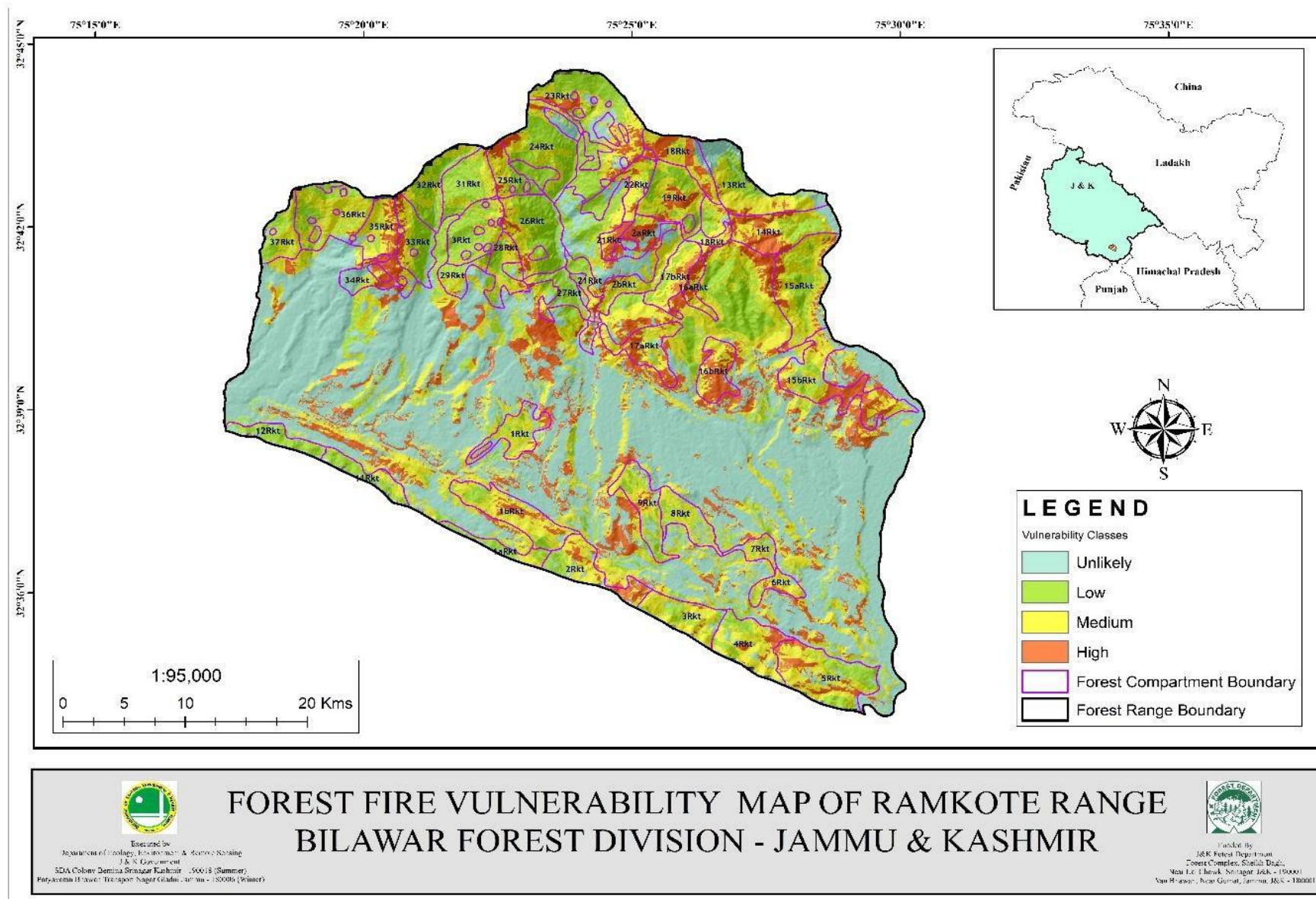
Fig. 27: Forest Fire Vulnerability Map of Ramkote Range Bilawar Forest Division Jammu & Kashmir

Table.21. Compartments of Ramkote Range Bilawar Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Ramkote	Unlikely	34Rkt	1	1.39	1.58
	Low	33Rkt,32Rkt,31Rkt,3Rkt,29Rkt,26Rkt,27Rkt,24Rkt,23Rkt,1a Rkt,11Rkt,12Rkt & 21Rkt	13	28.79	32.89
	Medium	37Rkt,36Rkt,35Rkt,28Rkt,25Rkt,22Rkt,2bRkt,19Rkt,13Rkt,14Rkt,15aRkt,17aRkt,17bRkt,16aRkt,9Rkt,8Rkt,7Rkt,6Rkt,5Rkt,4Rkt,2Rkt,1bRkt,15bRkt,1Rkt & 18Rkt	25	54.60	62.36
	High	2aRkt & 16bRkt	2	2.78	3.17
Total			41	87.56	100.00

Area	
Ramkote Range	
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	1.39
Low:	28.79
Medium:	54.60
High:	2.78
Total	**87.56**
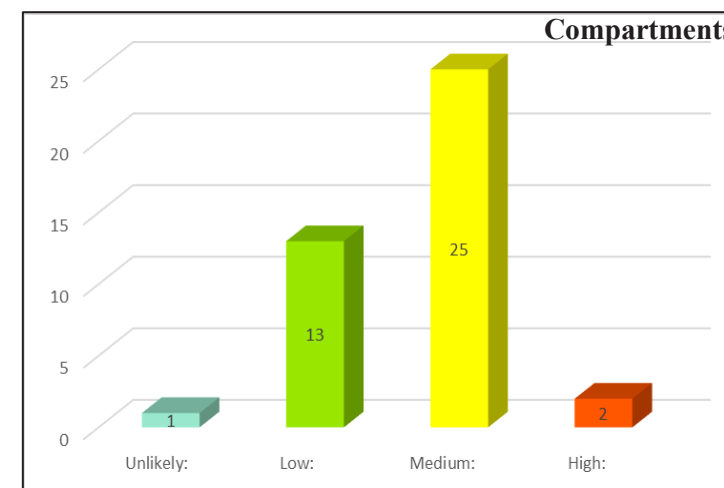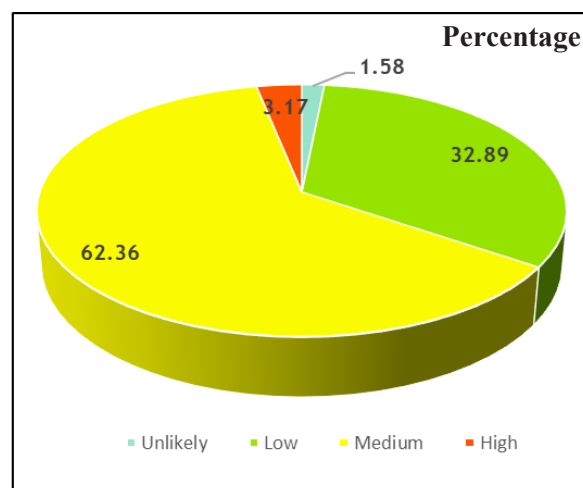
3.2.5 DODA FOREST DIVISION.

Doda forest division lies between 33°7'26.134"N - 33°24'32.23"N latitude & 75°21'40.904"E - 75°48'34.675"E longitude. Its elevation varies from 693 m - 4147 m above mean sea level. The division comprises of three ranges viz Kuntwara, Siraj and Thakrai. The total area (on GIS platform) of 318 Compartments of three territorial ranges is 694.03 km^2.
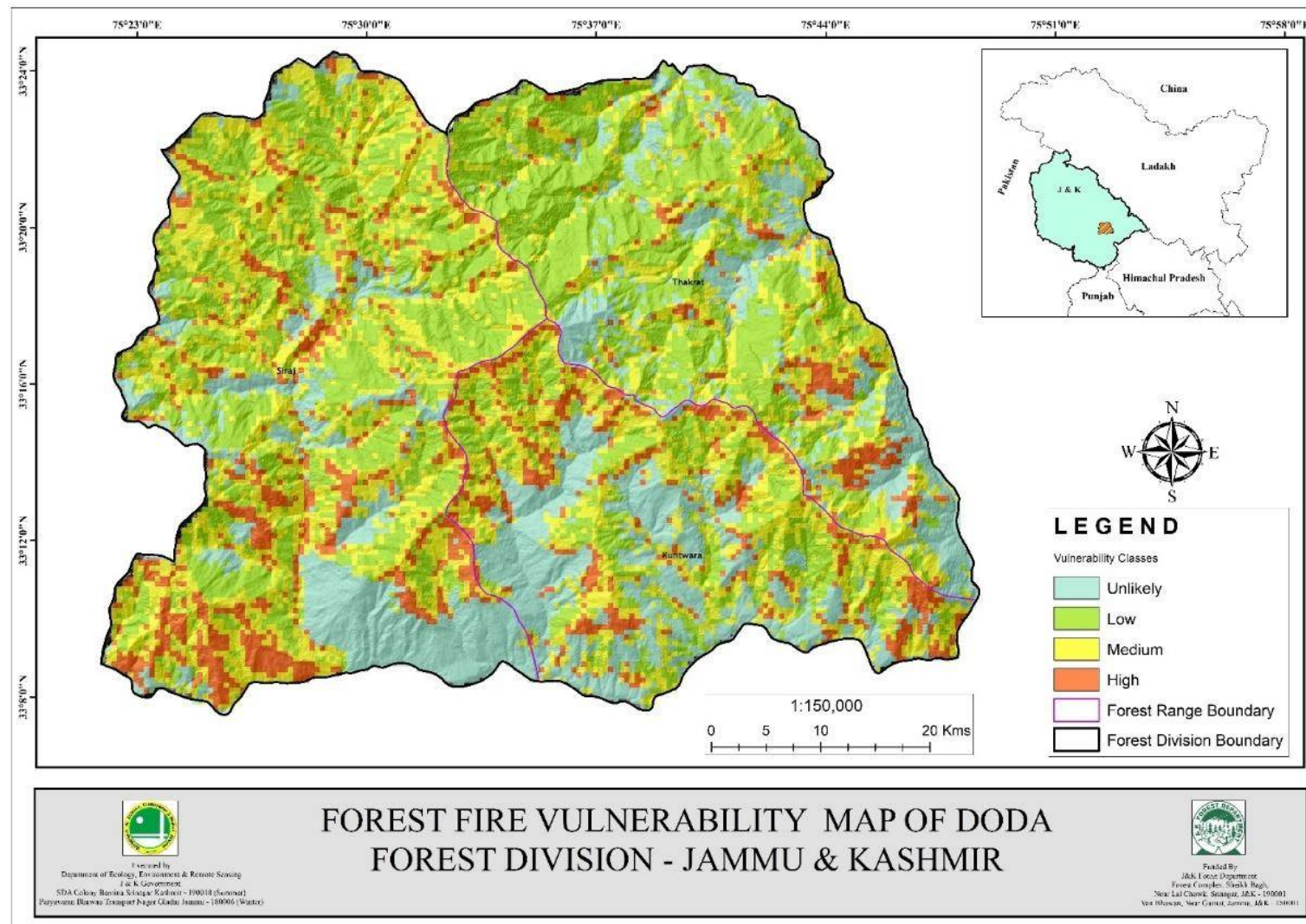
Fig. 28: Forest Fire Vulnerability Map of Doda Forest Division Jammu & Kashmir

Table.22. Compartments of Doda Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Doda Forest Division	Kuntwara	Unlikely	1	1.53	0.81
		Low	13	28.88	15.27
		Medium	30	64.17	33.93
		High	6	94.58	50.00
		Total	**50**	**189.15**	**100.00**
	Siraj	Unlikely	7	1.97	0.69
		Low	72	155.06	54.32
		Medium	58	119.32	41.80
		High	7	9.10	3.19
		Total	**144**	**285.45**	**100.00**
	Thakrai	Unlikely	13	18.25	8.32
		Low	84	161.29	73.51
		Medium	21	31.42	14.32
		High	6	8.46	3.86
		Total	**124**	**219.43**	**100.00**

Area

Doda Forest Division

Vulnerability Classes	Area(Sq Kms)
Unlikely:	21.75
Low:	345.23
Medium:	214.91
High:	112.14
Total	**694.03**

Percentage
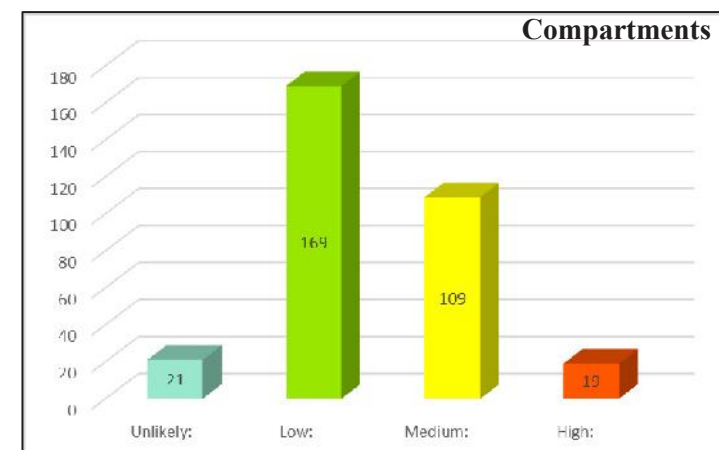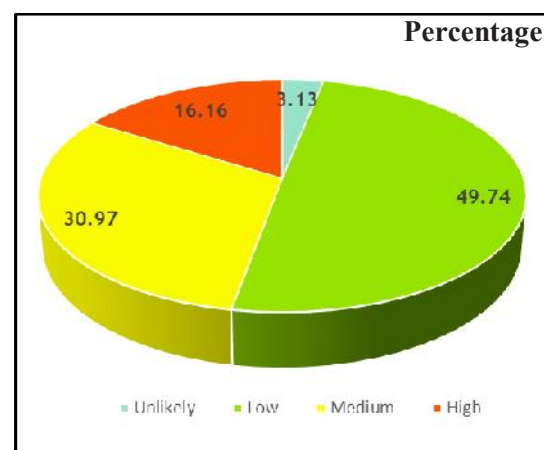
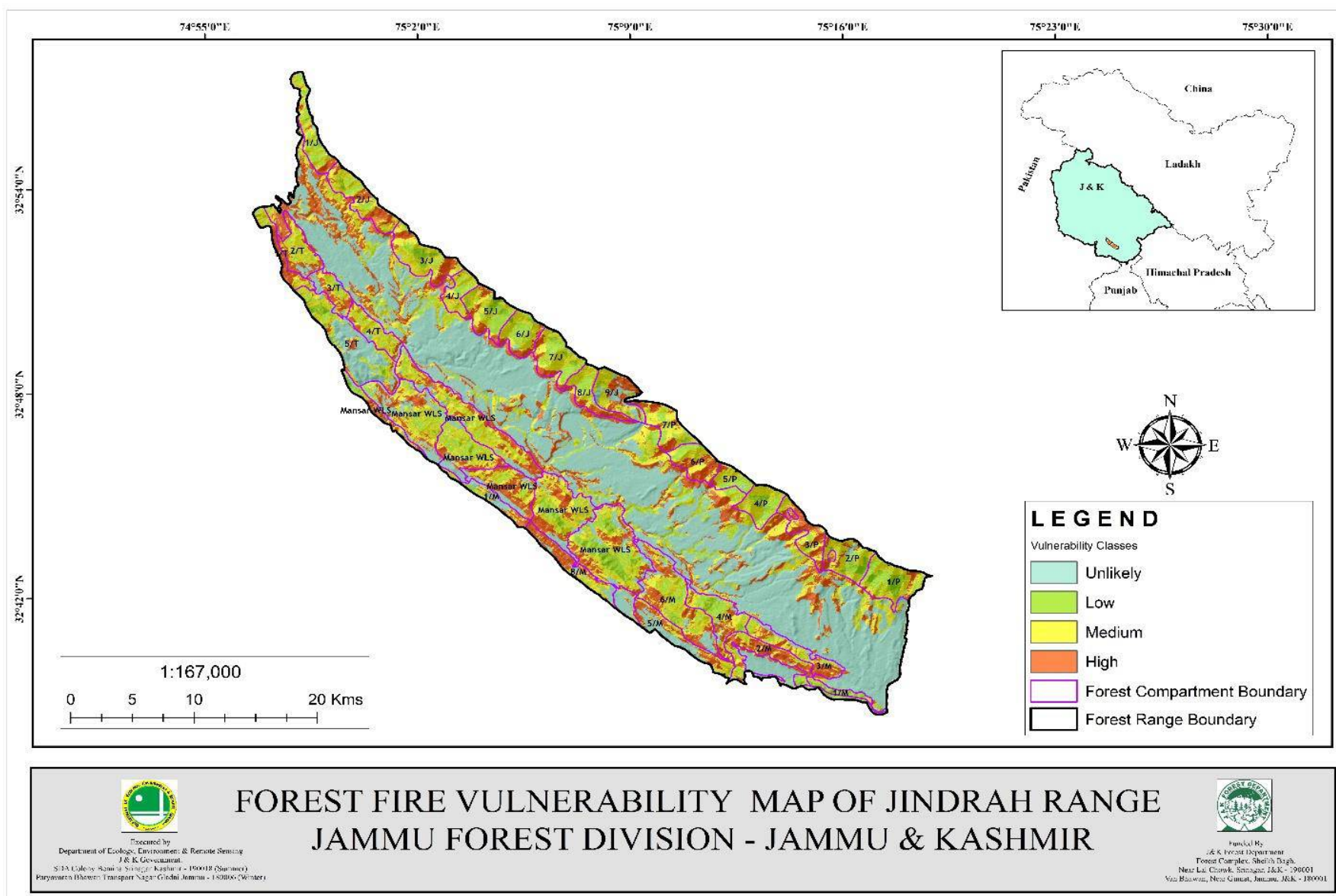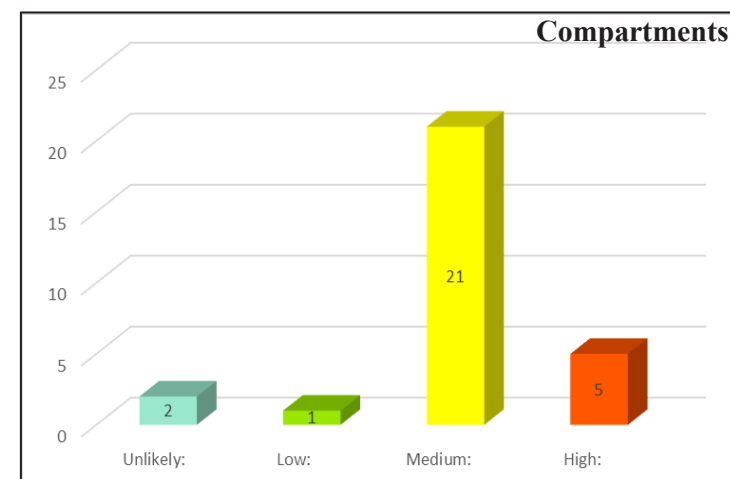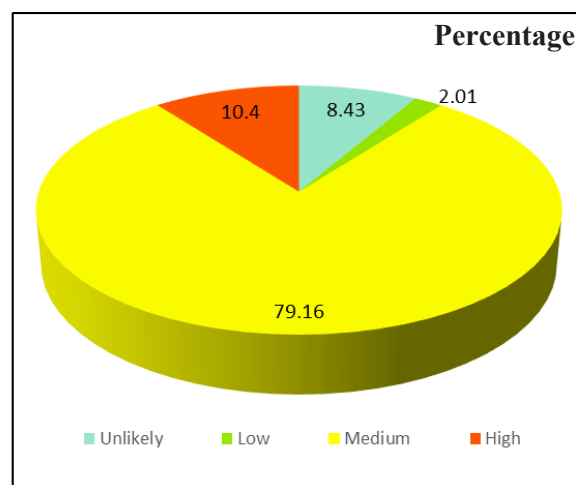
Compartments

3.2.5.1 Kuntwara Range
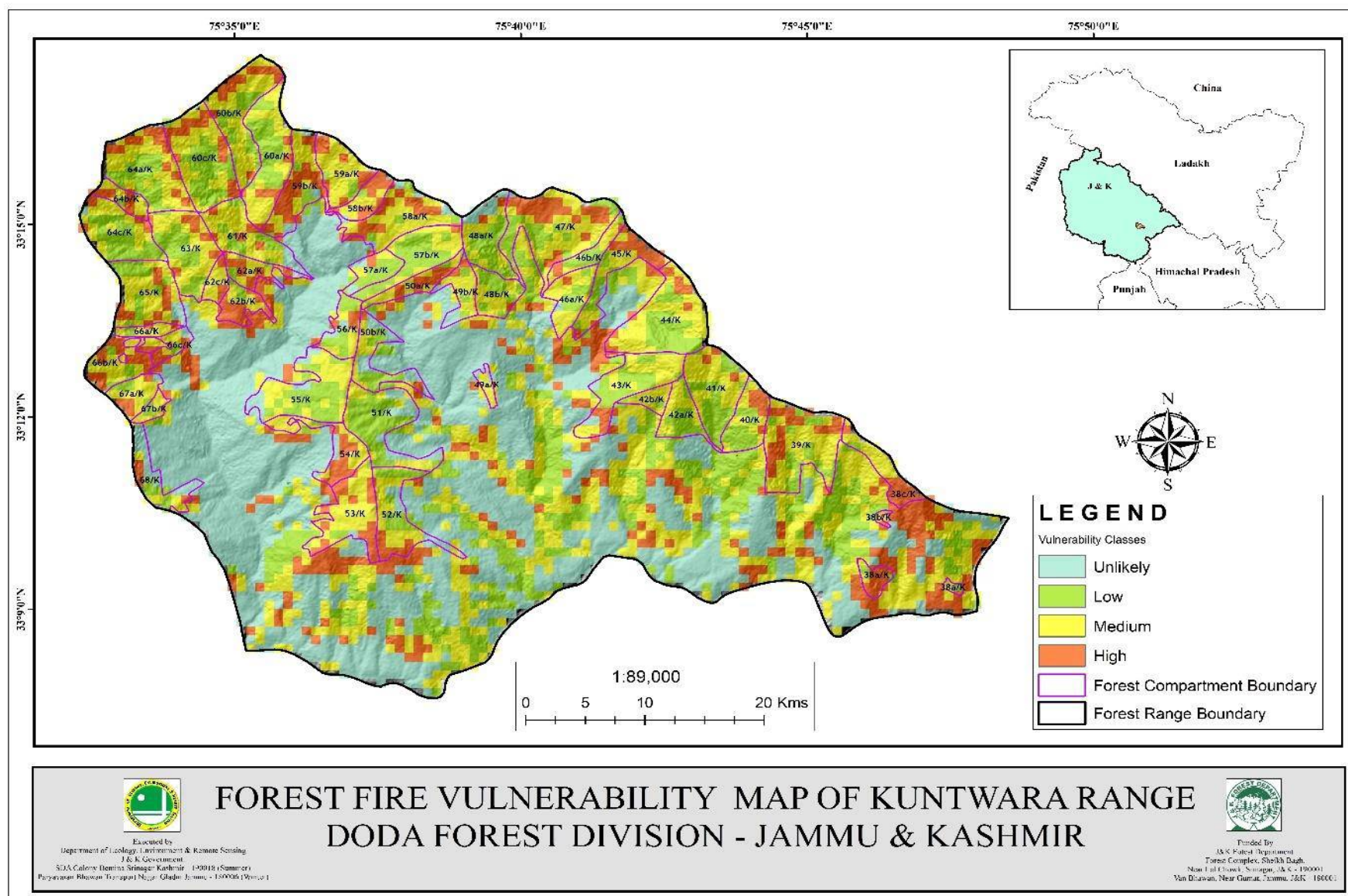
Fig. 29: Forest Fire Vulnerability Map of Kuntwara Range Doda Forest Division Jammu & Kashmir

Table.23. Compartments of Kuntwara Range Doda Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Kuntwara	Unlikely	68/K	1	1.53	0.81
	Low	40/K,42a/K,60c/K,46b/K,48a/K,51/K,55/K,56/K,57b/K,60a/K,64c/K,38b/K & 57a/K	13	28.88	15.27
	Medium	44/K,43/K,38c/K,39/K,41/K,42b/K,45/K,46a/K,47/K,49a/K,48b/K,49b/K,50a/K,50b/K,52/K,53/K,54/K,58a/K,67a/K,66a/K,66c/K,65/K,64a/K,62c/K,63/K,61/K,60b/K,64b/K,59a/K & 67b/K	30	64.17	33.93
	High	38a/K,58b/K,66b/K,62b/K,62a/K & 59b/K	6	94.58	50.00
Total			**50**	**189.15**	**100.00**

Kuntwara Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	1.53
Low:	28.88
Medium:	64.17
High:	94.58
Total	**189.15**

Percentage
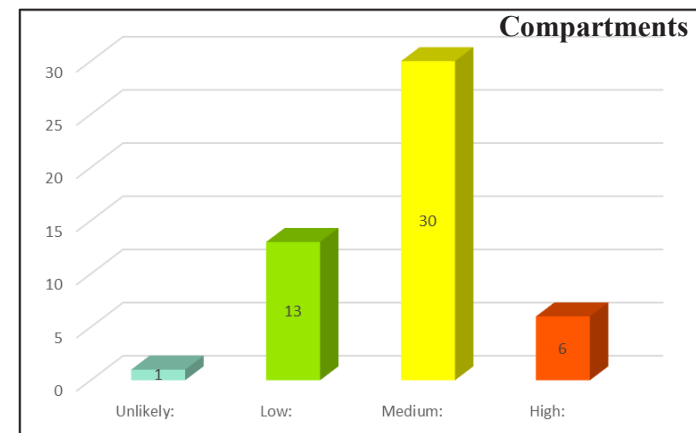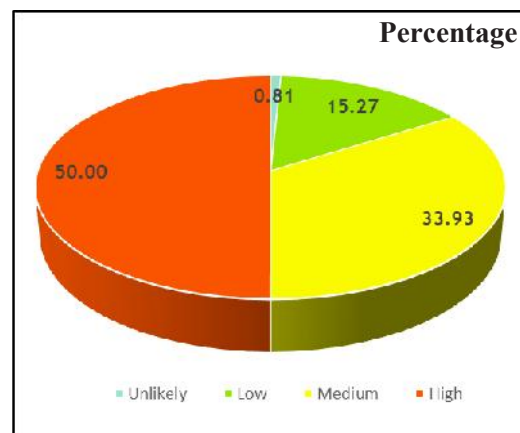
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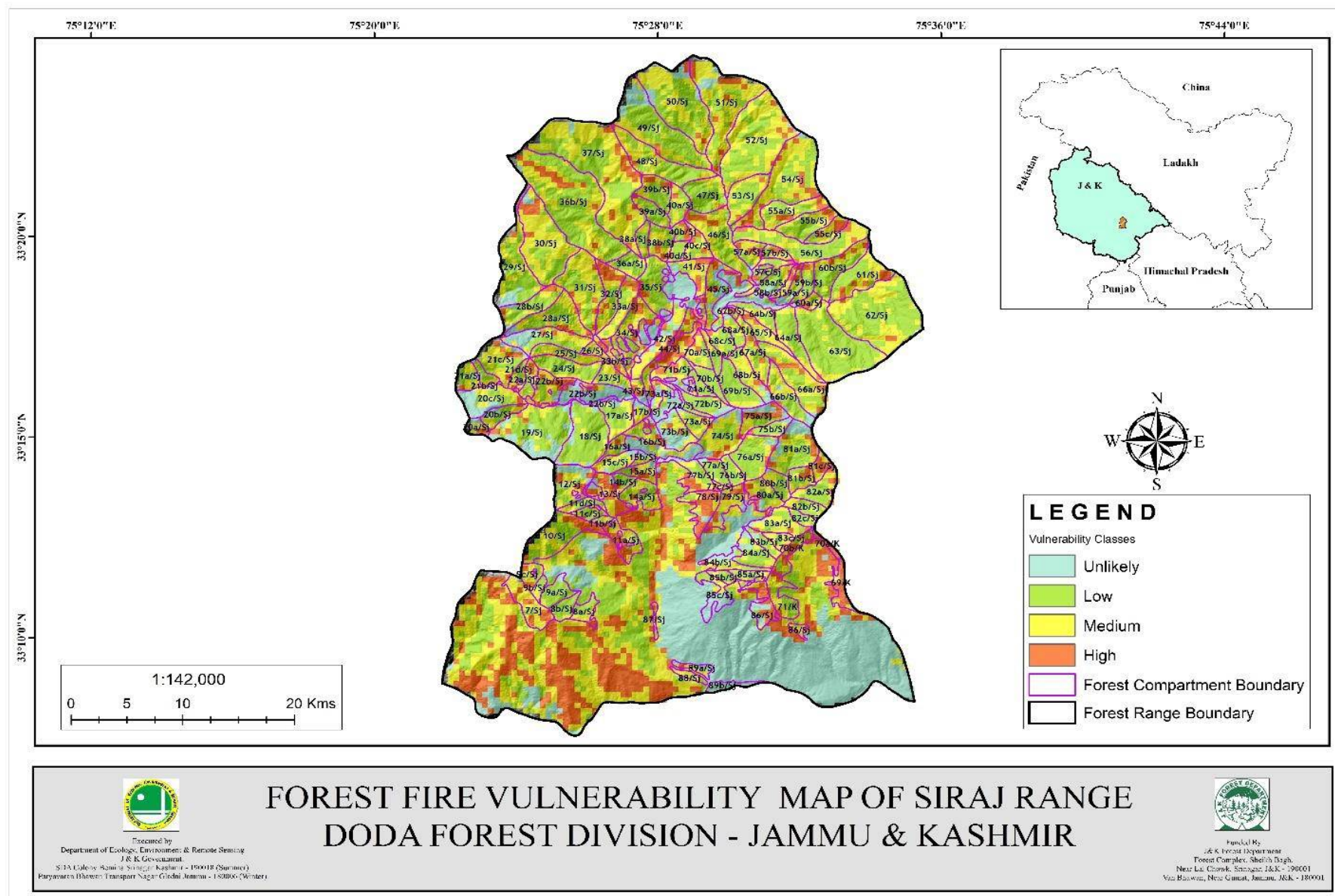
3.2.5.2 Siraj Range
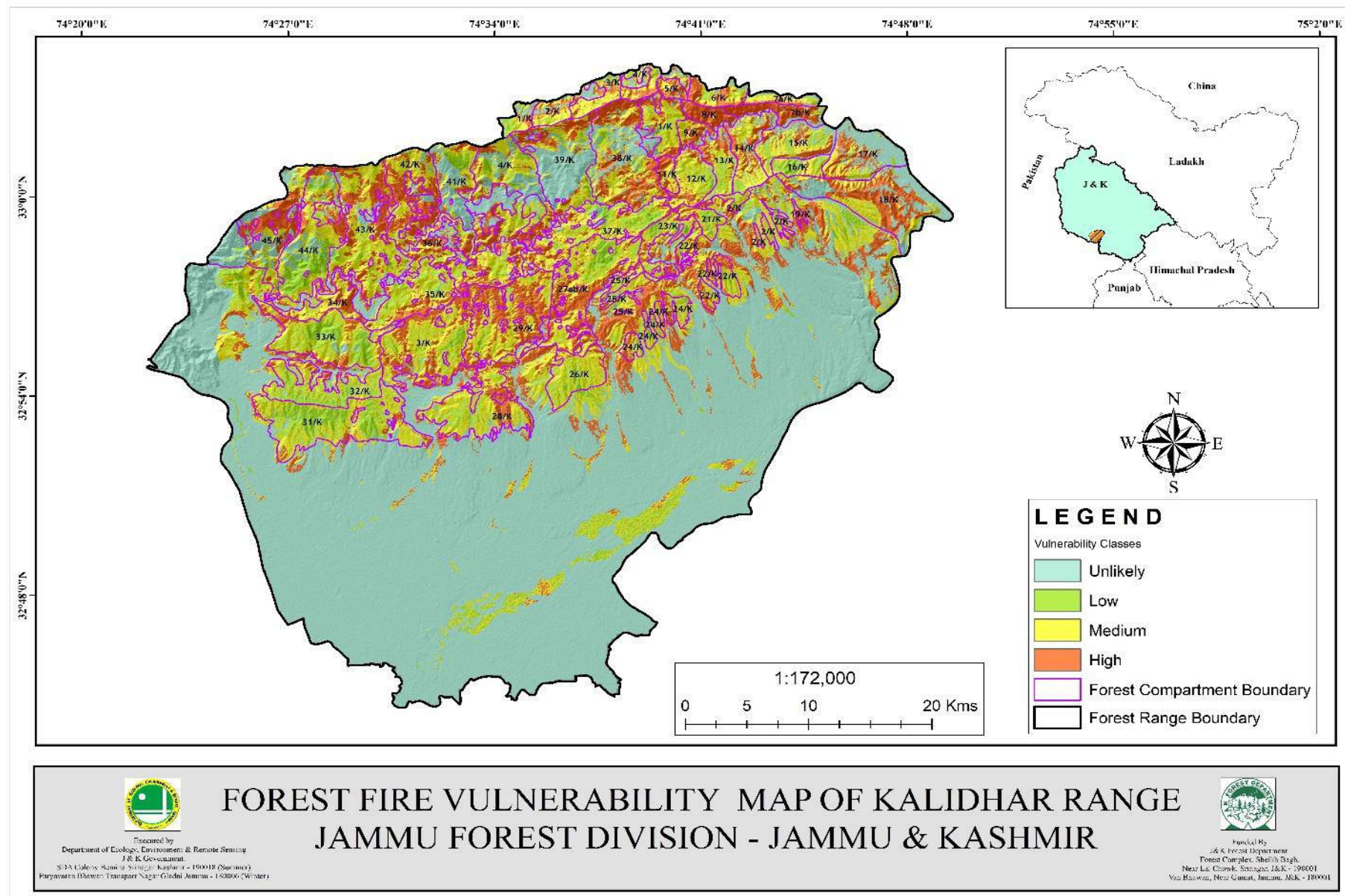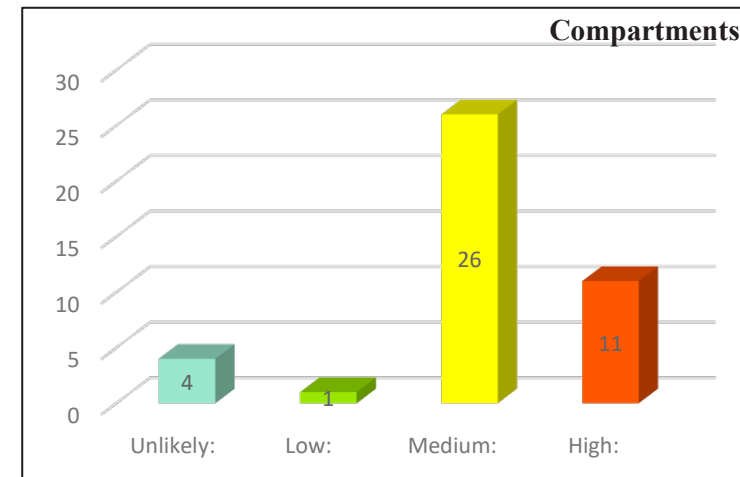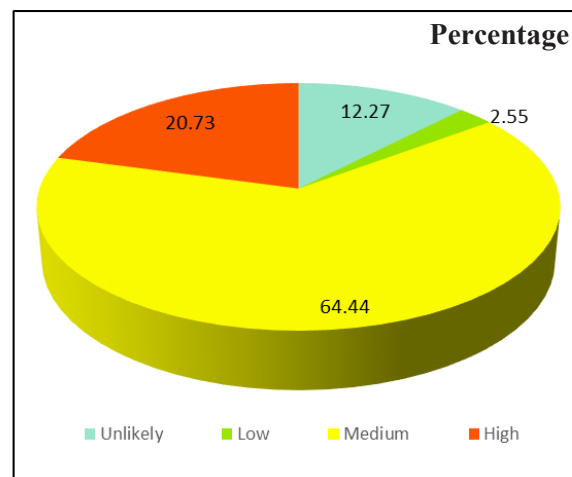

Fig. 30: Forest Fire Vulnerability Map of Siraj Range Doda Forest Division Jammu & Kashmir

Table.24. Compartments of Siraj Range Doda Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area (Sq Kms)	Percentage
Siraj	Unlikely	89b/Sj,89a/Sj,85c/Sj,75a/Sj,12/Sj,20c/Sj & 73b/Sj	7	1.97	0.69
	Low	8a/Sj,9a/Sj,9b/Sj,10/Sj,11d/Sj,11b/Sj,11c/Sj,84a/Sj,28a/Sj,48/Sj,61/Sj,62/Sj,81a/Sj,75b/Sj,82a/Sj,83b/Sj,82b/Sj,76a/Sj,80b/Sj,77b/Sj,77a/Sj,76b/Sj,69b/Sj,50/Sj,49/Sj,53/Sj,55b/Sj,56/Sj,57c/Sj,58a/Sj,59b/Sj,60b/Sj,66b/Sj,64a/Sj,63/Sj,47/Sj,36b/Sj,40a/Sj,38b/Sj,39b/Sj,35/Sj,14b/Sj,19/Sj,17a/Sj,18/Sj,20b/Sj,23/Sj,24/Sj,28b/Sj,29/Sj,33a/Sj,70b/Sj,72b/Sj,85b/Sj,85a/Sj,21d/Sj,21b/Sj,8b/Sj,22a/Sj,39a/Sj,38a/Sj,40d/Sj,40b/Sj,36a/Sj,72a/Sj,69a/Sj,68a/Sj,68c/Sj,71a/Sj,73a/Sj,81b/Sj & 82c/Sj	72	155.06	54.32
	Medium	70b/K,71/K,88/Sj,7/Sj,9c/Sj,83a/Sj,84b/Sj,34/Sj,37/Sj,68b/Sj,79/Sj,80a/Sj,77c/Sj,51/Sj,52/Sj,54/Sj,55a/Sj,55c/Sj,58b/Sj,59a/Sj,60a/Sj,67b/Sj,67a/Sj,65/Sj,66a/Sj,64b/Sj,46/Sj,44/Sj,43/Sj,42/Sj,41/Sj,45/Sj,14a/Sj,21c/Sj,15c/Sj,17b/Sj,16b/Sj,20a/Sj,25/Sj,26/Sj,27/Sj,30/Sj,31/Sj,32/Sj,33b/Sj,70a/Sj,74/Sj,71b/Sj,21a/Sj,22b/Sj,40c/Sj,57a/Sj,57b/Sj,81c/Sj,15a/Sj,15b/Sj,16a/Sj & 83c/Sj	58	119.32	41.80
	High	69/K,70a/K,87/Sj,11a/Sj,78/Sj,86/Sj & 13/Sj	7	9.10	3.19
	Total		144	285.45	100.00

Area

Siraj Range

Vulnerability Classes	Area(Sq Kms)
Unlikely:	1.97
Low:	155.06
Medium:	119.32
High:	9.1
Total	**285.45**

Percentage
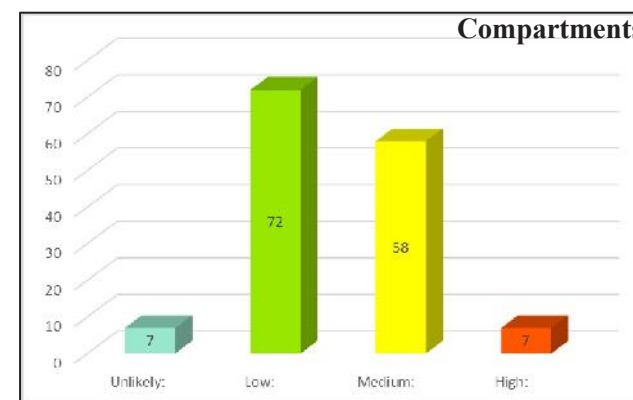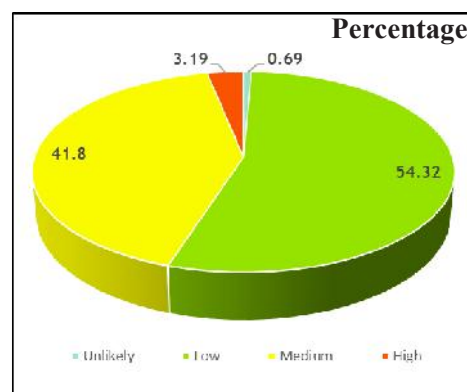
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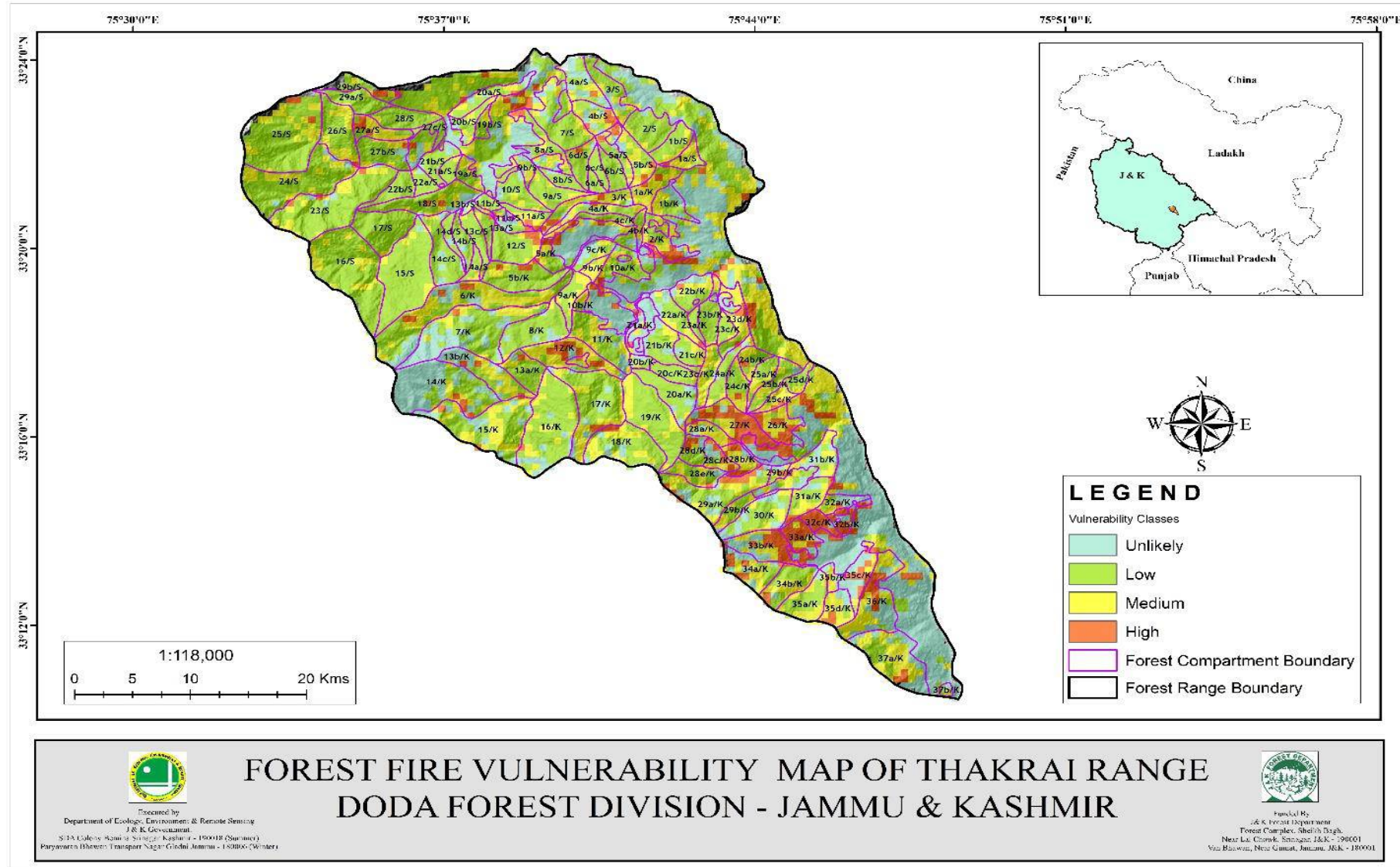
3.2.5.3 Thakrai Range

Fig. 31: Forest Fire Vulnerability Map of Thakrai Range Doda Forest Division Jammu & Kashmir

FOREST FIRE RISK ZONATION & VULNERABILITY
ASSESSMENT FORESTS OF JAMMU & KASHMIR

Table.25. Compartments of Thakrai Range Doda Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Thakrai	Unlikely	37b/K,21a/K,35c/K,14/K,2/K,11c/S,9b/S,4a/S,1b/K,32a/K,31b/K,35b/K & 4b/S	13	18.25	8.32
	Low	27b/S,15/K,16/K,17/K,18/K,19/K,23b/K,22b/K,22a/K,21b/K,20a/K,25b/K,24a/K,28e/K,30/K,29a/K,29b/K,34b/K,31a/K,23a/K,7/S,19b/S,20a/S,29a/S,28/S,29b/S,24/S,25/S,26/S,6/K,7/K,8/K,11/K,3/S,2/S,23/S,16/S,17/S,18/S,19a/S,21b/S,22a/S,22b/S,14a/S,14b/S,14c/S,14d/S,15/S,9c/K,5b/K,4b/K,5a/K,12/S,13c/S,10/S,9a/S,8a/S,5b/S,6b/S,6c/S,6a/S,6d/S,25d/K,25a/K,24b/K,24c/K,10a/K,11b/S,11a/S,13a/S,1b/S,13a/K,8b/S,5a/S,35a/K,28d/K,20c/K,20b/K,21c/K,20b/S,21a/S,4c/K,27c/S & 23c/K	84	161.29	73.51
	Medium	37a/K,26/K,36/K,34a/K,12/K,13b/K,1a/K,3/K,4a/K,25c/K,10b/K,9b/K,9a/K,13b/S,1a/S,35d/K,28b/K,28a/K,23d/K,23e/K & 27a/S	21	31.42	14.32
	High	32b/K,27/K,33b/K,33a/K,32c/K & 28c/K	6	8.46	3.86
Total			**124**	**219.43**	**100.00**

Thakrai Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	18.25
Low:	161.29
Medium:	31.42
High:	8.46
Total	**219.43**

Percentage

Compartments
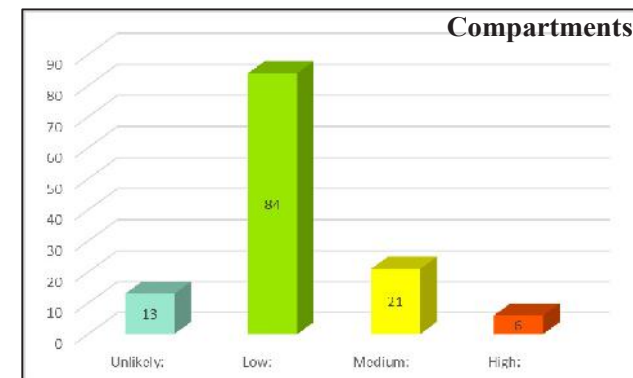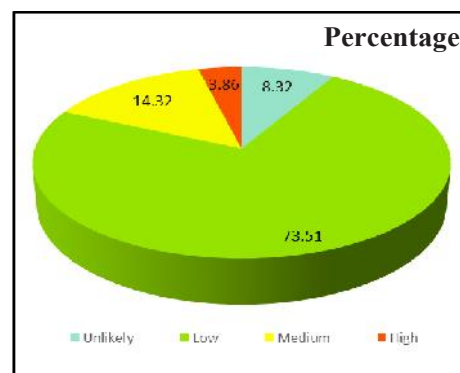
3.2.6 JAMMU FOREST DIVISION.

Jammu forest division lies between 32°30'8.491"N - 33°4'13.803"N latitude and 75°18'52.027"E - 74°22'24.504"E longitudes. The elevation varies from 189 m – 1609 m above mean sea level. The Division comprises of four territorial Ranges namely Bahu Range, Jammu Range, Jindrah Range and Kalidhar Range. The total area (on GIS platform) of 147 Compartments of four territorial ranges is 773.24 km^2.
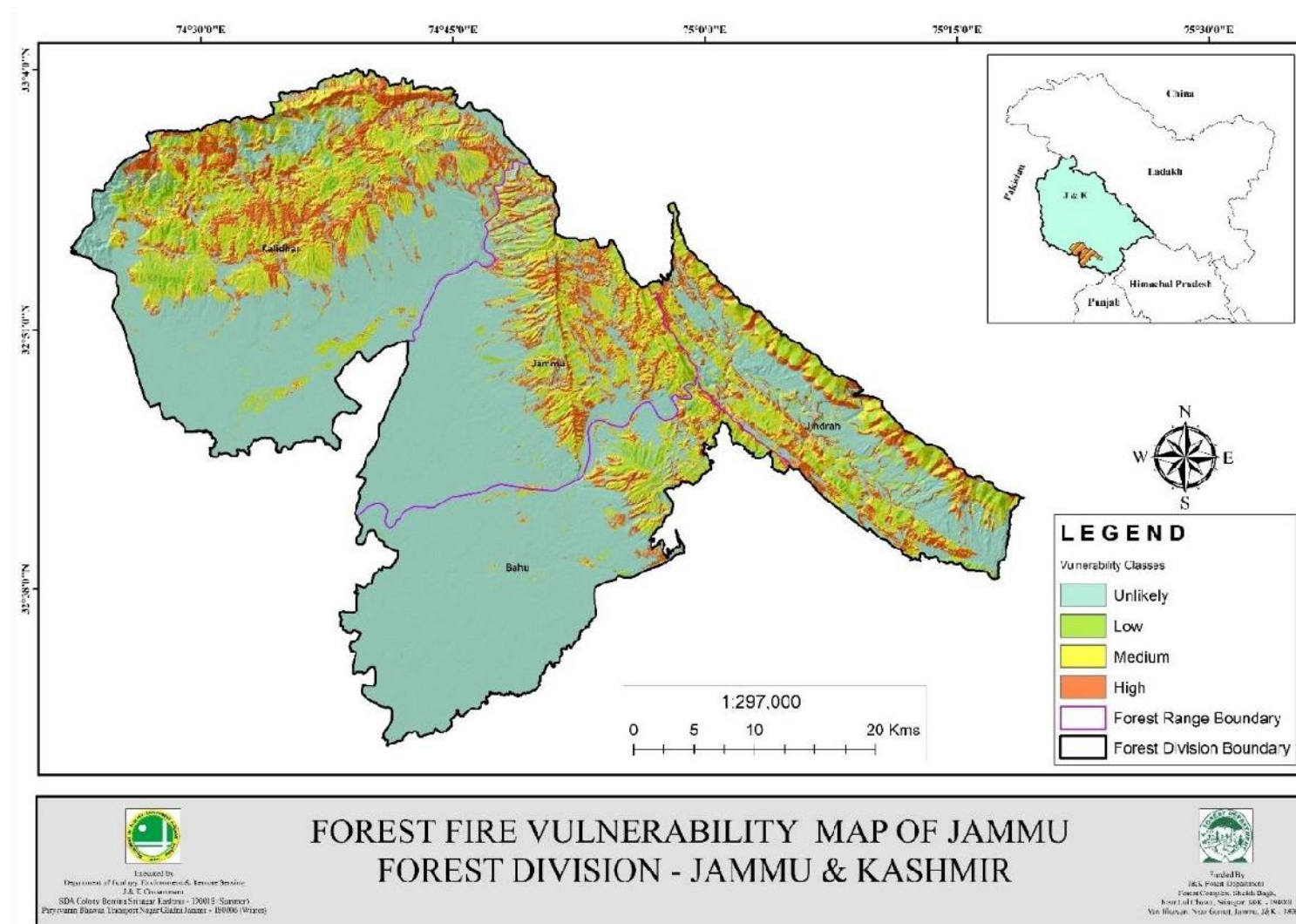
Fig. 32: Forest Fire Vulnerability Map of Jammu Forest Division Jammu & Kashmir

Table.26. Compartments of Jammu Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Jammu Forest Division	Bahu	Unlikely	12	14.73	17.19
		Low	5	11.77	13.73
		Medium	31	53.62	62.54
		High	5	5.61	6.54
		Total	**53**	**85.73**	**100.00**
	Jammu	Unlikely	2	4.86	3.56
		Low	0	0.00	0.00
		Medium	19	118.75	86.86
		High	2	13.09	9.58
		Total	**23**	**136.71**	**100.00**
	Jindrah	Unlikely	2	14.97	8.43
		Low	1	3.57	2.01
		Medium	21	140.59	79.16
		High	5	18.47	10.40
		Total	**29**	**177.61**	**100.00**
	Kalidhar	Unlikely	4	45.81	12.27
		Low	1	9.53	2.55
		Medium	26	240.48	64.44
		High	11	77.37	20.73
		Total	**42**	**373.19**	**100.00**

Jammu Forest Division — Area

| Vulnerability Classes	Area(Sq Kms)
Unlikely:	80.37
Low:	24.87
Medium:	553.44
High:	114.54
Total	**773.24**

Percentage
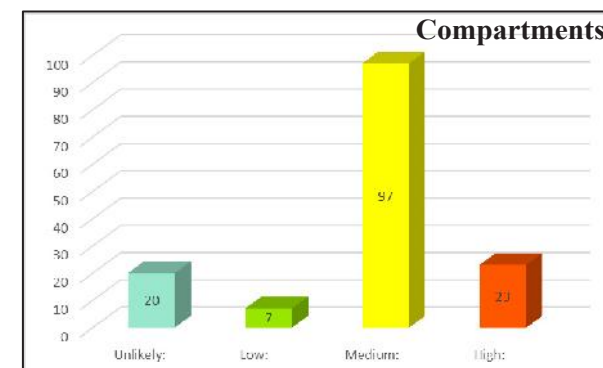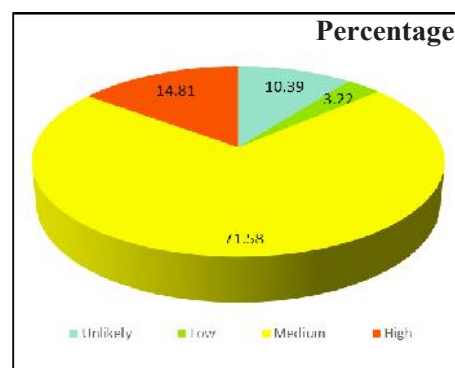
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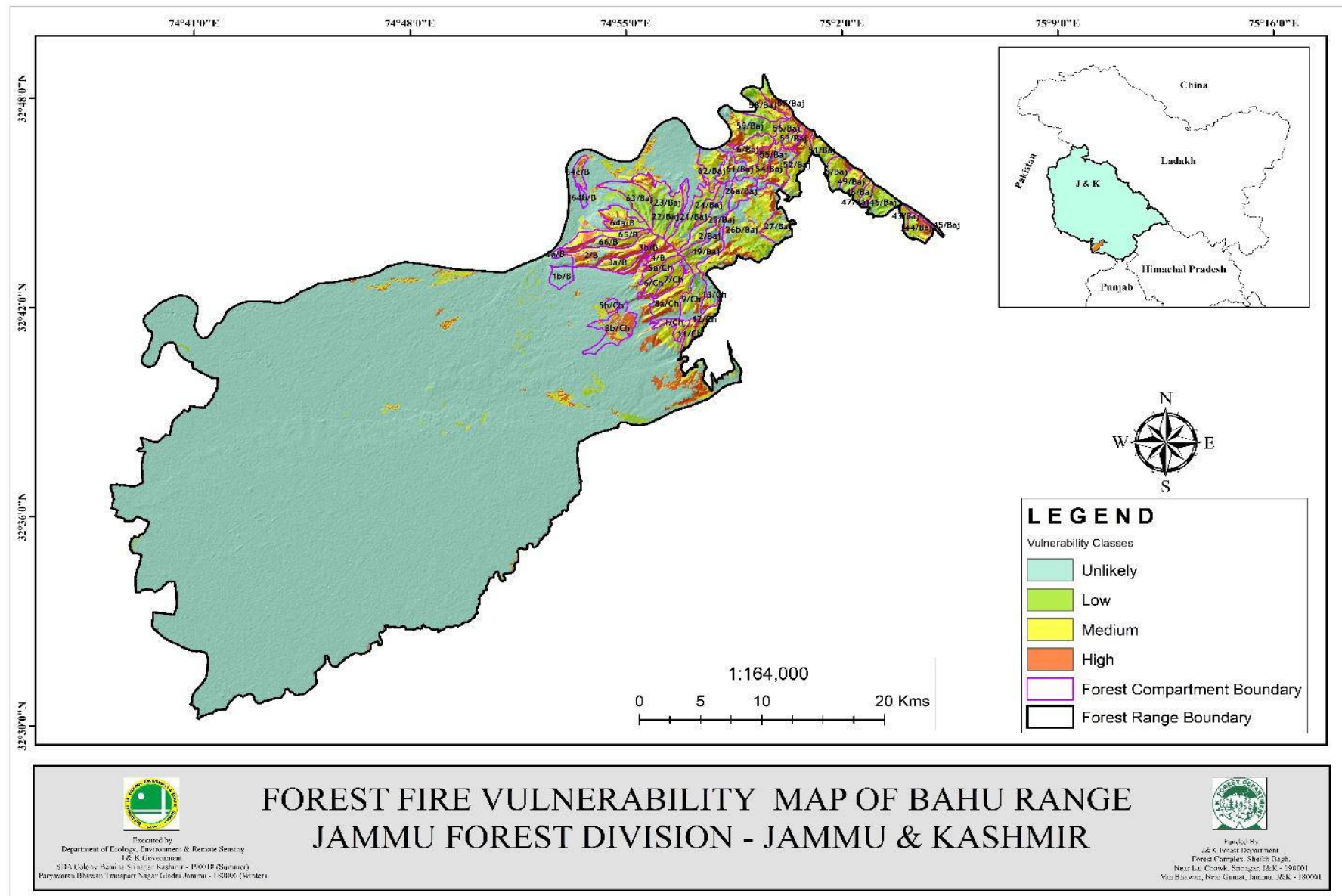
3.2.6.1 Bahu Range

Fig. 33: Forest Fire Vulnerability Map of Bahu Range Jammu Forest Division Jammu & Kashmir

Table.27. Compartments of Bahu Range Jammu Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Bahu	Unlikely	64b/B,64c/B,61/Baj,25/Baj,2/Baj,26a/Baj,9/Ch,13/Ch,1b/B,5b/Ch,8b/Ch & 1a/B	12	14.73	17.19
	Low	63/Baj,46/Baj,21/Baj,22/Baj,23/Baj	5	11.77	13.73
	Medium	66/B,65/B,5/Baj,49/Baj,48/Baj,47/Baj,43/Baj,44/Baj,51/Baj,53/Baj,52/Baj,54/Baj,56/Baj,58/Baj,59/Baj,55/Baj,6/Baj,62/Baj,24/Baj,19/Baj,27/Baj,26b/Baj,3a/B,4/B,5a/Ch,6/Ch,7/Ch,8a/Ch,12/Ch,11/Ch,1/Ch & 64a/B	31	53.62	62.54
	High	45/Baj,57/Baj,2/B & 3b/B	5	5.61	6.54
	Total		53	85.73	100.00

Area	
Bahu Range	
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	14.73
Low:	11.77
Medium:	53.62
High:	5.61
Total	**85.73**
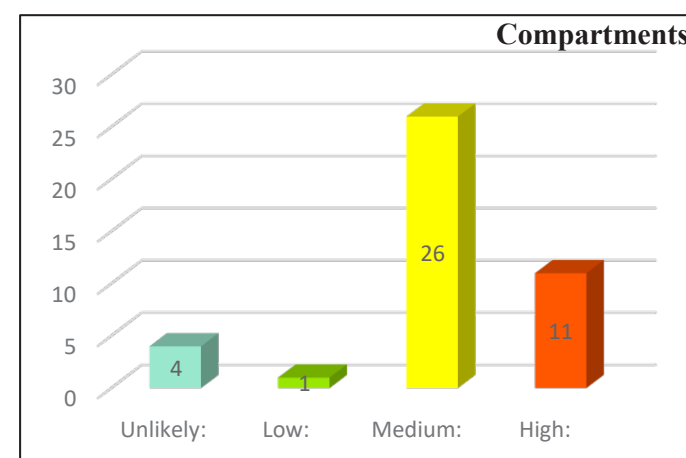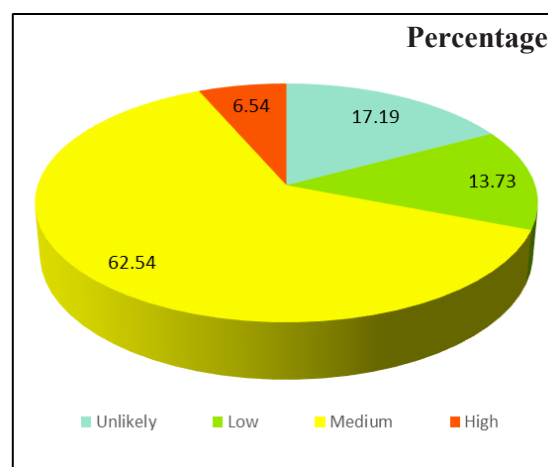
3.2.6.2 Jammu Range
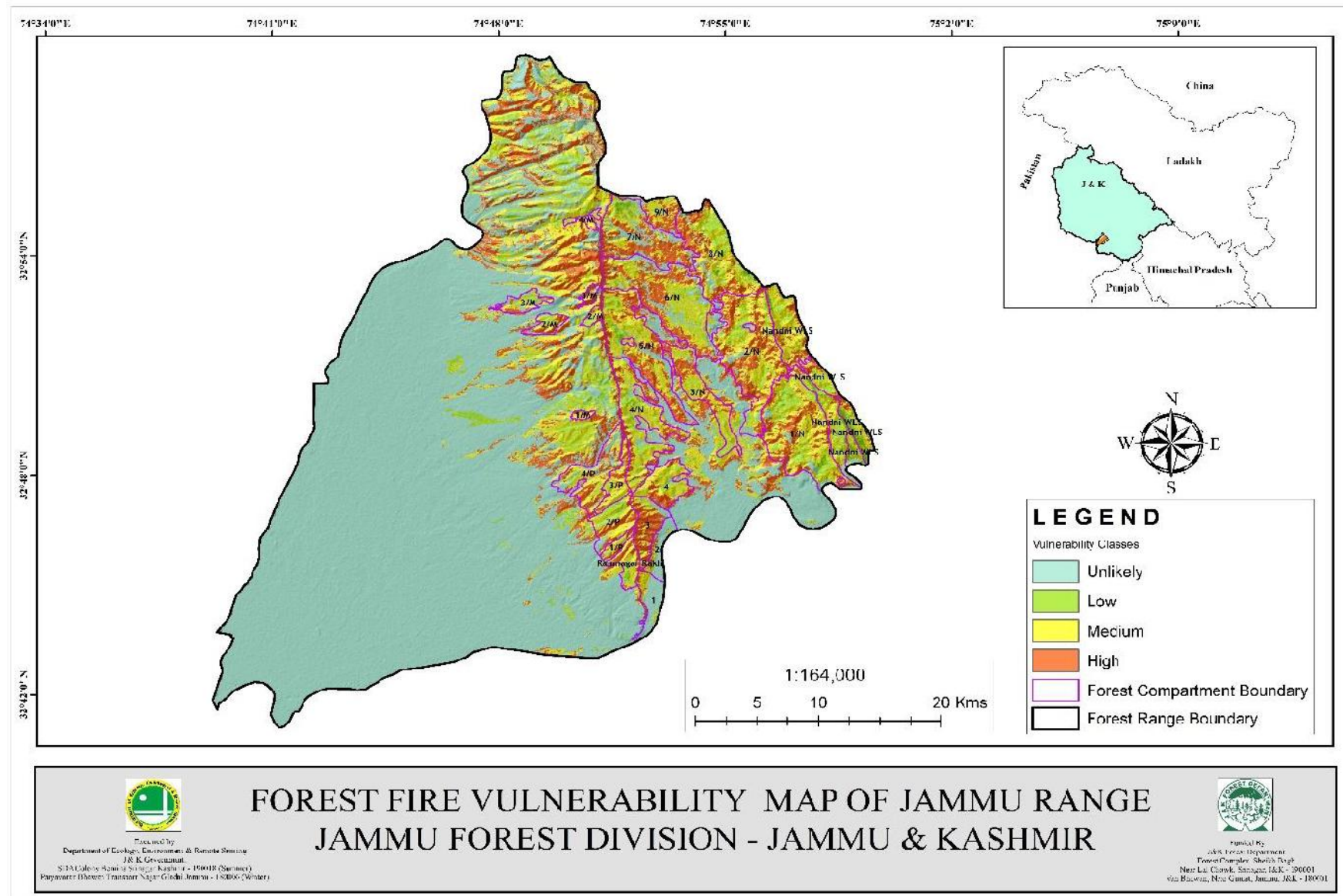
Fig. 34: Forest Fire Vulnerability Map of Jammu Range Jammu Forest Division Jammu & Kashmir

Table.28. Compartments of Jammu Range Jammu Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Jammu	Unlikely	1 & 2	2	4.86	3.56
	Low	None	0	0.00	0.00
	Medium	2/N,1/N, Nandni WLS,9/N,8/N,6/N,4/N,5/N,2/P, RamnagarRakh,1/P,3/P,4/P,4,3/M,2/M,1/M,4/M& 3/N	19	118.75	86.86
	High	7/N & 3	2	13.09	9.58
Total			23	136.71	100.00

Area	
Jammu Range	
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	4.86
Low:	0.00
Medium:	118.75
High:	13.09
Total	**136.71**
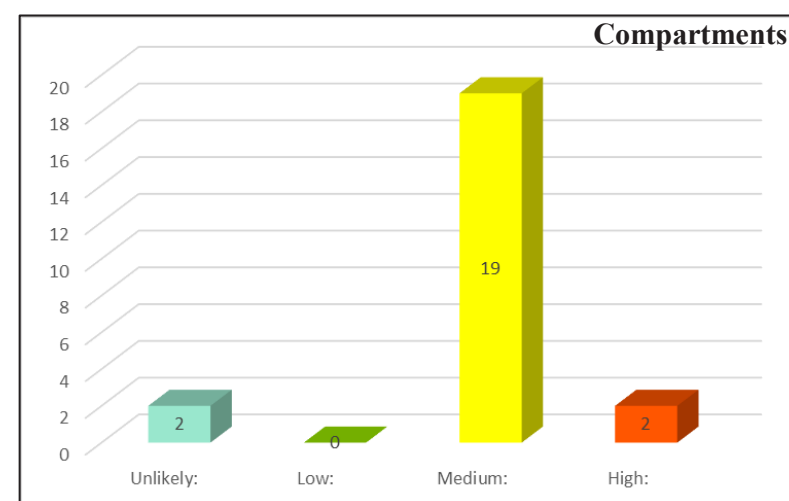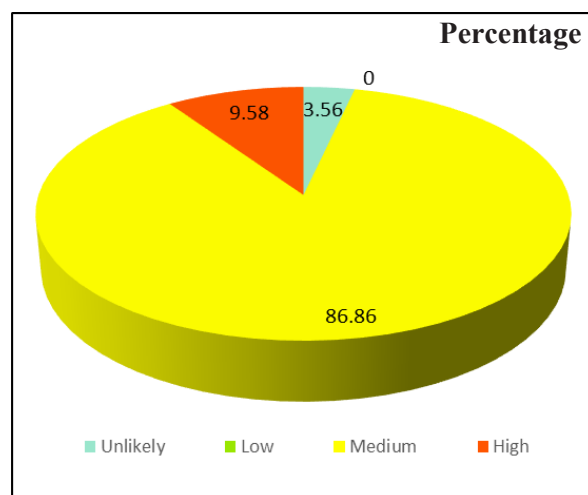
3.2.6.3 Jindrah Range

Fig. 35: Forest Fire Vulnerability Map of Jindrah Range Jammu Forest Division Jammu & Kashmir

Table.29. Compartments of Jindrah Range Jammu Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Jindrah	Unlikely	5/T & 5/M	2	14.97	8.43
	Low	1/M	1	3.57	2.01
	Medium	1/P,2/P,4/P,1/J,2/J,5/J,3/J,4/J,6/J,7/J,8/J,9/J,5/P,7/P,4/T,3/T, Mansar WLS,6/M,3/M,2/T & 4/M	21	140.59	79.16
	High	2/M,3/P,6/P,1/T & 8/M	5	18.47	10.40
Total			29	177.61	100.00

Area

Jindrah Range

Vulnerability Classes	Area(Sq Kms)
Unlikely:	14.97
Low:	3.57
Medium:	140.59
High:	18.47
Total	**177.61**

Percentage
- Unlikely 8.43
- Low 2.01
- Medium 79.16
- High 10.4

Compartments
- Unlikely: 2
- Low: 1
- Medium: 21
- High: 5

3.2.6.4 Kalidhar Range

Fig. 36: Forest Fire Vulnerability Map of Kalidhar Range Jammu Forest Division Jammu & Kashmir

Table.30. Compartments of Kalidhar Range Jammu Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Kalidhar	Unlikely	17/K,39/K,,41/K & 45/K	4	45.81	12.27
	Low	32/K	1	9.53	2.55
	Medium	44/K,16/K,15/K,14/K,13/K,12/K,7a/K,1/K,2/K,4/K, 3/K,43/K,27ab/K,23/K,37/K,31/K,33/K,34/K,35/K, 36/K,28/K,26/K,25/K,24/K,22/K & 21/K	26	240.48	64.44
	High	18/K,11/K,6/K,7b/K,8/K,9/K,5/K,38/K,42/K,29/K & 19/K	11	77.37	20.73
Total			42	373.19	100.00

Kalidhar Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	45.81
Low:	9.53
Medium:	240.48
High:	77.37
Total	**373.19**

Percentage

- Unlikely - Low - Medium - High

Compartments

3.2.7 KATHUA FOREST DIVISION.

Kathua forest division lies between 32°16'34.951"N - 32°38'43.044"N latitudes and 75°11'33.884"E - 75°44'41.491"E longitudes. The elevation varies from 217 m - 1213 m above mean sea level. The division comprises of two territorial ranges (Kathua and Jasrota). The total area (on GIS platform) of 123 Compartments of three territorial ranges is 349.40 km^2.
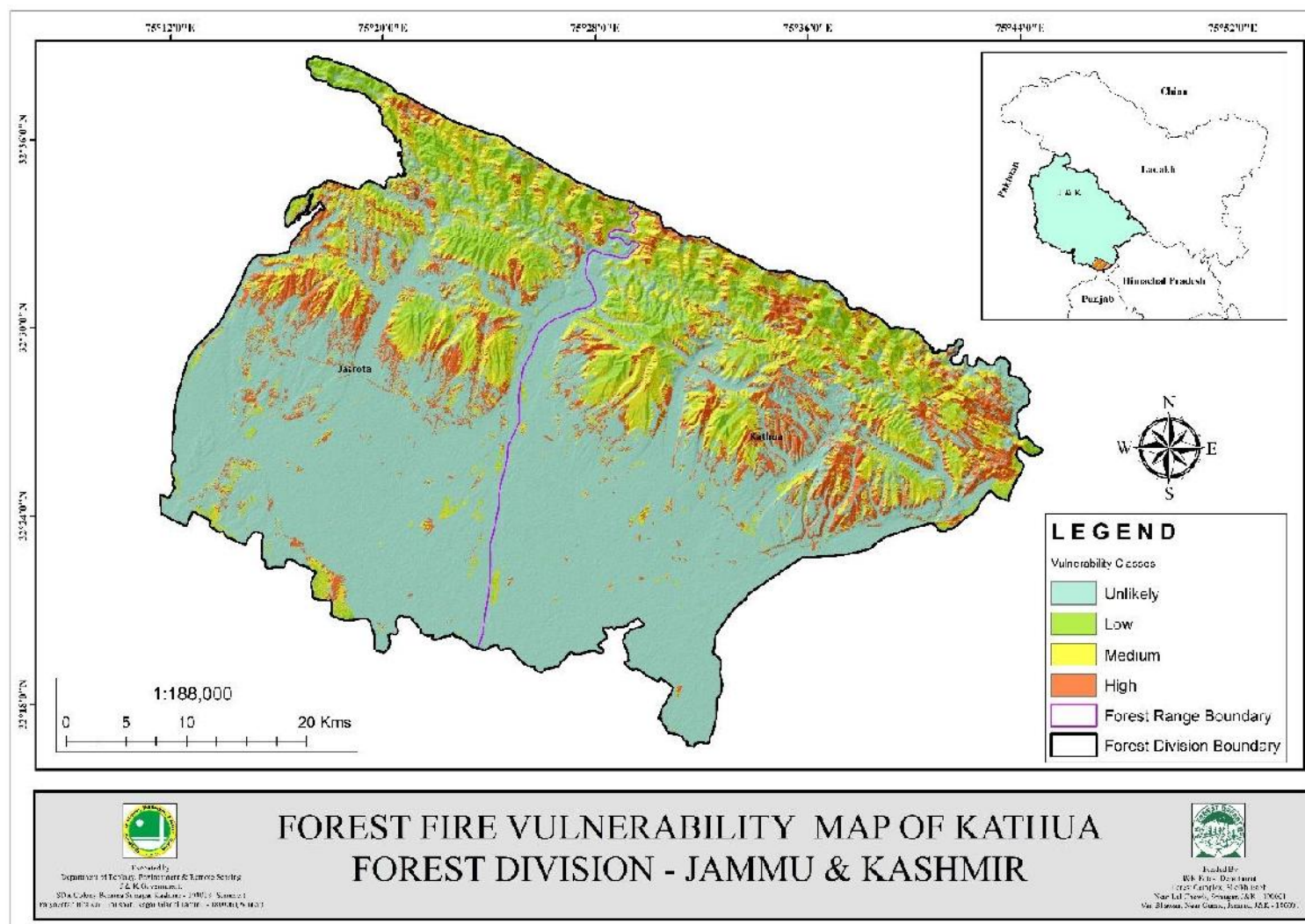
Fig. 37: Forest Fire Vulnerability Map of Kathua Forest Division Jammu & Kashmir

Table.31. Compartments of Kathua Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Kathua Forest Division	Jasrota	Unlikely	5	8.76	6.99
		Low	25	34.90	27.85
		Medium	46	69.67	55.58
		High	8	12.01	9.58
		Total	**84**	**125.35**	**100.00**
	Kathua	Unlikely	5	31.86	14.22
		Low	5	18.63	8.31
		Medium	21	130.01	58.03
		High	8	43.55	19.44
		Total	**39**	**224.05**	**100.00**

Area

Kathua Forest Division

Vulnerability Classes	Area(Sq Kms)
Unlikely:	40.62
Low:	53.53
Medium:	199.68
High:	55.56
Total	**349.40**
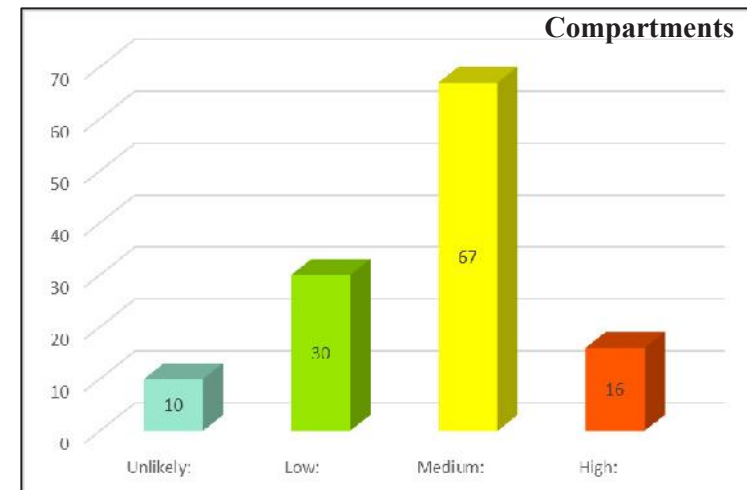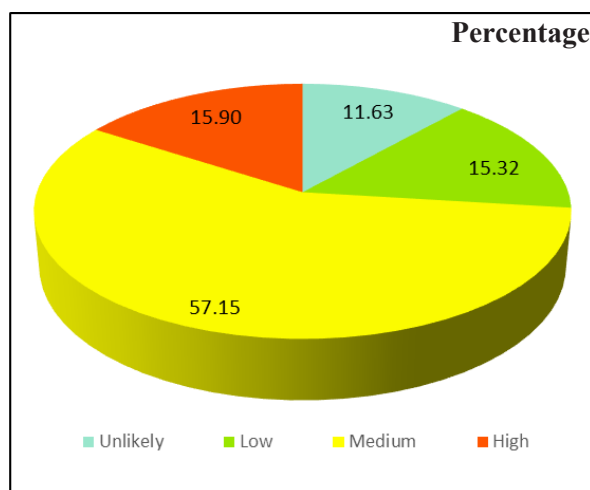
3.2.7.1 Jasrota Range
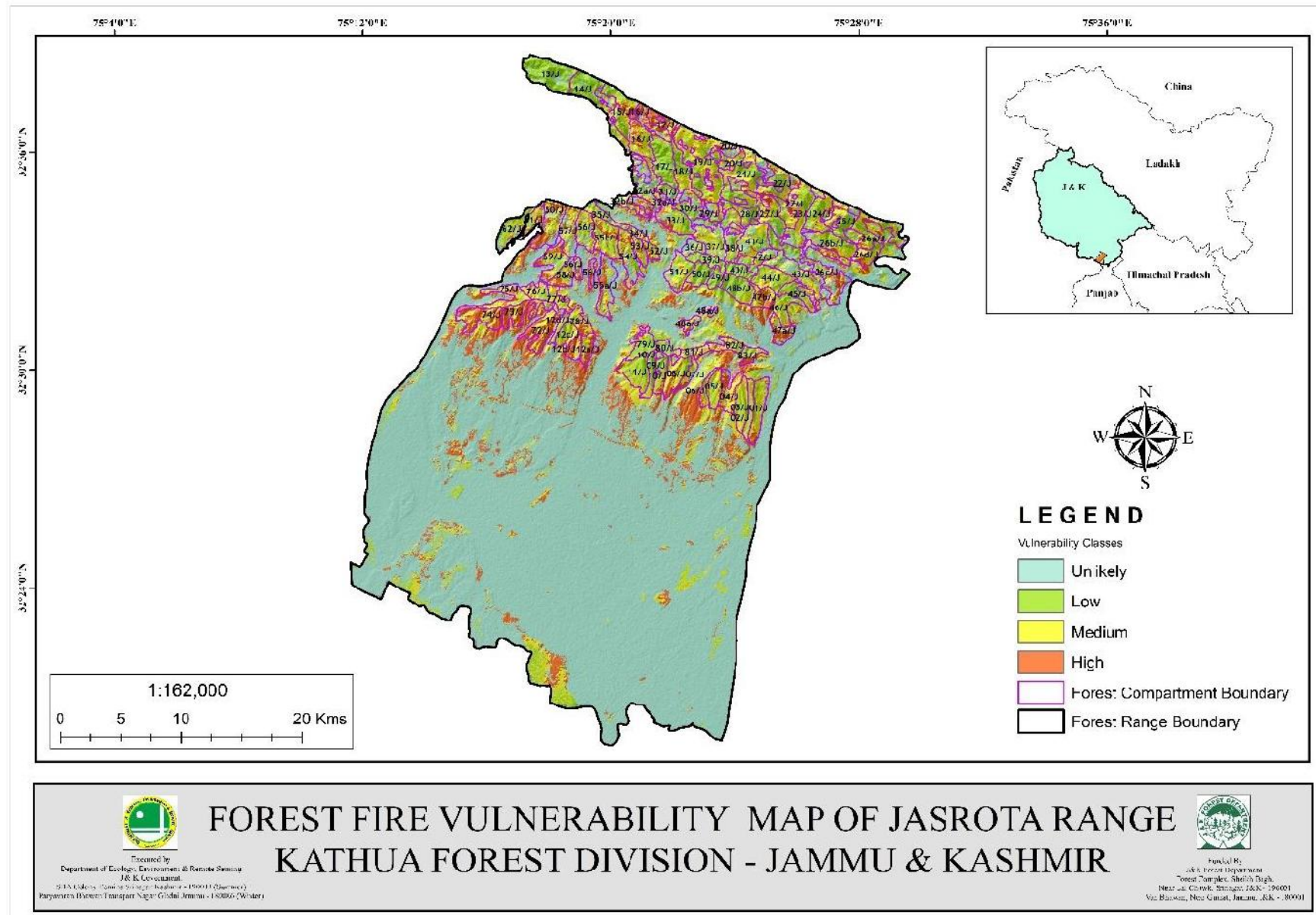
Fig. 38: Forest Fire Vulnerability Map of Jasrota Range Kathua Forest Division Jammu & Kashmir

Table.32. Compartments of Jasrota Range Kathua Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Jasrota	Unlikely	26c/J,32a/J,36/J,55a/J & 48a/J	5	8.76	6.99
	Low	25/J,21/J,18/J,17/J,13/J,14/J,31/J,30/J,29/J,28/J,38/J,45/J,48b/J,40/J,39/J,50/J,49/J,35/J,79/J,83/J,11/J,10/J,09/J,80/J & 62/J	25	34.90	27.85
	Medium	26a/J,26b/J,24/J,23/J,22/J,20/J,19/J,15/J,16/J,32b/J,33/J,27/J,43/J,42/J,41/J,37/J,44/J,46/J,51/J,54/J,53/J,52/J,34/J,55b/J,56/J,58/J,57/J,59/J,75/J,76/J,77/J,78/J,81/J,82/J,01/J (Jasrota WL S*,02/J (Jasrota WL S*,03/J (Jasrota WL S*,04/J (Jasrota WL S*,05/J (Jasrota WL S*,06/J (Jasrota WL S*,07/J,08/J,12d/J,12c/J,26d/J & 61/J	46	69.67	55.58
	High	47b/J,60/J,72/J,73/J,74/J,12b/J,12a/J & 47a/J	8	12.01	9.58
Total			84	125.35	100.00

Area	
Jasrota Range	
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	8.76
Low:	34.90
Medium:	69.67
High:	12.01
Total	**125.35**

Percentage
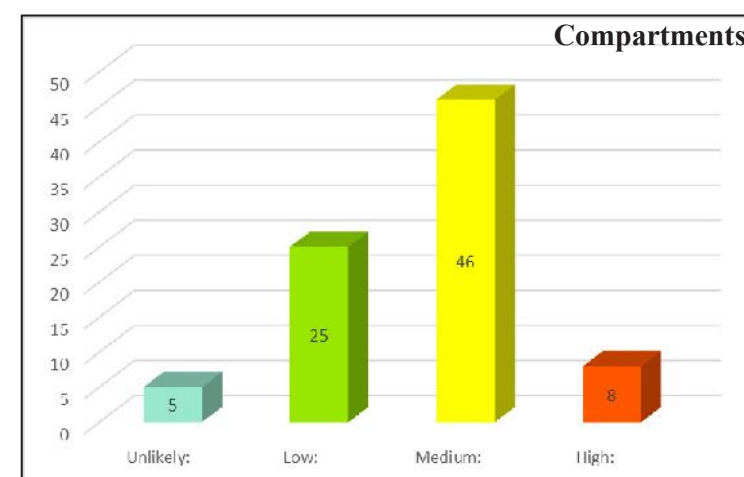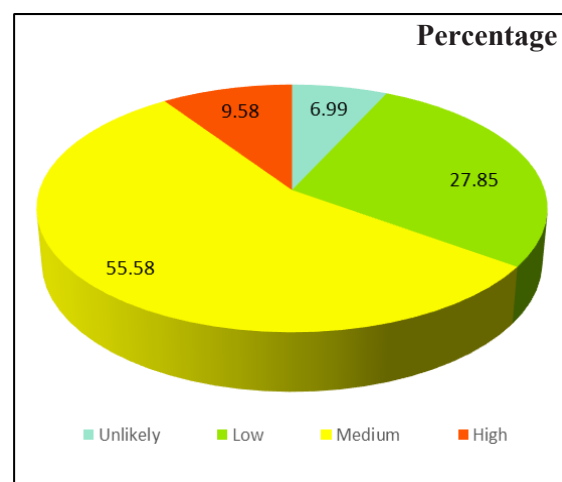
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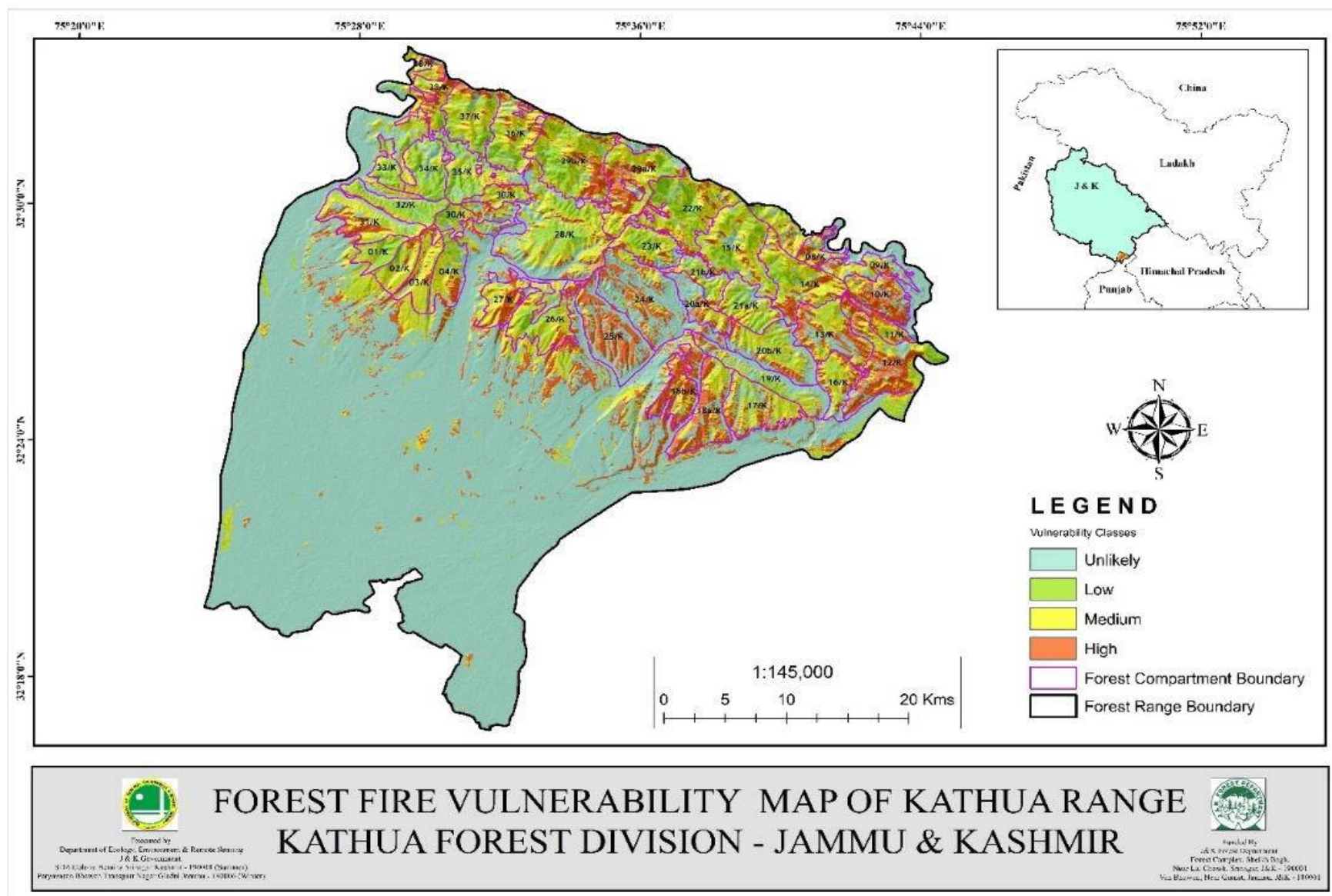
3.2.7.2 Kathua Range

Fig. 39: Forest Fire Vulnerability Map of Kathua Range Kathua Forest Division Jammu & Kashmir

Table.33. Compartments of Kathua Range Kathua Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
kathua	Unlikely	09/K,20b/K,19/K,20a/K & 24/K	5	31.86	14.22
	Low	35/K,34/K,33/K,32/K & 01/K	5	18.63	8.31
	Medium	37/K,36/K,29b/K,29a/K,22/K,15/K , 14/K,16/K,21a/K,21b/K,23/K,17/K,28/K,26/K,27/K,31/K,02/K,03/K,38/K,04/K & 30/K	21	130.01	58.03
	High	08/K,10/K,11/K,12/K,13/K,18a/K,25/K & 18b/K	8	43.55	19.44
Total			39	224.05	100.00

Area	
Kathua Range	
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	31.86
Low:	18.63
Medium:	130.01
High:	43.55
Total	**224.05**
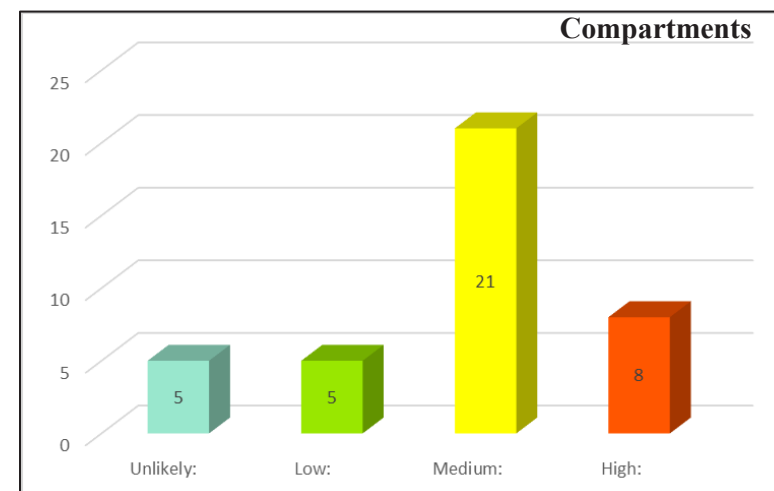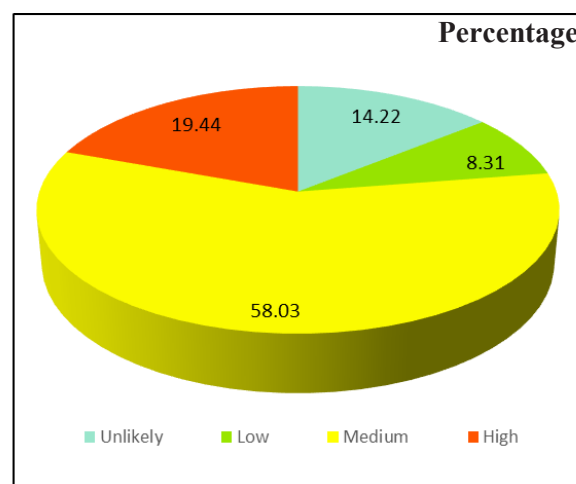
3.2.8 KISHTWAR FOREST DIVISION

Kishtwar forest division lies between Latitude 33°0'1.027"N - 33°36'37.646"N and Longitude 75°43'13.033"E - 76°46'57.644"E. The elevation varies from 894 m - 6462 m above mean sea level. Kishtwar Division consists of three territorial ranges viz; Kishtwar, Nagseni and Paddar. The total area (on GIS platform) of 197 Compartments of three territorial ranges is 1685.56 km^2.
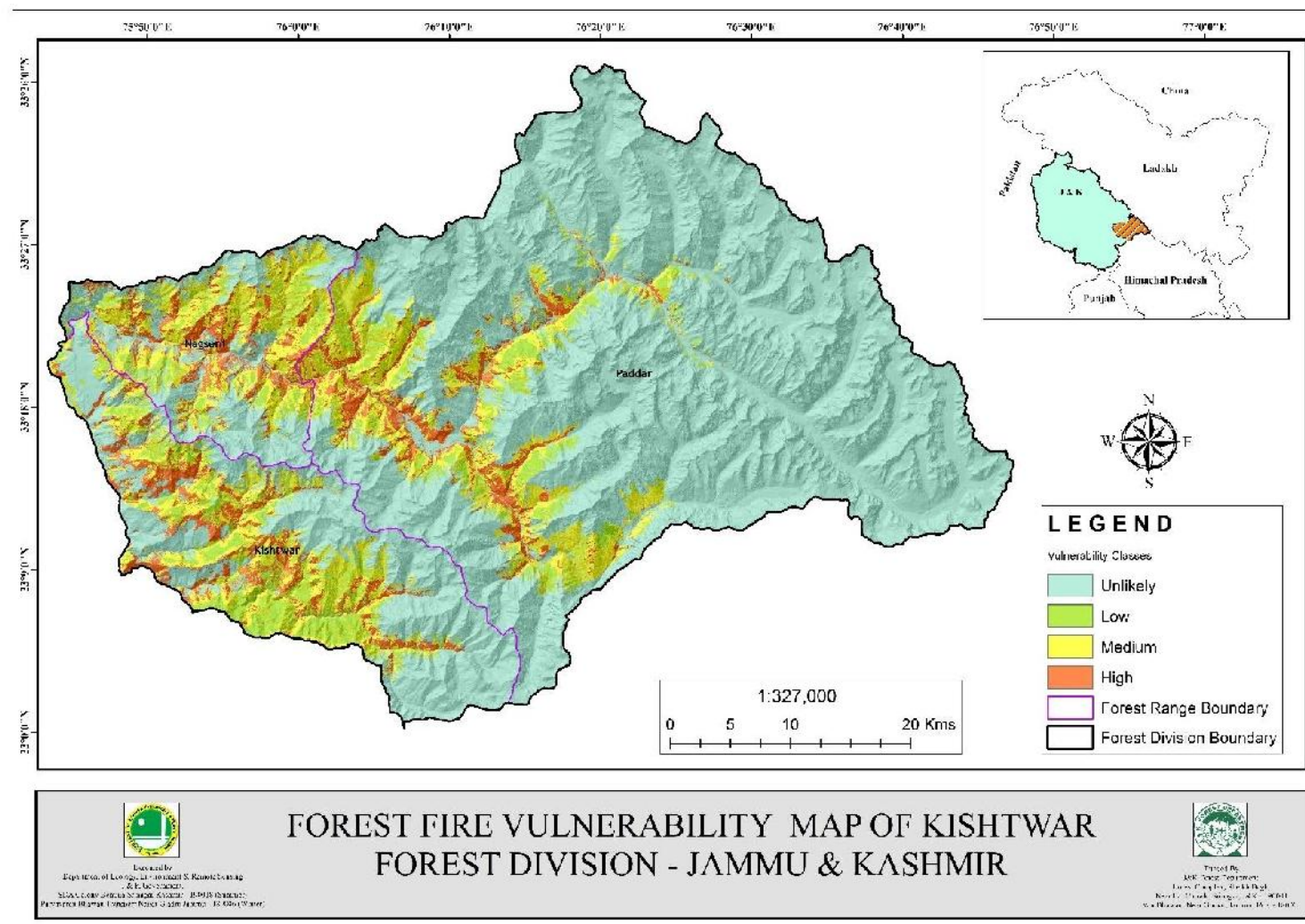
Fig. 40: Forest Fire Vulnerability Map of Kishtwar Forest Division Jammu & Kashmir

FOREST FIRE RISK ZONATION & VULNERABILITY ASSESSMENT FORESTS OF JAMMU & KASHMIR

Table.34. Compartments of Kishtwar Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Kishtwar Forest Division	Kishtwar	Unlikely	20	190.70	44.02
		Low	20	48.92	11.29
		Medium	34	138.36	31.94
		High	19	55.26	12.76
		Total	**93**	**433.24**	**100.00**
	Nagseni	Unlikely	16	153.95	23.39
		Low	1	3.69	0.56
		Medium	14	171.49	26.05
		High	6	329.13	50.00
		Total	**37**	**658.26**	**100.00**
	Paddar	Unlikely	34	374.59	63.06
		Low	6	43.62	7.34
		Medium	18	139.19	23.43
		High	7	36.66	6.17
		Total	**67**	**594.06**	**100.00**

Area

Kishtwar Forest Division

Vulnerability Classes	Area(Sq Kms)
Unlikely:	719.24
Low:	96.23
Medium:	449.04
High:	421.05
Total	**1685.56**

Percentage
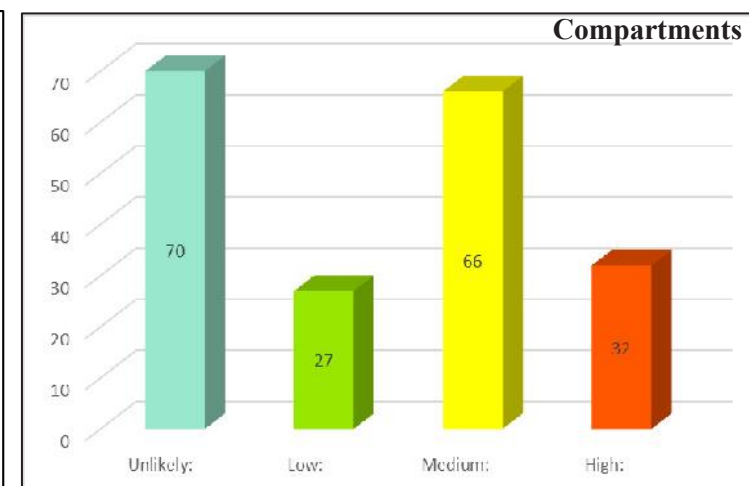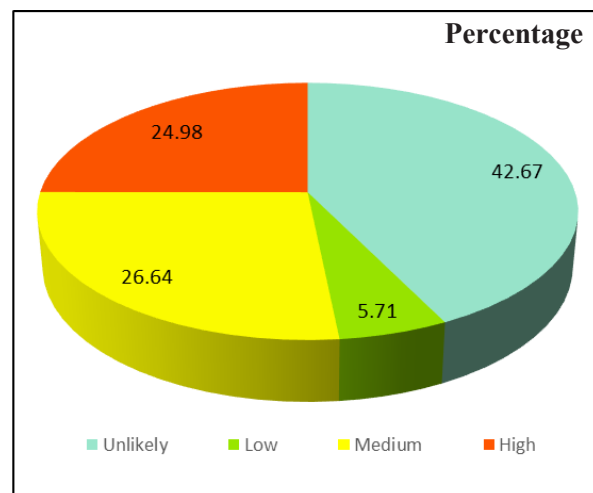
Compartments

3.2.8.1 Kishtwar Range
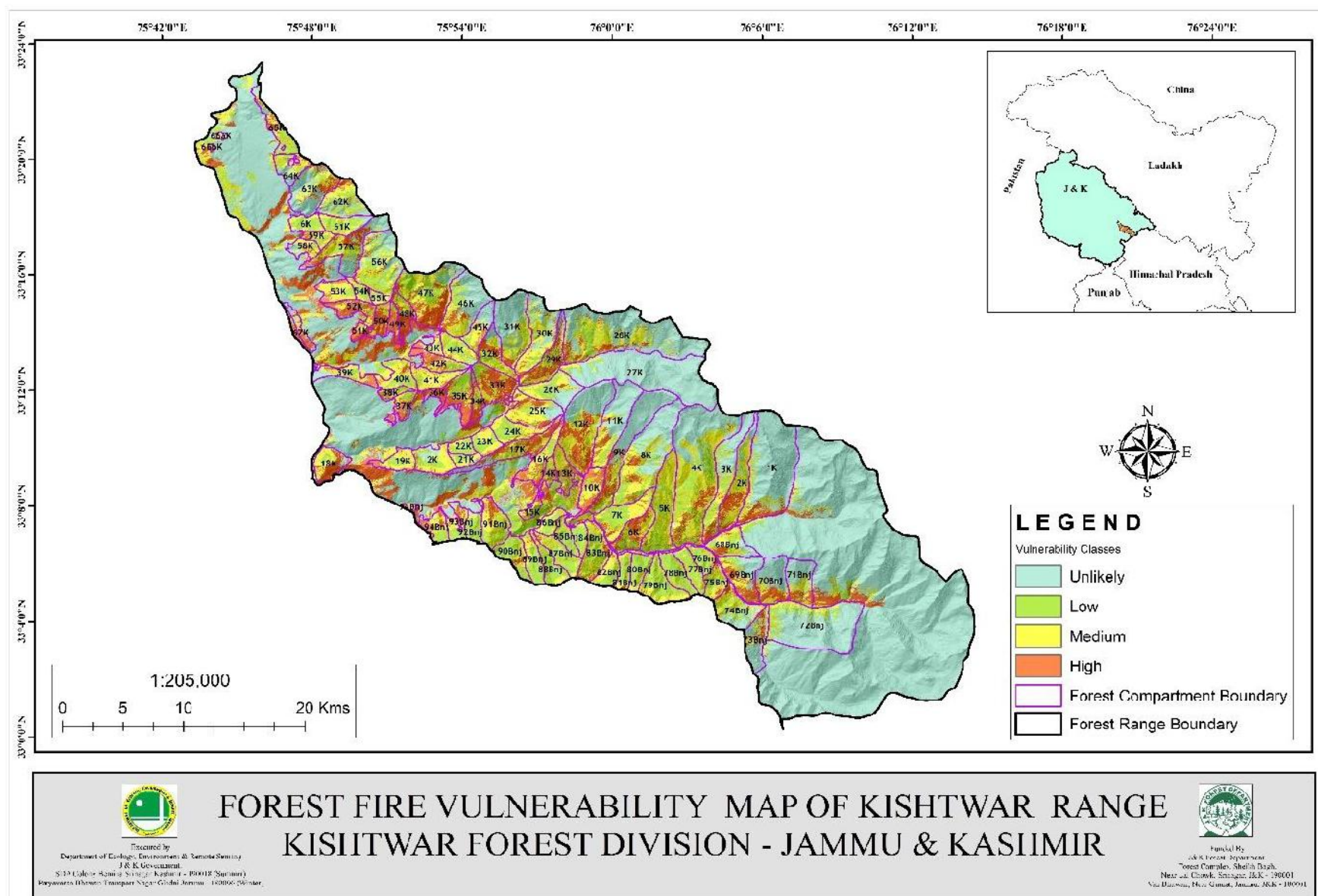
Fig. 41: Forest Fire Vulnerability Map of Kishtwar Range Kishtwar Forest Division Jammu & Kashmir

Table.35. Compartments of Kishtwar Range Kishtwar Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Kishtwar	Unlikely	28K,31K,45K,56K,46K,57K,63K,1K,3K,9K,8K,11K,27K,26K,12K,72Bnj,70Bnj,73Bnj,69Bnj & 71Bnj	20	190.70	44.02
	Low	61K,38K,55K,54K,6K,85Bnj,87Bnj,81Bnj,80Bnj,79Bnj,78Bnj,77Bnj,76Bnj,92Bnj,89Bnj,21K,22K,84Bnj,88Bnj & 90Bnj	20	48.92	11.29
	Medium	65K,30K,32K,39K,40K,41K,43K,44K,53K,59K,58K,62K,64K,5K,74Bnj,2K,4K,7K,83Bnj,82Bnj,75Bnj,66aK,94Bnj,93Bnj,25K,91Bnj,23K,24K,13K,19K,68Bnj,86Bnj,15K & 16K	34	138.36	31.94
	High	47K,29K,37K,36K,35K,34K,33K,42K,48K,49K,50K,52K,51K,10K,66bK,17K,14K,18K & 67K	19	55.26	12.76
Total			**93**	**433.24**	**100.00**

Area

Kishtwar Range

Vulnerability Classes	Area(Sq Kms)
Unlikely:	190.70
Low:	48.92
Medium:	138.36
High:	55.26
Total	**433.24**

Percentage
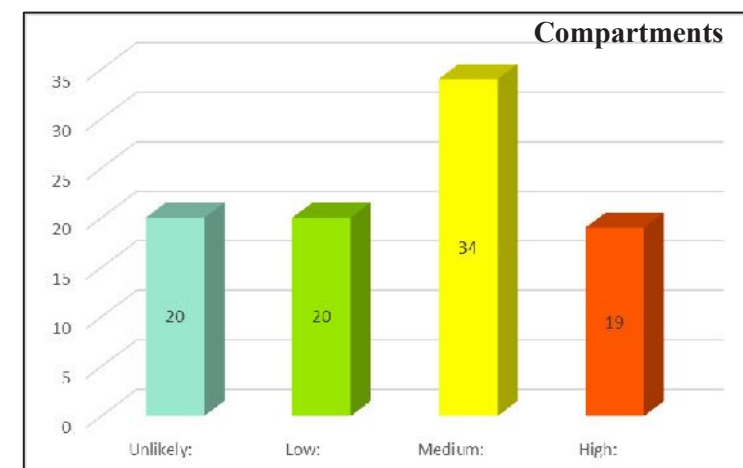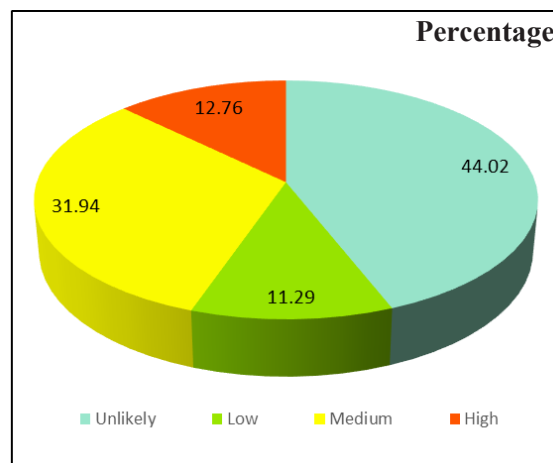
Compartments
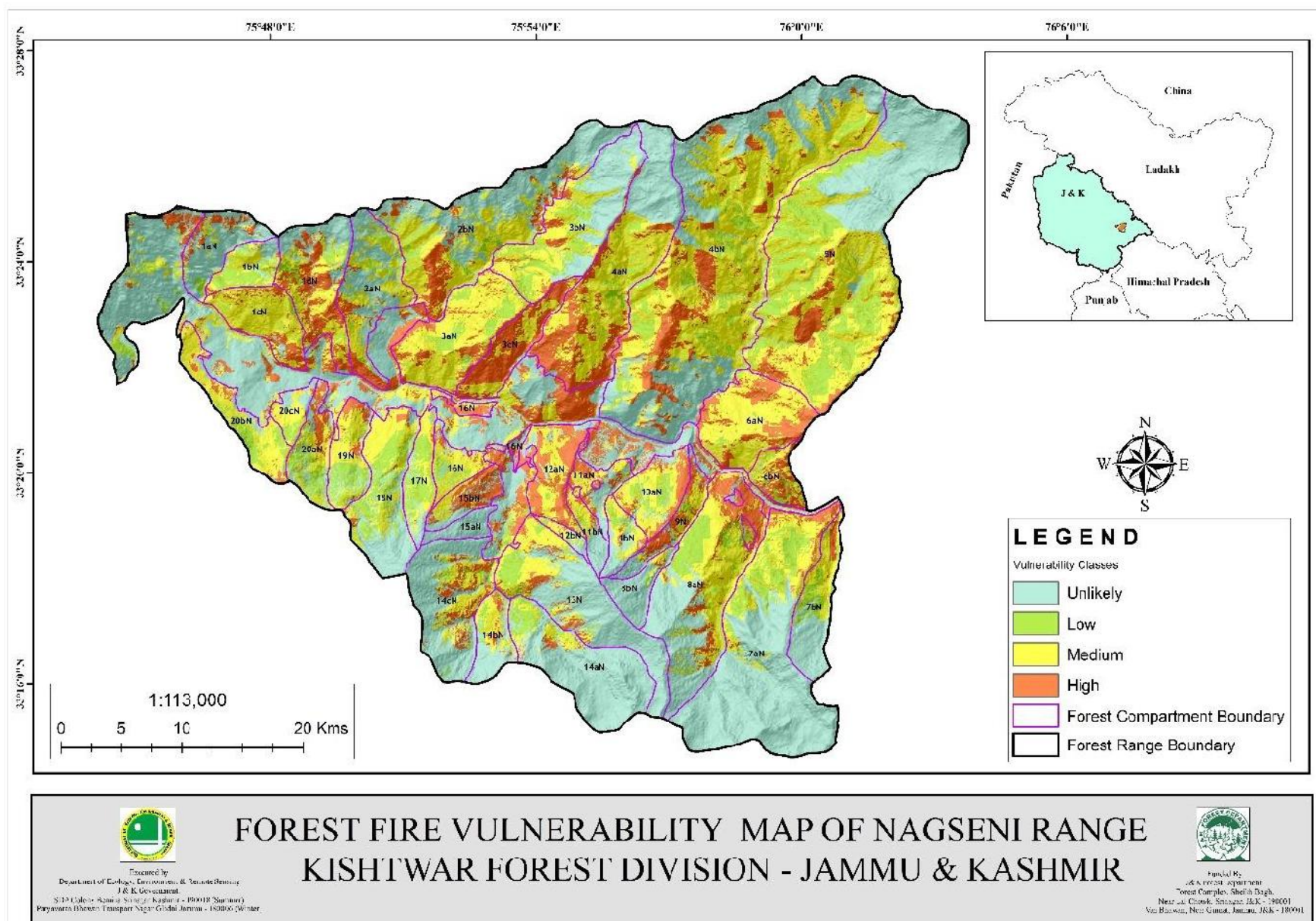
3.2.8.2 Nagseni Range

Fig. 42: Forest Fire Vulnerability Map of Nagseni Range Kishtwar Forest Division Jammu & Kashmir

Table.36. Compartments of Nagseni Range Kishtwar Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Nagseni	Unlikely	7aN,3bN,2aN,2bN,14cN,14aN,13N,8aN,11bN,8bN,18N,11aN,15aN,14bN,1aN & 7bN	16	153.95	23.39
	Low	17N	1	3.69	0.56
	Medium	4aN,3aN,1bN,1cN,6aN,10aN,20bN,20aN,19N,5N,20cN,4bN,12bN & 16N	14	171.49	26.05
	High	1dN,3cN,9N,12aN,6bN & 15bN	6	329.13	50.00
Total			37	658.26	100.00

Area

Nagseni Range

Vulnerability Classes	Area(Sq Kms)
Unlikely:	153.39
Low:	3.69
Medium:	171.49
High:	329.13
Total	**658.26**

Percentage
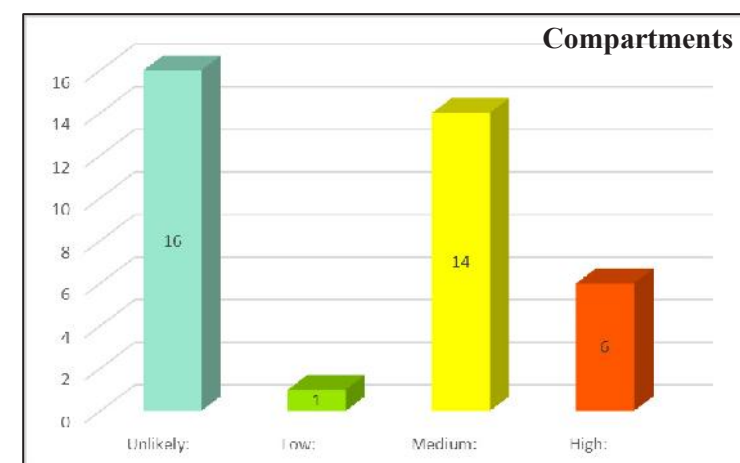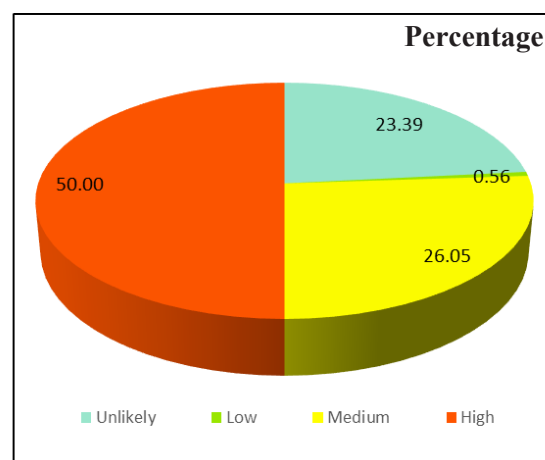
Compartments
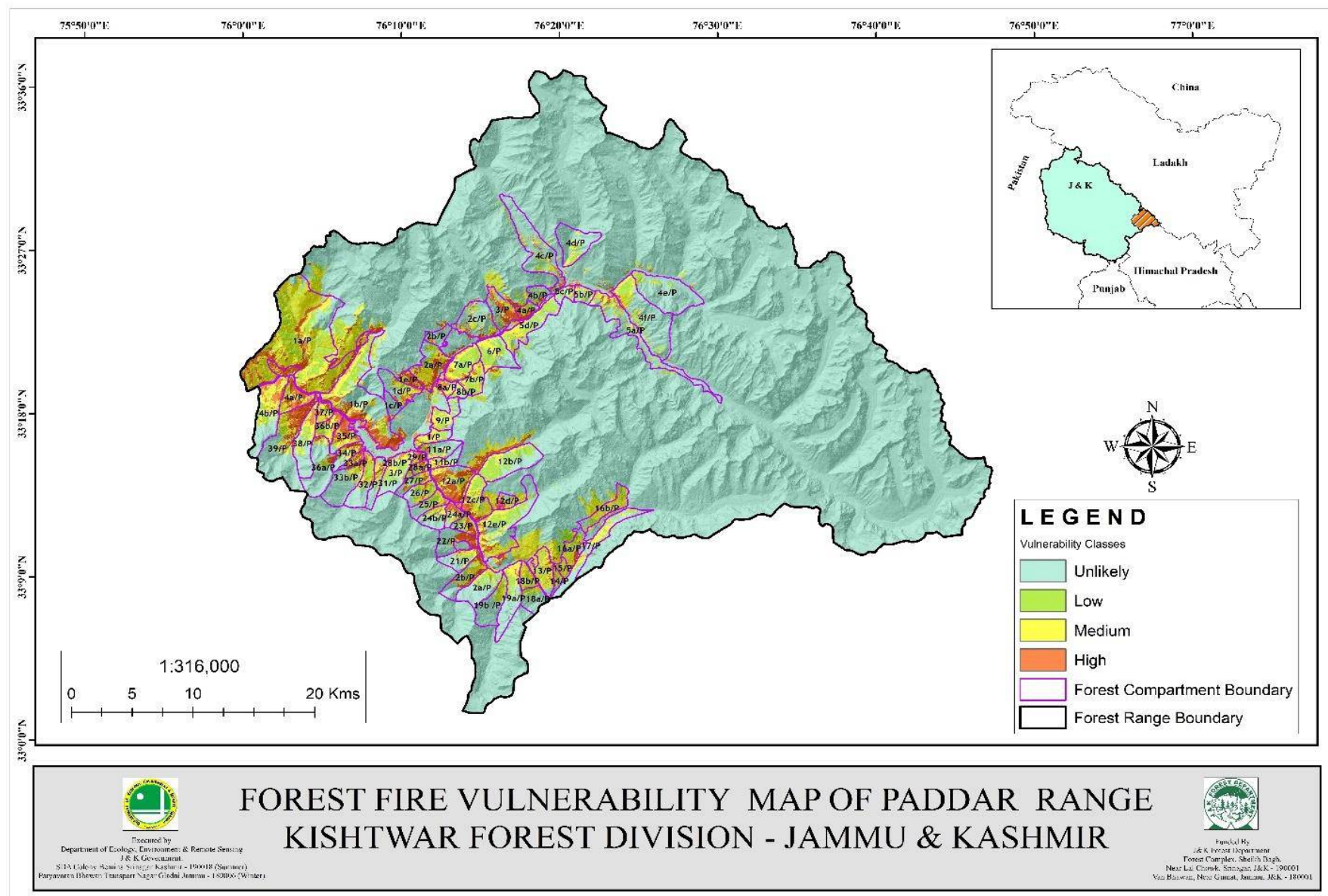
3.2.8.3 Paddar Range

Fig. 43: Forest Fire Vulnerability Map of Paddar Range Kishtwar Forest Division Jammu & Kashmir

Table.37. Compartments of Paddar Range Kishtwar Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Paddar	Unlikely	18a/P,38/P,39/P,4b/P,11b/P,11a/P,1b/P,2a/P,3/P,31/P,26/P,21/P,1d/P,4d/P,4f/P,5a/P,5b/P,5c/P,12e/P,19a/P,19b/P,2b/P,25/P,24b/P,22/P,17/P,2c/P,32/P,33b/P,4e/P,4c/P,1c/P,27/P,36a/P	34	374.59	63.06
	Low	5d/P,12b/P,6/P,7a/P,8b/P,28b/P	6	43.62	7.34
	Medium	34/P,29/P,36b/P,37/P,18b/P,9/P,1/P,13/P,14/P,15/P,1a/P,28a/P,12d/P,16b/P,16a/P,7b/P,8a/P,12c/P	18	139.19	23.43
	High	35/P,4a/P,12a/P,23/P,24a/P,1e/P,33a/P	7	36.66	6.17
Total			**67**	**594.06**	**100.00**

Area	
Paddar Range	
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	374.59
Low:	43.62
Medium:	139.19
High:	36.66
Total	**594.06**

Percentage

Compartments
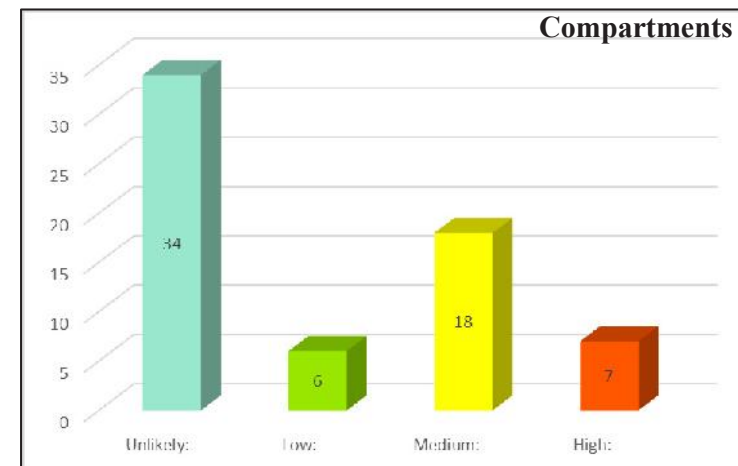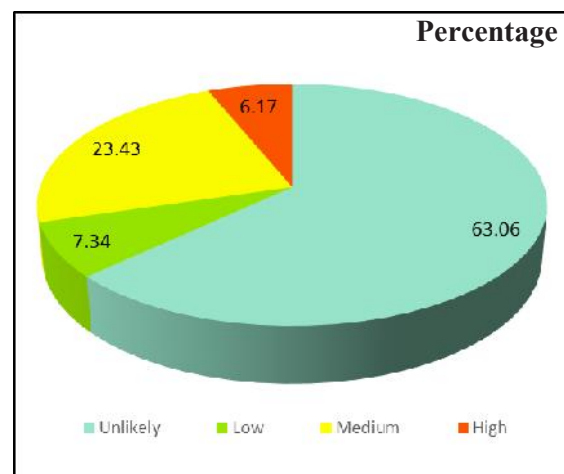
3.2.9 MAHORE FOREST DIVISION

The forest division falls between 33°8'37.09"N - 33°31'41.822"N latitude and 74°36'6.425"E - 75°10'21.568"E longitude. The altitude varies between 440 m – 4540 m above mean sea level. Mahore Division now consists of three territorial ranges viz; Gool, Gulabgarh and Mahore. The total area (on GIS platform) of 255 Compartments of three territorial ranges is 921.90 km^2.
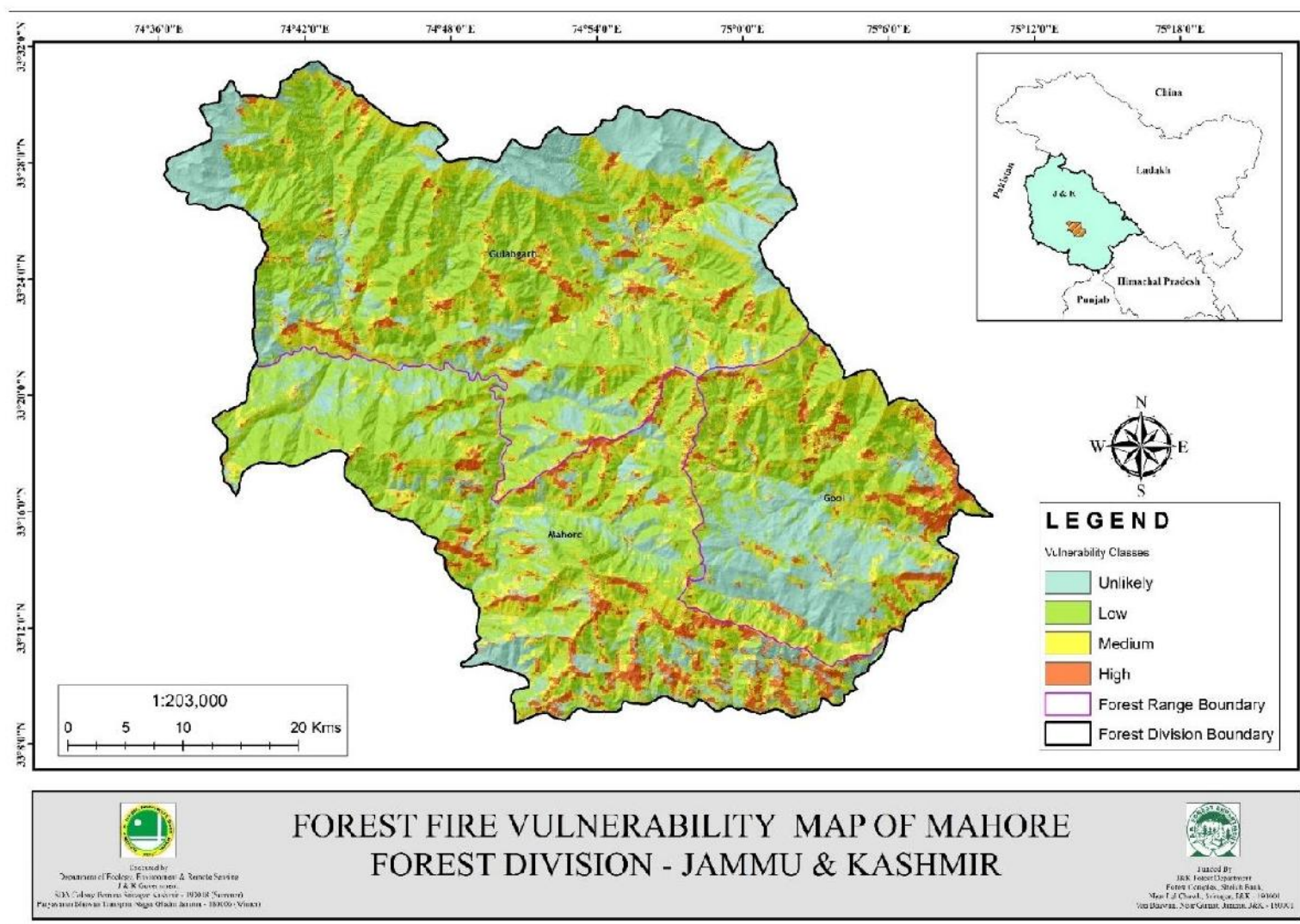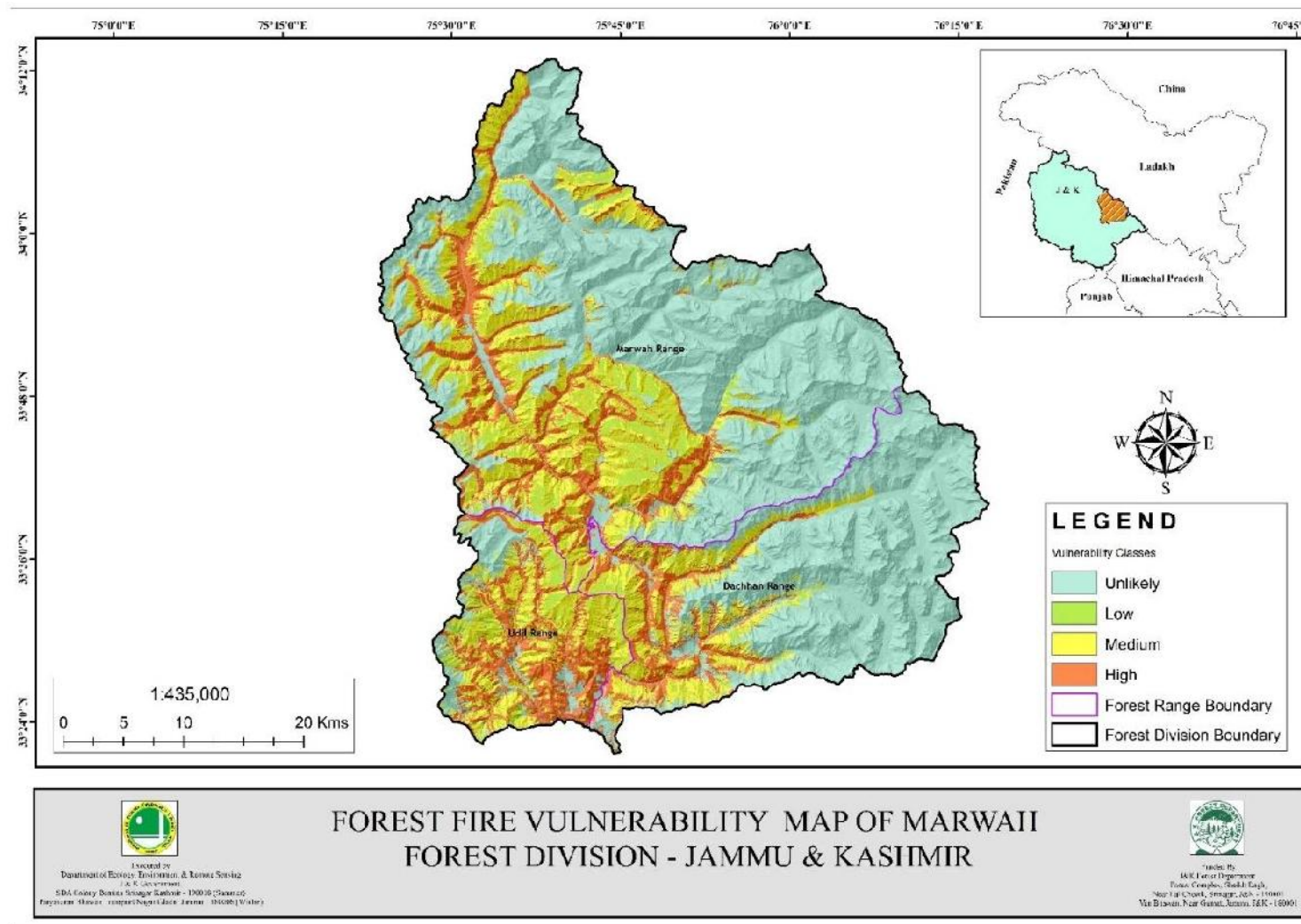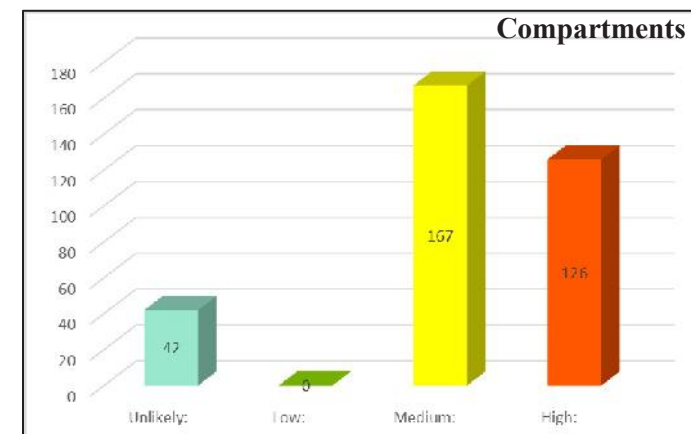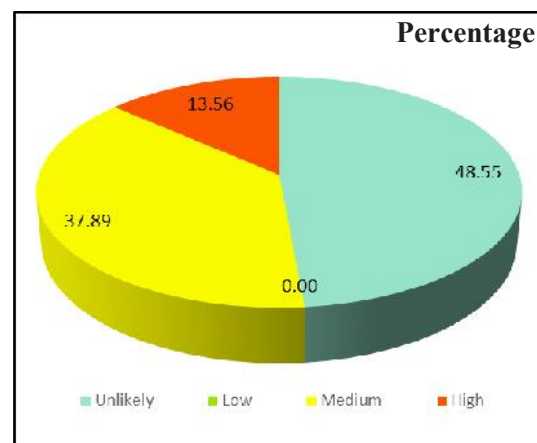

Fig. 44: Forest Fire Vulnerability Map of Mahore Forest Division Jammu & Kashmir

Table.38. Compartments of Mahore Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Mahore Forest Division	Gool	Unlikely	29	34.04	19.95
		Low	34	97.41	57.09
		Medium	13	33.89	19.86
		High	3	5.29	3.10
		Total	**79**	**170.62**	**100.00**
	Gulabgarh	Unlikely	7	111.97	23.58
		Low	60	328.69	69.22
		Medium	9	34.18	7.20
		High	0	0.00	0.00
		Total	**76**	**474.85**	**100.00**
	Mahore	Unlikely	4	11.42	4.13
		Low	71	200.48	72.53
		Medium	14	38.72	14.01
		High	11	25.81	9.34
		Total	**100**	**276.43**	**100.00**

Mahore Forest Division	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	157.43
Low:	626.58
Medium:	106.79
High:	31.1
Total	**921.90**

Percentage pie chart: Unlikely 17.08, High 3.37, Medium 11.58, Low 67.97

Compartments bar chart: Unlikely 40, Low 165, Medium 36, High 14
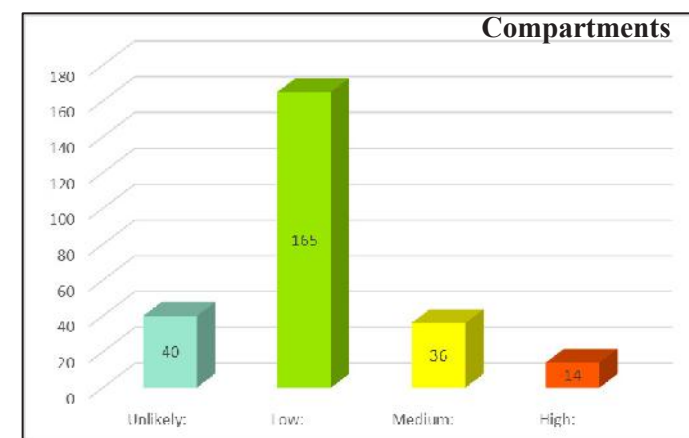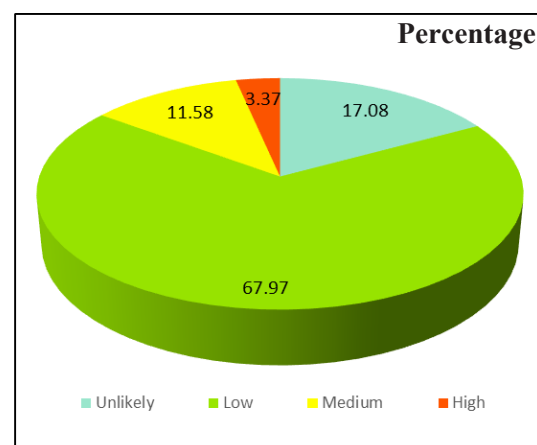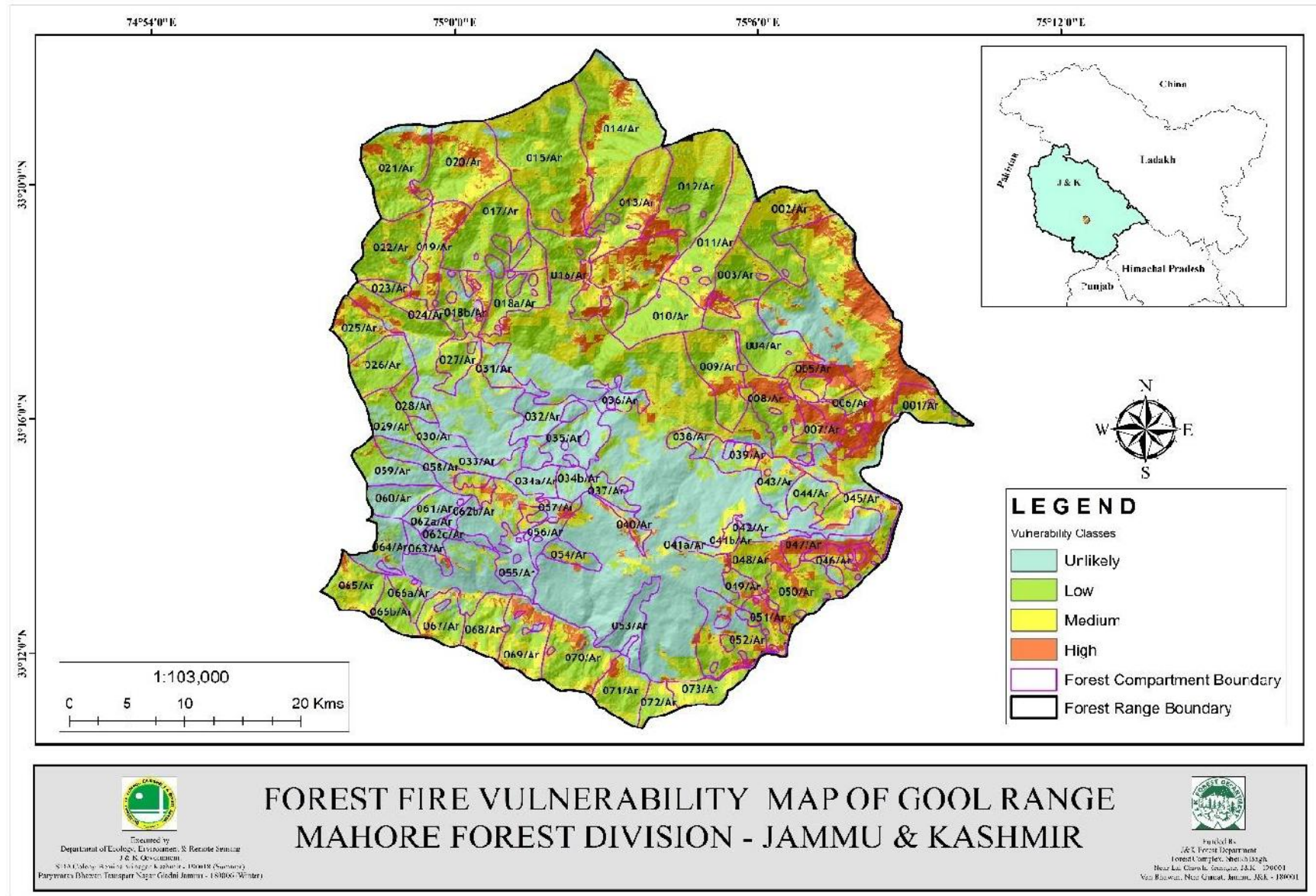
3.2.9.1 Gool Range

Fig. 45: Forest Fire Vulnerability Map of Gool Range Mahore Forest Division Jammu & Kashmir

Table.39. Compartments of Gool Range Mahore Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Gool	Unlikely	053/Ar,054/Ar,055/Ar,063/Ar,064/Ar,057/Ar,056/Ar,040/Ar,060/Ar, 037/Ar,034a/Ar,059/Ar,058/Ar,041a/Ar,042/Ar,061/Ar,062c/Ar,033/Ar,031/Ar,032/Ar,036/Ar,038/Ar,039/Ar,043/Ar,030/Ar,035/Ar,034b/Ar,062a/Ar & 062b/Ar	29	34.04	19.95
	Low	072/Ar,073/Ar,071/Ar,070/Ar,068/Ar,067/Ar,065/Ar,008/Ar,009/Ar, 024/Ar,025/Ar,004/Ar,023/Ar,018a/Ar,018b/Ar,003/Ar,016/Ar,022/Ar,017/Ar,012/Ar,021/Ar,015/Ar,026/Ar,029/Ar,027/Ar,044/Ar,011/Ar,010/Ar,014/Ar,028/Ar,051/Ar,049/Ar,066b/Ar & 066a/Ar	34	97.41	57.09
	Medium	069/Ar,006/Ar,001/Ar,019/Ar,002/Ar,020/Ar,041b/Ar,045/Ar,052/Ar,048/Ar,050/Ar,046/Ar & 013/Ar	13	33.89	19.86
	High	007/Ar,005/Ar & 047/Ar	3	5.29	3.10
Total			79	170.62	100.00

Gool Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	34.04
Low:	97.41
Medium:	33.89
High:	5.29
Total	**170.62**
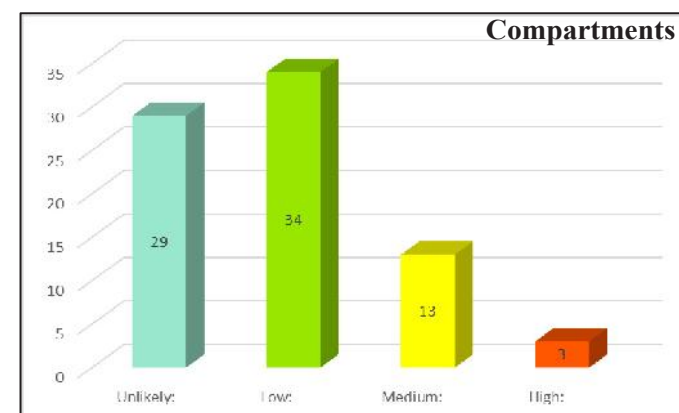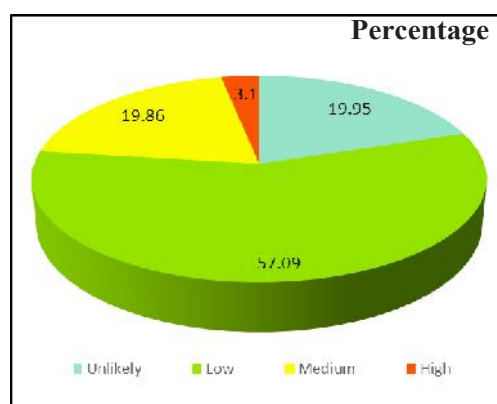
3.2.9.2 Gulabgarh Range
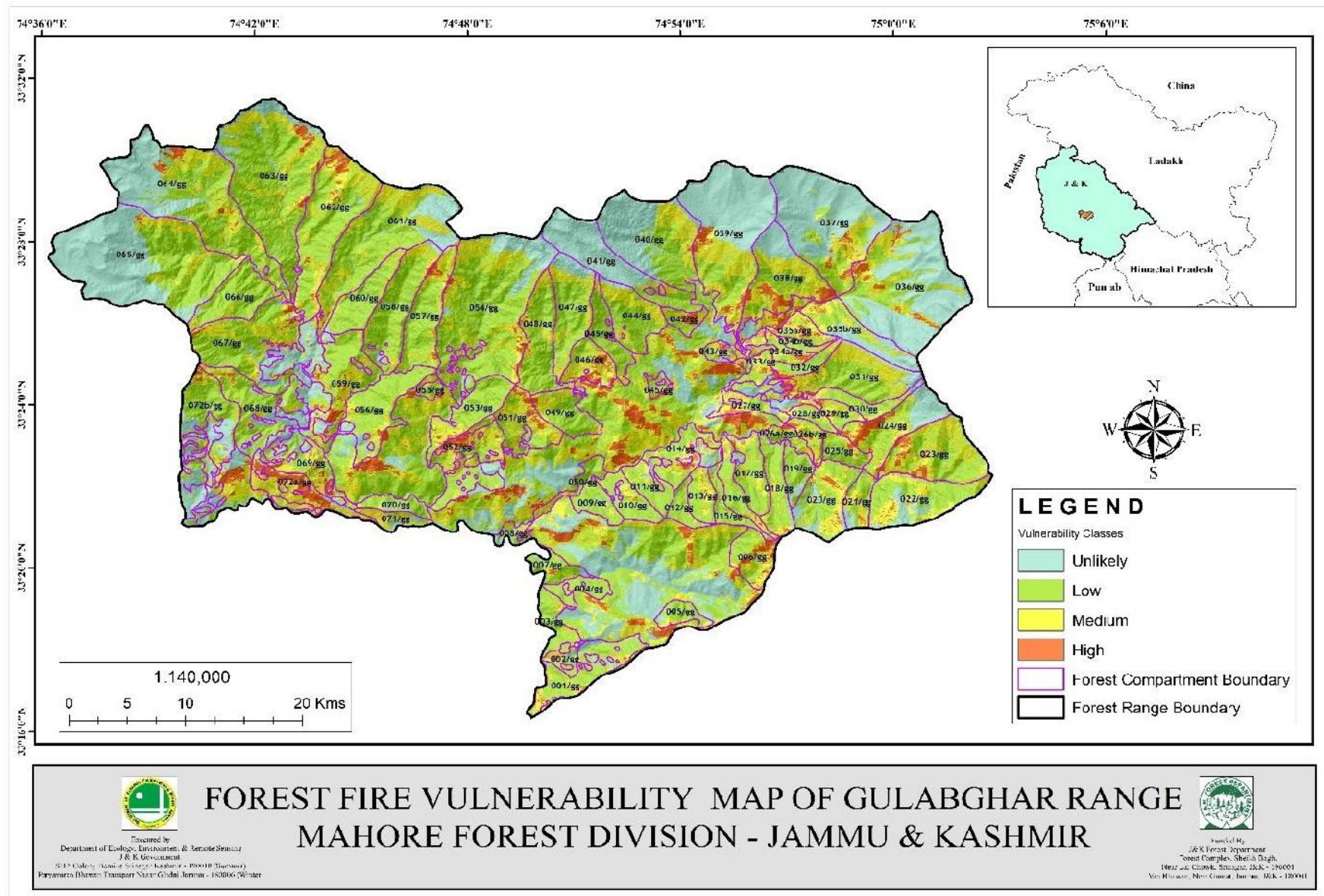
Fig. 46: Forest Fire Vulnerability Map of Gulabghar Range Mahore Forest Division Jammu & Kashmir

Table.40. Compartments of Gulabgarh Range Mahore Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Gulabgarh	Unlikely	035b/GG,036/GG,041/GG,065/GG,040/GG,037/GG,039/gg	7	111.97	23.58
	Low	002/GG,001/GG,005/GG,003/GG,004/GG,007/GG,006/GG,008/GG,009/GG,012/GG,022/GG,021/GG,010/GG,013/GG,011/GG,020/GG,050/GG,015/GG,019/GG,016/GG,018/GG,025/GG,017/GG,014/GG,052/GG,023/GG,028/GG,029/GG,024/GG,030/GG,053/GG,072b/GG,031/GG,066/GG,062/GG,064/GG,063/GG,060/GG,058/GG,057/GG,054/GG,048/GG,049/GG,047/GG,045/GG,070/GG,044/GG,068/GG,056/GG,055/GG,067/GG,061/GG,059/GG,026a/GG,026b/GG,034a/GG,033/GG,032/GG,034b/GG,042/gg	60	328.69	69.22
	Medium	071/GG,072a/GG,035a/GG,038/GG,051/GG,046/GG,069/GG,043/GG,027/gg	9	34.18	7.20
	High	None	0	0.00	0.00
Total			**76**	**474.85**	**100.00**

Gulabgarh Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	111.97
Low:	328.69
Medium:	34.18
High:	0.00
Total	**474.85**
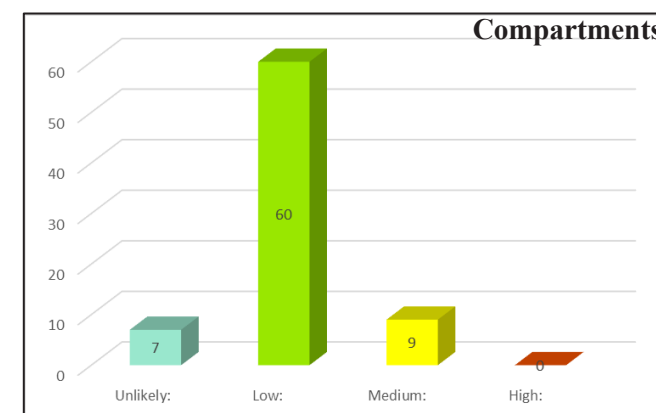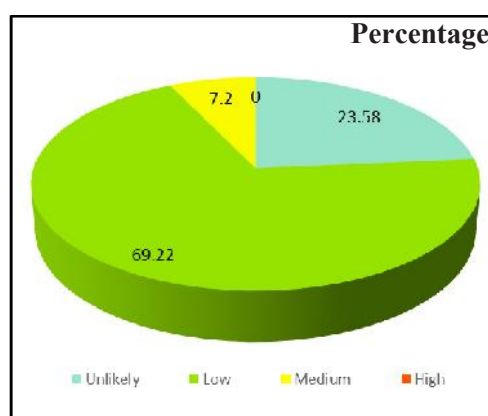
3.2.9.3 Mahore Range
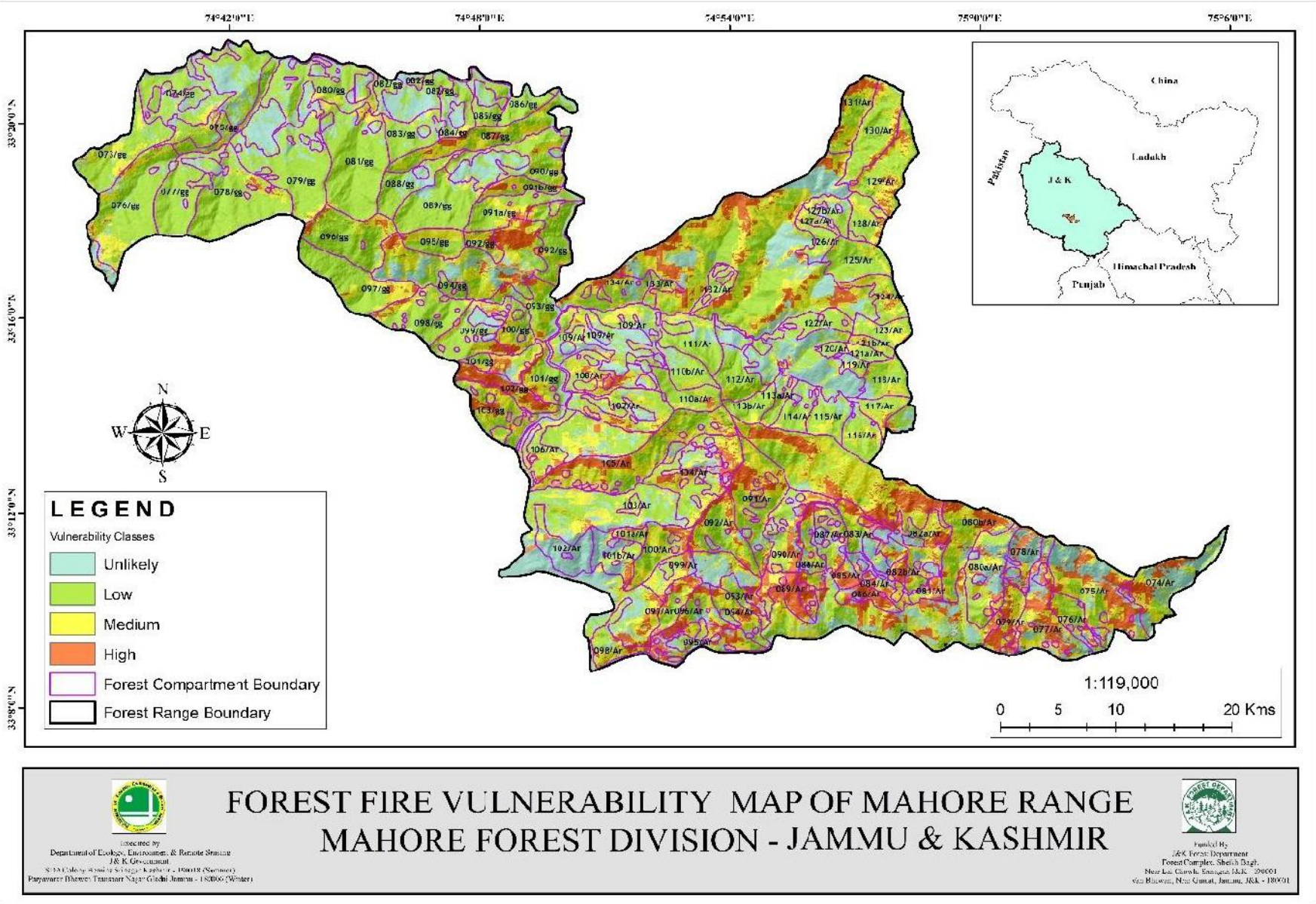
Fig. 47: Forest Fire Vulnerability Map of Mahore Range Mahore Forest Division Jammu & Kashmir

Table.41. Compartments of Mahore Range Mahore Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area (Sq Kms)	Percentage
Mahore	Unlikely	078/Ar,074/Ar,101b/Ar & 102/Ar	4	11.42	4.13
	Low	076/Ar,093/Ar,097/Ar,080a/Ar,103/Ar,092/Ar,090/Ar,104/Ar,091/Ar,106/Ar,116/Ar,117/Ar,115/Ar,114/Ar,103/GG,113b/Ar,119/Ar,118/Ar,121a/Ar,120/Ar,110b/Ar,121b/Ar,112/Ar,111/Ar,123/Ar,122/Ar,100/GG,099/GG,098/GG,124/Ar,094/GG,134/Ar,133/Ar,132/Ar,097/GG,125/Ar,095/GG,126/Ar,096/GG,127a/Ar,127b/Ar,128/Ar,077/GG,078/GG,083/GG,079/GG,081/GG,087/GG,086/GG,130/Ar,084/GG,085/GG,076/GG,073/GG,087/Ar,113a/Ar,088/GG,090/GG,089/GG,091b/GG,091a/GG,093/GG,080/GG,082/GG,107/Ar,110a/Ar,075/GG,109/Ar,092/GG,074/gg & 101/gg	71	200.48	72.53
	Medium	098/Ar,094/Ar,084/Ar,099/Ar,082a/Ar,105/Ar,129/Ar,131/Ar,088/Ar,083/Ar,080b/Ar,100/Ar,108/Ar & 101a/Ar	14	38.72	14.01
	High	086/Ar,079/Ar,089/Ar,082b/Ar,075/Ar,102/GG,085/Ar,081/Ar,095/Ar,077/Ar & 096/Ar	11	25.81	9.34
Total			**100**	**276.43**	**100.00**

Area	
Mahore Range	
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	11.42
Low:	200.48
Medium:	37.72
High:	25.81
Total	**276.43**

Percentage

Compartments
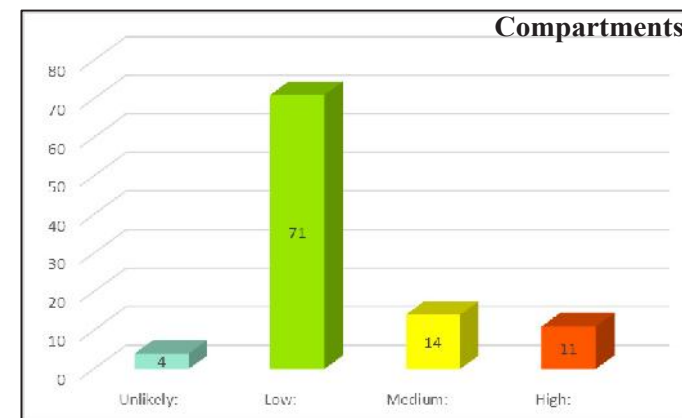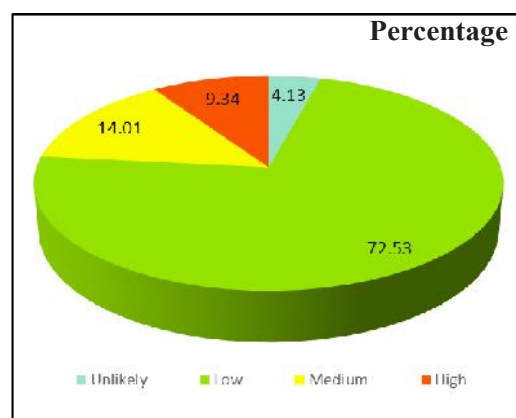
3.2.10 MARWAH FOREST DIVISION

This Division spreads between the Latitudes 33°21'27.56"N - 34°12'48.238"N and Longitudes 75°23'22.874"E - 76°17'11.58"E. The Altitude ranges between 1067 m – 6997 m above mean sea level. Marwah division comprises three territorial ranges viz; Dachan, Marwah and Udil. The total area (on GIS platform) of 335 Compartments of three territorial ranges is 2735.49 km^2.

Fig. 48: Forest Fire Vulnerability Map of Marwah Forest Division Jammu & Kashmir

Table.42. Compartments of Marwah Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Marwah Forest Division	Dachhan	Unlikely	19	942.92	76.59
		Low	0	0.00	0.00
		Medium	44	208.84	16.96
		High	22	79.43	6.45
		Total	85	**1231.19**	**100.00**
	Marwah	Unlikely	13	312.85	29.62
		Low	0	0.00	0.00
		Medium	53	613.44	58.07
		High	19	130.09	12.31
		Total	85	**1056.38**	**100.00**
	Udil	Unlikely	10	72.41	16.17
		Low	0	0.00	0.00
		Medium	70	214.07	47.79
		High	85	161.43	36.04
		Total	165	**447.92**	**100.00**

Area	
Marwah Forest Division	
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	1328.18
Low:	0.00
Medium:	1036.35
High:	370.95
Total	**2735.49**

3.2.10.1 Dachhan Range
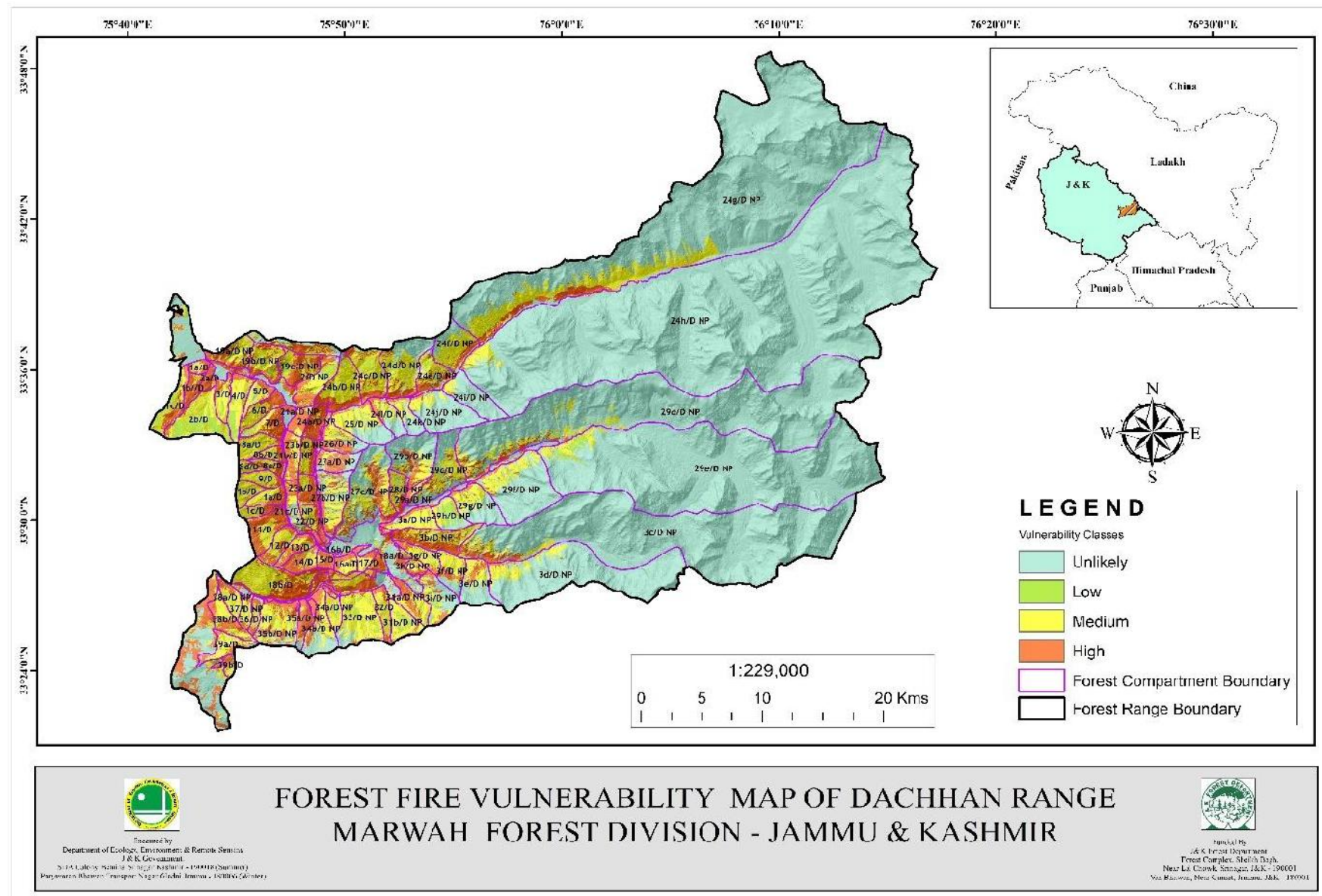
Fig. 49: Forest Fire Vulnerability Map of Dachhan Range Marwah Forest Division Jammu & Kashmir

Table.43. Compartments of Dachhan Range Marwah Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area (Sq Kms)	Percentage
Dachhan	Unlikely	3d/D NP,34b/D NP,24j/D NP,24l/D NP,24k/D NP,16b/D,27c/D NP,24h/D NP,3i/D NP,3e/D NP,29e/D NP,29g/D NP,29f/D NP,29c/D NP,29b/D NP,24g/D NP,24i/D NP,29d/D NP & 3c/D NP	19	942.92	76.59
	Low	None	0	0.00	0.00
	Medium	38b/D,31b/D NP,32/D,33/D NP,34a/D NP,35b/D NP,38a/D NP,37/D NP,36/D NP,18b/D,17/D,8a/D,9/D,1b/D,12/D,16a/D,8d/D,8c/D,8b/D,5/D,6/D,4/D,3/D,2b/D,1c/D,1a/D,19b/D NP,24b/D NP,27b/D NP,25/D NP,22/D NP,23b/D NP,24e/D NP,24d/D NP,24c/D NP,28/D NP,3g/D NP,3f/D NP,3a/D NP,29h/D NP,29a/D NP,24f/D NP,39a/D & 31a/D NP	44	208.84	16.96
	High	35a/D NP,11/D,13/D,14/D,15/D,7/D,19a/D NP,19c/D NP,27a/D NP,26/D NP,2/D NP,23a/D NP,21b/D NP,21c/D NP,21a/D NP,18a/D,3h/D NP,3b/D NP,24a/D NP,2a/D,1b//D & 39b/D	22	79.43	6.45
Total			85	1231.19	100.00

Area

Dachhan Range

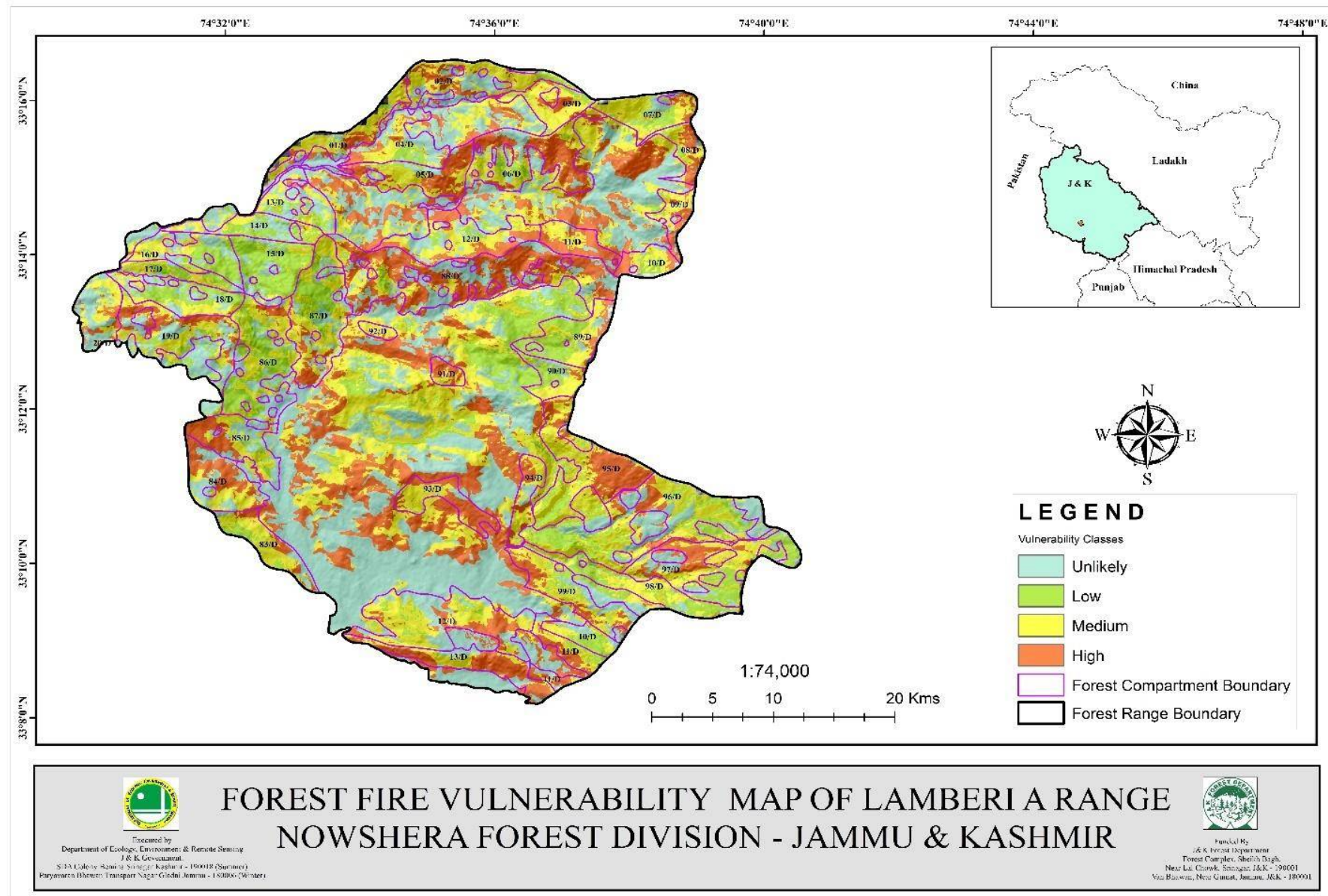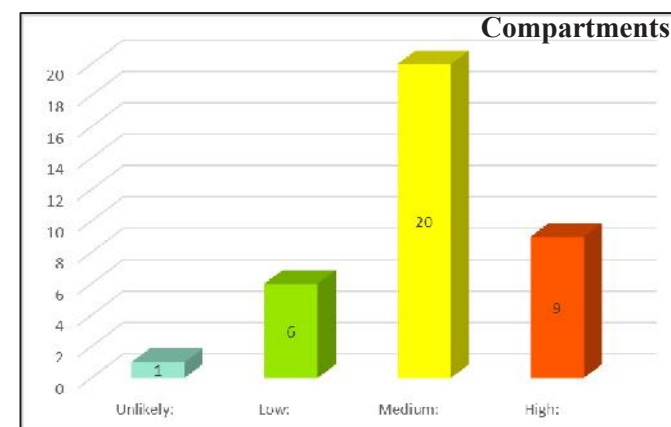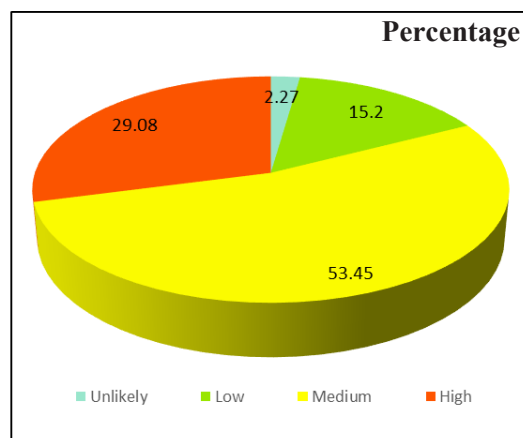| Vulnerability Classes	Area(Sq Kms)
Unlikely:	942.92
Low:	0.00
Medium:	208.84
High:	79.43
Total	**1231.19**

Percentage
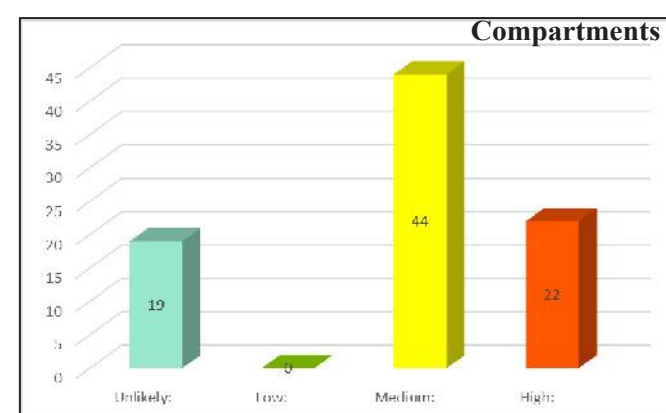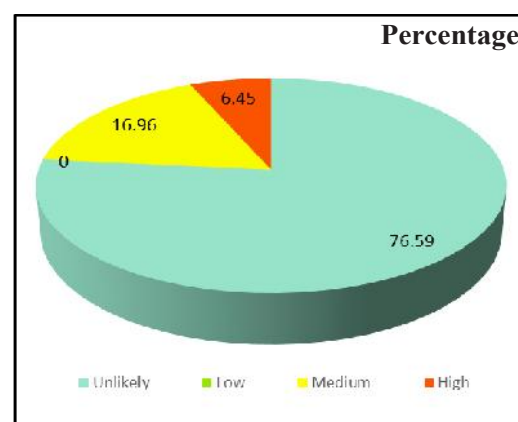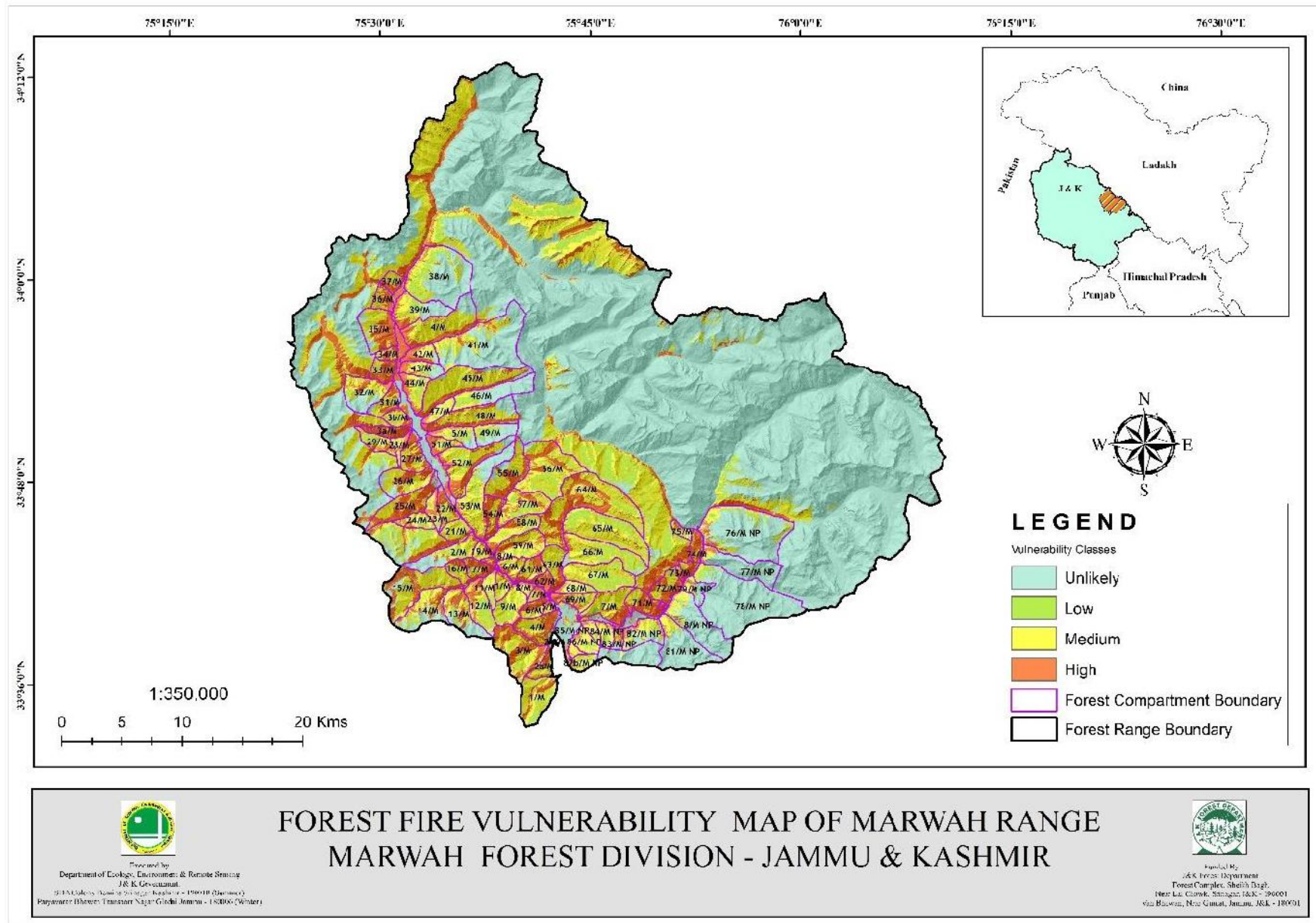
Compartments

Fig. 50: Forest Fire Vulnerability Map of Marwah Range Marwah Forest Division Jammu & Kashmir

Table.44. Compartments of Marwah Range Marwah Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area (Sq Kms)	Percentage
Marwah	Unlikely	2/M,13/M,41/M,46/M,49/M,39/M,8/M NP,76/M NP,77/M NP,78/M NP,81/M NP,38/M & 79/M NP	13	312.85	29.62
	Low	None	0	0.00	0.00
	Medium	2a/M,1/M,15/M,4/M,19/M,16/M,14/M,12/M,11/M,7/M,9/M,21/M,22/M,23/M,26/M,31/M,3b/M,28/M,45/M,47/M,48/M,5/M,51/M,52/M,53/M,43/M,44/M,55/M,56/M,57/M,58/M,59/M,6/M,61/M,63/M,64/M,87a/MNP,87b/M NP,84/M NP,85/M NP,86/M NP,82/MNP,66/M,67/M,68/M,69/M,8/M,37/M,32/M,75/M,29/M,24/M & 65/M	53	613.44	58.07
	High	2b/M,18/M,17/M,3/M,25/M,27/M,34/M,35/M,42/M,54/M,62/M,83/M NP,72/M,71/M,73/M,74/M,33/M,36/M & 3a/M	19	130.09	12.31
Total			85	1056.38	100.00

Marwah Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	312.85
Low:	0.00
Medium:	613.44
High:	130.09
Total	**1056.38**
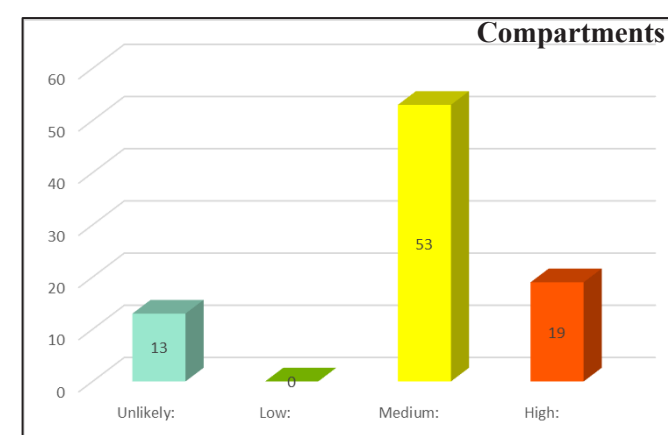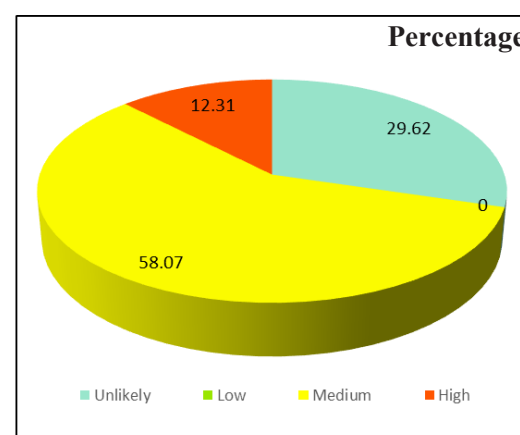
3.2.10.3 Udil Range
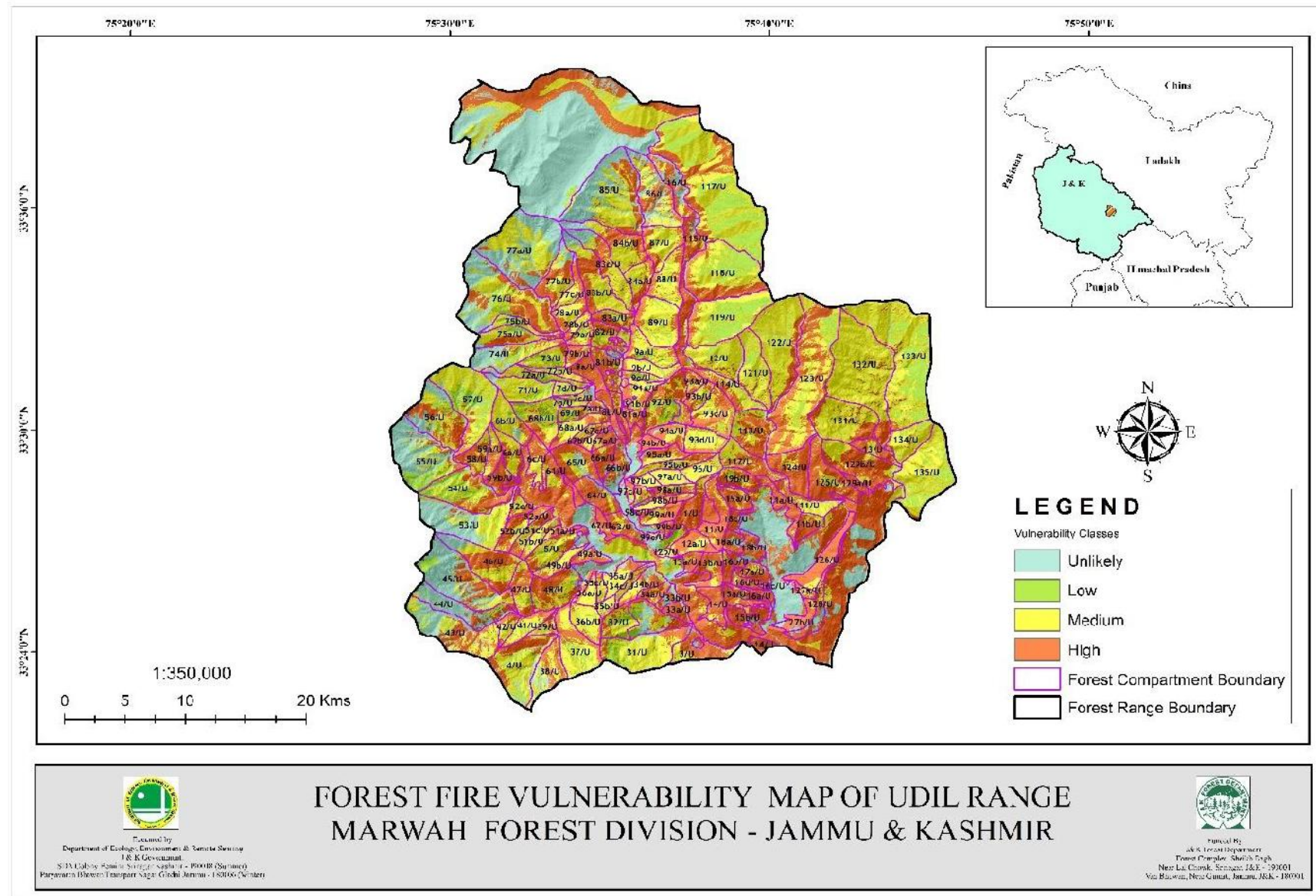
Fig. 51: Forest Fire Vulnerability Map of Udil Range Marwah Forest Division Jammu & Kashmir

FOREST FIRE RISK ZONATION & VULNERABILITY ASSESSMENT FORESTS OF JAMMU & KASHMIR

Table.45. Compartments of Udil Range Marwah Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area (Sq Kms)	Percentage
Udil	Unlikely	76/U,43/U,86/U,55/U,77a/U,45/U,53/U,44/U,74/U & 85/U	10	72.41	16.17
	Low	None	0	0.00	0.00
	Medium	31/U,41/U,42/U,4/U,39/U,38/U,133/U,135/U,134/U,132/U,131/U,118/U,119/U,12/U,122/U,121/U,89/U,87/U,88/U,111/U,97b/U,12b/U,98b/U,96/U,97a/U,95b/U,93d/U,93b/U,9a/U,9b/U,9c/U,91a/U,83b/U,6b/U,49b/U,5/U,51c/U,51b/U,37/U,36b/U,35a/U,34c/U,35c/U,36a/U,57/U,6a/U,67c/U,67b/U,7b/U,68b/U,68a/U,69/U,7c/U,73/U,71/U,72a/U,72b/U,7d/U,75a/U,75b/U,78a/U,79a/U,78b/U,77c/U,84b/U,84a/U,83c/U,32/U,35b/U & 117/U	70	214.07	47.79
	High	3/U,34b/U,13/U,123/U,124/U,116/U,115/U,126/U,128/U,127b/U,15b/U,15a/U,113/U,112/U,114/U,91b/U,92/U,127a/U,93c/U,11/U,18b/U,11b/U,11a/U,19b/U,19a/U,16d/U,16a/U,16b/U,16c/U,17a/U,17b/U,129b/U,125/U,129a/U,14/U,13b/U,13a/U,12a/U,1/U,99a/U,99b/U,98a/U,98c/U,97c/U,94a/U,95a/U,93a/U,48/U,49a/U,51a/U,52b/U,52c/U,54/U,33a/U,34a/U,46/U,47/U,56/U,58/U,59a/U,61/U,6c/U,64/U,63/U,65/U,66b/U,66a/U,67a/U,7a/U,8a/U,8b/U,81b/U,81a/U,79b/U,77b/U,82/U,83a/U,33b/U,62/U,59b/U,52a/U,94b/U,99c/U,18a/U & 18c/U	85	161.43	36.04
Total			165	447.92	100.00

Udil Range — Area

Vulnerability Classes	Area(Sq Kms)
Unlikely:	72.41
Low:	0.00
Medium:	214.07
High:	161.43
Total	**447.92**

Percentage

Compartments
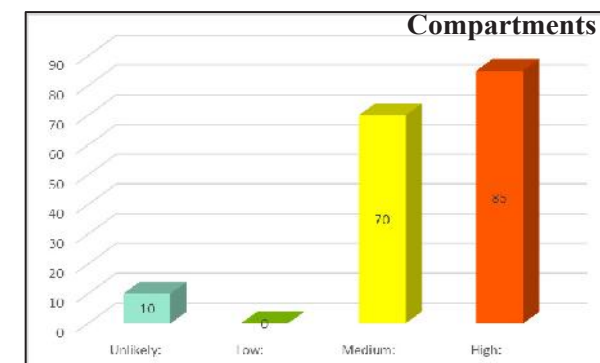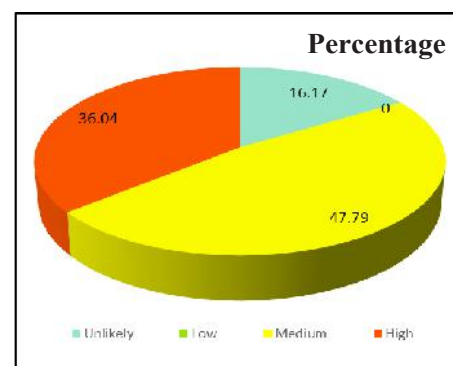
3.2.11 NOWSHERA FOREST DIVISION

Nowshera forest division is situated between 32°58'13.944"N - 33°21'59.717"N latitude and 74°0'49.842"E - 74°40'34.885"E longitude. The elevation varies from 270 m – 2058 m above mean sea level. The division comprises of four territorial ranges (Lamberi, Lamberi A, Nowshera and Sunderbani). The total area (on GIS platform) of 344 Compartments of four territorial ranges is 960.72 km^2.
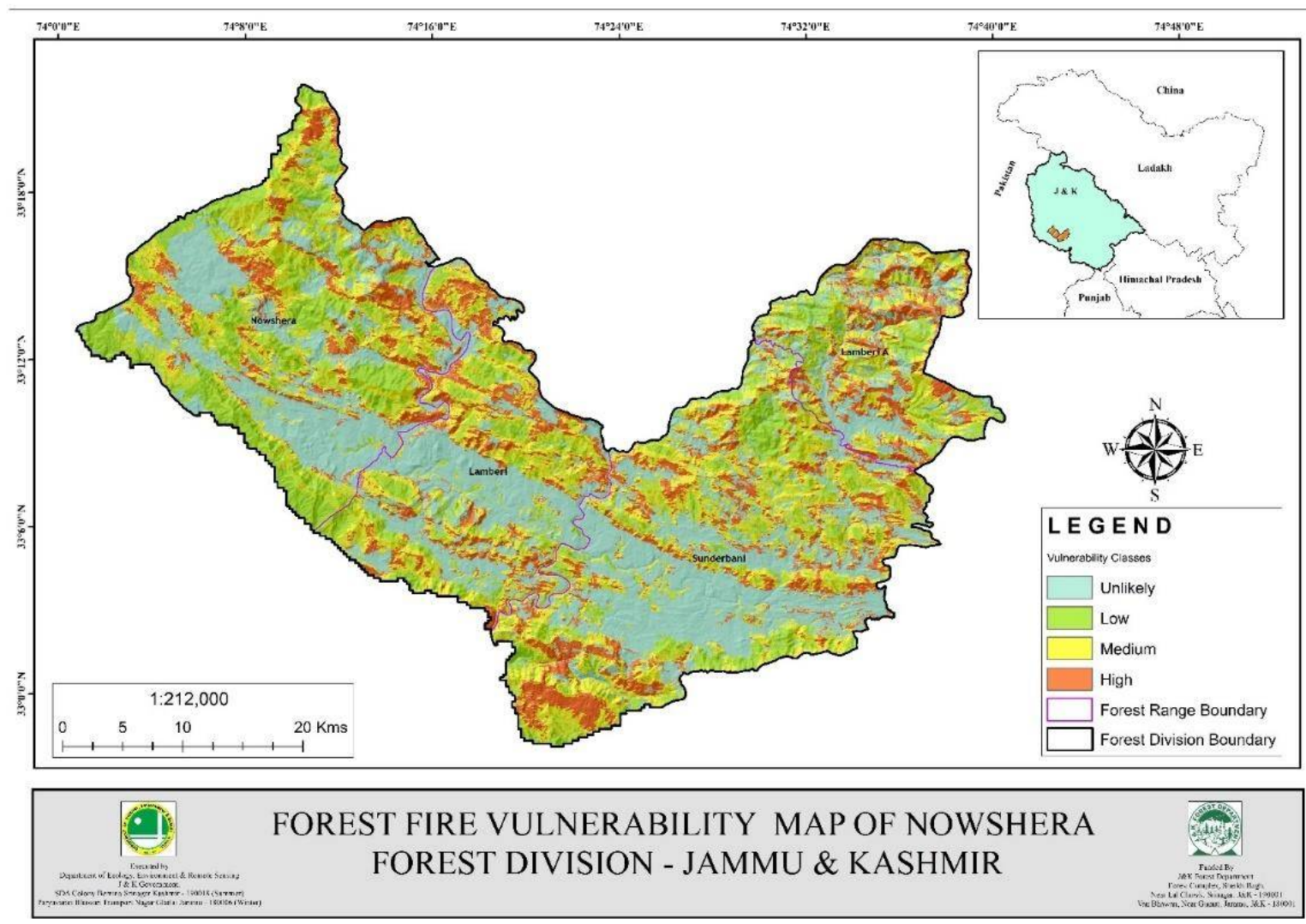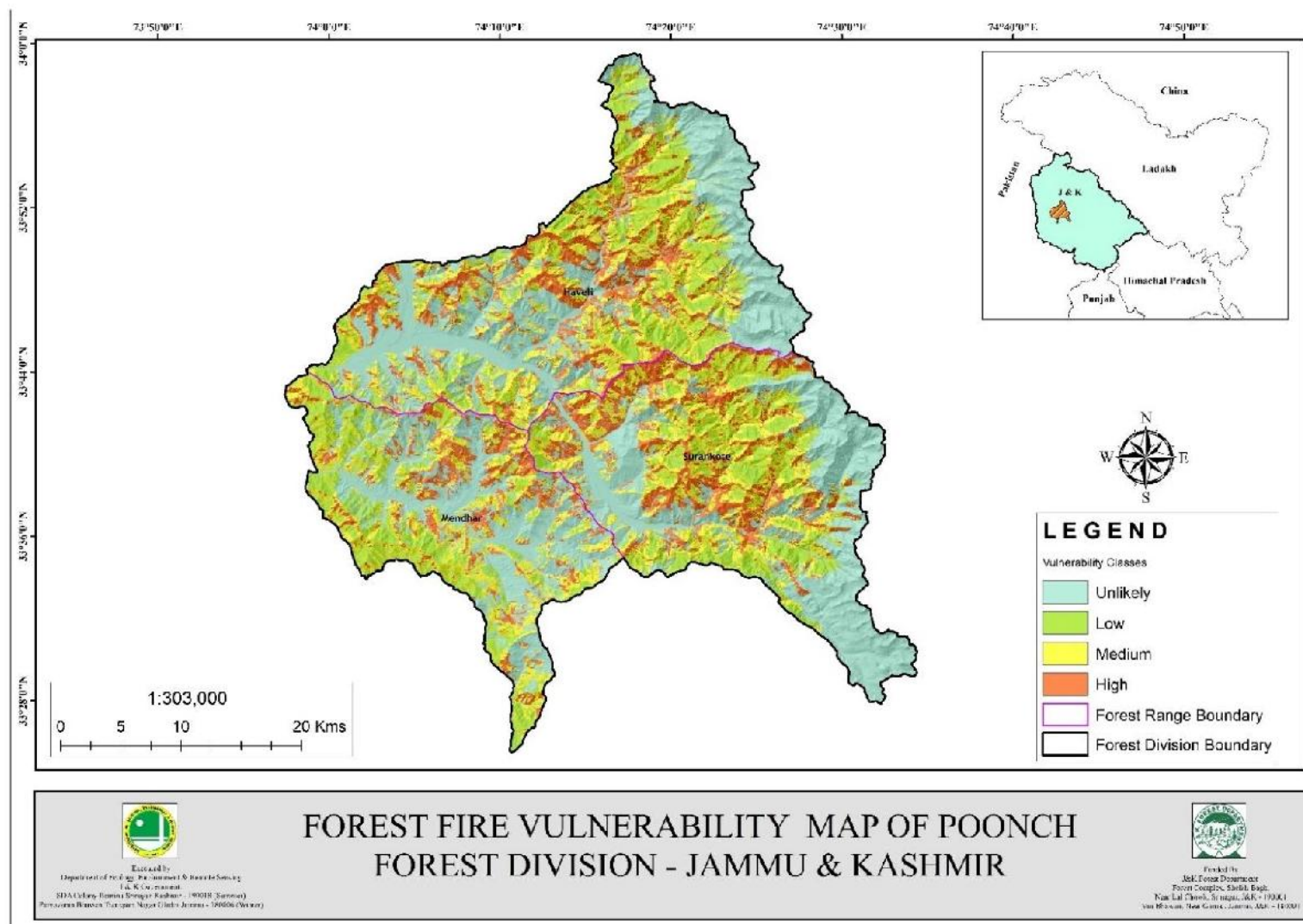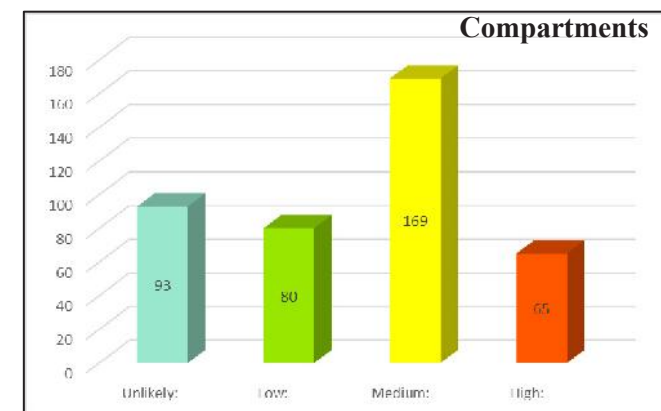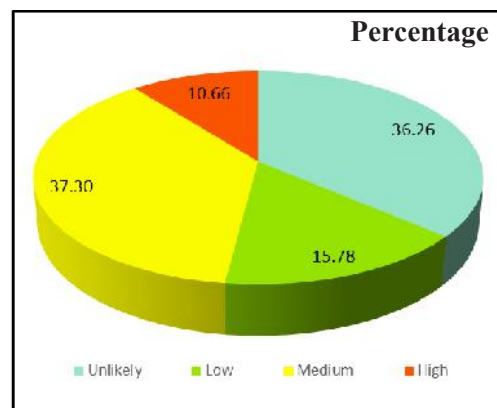

Fig. 52: Forest Fire Vulnerability Map of Nowshera Forest Division Jammu & Kashmir

Table.46. Compartments of Nowshera Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Nowshera Forest Division	Lambri	Unlikely	3	4.11	2.00
		Low	10	12.75	6.21
		Medium	45	85.78	41.79
		High	13	102.63	50.00
		Total	**71**	**205.26**	**100.00**
	Lambri A	Unlikely	1	1.74	2.27
		Low	6	11.67	15.20
		Medium	20	41.05	53.45
		High	9	22.33	29.08
		Total	**36**	**76.80**	**100.00**
	Nowshera	Unlikely	5	15.17	3.42
		Low	30	105.11	23.72
		Medium	48	101.24	22.85
		High	12	221.52	50.00
		Total	**95**	443.04	100.00
	Sunderbani	Unlikely	9	16.88	7.16
		Low	17	25.11	10.66
		Medium	90	152.85	64.87
		High	26	40.78	17.31
		Total	**142**	**235.62**	**100.00**

Nowshera Forest Division	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	154.64
Low:	380.92
Medium:	387.26
High:	37.90
Total	**960.72**
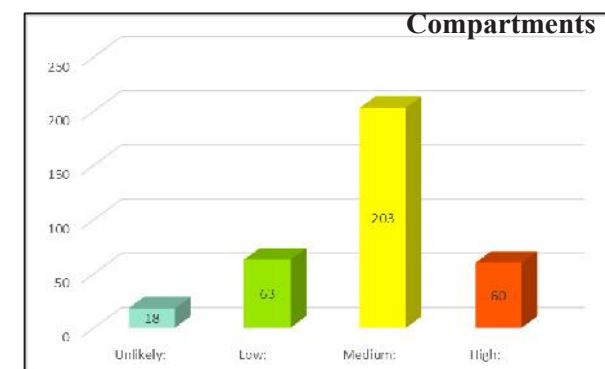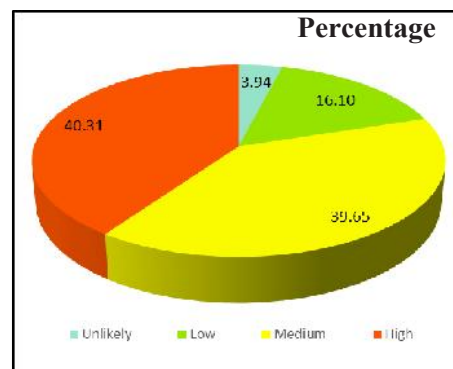
3.2.11.1 Lambri Range
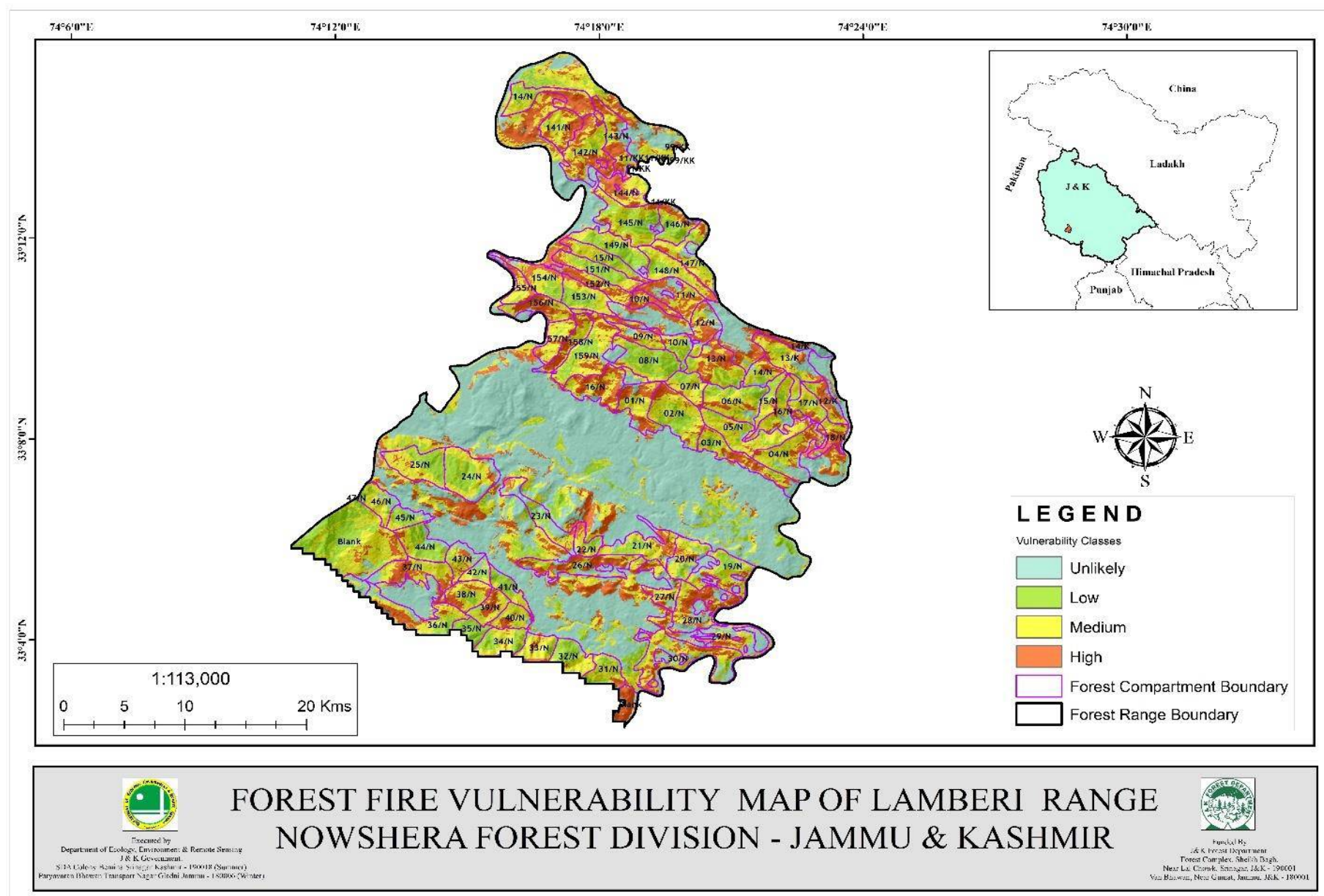
Fig. 53: Forest Fire Vulnerability Map of Lamberi Range Nowshera Forest Division Jammu & Kashmir

Table.47. Compartments of Lambri Range Nowshera Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Lamberi	Unlikely	11/KK,23/N & 29/N	3	4.11	2.00
	Low	149/N,151/N,08/N,45/N,146/N,41/N,47/N,32/N,35/N & 44/N	10	12.75	6.21
	Medium	99/KK,Blank,13/N,141/N,14/N,145/N,147/N,157/N,155/N,154/N,153/N,15/N,148/N,02/N,16/N,01/N,03/N,159/N,09/N,05/N,06/N,36/N,40/N,39/N,38/N,42/N,30/N,19/N,21/N,20/N,46/N,27/N,144/N,13/K,24/N,25/N,43/N,37/N,31/N,33/N,34/N,04/N,17/N,07/N & 22/N	45	85.78	41.79
	High	142/N,156/N,152/N,158/N,11/N,28/N,12/N,10/N,12/K,26/N,143/N,14/K & 18/N	13	102.63	50.00
Total			71	205.26	100.00

Lamberi Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	4.11
Low:	12.75
Medium:	85.78
High:	102.63
Total	**205.26**
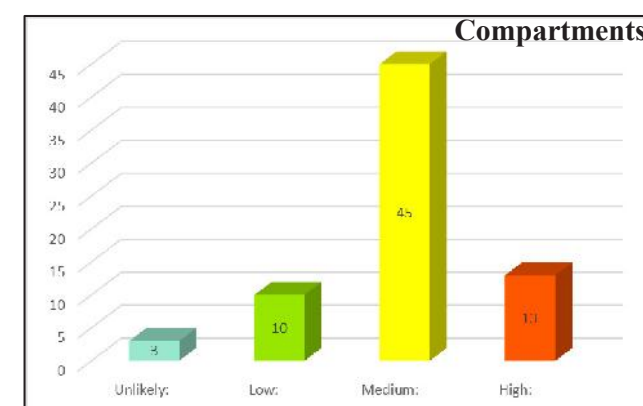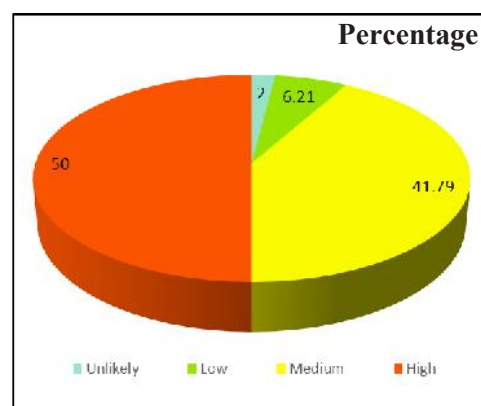
3.2.11.2 Lambri (A) Range

Fig. 54: Forest Fire Vulnerability Map of Lamberi A Range Nowshera Forest Division Jammu & Kashmir

Table.48. Compartments of Lambri A Range Nowshera Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Lamberi A	Unlikely	04/D	1	1.74	2.27
	Low	18/D,15/D,14/D,16/D,86/D,89/D	6	11.67	15.20
	Medium	02/D,01/D,10/D,98/D,99/D,95/D,97/D,96/D,83/D,87/D,90/D,07/D,19/D,03/D,08/D,09/D,12/D,17/D,92/D,94/D	20	41.05	53.45
	High	06/D,05/D,13/D,88/D,84/D,85/D,11/D,91/D,93/D	9	22.33	29.08
Total			36	76.80	100.00

Lamberi A Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	1.74
Low:	11.67
Medium:	41.05
High:	23.33
Total	**76.80**

Percentage

Compartments

3.2.11.3 Nowshera Range
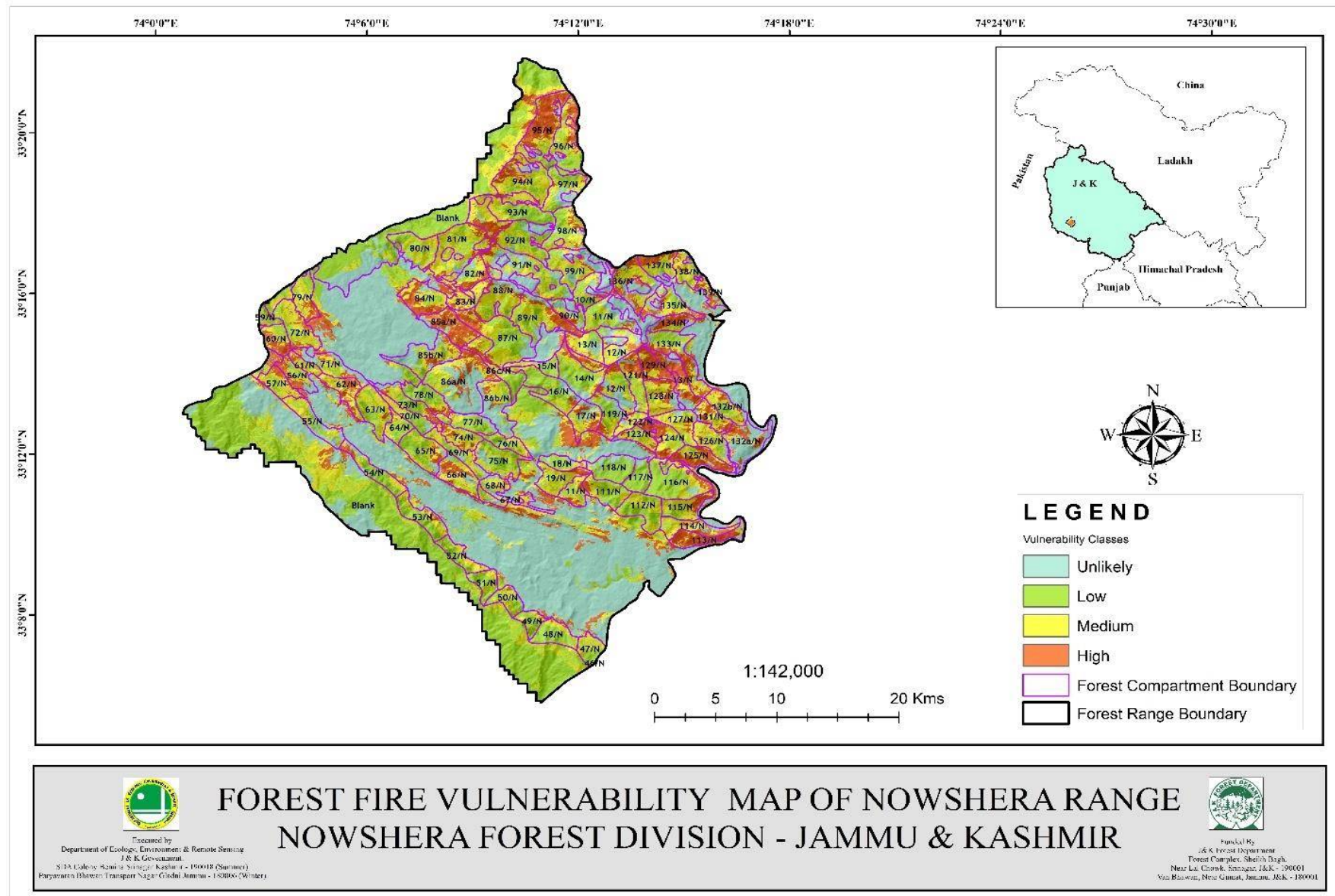
Fig. 55: Forest Fire Vulnerability Map of Nowshera Range Nowshera Forest Division Jammu & Kashmir

Table.49. Compartments of Nowshera Range Nowshera Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Nowshera	Unlikely	86a/N,132a/N,90/N,85b/N & 86b/N	5	15.17	3.42
	Low	59/N,Blank,51/N,112/N,116/N,111/N,117/N,18/N,118/N,76/N,77/N,78/N,75/N,73/N,70/N,65/N,64/N,10/N,14/N,119/N,93/N,97/N,46/N,48/N,49/N,52/N,53/N,54/N,15/N & 16/N	30	105.11	23.72
	Medium	94/N,114/N,115/N,19/N,11/N,74/N,68/N,69/N,67/N,66/N,63/N,71/N,62/N,61/N,96/N,98/N,99/N,136/N,12/N,138/N,126/N,128/N,122/N,121/N,87/N,89/N,91/N,92/N,82/N,88/N,132b/N,135/N,127/N,131/N,133/N,79/N,86c/N,81/N,80/N,83/N,47/N,50/N,55/N,57/N,72/N,137/N,17/N,123/N	48	101.24	22.85
	High	56/N,60/N,13/N,129/N,124/N,85a/N,84/N,95/N,139/N,113/N,125/N & 134/N	12	221.52	50.00
Total			95	443.04	100.00

Nowshera Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	15.17
Low:	105.11
Medium:	101.24
High:	221.52
Total	**443.04**

Percentage
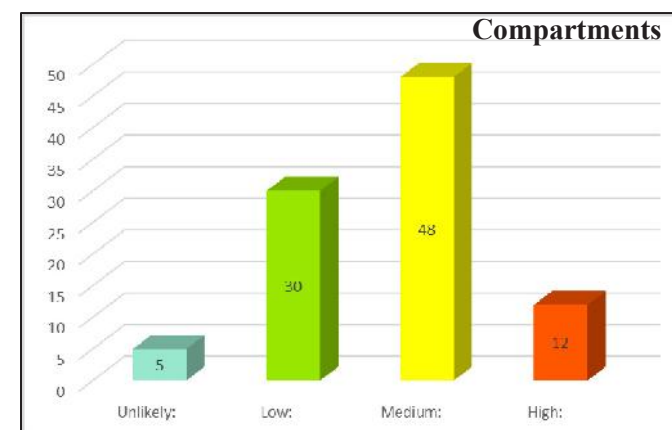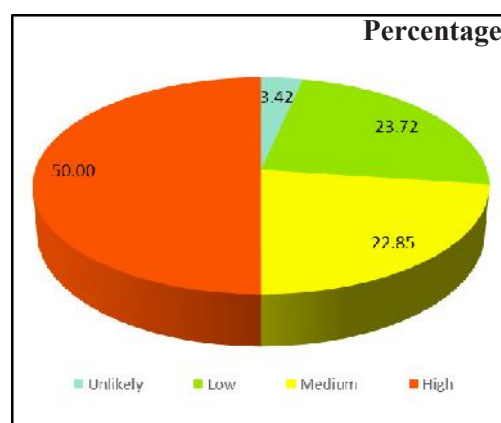
Compartments

3.2.11.4 Sunderbani Range
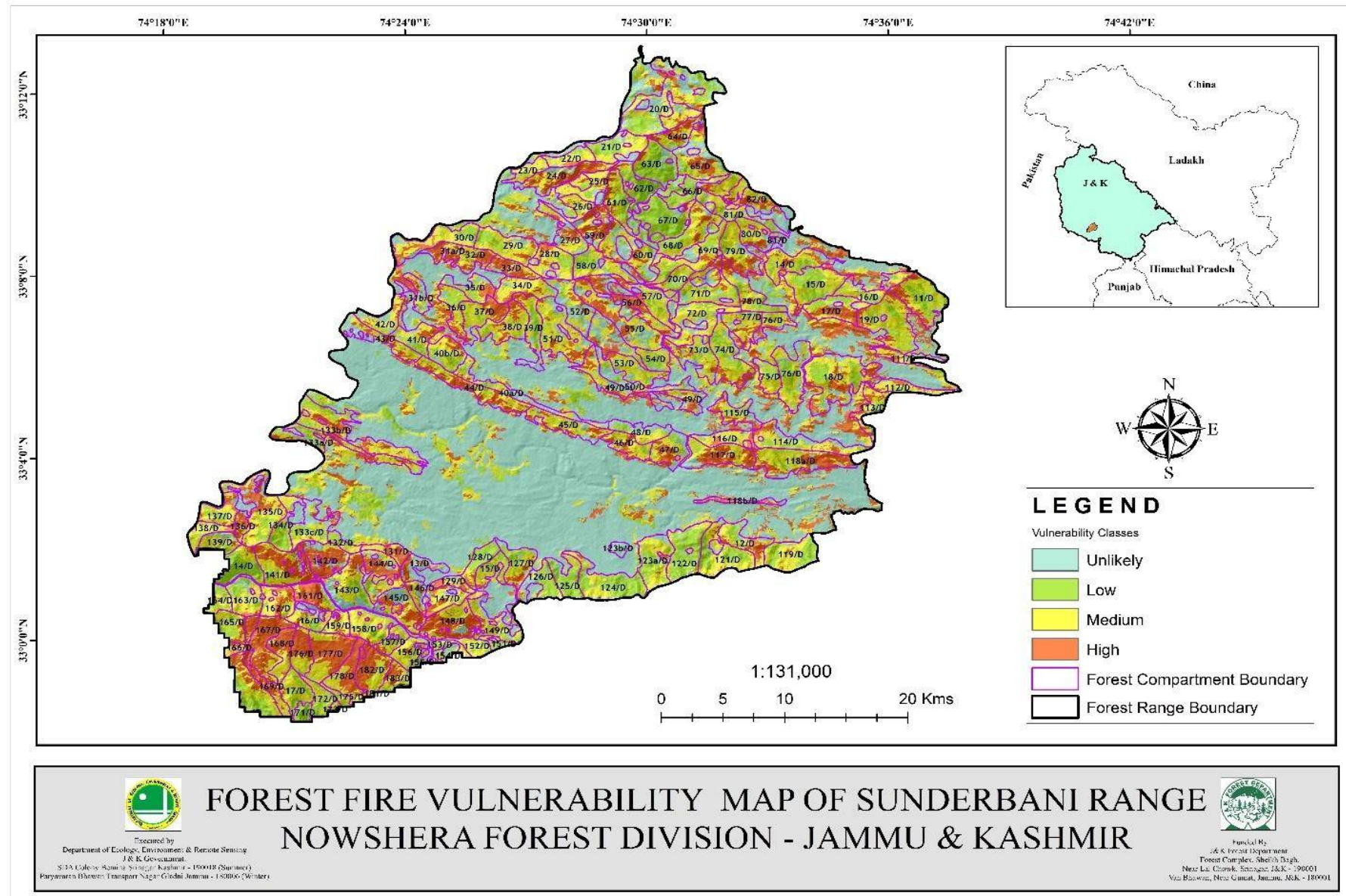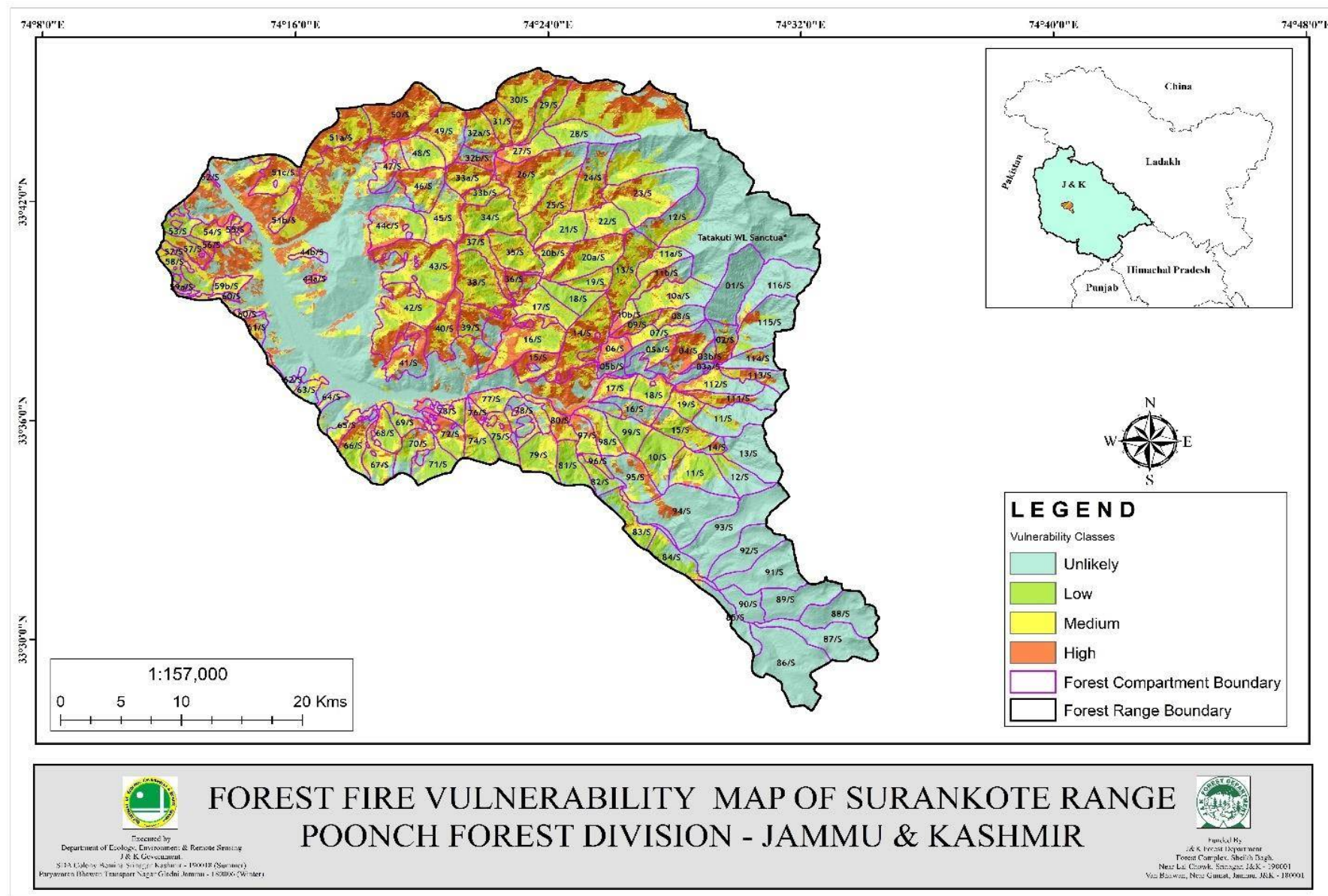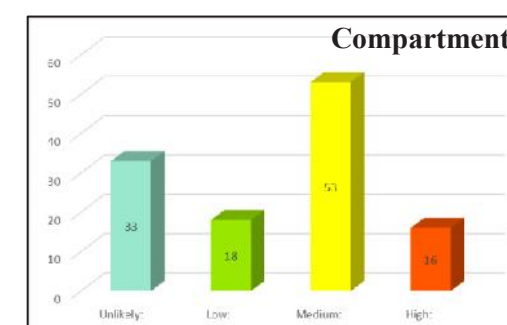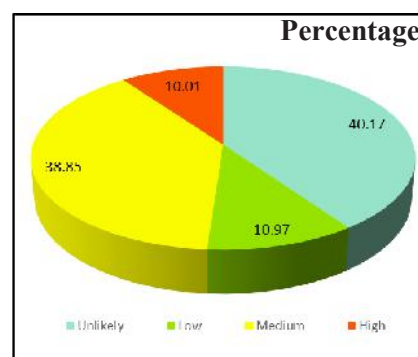

Fig. 56: Forest Fire Vulnerability Map of Sunderbani Range Nowshera Forest Division Jammu & Kashmir

Table.50. Compartments of Sunderbani Range Nowshera Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Sunderbani	Unlikely	13/D,20/D,52/D,48/D,123b/D,31b/D,40a/D,49/D & 50/D	9	16.88	7.16
	Low	155/D,14/D,128/D,171/D,172/D,63/D,62/D,67/D,66/D,125/D,124/D,122/D,154/D,39/D,126/D,134/D & 151/D	17	25.11	10.66
	Medium	119/D,163/D,165/D,113/D,114/D,183/D,156/D,157/D,158/D,159/D,162/D,164/D,143/D,146/D,145/D,139/D,132/D,133c/D,135/D,137/D,138/D,153/D,116/D,147/D,149/D,16/D,15/D,11/D,17/D,65/D,80/D,74/D,68/D,69/D,70/D,71/D,79/D,72/D,73/D,77/D,23/D,22/D,21/D,30/D,29/D,26/D,25/D,61/D,60/D,58/D,78/D,82/D,55/D,57/D,51/D,47/D,45/D,43/D,44/D,41/D,37/D,38/D,36/D,32/D,28/D,123a/D,121/D,12/D,152/D,181/D,175/D,173/D,127/D,112/D,27/D,34/D,35/D,40b/D,42/D,46/D,75/D,133b/D,133a/D,54/D,53/D,76/D,81/D,111/D,18/D & 19/D	90	152.85	64.87
	High	118a/D,117/D,182/D,161/D,144/D,141/D,142/D,131/D,167/D,166/D,168/D,148/D,129/D,64/D,59/D,56/D,33/D,176/D,177/D,178/D,169/D,24/D,118b/D,31a/D,115/D & 136/D	26	40.78	17.31
Total			142	235.62	100.00

Sunderbani Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	16.88
Low:	25.11
Medium:	152.85
High:	40.78
Total	**235.62**

Percentage

Compartments
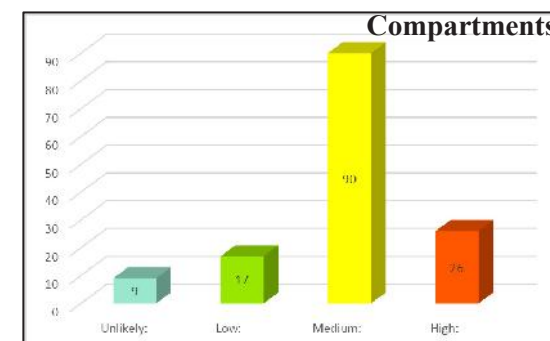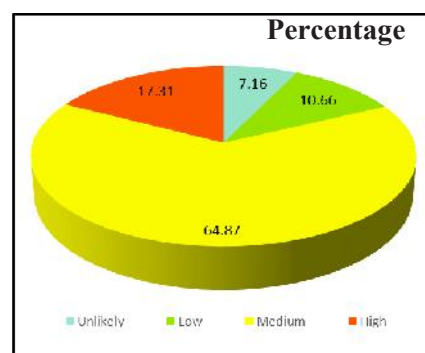
3.2.12 POONCH FOREST DIVISION.

The poonch forest division lies between 33°25'44.705"N - 33°59'52.444"N and 73°57'38.461"E - 74°34'39.438"E. The elevation varies from 693 m - 4679 m above mean sea level. The division comprises of three territorial ranges (Haveli, Mendhar and Surankote). The total area (on GIS platform) of 407 Compartments of three territorial ranges is 918.61 km^2.
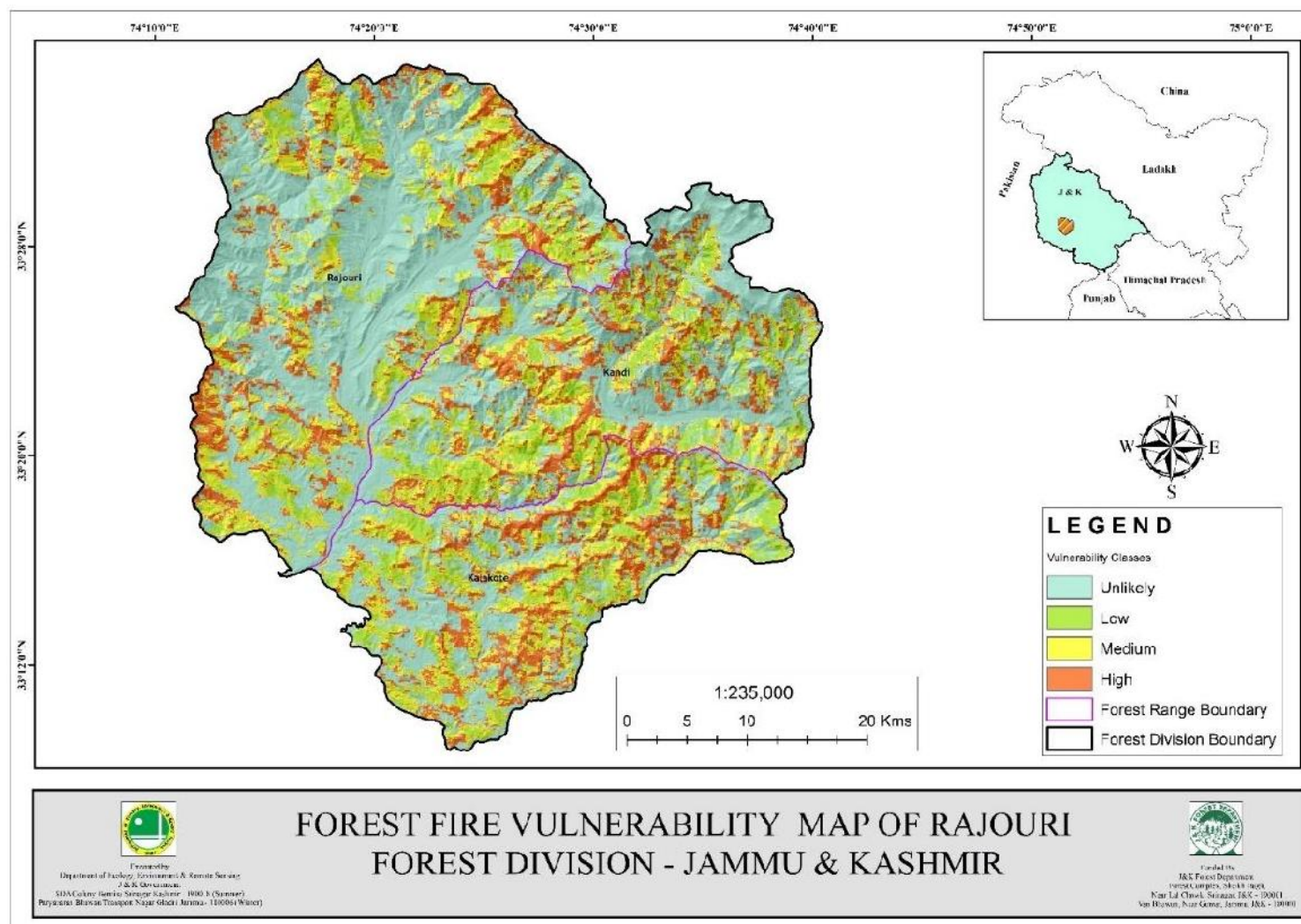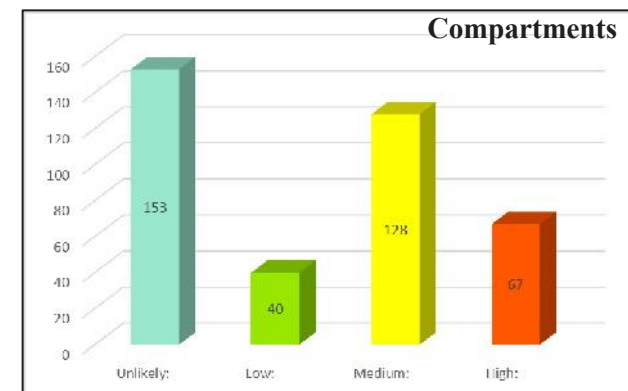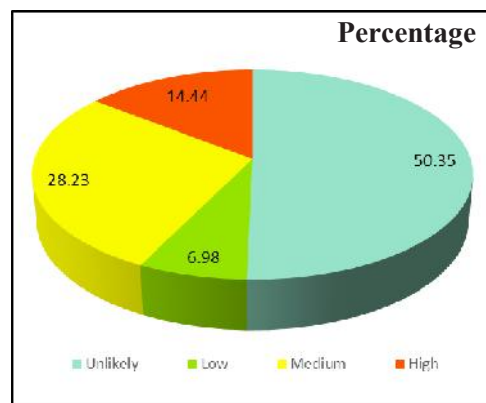

Fig. 57: Forest Fire Vulnerability Map of Poonch Forest Division Jammu & Kashmir

Table.51. Compartments of Poonch Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Poonch Forest Division	Haveli	Unlikely	38	137.82	36.96
		Low	38	74.34	19.94
		Medium	78	128.40	34.44
		High	26	32.32	8.67
		Total	**180**	**372.88**	**100.00**
	Mendhar	Unlikely	22	17.64	17.02
		Low	24	22.16	21.37
		Medium	38	42.54	41.04
		High	23	21.33	20.56
		Total	**107**	**103.67**	**100.00**
	Surankote	Unlikely	33	177.59	40.17
		Low	18	48.48	10.97
		Medium	53	171.74	38.85
		High	16	44.25	10.01
		Total	**120**	**442.06**	**100.00**

Nowshera Forest Division	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	333.05
Low:	144.98
Medium:	342.68
High:	97.90
Total	**918.61**

Percentage

Compartments
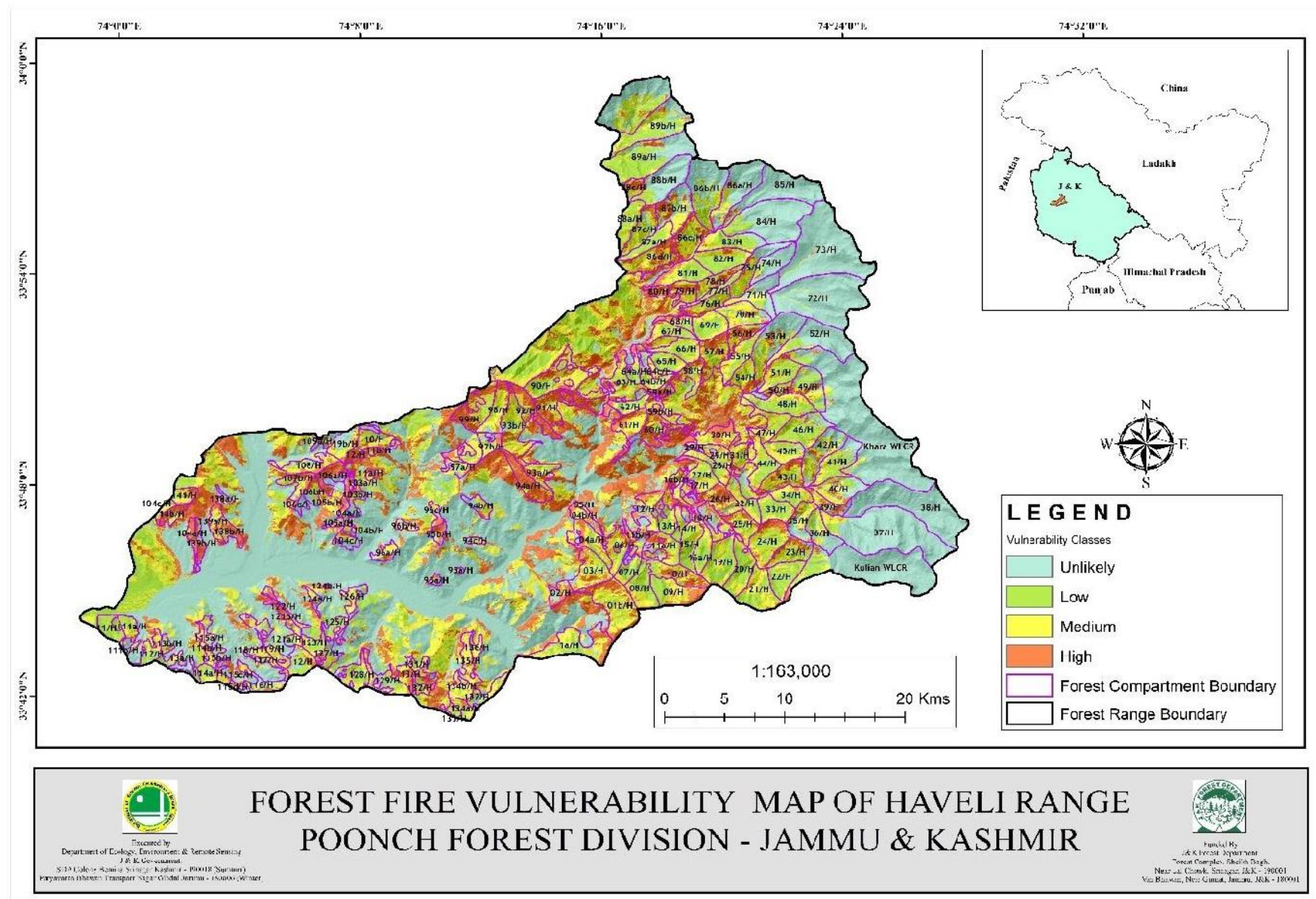
3.2.12.1 Haveli Range

Fig. 58: Forest Fire Vulnerability Map of Haveli Range Poonch Forest Division Jammu & Kashmir

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Table.52. Compartments of Haveli Range Poonch Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area (Sq Kms)	Percentage
Haveli	Unlikely	53/H,88b/H,86b/H,74/H,19b/H,124a/H,116/H,111b/H,127/H,117/H,35/H,37/H,52/H,75/H,KharaWLCR,38/H,49/H,42/H,94b/H,73/H,86a/H,95a/H,115d/H,115b/H,104c/H,103b/H,106c/H,104b/H,104a/h,105a/H,109a/H,72/H,71/H,84/H,85/H,36/H,Kulian WLCR & 87b/H	38	137.82	36.96
	Low	89b/H,89a/H,128/H,11/H,114a/H,113a/H,123/H,33/H,48/H,44/H,46/H,51/H,69/H,68/H,67/H,66/H,65/H,77/H,81/H,82/H,83/H,07/H,15/H,13/H,19/H,20/H,22/H,28/H,125/H,08/H,16a/H,62/H,64a/H,133/H,121a/H,14/H,87a/H & 88a/H	38	74.34	19.94
	Medium	63/H,87c/H,86c/H,94c/H,96a/H,96b/H,97a/H,134a/H,126/H,11a/H,113b/H,112/H,119/H,12/H,122/H,111a/H,129/H,131/H,136/H,135/H,137/H,134b/H,59b/H,32/H,31/H,34/H,43/H,47/H,45/H,54/H,55/H,57/H,70/H,64b/H,30/H,58/H,76/H,78/H,86d/H,04b/H,06/H,04a/H,01b/H,09/H,10/H,21/H,23/H,24/H,25/H,27/H,03/H,05/H,17/H,18/H,16b/H,40/H,41/H,50/H,79/H,90/H,98/H,93b/H,97b/H,132/H,118/H,115a/H,115c/H,114b/H,139a/H,138a/H,141/H,103a/H,106bH,108/H,1a/H,29/H,93a/H & 64c/H	78	128.40	34.44
	High	121b/H,124b/H,56/H,61/H,60/H,80/H,02/H,26/H,92/H,39/H,59a/H,91/H,99/H,94a/H,95b/H,96c/H,11b/H,138b/H,139b/H,14b/H,104a/H,106a/H,105b/H,107a/H,107b/H & 88c/H	26	32.32	8.67
Total			**180**	**372.88**	**100.00**

Haveli Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	137.82
Low:	74.34
Medium:	128.40
High:	32.32
Total	**372.88**

Percentage
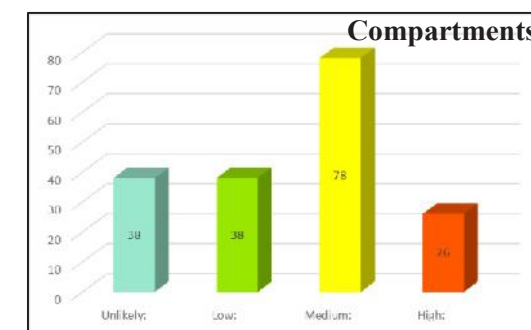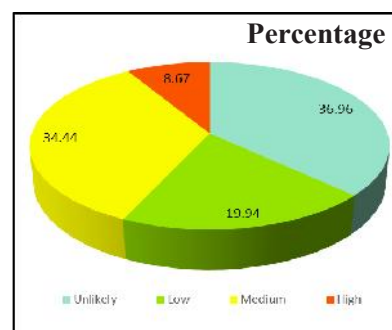
Compartments

3.2.12.2 Mendhar Range
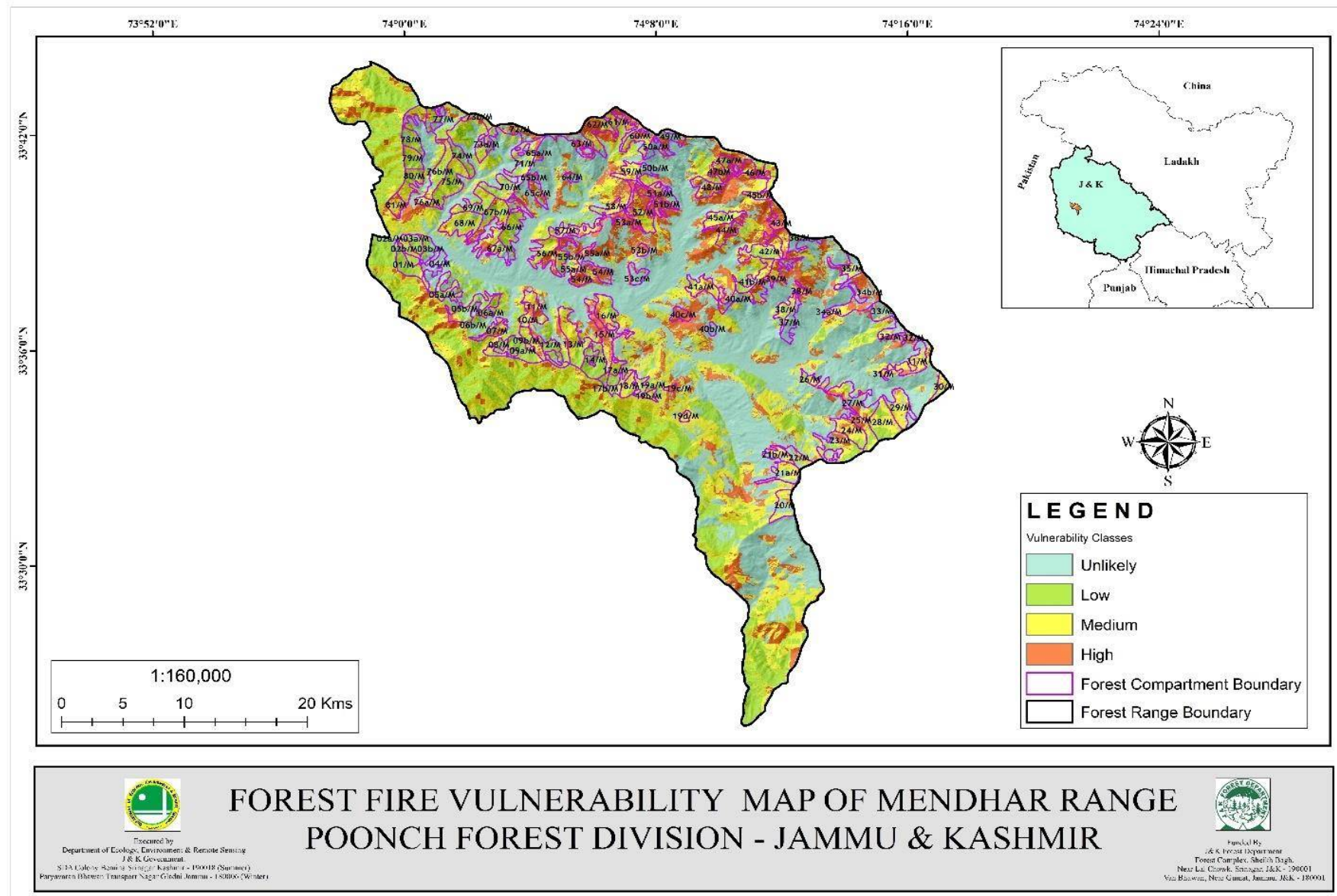
Fig. 59: Forest Fire Vulnerability Map of Mendhar Range Poonch Forest Division Jammu & Kashmir

Table.53. Compartments of Mendhar Range Poonch Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Mendhar	Unlikely	51a/M,33/M,03b/M,37/M,40a/M,36/M,27/M,22/M,77/M,71/M ,63/M,50a/M,04/M,50b/M,35/M,34a/M,40b/M,49/M,53c/M,64 /M,65b/M & 65a/M	22	17.64	17.02
	Low	26/M,09a/M,12/M,14/M,17a/M,08/M,06a/M,02a/M,03a/M,69/ M,70/M,66/M,74/M,76b/M,19a/M,05a/M,05b/M,06b/M,17b/M ,73a/M,78/M,79/M,01/M & 73b/M	24	22.16	21.37
	Medium	45a/M,31/M,29/M,23/M,21a/M,19d/M,16/M,07/M,41a/M,41b/ M,42/M,61/M,58/M,67a/M,57/M,20/M,13/M,18/M,28/M,68/M ,67b/M,75/M,80/M,19b/M,11/M,10/M,60/M,59/M,02b/M,09b/ M,21b/M,24/M,30/M,45b/M,38/M,76a/M,56/M & 81/M	38	42.54	41.04
	High	46/M,19c/M,53b/M,25/M,15/M,62/M,43/M,39/M,48/M,53a/M ,51b/M,52/M,32/M,54/M,34b/M,40c/M,44/M,47a/M,47bM,72/ M,65c/M,55a/M & 55b/M	23	21.33	20.56
Total			**107**	**103.67**	**100.00**

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Mendhar Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	17.64
Low:	22.16
Medium:	42.54
High:	21.33
Total	**103.67**

Percentage
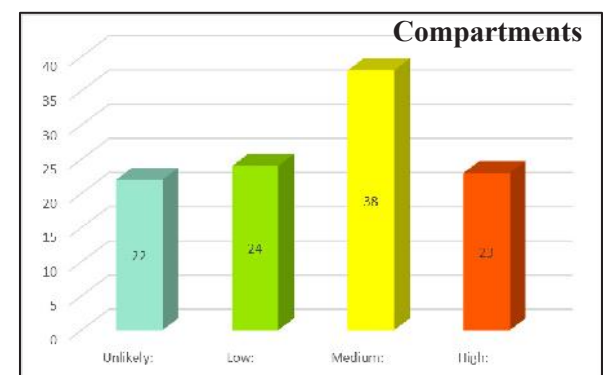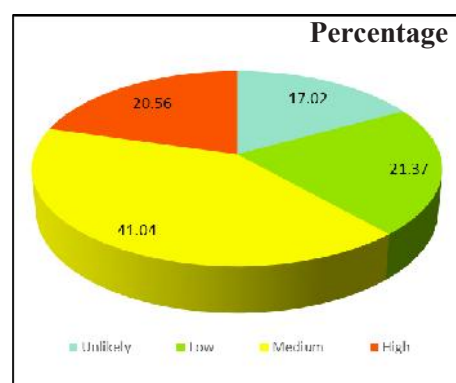
Compartments

3.2.12.3 Surankote Range

Fig. 60: Forest Fire Vulnerability Map of Surankote Range Poonch Forest Division Jammu & Kashmir

Table.54. Compartments of Surankote Range Poonch Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Surankote	Unlikely	63/S, Tatakuti WL Sanctua*,13/S,12/S,03b/S,02/S,01/S,08/S,11b/S,116/S,114/S,113/S,111/S,112/S,11/S,88/S,89/S,95/S,94/S,93/S,92/S,91/S,90/S,87/S,86/S,85/S,62/S,60/S,115/S,64/S,05b/S,05a/S & 03a/S	33	177.59	40.17
	Low	48/S,28/S,22/S,18/S,81/S,10/S,99/S,84/S,82/S,79/S,83/S,75/S,71/S,69/S,68/S,53/S,21/S & 59a/S	18	48.48	10.97
	Medium	98/S,67/S,43/S,44b/S,77/S,54/S,51b/S,51c/S,49/S,46/S,44c/S,38/S,35/S,34/S,33a/S,31/S,30/S,42/S,45/S,47/S,25/S,24/S,27/S,23/S,16/S,19/S,20a/S,15/S,14/S,07/S,10b/S,10a/S,20b/S,17/S,96/S,97/S,80/S,78/S,74/S,73/S,70/S,65/S,66/S,57/S,55/S,36/S,37/S,32a/S,11a/S,29/S,33b/S,58/S & 59b/S	53	171.74	38.85
	High	61/S,51a/S,50/S,26/S,40/S,39/S,04/S,06/S,09/S,76/S,72/S,56/S,32b/S,41/S,44a/S & 52/S	16	44.25	10.01
Total			120	442.06	100.00

Surankote Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	177.59
Low:	48.48
Medium:	171.74
High:	44.25
Total	**442.06**

3.2.13 RAJOURI FOREST DIVISION

Rajouri forest Division lies between 33°8'46.505"N - 33°35'13.408"N latitude and 74°10'57.73"E - 74°40'28.275"E longitude. The altitude varies from the minimum of 496 m – 4590 m above mean sea level. Rajouri Forest Division comprises of three territorial ranges viz., Kalakote, Kandi and Rajouri. The total area (on GIS platform) of 388 Compartments of three territorial ranges is 865.08 km^2.
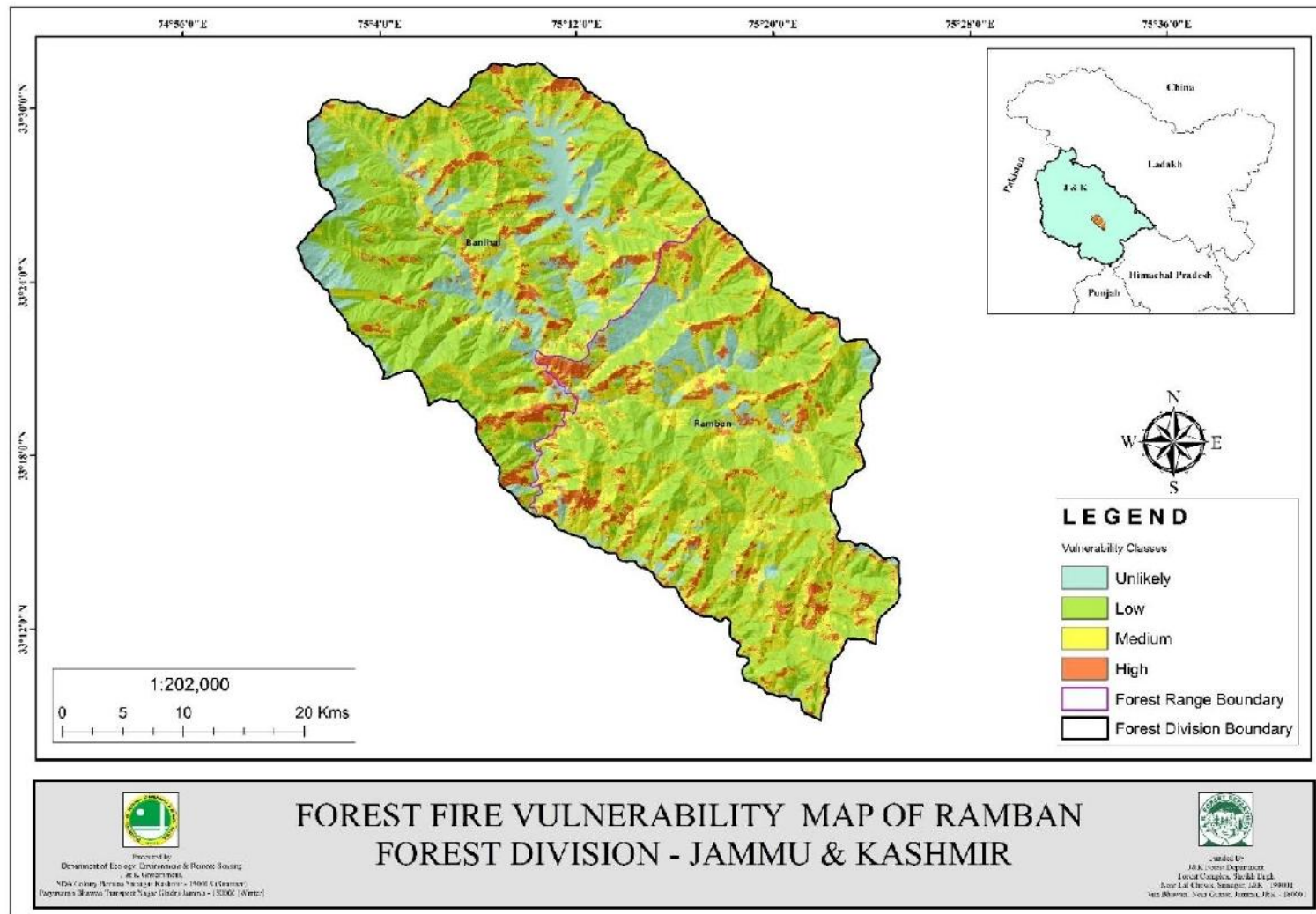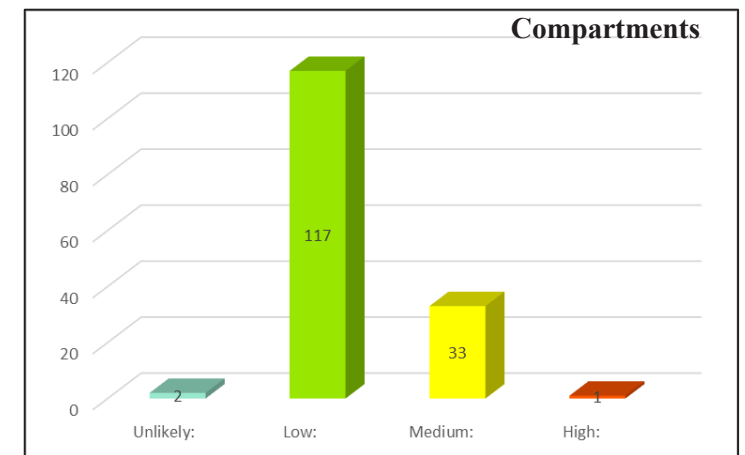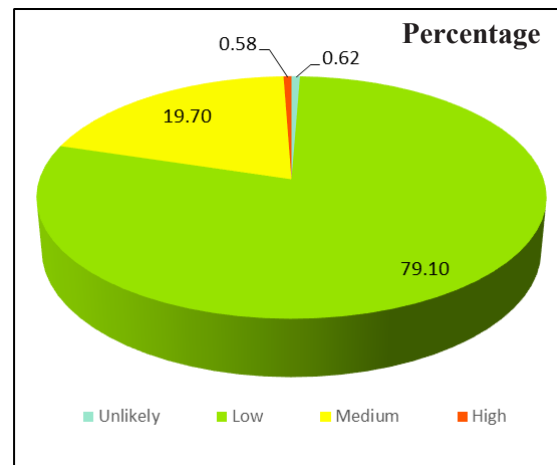

Fig. 61: Forest Fire Vulnerability Map of Rajouri Forest Division Jammu & Kashmir

Table.55. Compartments of Rajouri Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Rajouri Forest Division	Kalakote	Unlikely	32	89.79	31.76
		Low	12	21.31	7.54
		Medium	52	113.51	40.15
		High	31	58.08	20.55
		Total	**127**	**282.69**	**100.00**
	Kandi	Unlikely	59	154.95	60.57
		Low	15	21.12	8.26
		Medium	33	55.87	21.84
		High	17	23.90	9.34
		Total	**124**	**255.85**	**100.00**
	Rajouri	Unlikely	62	190.84	58.44
		Low	13	17.95	5.50
		Medium	43	74.85	22.92
		High	19	42.90	13.14
		Total	**137**	**326.54**	**100.00**

Rajouri Forest Division	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	435.58
Low:	60.38
Medium:	244.23
High:	124.88
Total	**865.08**

Percentage

Compartments

3.2.13.1 Kalakote Range
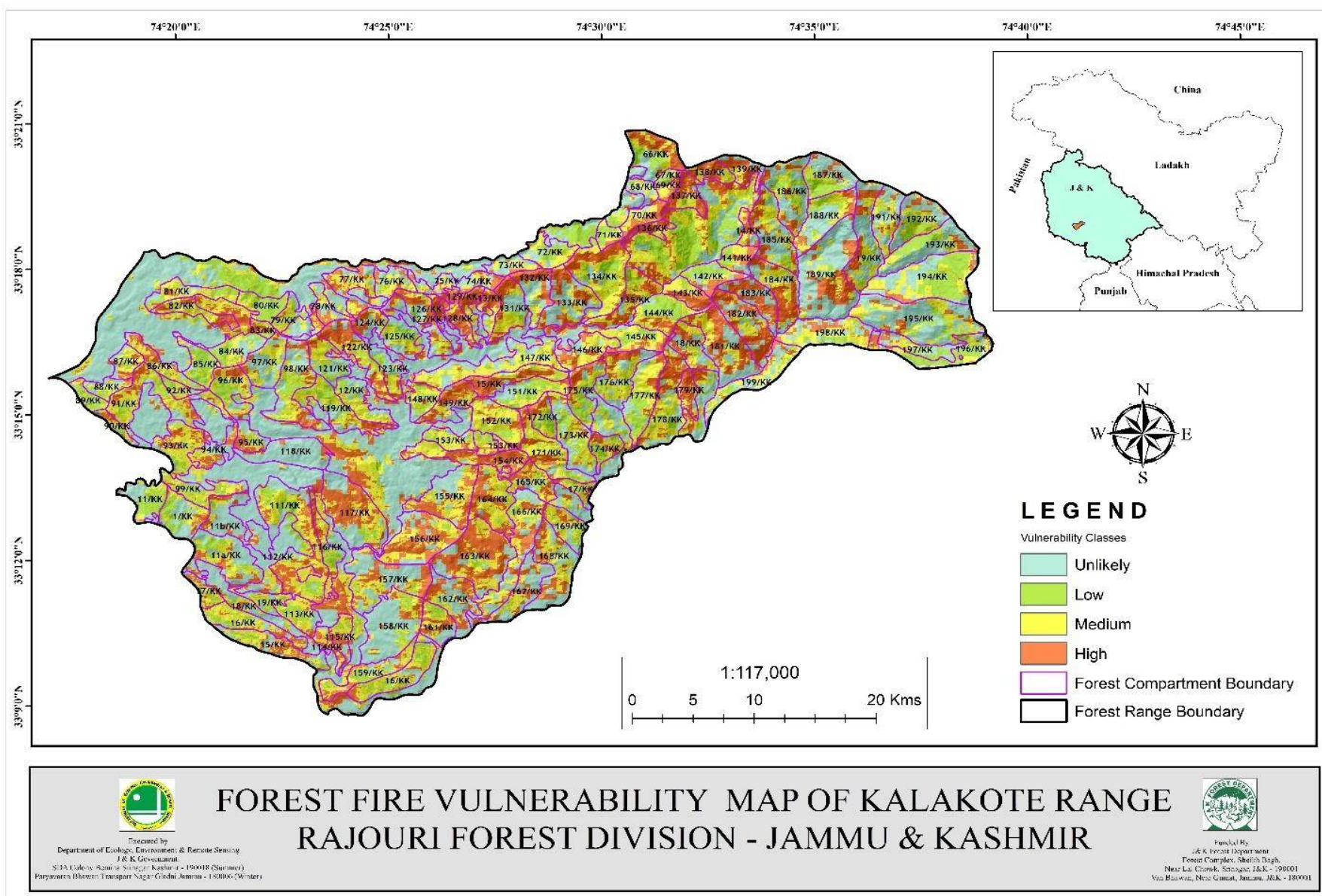
Fig. 62: Forest Fire Vulnerability Map of Kalakote Range Rajouri Forest Division Jammu & Kashmir

Table.56. Compartments of Kalakote Range Rajouri Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area (Sq Kms)	Percentage
Kalakote	Unlikely	192/KK,195/KK,197/KK,193/KK,191/KK,19/KK,189/KK,188/KK,186/KK,187/KK,185/KK,112/KK,73/KK,74/KK,157/KK,167/KK,168/KK,18/KK,133/KK,125/KK,123/KK,98/KK,97/KK,95/KK,94/KK,11a/KK,68/KK,78/KK,162/KK,118/KK,158/KK & 11b/KK	32	89.79	31.76
	Low	194/KK,196/KK,80/KK,144/KK,142/KK,1/KK,71/KK,85/KK,89/KK,84/KK,67/KK & 11/KK	12	21.31	7.54
	Medium	198/KK,199/KK,134/KK,111/KK,16/KK,17/KK,178/KK,81/KK,82/KK,115/KK,113/KK,72/KK,75/KK,76/KK,77/KK,79/KK,148/KK,146/KK,151/KK,175/KK,174/KK,173/KK,152/KK,171/KK,165/KK,155/KK,166/KK,164/KK,169/KK,177/KK,176/KK,135/KK,145/KK,147/KK,131/KK,12/KK,86/KK,88/KK,91/KK,93/KK,116/KK,121/KK,90/KK,87/KK,96/KK,92/KK,119/KK,172/KK,153/KK,159/KK,99/KK & 161/KK	52	113.51	40.15
	High	138/KK,15/KK,114/KK,149/KK,154/KK,156/KK,163/KK,179/KK,181/KK,182/KK,183/KK,143/KK,141/KK,132/KK,13/KK,129/KK,128/KK,127/KK,126/KK,122/KK,66/KK,70/KK,139/KK,124/KK,117/KK,83/KK,184/KK,136/KK,14/KK,137/KK & 69/KK	31	58.08	20.55
Total			**127**	**282.69**	**100.00**

Kalakote Range — **Area**

Vulnerability Classes	Area(Sq Kms)
Unlikely:	89.79
Low:	21.31
Medium:	113.51
High:	58.08
Total	**282.69**

Percentage
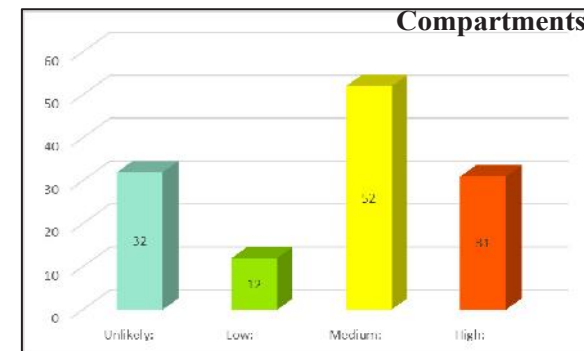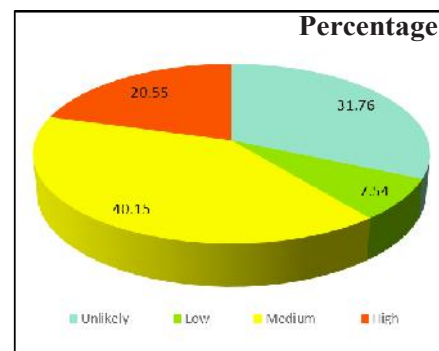
Compartments
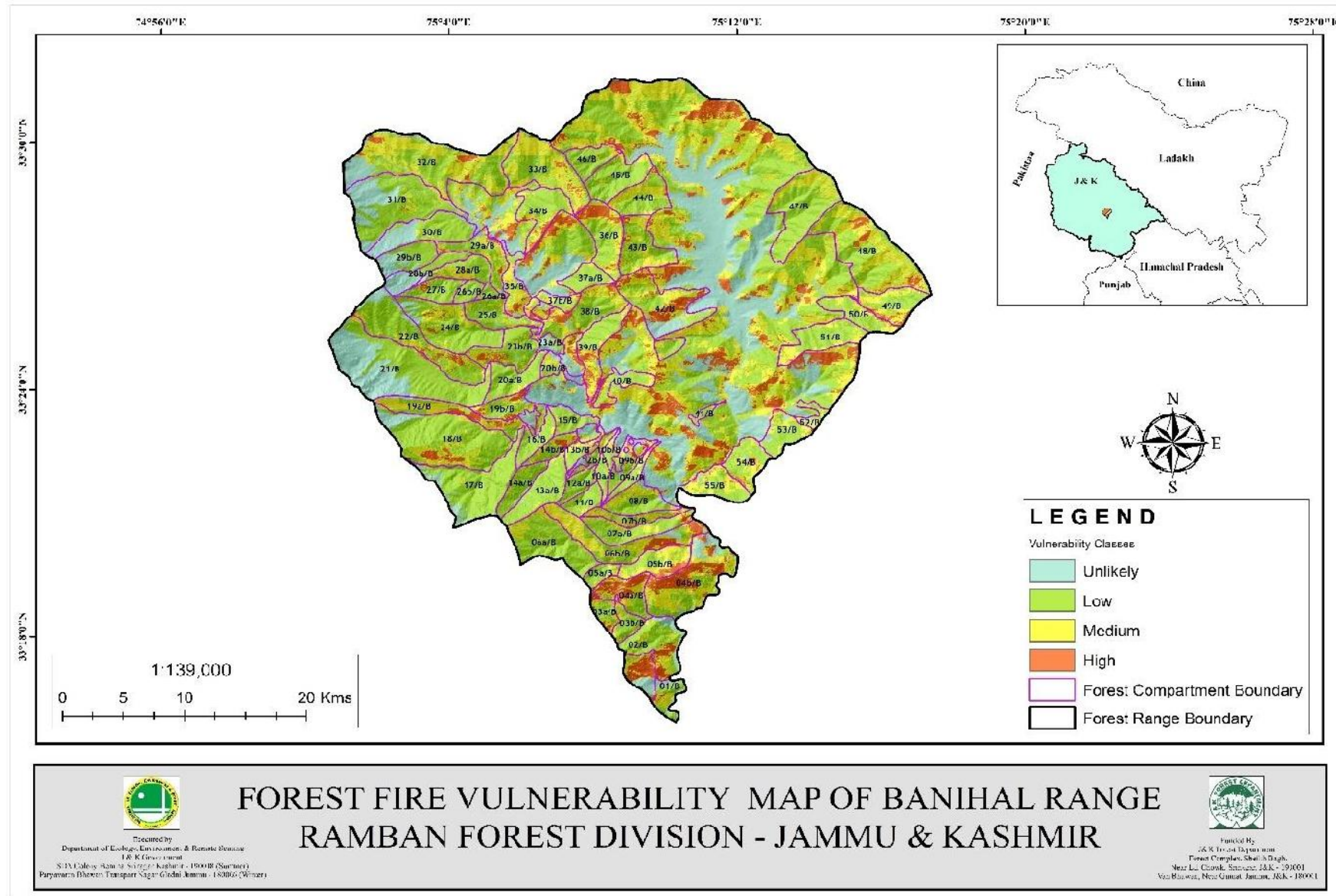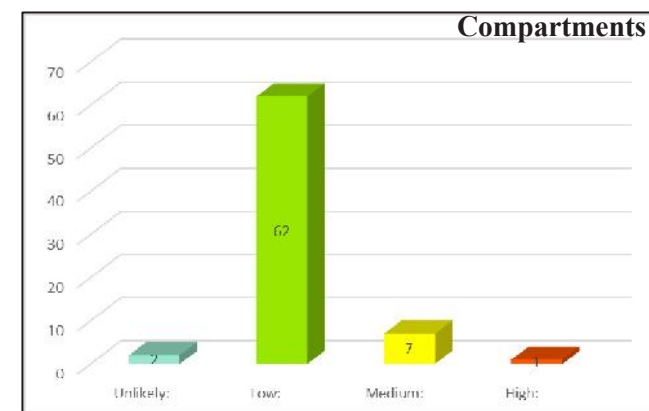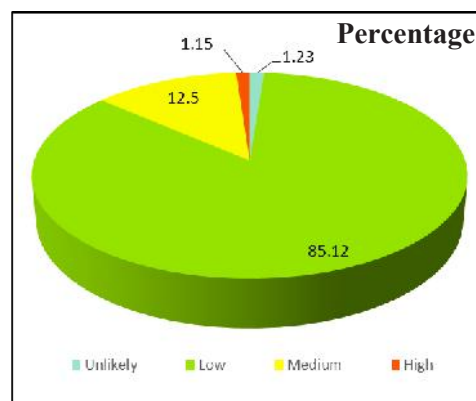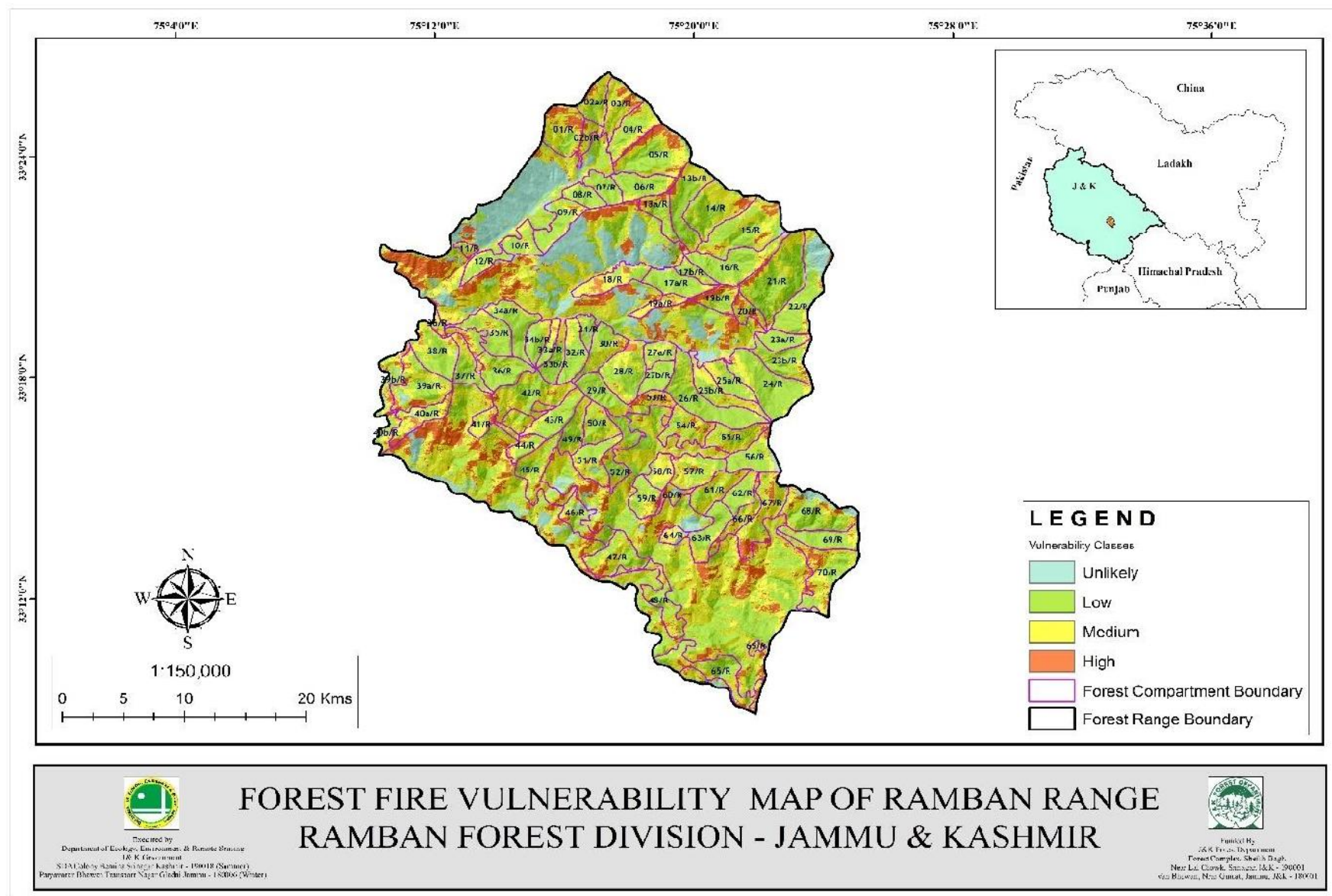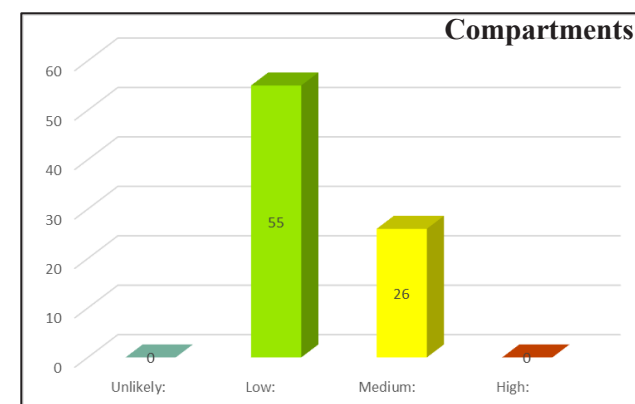
3.2.13.2 Kandi Range
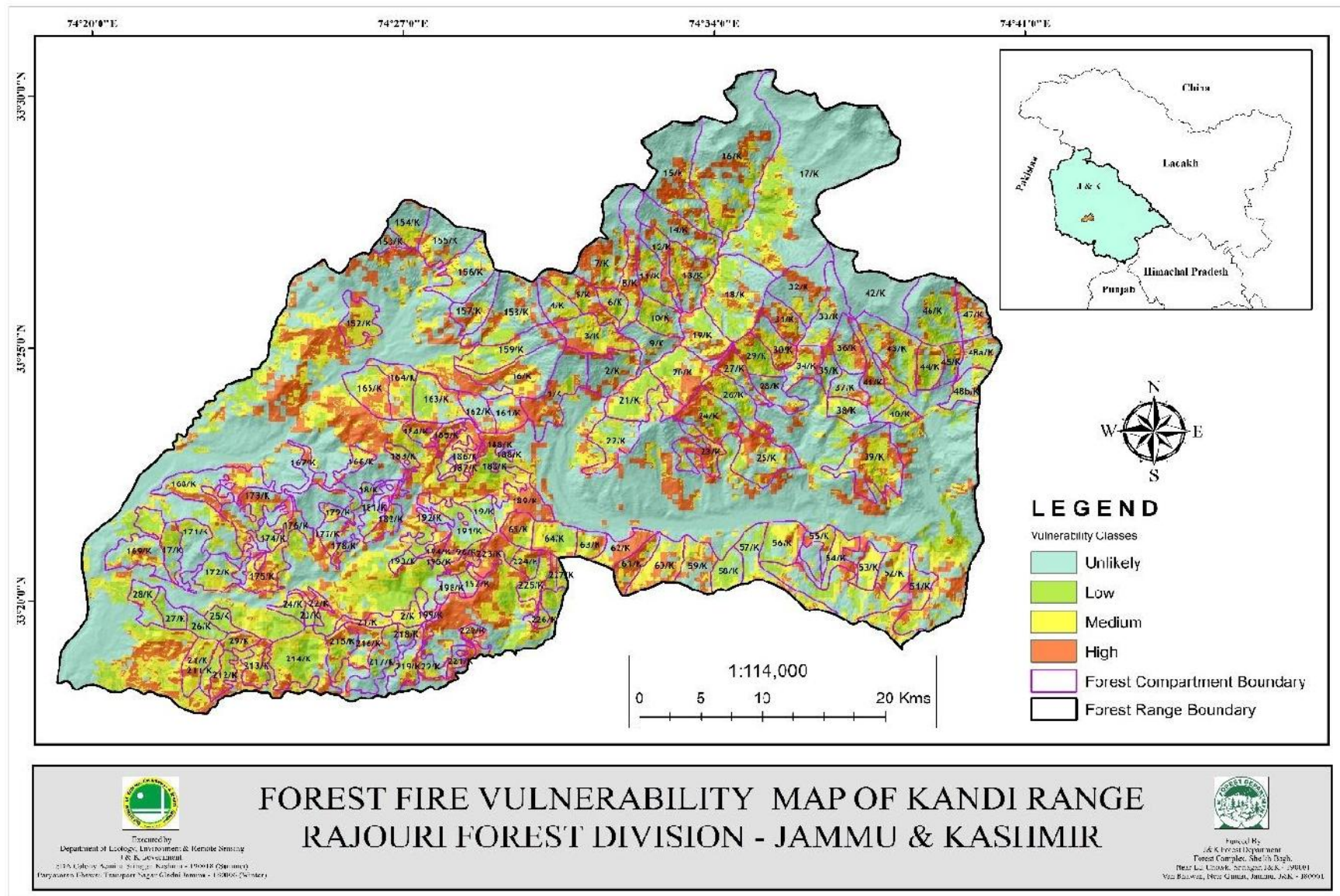
Fig. 63: Forest Fire Vulnerability Map of Kandi Range Rajouri Forest Division Jammu & Kashmir

Table.57. Compartments of Kandi Range Rajouri Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Kandi	Unlikely	7/K,153/K,154/K,155/K,156/K,157/K,16/K,158/K,159/K,1/K,2/K, 15/K,14/K,13/K,11/K,4/K,9/K,8/K,48a/K,17/K,25/K,28/K,34/K,33/K,35/K,38/K,36/K,37/K,41/K,42/K,43/K,45/K,46/K,47/K,48b/K,55/K,57/K,59/K,179/K,182/K,169/K,172/K,198/K,219/K,217/K,171/K,168/K,173/K,178/K,177/K,167/K,166/K,18/K,181/K,12/K,32/K,161/K,162/K & 176/K	59	154.95	60.57
	Low	19/K,26/K,27/K,58/K,214/K,174/K,227/K,225/K,193/K,192/K,195/K,191/K,197/K,199/K &188/K	15	21.12	8.26
	Medium	10/K,3/K,6/K,39/K,22/K,21/K,23/K,29/K,30/K,40/K,44/K,51/K,52/K,54/K,56/K,60/K,63/K,215/K,64/K,212/K,213/K,186/K,226/K,224/K,211/K,53/K,218/K,183/K,187/K,152/K,165/K,164/K &163/K	33	55.87	21.84
	High	5/K,20/K,24/K,31/K,61/K,62/K,65/K,223/K,189/K,196/K,222/K,221/K,216/K,175/K,185/K,184/K & 194/K	17	23.90	9.34
	Total		124	255.85	100.00

Kandi Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	154.95
Low:	21.12
Medium:	55.87
High:	23.90
Total	**255.85**
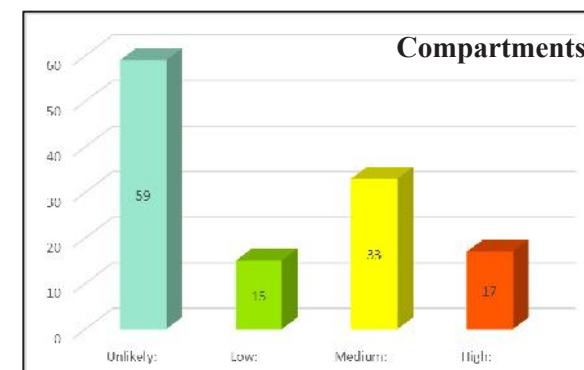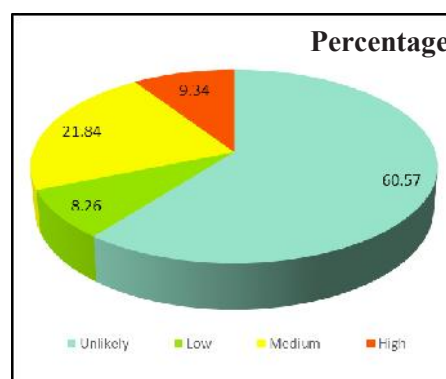
3.2.13.3 Rajouri Range
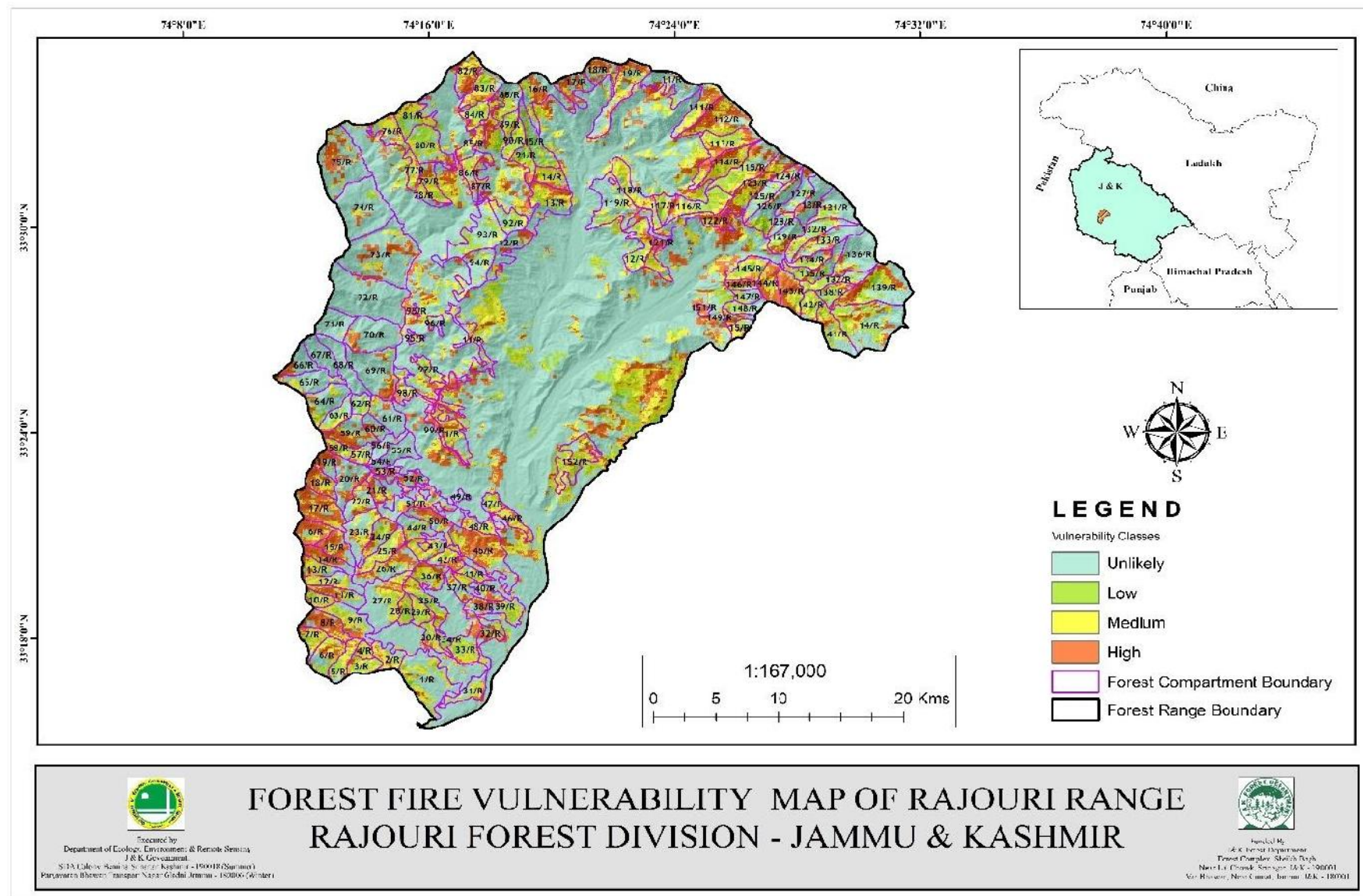
Fig. 64: Forest Fire Vulnerability Map of Rajouri Range Rajouri Forest Division Jammu & Kashmir

Table.58. Compartments of Rajouri Range Rajouri Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area (Sq Kms)	Percentage
Rajouri	Unlikely	19/R,15/R,1/R,12/R,11/R,13/R,14/R,92/R,93/R,94/R,131/R,88/R,119/R,124/R,125/R,126/R,127/R,128/R,129/R,148/R,141/R,147/R,75/R,74/R,73/R,72/R,70/R,71/R,68/R,69/R,65/R,67/R,66/R,64/R,63/R,62/R,60/R,61/R,55/R,56/R,20/R,23/R,54/R,22/R,98/R,96/R,26/R,27/R,31/R,44/R,39/R,38/R,37/R,40/R,49/R,51/R,139/R,136/R,135/R,133/R,132/R & 52/R	62	190.84	58.44
	Low	90/R,91/R,84/R,117/R,80/R,97/R,29/R,28/R,34/R,35/R,138/R,137/R & 89/R	13	17.95	5.50
	Medium	9/R,2/R,3/R,5/R,7/R,6/R,10/R,86/R,83/R,85/R,111/R,113/R,114/R,115/R,121/R,116/R,118/R,123/R,145/R,79/R,81/R,78/R,77/R,76/R,58/R,57/R,24/R,95/R,25/R,30/R,33/R,36/R,41/R,42/R,43/R,48/R,46/R,47/R,134/R,152/R,142/R,4/R & 32/R	43	74.85	22.92
	High	18/R,17/R,16/R,8/R,82/R,87/R,112/R,122/R,143/R,144/R,146/R,149/R,151/R,59/R,99/R,50/R,45/R,53/R & 21/R	19	42.90	13.14
Total			137	326.54	100.00

Rajouri Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	190.84
Low:	17.95
Medium:	74.85
High:	42.90
Total	**326.54**
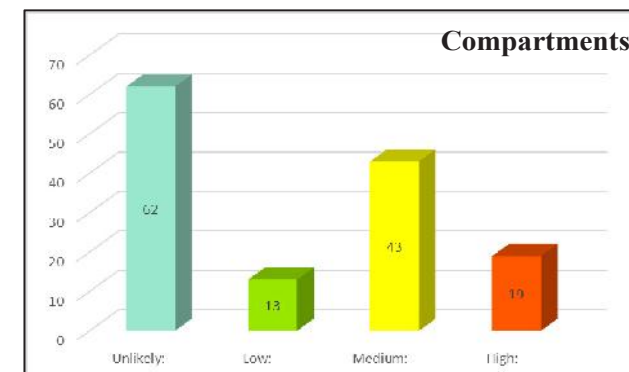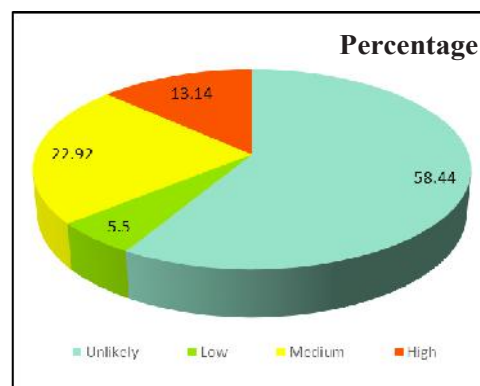
3.2.14 RAMBAN FOREST DIVISION

Ramban Forest Division lies between 33°8'49.71"N - 33°31'34.961"N latitude and 75°0'34.733"E - 75°24'59.948"E longitude. Elevation of the division varies from 607 m - 4427 m above mean sea level. Ramban Forest Division comprises of two territorial ranges viz., Banihal and Ramban. The total area (on GIS platform) of 153 Compartments of three territorial ranges is 498.71 km^2.

Fig. 65: Forest Fire Vulnerability Map of Ramban Forest Division Jammu & Kashmir

Table.59. Compartments of Ramban Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Ramban Forest Division	Banihal	Unlikely	2	3.08	1.23
		Low	62	213.46	85.12
		Medium	7	31.34	12.50
		High	1	2.89	1.15
		Total	**72**	**250.77**	**100.00**
	Ramban	Unlikely	0	0.00	0.00
		Low	55	181.02	73.01
		Medium	26	66.92	26.99
		High	0	0.00	0.00
		Total	**81**	**247.94**	**100.00**

Ramban Forest Division	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	3.08
Low:	394.48
Medium:	98.26
High:	2.89
Total	**498.71**

Percentage

Compartments

3.2.14.1 Banihal Range

Fig. 66: Forest Fire Vulnerability Map of Banihal Range Ramban Forest Division Jammu & Kashmir

FOREST FIRE RISK ZONATION & VULNERABILITY
ASSESSMENT FORESTS OF JAMMU & KASHMIR

Table.60. Compartments of Banihal Range Ramban Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Banihal	Unlikely	28b/B & 23a/B	2	3.08	1.23
	Low	02/B,06a/B,07a/B,24/B,53/B,55/B,54/B,52/B,48/B,47/B,49/B,50/B,51/B,41/B,40/B,45/B,39/B,42/B,43/B,46/B,44/B,37a/B,08/B,09b/B,10a/B,11/B,13a/B,14a/B,15/B,17/B,18/B,21/B,20a/B,20b/B,31/B,32/B,34/B,36/B,38/B,30/B,29a/B,28a/B,27/B,26b/B,25/B,23b/B,22/B,01/B,03a/B,03b/B,05a/B,09a/B,10b/B,12a/B,12b/B,13b/B,14b/B,16/B,19b/B,26a/B,29b/B & 37b/B	62	213.46	85.12
	Medium	04b/B,05b/B,19a/B,33/B,35/B,06b/B & 07b/B	7	31.34	12.50
	High	04a/B	1	2.89	1.15
Total			72	250.77	100.00

Banihal Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	3.08
Low:	213.46
Medium:	31.34
High:	2.89
Total	**250.77**

3.2.14.2 Ramban Range

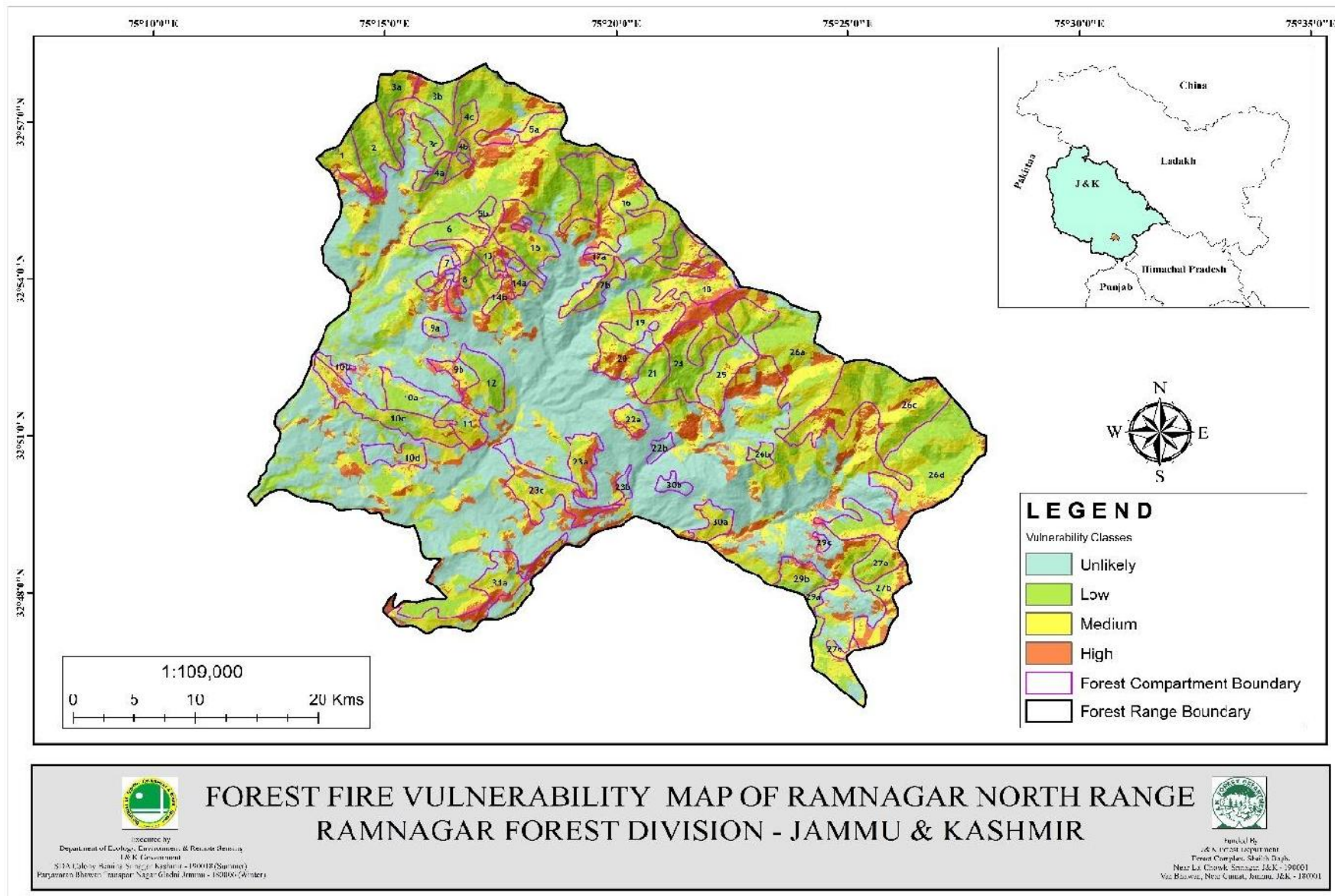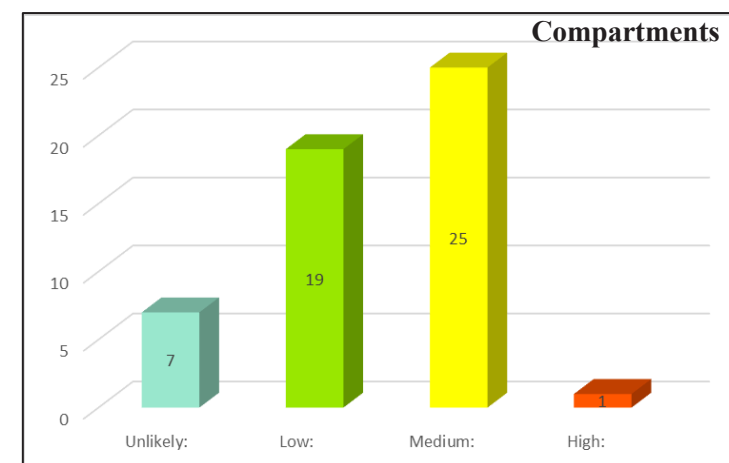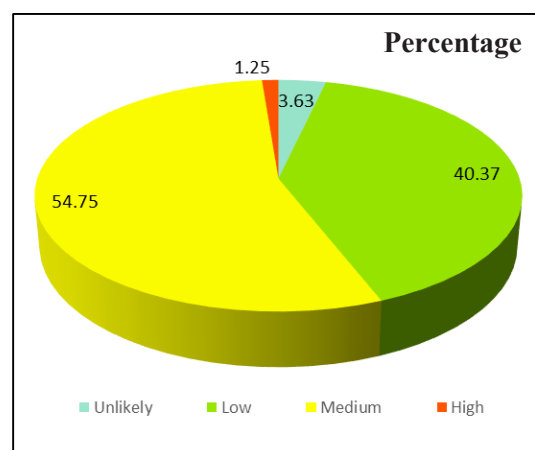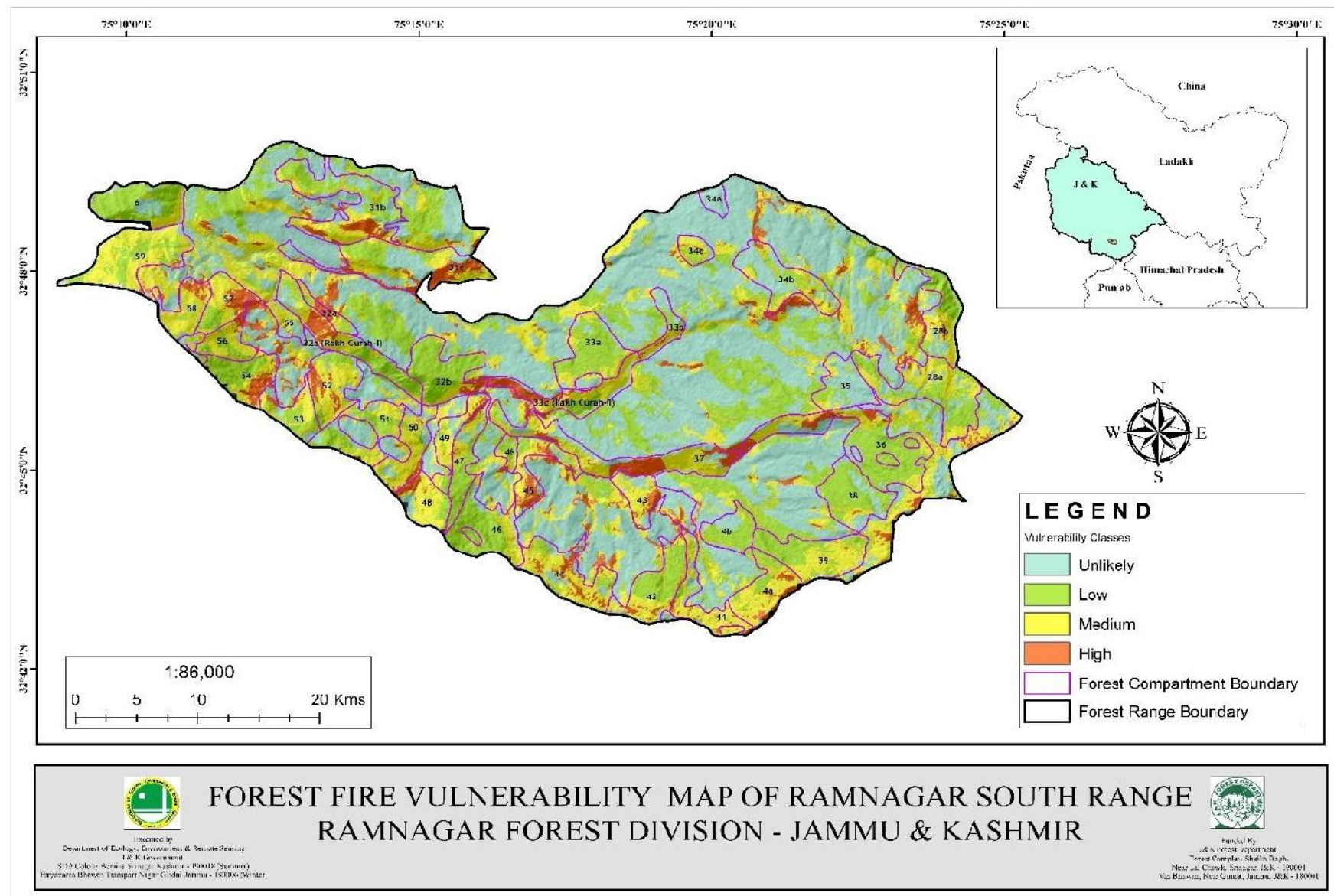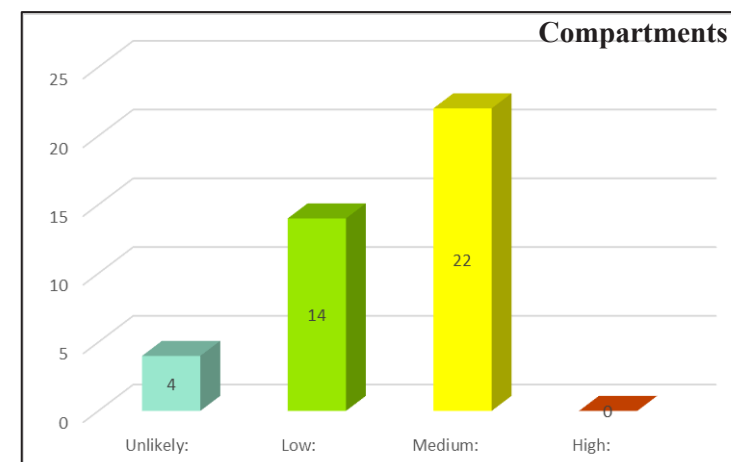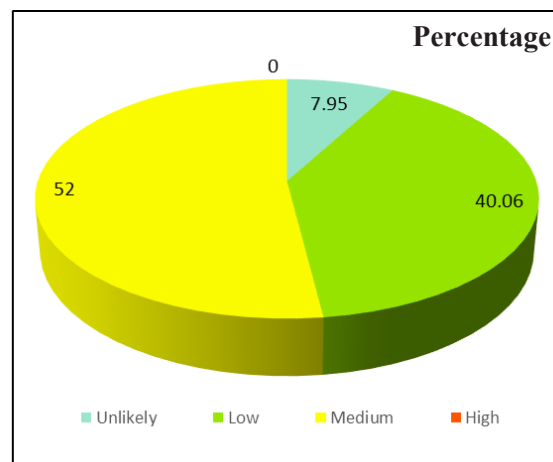
Fig. 67: Forest Fire Vulnerability Map of Ramban Range Ramban Forest Division Jammu & Kashmir

Table.61. Compartments of Banihal Range Ramban Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Ramban	Unlikely	None	0	0.00	0.00
	Low	09/R,04/R,05/R,06/R,07/R,08/R,10/R,12/R,13b/R,14/R,15/R, 16/R,38/R,65/R,48/R,47/R,46/R,39a/R,69/R,68/R,17a/R,19b/ R,21/R,22/R,23a/R,23b/R,63/R,24/R,25a/R,28/R,30/R,29/R,2 6/R,59/R,62/R,56/R,51/R,52/R,50/R,44/R,43/R,31/R,34a/R,3 2/R,33b/R,35/R,36/R,37/R,27a/R,27b/R,17b/R,33a/R,34b/R,1 3a/R & 49/R	55	181.02	73.01
	Medium	67/R,01/R,02a/R,03/R,11/R,18/R,40a/R,70/R,66/R,19a/R,20/ R,25b/R,54/R,53/R,55/R,58/R,57/R,60/R,61/R,64/R,45/R,41/ R,42/R,40b/R,39b/R & 02b/R	26	66.92	26.99
	High	None	0	0.00	0.00
Total			81	247.94	100.00

Ramban Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	0.00
Low:	181.02
Medium:	66.92
High:	0.00
Total	**247.94**
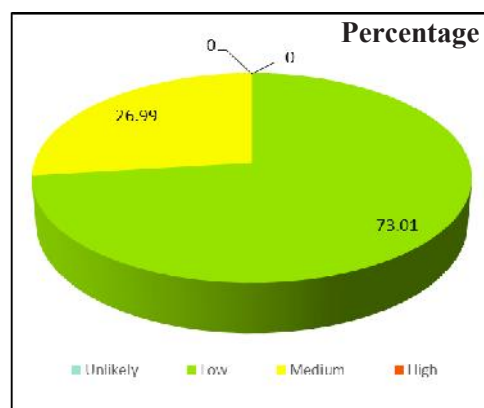
3.2.15 RAMNAGAR FOREST DIVISION

The Forest Division is situated between 75°8'43.61"E - 75°41'46.641"E Longitude and 32°42'29.732"N - 32°58'5.049"N Latitude. The altitude of the division varies from 405 m – 4295 m above mean sea level. Ramnagar Forest Division comprises of three territorial ranges viz., Basantgarh, Ramnagaer North and Ramnagar South. The total area (on GIS platform) of 181 Compartments of three territorial ranges is 396.94 km^2.
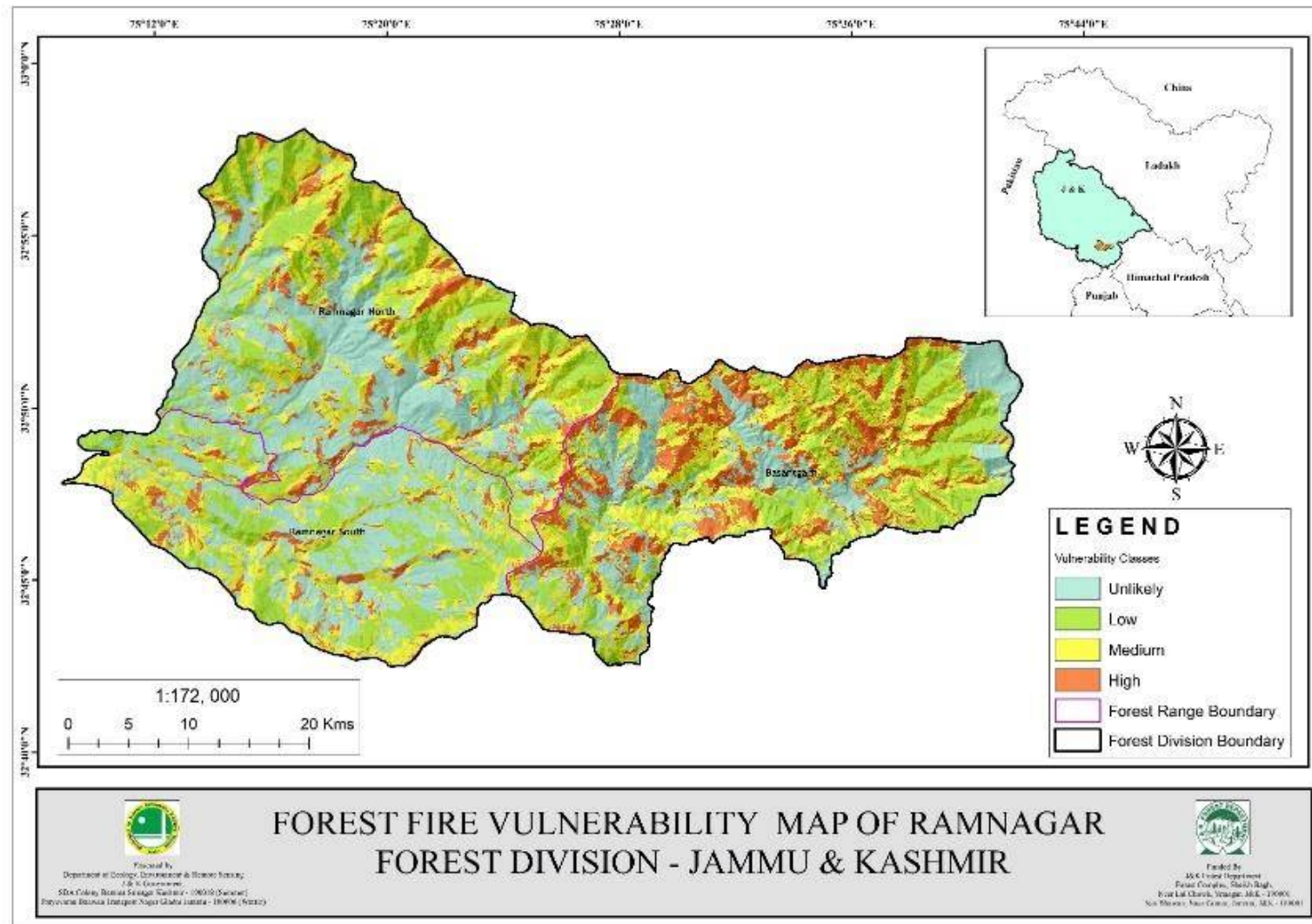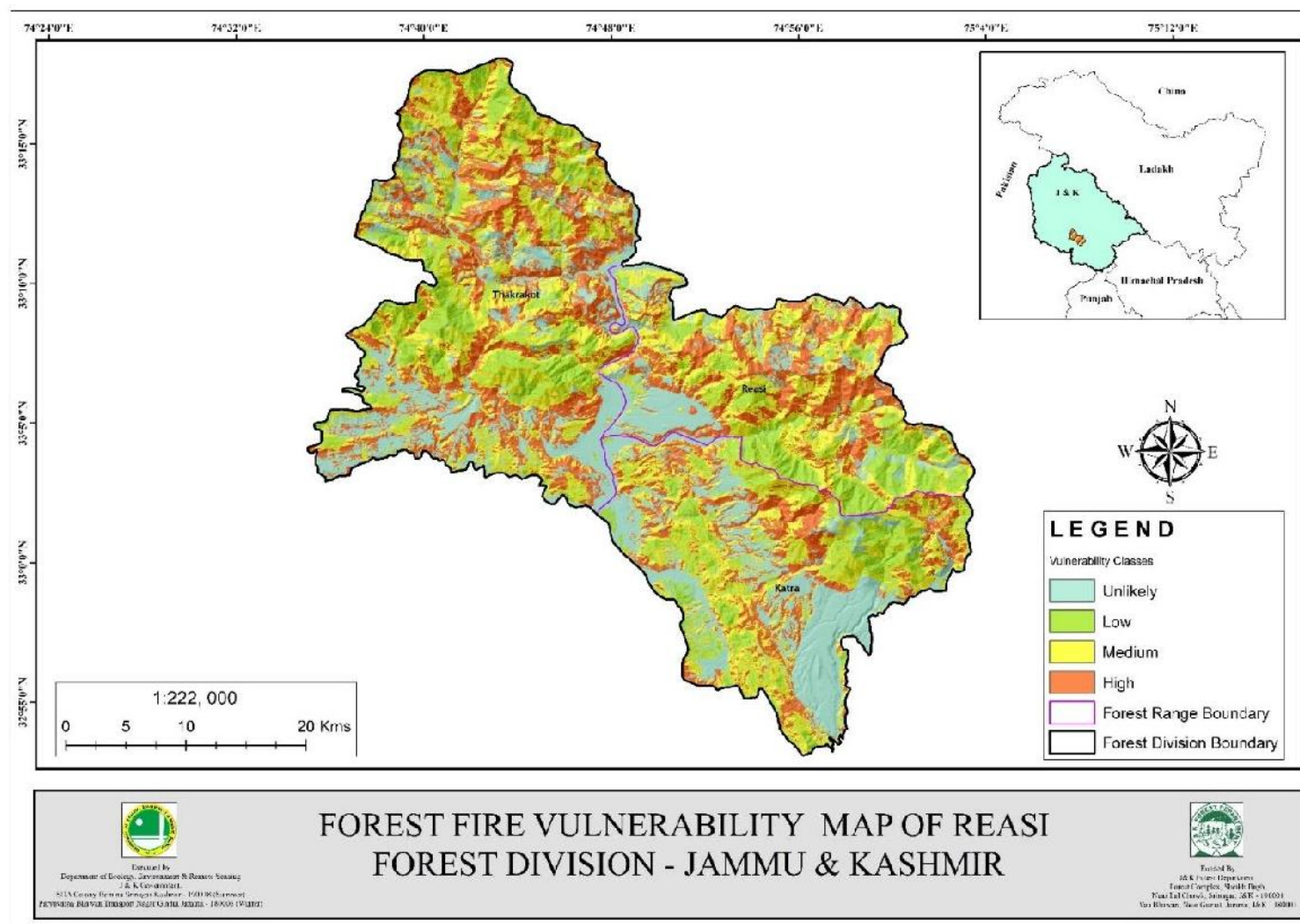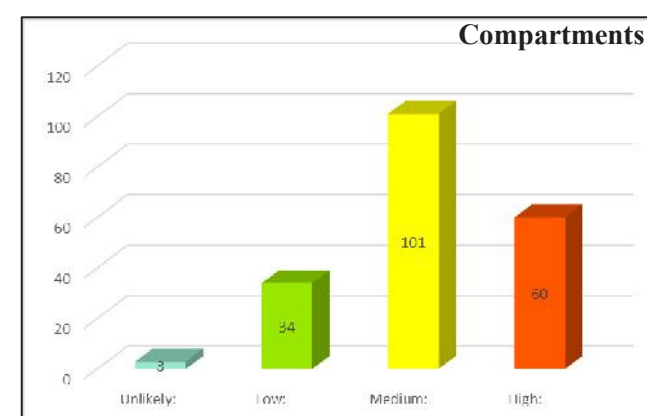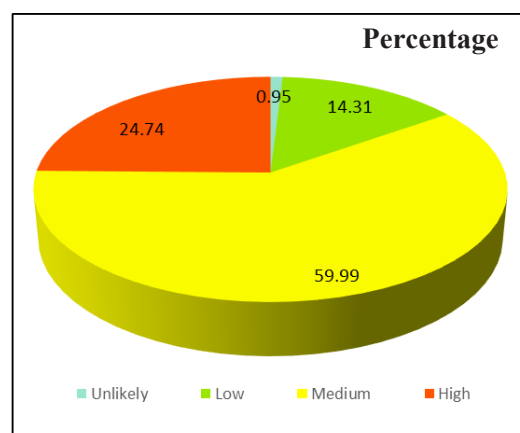

Fig. 68: Forest Fire Vulnerability Map of Ramnagar Forest Division Jammu & Kashmir

Table.62. Compartments of Ramnagar Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Ramnagar Forest Division	Basantgarh	Unlikely	9	28.92	14.01
		Low	19	47.88	23.20
		Medium	38	85.08	41.23
		High	23	44.49	21.56
		Total	**89**	**206.38**	**100.00**
	Ramnagar North	Unlikely	7	3.89	3.63
		Low	19	43.18	40.37
		Medium	25	58.58	54.75
		High	1	1.33	1.25
		Total	**52**	**106.98**	**100.00**
	Ramnagar South	Unlikely	4	6.64	7.95
		Low	14	33.48	40.06
		Medium	22	43.46	52.00
		High	0	0.00	0.00
		Total	**40**	**83.58**	**100.00**

Ramnagar Forest Division	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	39.45
Low:	124.54
Medium:	187.12
High:	45.82
Total	**396.94**

Percentage
9.94 — Unlikely
31.38 — Low
47.14 — Medium
11.54 — High

Compartments
Unlikely: 20
Low: 52
Medium: 85
High: 24
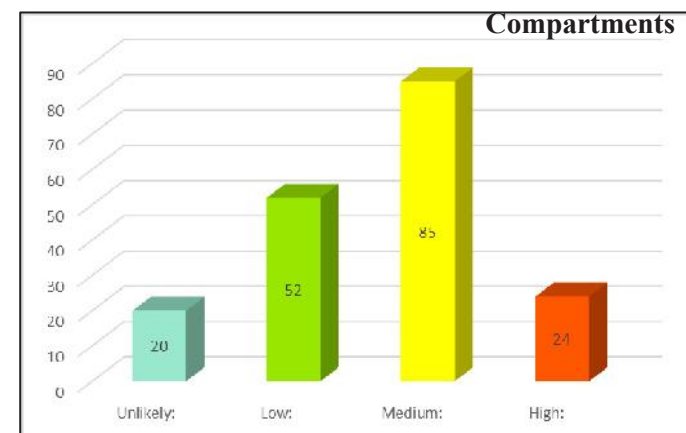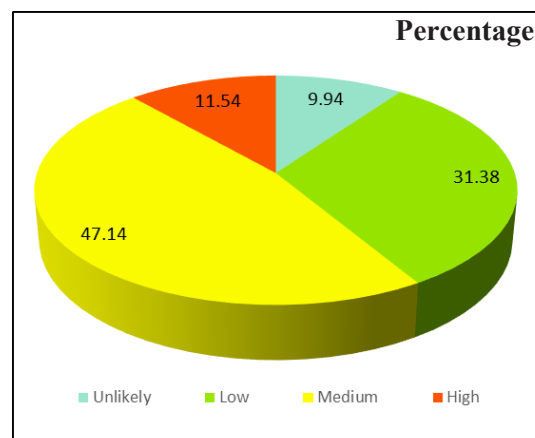
3.2.15.1 Basantgarh Range
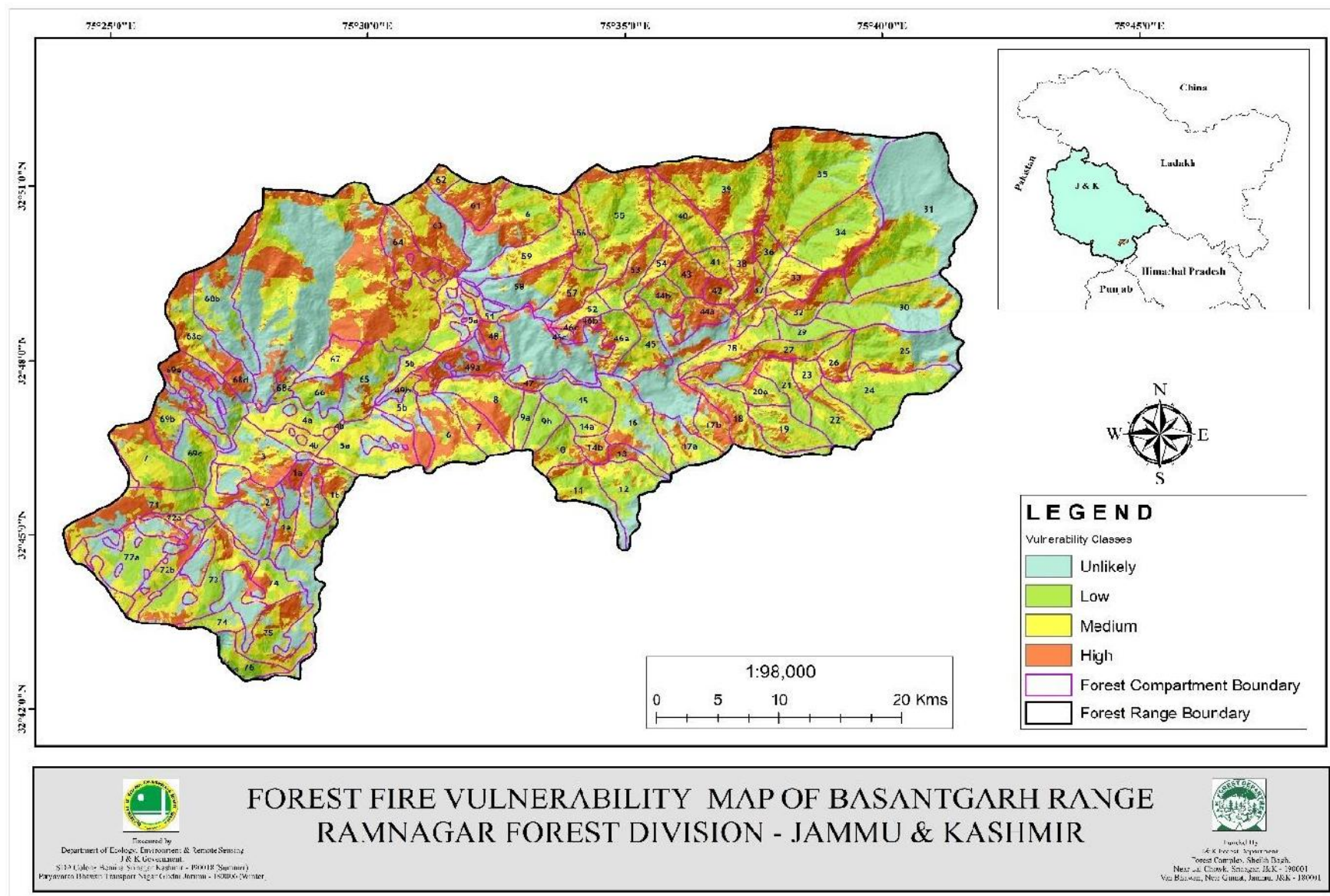
Fig. 69: Forest Fire Vulnerability Map of Basantgarh Range Ramnagar Forest Division Jammu & Kashmir
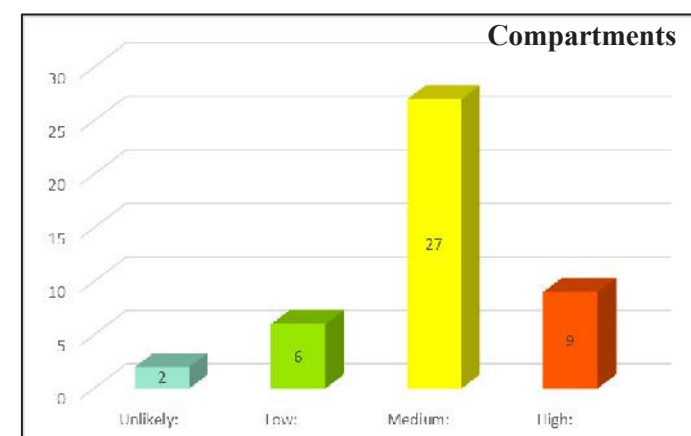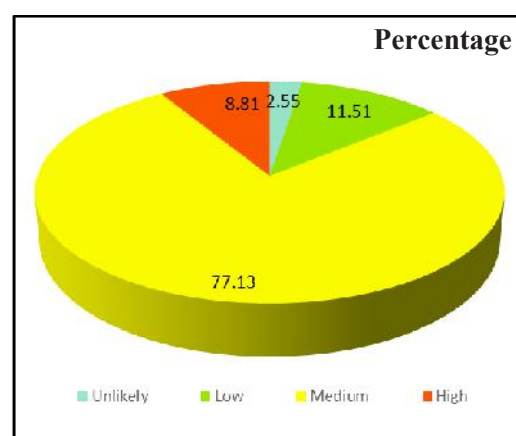
Table.63. Compartments of Basantgarh Range Ramnagar Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Basantgarh	Unlikely	16,25,31,58,68b,47,46c,51 & 68a	9	28.92	14.01
	Low	24,21,19,15,12,11,9b,9a,20a,72a,69c,30,29,35,34,76,22,14a & 44b	19	47.88	23.20
	Medium	23,17a,10,8,7,4a,5a,1b,3,75,74,73,5b,27,28,26,45,40,39,37,36,32,33,41,57,55,59,56,52,54,62,66,65,4b,46a,49b,67 & 72b	38	85.08	41.23
	High	2,18,13,14b,6,71,63,61,44a,43,38,49a,53,42,17b,68c,68d,1a,46b,48,64,69a & 69b	23	44.49	21.56
Total			89	206.38	100.00

Basantgarh Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	28.92
Low:	47.88
Medium:	85.08
High:	44.49
Total	**206.38**
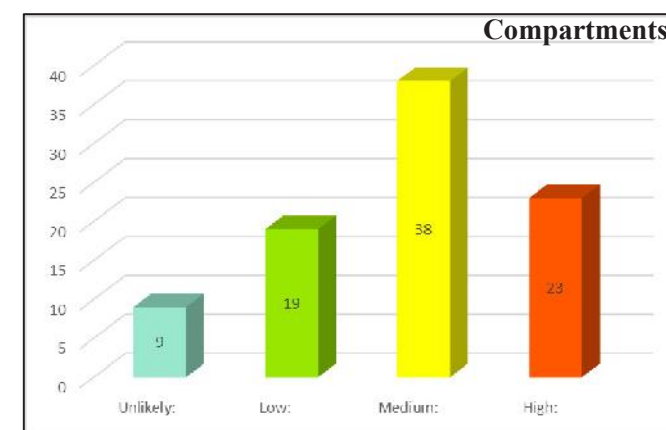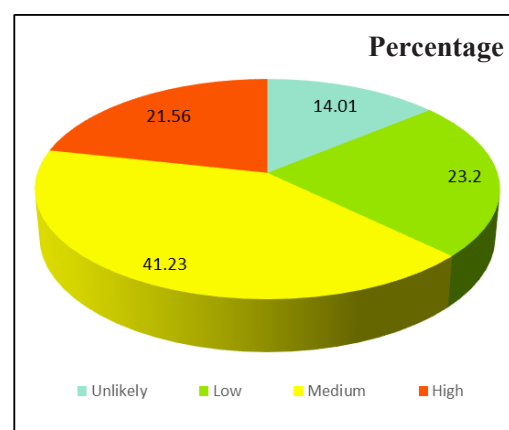
3.2.15.2. Ramnagar North Range

Fig. 70: Forest Fire Vulnerability Map of Ramnagar North Range Ramnagar Forest Division Jammu & Kashmir

FOREST FIRE RISK ZONATION & VULNERABILITY ASSESSMENT FORESTS OF JAMMU & KASHMIR

Table.64. Compartments of Ramnagar North Range Ramnagar Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Ramnagar North	Unlikely	30b,23b,9a,10b,10d,22b & 29c	7	3.89	3.63
	Low	3b,2,3a,3c,4b,26d,16,19,21,4a,4c,5b,6,12,10a,24,26b,29a & 27a	19	43.18	40.37
	Medium	1,11,9b,18,26c,30a,20,22a,23a,23c,5a,7,15,14a,14b,13,10c,31a,25,26a,29b,27b,27c,17b & 17a	25	58.58	54.75
	High	8	1	1.33	1.25
Total			52	106.98	100.00

Ramnagar North Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	3.89
Low:	43.18
Medium:	58.58
High:	1.33
Total	**106.98**

3.2.15.3 Ramnagar South Range

Fig. 71: Forest Fire Vulnerability Map of Ramnagar South Range Ramnagar Forest Division Jammu & Kashmir

Table.65. Compartments of Ramnagar South Range Ramnagar Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Ramnagar South	Unlikely	43,34b,35 & 34a	4	6.64	7.95
	Low	6,54,51,47,39,36,33a,46,42,38,32c (Rakh Curah-I),32b,28b & 4b	14	33.48	40.06
	Medium	28a,59,58,56,52,53,50,48,49,41,31c,57,37,34c, 55,45,44,31b,32a,33b,33c (Rakh Curah-II) & 4a	22	43.46	52.00
	High	None	0	0.00	0.00
Total			**40**	**83.58**	**100.00**

Ramnagar South Range Area	
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	6.64
Low:	33.48
Medium:	43.46
High:	0.00
Total	**83.58**

3.2.16 REASI FOREST DIVISION

The forest division lies between 74°35'4.787"E - 75°3'26.702"E and 33°18'11.364"N - 32°53'3.706"N. The altitude of the tract varies from 296 m – 2523 m above mean sea level. Reasi Forest Division comprises of three territorial ranges viz., Katra, Reasi and Thakrakot. The total area (on GIS platform) of 198 Compartments of three territorial ranges is 565.60 km^2.
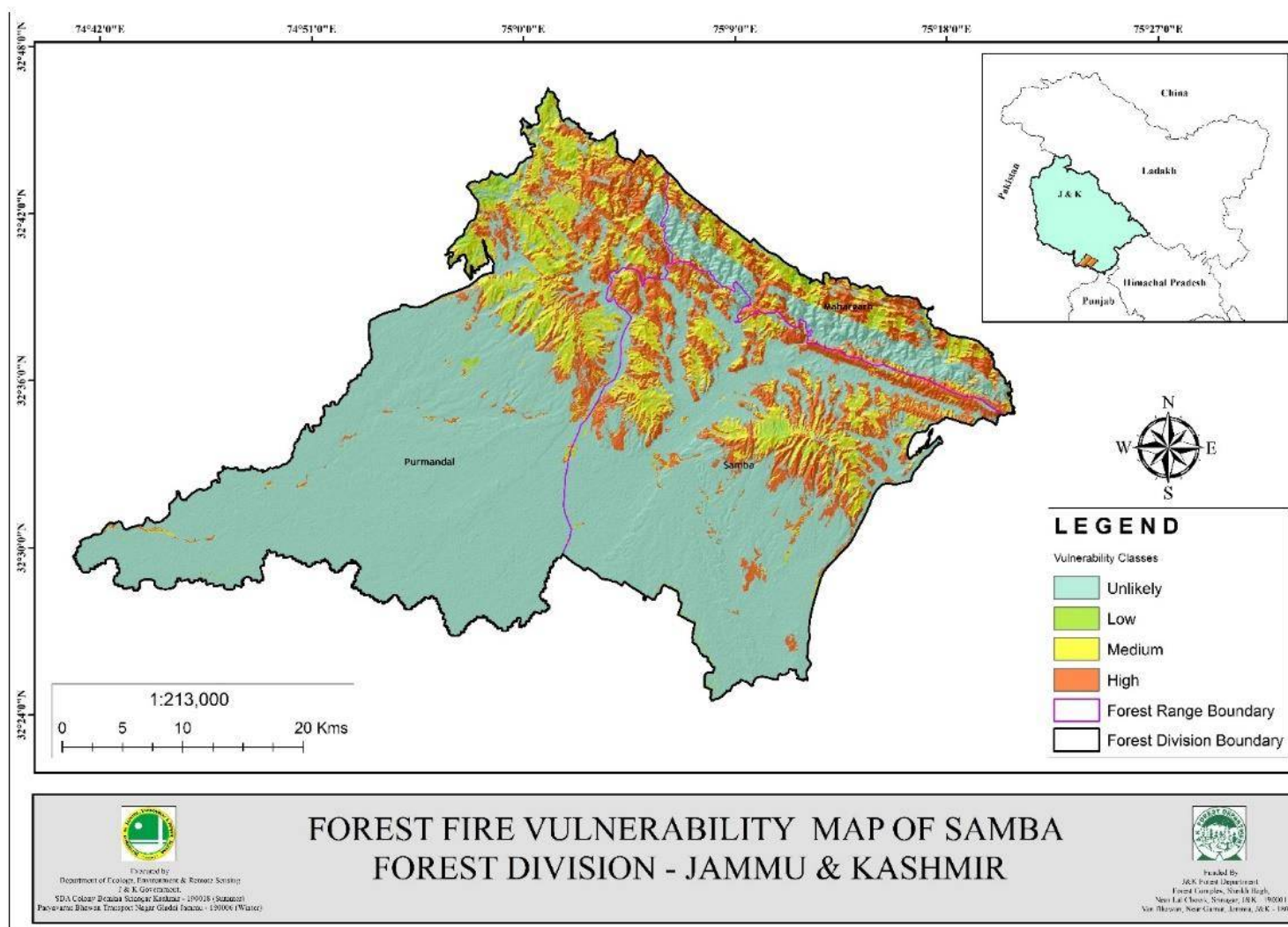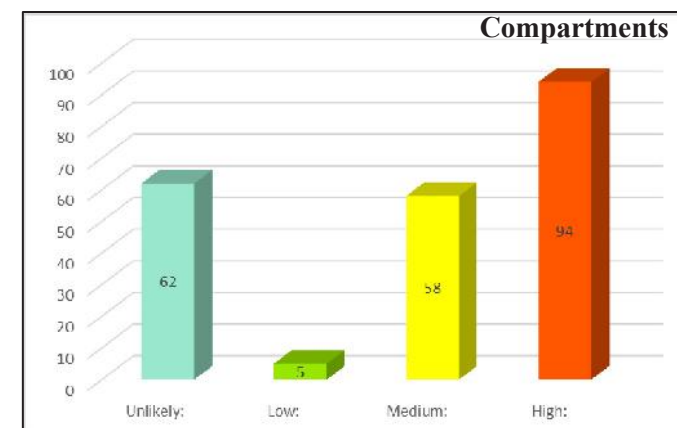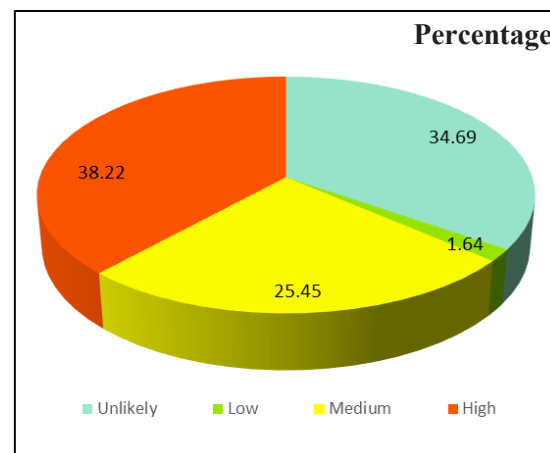

Fig. 72: Forest Fire Vulnerability Map of Reasi Forest Division Jammu & Kashmir

FOREST FIRE RISK ZONATION & VULNERABILITY ASSESSMENT FORESTS OF JAMMU & KASHMIR

Table.66. Compartments of Reasi Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Reasi Forest Division	Katra	Unlikely	2	3.54	2.55
		Low	6	15.99	11.51
		Medium	27	107.19	77.13
		High	9	12.25	8.81
		Total	**44**	**138.96**	**100.00**
	Reasi	Unlikely	0	0.00	0.00
		Low	19	30.36	20.10
		Medium	31	65.96	43.67
		High	23	54.72	36.23
		Total	**73**	**151.04**	**100.00**
	Thakrakot	Unlikely	1	1.86	0.68
		Low	9	34.59	12.58
		Medium	43	166.18	60.22
		High	28	72.96	26.53
		Total	**81**	**275.59**	**100.00**

Area	
Reasi Forest Division	
Vulnerability Classes	Area(Sq Kms)
Unlikely:	5.40
Low:	80.93
Medium:	339.33
High:	139.93
Total	**565.60**

Percentage

Compartments

3.2.16.1 Katra Range

Fig. 73: Forest Fire Vulnerability Map of Katra Range Reasi Forest Division Jammu & Kashmir

FOREST FIRE RISK ZONATION & VULNERABILITY ASSESSMENT FORESTS OF JAMMU & KASHMIR

Table.67. Compartments of Katra Range Reasi Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Katra	Unlikely	20/U/K & 83a/K	2	3.54	2.55
	Low	32/U/K,24/U/K,21/U/K,10/J/K,80/K & 12/J/K	6	15.99	11.51
	Medium	26b/U/K,29/U/K,30/U/K,23/U/K,25/U/K,33/U/K,22/U/K,90b/K,89/K,87/K,85/K,92/K,93/K,91/K,Trikuta WL Sanctuary,09/J/K,94/K,11/J/K,90a/K,88/K,86/K,82/K,84/K,83b/K,78/K,77/K & 79/K	27	107.19	77.13
	High	31/U/K,27/U/K,28/U/K,26a/U/K,95/K,96/K,97/K,81/K & 76/K	9	12.25	8.81
Total			44	138.96	100.00

Katra range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	3.54
Low:	15.99
Medium:	107.19
High:	12.25
Total	**138.96**

Percentage

Compartments

3.2.16.2 Reasi Range
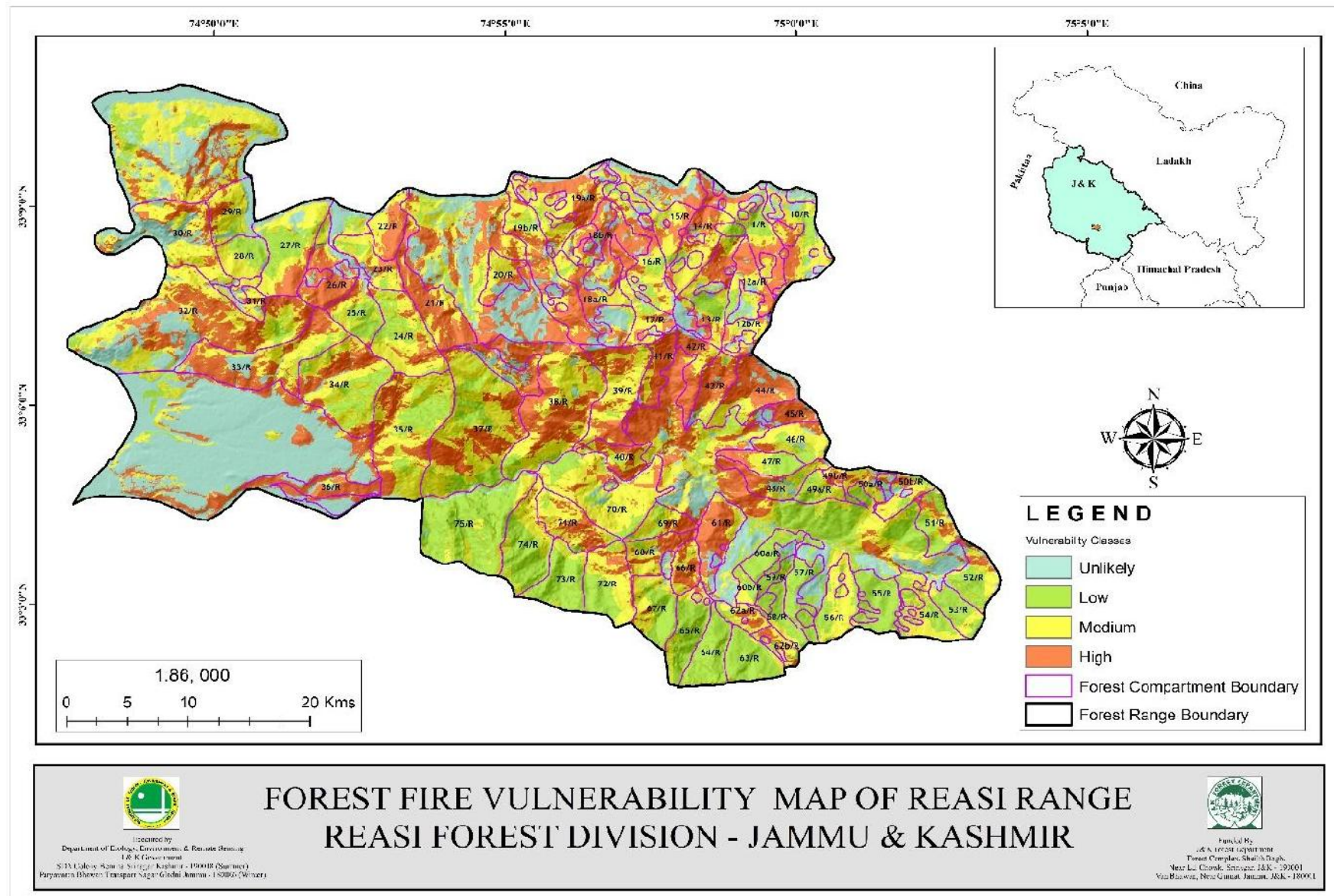
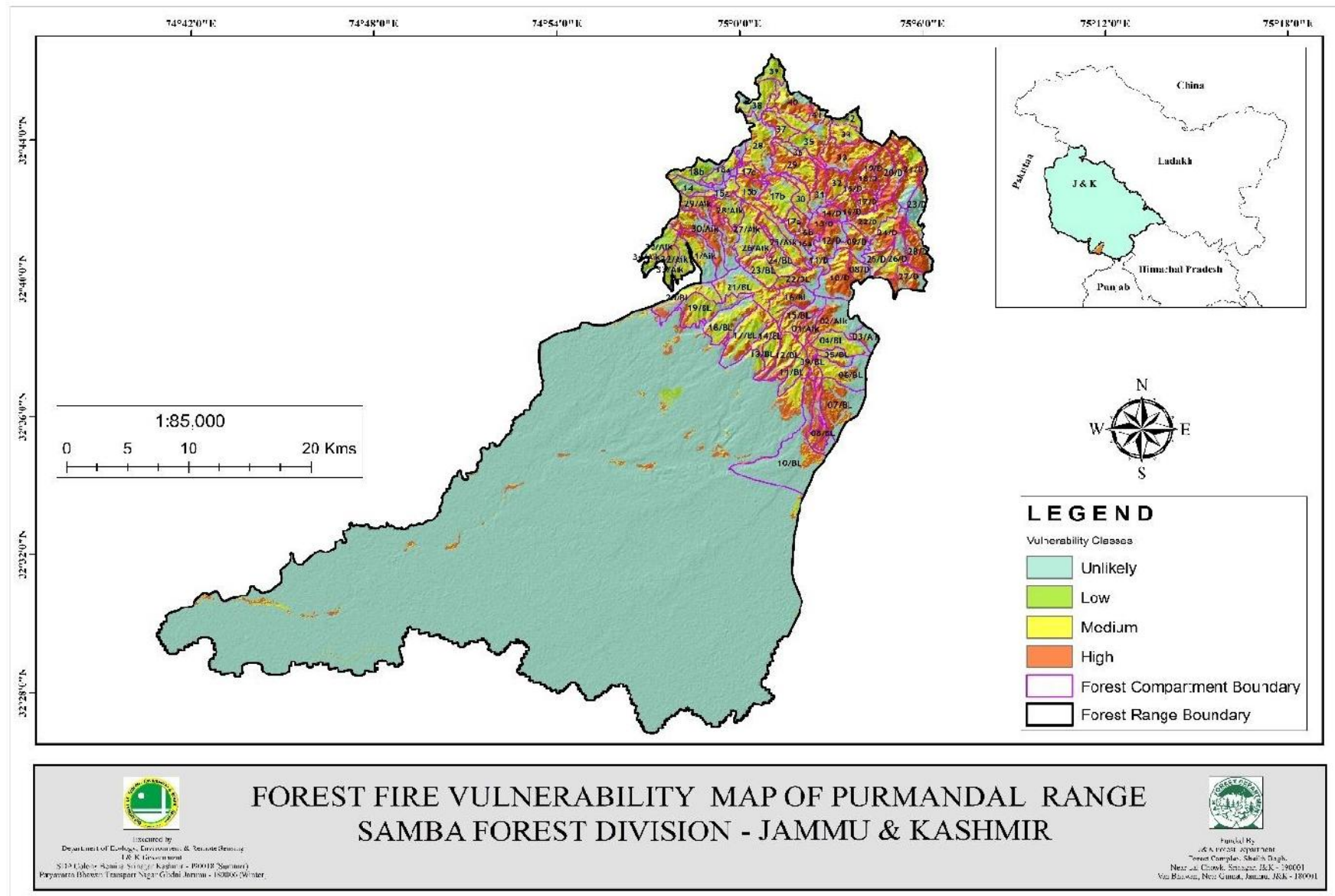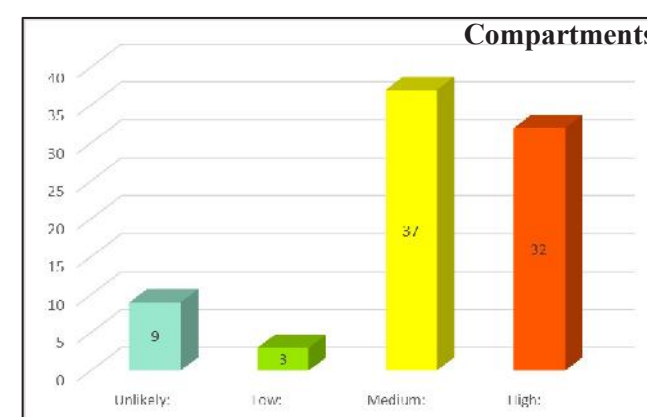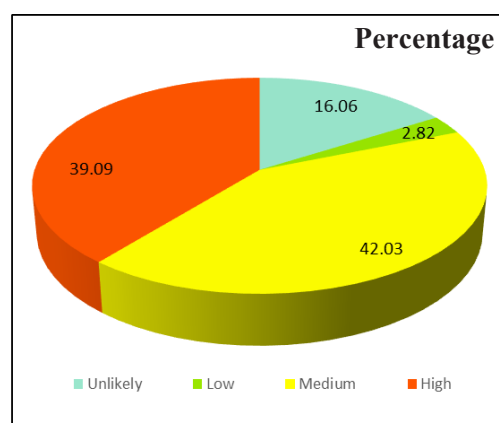

Fig. 74: Forest Fire Vulnerability Map of Reasi Range Reasi Forest Division Jammu & Kashmir

Table.68. Compartments of Reasi Range Reasi Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Reasi	Unlikely	None	0	0.00	0.00
	Low	25/R,52/R,53/R,63/R,64/R,65/R,67/R,73/R,74/R,75/R,60b/R, 58/R,47/R,49a/R,51/R,55/R,60a/R,57/R & 59/R	19	30.36	20.10
	Medium	24/R,17/R,16/R,49b/R,54/R,56/R,62b/R,62a/R,68/R,72/ R,71/R,70/R,35/R,46/R,27/R,31/R,34/R,12b/R,15/R,14/ R,69/R,37/R,28/R,29/R,30/R,20/R,50b/R,39/R,50a/R,23/R & 10/R	31	65.96	43.67
	High	22/R,66/R,61/R,26/R,38/R,33/R,32/R,13/R,12a/R,43/R,44/R, 45/R,42/R,18b/R,18a/R,48/R,41/R,19b/R,40/R,11/R,21/ R,19a /R & 36/R	23	54.72	36.23
	Total		73	151.04	100.00

Reasi range — Area

Vulnerability Classes	Area(Sq Kms)
Unlikely:	0.00
Low:	30.36
Medium:	65.96
High:	54.72
Total	**151.04**

Percentage

Unlikely, Low, Medium, High
0, 20.1, 43.67, 36.23

Compartments

Unlikely: 0, Low: 19, Medium: 31, High: 23
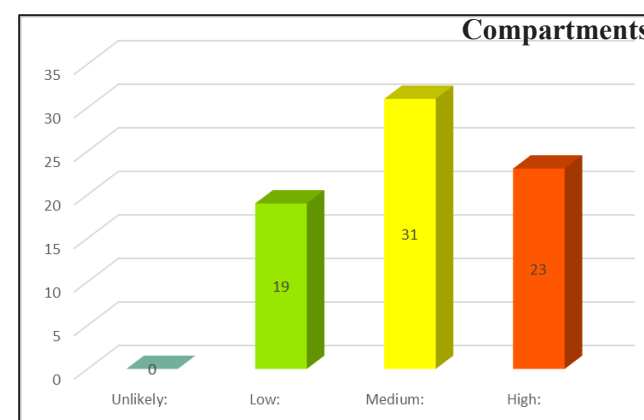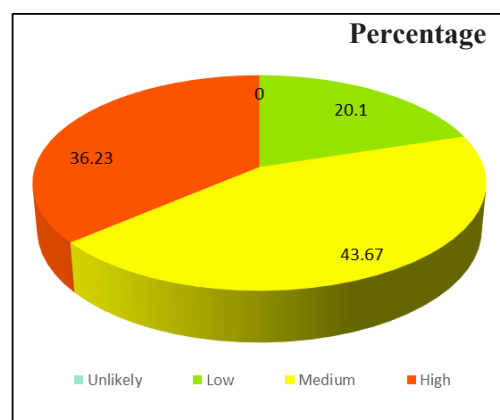
3.2.16.3 Thakrakot Range
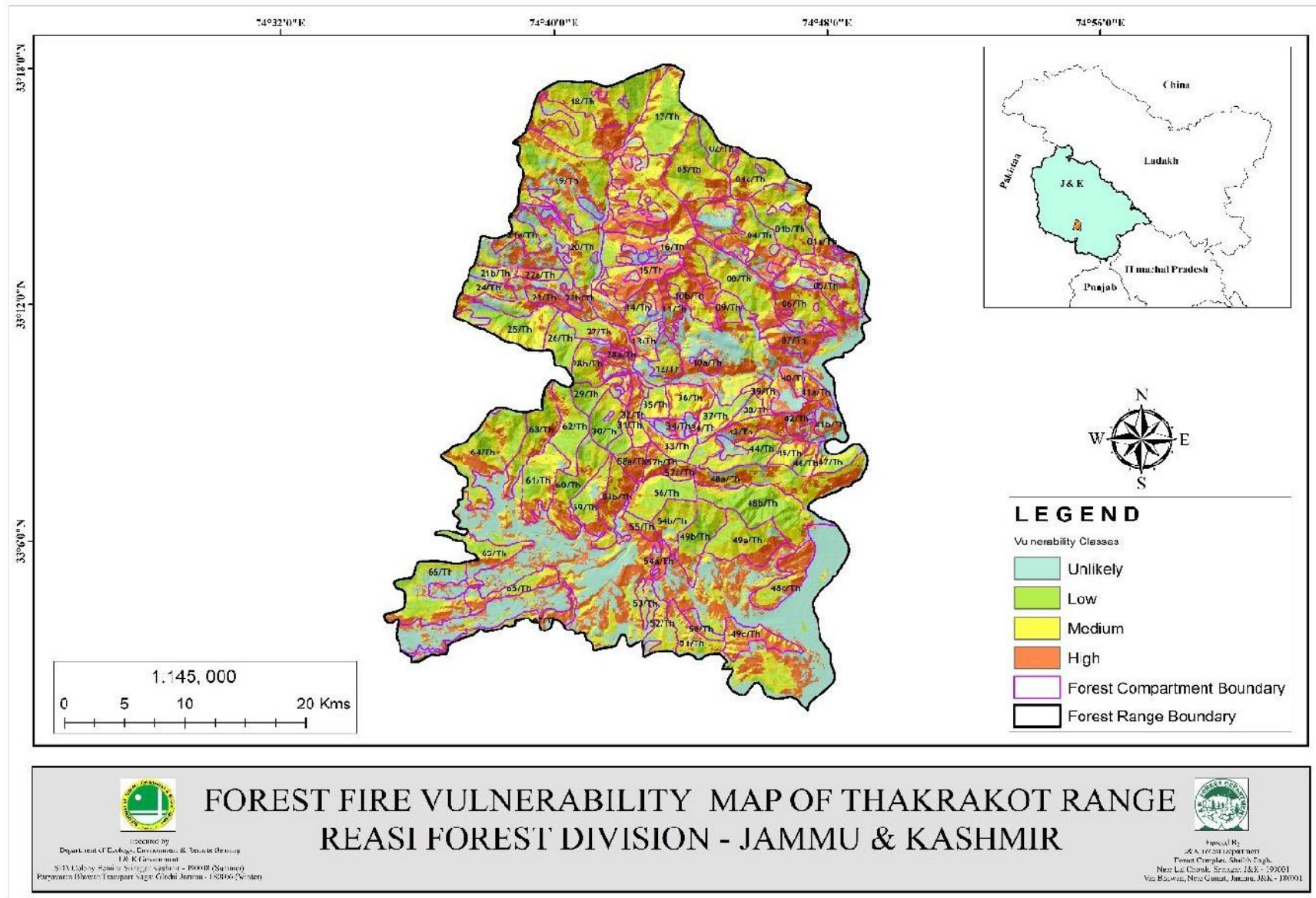
Fig. 75: Forest Fire Vulnerability Map of Thakrakot Range Reasi Forest Division Jammu & Kashmir

Table.69. Compartments of Thakrakot Range Reasi Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area (Sq Kms)	Percentage
Thakrakot	Unlikely	41b/Th	1	1.86	0.68
	Low	62/Th,56/Th,29/Th,31/Th,30/Th,26/Th,02/Th,17/Th & 48b/Th	9	34.59	12.58
	Medium	51/Th,55/Th,54b/Th,60/Th,33/Th,32/Th,63/Th,61/Th,46/Th,47/Th,45/Th,44/Th,01c/Th,01b/Th,05/Th,12/Th,13/Th,38/Th,39/Th,08/Th,37/Th,35/Th,25/Th,27/Th,28b/Th,21a/Th,03/Th,19/Th,20/Th,48a/Th,64/Th,66/Th,53/Th,36/Th,21b/Th,24/Th,18/Th,59/Th,52/Th,49b/Th,09/Th,49a/Th & 65/Th	43	166.18	60.22
	High	54a/Th,57a/Th,57b/Th,58a/Th,04/Th,14/Th,11/Th,34/Th,40/Th,42/Th,48c/Th,67/Th,50/Th,07/Th,15/Th,10b/Th,10a/Th,16/Th,28a/Th,22a/Th,23/Th,22b/Th,58b/Th,41a/Th,06/Th,49c/Th,01a/Th & 43/Th	28	72.96	26.53
Total			81	275.59	100.00

Thakrakot Range	Area
Vulnerability Classes	Area(Sq Kms)
Unlikely:	1.86
Low:	34.59
Medium:	166.18
High:	72.96
Total	**275.59**
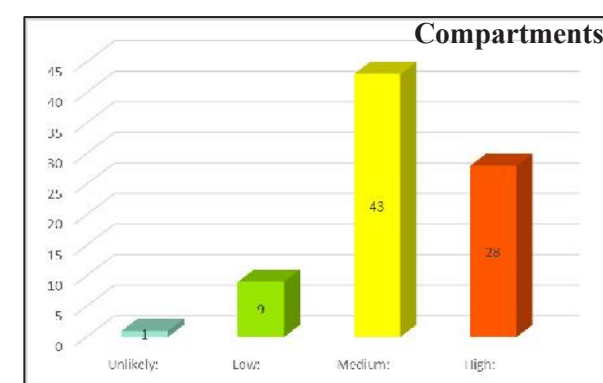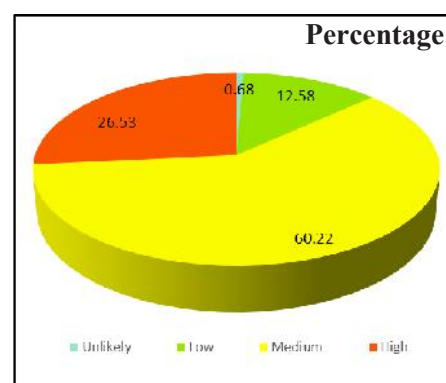
3.2.17 SAMBA FOREST DIVISION

The forest division is situated between longitude of 74°40'59.082"E - 75°20'48.999"E and 32°24'28.466"N - 32°46'31.955"N. It is situated at an elevation range of 206 m - 912 m above mean sea level. Samba Forest Division comprises of three territorial ranges viz., Mahangarh, Purmandal and Samba. The total area (on GIS platform) of 219 Compartments of three territorial ranges is 430.27 km^2.
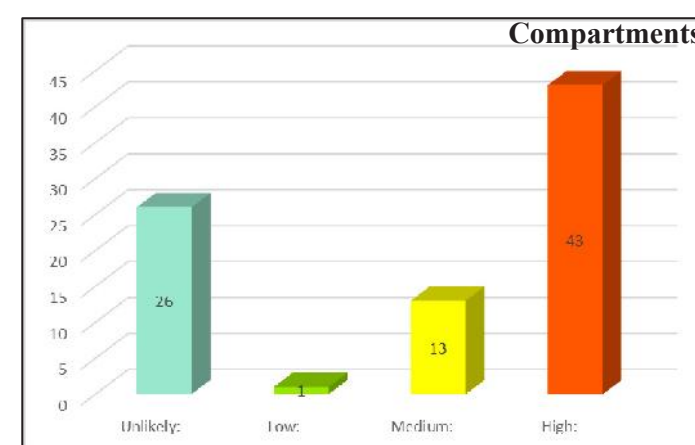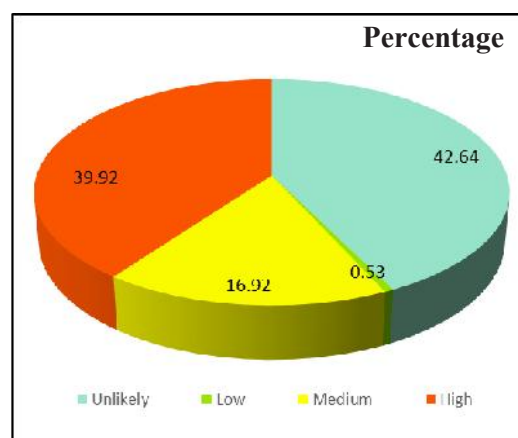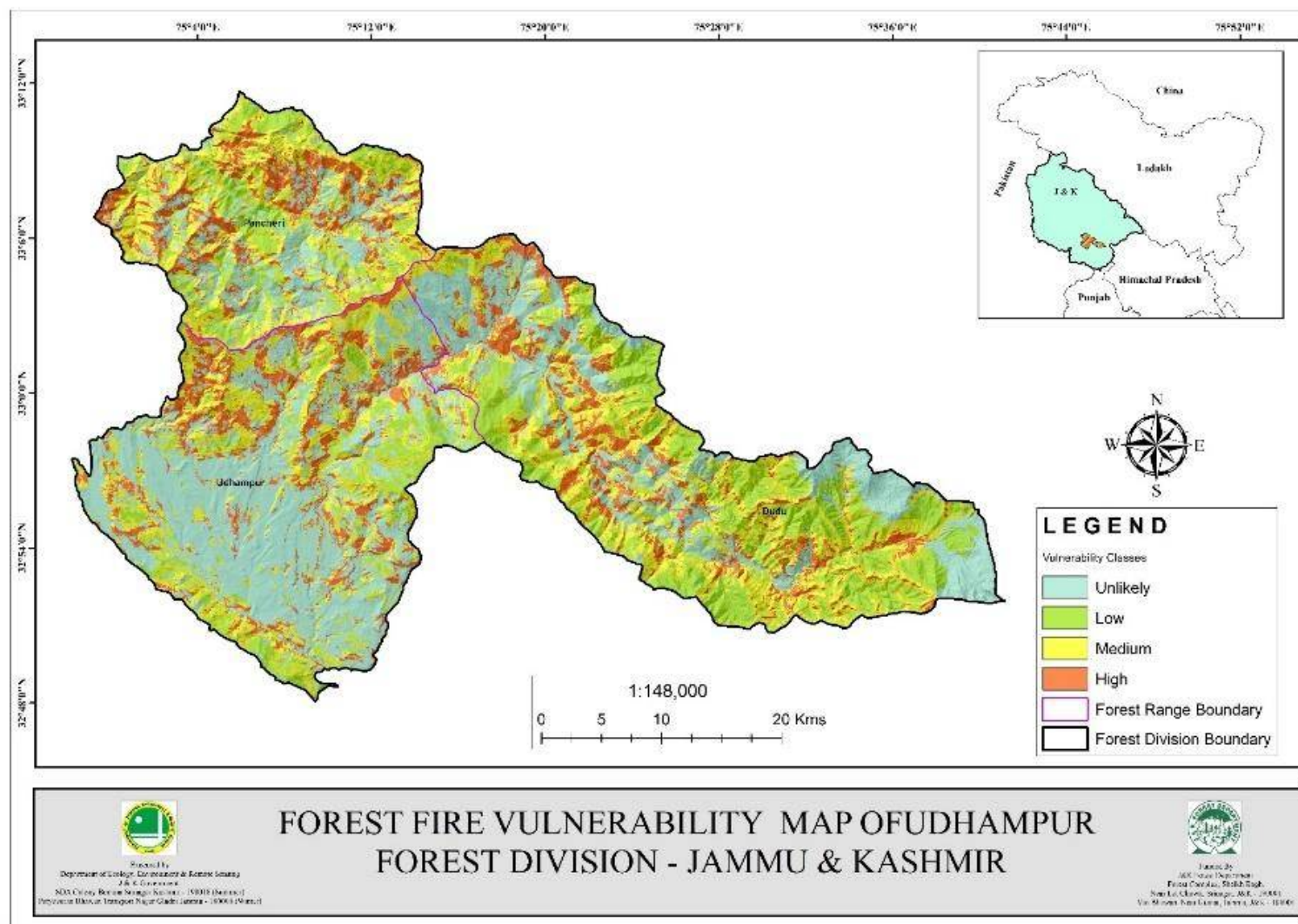

Fig. 76: Forest Fire Vulnerability Map of Samba Forest Division Jammu & Kashmir

Table.70. Compartments of Samba Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area(Sq Kms)	Percentage
Samba Division	Purmandal Range	Unlikely	9	26.20	16.06
		Low	3	4.60	2.82
		Medium	37	68.57	42.03
		High	32	63.78	39.09
		Total	**81**	**163.15**	**100.00**
	Mahargarh Range	Unlikely	27	50.18	52.16
		Low	1	1.57	1.63
		Medium	8	12.03	12.50
		High	19	32.43	33.71
		Total	**55**	**96.21**	**100.00**
	Samba Range	Unlikely	26	72.87	42.64
		Low	1	0.90	0.53
		Medium	13	28.92	16.92
		High	43	68.22	39.92
		Total	**83**	**170.91**	**100.00**

Area

Samba Forest Division

Vulnerability Classes	Area(Sq Kms)
Unlikely:	149.25
Low:	7.07
Medium:	109.52
High:	164.43
Total	430.27

Percentage pie chart: 34.69, 1.64, 25.45, 38.22 (Unlikely, Low, Medium, High)

Compartments bar chart: Unlikely 62, Low 5, Medium 58, High 94

3.2.17.1 Purmandal Range

Fig. 77: Forest Fire Vulnerability Map of Purmandal Range Samba Forest Division Jammu & Kashmir

Table.71. Compartments of Purmandal Range Samba Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Purmandal	Unlikely	06/BL,03/Aik,02/Aik,10/BL,16a,20/BL,23/D,31/Aik & 14	9	26.20	16.06
	Low	39,18b & 35/Aik	3	4.60	2.82
	Medium	05/BL,13/BL,17/BL,18/BL,19/BL,04/BL,11/BL,12/BL,09/BL,14/BL,21/BL,23/BL,26/Aik,24/BL,27/Aik,25/Aik,11/D,30,36,35,37,34,42,40,41,38,17a,17b,28,15b,25/D,32/Aik,33/Aik,34/Aik,28/Aik,15a & 18a	37	68.57	42.03
	High	08/D,10/D,09/D,15/BL,16/BL,01/Aik,07/BL,08/BL,22/BL,12/D,13/D,14/D,16/D,15/D,16b,29,19/D,17/D,18/D,24/D,26/D,20/D,22/D,21/D,32,31,33,17c,28/D,27/D,30/Aik & 29/Aik	32	63.78	39.09
Total			81	163.15	100.00

Purmandal Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	26.20
Low:	4.60
Medium:	68.57
High:	63.78
Total	430.27

Percentage

Compartments

3.2.17.2 Mahangarh Range
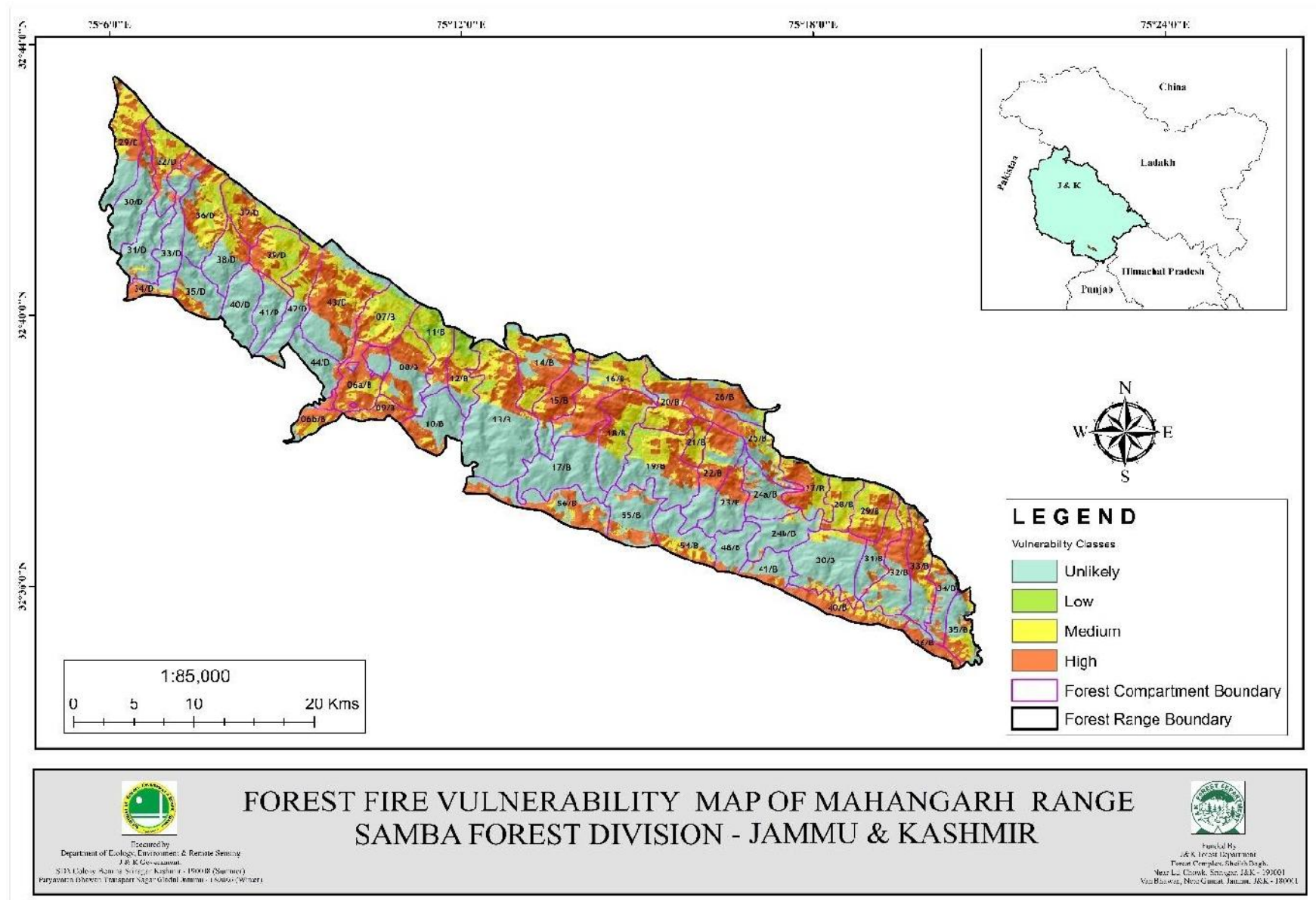
Fig. 78: Forest Fire Vulnerability Map of Mahangarh Range Samba Forest Division Jammu & Kashmir

Table.72. Compartments of Mahargarh Range Samba Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Mahargarh Range	Unlikely	59/D,02/D,56/D,55/D,61/D,51/D,54/D,53/D,52/D,45/D,01/B,53/B,57/B,77/B,76/B,71/B,70/B,68/B,64/B,62/B,50/B,43/B,03b/D,74/B,75/B & 46/B	27	50.18	52.16
	Low	72/B	1	1.57	1.63
	Medium	01/D,58/D,62/D,63/D,03/B,04/B,61/B,51/B,70/J,67abc/J,66/J,81/B & 80/B	8	12.03	12.50
	High	07a/D,06/D,05/D,57/D,60/D,50/D,49/D,48/D,47/D,05/B,37/B,39/B,42/B,44/B,47/B,49/B,67/B,66/B,52/B,45/B,38/B,71/J,69/J,68/J,65/J,64/J,82/B,78/B,79/B,03a/D,04a/D,04b/D,73/B,02/B,46/D,69/B,07b/D,63/J,58/B,60/B,59/B,63/B & 65/B	19	32.43	33.71
	Total		55	96.21	100.00

Mahargarh Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	50.18
Low:	1.57
Medium:	12.03
High:	32.43
Total	96.21
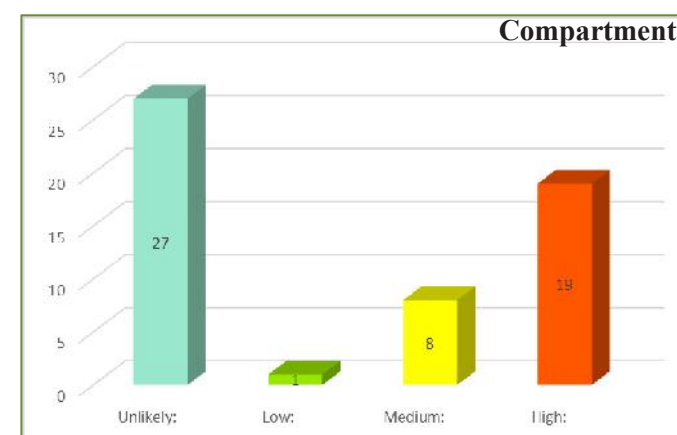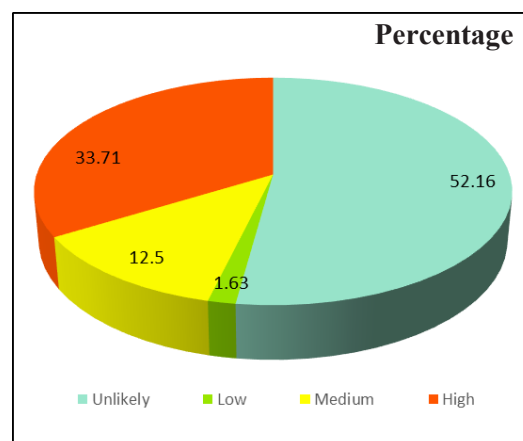
3.2.17.3 Samba Range
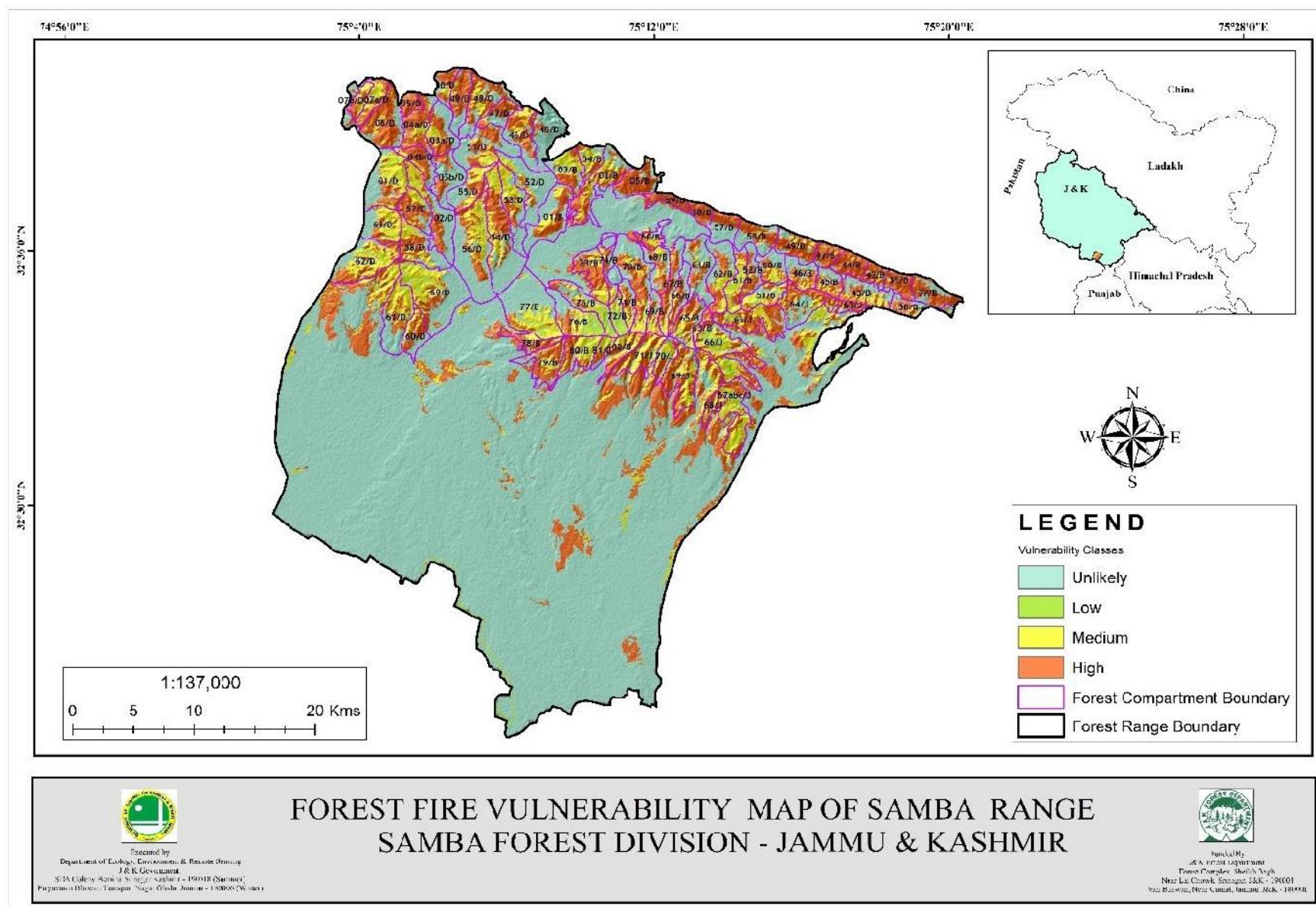
Fig. 79: Forest Fire Vulnerability Map of Samba Range Samba Forest Division Jammu & Kashmir

Table.73. Compartments of Samba Range Samba Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Samba Range	Unlikely	59/D,02/D,56/D,55/D,61/D,51/D,54/D,53/D,52/D,45/D,01/B,53/B,57/B,77/B,76/B,71/B,70/B,68/B,64/B,62/B,50/B,43/B,03b/D,74/B,75/B & 46/B	26	72.87	42.64
	Low	72/B	1	0.90	0.53
	Medium	01/D,58/D,62/D,63/D,03/B,04/B,61/B,51/B,70/J,67abc/J,66/J,81/B & 80/B	13	28.92	16.92
	High	07a/D,06/D,05/D,57/D,60/D,50/D,49/D,48/D,47/D,05/B,37/B,39/B,42/B,44/B,47/B,49/B,67/B,66/B,52/B,45/B,38/B,71/J,69/J,68/J,65/J,64/J,82/B,78/B,79/B,03a/D,04a/D,04b/D,73/B,02/B,46/D,69/B,07b/D,63/J,58/B,60/B,59/B,63/B & 65/B	43	68.22	39.92
	Total		83	170.91	100.00

Samba Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	72.87
Low:	0.90
Medium:	28.92
High:	68.22
Total	170.91

Percentage

Compartments

3.2.18 UDAMPUR FOREST DIVISION.

Udhampur forest Division lies between 74°58'4.533"E - 75°40'50.248"E and 32°48'7.849"N - 33°11'37.125"N. The altitude varies from 397 m – 4294 m above mean sea level. The Udampur Forest Division Comprises of three territorial ranges namely Dudu, Pancheri & Udampur. The total area (on GIS platform) of 351 Compartments of three territorial ranges is 664.81 km².

Fig. 80: Forest Fire Vulnerability Map of Udhampur Forest Division Jammu & Kashmir

Table.74. Compartments of Udhampur Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Udhampur Forest Division	Dudu Range	Unlikely	7	69.68	20.38
		Low	43	127.94	37.42
		Medium	82	122.79	35.92
		High	20	21.47	6.28
		Total	**152**	**341.88**	**100.00**
	Pancheri Range	Unlikely	3	7.49	4.85
		Low	16	37.51	24.27
		Medium	52	92.67	59.96
		High	12	16.90	10.93
		Total	**83**	**154.56**	**100.00**
	Udhampur Range	Unlikely	8	26.45	15.71
		Low	21	25.64	15.23
		Medium	59	77.49	46.02
		High	28	38.79	23.04
		Total	**116**	**168.37**	**100.00**

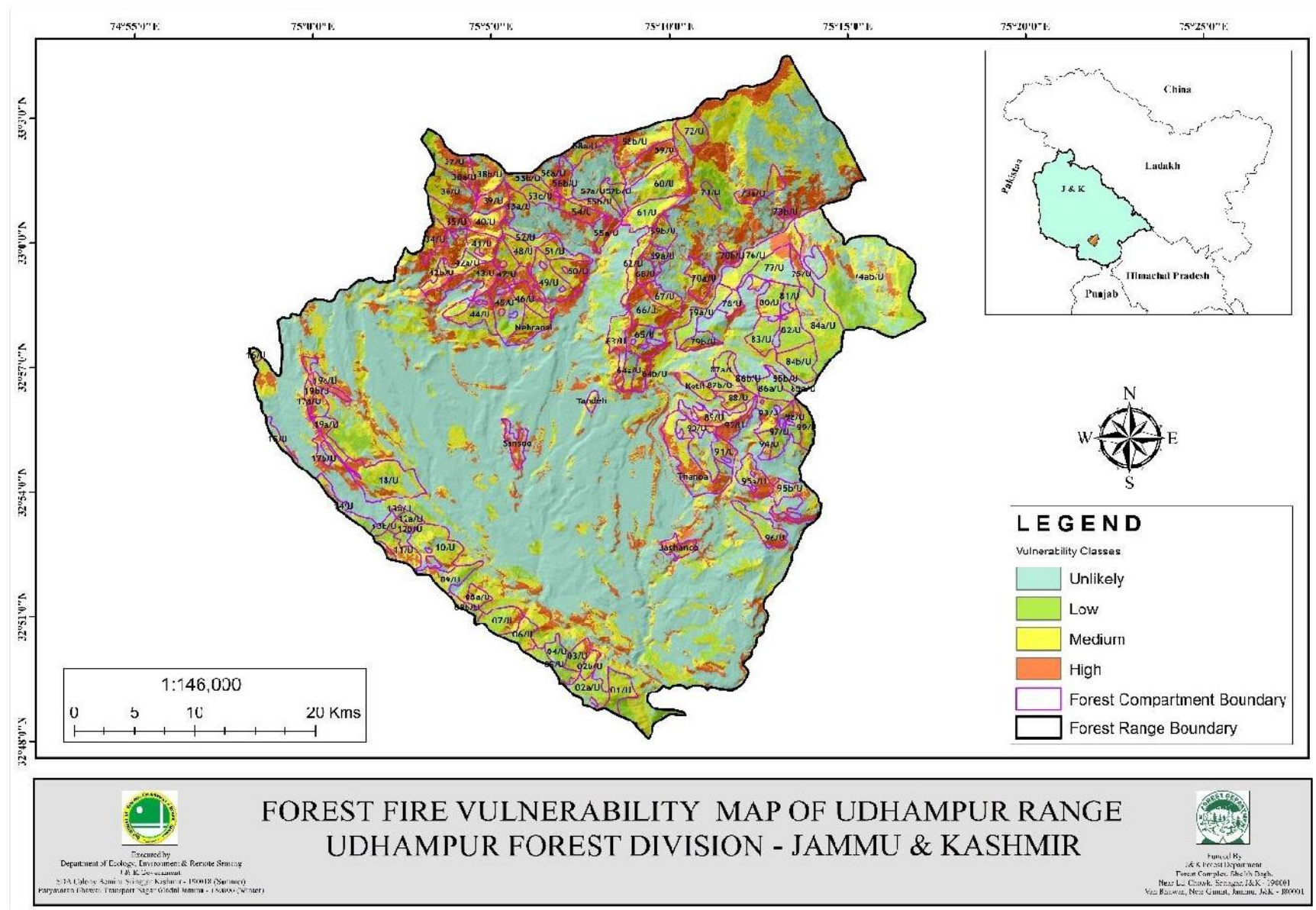| Udhampur Forest Division	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	103.62
Low:	191.09
Medium:	292.95
High:	77.16
Total	664.81
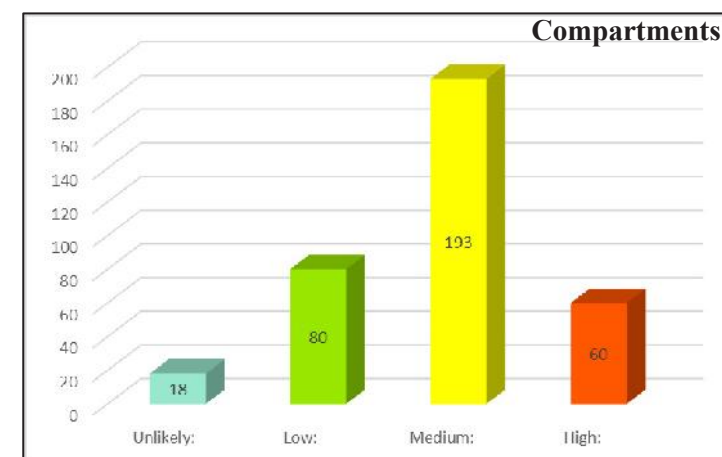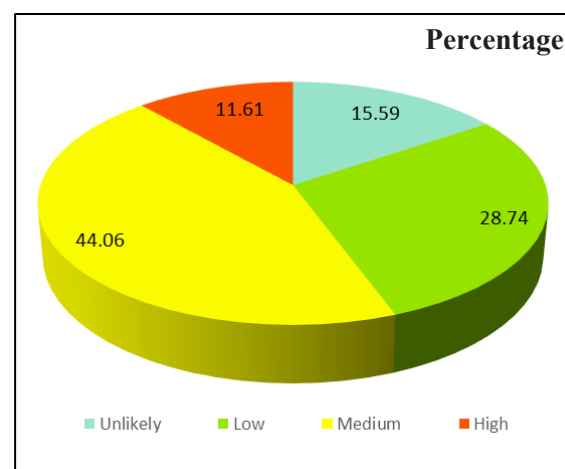
3.2.18.1 Dudu Range
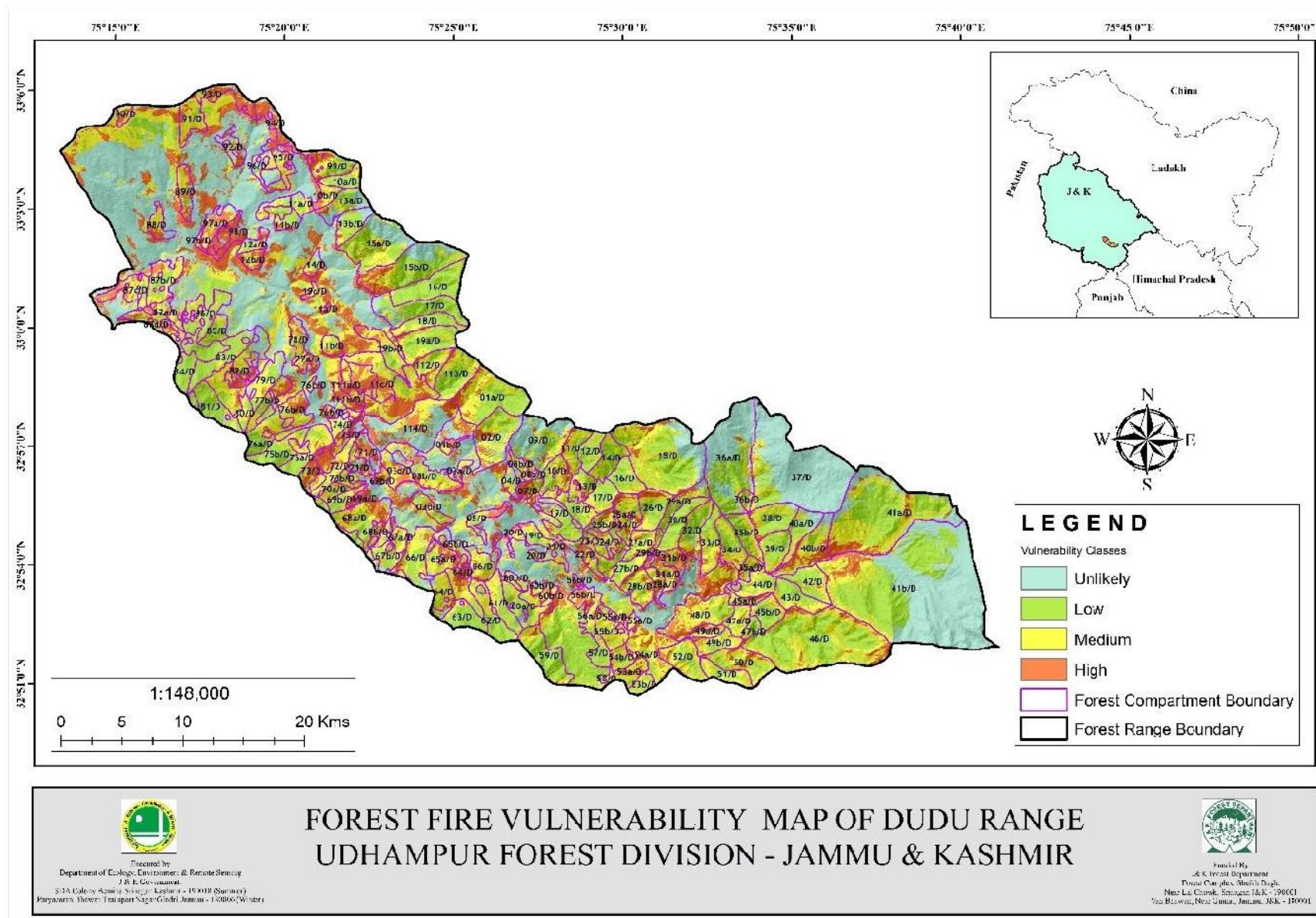
Fig. 81: Forest Fire Vulnerability Map of Dudu Range Udhampur Forest Division Jammu & Kashmir

Table.75. Compartments of Dudu Range Udhampur Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area (Sq Kms)	Percentage
Dudu	Unlikely	37/D,36a/D,09/D,114/D,13a/D,41b/D,92/D	7	69.68	20.38
	Low	38/D,42/D,39/D,46/D,35b/D,32/D,30/D,26/D,13/D,12/D,14/D,16/D,17/D,18/D,113/D,01a/D,19a/D,15b/D,13b/D,15a/D,10a/D,43/D,45b/D,47b/D,60a/D,61/D,62/D,63/D,81/D,84/D,83/D,85/D,86/D,59/D,57/D,75b/D,75a/D,76a/D,41a/D,29a/D,19/D,27b/D & 40a/D	43	127.94	37.42
	Medium	88/D,40b/D,35a/D,34/D,33/D,28b/D,27a/D,15/D,10/D,11/D,23/D,06/D,05/D,08b/D,03d/D,03b/D,02/D,19c/D,11a/D,11b/D,19b/D,112/D,91/D,90/D,95/D,96/D,45a/D,47a/D,48/D,52/D,50/D,51/D,49a/D,49b/D,53a/D,53b/D,64/D,66/D,67a/D,67b/D,65b/D,65a/D,68a/D,69b/D,80/D,79/D,78/D,87c/D,87b/D,87a/D,82/D,87d/D,58/D,55b/D,54b/D,56a/D,72/D,70a/D,44/D,74/D,11c/D,03c/D,60b/D,68b/D,77b/D,22/D,21/D,20/D,54a/D,55a/D,25a/D,25b/D,04/D,24/D,03a/D,08a/D,28a/D,29b/D,36b/D,70b/D,76b/D & 10b/D	82	122.79	35.92
	High	31a/D,07/D,01b/D,12a/D,12b/D,97a/D,98/D,89/D,99/D,56b/D,71/D,73/D,94/D,93/D,77a/D,69a/D,31b/D,97b/D,111b/D & 111a/D	20	21.47	6.28
Total			152	341.88	100.00

Dudu Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	69.68
Low:	127.94
Medium:	122.79
High:	21.47
Total	341.88
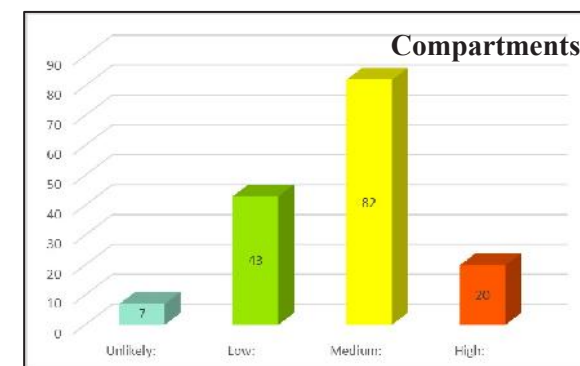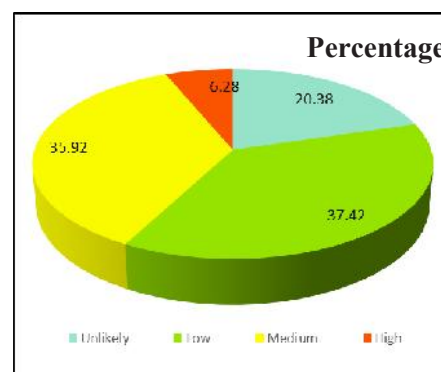
3.2.18.2 Pancheri Range
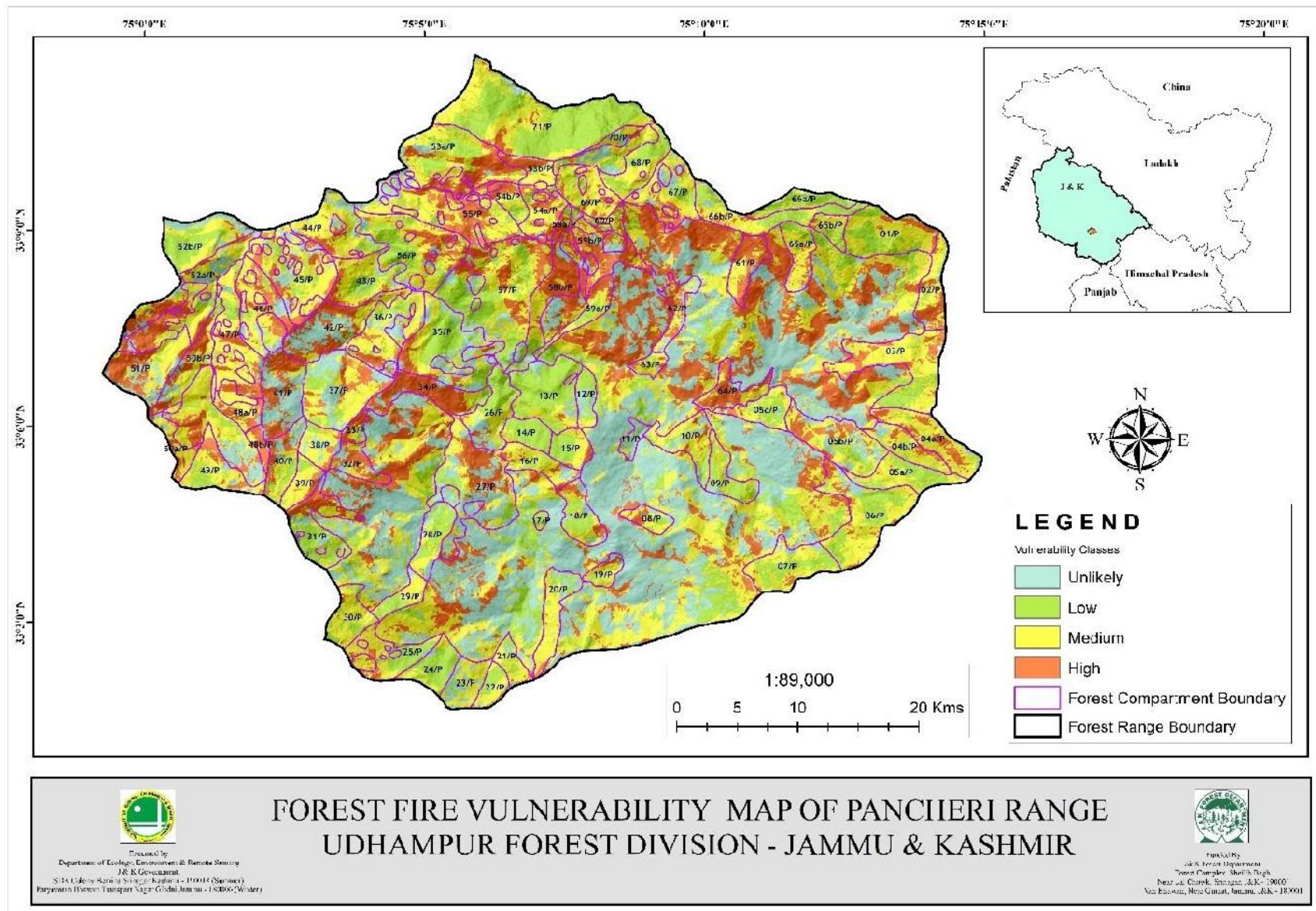
Fig. 82: Forest Fire Vulnerability Map of Pancheri Range Udhampur Forest Division Jammu & Kashmir

Table.76. Compartments of Pancheri Range Udhampur Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Pancheri	Unlikely	11/P,27/P & 41/P	3	7.49	4.85
	Low	66a/P,66b/P,09/P,12/P,15/P,14/P,17/P,24/P,28/P,26/P,31/P,71/P,13/P, 35/P,57/P & 05a/P	16	37.51	24.27
	Medium	37/P,65b/P,01/P,02/P,03/P,05b/P,06/P,07/P,08/P,10/P,18/P,16/P,19/P, 20/P,21/P,50b/P,30/P,25/P,23/P,22/P,29/P,38/P,39/P,44/P,43/P,40/P,4 5/P,46/P,49/P,53a/P,54a/P,68/P,69/P,60/P,67/P,04a/P,04b/P,36/P,56/ P,55/P,52b/P,52a/P,65a/P,63/P,54b/P,53b/P,48a/P,05c/P,70/P,47/P,50 a/P & 59a/P	52	92.67	59.96
	High	61/P,51/P,32/P,34/P,42/P,58b/P,64/P,62/P,58a/P,48b/P,33/P & 59b/P	12	16.90	10.93
		Total	**83**	**154.56**	**100.00**

Pancheri Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	7.49
Low:	37.51
Medium:	92.67
High:	16.90
Total	154.56
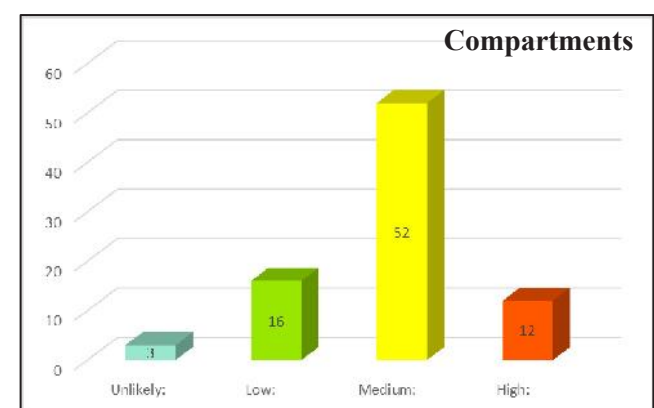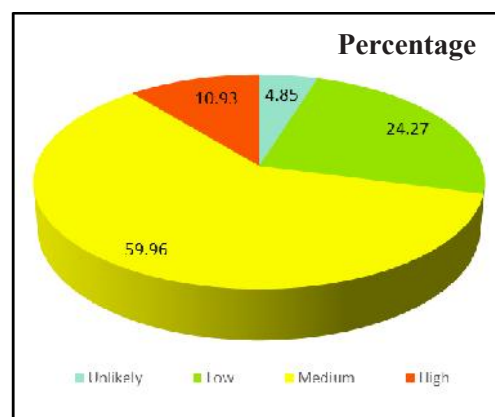
3.2.18.3 Udhampur Range

Fig. 83: Forest Fire Vulnerability Map of Udhampur Range Udhampur Forest Division Jammu & Kashmir

Table.77. Compartments of Udhampur Range Udhampur Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Classes	Compartment Name	Number of Compartments	Area(Sq Kms)	Percentage
Udhampur	Unlikely	15/U,14/U,95b/U,77/U,69b/U,69a/U,74ab/U & 78/U	8	26.45	15.71
	Low	71/U,03/U,02a/U,13a/U,13b/U,07/U,04/U,05/U,85a/U,85b/U,86a/U,87a/U,87b/U,98/U,96/U,84a/U,84b/U,82/U,83/U,81/U & 79a/U	21	25.64	15.23
	Medium	72/U,02b/U,10/U,12a/U,12b/U,11/U,09/U,08a/U,08b/U,06/U,16/U,19b/U,17a/U,17b/U,19a/U,Kotli,88/U,89/U,90/U,91/U,93/U,94/U,97/U,99/U,76/U,80/U,79b/U,36/U,35/U,42a/U,42b/U,40/U,46/U,47/U,48/U,49/U,50/U,51/U,52/U,53a/U,53b/U,53c/U,60/U,55b/U,57b/U,57a/U,58b/U,61/U,63/U,62/U,64a/U,67/U,44/U,Nehranal,Tandeh,18/U,70a/U,01/U & 86b/U	59	77.49	46.02
	High	73a/U,92/U, Thanoa, 95a/U,75/U,37/U,38b/U,34/U,39/U,41/U,43/U,59/U,55a/U,54/U,56a/U,58a/U,64b/U,65/U,66/U,68/U,45/U, Sansoo, Jaghanoo,38a/U,19c/U,70b/U,73b/U & 56b/U	28	38.79	23.04
		Total	**116**	**168.37**	**100.00**

Udhampur Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	26.45
Low:	25.64
Medium:	77.49
High:	38.79
Total	168.37

Percentage
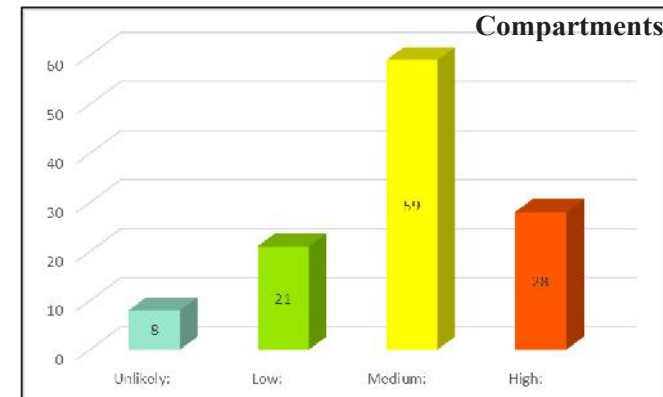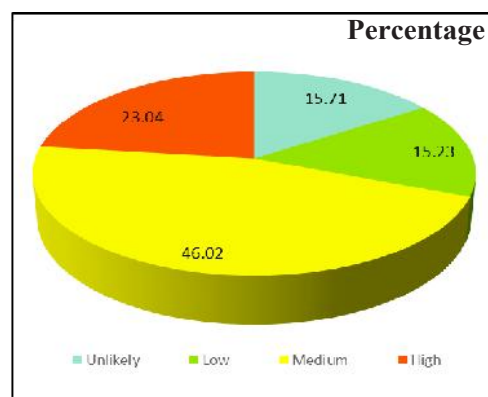
Compartments

KASHMIR PROVINCE

FOREST DIVISIONS OF KASHMIR PROVINCE.
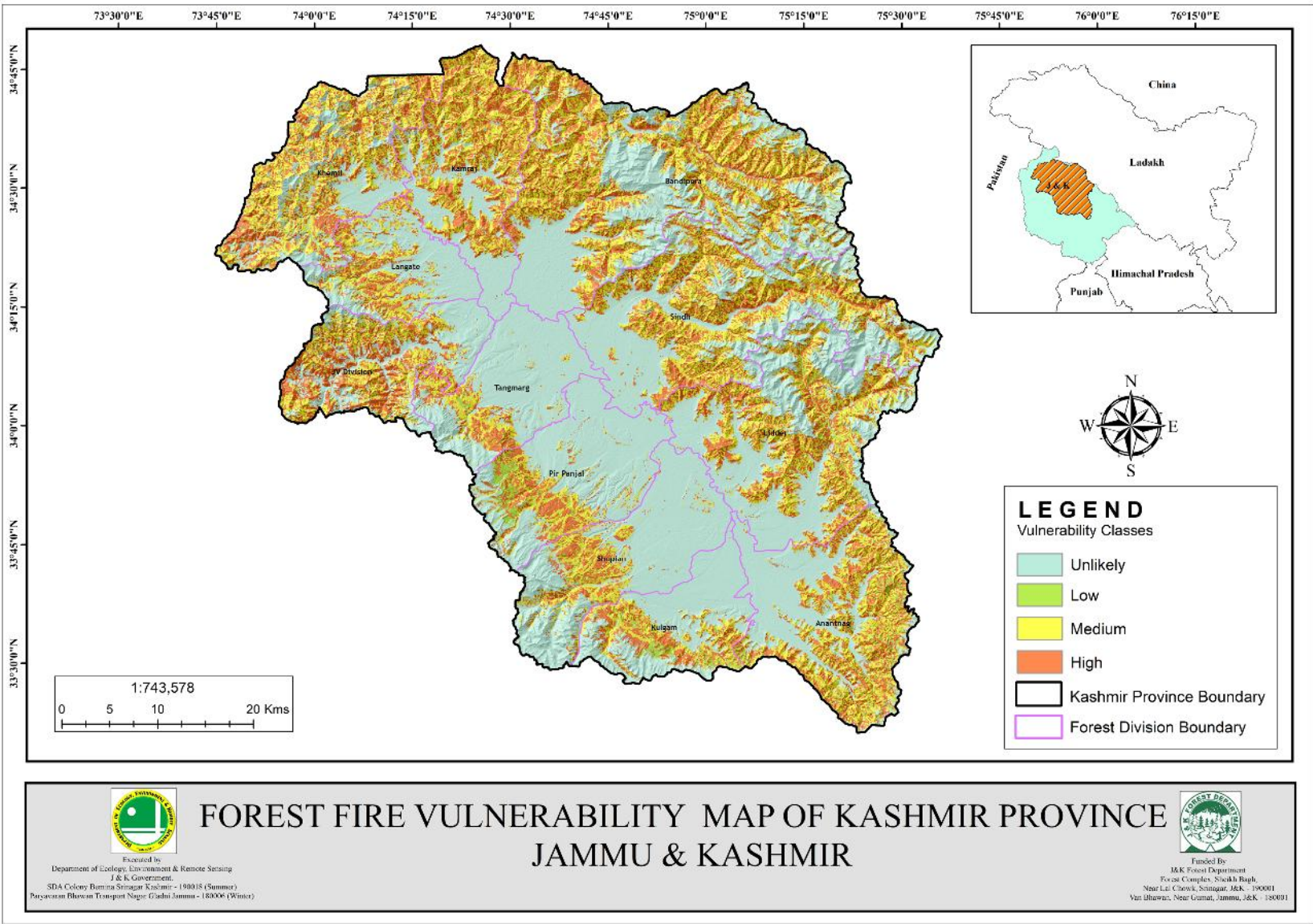
Fig. 84: Forest Fire Vulnerability Map of Kashmir Province Jammu & Kashmir

Table.78. Compartments of Forest Divisions of Kashmir Province under Different Vulnerability Classes.

Division Name	Unlikely Vulnerability		Low Vulnerability		Medium Vulnerability		Low Vulnerability	
	No of Compartments	Area Sq Kms	No of Compartments	Area Sq Kms	No of Compartments	Area Sq Kms	No of Compartments	Area Sq Kms
Anantnag	50	630.2	52	485.07	162	1153.78	31	1597.61
Bandipora	77	1586.68	54	436.7	114	314.81	19	58.89
JV	39	133.01	95	299.06	39	91.2	3	13.45
Kamraj	62	158.71	101	239.19	167	455.87	14	37.49
Khemil	56	225.37	11	23.01	70	450.42	36	78
Kulgam	21	226.93	29	98.79	30	92.85	6	18.51
Langate	29	129.76	0	0	112	181.34	53	59.21
Lidder	51	959.24	0	0	149	649.84	3	2.99
Pir Panjal	18	211.03	37	114.08	30	70.17	3	4.47
Shopian	25	380.24	28	84.67	35	89.88	1	1.67
Sindh	24	838.69	42	116.91	71	309.65	3	3.65
Tangmarg	22	166.59	9	23.02	44	102.09	14	17.69
Total	**474**	**5646.45**	**458**	**1920.5**	**1023**	**3961.9**	**186**	**1893.63**

Kashmir Province	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	5646.45
Low:	1920.5
Medium:	3961.9
High:	1893.63
Total	**13422.48**

Percentage

Compartments

FOREST FIRE RISK ZONATION & VULNERABILITY ASSESSMENT FORESTS OF JAMMU & KASHMIR
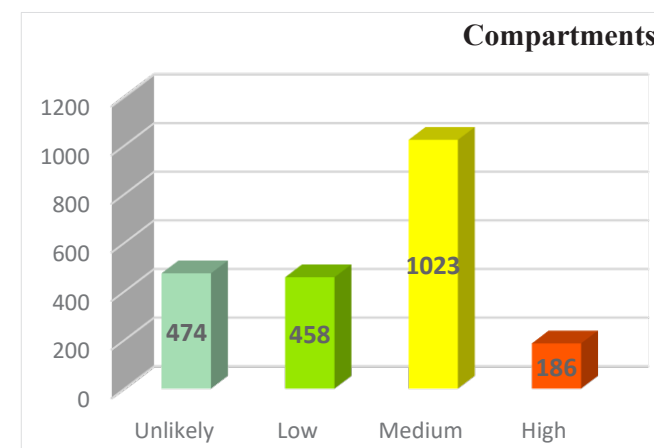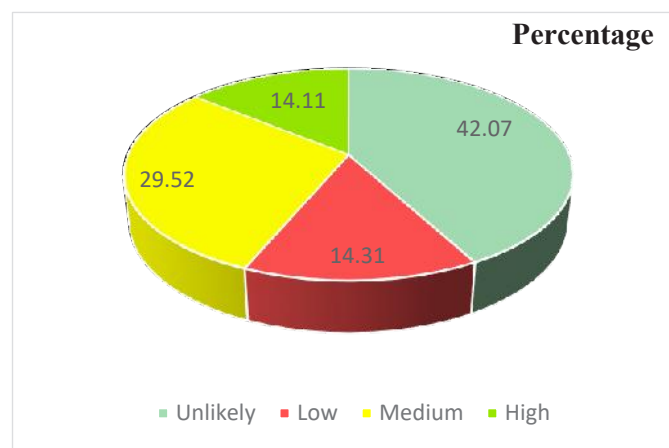
3.3.1 ANANTNAG FOREST DIVISION

The anantnag forest division lies between 33° 21' 56.63''N to 33° 50'49.13" North Latitude and 75° 04'04.60" E to 75° 32'06.59" East Longitude. The average elevation of the division lies between 1000 meters to 2300 meters. Anantnag forest division ranges include, Daksum, Kuthar, Verinag, Qazigund, Kokernag and Mattan.The total area (on GIS Platform) of 309 compartments of six territorial ranges is 3,888.7 Km .[2]
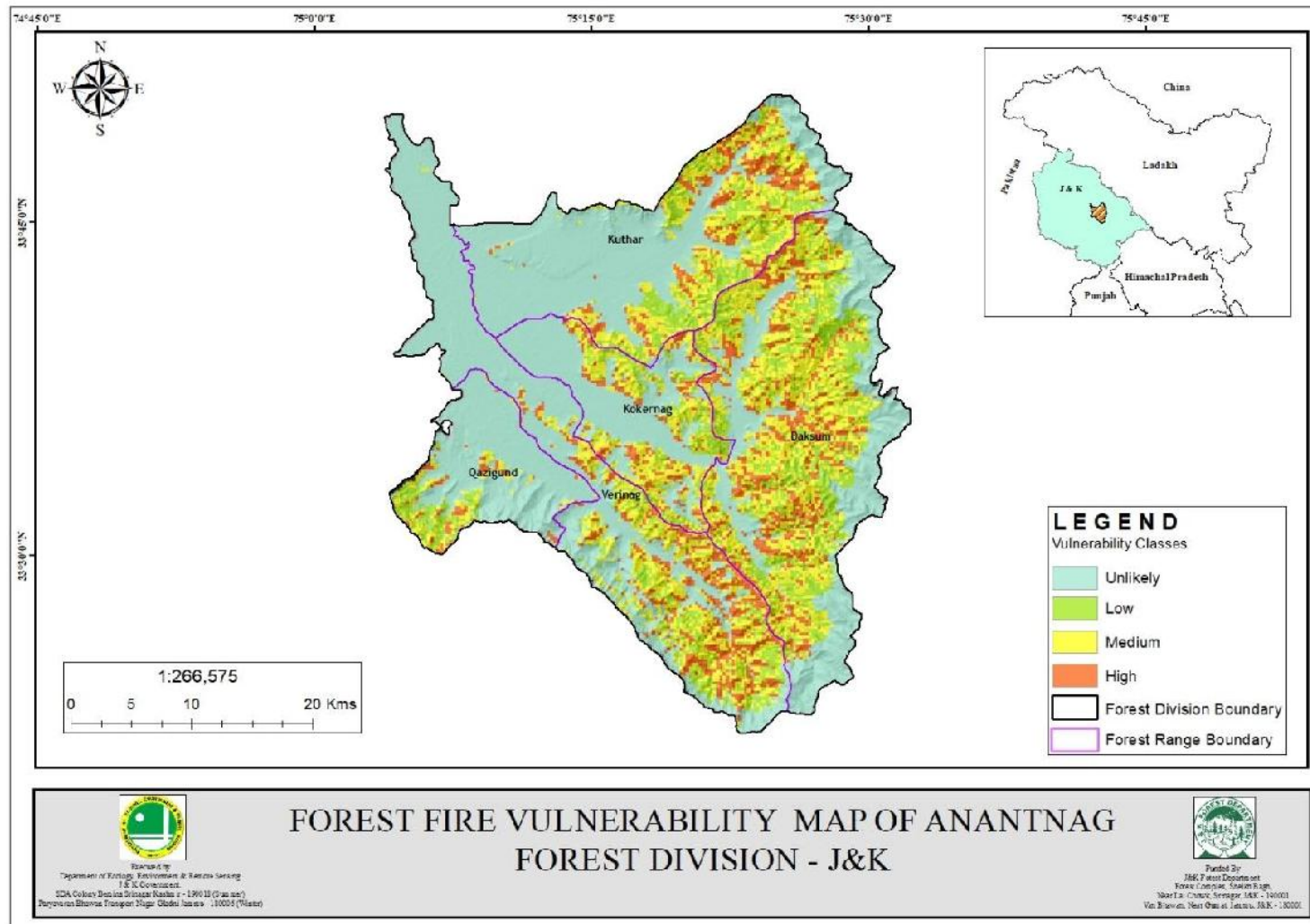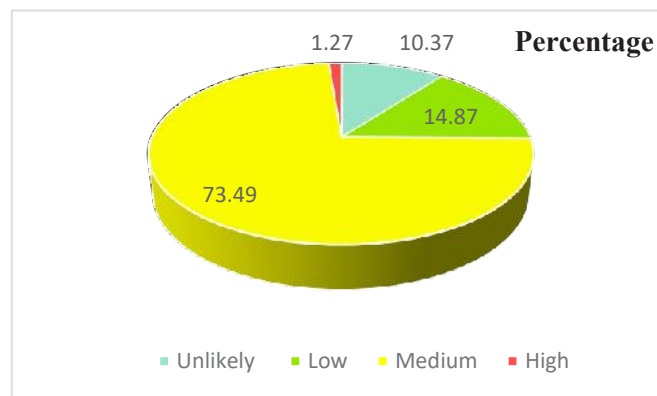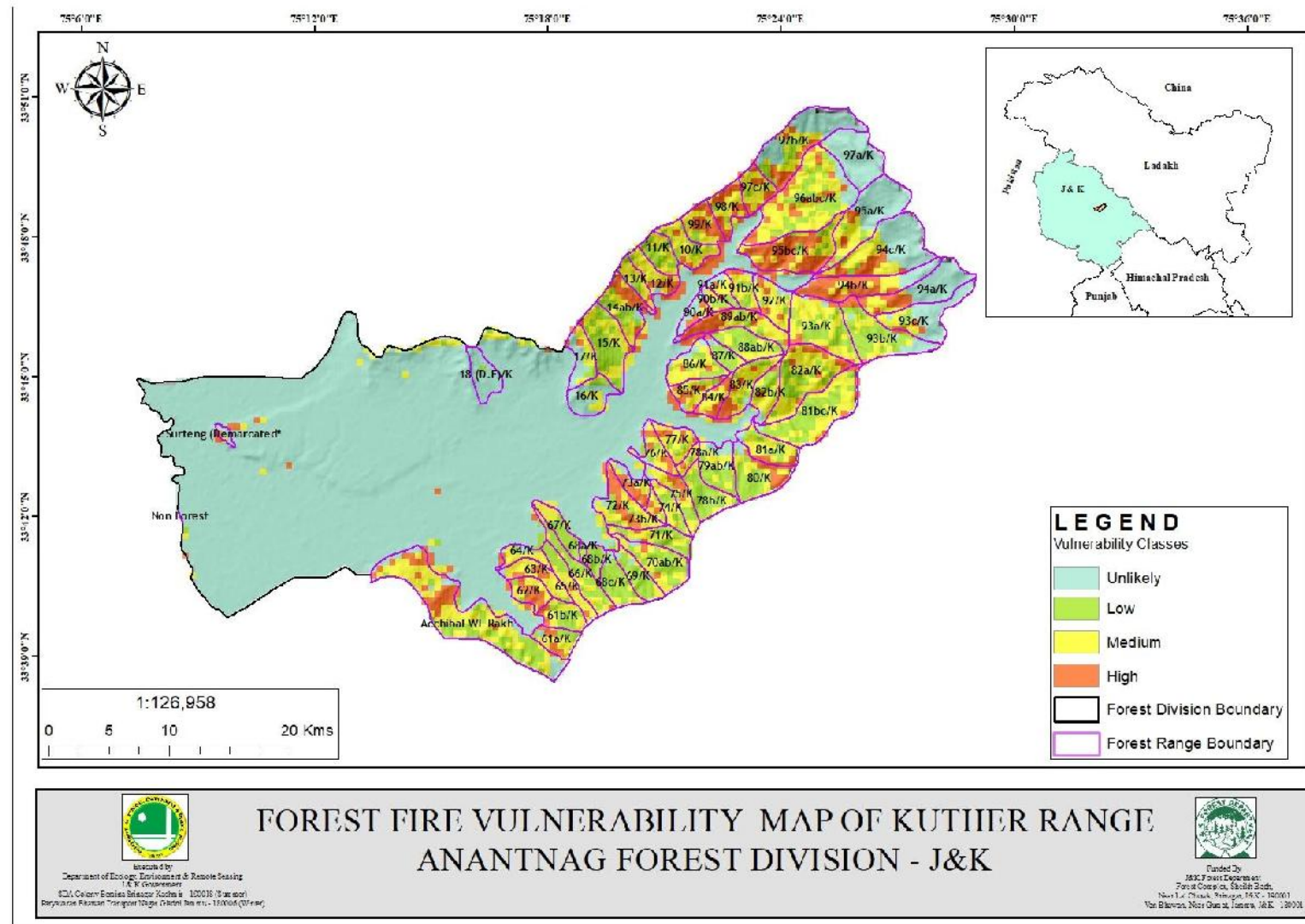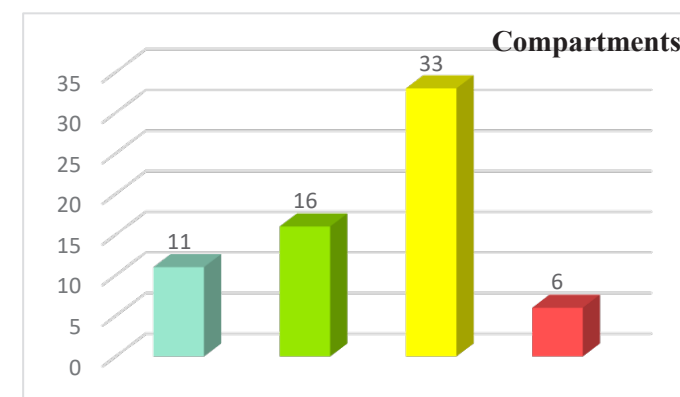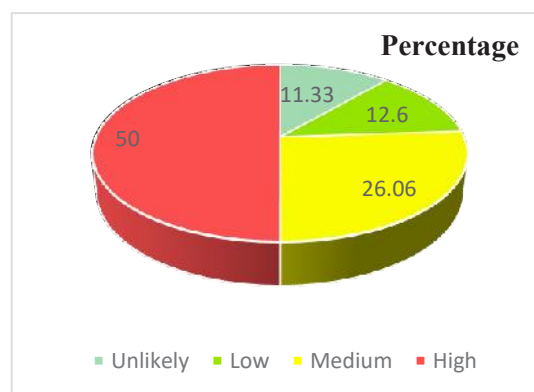

Fig. 85: Forest Fire Vulnerability Map of Anantnag Forest Division Jammu & Kashmir

Table.79. Compartments of Anantnag Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Anantnag Forest Division	Daksum	Unlikely	18	96.06	24.50
		Low	19	51.12	13.04
		Medium	73	226.54	57.78
		High	10	18.40	4.69
		Total	**120**	**392.11**	**100.00**
	Kokernag	Unlikely	1	6.96	10.37
		Low	5	9.98	14.87
		Medium	23	49.34	73.49
		High	1	0.85	1.27
		Total	**30**	**67.14**	**100.00**
	Kuthar	Unlikely	11	350.85	11.33
		Low	16	390.27	12.60
		Medium	33	806.82	26.06
		High	6	1547.94	50.00
		Total	**66**	**3095.89**	**100.00**
	Qazigund	Unlikely	15	26.80	54.04
		Low	4	18.00	36.29
		Medium	1	4.79	9.66
		High	NA	NA	NA

		Total	20	49.60	100.00
		Unlikely	19	171.54	60.41
		Low	8	15.70	5.52
	Verinag	Medium	32	66.29	23.34
		High	14	30.42	10.71
		Total	73	283.96	100.00

Anantnag Forest Division — Area

Vulnerability Classes	Area(Sq Kms)
Unlikely:	651.94
Low:	647.28
Medium:	1153.78
High:	1597.59
Total	3,888.7

Percentage
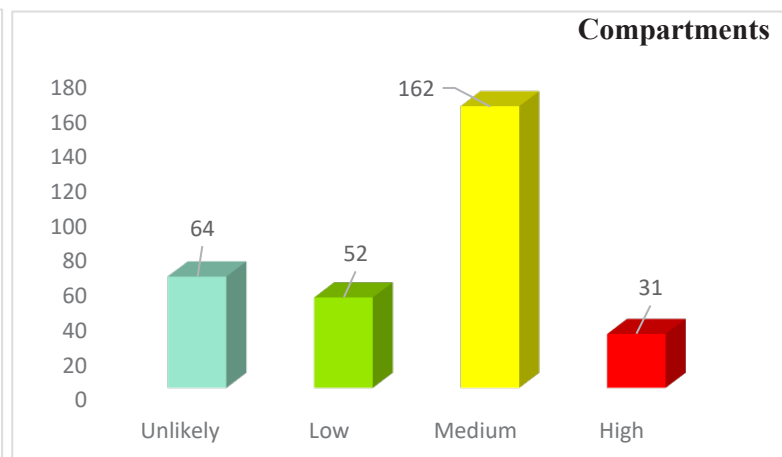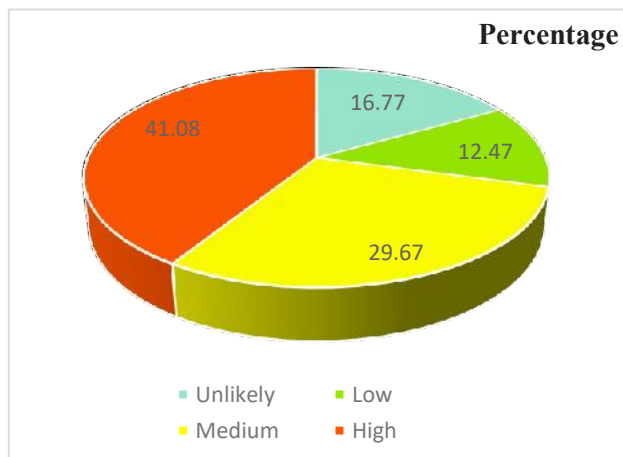
Compartments
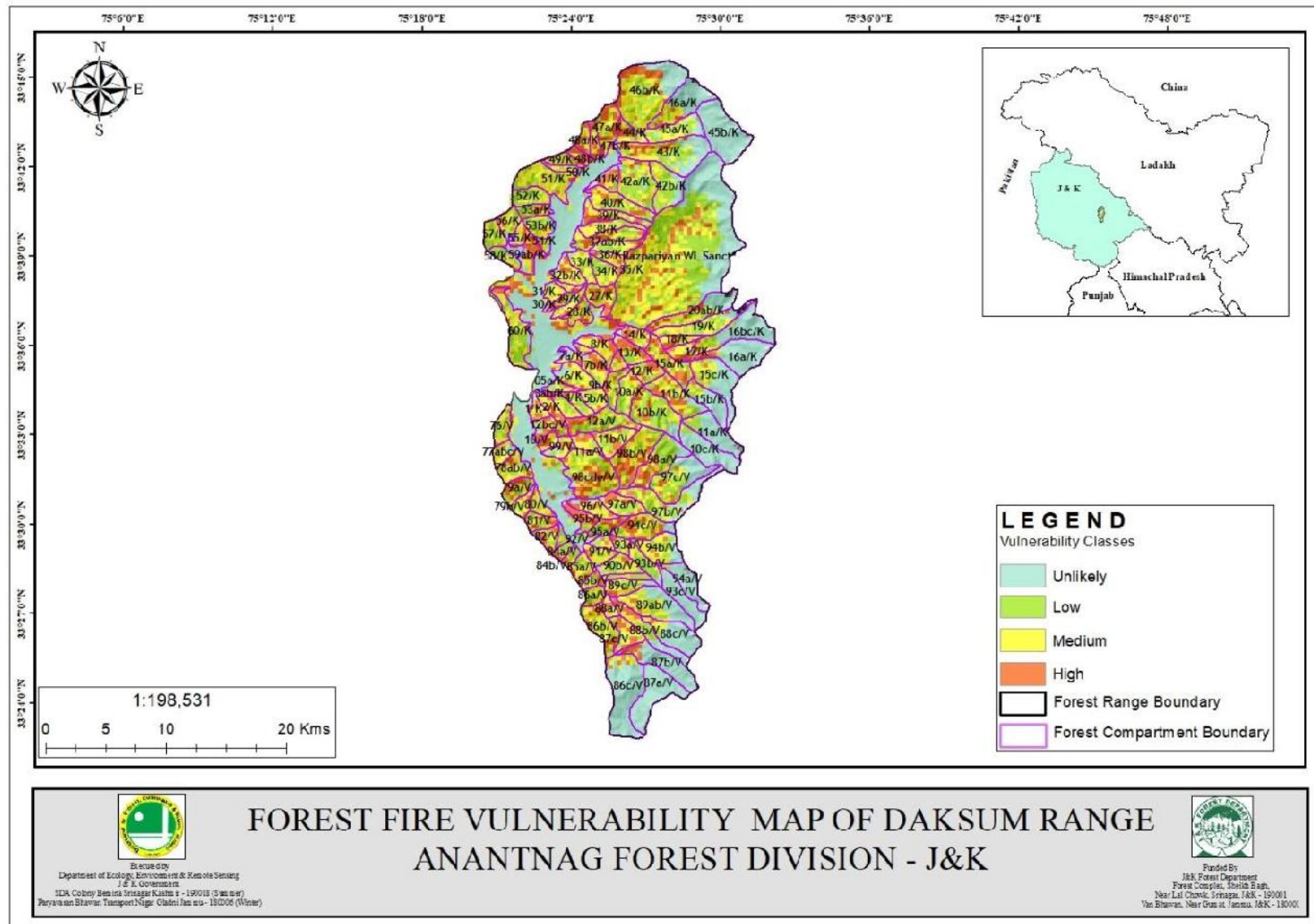
3.3.1.1 Daksum Range

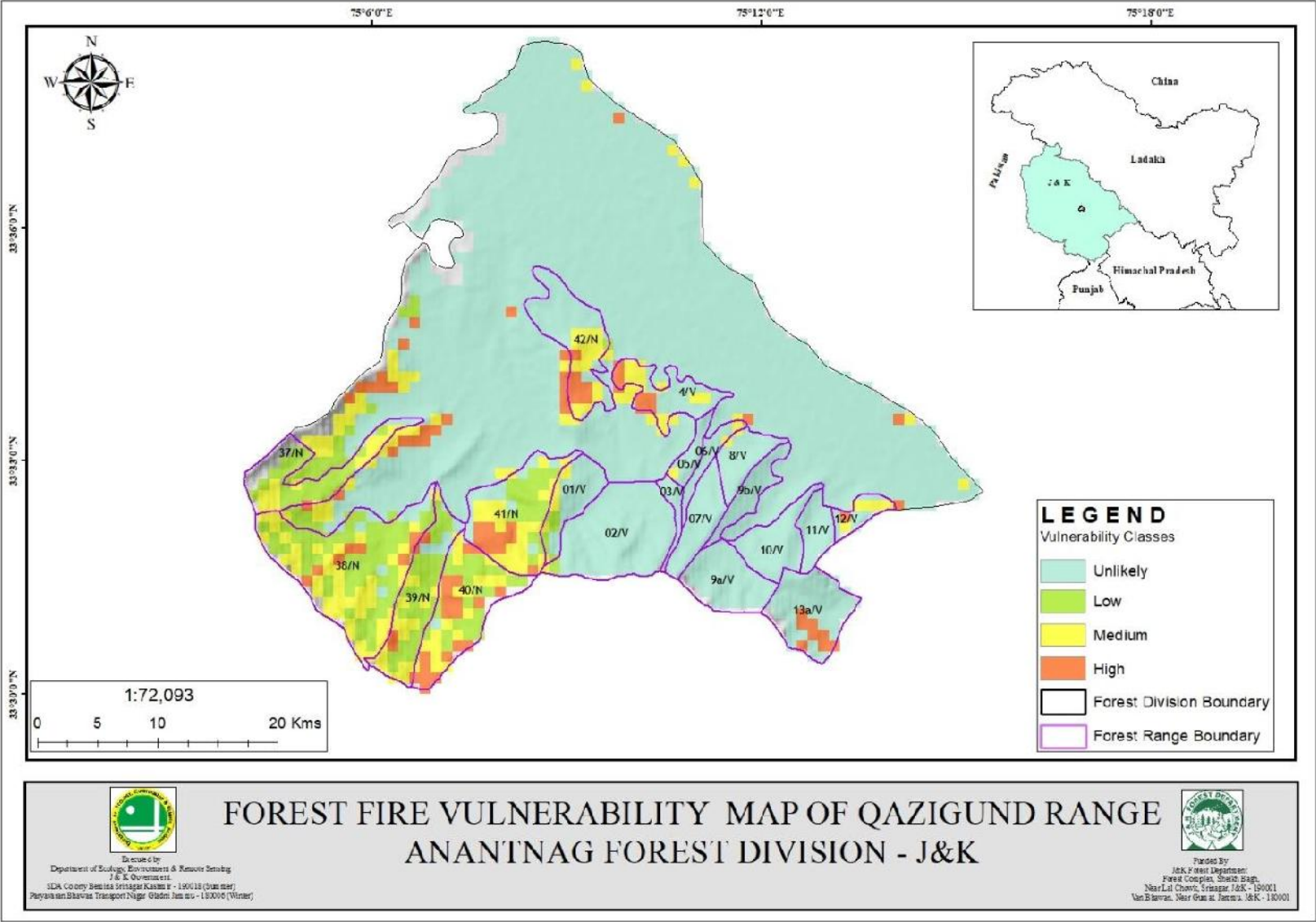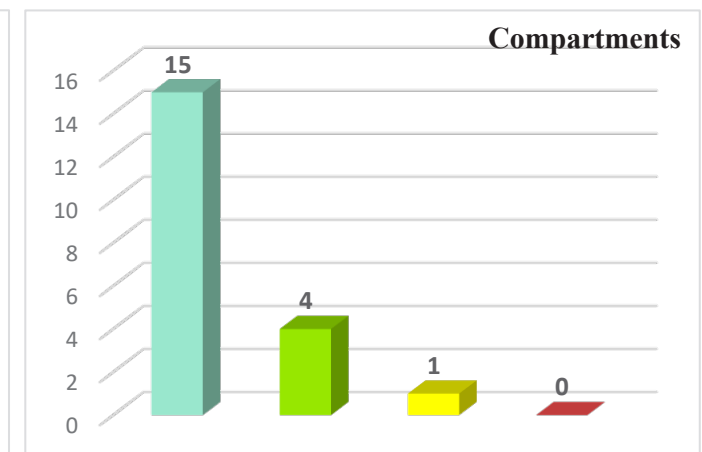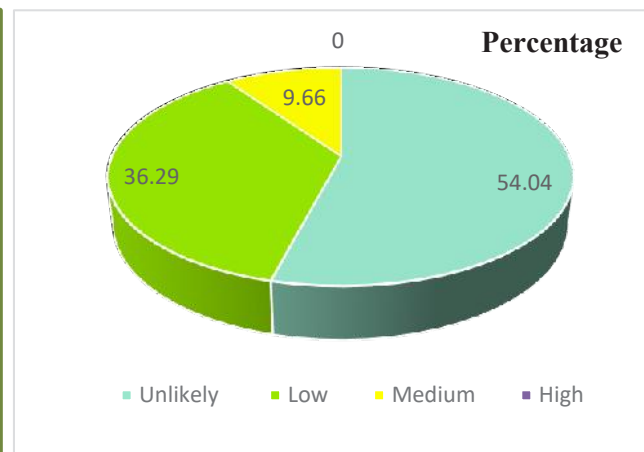

Fig. 86: Forest Fire Vulnerability Map of Daksum Range Anantnag Forest Division Jammu & Kashmir

Table.80. Compartments of Daksum Range Anantnag Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area Sq. Km	Percentage
Daksum	Unlikely	88c/V,87b/V,86c/V,93c/V,94a/V,16bc/K,45b/K,43/K,89ab/V,88b/V,10c/K,11a/K,15b/K,15c/K,16a/K,46a/K,87a/V & 97c/V	18	96.06	24.50
	Low	84a/V,83/V,97b/V,3ab/K,12a/V,10b/K,12/K,42a/K,36/K,52/K,58/K,42b/K,84b/V,85b/V,90ac/V,93b/V,95a/V,98a/V & 53a/K	19	51.12	13.04
	Medium	RazpariyanWLSanct*,85a/V,91/V,90b/V,94c/V,94b/V,81/V,80/V,79a/V,78ab/V,77abc/V,56/K,60/K,92/V,98cde/V,96/V,11b/V,99/V,6/K,5b/K,4/K,2/K,8/K,7b/K,11b/K,20ab/K,14/K,35/K,34/K,33/K,32b/K,27/K,28/K,29/K,30/K,31/K,46b/K,40/K,39/K,38/K,37ab/K,48a/K,47a/K,50/K,49/K,51/K,54/K,53b/K,55/K,57/K,44/K,1/K,9b/K,76/V,88a/V,05a/K,7a/K,10a/K,17/K,32a/K,45a/K,79b/V,86a/V,86b/V,87c/V,89c/V,93a/V,97a/V,98b/V,11a/V,10/V,18/K &19/K	73	226.54	57.78
	High	82/V,95b/V,13/K,15a/K,41/K,59ab/K,9a/K,12bc/V,47b/K & 48b/K	10	18.40	4.69
Total			120	392.11	100.00

Daksum Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	96.06
Low:	51.12
Medium:	226.54
High:	18.40
Total	**392.11**

Percentage
- Unlikely 24.5
- Low 13.04
- Medium 57.78
- High 4.69

Compartments
- Unlikely 18
- Low 19
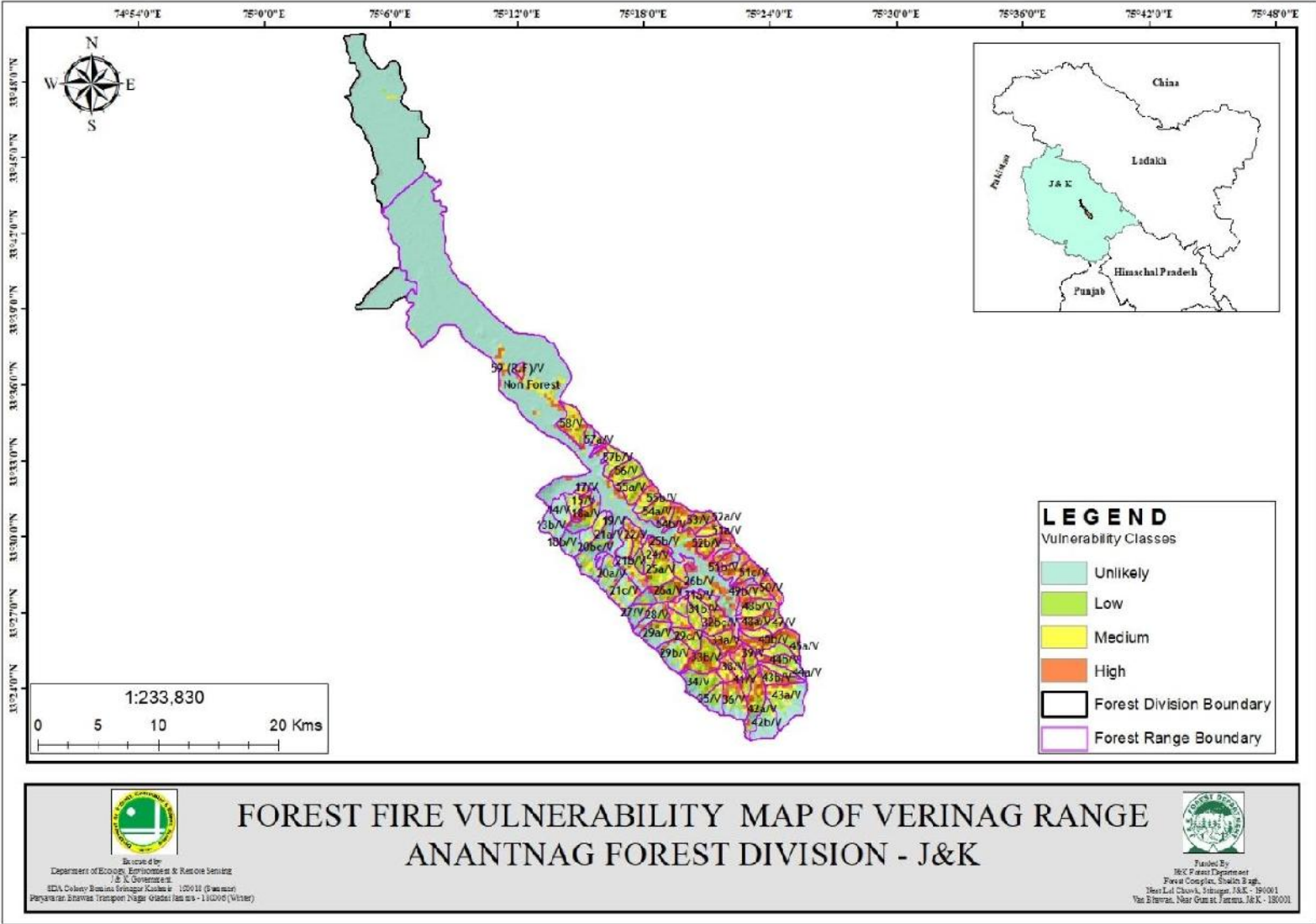- Medium 73
- High 10
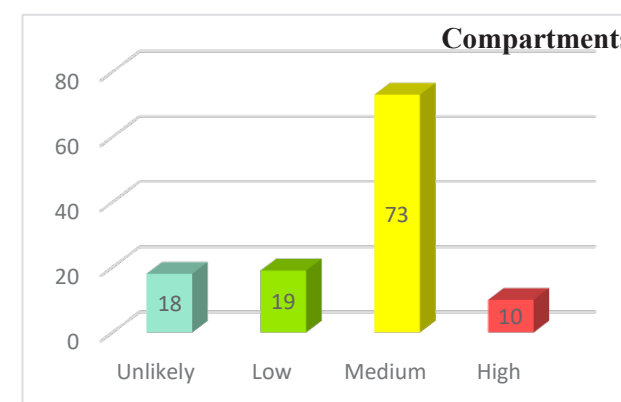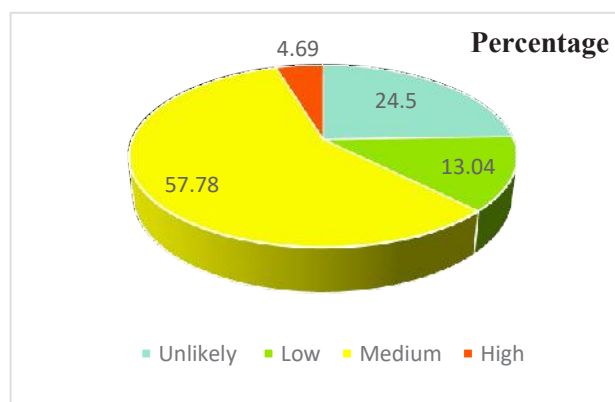
3.3.1.2 Kokernag Range
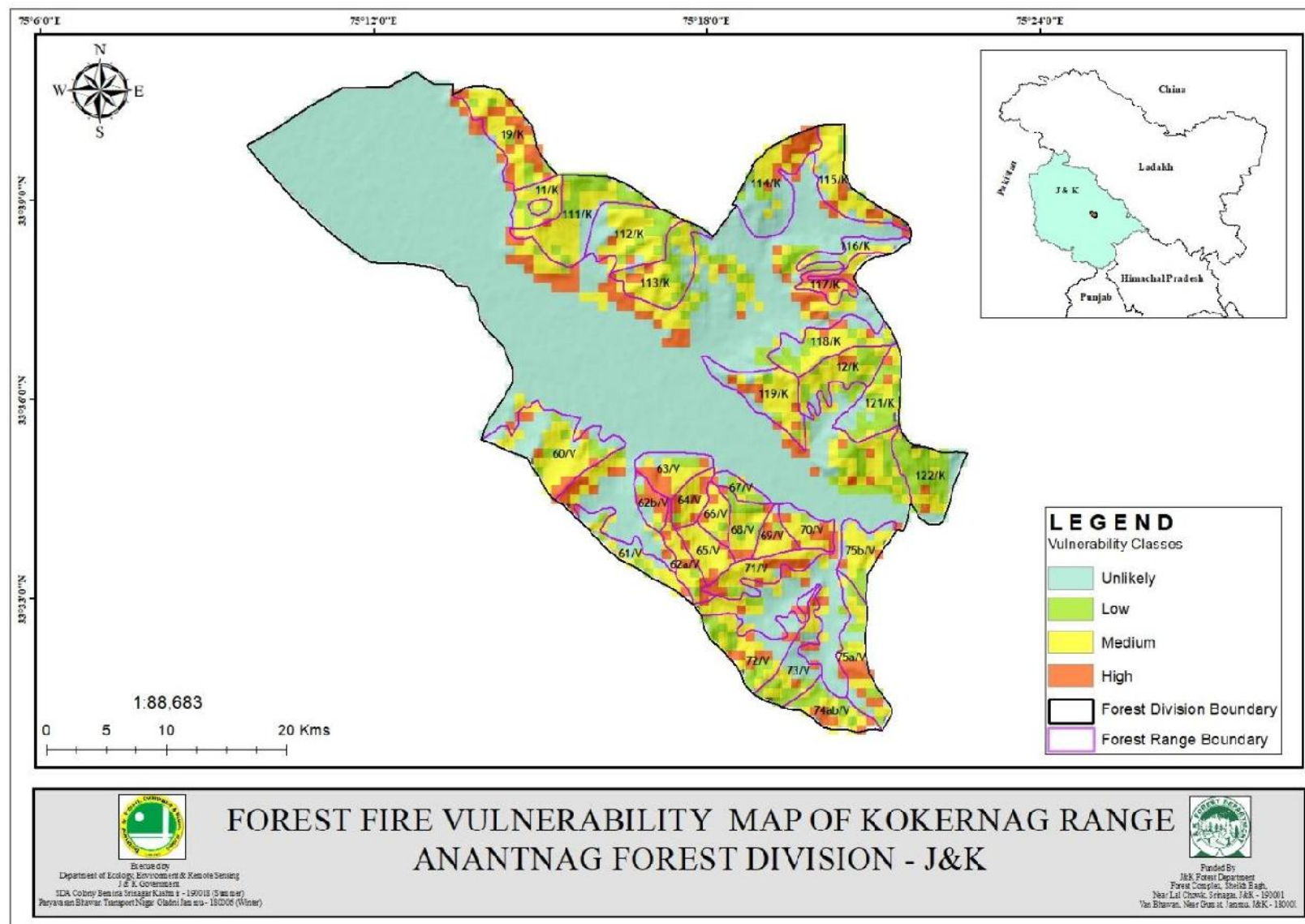
Fig. 87: Forest Fire Vulnerability Map of Kokernag Range Anantnag Forest Division Jammu & Kashmir

Table.81. Compartments of Kokernag Range Anantnag Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area Sq Km	Percentage
Kokernag	Unlikely	114/K,116/K,73/V	1	6.94	10.37
	Low	121/K,12/K,67/V,74ab/V,122/K	5	9.86	14.87
	Medium	115/K,113/K,112/K,11/K,19/K,111/K,117/K,118/K,72/V,65/V,71/V,70/V,69/V,68/V,66/V,63/V,62a/V,64/V,75a/V,61/V,60/V,75b/V,119/K	23	49.34	73.49
	High	62b/V	1	0.85	1.27
Total			30	67.14	100.00

Kokernag Range **Area**

Vulnerability Classes	Area(Sq Kms)
Unlikely:	6.94
Low:	9.86
Medium:	49.34
High:	0.85
Total	**67.14**

Percentage pie chart: 1.27, 10.37, 14.87, 73.49 — Unlikely, Low, Medium, High

Compartments bar chart: 1, 5, 23, 1
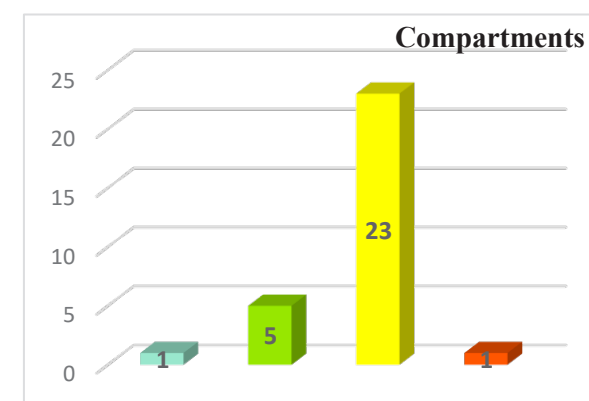
3.3.1.3 Kuthar Range

Fig. 88: Forest Fire Vulnerability Map of Kuther Range Anantnag Forest Division Jammu & Kashmir

Table.82. Compartments of Kuthar Range Anantnag Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area Sq. Km	Percentage
Kuthar	Unlikely	97a/K,97b/K,16/K,17/K,94c/K,90a/K,93c /K,94a/K,18(D.F)/K, Surteng (Demarcated*,95a/K	11	350.85	11.33
	Low	15/K,80/K,81bc/K,87/K,88ab/K,93b/K,6 1b/K,66/K,67/K,68a/K,68b/K,68c/K,69/ K,71/K,79ab/K,78b/K	16	390.27	12.60
	Medium	96abc/K,97c/K,14ab/K,13/K,12/K,11/K,1 0/K,81a/K,82b/K,83/K,84/K,85/K,86/K,8 9ab/K,90b/K,91a/K,91b/K,92/K,93a/K,63 /K,64/K,65/K,70ab/K,72/K,73b/K,75/K,7 6/K,77/K,Acchibal WL Rakh,74/K,61a/K,78a/K,82a/K	33	806.82	26.06
	High	98/K,99/K,94b/K,62/K,73a/K,95bc/K	6	1547.94	50.00
Total			66	3095.89	100.00

Anantnag Forest Division	Area
Vulnerability Classes	**Area (Sq Kms)**
Unlikely:	350.85
Low:	390.27
Medium:	806.82
High:	1547.94
Total	**3095.89**

3.3.1.4 Qazigungd Range

Fig. 89: Forest Fire Vulnerability Map of Qazigund Range Anantnag Forest Division Jammu & Kashmir

Table.83. Compartments of Qazigund Range Anantnag Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area Sq.Km	Percentage
Qazigund	Unlikely	4/V,13a/V,8/V,9b/V,9a/V, 11/V,10/V,12/V,01/V,02/ V,07/V,06/V,05/V,03/V,4 2/N	15	26.80	54.04
	Low	38/N,40/N,39/N,37/N	4	18.00	36.29
	Medium	41/N	1	4.79	9.66
	High	0	0	0	0
Total			20	49.60	100.00

Qazigund Range Area	
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	26.80
Low:	18.00
Medium:	4.79
High:	0
Total	**49.60**

3.3.1.5 Verinag Range

Fig. 90: Forest Fire Vulnerability Map of Verinag Range Anantnag Forest Division Jammu & Kashmir

Table.83. Compartments of Verinag Range Anantnag Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area Sq. Km	Percentage
Verinag	Unlikely	36/V,43a/V,13b/V,42b/V,35/V,16/V,14/V,18a/V,18c/V,18b/V,20bc/V,21b/V,20a/V,21c/V,29a/V,27/V,28/V,29b/V, Non-Forest	19	171.54	60.41
	Low	45a/V,44b/V,34/V,23/V,30b/V,31a/V,29c/V,44a/V	8	157.02	5.52
	Medium	22/V,40/V,41/V,33b/V,37/V,38/V,39/V,32bc/V,58/V,47/V,46/V,48b/V,57b/V,52b/V,52a/V,53/V,54a/V,55b/V,55a/V,56/V,57a/V,17/V,15/V,19/V,21a/V,24/V,26a/V,26b/V,25a/V,30a/V,32a/V,31b/V	32	66.29	23.34
	High	42a/V,33a/V,45b/V,43b/V,48a/V,49b/V,49a/V,50/V,51c/V,51b/V,51a/V,54b/V,25b/V,59 (R.F)/V	14	30.42	10.71
Total			73	283.96	100.00

Verinag Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	171.54
Low:	157.02
Medium:	66.29
High:	30.42
Total	**283.96**
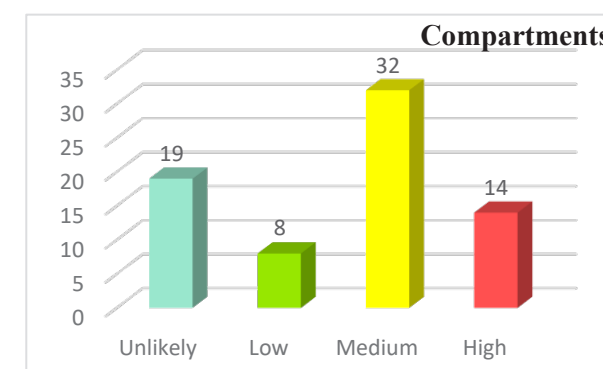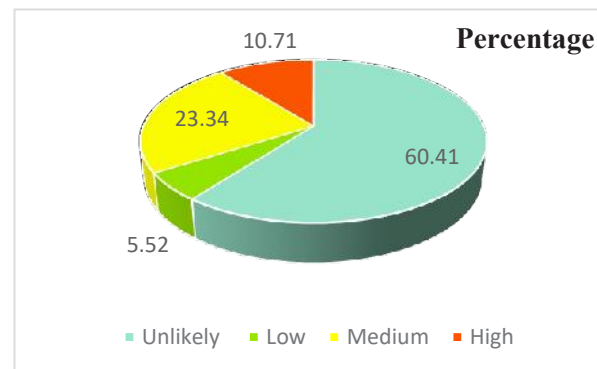
3.3.2 BANDIPORA FOREST DIVISION

The forest division is Located between Latitude-34°.4N, Longitude-74°.6E. The elevation of the forest division ranges between 1581 meters to 1578 meters. Bandipore is situated on the banks of the Wular, the largest fresh-water lake in Asia which is home to a lot of migratory birds. Bandipora forest division includes four ranges namely, Ajas, Gurez, Kuihama and Ningli. The total area (on GIS Platform) of 264 compartments of four territorial ranges is 2,467.12Km. [2]
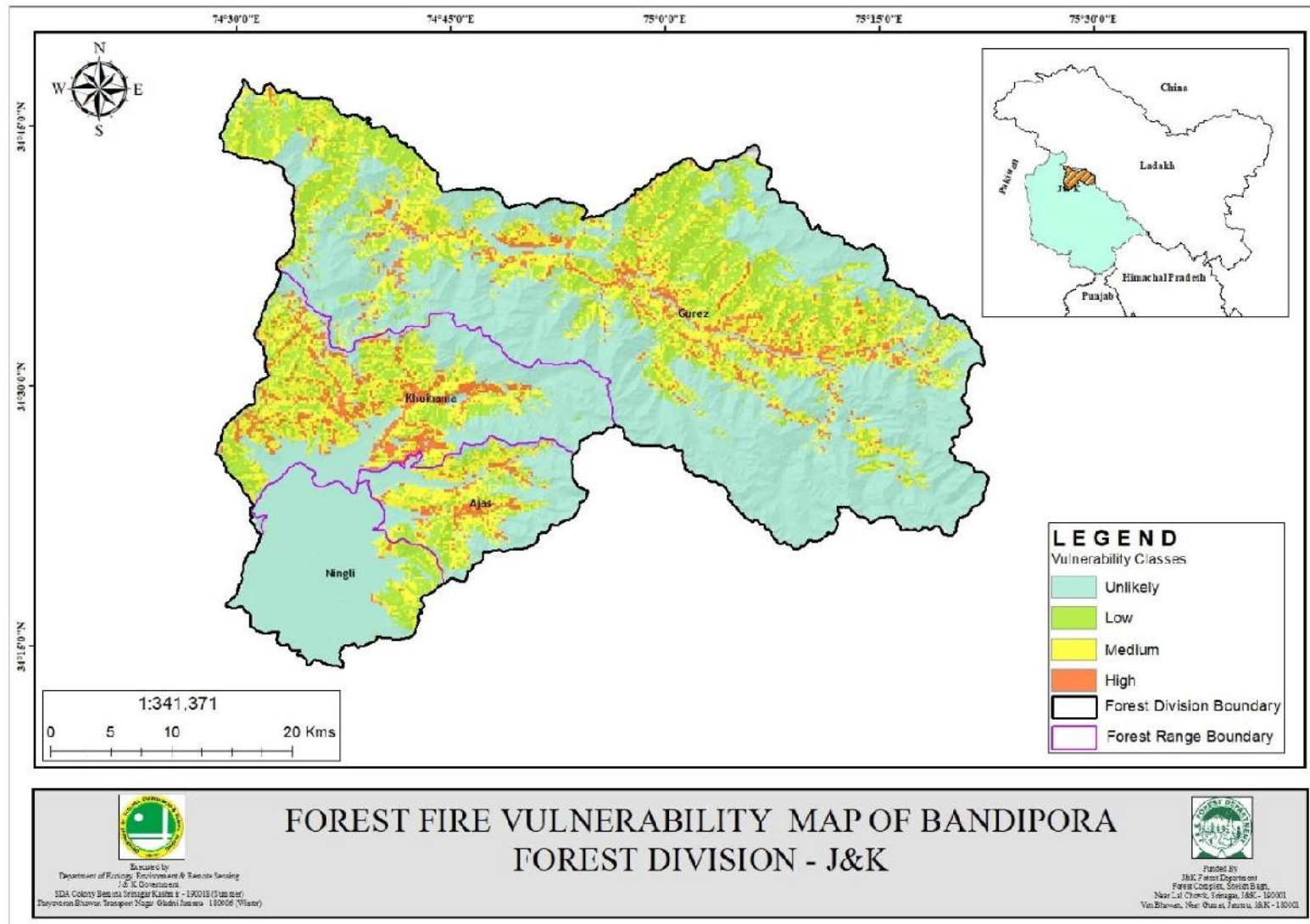
Fig. 91: Forest Fire Vulnerability Map of Bandipora Forest Division Jammu & Kashmir

FOREST FIRE RISK ZONATION & VULNERABILITY ASSESSMENT FORESTS OF JAMMU & KASHMIR

Table.85. Compartments of Bandipora Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Bandipora Forest Division	Ajas	Unlikely	9	118.80	53.64
		Low	9	25.47	11.50
		Medium	22	70.91	32.02
		High	4	6.25	2.82
		Total	**44**	**221.45**	**100.00**
	Gurez	Unlikely	52	1273.16	70.93
		Low	20	333.12	18.56
		Medium	30	118.47	10.50
		High	NA	NA	NA
		Total	**102**	**1794.75**	**100.00**
	Kuihama	Unlikely	16	194.72	43.18
		Low	25	78.11	17.32
		Medium	62	125.43	27.81
		High	15	52.64	11.67
		Total	**118**	**450.92**	**100.00**
		Unlikely	**NA**	**NA**	**NA**
		Low	**NA**	**NA**	**NA**
		Medium	**NA**	**NA**	**NA**

	Ningli	High	NA	NA	NA
		Total	NA	NA	NA

Bandipora Forest Division Area	
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	1586.68
Low:	436.7
Medium:	314.81
High:	58.71
Total	**2467.12**

Percentage

- Unlikely
- Low
- Medium
- High

0.00
17.86
65.16
16.99

Compartments

Unlikely 42
Low 95
Medium 39
High 3

FOREST FIRE RISK ZONATION & VULNERABILITY ASSESSMENT FORESTS OF JAMMU & KASHMIR
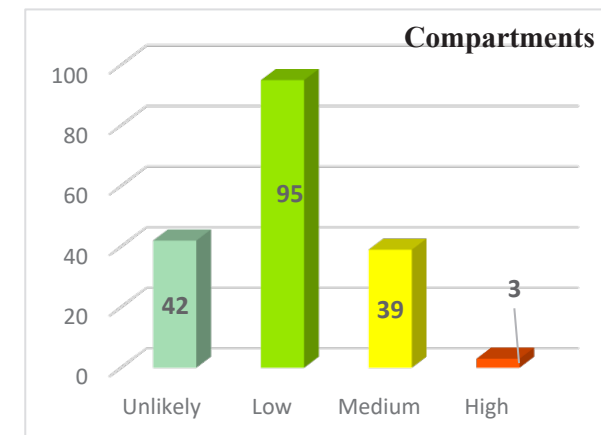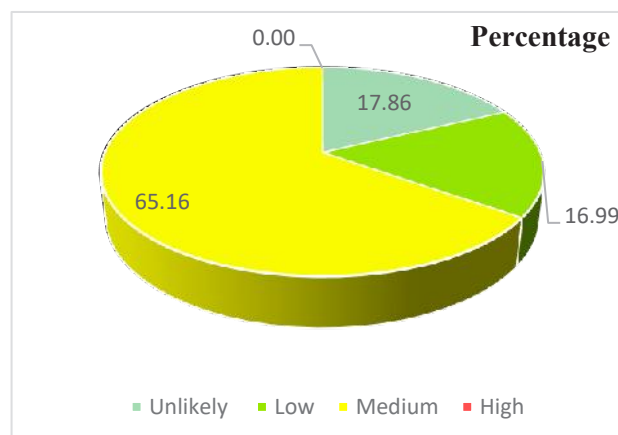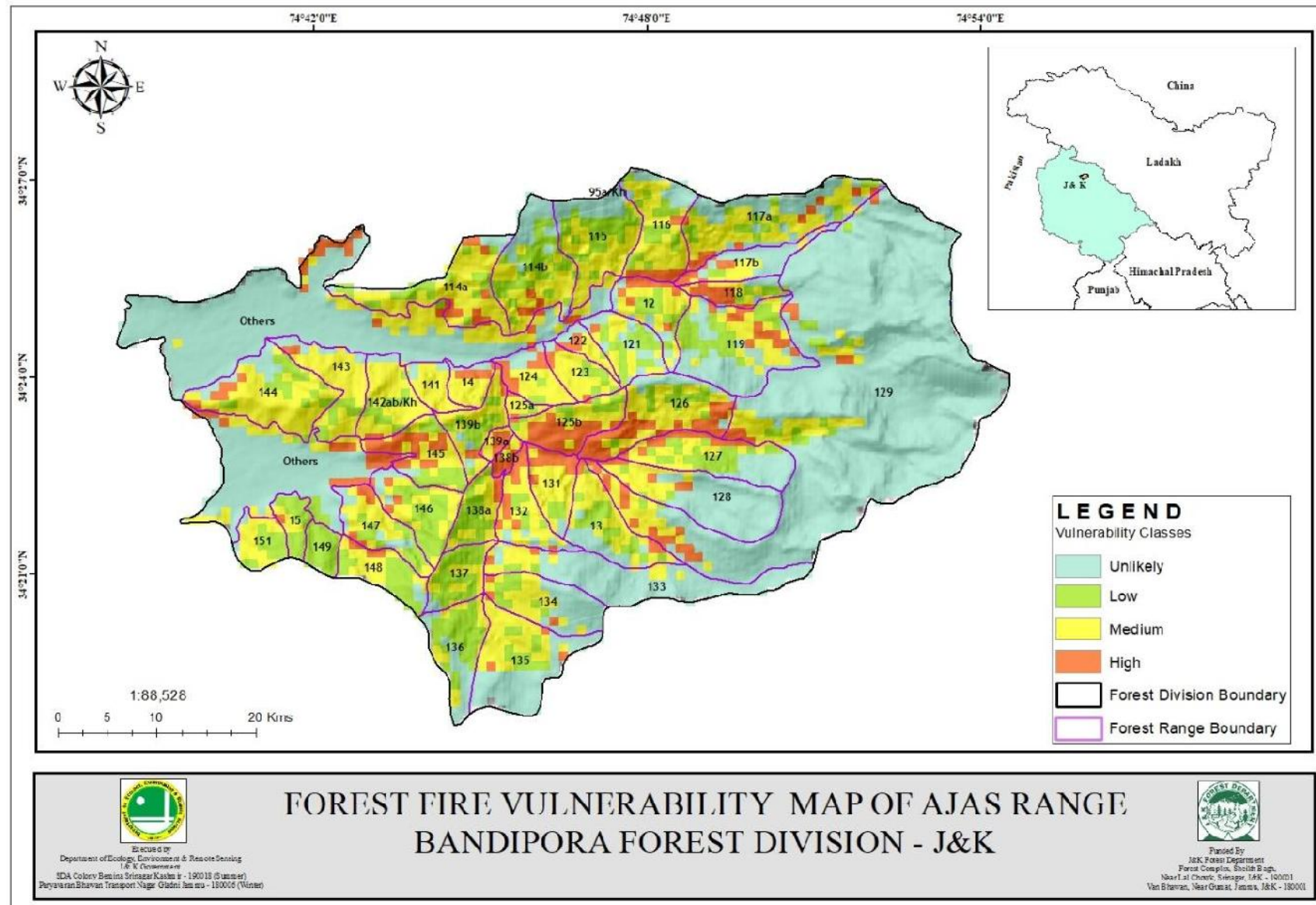
3.3.2.1 Ajas Range

Fig. 92: Forest Fire Vulnerability Map of Ajas Range Bandipora Forest Division Jammu & Kashmir

Table.86. Compartments of Ajas Range Bandipora Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area Sq Km	Percentage
Ajas	Unlikely	119,129,135,134,133,127,128, Others,117b	9	118.80	53.64
	Low	136,138a,121,148,114b,149,15,146, 137	9	25.47	11.50
	Medium	117a,116,139b,145,132,131,13,12,115, 14,141,151,147,124,123,122,126,143,1 44,142ab/Kh,114a,125a	22	70.91	32.02
	High	118,125b,138b,139a	4	6.25	2.82
Total			44	221.45	100.00

Ajas Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	118.80
Low:	25.47
Medium:	70.91
High:	6.25
Total	221.45
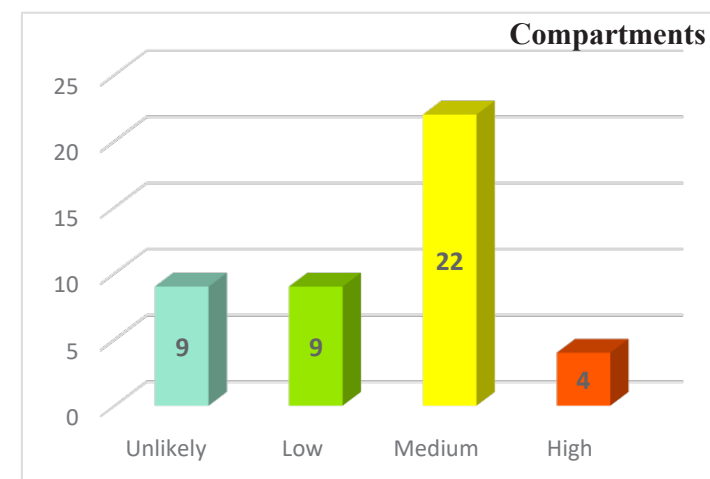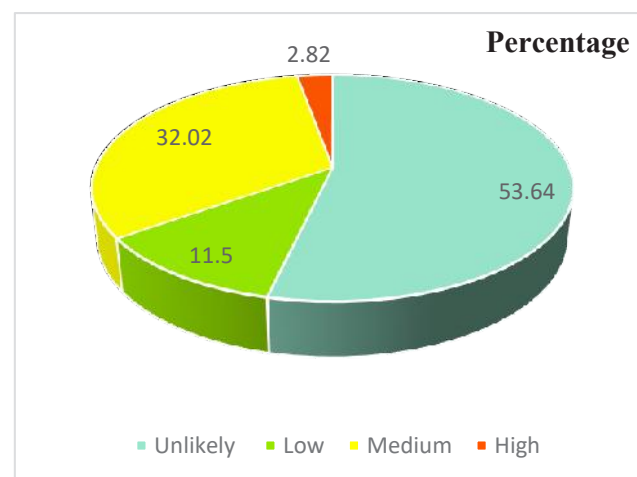
3.3.2.2 Gurez Range
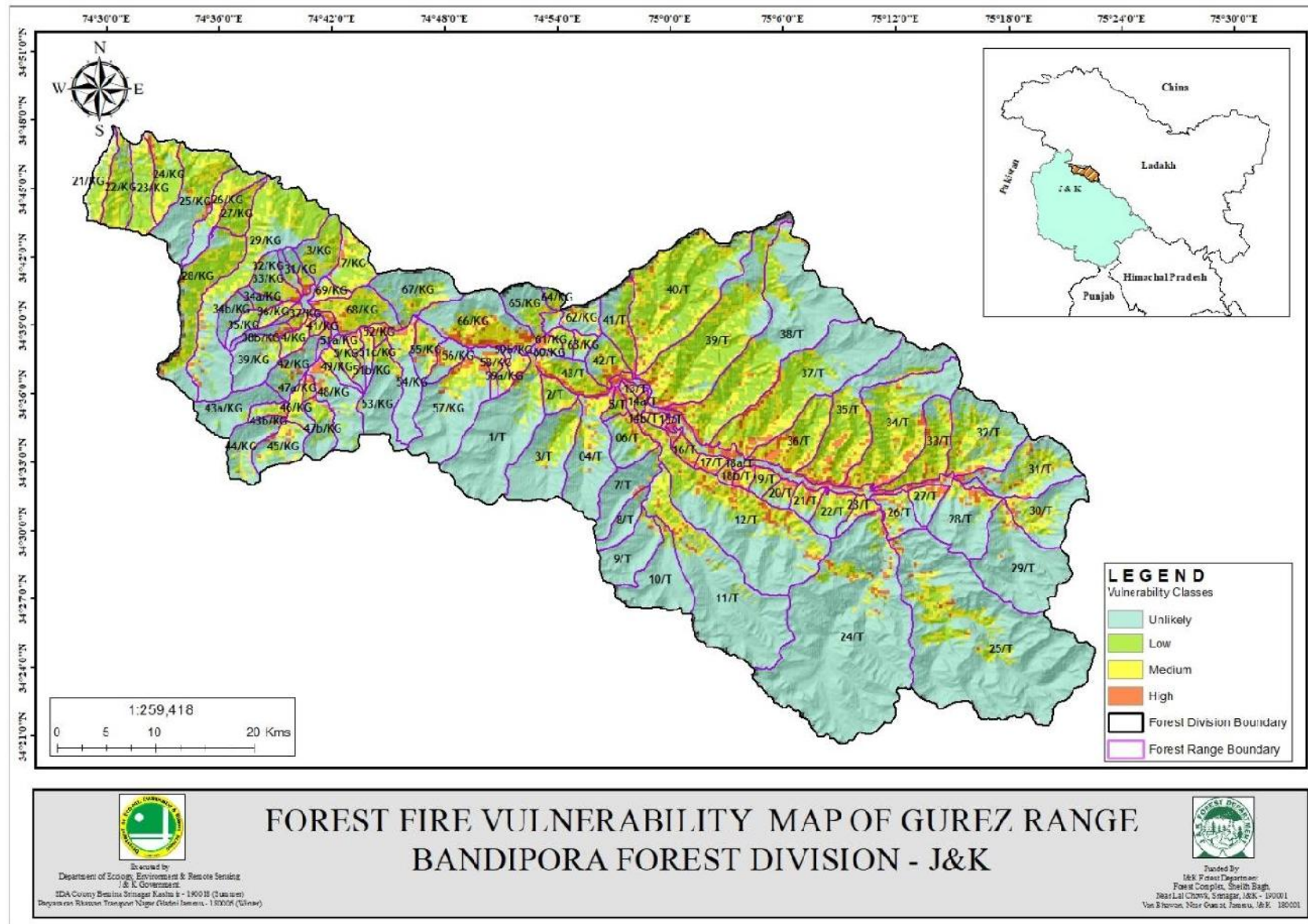
Fig. 93: Forest Fire Vulnerability Map of Gurez Range Bandipora Forest Division Jammu & Kashmir

Table.87. Compartments of Gurez Range Bandipora Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area Sq Km	Percentage
Gurez	Unlikely	29/T,45/KG,47b/KG,25/KG,67/KG,65/KG,57/KG,12/T,11/T,04/T,06/T,8/T,10/T,9/T,7/T,48/KG,51b/KG,49/KG,42/KG,51c/KG,66/KG,3/T,1/T,54/KG,55/KG,56/KG,44/KG,43b/KG,22/T,24/T,25/T,32/T,31/T,30/T,27/T,43a/KG,35/KG,33/KG,32/KG,34a/KG,34b/KG,38b/KG,39/KG,28/T,31/KG,62/KG,38/T,37/T,35/T,26/T,53/KG,63/KG	52	1273.16	70.93
	Low	22/KG,28/KG,29/KG,2/T,59a/KG,61/KG,5/T,5/KG,64/KG,4/KG,7/KG,39/T,21/KG,24/KG,23/KG,26/KG,27/KG,3/KG,40/T,41/T	20	333.12	18.56
	Medium	46/KG,34/T,68/KG,43/T,58/KG,51a/KG,52/KG,60/KG,13/T,14a/T,15/T,14b/T,18b/T,17/T,16/T,19/T,20/T,21/T,33/T,36/T,59b/KG,47a/KG,37/KG,36/KG,38a/KG,69/KG,41/KG,23/T,42/T,18a/T	30	118.47	10.50
	High	NA	NA	NA	NA
Total			102	1794.75	100.00

Gurez Range   **Area**

Vulnerability Classes	Area(Sq Kms)
Unlikely:	1273.16
Low:	333.12
Medium:	118.47
High:	0
Total	1794.75

Percentage pie chart — Unlikely 70.93, Low 18.56, Medium 10.5, High 0

Compartments bar chart — Unlikely 52, Low 20, Medium 30, High 0
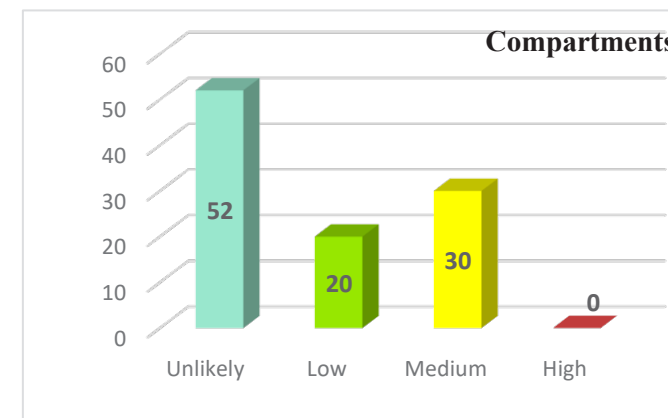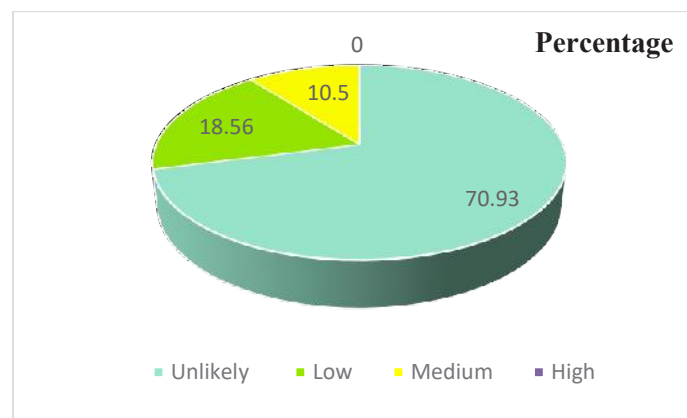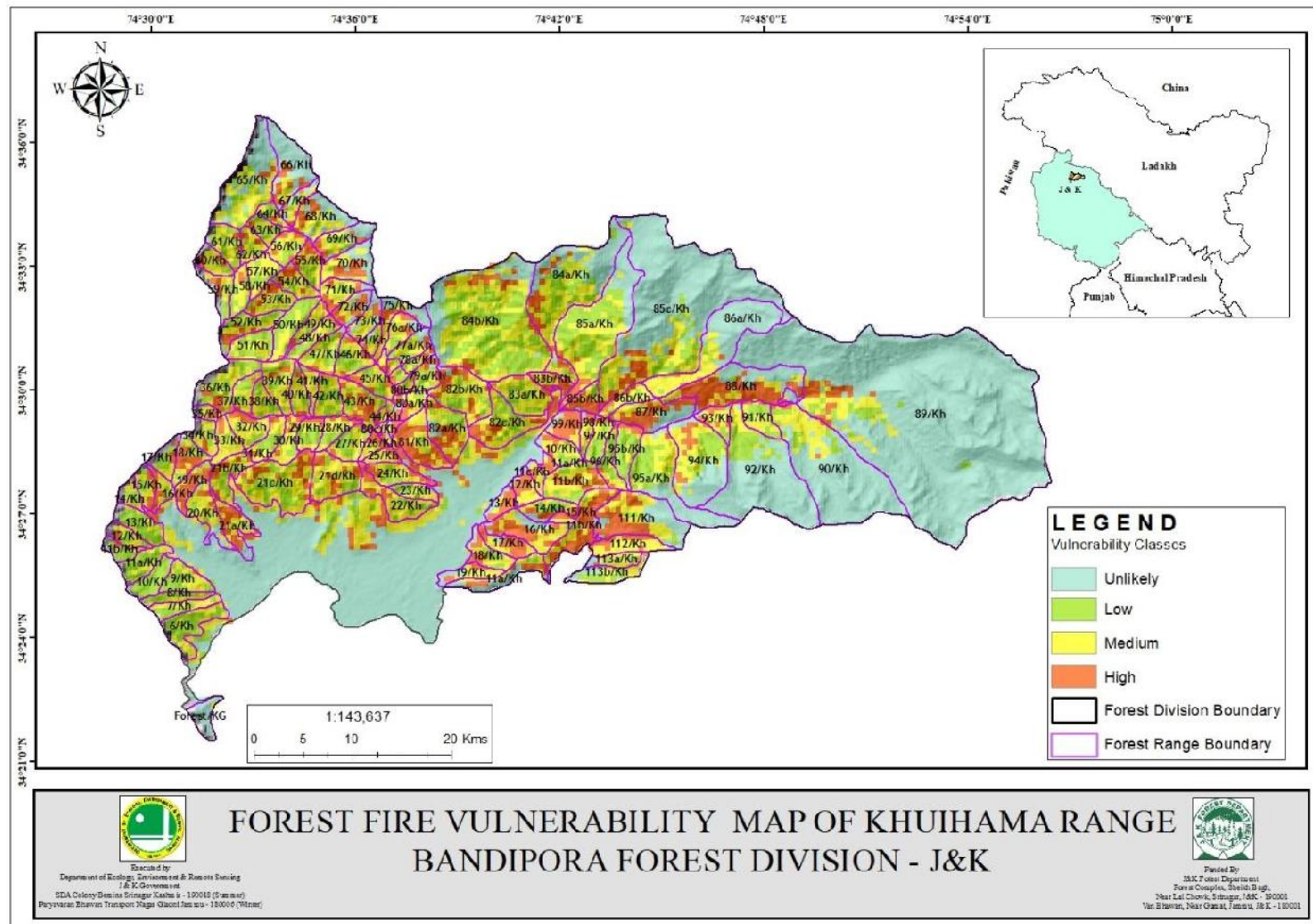
3.3.2.3 Kuihama Range

Fig. 94: Forest Fire Vulnerability Map of Khuihama Range Bandipora Forest Division Jammu & Kashmir

Table.88. Compartments of Khuihama Range Bandipora Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Khuihama	Unlikely	90/Kh,89/Kh,95a/Kh,94/Kh,92/Kh,86a/Kh,85c/Kh,65/Kh,67/Kh,66/Kh,69/Kh,68/Kh,70/Kh,75/Kh, Forest/KG,84a/Kh	16	194.72	43.18
	Low	84b/Kh,36/Kh,10/Kh,6/Kh,9/Kh,8/Kh,96/Kh,50/Kh,51/Kh,48/Kh,46/Kh,31/Kh,13/Kh,52/Kh,78a/Kh,29/Kh,23/Kh,58/Kh,63/Kh,95b/Kh,61/Kh,97/Kh,78b/Kh,79b/Kh,85a/Kh	25	78.11	17.32
	Medium	21c/Kh,38/Kh,98/Kh,93/Kh,91/Kh,83a/Kh,41/Kh,40/Kh,39/Kh,49/Kh,45/Kh,47/Kh,34/Kh,32/Kh,12/Kh,11a/Kh,7/Kh,33/Kh,55/Kh,60/Kh,59/Kh,56/Kh,62/Kh,71/Kh,76a/Kh,77a/Kh,79a/Kh,82b/Kh,42/Kh,43/Kh,80a/Kh,30/Kh,28/Kh,25/Kh,27/Kh,24/Kh,20/Kh,15/Kh,37/Kh,54/Kh,53/Kh,57/Kh,64/Kh,74/Kh,73/Kh,113b/Kh,112/Kh,14/Kh,35/Kh,22/Kh,44/Kh,21a/Kh,21b/Kh,21d/Kh,77b/Kh,76b/Kh,82a/Kh,82c/Kh,86b/Kh,11c/Kh,83b/Kh,113a/Kh	62	125.43	27.81
	High	111/Kh,99/Kh,17/Kh,18/Kh,72/Kh,81/Kh,26/Kh,16/Kh,19/Kh,11b/Kh,87/Kh,88/Kh,80b/Kh,80c/Kh,85b/Kh	15	52.64	11.67
Total			**118**	**450.92**	**100.00**

Khuihama Range   Area

Vulnerability Classes	Area(Sq Kms)
Unlikely:	194.72
Low:	78.11
Medium:	125.43
High:	52.64
Total	450.92

Percentage

Compartments

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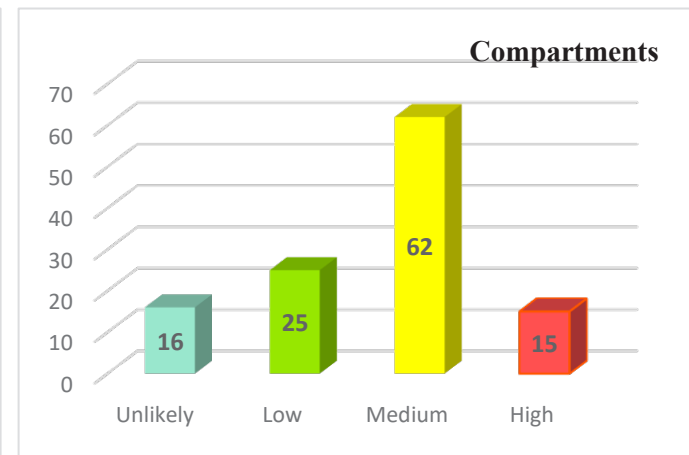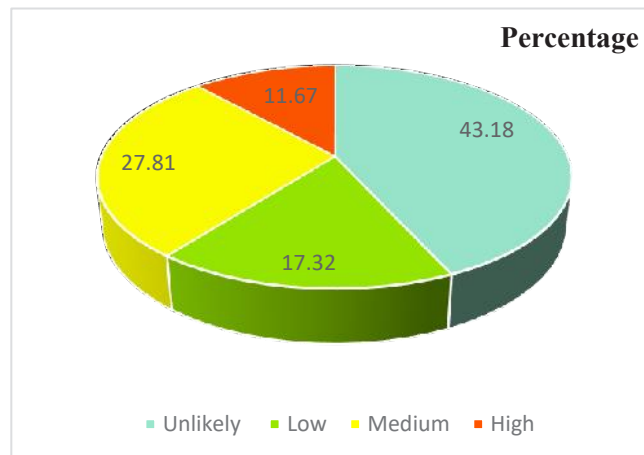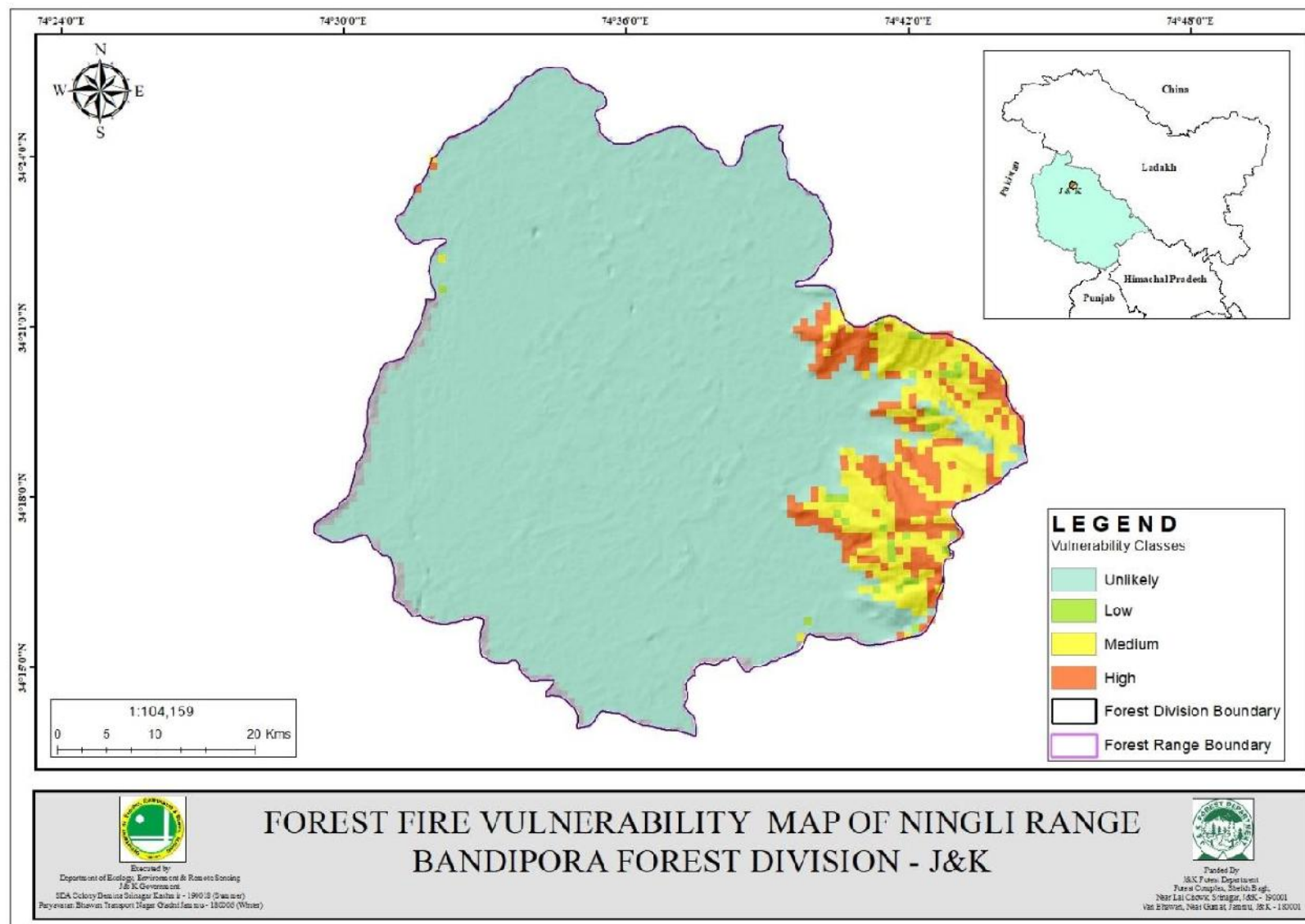
3.3.2.4 Ningli Range

Fig. 95: Forest Fire Vulnerability Map of Ningli Range Bandipora Forest Division Jammu & Kashmir

3.3.3 J V (JEHLUM VALLEY) FOREST DIVISION.

This division lies between latitude 34°12'25"N and longitude 74°21'26"E. Jehlum Valleyhaving an elevation of 1620meters.kms.Forest Division Baramulla is among the main Forest Divisions of Kashmir consists 4 territorial Forest Ranges viz Baramulla, Doabgah, Boniyar and Uri Ranges and a non teritorial range as Soil conservation Range. The total area (on GIS Platform) of 183 compartments of four territorial ranges is area 551.36 Km. [2]
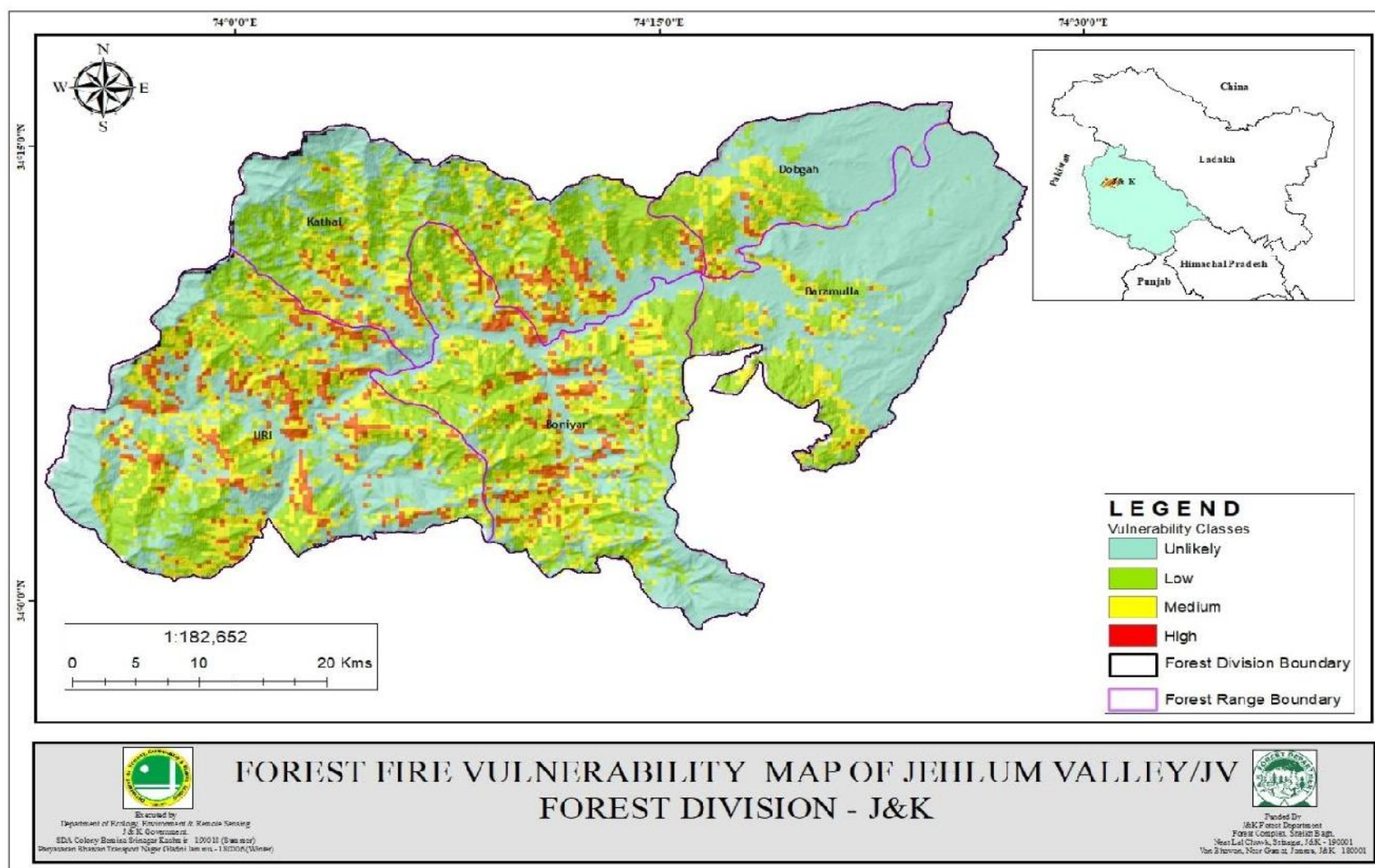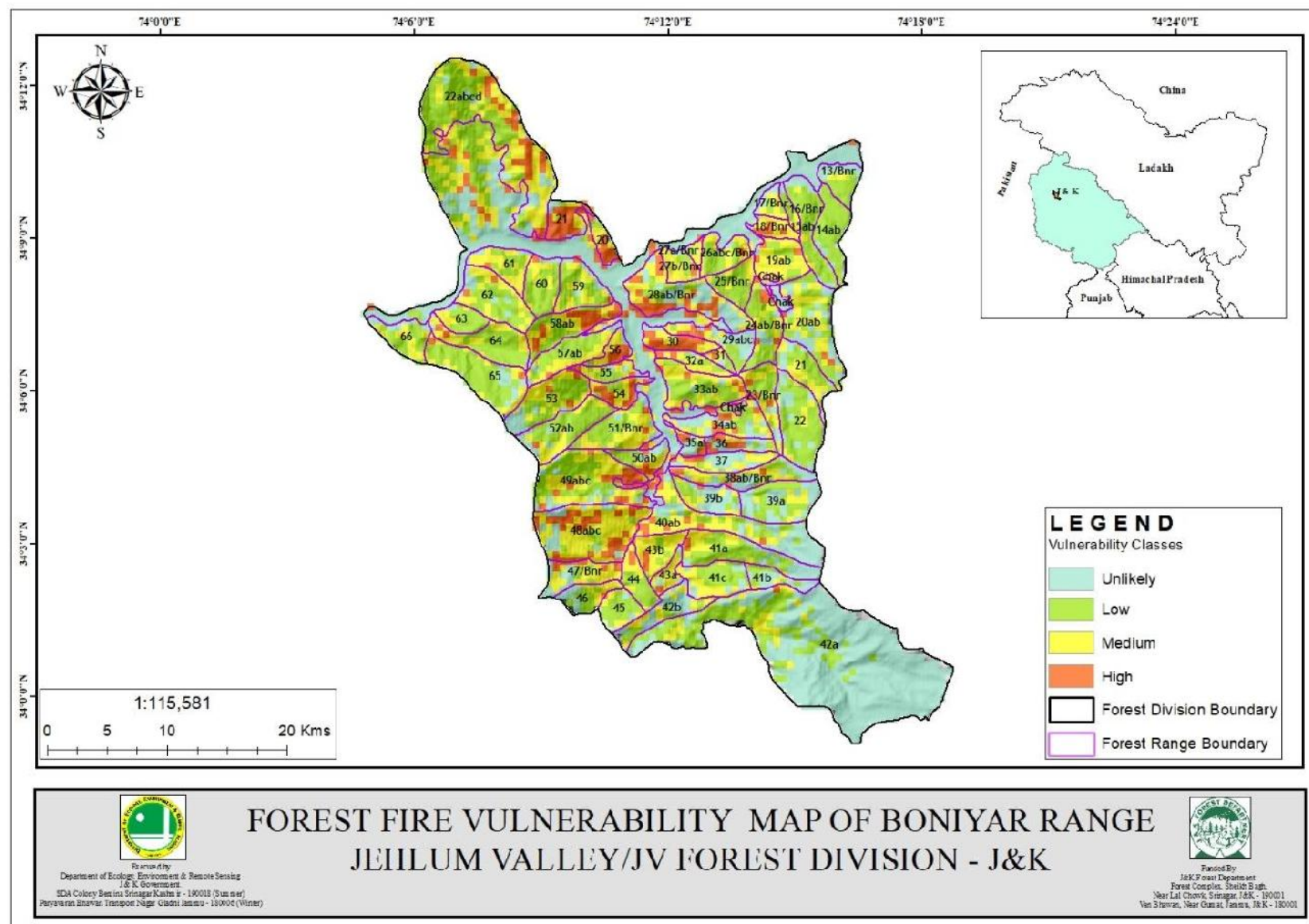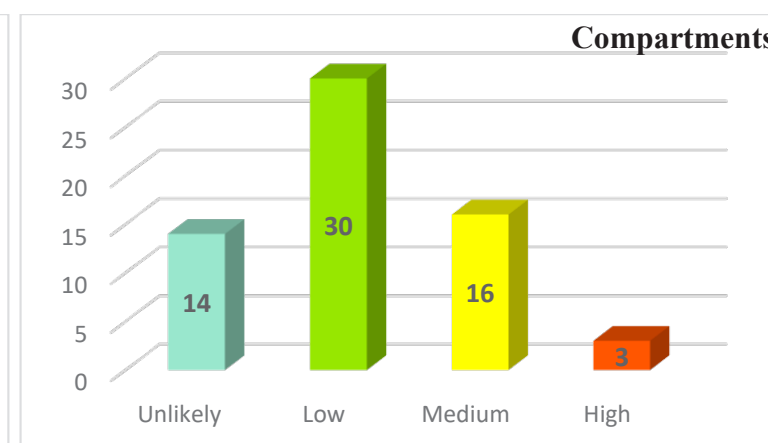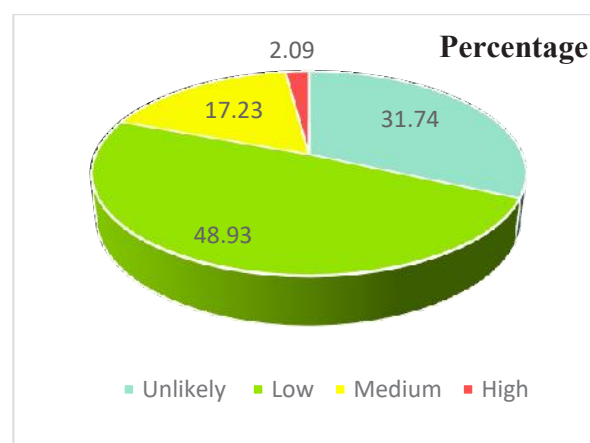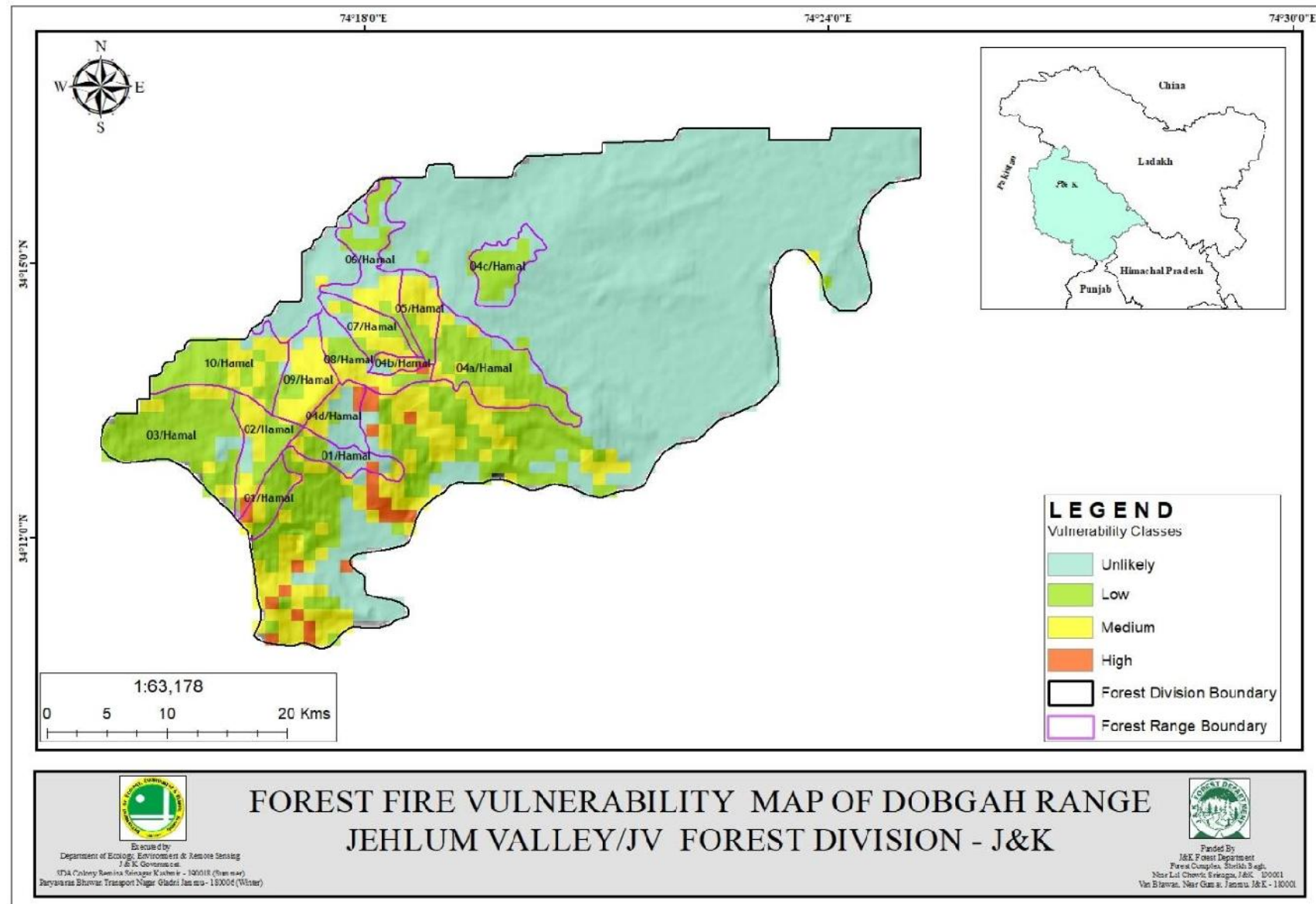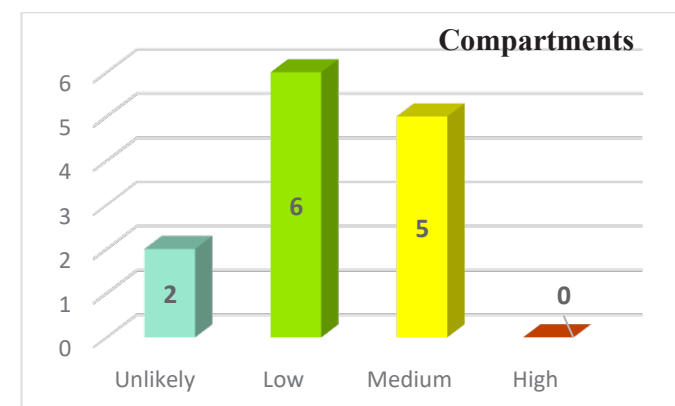

Fig. 96: Forest Fire Vulnerability Map of Jhelum Valley / JV Forest Division Jammu & Kashmir

Table:89. Compartments of Jhelum Valley (JV) Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
JV Forest Division	Baramulla	Unlikely	7	6.35	0.14
		Low	22	6.04	0.13
		Medium	5	23.17	0.51
		High	0	9.28	0.20
		Total	**34**	**44.86**	**100.00**
	Boniyar	Unlikely	14	63.24	31.74
		Low	30	97.51	48.93
		Medium	16	34.33	17.23
		High	3	4.17	2.09
		Total	**63**	**199.26**	**100.00**
	Dobgah	Unlikely	2	3.42	14.58
		Low	6	13.95	59.41
		Medium	5	6.10	25.99
		High	0	0	0
		Total	**13**	**23.49**	**100.00**
	Kathai	Unlikely	5	37.32	25.05
		Low	15	106.73	71.64
		Medium	2	4.92	3.30
		High	0	0	0
		Total	**22**	**148.98**	**100.00**

		Unlikely	14	32.21	23.90
		Low	22	74.83	55.52
	Uri	Medium	11	22.68	16.82
		High	0	0	0
		Total	**51**	**134.77**	**100.00**

Jehlum Valley Forest Division Area	
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	142.54
Low:	299.06
Medium:	91.2
High:	18.86
Total	**551.36**

Percentage

0.00
17.86
16.99
65.16

Unlikely Low Medium High

Compartments

Unlikely 42
Low 95
Medium 39
High 3

FOREST FIRE RISK ZONATION & VULNERABILITY ASSESSMENT FORESTS OF JAMMU & KASHMIR
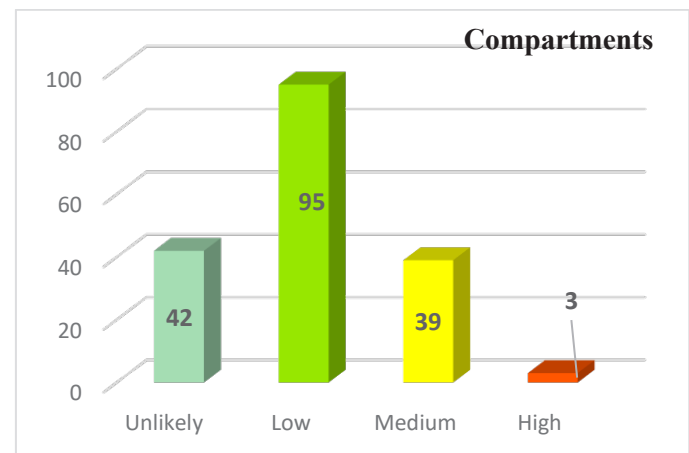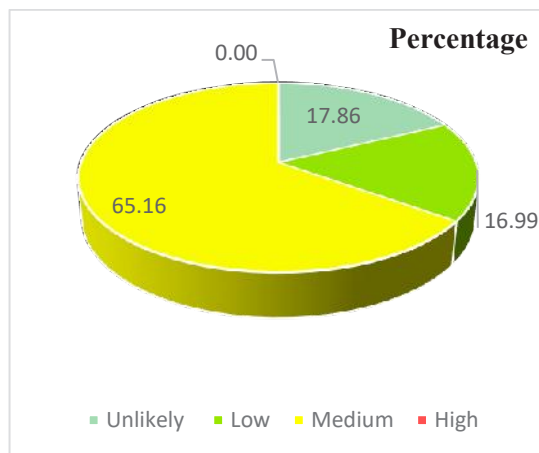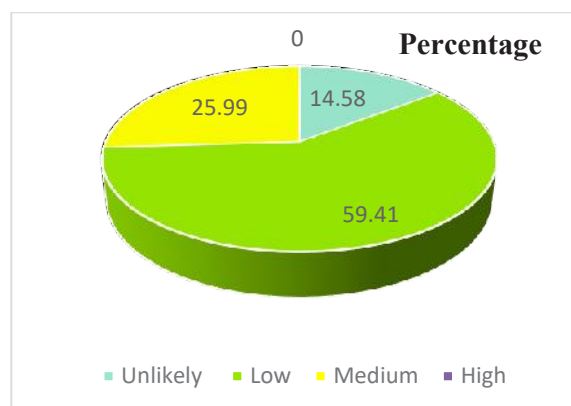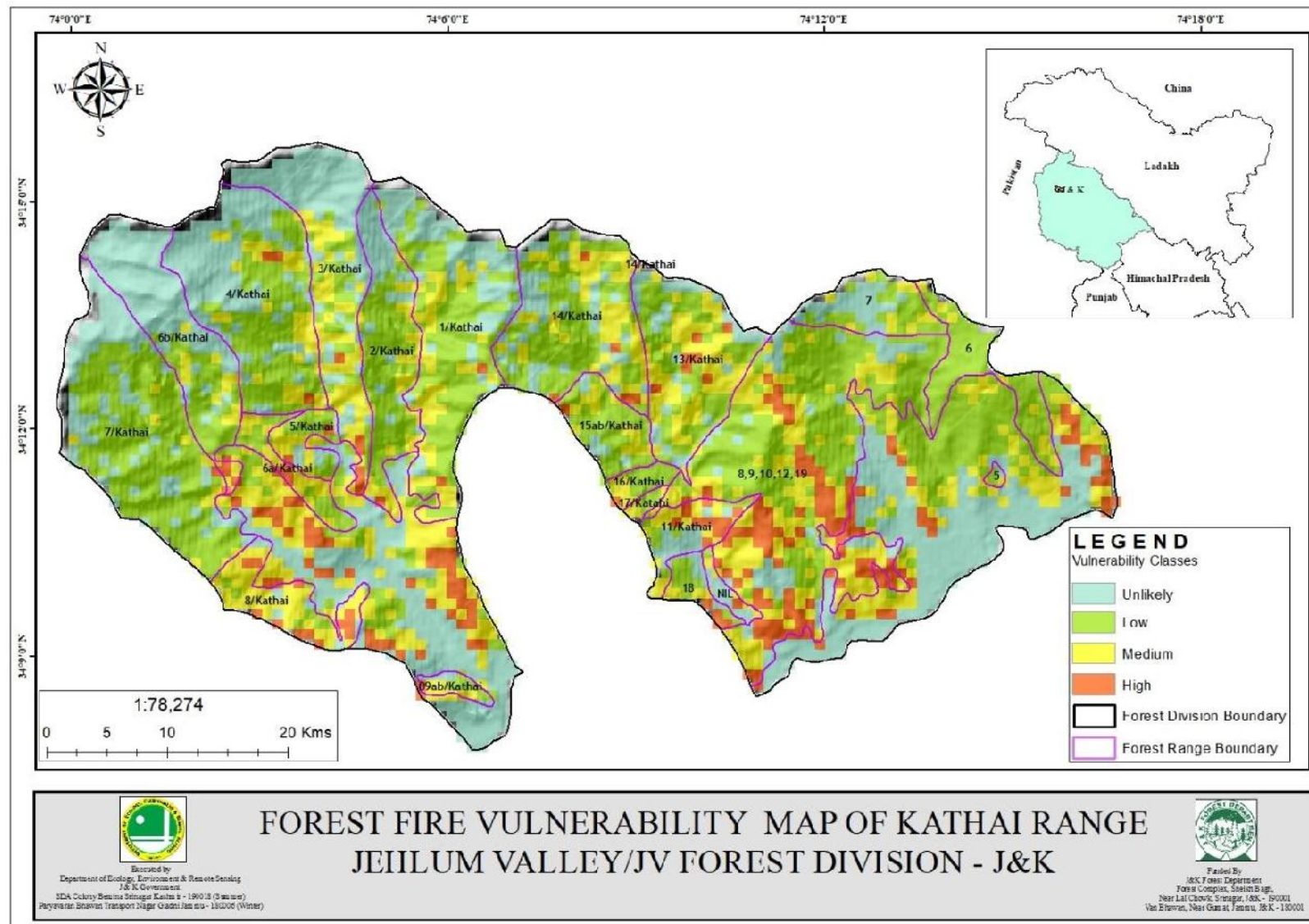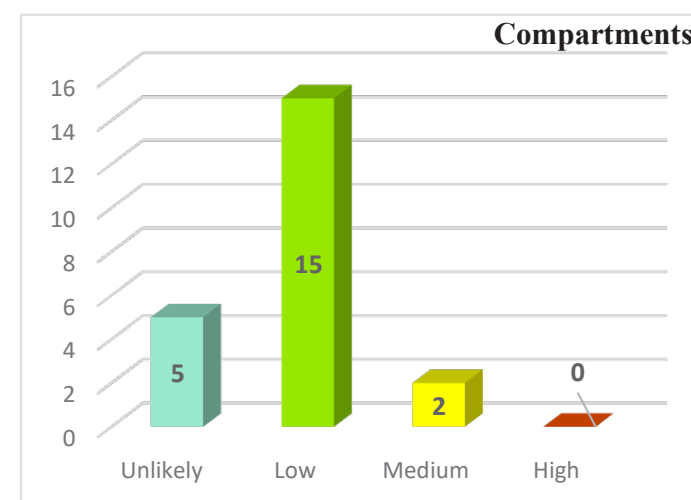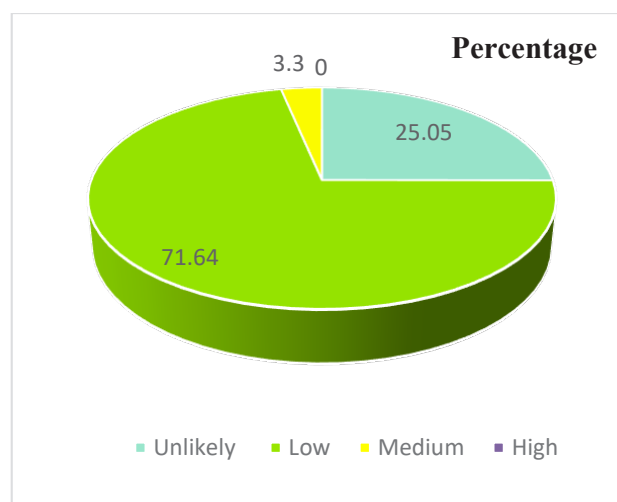
3.3.3.1 Baramullah Range
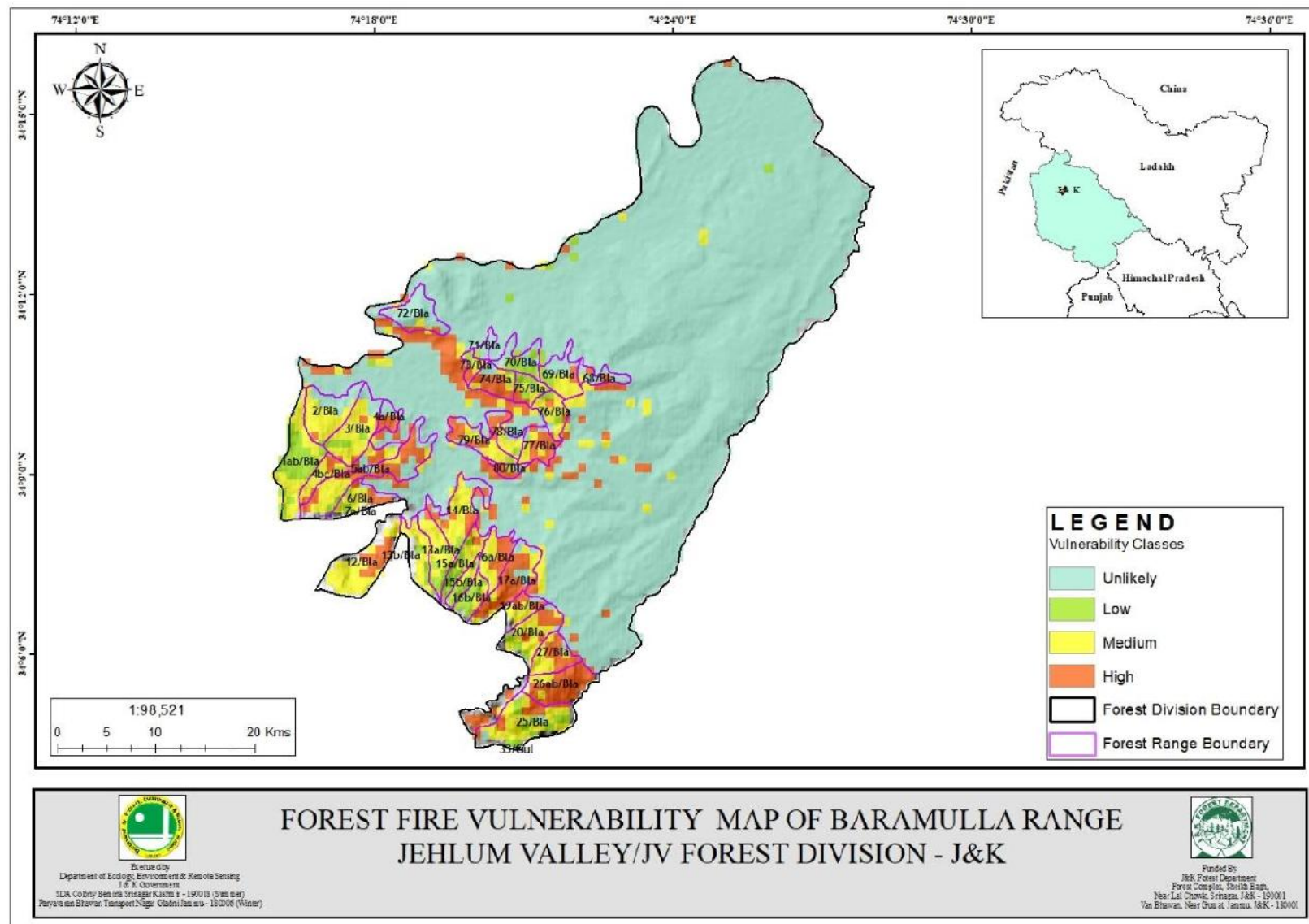
Fig. 97: Forest Fire Vulnerability Map of Baramulla Range Jhelum Valley / JV Forest Division Jammu & Kashmir

Table.90. Compartments of Baramullah Range Jhelum Valley (JV) Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area Sq Km	Percentage
Baramullah	Unlikely	4a/Bla,72/Bla,71/Bla,70/Bla,68/Bla,80/Bla,78/Bla	7	6.35	17.86
	Low	1ab/Bla,2/Bla,3/Bla,6/Bla,73/Bla,69/Bla, 79/Bla,75/Bla,76/Bla,12/Bla,20/Bla,27/Bla,25/Bla,14/Bla,13a/Bla,15a/Bla,16a/Bla, 19ab/Bla,13b/Bla,16b/Bla,15b/Bla,4bc/Bla	22	6.04	16.99
	Medium	5ab/Bla,74/Bla,77/Bla,17a/Bla,26ab/Bla	5	23.17	65.16
	High	NA	NA	NA	NA
Total			**34**	**44.86**	**100.00**

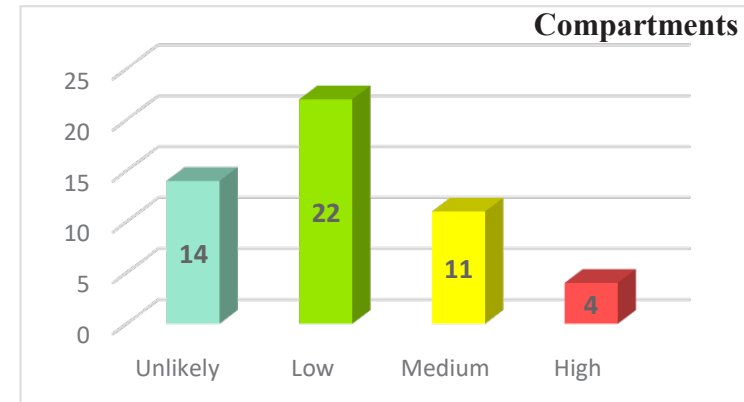| Baramullah Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	6.35
Low:	6.04
Medium:	23.17
High:	0
Total	**44.86**
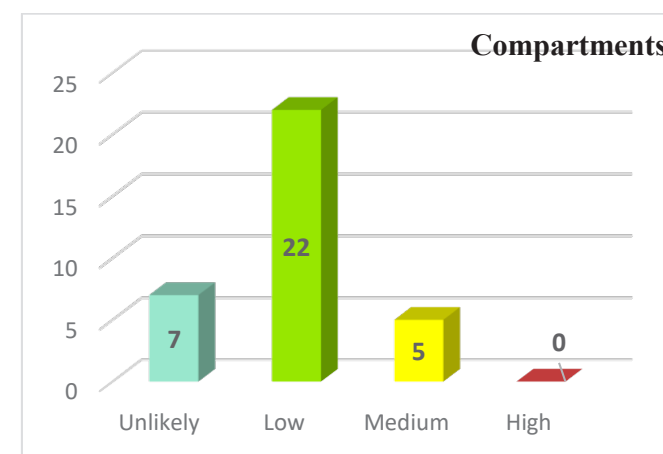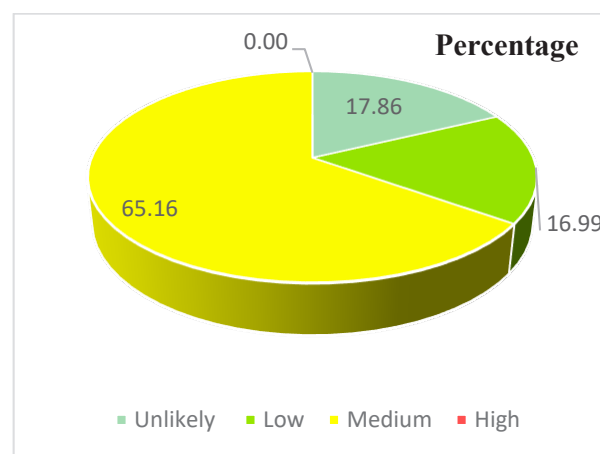
3.3.3.2 Boniyar Range

Fig. 98: Forest Fire Vulnerability Map of Boniyar Range Jhelum Valley / JV Forest Division Jammu & Kashmir

Table.91. Compartments of Boniyar Range Jhelum Valley (JV) Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area Sq Km	Percentage
Boniyar	Unlikely	39a,28ab/Bnr,37,42a,40ab, Chak,29abc,34ab,36,35a,38ab/Bnr,42b,41b, 39b	14	63.24	31.74
	Low	65,50ab,49abc,59,52ab,57ab,58ab,60,62,63, 64,66,45,13/Bnr,14ab,15ab,16/Bnr,26abc/B nr,21,24ab/Bnr,23/Bnr,33ab,41a,22abcd,25/ Bnr,44,53,46,22,41c	30	97.51	48.93
	Medium	51/Bnr,56,61,20ab,17/Bnr,18/Bnr,19ab,32a,55, 27b/Bnr,48abc,47/Bnr,31,43b,43a,27a/Bnr	16	34.33	17.23
	High	30,54,20	3	4.17	2.09
Total			63	199.26	100.00

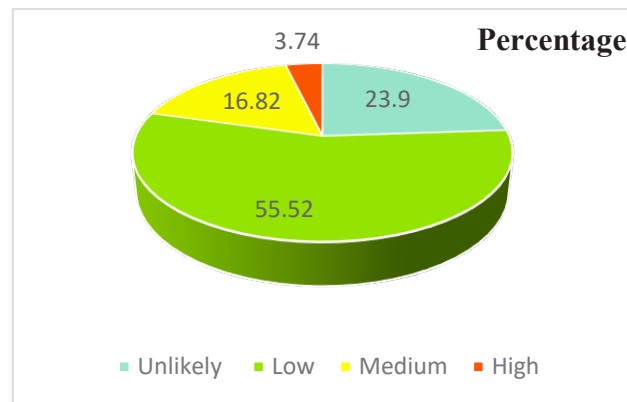| Boniyar Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	63.24
Low:	97.51
Medium:	34.33
High:	4.17
Total	**199.26**

3.3.3.3 Dobgah Range

Fig. 99: Forest Fire Vulnerability Map of Dobgah Range Jhelum Valley / JV Forest Division Jammu & Kashmir

Table.92. Compartments of Dobgah Range Jhelum Valley (JV) Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Dobgah	Unlikely	06/Hamal,04d/Hamal	2	3.42	14.58
	Low	03/Hamal,10/Hamal,04a/Hamal,08/Hamal,04c/Hamal,01/Hamal	6	13.95	59.41
	Medium	02/Hamal,09/Hamal,05/Hamal,04b/Hamal,07/Hamal	5	6.10	25.99
	High	NA	NA	NA	NA
Total			13	23.49	100.00

Dobgah Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	3.42
Low:	13.95
Medium:	6.10
High:	0
Total	**23.49**

Percentage

25.99 14.58 59.41 0

- Unlikely - Low - Medium - High

Compartments

Unlikely 2, Low 6, Medium 5, High 0

3.3.3.4 Kathai Range

Fig. 100: Forest Fire Vulnerability Map of Kathai Range Jhelum Valley / JV Forest Division Jammu & Kashmir

Table.93. Compartments of Kathai Range Jhelum Valley (JV) Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Kathai	Unlikely	NIL,11/Kathai,6b/Kathai,3/Kathai ,4/Kathai	5	37.32	25.05
	Low	14/Kathai,18,15ab/Kathai,6,7,8,9, 10,12,19,17/Katahi,16/Kathai,5,5/ Kathai,7/Kathai,2/Kathai,1/Kathai ,13/Kathai,6a/Kathai	15	106.73	71.64
	Medium	8/Kathai,09ab/Kathai	2	4.92	3.30
	High	NA	NA	NA	NA
Total			27	148.98	100.00

Kathai Range	Area
Vulnerability Classes	Area(Sq Kms)
Unlikely:	37.32
Low:	106.73
Medium:	4.92
High:	0
Total	148.98

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3.3.3.5 Uri Range
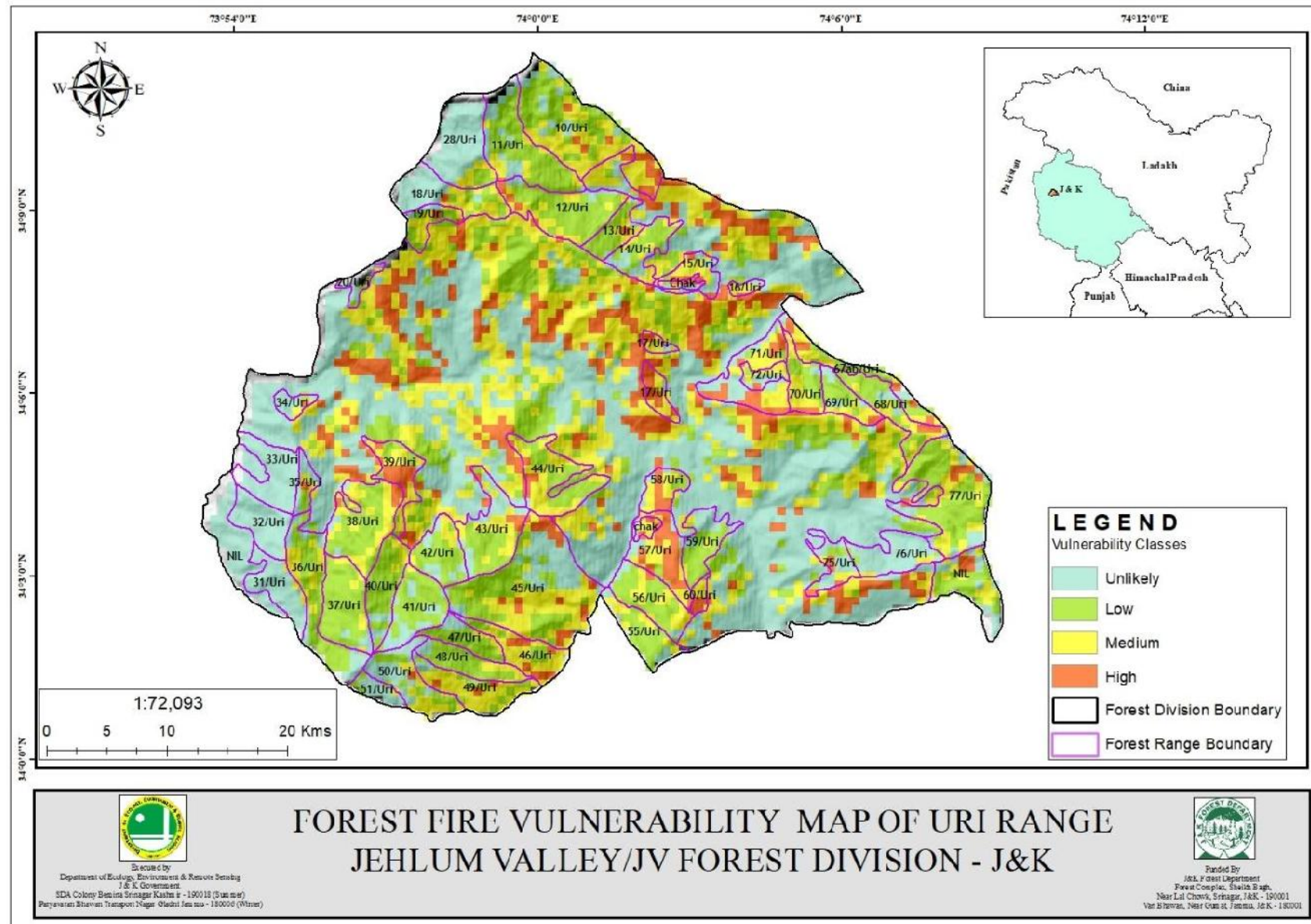
Fig. 101: Forest Fire Vulnerability Map of Uri Range Jhelum Valley / JV Forest Division Jammu & Kashmir

Table.94. Compartments of Uri Range Jhelum Valley (JV) Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area Sq Km	Percentage
Uri	Unlikely	51/Uri,50/Uri,34/Uri,31/Uri,33/Uri,32/Uri, 71/Uri,75/Uri,76/Uri, NIL,20/Uri,35/Uri,18/Uri,28/Uri	14	32.21	23.90
	Low	14/Uri,13/Uri,11/Uri,41/Uri,48/Uri,47/Uri, 43/Uri,44/Uri,38/Uri,36/Uri,40/Uri,42/Uri, 55/Uri,56/Uri,59/Uri,77/Uri,67ab/Uri,69/Uri,37/Uri,45/Uri,12/Uri,68/Uri	22	74.83	55.52
	Medium	10/Uri,49/Uri,46/Uri, chak,58/Uri,16/Uri,72/Uri,70/Uri,39/Uri,19/Uri,15/Uri	11	22.68	16.82
	High	Chak,60/Uri,57/Uri,17/Uri	4	5.04	3.74
Total			51	134.77	100.00

Uri Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	32.21
Low:	74.83
Medium:	22.68
High:	5.04
Total	134.77

Percentage

3.74, 16.82, 23.9, 55.52
Unlikely ▪ Low ▪ Medium ▪ High

Compartments

Unlikely 14, Low 22, Medium 11, High 4

3.3.4 KAMRAJ FOREST DIVISION

Kamraj forest division is situated between74°23'17.055"E 34°33'58.887"N. The average elevation is 1660 meters. Forest division Kamraj comprises five ranges namely Kandi, Kupwara, Matchil, North Lolab and South Lolab. The total area (on GIS Platform) of 314 compartments of five territorial ranges is area 806.86 Km.[2]
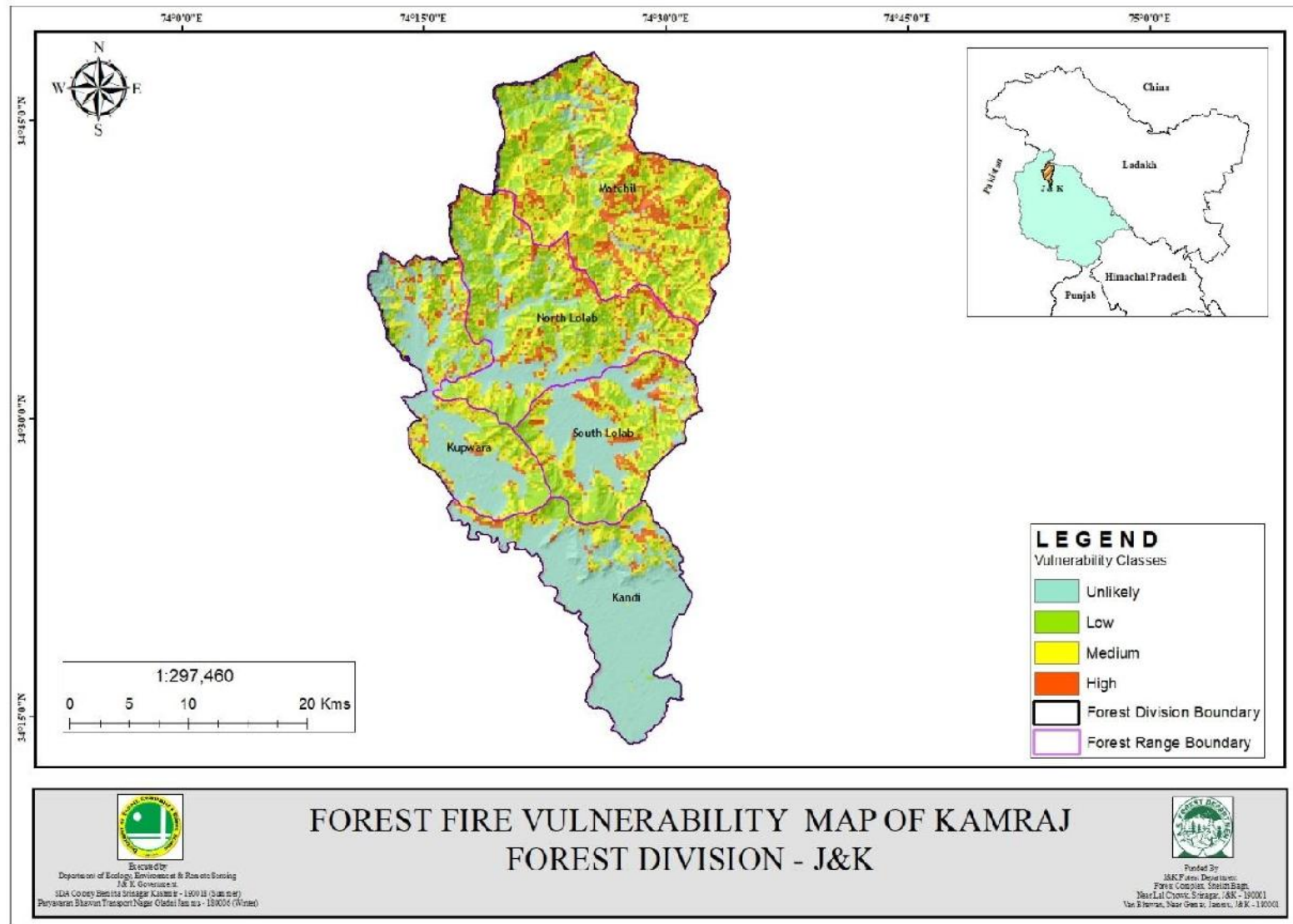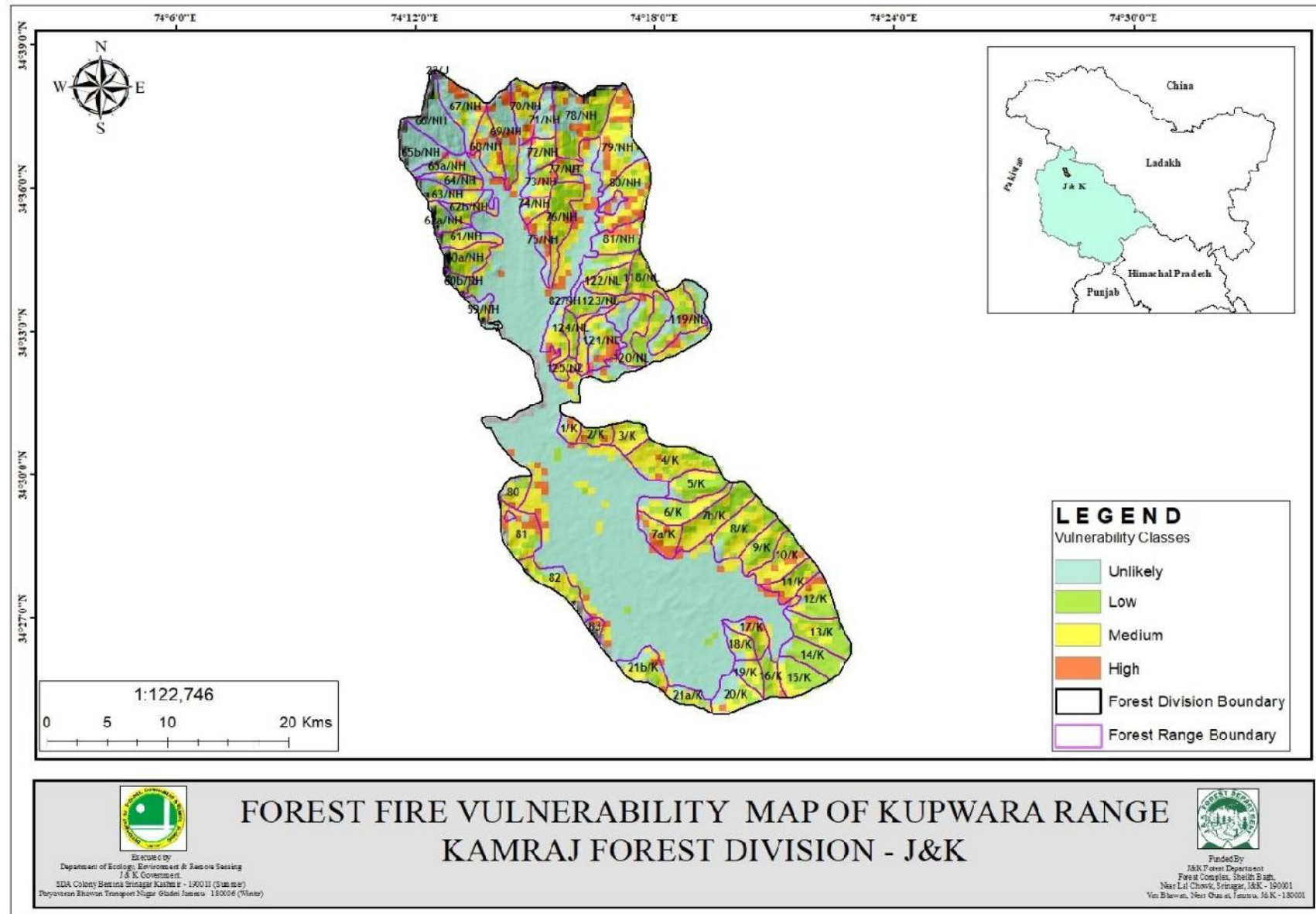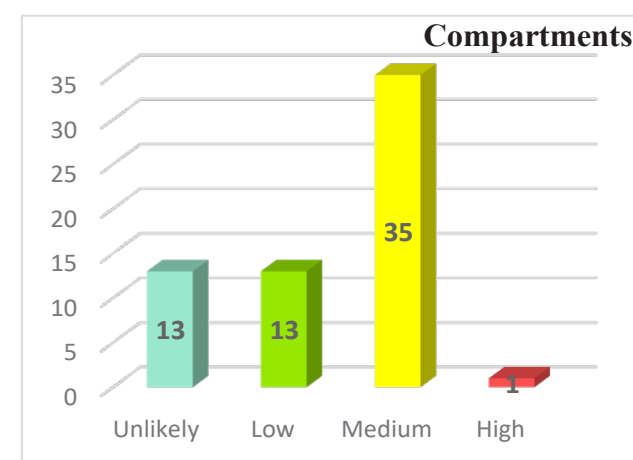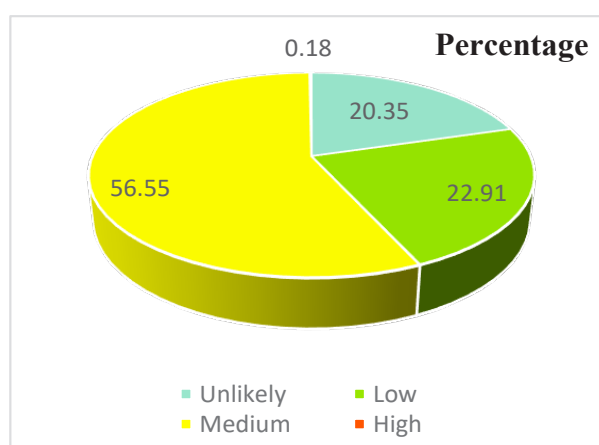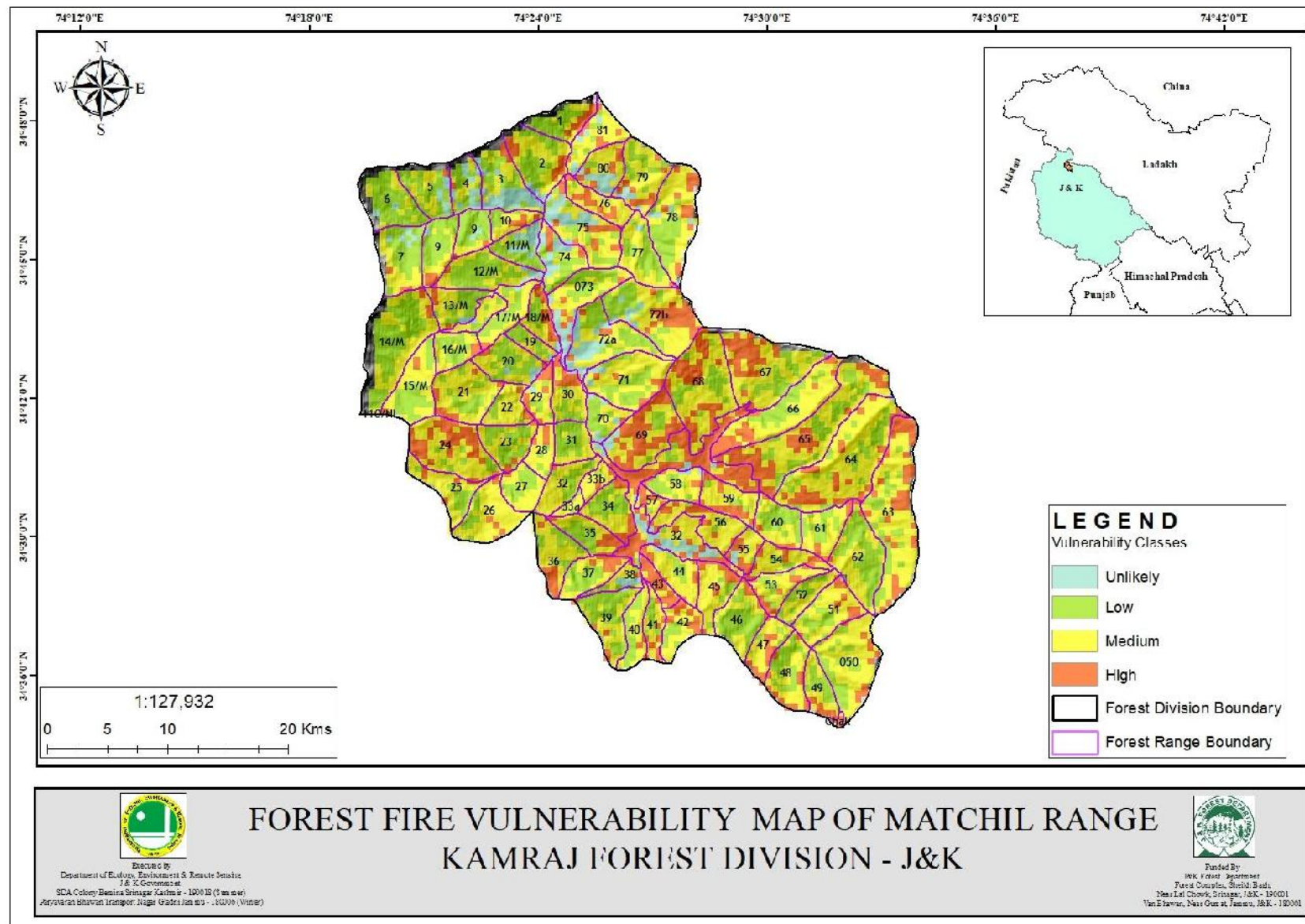

Fig. 102: Forest Fire Vulnerability Map of Kamraj Forest Division Jammu & Kashmir

Table:95 Compartments of Kamraj Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Kamraj Forest Division	Kandi	Unlikely	6	31.97	56.26
		Low	3	5.08	8.93
		Medium	8	18.26	32.13
		High	1	1.52	2.66
		Total	**18**	**56.82**	**100.00**
	Kupwara	Unlikely	13	22.01	20.35
		Low	13	24.78	22.91
		Medium	35	61.17	56.55
		High	1	0.19	0.18
		Total	**62**	**108.17**	**100.00**
	Matchil	Unlikely	**1**	4.02	1.24
		Low	**23**	77.05	23.84
		Medium	**54**	219.24	67.90
		High	**5**	22.54	6.98
		Total	**83**	**322.85**	**100.00**
	North Lolab	Unlikely	3	2.96	1.47
		Low	33	87.40	43.31
		Medium	38	102.30	50.70

		High	4	9.09	4.50
		Total	**78**	**201.77**	**100.00**
	South Lolab	Unlikely	**9**	13.31	11.35
		Low	**29**	44.88	38.28
		Medium	**32**	54.90	46.82
		High	**3**	4.15	3.54
		Total	**73**	**117.26**	**100.00**

Kamraj Forest Division	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	74.27
Low:	239.19
Medium:	455.87
High:	37.49
Total	**806.87**

Percentage

- Unlikely: 9.21
- Low: 29.65
- Medium: 56.50
- High: 4.65

Compartments

- Unlikely: 32
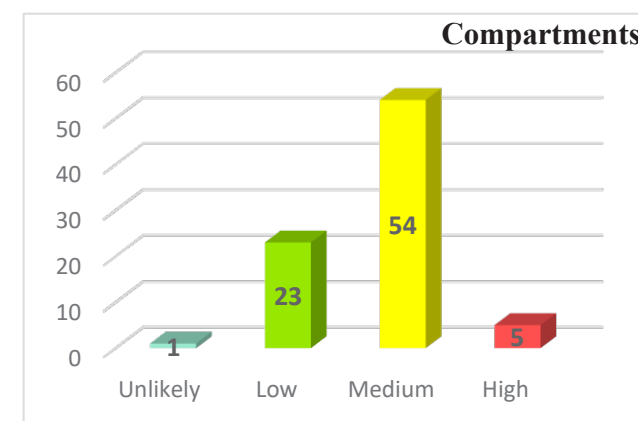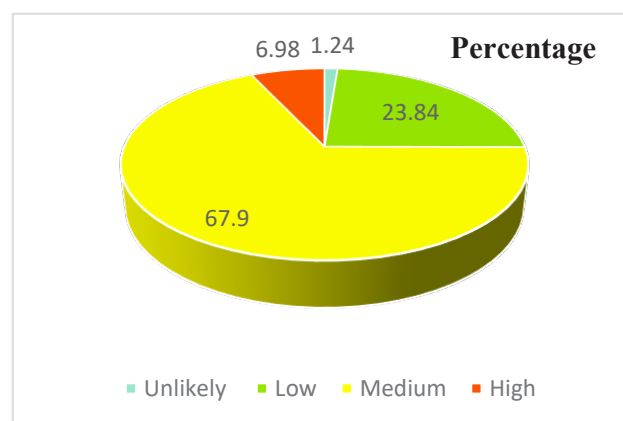- Low: 101
- Medium: 167
- High: 14
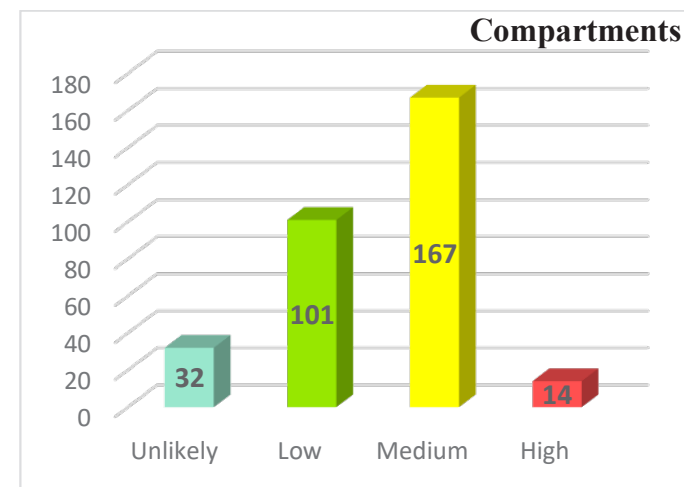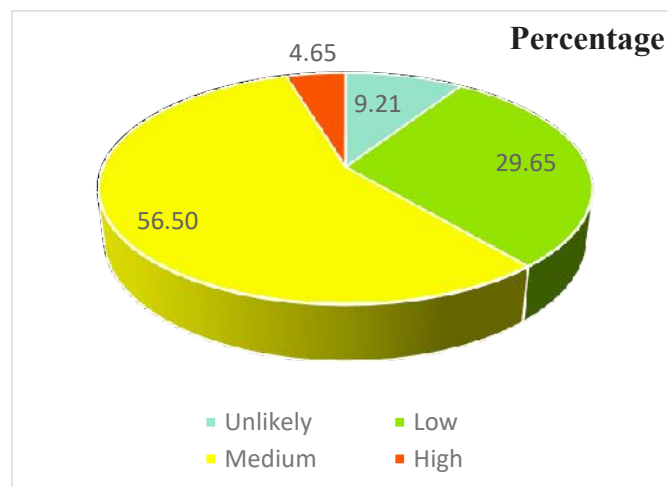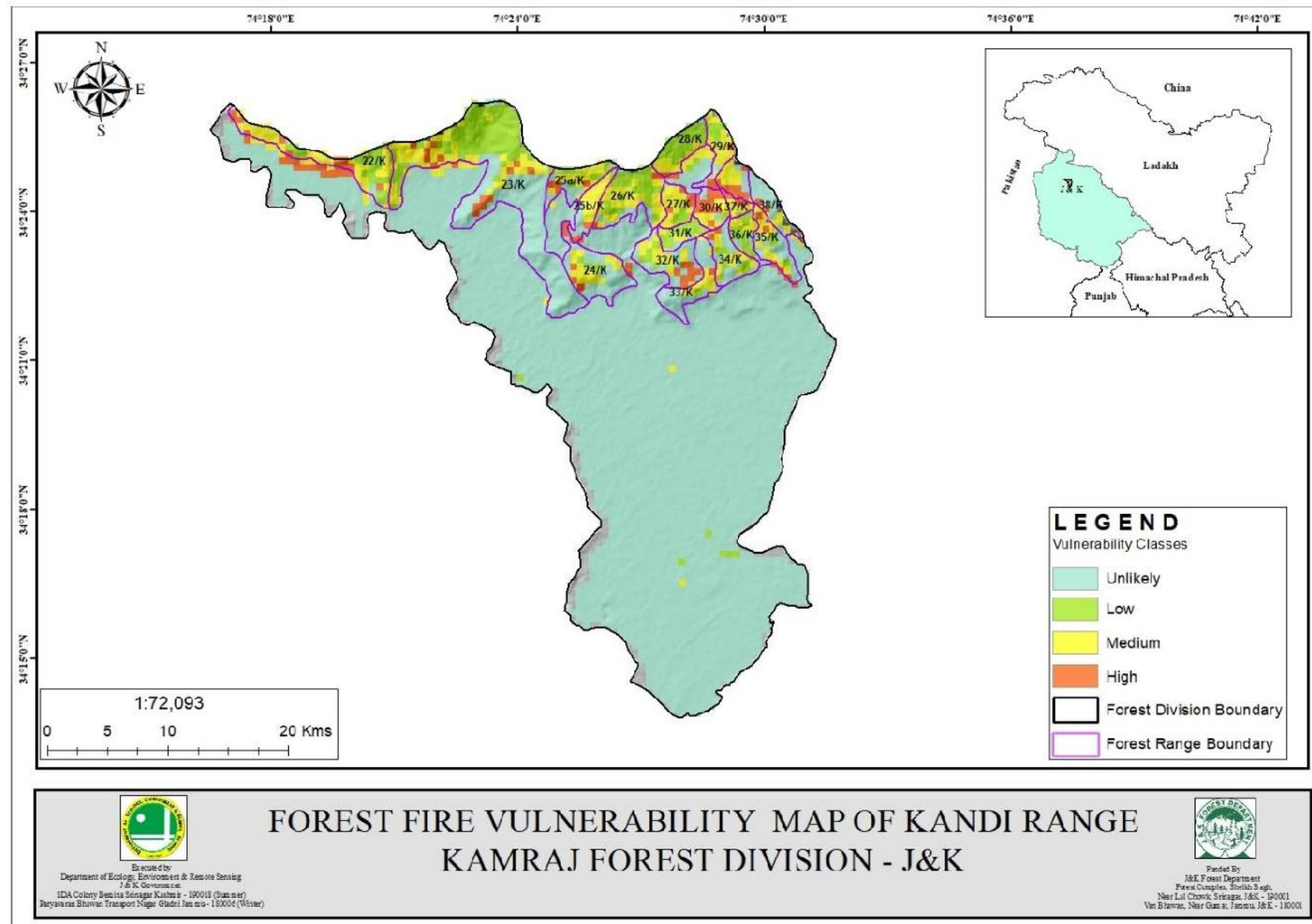
3.3.4.1 Kandi Range

Fig. 103: Forest Fire Vulnerability Map of Kandi Range Kamraj Forest Division Jammu & Kashmir

Table.96. Compartments of Kandi Range Kamraj Forest Division under Different Vulnerability Classes.

Range Name	Vulnera bility Class	Compartment Name	Number of Compartments	Area	Percentage
Kandi	Unlikely	23/K,24/K,33/K,32/K,34/K,38/K	6	31.97	56.26
	Low	28/K,36/K,31/K	3	5.08	8.93
	Medium	22/K,35/K,26/K,29/K,25a/K,37/K,27/K,25b/K	8	18.26	32.13
	High	30/K	1	1.52	2.66
Total			18	56.82	100.00

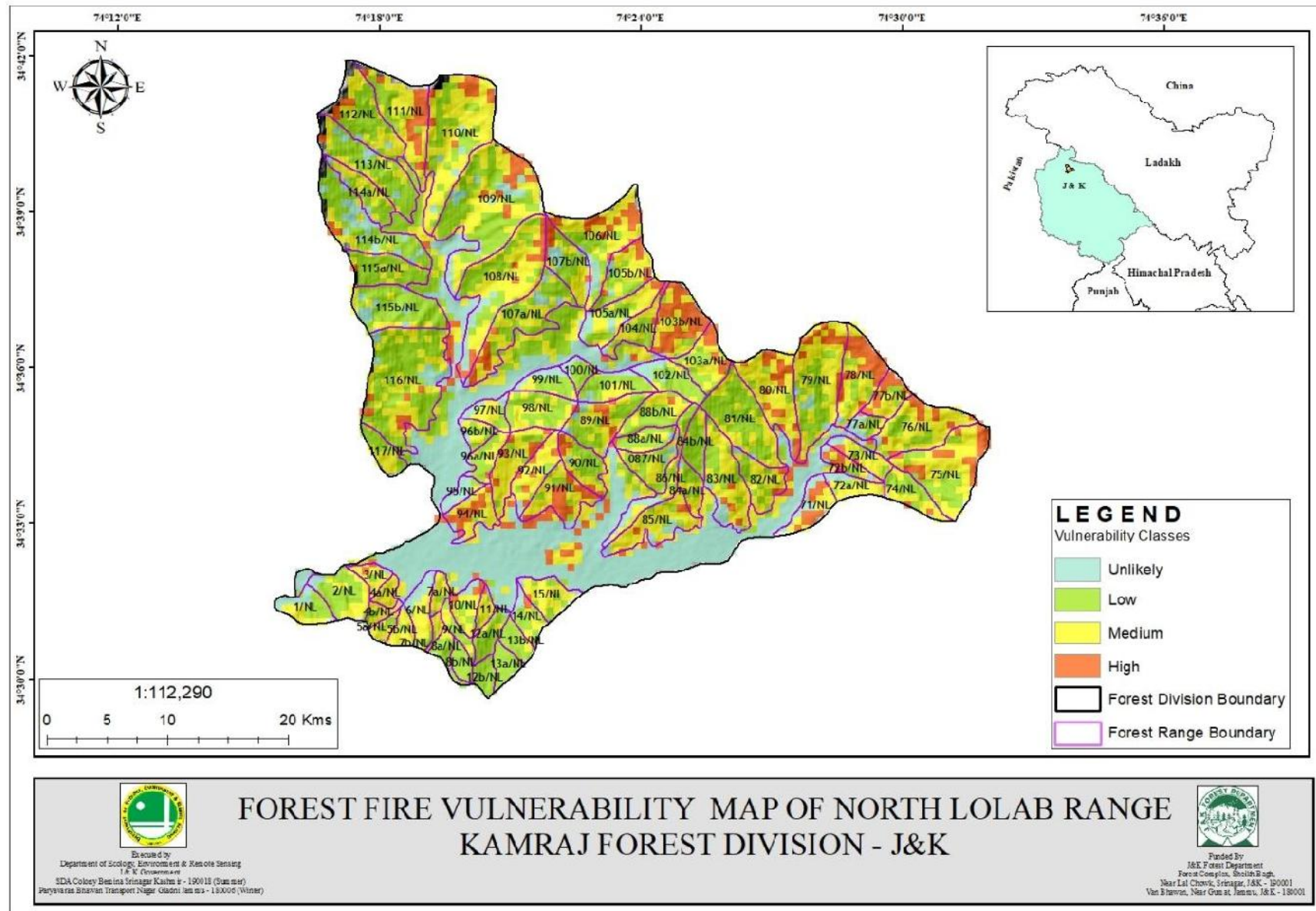| Kandi Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	31.97
Low:	5.08
Medium:	18.26
High:	1.52
Total	56.82
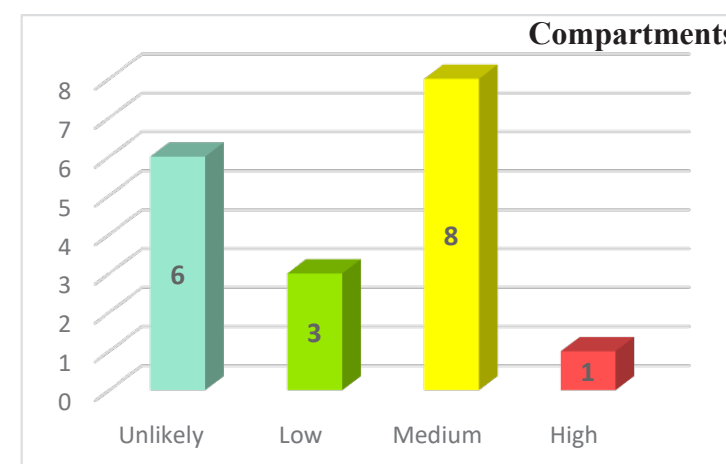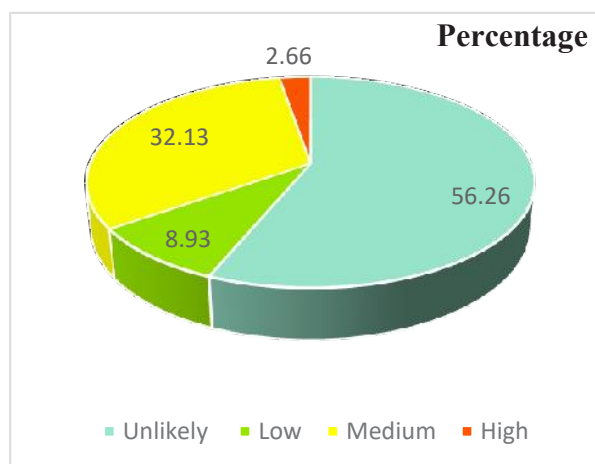
3.3.4.2 Kupwara Range

Fig. 104: Forest Fire Vulnerability Map of Kupwara Range Kamraj Forest Division Jammu & Kashmir

Table.97. Compartments of Kupwara Range Kamraj Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Kupwara	Unlikely	71/NH,82/NH,69/NH,67/NH,66/NH,65b/NH,18/K,20/K,64/NH,59/NH,121/NL,60b/NH,65a/NH	13	22.01	20.35
	Low	119/NL,123/NL,81/NH,78/NH,5/K,9 /K,12/K,13/K,14/K,15/K,16/K,124/N L,62a/NH	13	24.78	22.91
	Medium	122/NL,79/NH,77/NH,76/NH,75/NH,73/NH,72/NH,70/NH,120/NL,21b/K,6/K ,7b/K,8/K,10/K,11/K,17/K,19/K,68/NH, 62b/NH,60a/NH,63/NH,61/NH,4/K,1/K ,2/K,3/K,118/NL,125/NL,74/NH,80/NH ,82,81,80,7a/K,21a/K	35	61.17	56.55
	High	83	1	0.19	0.18
Total			62	108.17	100.00

| Kupwara Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	22.01
Low:	24.78
Medium:	61.17
High:	0.19
Total	108.17

3.3.4.3 Matchil Range

Fig. 105: Forest Fire Vulnerability Map of Matchil Range Kamraj Forest Division Jammu & Kashmir

Table.98. Compartments of Matchil Range Kamraj Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Matchil	Unlikely	3	1	4.02	1.24
	Low	1,6,4,5,7,9,12/M,14/M,19,20,16/M,23,11/M,7 4,70,31,60,62,35,37,39,46,40	23	77.05	23.84
	Medium	2,10,13/M,15/M,18/M,29,21,22,17/M,24,28,27, 25,78,81,80,79,75,77,76,72b,71,30,73,50,68,59, 66,34,33b,36,67,61,65,63,45,44,64,26,58,56,55, 53,54,52,51,47,48,49,42,38,41,72a,33a	54	219.24	67.90
	High	32,57, Chak,69,43	5	22.54	6.98
Total			83	322.85	100.00

Area Kupwara Range	
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	4.02
Low:	77.05
Medium:	219.14
High:	22.54
Total	322.85

Percentage

Unlikely 1.24, Low 23.84, Medium 67.9, High 6.98

Compartments

Unlikely 1, Low 23, Medium 54, High 5

3.3.4.4 North Lolab Range

Fig. 106:Forest Fire Vulnerability Map of North Lolab Range Kamraj Forest Division Jammu & Kashmir

Table.99. Compartments of North Lolab Range Kamraj Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
North Lolab	Unlikely	97/NL,95/NL,77a/NL	3	2.96	1.47
	Low	107a/NL,109/NL,112/NL,114b/NL,117/NL,116/NL,115b/NL,113/NL,1/NL,2/NL,8a/NL,12a/NL,13b/NL,14/NL,74/NL,81/NL,84b/NL,96a/NL,102/NL,1 01/NL,99/NL,100/NL,88b/NL,90/NL,98/NL,9/NL, 087/NL,115a/NL,88a/NL,84a/NL,8b/NL,12b/NL,1 3a/NL	33	87.40	43.31
	Medium	110/NL,104/NL,105a/NL,108/NL,111/NL,15/NL,6/NL,5b/NL,11/NL,10/NL,7a/NL,4a/NL,3/NL,75/NL,83/NL,72a/NL,76/NL,73/NL,79/NL,80/NL,85/NL,82/NL ,86/NL,89/NL,91/NL,92/NL,93/NL,94/NL,106/NL,11 4a/NL,107b/NL,105b/NL,103a/NL,96b/NL,4b/NL,5a/NL,7b/NL,72b/NL	38	102.30	50.70
	High	103b/NL,78/NL,77b/NL,71/NL	4	9.09	4.50
Total			78	201.77	100.00

North Lolab Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	2.96
Low:	87.40
Medium:	102.3
High:	9.09
Total	201.77
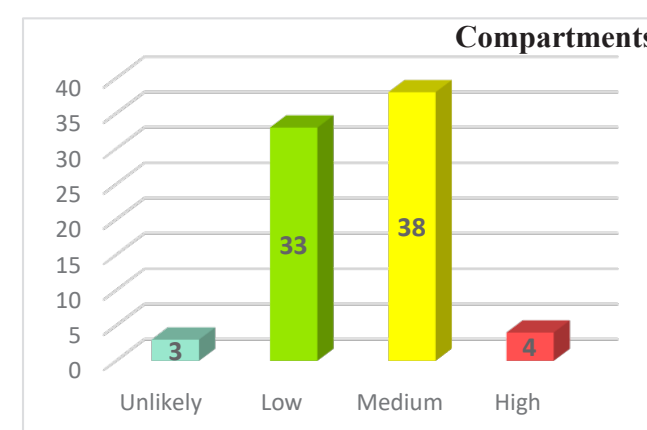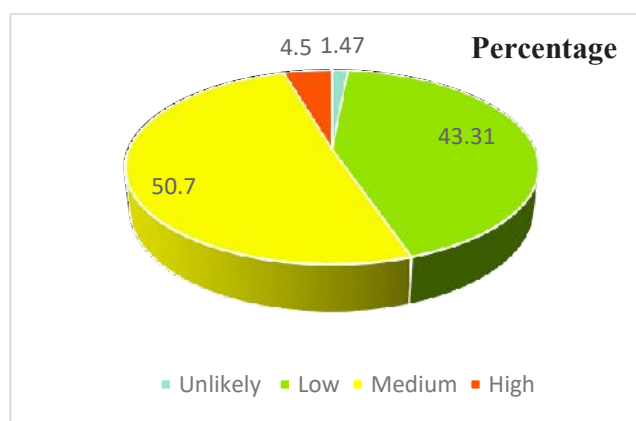
3.3.4.5 South Lolab Range
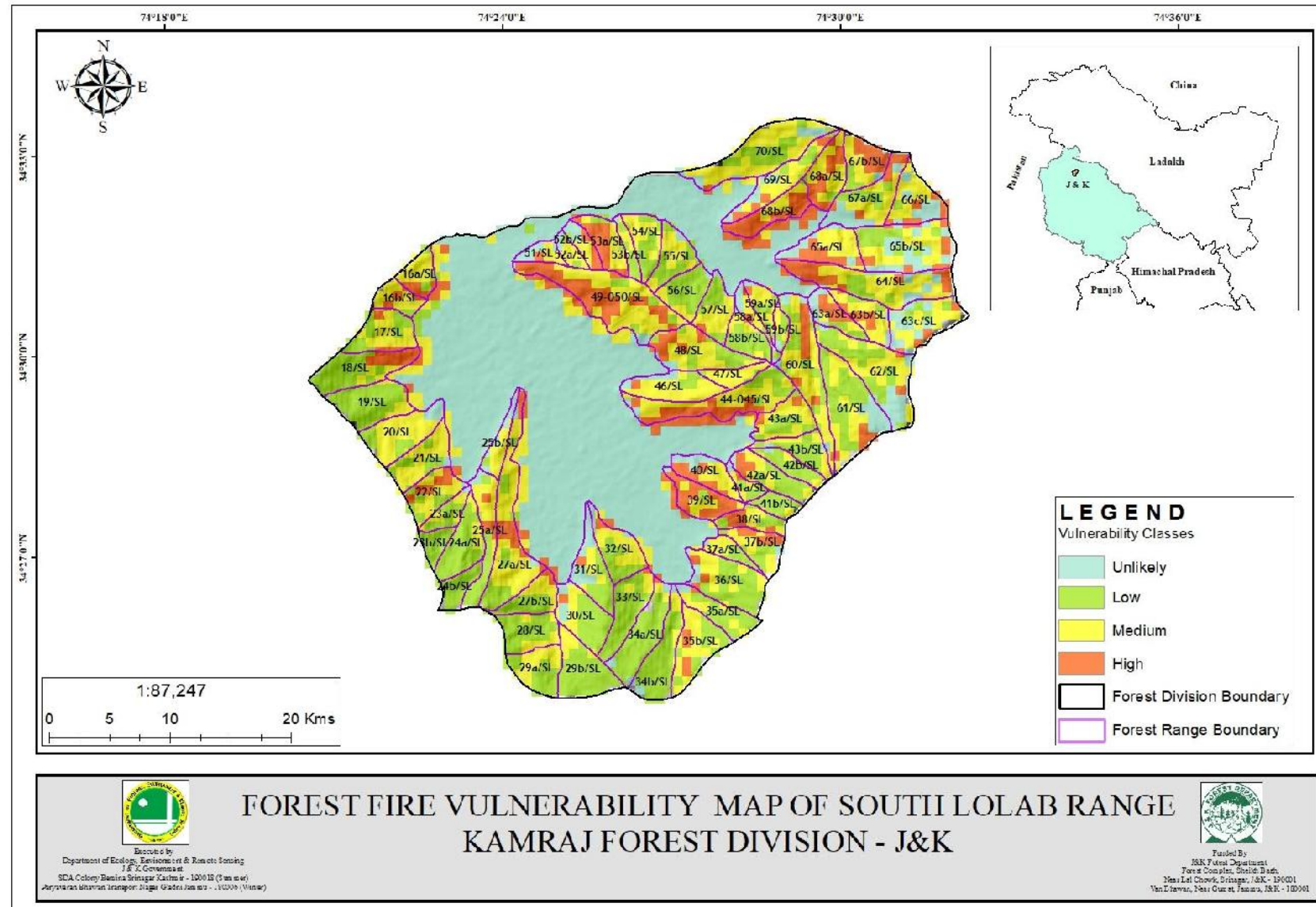
Fig. 107:Forest Fire Vulnerability Map of South Lolab Range Kamraj Forest Division Jammu & Kashmir

Table.100. Compartments of South Lolab Range Kamraj Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
South Lolab	Unlikely	65b/SL,67a/SL,63c/SL,31/SL,51/SL,52b/SL,63a/SL,58a/SL,25b/SL	9	13.31	11.35
	Low	61/SL,57/SL,58b/SL,56/SL,62/SL,34a/SL,18/SL,19/SL,25a/SL,24a/SL,28/SL,29b/SL,30/SL,33/SL,36/SL,54/SL,42a/SL,41b/SL,37b/SL,23a/SL,53b/SL,43b/SL,42b/SL,35a/SL,34b/SL,29a/SL,27b/SL,24b/SL,23b/SL	29	44.88	38.28
	Medium	49-050/SL,66/SL,55/SL,70/SL,69/SL,68a/SL,60/SL,59a/SL,16a/SL,17/SL,20/SL,21/SL,22/SL,27a/SL,32/SL,35b/SL,46/SL,47/SL,44-045/SL,43a/SL,40/SL,38/SL,64/SL,48/SL,16b/SL,52a/SL,67b/SL,65a/SL,63b/SL,59b/SL,41a/SL,37a/SL	32	54.90	46.82
	High	53a/SL,39/SL,68b/SL	3	4.15	3.54
Total			**73**	**117.26**	**100.00**

South Lolab Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	13.31
Low:	44.88
Medium:	54.90
High:	4.5
Total	117.26

Percentage

Compartments
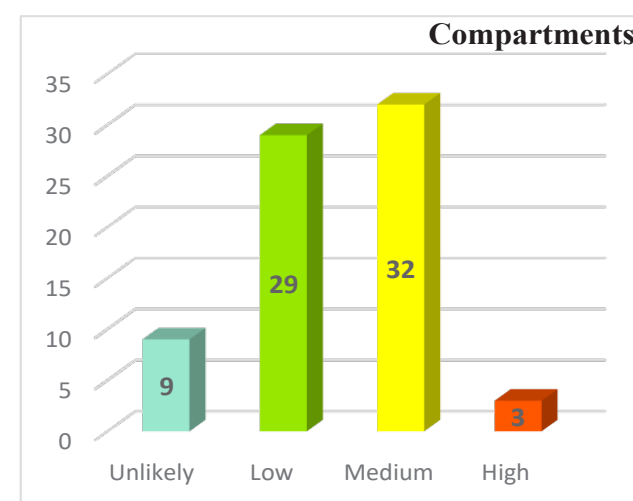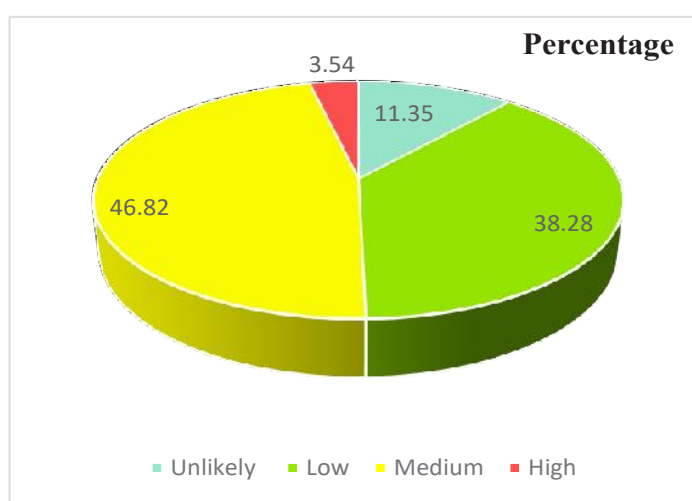
3.3.5 KHEMIL FOREST DIVISION

Khemil forest division is situated between74°0'58.486"E 34°31'29.195"N. The average elevation is 2500 meters. Forest division Khemil comprises four ranges namely Keran, Karnah, Naihari and Ramhal. The total area (on GIS Platform) of 173 compartments of four territorial ranges is area 770.64Km.[2]
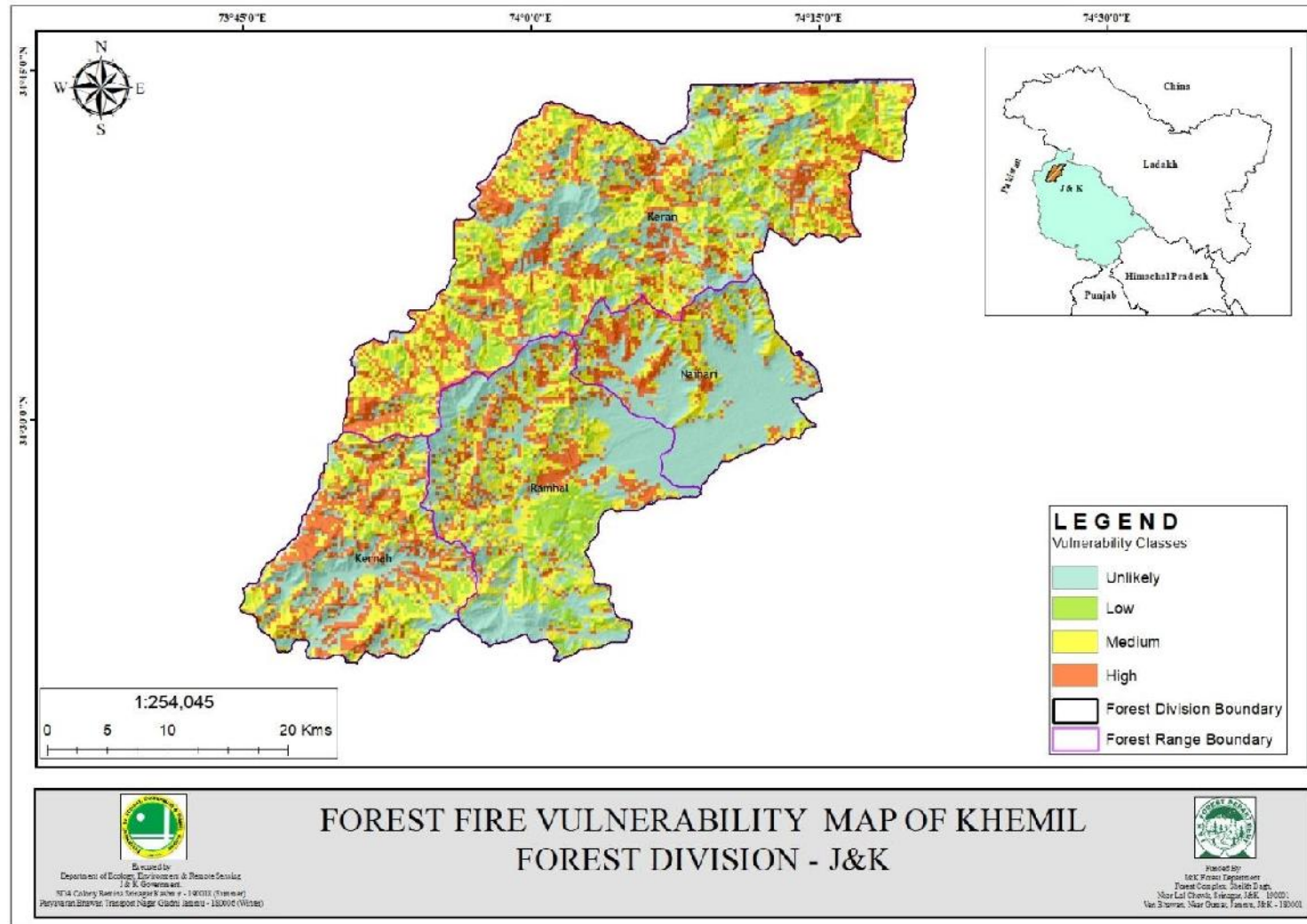
Fig. 108:Forest Fire Vulnerability Map of Khemil Forest Division Jammu & Kashmir

FOREST FIRE RISK ZONATION & VULNERABILITY ASSESSMENT FORESTS OF JAMMU & KASHMIR

Table:101 Compartments of Khemil Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Khemil Forest Division	Kernah	Unlikely	1	13.24	8.77
		Low	NA	NA	NA
		Medium	11	98.50	65.24
		High	10	39.22	25.98
		Total	**22**	**150.96**	**100.00**
	Keran	Unlikely	5	27.05	10.42
		Low	0	NA	NA
		Medium	15	230.92	89.01
		High	4	1.45	0.55
		Total	**24**	**259.42**	**100.00**
	Naihari	Unlikely	25	36.32	40.53
		Low	NA	NA	NA
		Medium	17	29.76	33.21
		High	15	23.52	26.25
		Total	**57**	**89.60**	**100.00**
	Ramhal	Unlikely	25	148.75	53.73
		Low	11	23.01	8.31
		Medium	27	91.24	32.92

		High	7	13.81	4.98
		Total	70	276.83	100.00

Khemil Forest Division	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	225.36
Low:	23.1
Medium:	444.18
High:	78
Total	770.64

Percentage

10.04 · 29.01 · 57.98 · 2.96

Unlikely · Low · Medium · High

Compartments

56 · 11 · 70 · 36

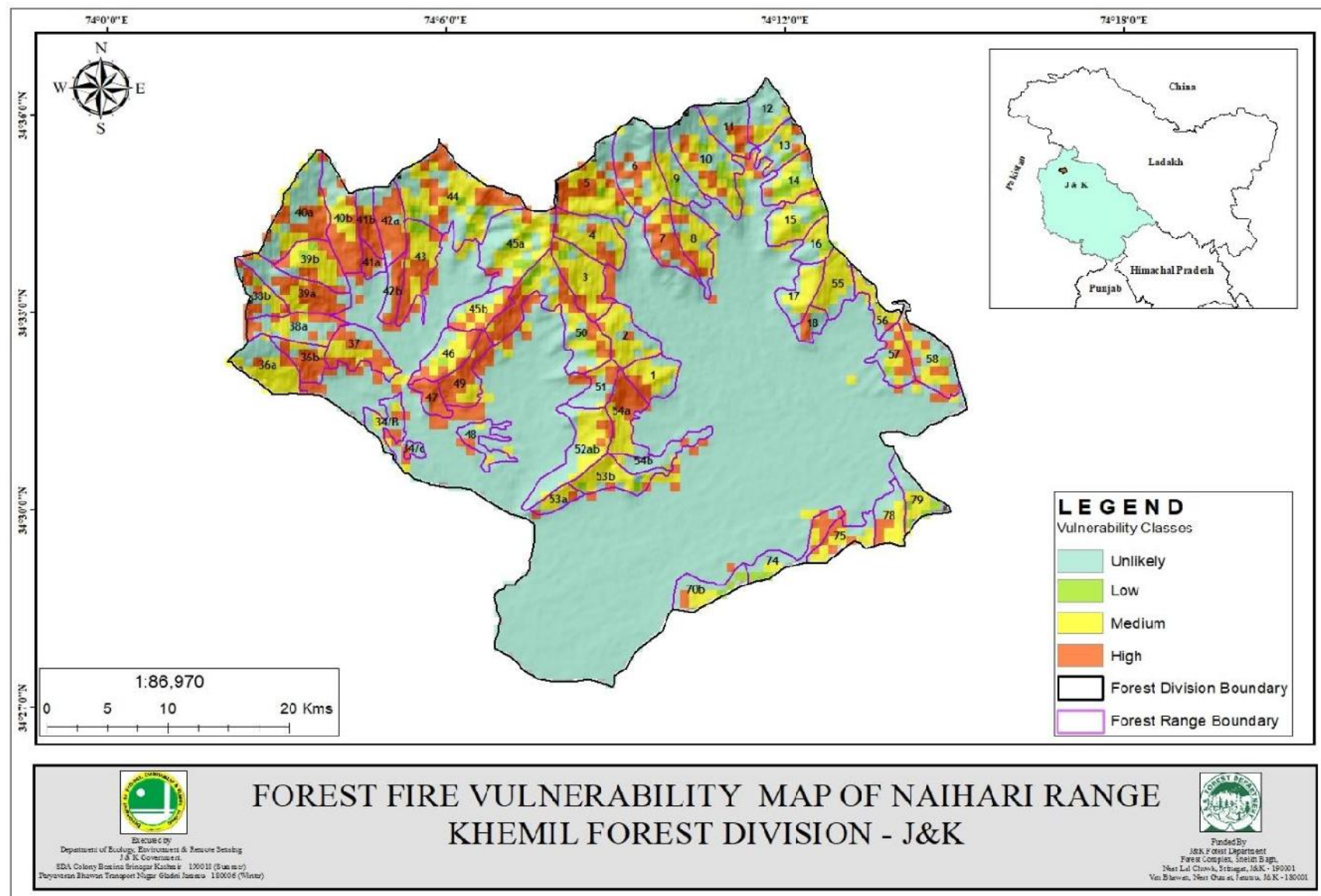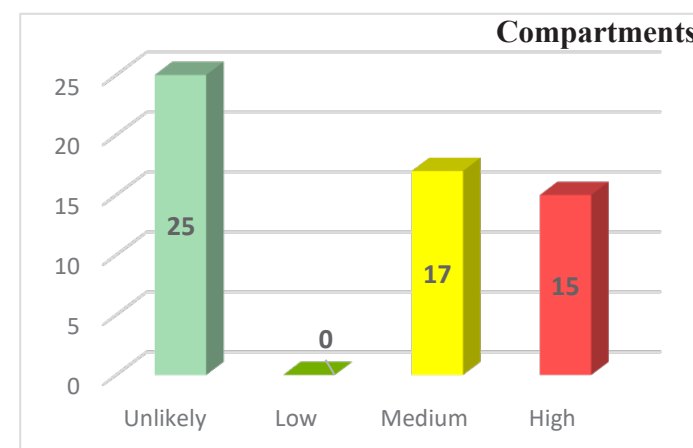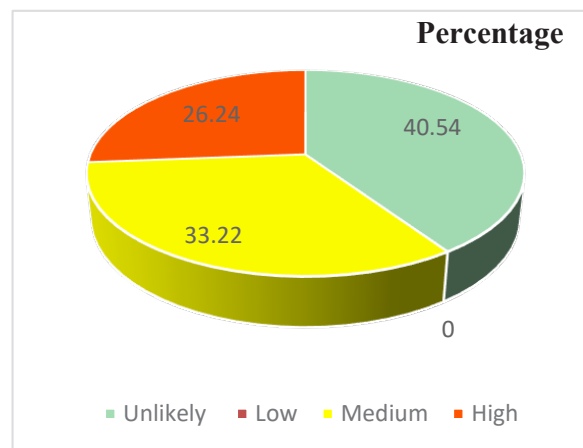Unlikely · Low · Medium · High
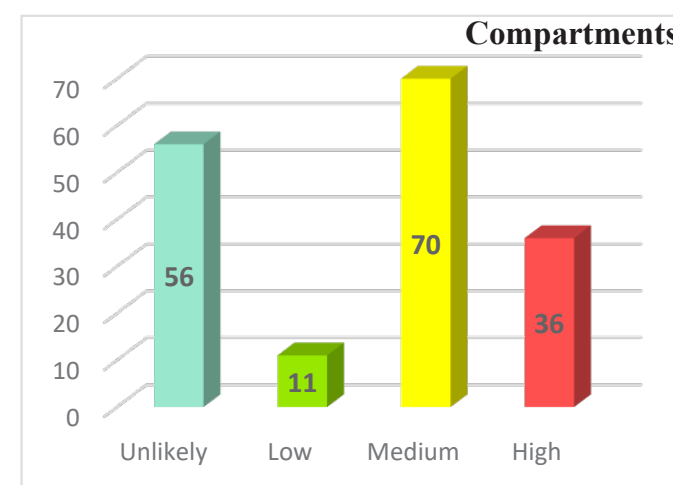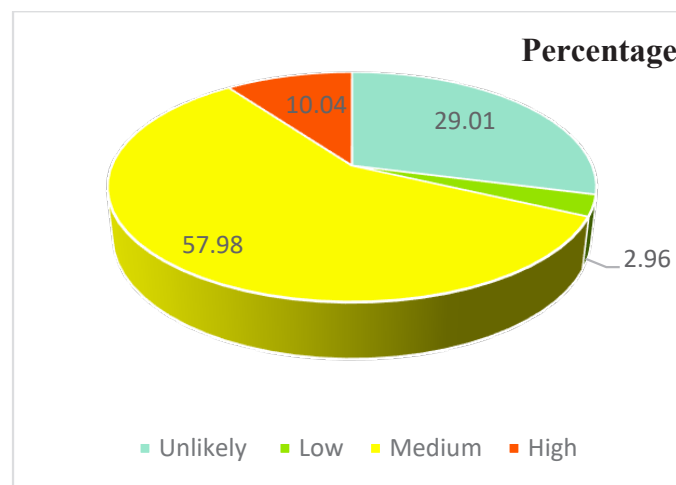
3.3.5.1 Karnah Range
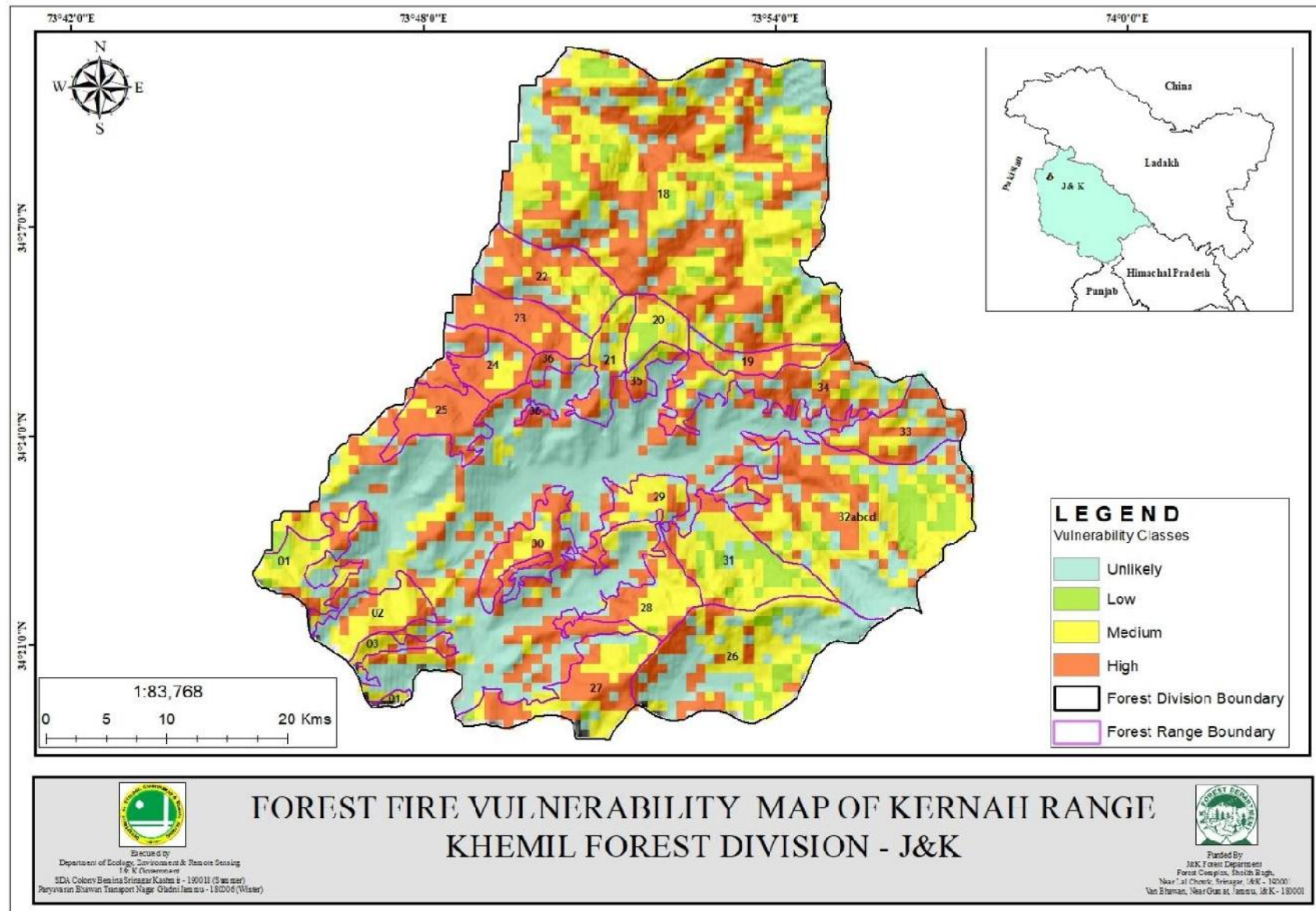
Fig. 109:Forest Fire Vulnerability Map of Kernah Range Khemil Forest Division Jammu & Kashmir

Table.102. Compartments of Kernah Range Khemil Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area Sq Km	Percentage
Kernah	Unlikely	26	1	13.24	8.77
	Low	NA	NA	NA	NA
	Medium	3,1,18,21,32abcd,28,31,29,2,35,20	11	98.49	65.24
	High	36,22,25,24,23,34,33,27,30,19	10	39.22	25.98
Total			22	150.96	100.00

Kernah Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	13.24
Low:	0
Medium:	98.49
High:	39.22
Total	**150.96**

Percentage

Compartments

FOREST FIRE RISK ZONATION & VULNERABILITY ASSESSMENT FORESTS OF JAMMU & KASHMIR
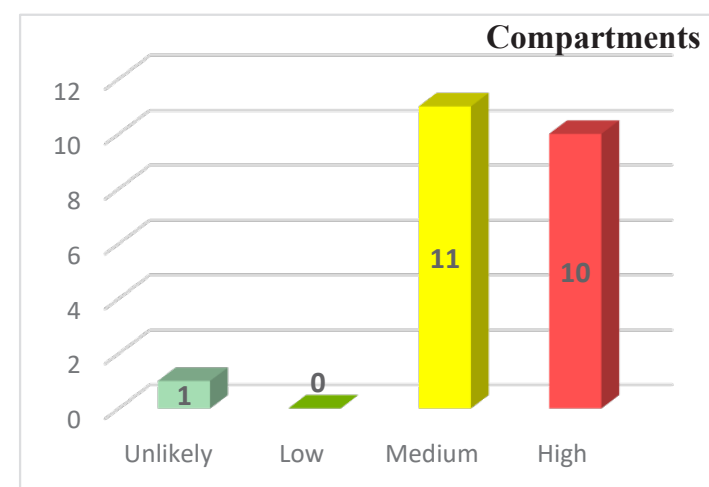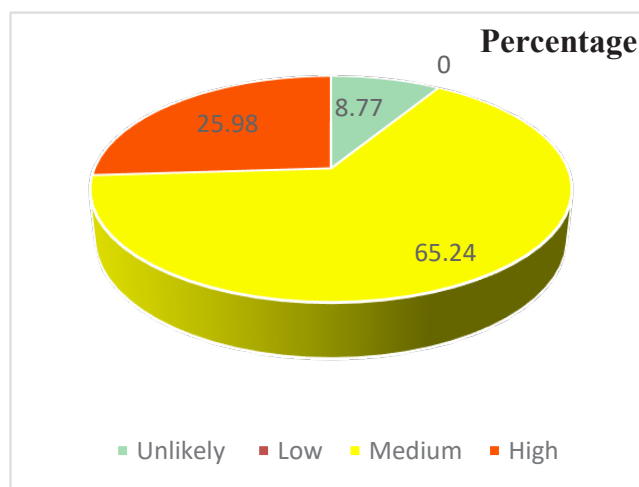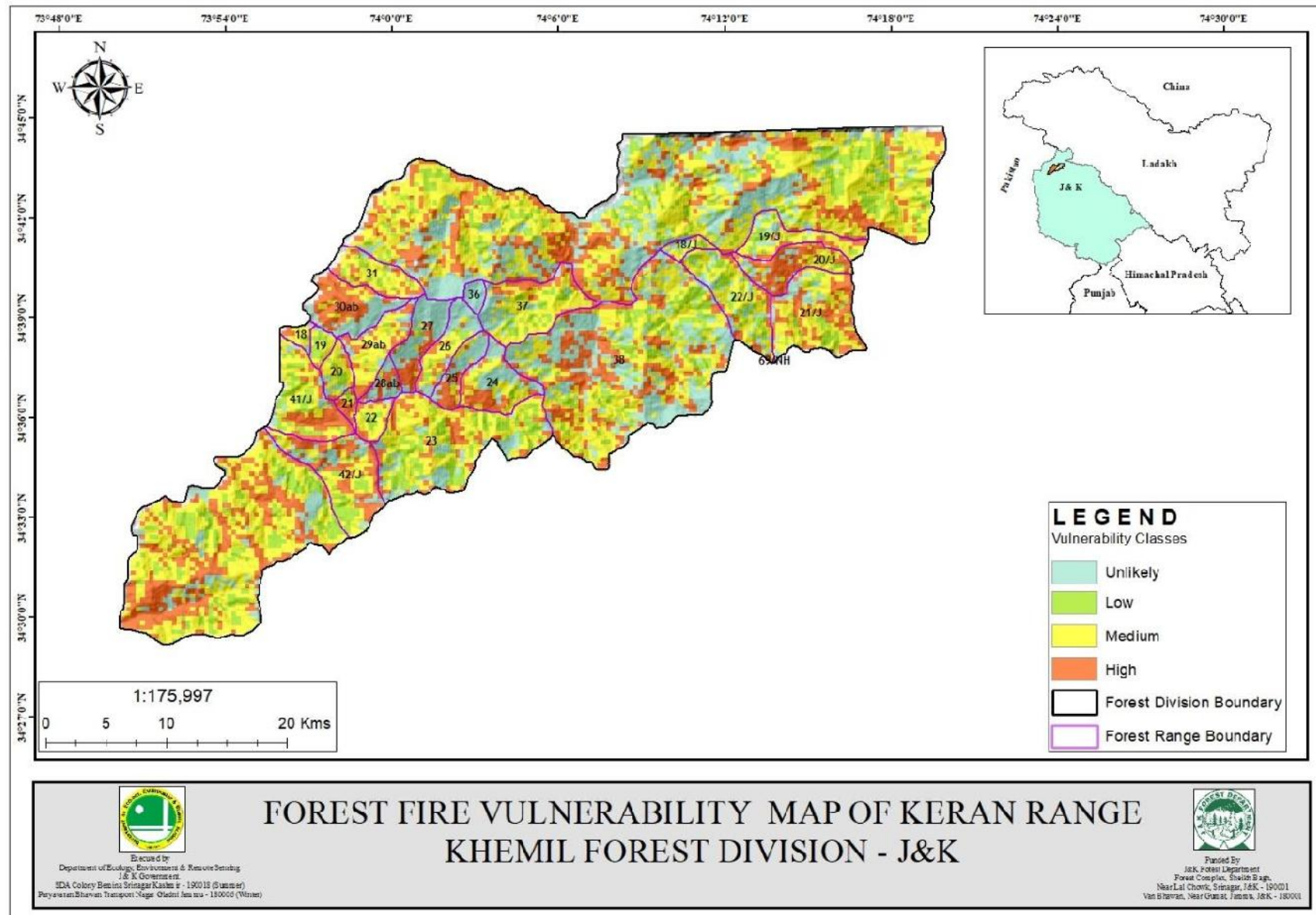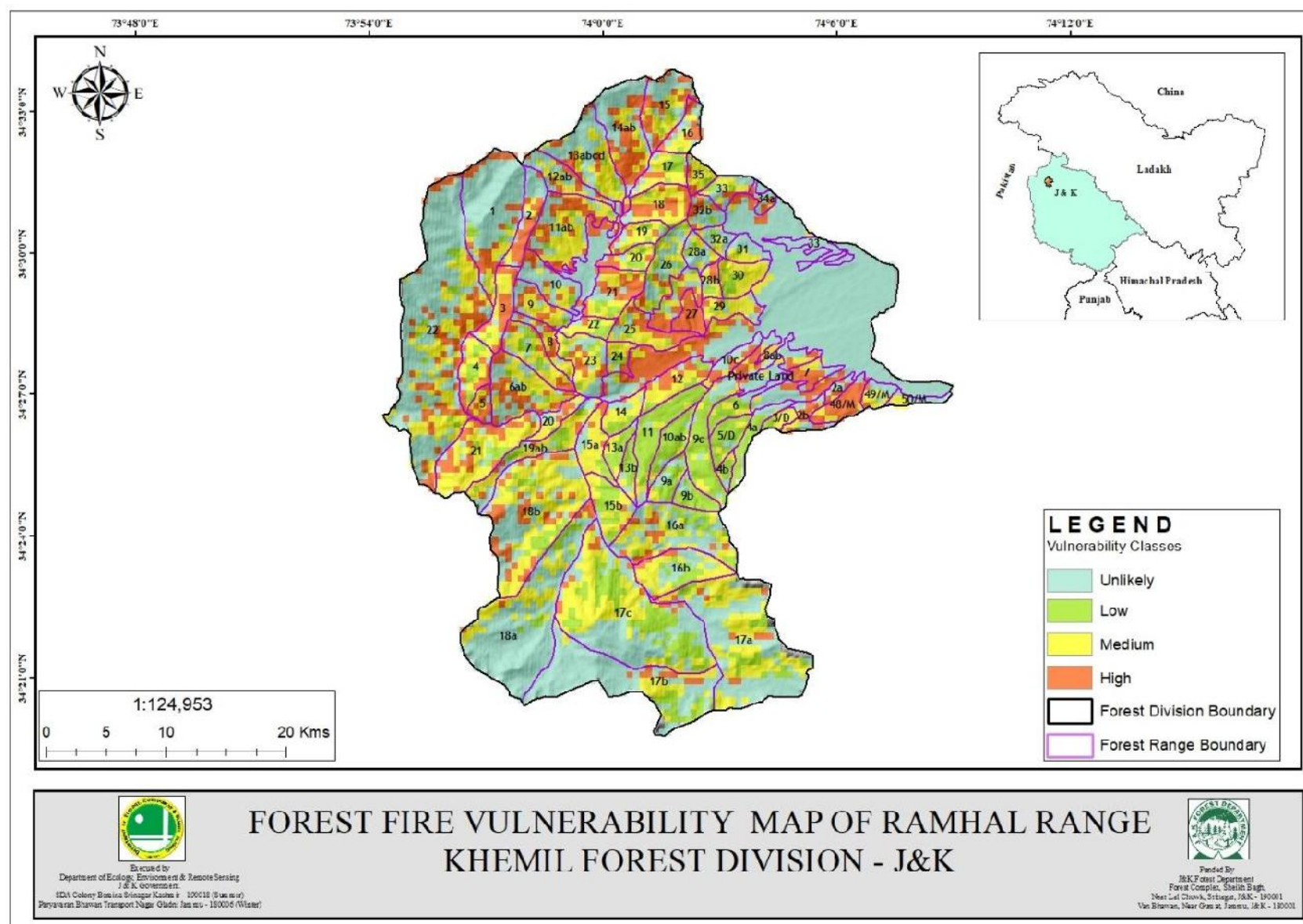
3.3.5.2 Keran Range

Fig. 110:Forest Fire Vulnerability Map of Keran Range Khemil Forest Division Jammu & Kashmir

Table.103. Compartments of Keran Range Khemil Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Keran	Unlikely	36,26,25,27,28ab	5	27.05	9.09
	Low	NA	NA	NA	NA
	Medium	19/J,21/J,37,24,23,29ab,31,18,19, 20,22,41/J,22/J,18/J,38	15	230.92	77.63
	High	30ab,42/J,20/J,21	4	39.47	13.27
Total			24	259.42	100.00

Area

Keran Range

Vulnerability Classes	Area(Sq Kms)
Unlikely:	27.05
Low:	0
Medium:	230.92
High:	39.47
Total	**256.42**

Percentage

13.27 9.09

77.63

- Unlikely - Low - Medium - High

Compartments

5 0 15 4

Unlikely Low Medium High

FOREST FIRE RISK ZONATION & VULNERABILITY ASSESSMENT FORESTS OF JAMMU & KASHMIR
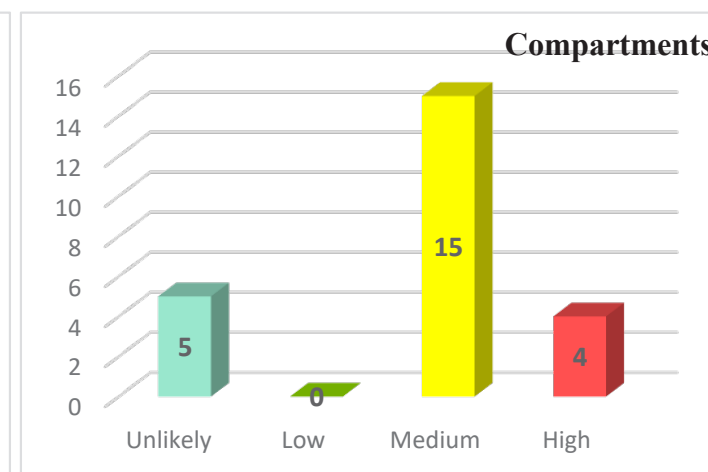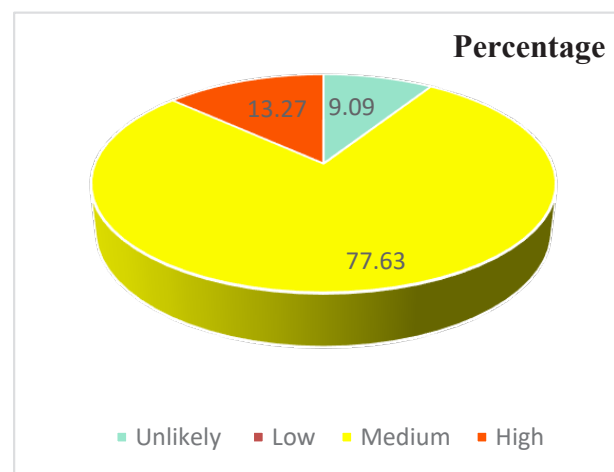
3.3.5.3 Naihari Range

Fig. 111:Forest Fire Vulnerability Map of Naihari Range Khemil Forest Division Jammu & Kashmir

Table.104. Compartments of Naihari Range Khemil Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Naihari	Unlikely	12,10,79,13,11,9,6,51,52ab,70b,74,78,16,17,18,58,45a,40a,38a,34/c,34/B,48,54b,45b,42b	25	36.32	40.54
	Low	NA	NA	NA	NA
	Medium	14,15,8,5,4,3,2,1,53b,75,55,56,46,44,36a,53a,39b	17	29.76	33.22
	High	7,54a,57,50,49,43,42a,41b,37,39a,47,41a,40b,38b,36b	15	23.52	26.24
Total			52	89.61	100.00

Naihari Range — Area

Vulnerability Classes	Area(Sq Kms)
Unlikely:	36.32
Low:	0
Medium:	29.76
High:	23.52
Total	**89.61**

Percentage: 26.24, 40.54, 33.22, 0 — Unlikely, Low, Medium, High

Compartments: Unlikely 25, Low 0, Medium 17, High 15

3.3.5.4 Ramhal Range
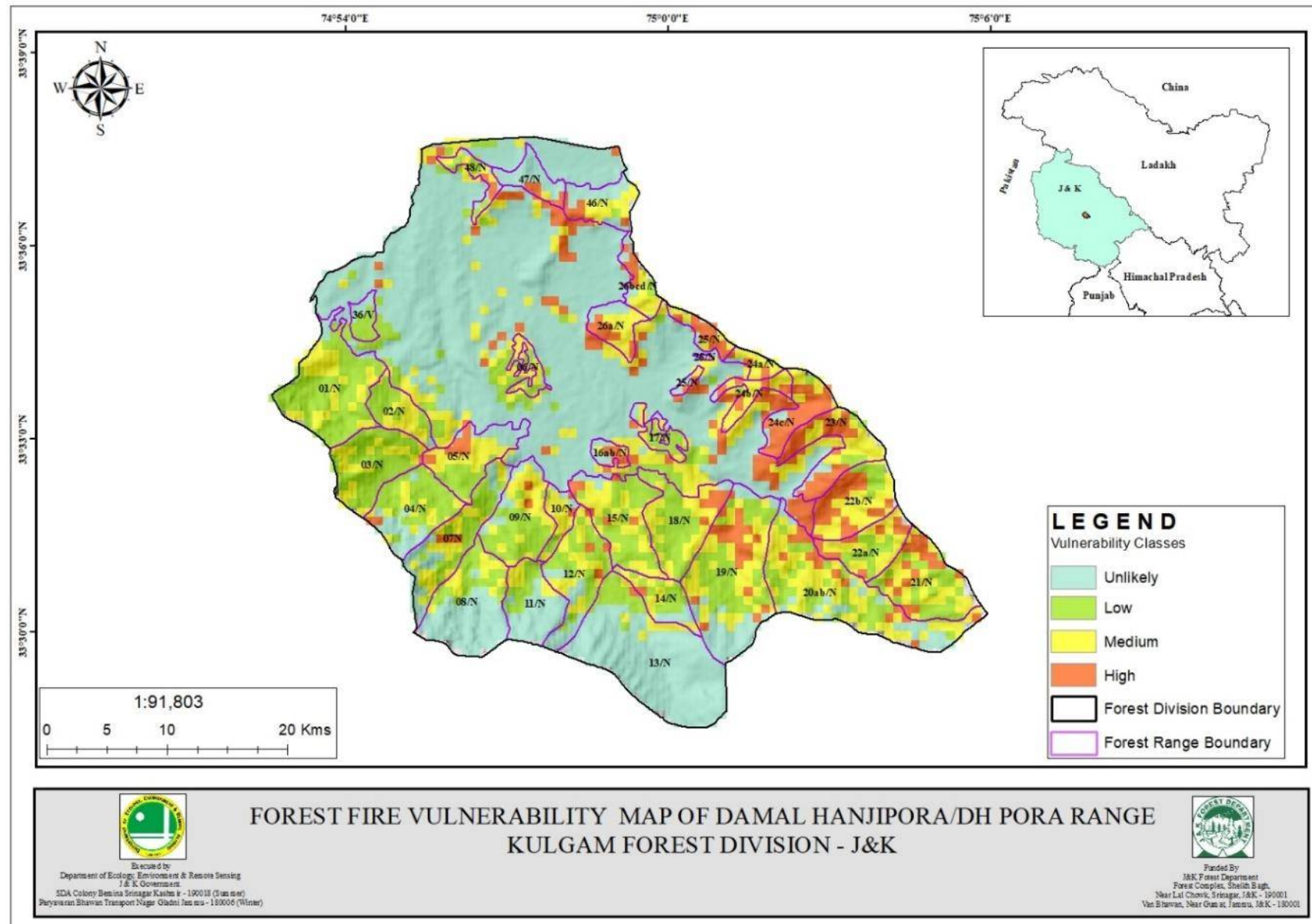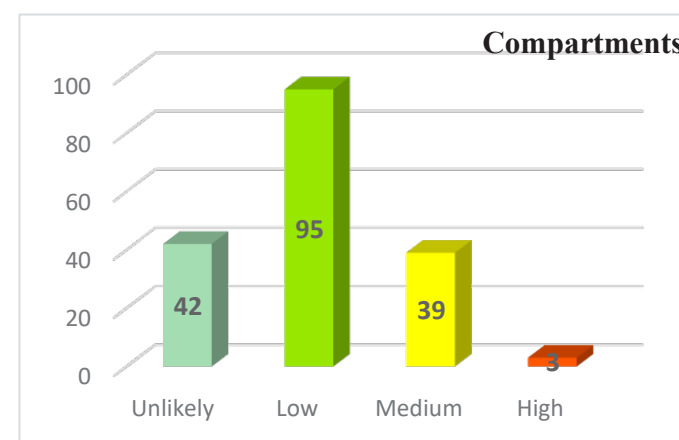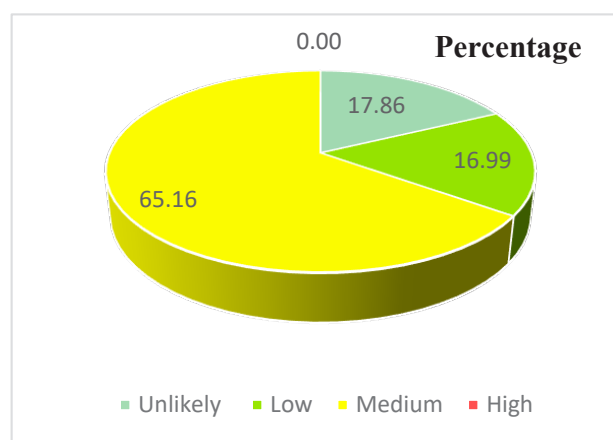

Fig. 112:Forest Fire Vulnerability Map of Ramhal Range Khemil Forest Division Jammu & Kashmir

Table.105. Compartments of Ramhal Range Khemil Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Ramhal	Unlikely	10,22,8ab,18a,26,33,34a,1,12ab,15,14ab,50/M ,49/M, Private Land,16a,17c,28a,31,32b,13abcd,17b,17a,2a,10c,32a	25	148.76	53.74
	Low	11,13a,4a,5/D,6,9c,10ab,13b,9a,9b,4b	11	23.02	8.31
	Medium	12,15b,19ab,21,4,23,29,30,11ab,20,19,18,17,24,35,3/D,7,14,6ab,25,9,8,15a,18b,16b,28b	26	91.25	32.96
	High	3,5,27,2,16,2b,48/M	7	13.81	4.99
Total			69	276.83	100.00

Ramhal Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	148.76
Low:	23.02
Medium:	91.25
High:	13.81
Total	**276.83**

3.3.6 KULGAM FOREST DIVISION
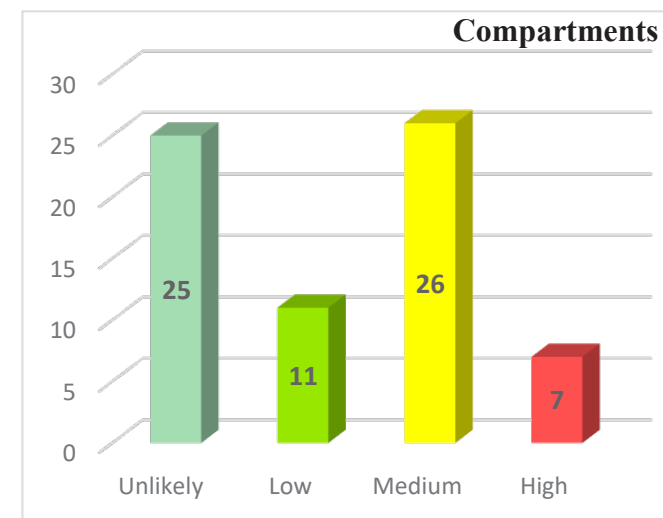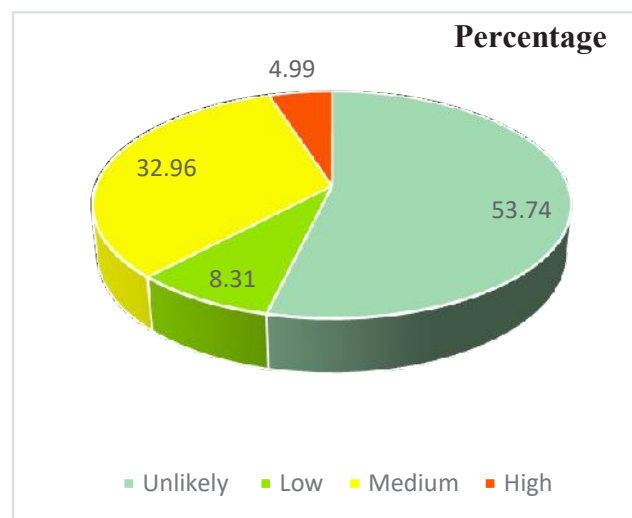
The forests of Kulgam Forest Division are spread between 33°_ 28'-0'' and 33°_ 49'-15'' North Latitude and 74°_ 39'-30'' and 75°_ 07'-45'' East Longitude.The average elevation of the division is 1739 meters. The Division comprises of three Territorial Forest Ranges and one Soil Conservation Range. The Territorial Ranges are: - Vishav Forest Range Damhal Hanjipora Forest Range and Kulgam Forest Range. The total area (on GIS Platform) of 86 compartments of three territorial ranges is area 437.08 Km.[2]
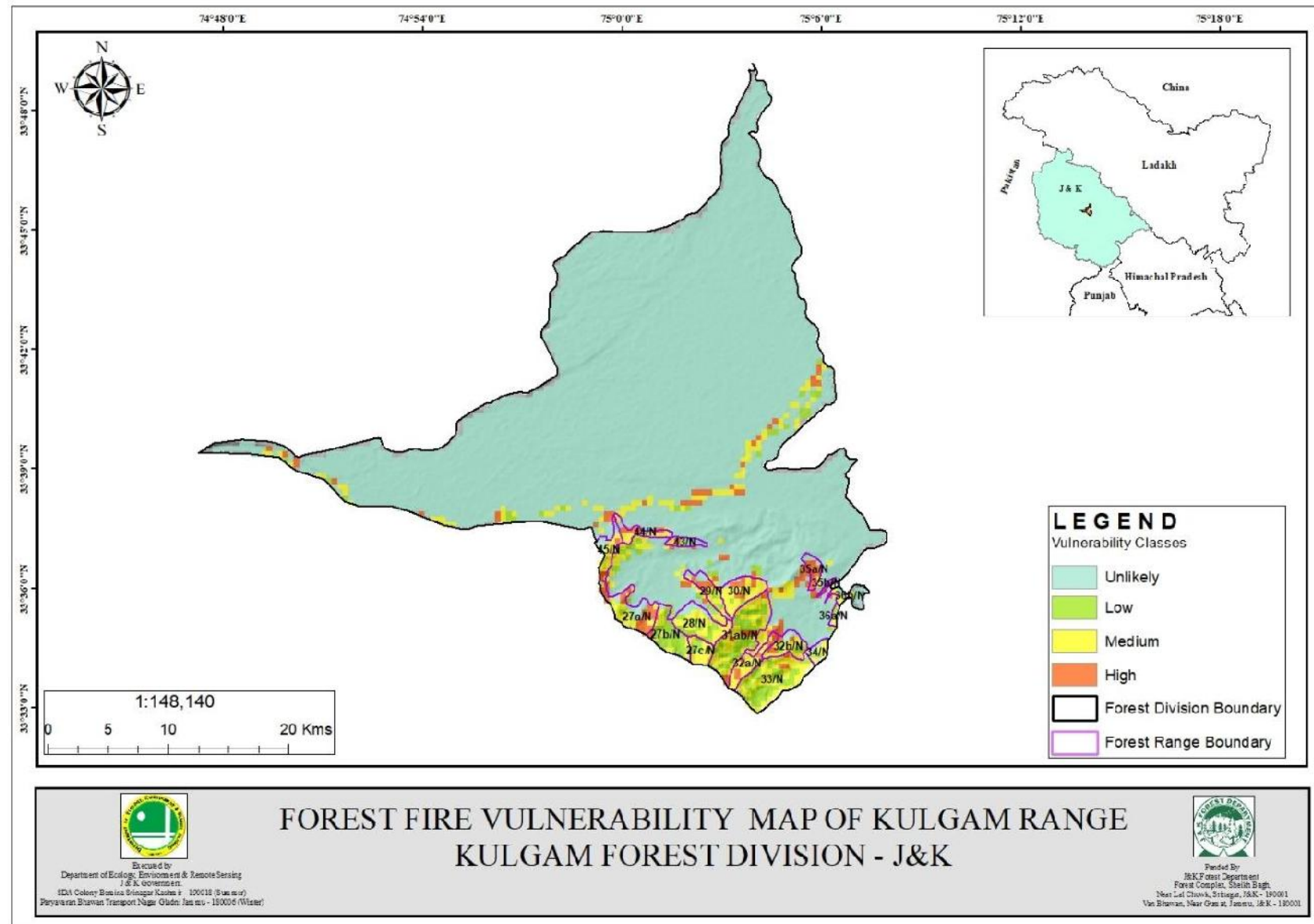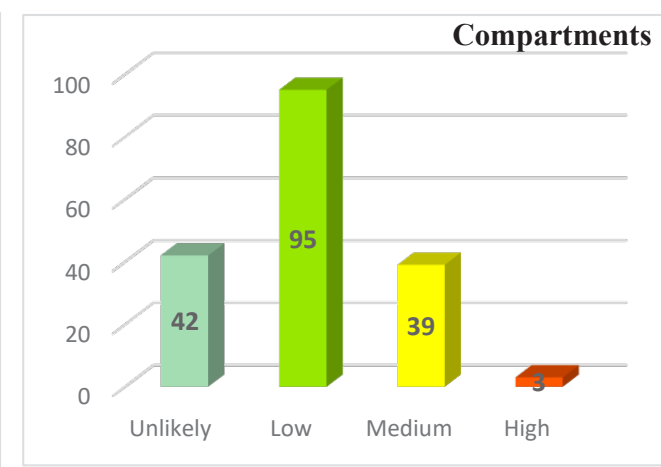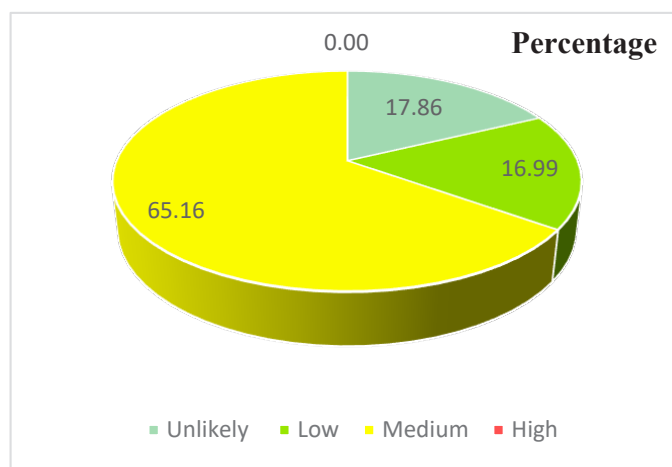

Fig. 113:Forest Fire Vulnerability Map of Kulgam Forest Division Jammu & Kashmir

Table.106. Compartments of Kulgam Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Kulgam Forest Division	DH Pora	Unlikely	6	23.48	20.56
		Low	14	52.84	46.26
		Medium	11	30.57	26.76
		High	3	7.34	6.42
		Total	**34**	**114.23**	**100.00**
	Kulgam	Unlikely	5	5.30	1.56
		Low	2	2.94	0.87
		Medium	10	24.82	7.33
		High	1	0.83	0.24
		Total	**18**	**33.89**	**10.00**
	Vishav	Unlikely	10	198.15	68.57
		Low	13	43.01	14.89
		Medium	9	37.46	12.96
		High	2	10.34	3.58
		Total	**34**	**288.96**	**100.00**

Kulgam Forest Division	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	226.93
Low:	98.79
Medium:	92.85
High:	18.51
Total	437.08

Percentage

0.00
17.86
16.99
65.16

- Unlikely ■ Low ■ Medium ■ High

Compartments

Unlikely	42
Low	95
Medium	39
High	3
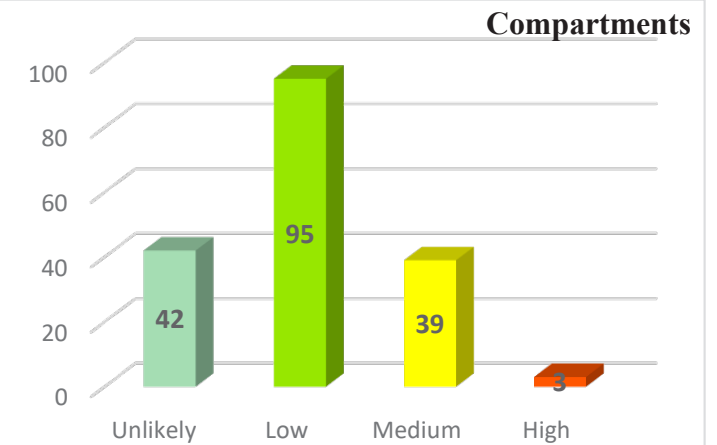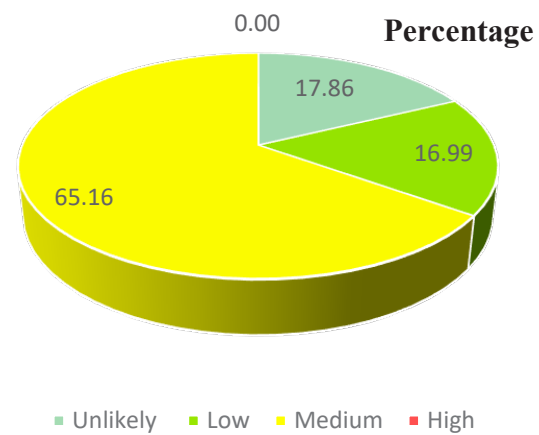
3.3.6.1 Damal Hajipora/DH Pora Range
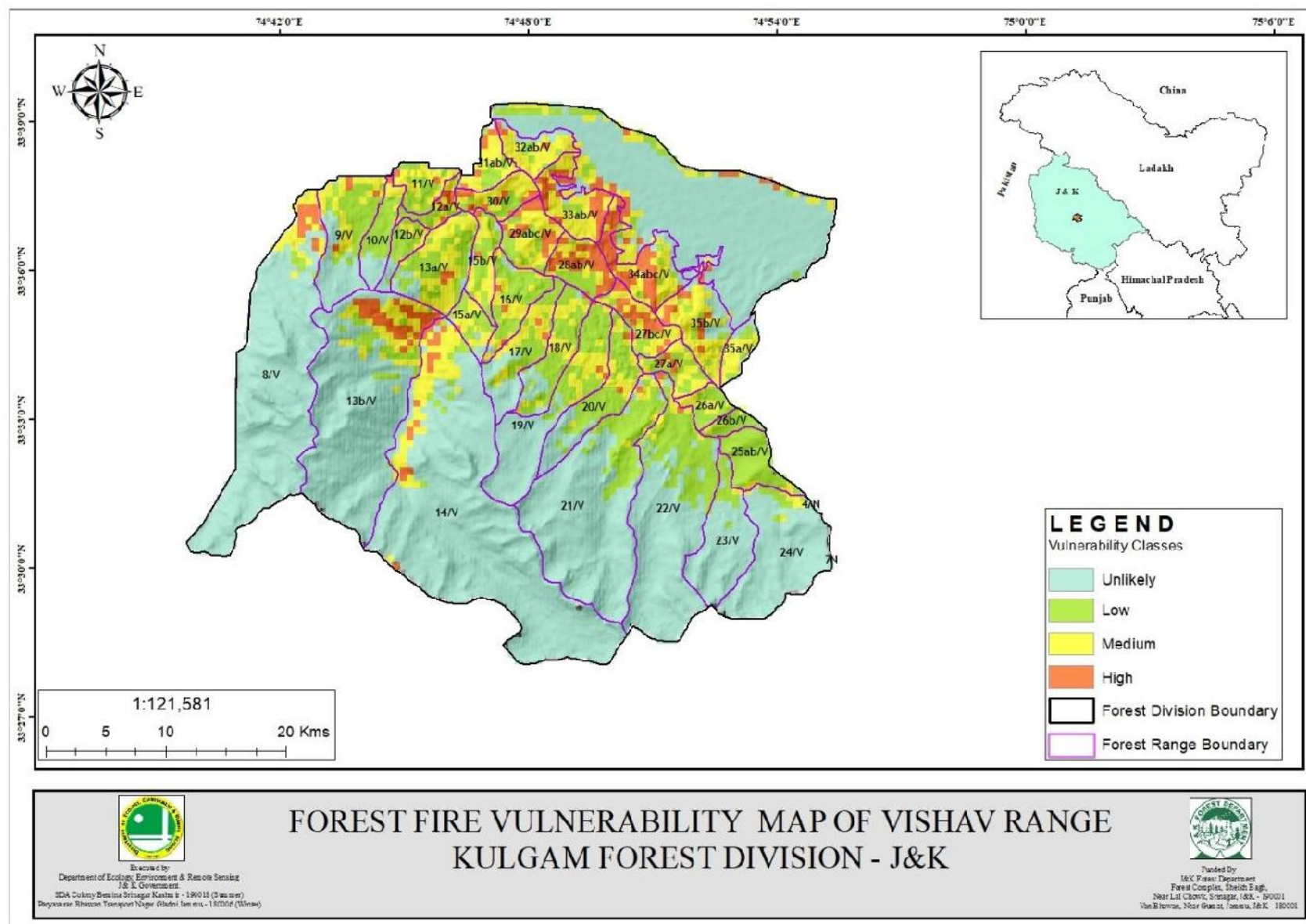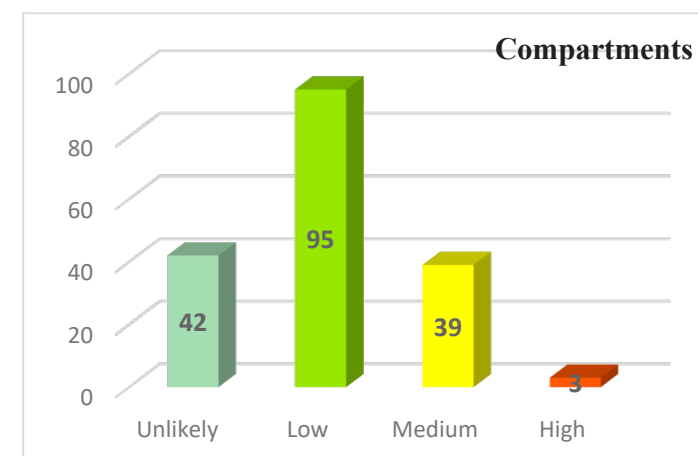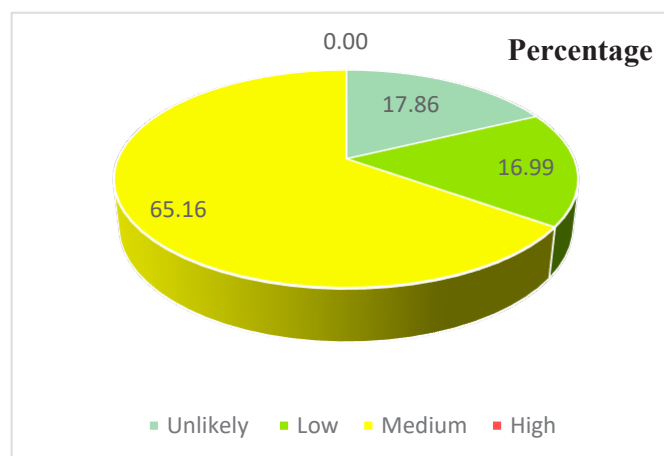

Fig. 114:Forest Fire Vulnerability Map of Damal Hanjipora Range Kulgam Forest Division Jammu & Kashmir

Table.107. Compartments of DH Pora Range Kulgam Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
DH Pora	Unlikely	08/N,16ab/N,11/N,13/N,46/N,47/N	6	23.48	20.56
	Low	36/V,02/N,03/N,04/N,06/N,07N,09/N ,17/N,19/N,12/N,14/N,15/N,18/N,01/N	14	52.84	46.26
	Medium	05/N,26a/N,22b/N,21/N,20ab/N,10/N,48 /N,24a/N,24b/N,26bcd/N,22a/N	11	30.57	26.76
	High	25/N,24c/N,23/N	3	7.34	6.42
Total			34	114.23	100.00

Damal Hanjipora Range   Area

Vulnerability Classes	Area(Sq Kms)
Unlikely:	23.48
Low:	52.84
Medium:	30.57
High:	7.34
Total	**114.23**

Percentage

0.00
17.86
16.99
65.16

Unlikely Low Medium High

Compartments

42
95
39
3

Unlikely Low Medium High

3.3.6.2 Kulgam Range

Fig. 115:Forest Fire Vulnerability Map of Kulgam Range Kulgam Forest Division Jammu & Kashmir

Table.108. Compartments of Kulgam Range Kulgam Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Kulgam	Unlikely	34/N,35b/N,36b/N,43/N,27a/N	5	5.30	1.56
	Low	27b/N,36a/N	2	2.94	0.87
	Medium	33/N,32b/N,31ab/N,45/N,28/N,30/N,29/N,44/N,27c/N,32a/N	10	24.82	7.33
	High	35a/N	1	0.83	0.24
Total			18	33.89	100.00

Kulgam Range	Area
Vulnerability Classes	Area(Sq Kms)
Unlikely:	5.30
Low:	2.94
Medium:	24.82
High:	0.83
Total	**33.89**

3.3.6.3 Vishav Range
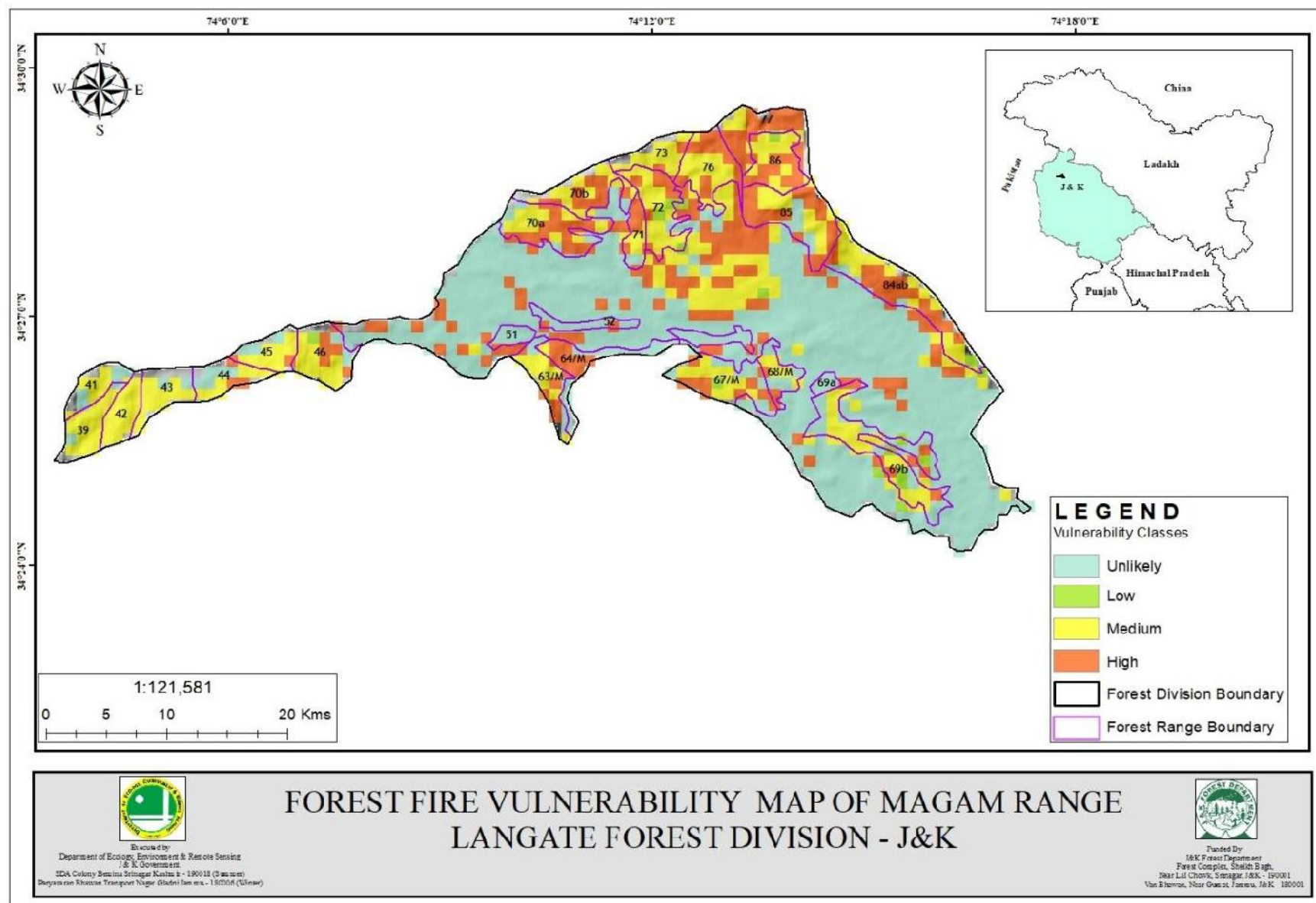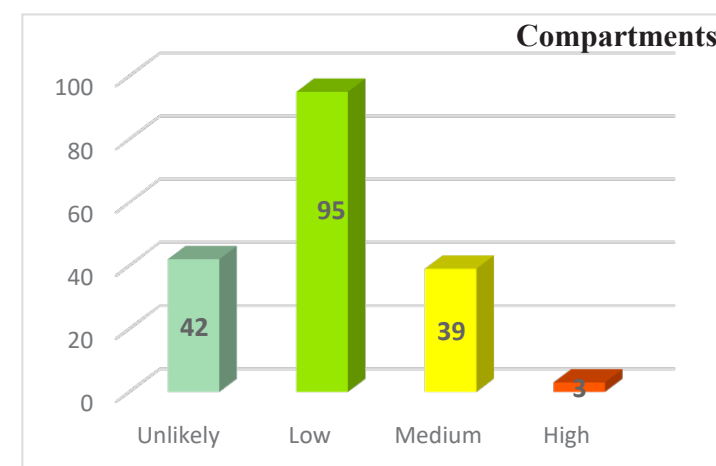

Fig. 116:Forest Fire Vulnerability Map of Vishav Range Kulgam Forest Division Jammu & Kashmir

Table.109. Compartments of Vishav Range Kulgam Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Vishav	Unlikely	8/V,9/V,24/V,23/V,22/V,21/V,19/V,17/V,13b/V,14/V	10	198.15	68.57
	Low	10/V,11/V,12b/V,15b/V,26a/V,25ab/V,18/V,16/V,20/V,27a/V,12a/V,15a/V,26b/V	13	43.01	14.89
	Medium	31ab/V,30/V,29abc/V,27bc/V,32ab/V,33ab/V,35b/V,13a/V,35a/V	9	37.46	12.96
	High	28ab/V,34abc/V	2	10.34	3.58
Total			34	288.96	100.00

Vishav Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	198.15
Low:	43.01
Medium:	37.46
High:	10.34
Total	**288.96**

3.3.7 LANGATE FOREST DIVISION

Langateforest division is situated between74°12'25.395"E 34°21'23.418"N. The average elevation is 1650 meters. Forest division Langate comprises four teritorial ranges namely Marwah, Rajwar, Magam and Rafiabad. The total area (on GIS Platform) of 194 compartments of four territorial ranges is area 370.31Km.[2]
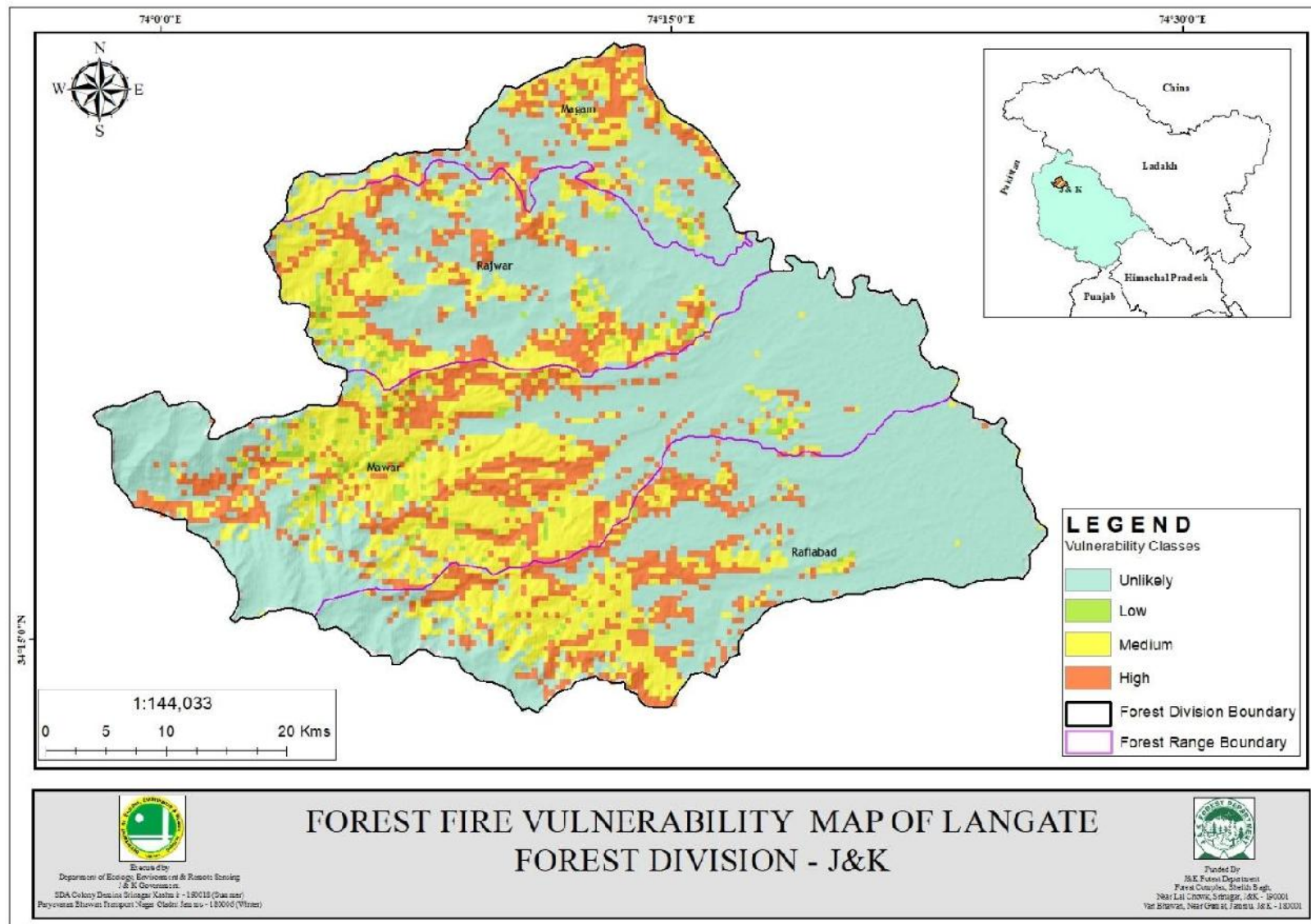
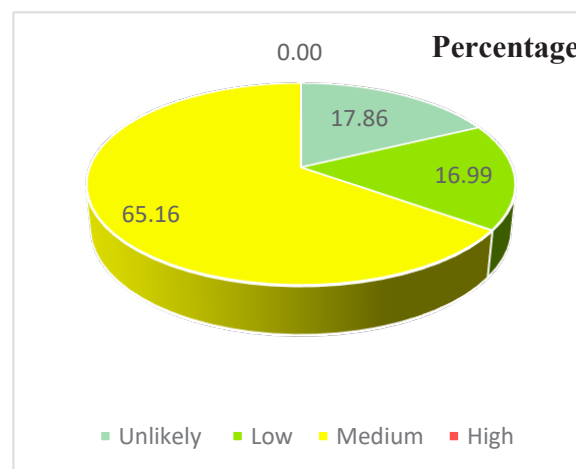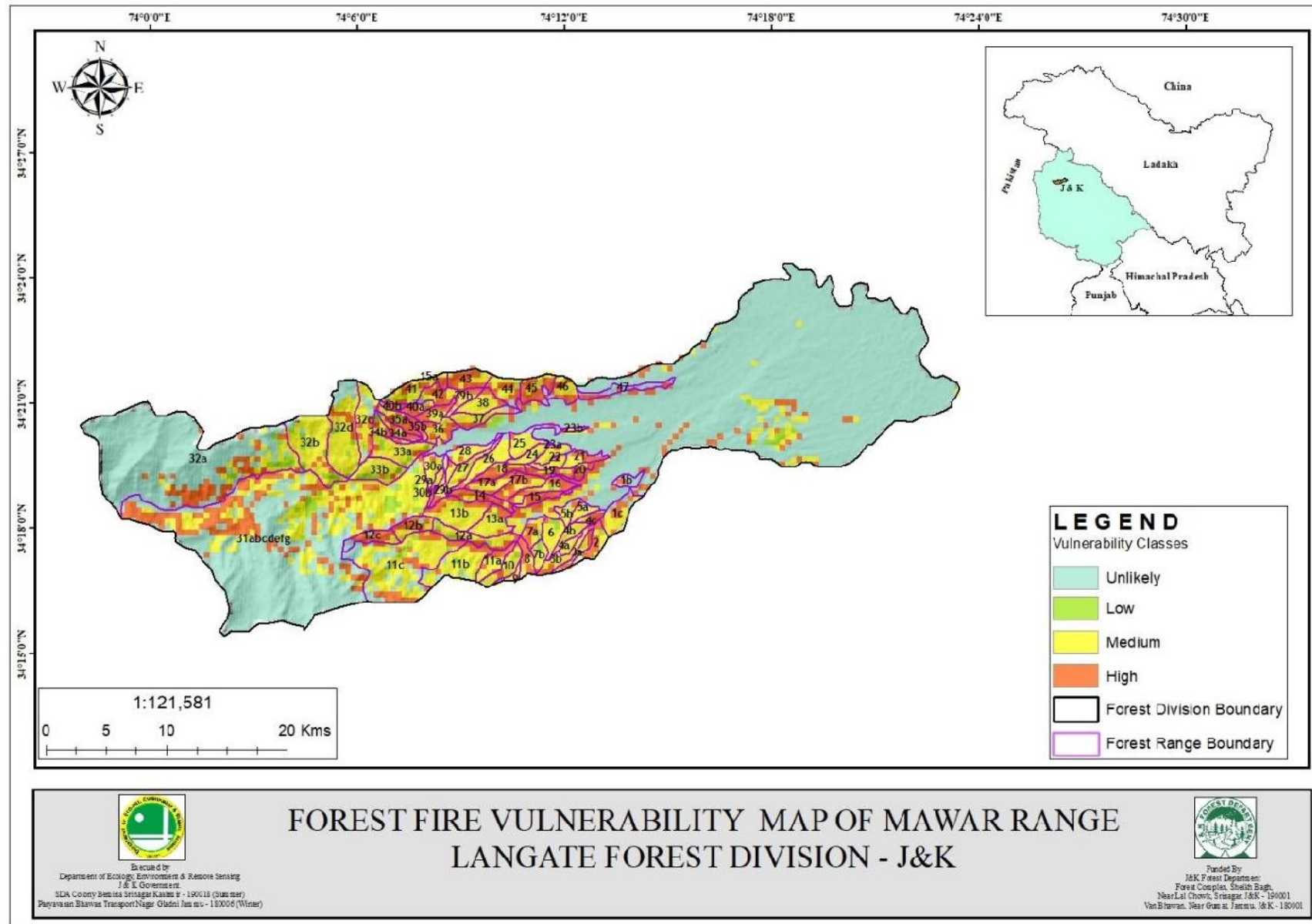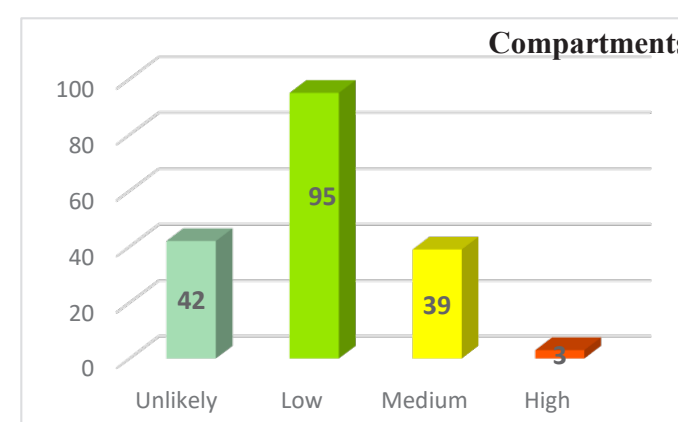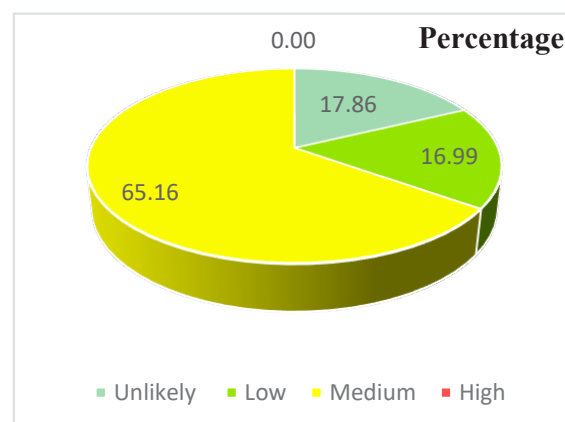Fig. 117:Forest Fire Vulnerability Map of Langate Forest Division Jammu & Kashmir

Table.110. Compartments of Langate Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Langate Forest Division	Magam	Unlikely	6	6.38	21.94
		Low	0	0.00	0.00
		Medium	17	19.38	66.68
		High	2	3.31	11.40
		Total	**25**	29.08	100.00
	Mawar	Unlikely	4	79.17	47.70
		Low	0	0.00	0.00
		Medium	43	65.22	39.30
		High	23	21.57	13.00
		Total	**70**	**165.96**	**100.01**
	Rafiabad	Unlikely	**10**	31.58	35.00
		Low	**0**	0.00	0.00
		Medium	**15**	43.71	48.44
		High	**12**	14.95	16.56
		Total	**37**	**90.23**	100.00
	Rajwar	Unlikely	9	12.63	14.85
		Low	0	0.00	0.00
		Medium	37	53.03	62.36
		High	16	19.38	22.79
		Total	**62**	**85.04**	**100.00**

Langate Forest Division	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	129.76
Low:	0
Medium:	181.34
High:	59.2
Total	370.31

Percentage

- Unlikely ■ Low ■ Medium ■ High

0.00
17.86
16.99
65.16

Compartments

Unlikely	Low	Medium	High
42	95	39	3

FOREST FIRE RISK ZONATION & VULNERABILITY ASSESSMENT FORESTS OF JAMMU & KASHMIR
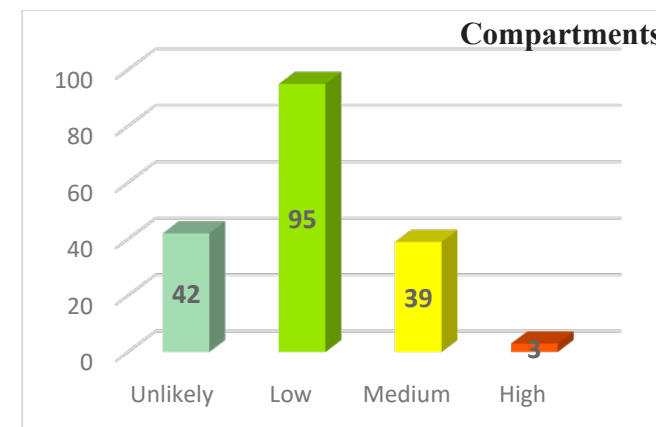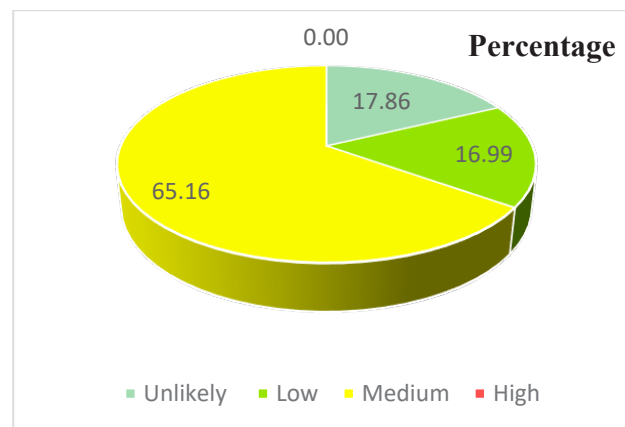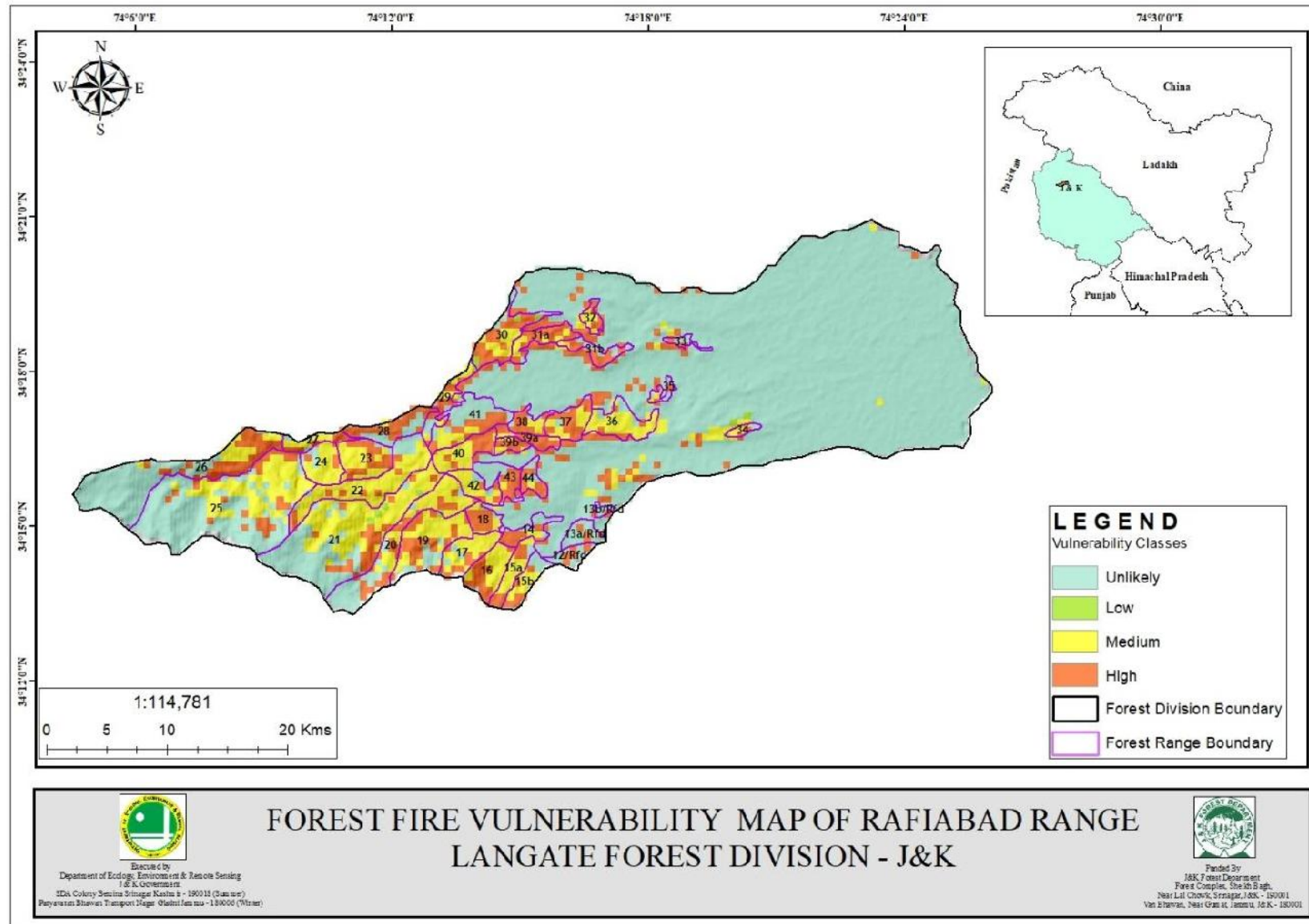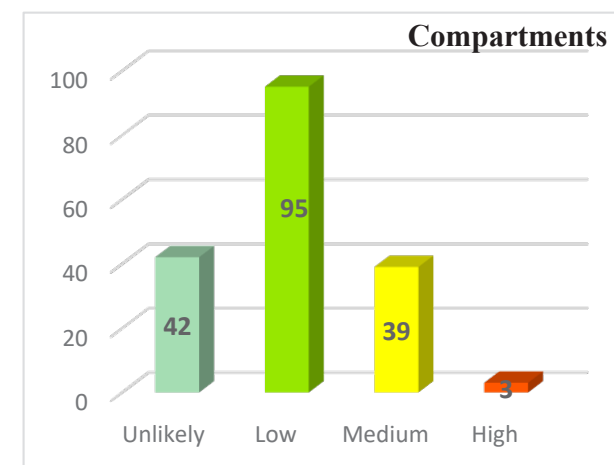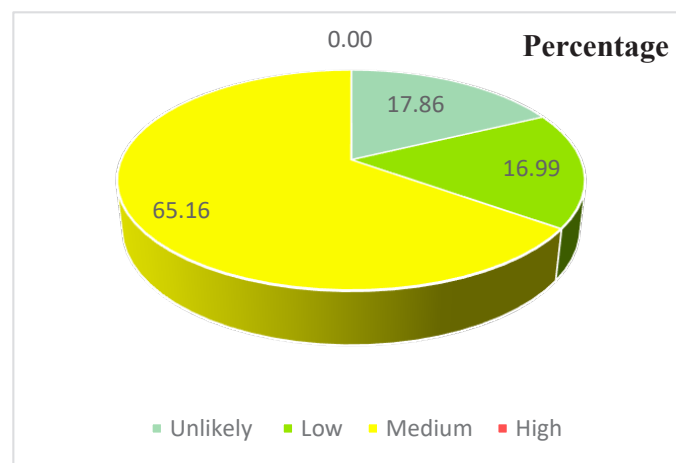
3.3.7.1 Magam Range

Fig. 118:Forest Fire Vulnerability Map of Magam Range Langate Forest Division Jammu & Kashmir

Table.111. Compartments of Magam Range Langate Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Magam	Unlikely	69b,51,52,68/M,64/M,69 a	6	6.38	21.94
	Low		0	0.00	0.00
	Medium	39,41,42,70b,43,44,45,46,67/M,63/M,70a,71,72,73,76,86,84ab	17	19.38	66.68
	High	77,85	2	3.31	11.40
Total			25	29.08	100.00

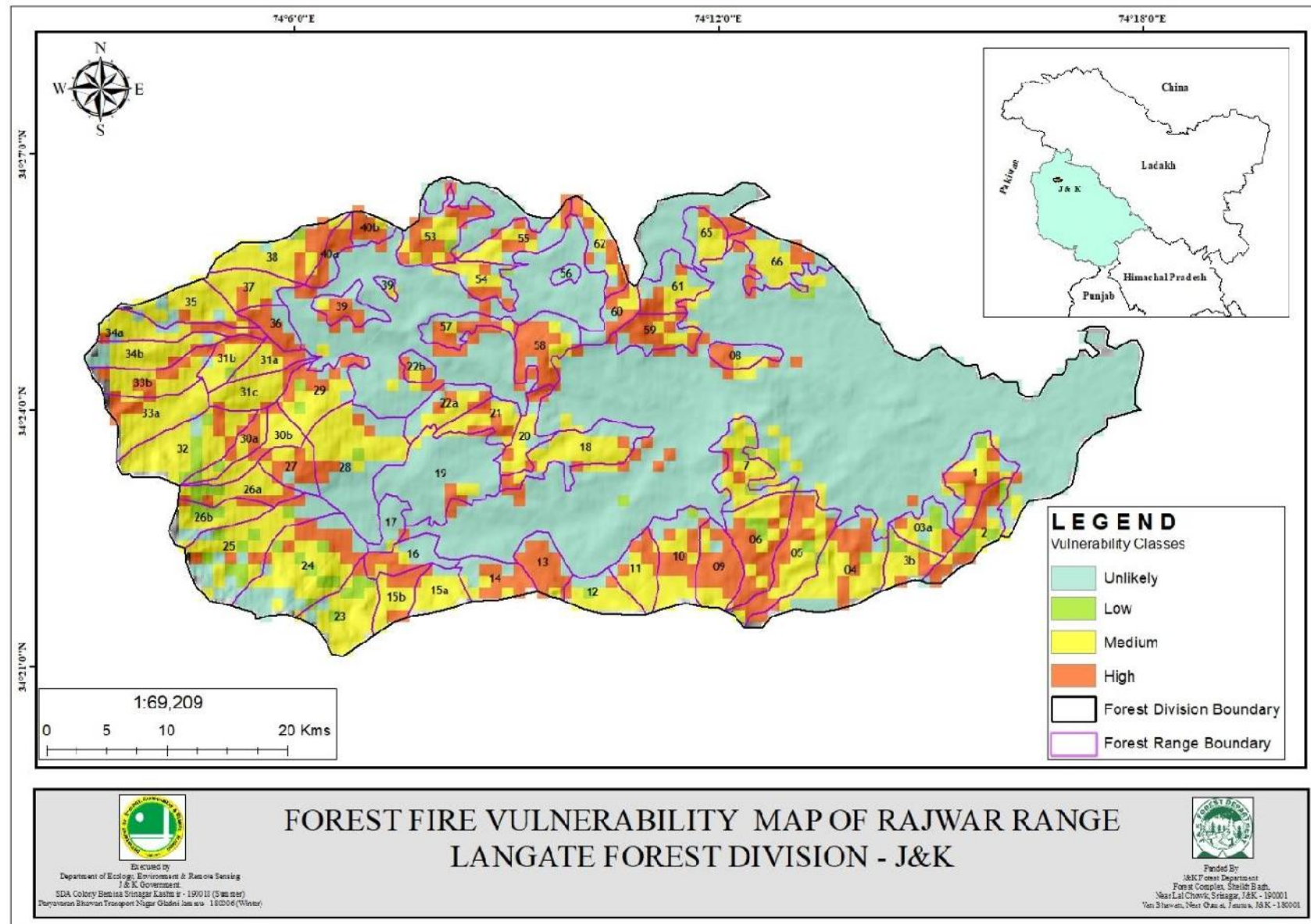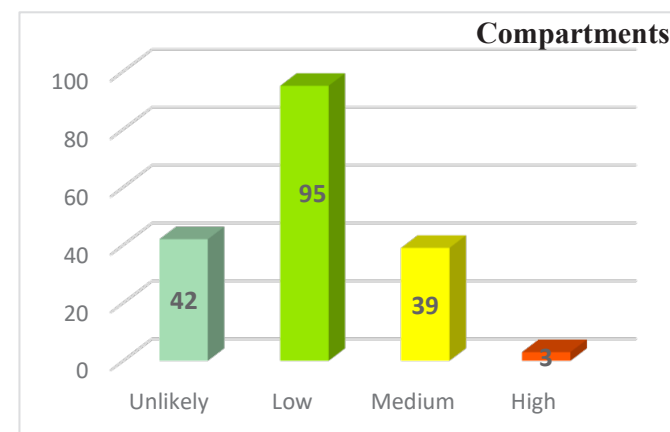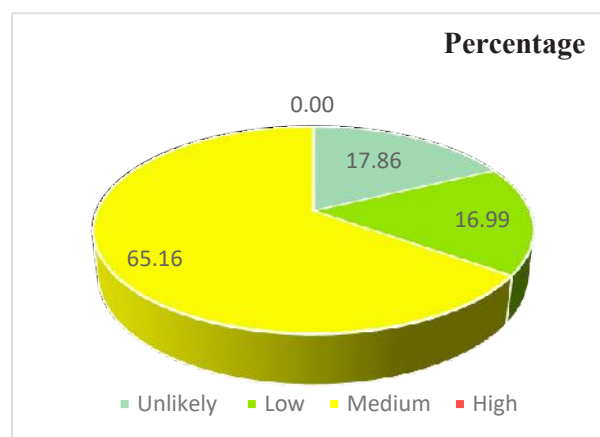| Magam Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	6.38
Low:	0
Medium:	19.38
High:	3.31
Total	29.08

3.3.7.2 Mawar Range

Fig. 119:Forest Fire Vulnerability Map of Mawar Range Langate Forest Division Jammu & Kashmir

Table.112. Compartments of Mawar Range Langate Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Mawar	Unlikely	32a,31abcdefg,47,1b	4	79.17	47.70
	Low		0	0.00	0.00
	Medium	33a,34b,36,37,38,41,44,11c,12a,10,9,6,3b,4b,1c,5b,13b,29b,30a,27,28,26,25,24,22,23a,23b,11b,12b,13a,5a,4a,3a,7b,30b,29a,39b,40b,33b,32c,32d,32b,11a	43	65.22	39.30
	High	35a,39a,43,40a,42,45,46,8,7a,2,15,16,17b,14,18,19,20,21,12c,17a,4c,35b,34a	23	21.57	13.00
Total			70	165.96	100.00

Mawar Range — **Area**

Vulnerability Classes	Area(Sq Kms)
Unlikely:	79.17
Low:	0
Medium:	65.22
High:	21.57
Total	**165.96**

FOREST FIRE RISK ZONATION & VULNERABILITY ASSESSMENT FORESTS OF JAMMU & KASHMIR

3.3.7.3 Rafiabad Range

Fig. 120: Forest Fire Vulnerability Map of Rafiabad Range Langate Forest Division Jammu & Kashmir

Table.113. Compartments of Rafiabad Range Langate Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Rafiabad	Unlikely	26,25,13b/Rfd,13a/Rfd,12/Rfd,43,41,35,33,14	10	31.58	35.00
	Low		0	0.00	0.00
	Medium	27,24,22,23,21,20,19,17,16,15a,42,40,36,34,15b	15	43.71	48.44
	High	28,18,39a,29,30,31a,32,38,37,39b,31b,44	12	14.95	16.56
Total			37	90.23	100.00

Rafiabad Range — **Area**

Vulnerability Classes	Area(Sq Kms)
Unlikely:	31.58
Low:	0
Medium:	43.71
High:	14.95
Total	**90.23**

Percentage pie chart: 0.00, 17.86, 16.99, 65.16 — Unlikely, Low, Medium, High

Compartments bar chart: Unlikely 42, Low 95, Medium 39, High 3
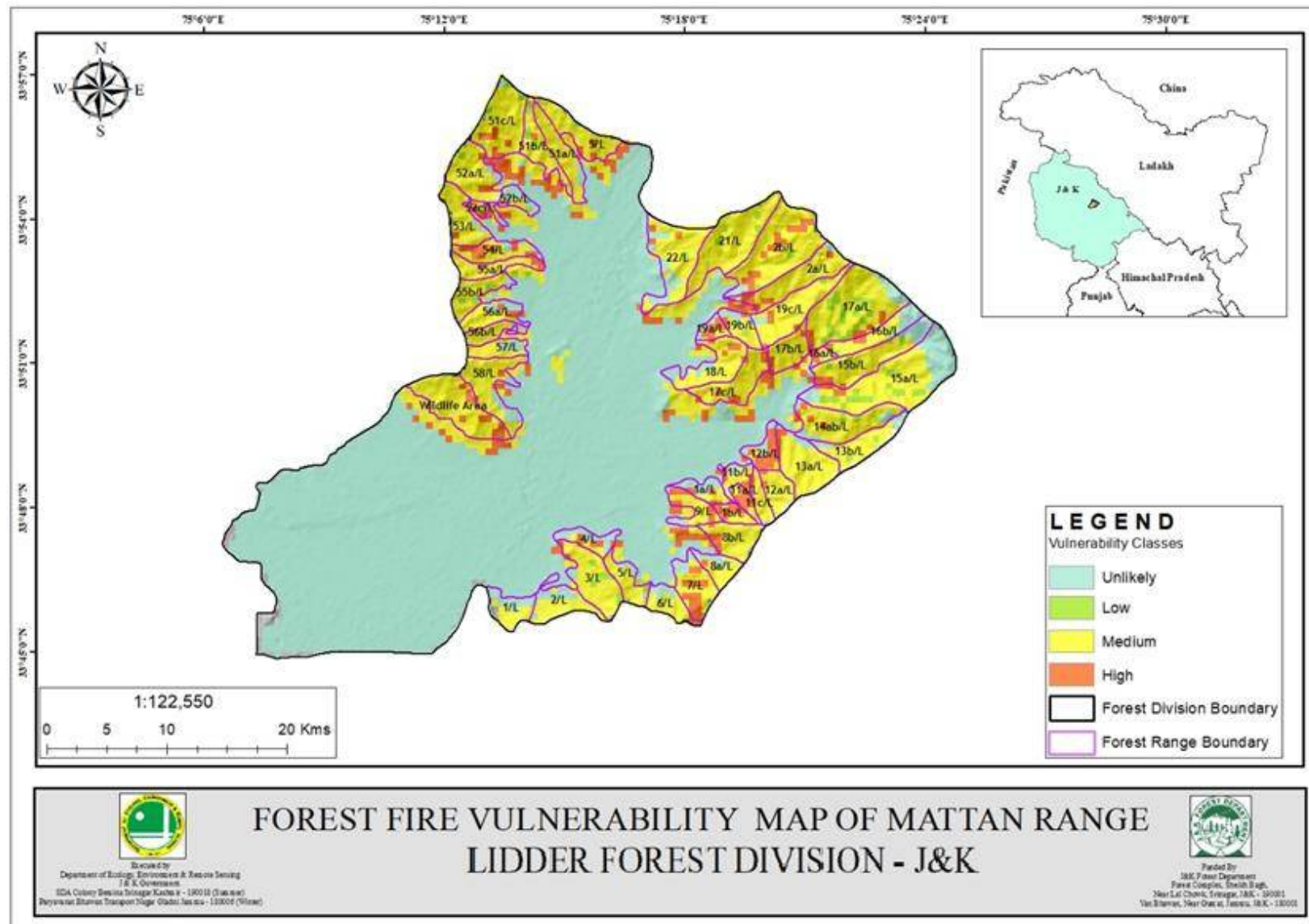
3.3.7.4 Rajwar Range

Fig. 121: Forest Fire Vulnerability Map of Rajwar Range Langate Forest Division Jammu & Kashmir

Table.114. Compartments of Rajwar Range Langate Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Rajwar	Unlikely	17,19,22b,28,39,56,61,8,16	9	12.63	14.85
	Low	0	0	0.00	0.00
	Medium	7,21,22a,20,18,29,37,38,55,54,65,66, 35,34b,33a,31b,32,30b,26b,25,24,23, 15a,12,11,10,5,4,03a,26a,30a,31a,31 c,33b,34a,15b,03b	37	53.03	62.36
	High	36,40a,53,62,60,59,58,57,27,14,13,9,6,2 ,1,40b	16	19.38	22.79
Total			**62**	**85.04**	**100.00**

Rajwar Range	Area
Vulnerability Classes	Area(Sq Kms)
Unlikely:	12.63
Low:	0
Medium:	53.03
High:	19.38
Total	**85.04**

Percentage

- Unlikely - Low - Medium - High

0.00
17.86
16.99
65.16

Compartments

42, 95, 39, 3

Unlikely, Low, Medium, High

3.3.8 LIDDER FOREST DIVISION

The Lidder Forest Division is situated between 34 ° 08′ 4.22′′ to 34 ° 02′ 43.41′′E Latitude and 75 ° 32′ 38.40′′ to 74 ° 51′ 37.57′′N Longitude. The lidder forest division comprises of two forest ranges viz Pahalgam and Tral and Mattan. The total area (on GIS Platform) of 203 compartments of three territorial ranges is area 1,612,08 Km.[2]
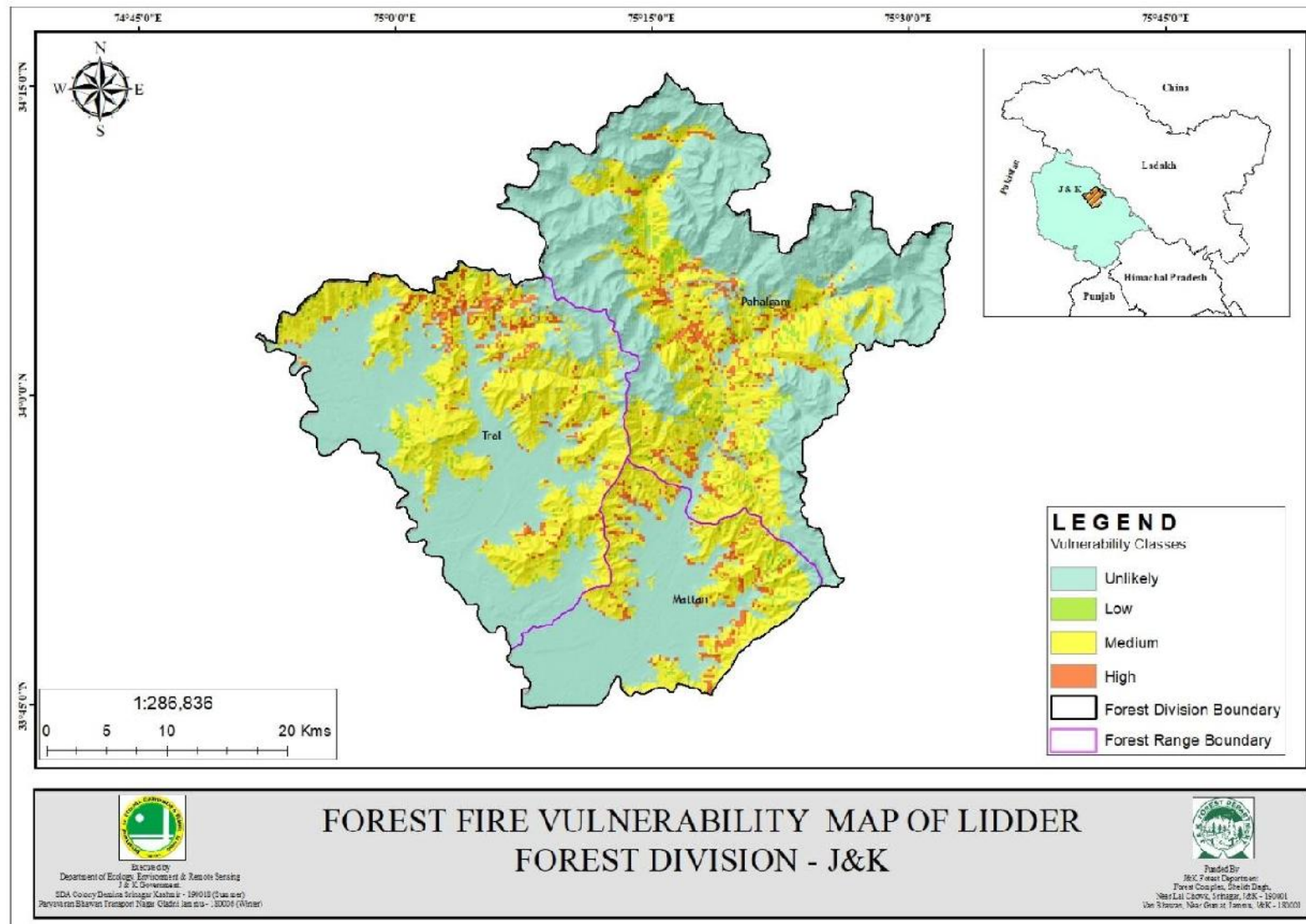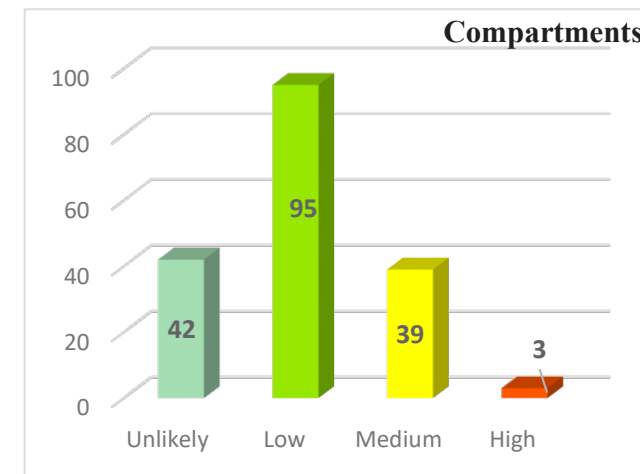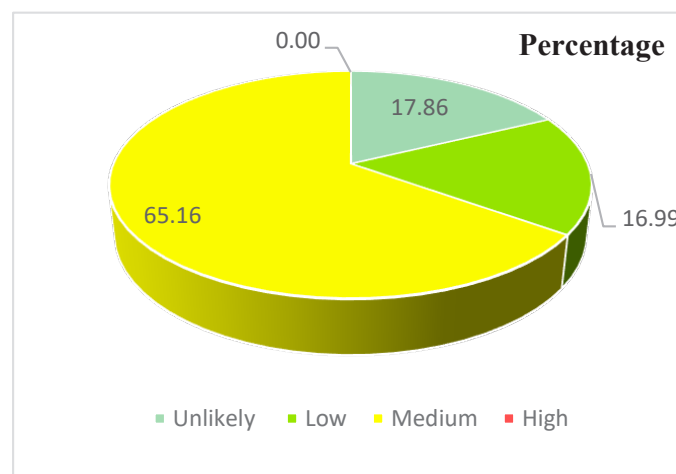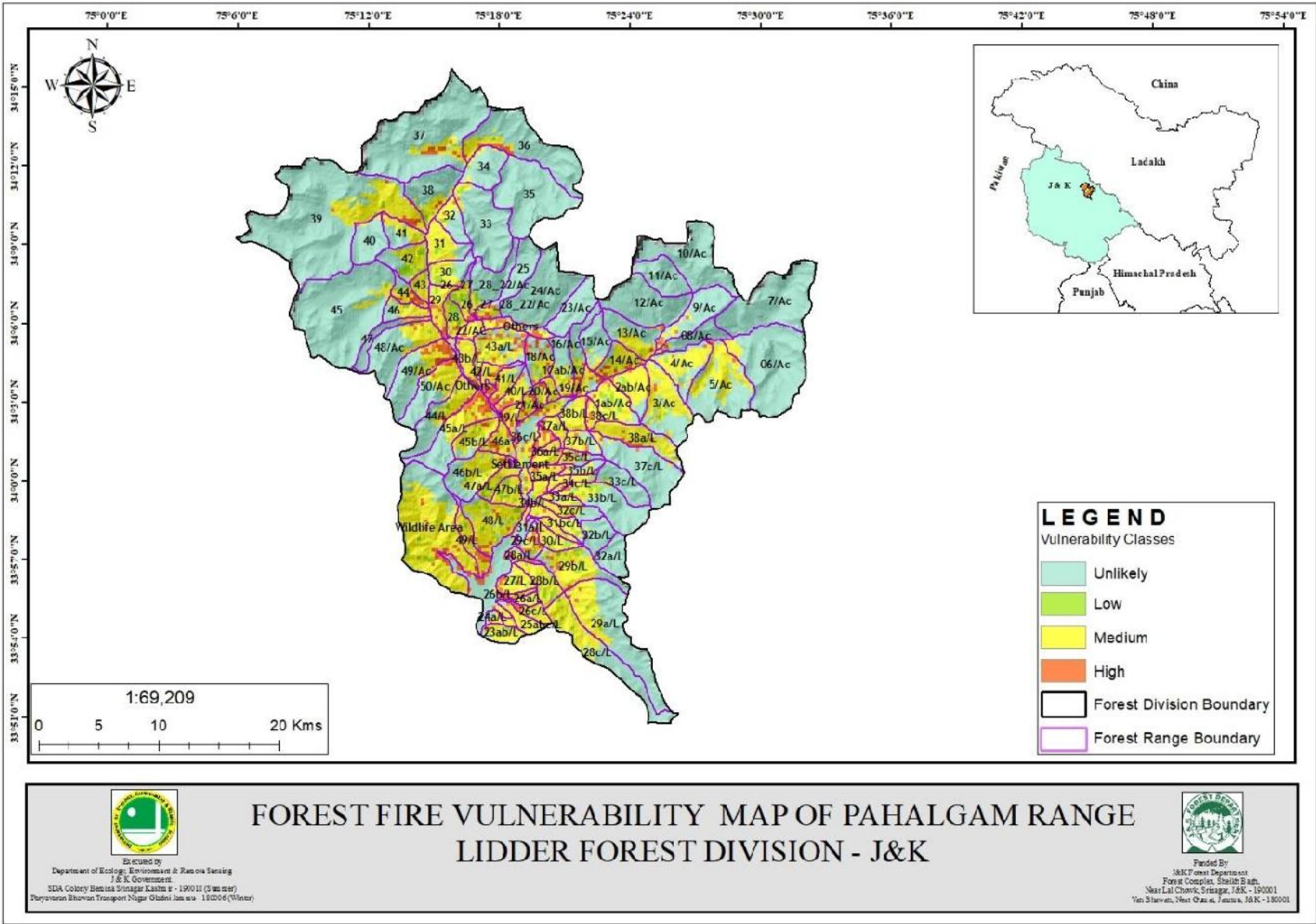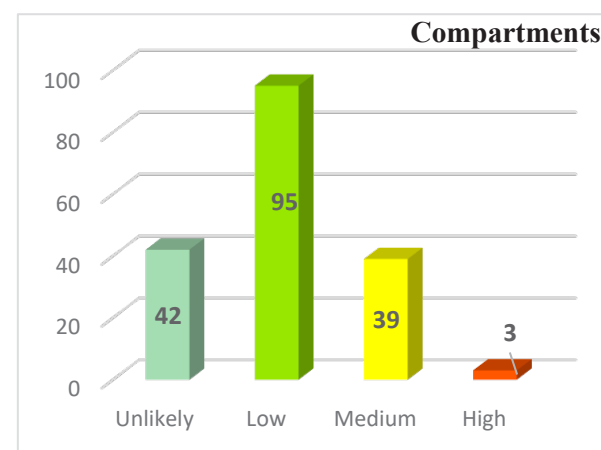

Fig. 122: Forest Fire Vulnerability Map of Lidder Forest Division Jammu & Kashmir

Table.115. Compartments of Lidder Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Lidder Forest Division	Mattan	Unlikely	3	3.63	2.69
		Low	0	0.00	0.00
		Medium	43	128.44	95.10
		High	3	2.99	2.21
		Total	**49**	**135.06**	**100.00**
	Pahalgam	Unlikely	42	542.22	67.52
		Low	0	0.00	0.00
		Medium	63	260.83	32.48
		High	0	0.00	0.00
		Total	**105**	**803.05**	**100.00**
	Tral	Unlikely	6	413.39	61.34
		Low	0	NA	NA
		Medium	43	260.57	38.66
		High	0	NA	NA
		Total	**49**	**673.97**	**100.00**

Lidder Forest Division	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	959.24
Low:	0
Medium:	649.84
High:	2.99
Total	1612.08

Percentage

0.00
17.86
16.99
65.16

Unlikely · Low · Medium · High

Compartments

|	Unlikely	Low	Medium	High
	42	95	39	3
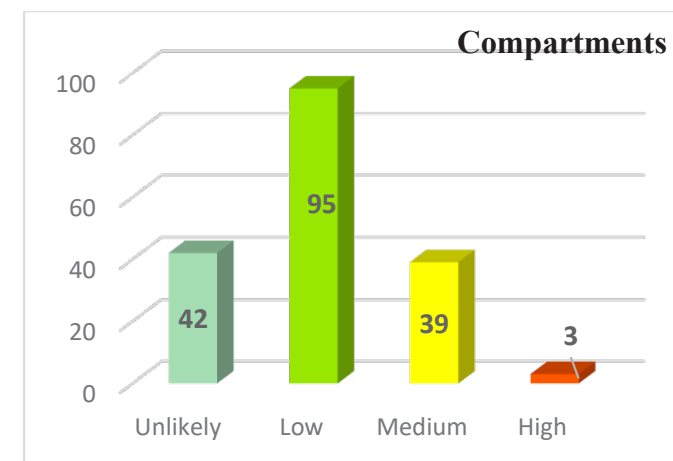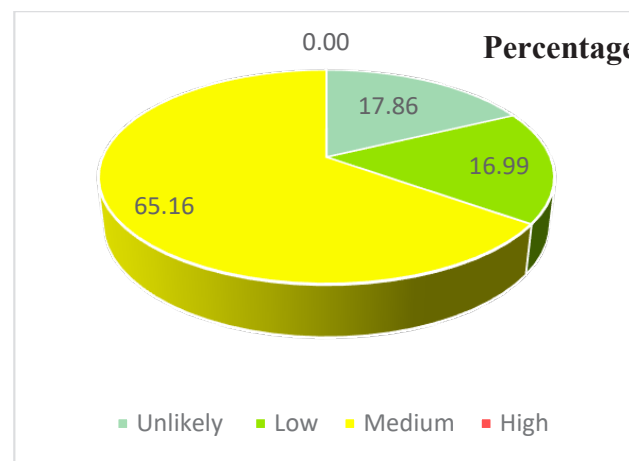
3.3.8.1 Mattan Range

Fig. 123: Forest Fire Vulnerability Map of Mattan Range Lidder Forest Division Jammu & Kashmir

Table.116. Compartments of Mattan Range Lidder Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Mattan	Unlikely	52b/L,1a/L,4/L	3	3.63	2.69
	Low		0	0.00	0.00
	Medium	5/L,52a/L,51c/L,8b/L,12a/L,55b/L,Wildlife Area,57/L,58/L,56b/L,56a/L,55a/L,54/L,53/L,52c/L,2b/L ,19c/L,21/L,18/L,17a/L,16b/L,15a/L,14ab/L,13b/L,13a/L ,9/L,11c/L,11b/L,1/L,2/L,3/L,6/L,7/L,22/L,8a/L,1b/L,15b /L,16a/L,17c/L,17b/L,19b/L,2a/L,51b/L,51a/L	44	128.44	95.10
	High	11a/L,12b/L,19a/L	3	2.99	2.21
Total			50	135.06	100.00

Mattan Range — Area

Vulnerability Classes	Area(Sq Kms)
Unlikely:	3.63
Low:	0
Medium:	128.44
High:	2.99
Total	135.06

Percentage

- Unlikely: 17.86
- Low: 0.00
- High: 16.99
- Medium: 65.16

Legend: Unlikely, Low, Medium, High

Compartments

	Value
Unlikely	42
Low	95
Medium	39
High	3

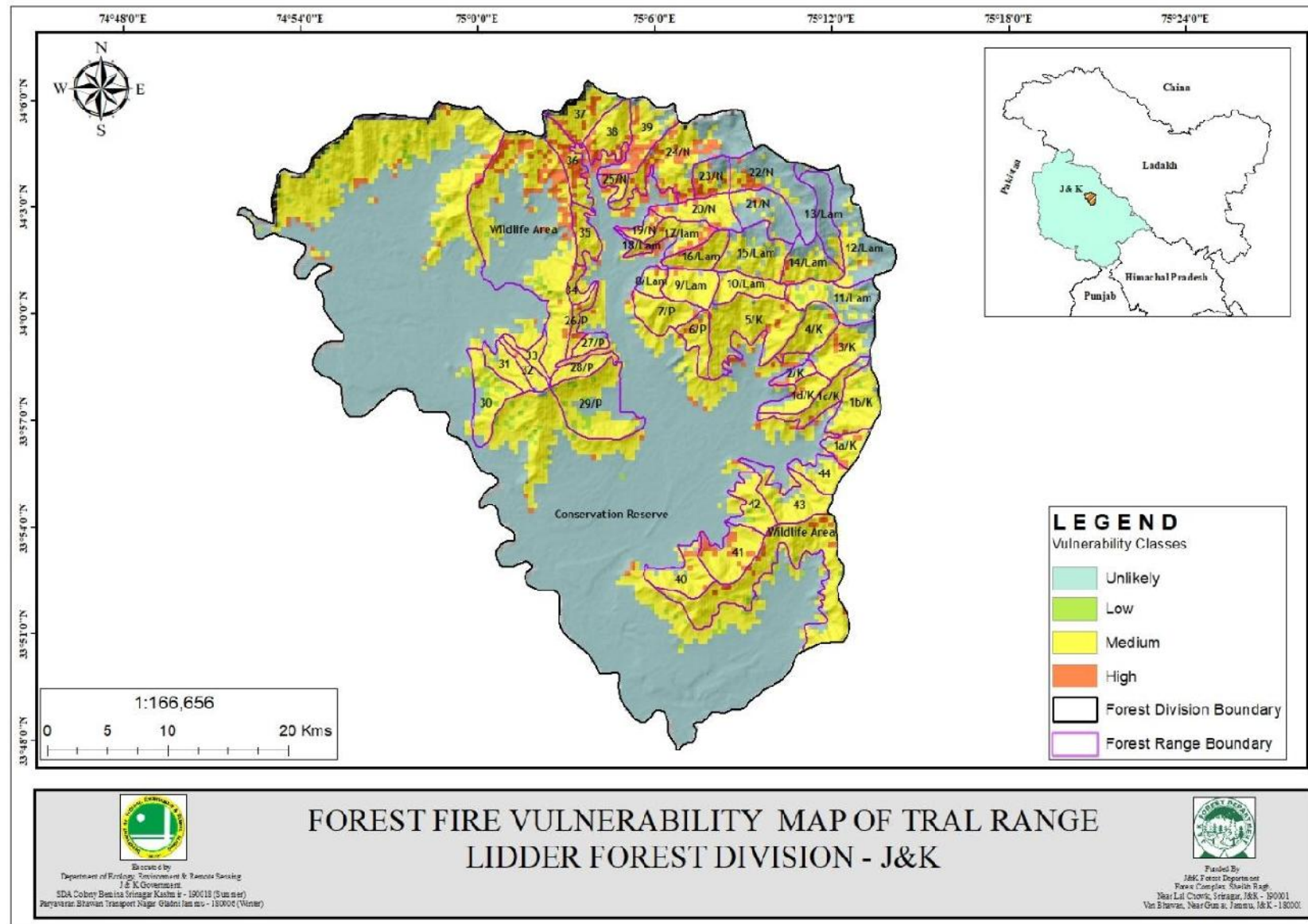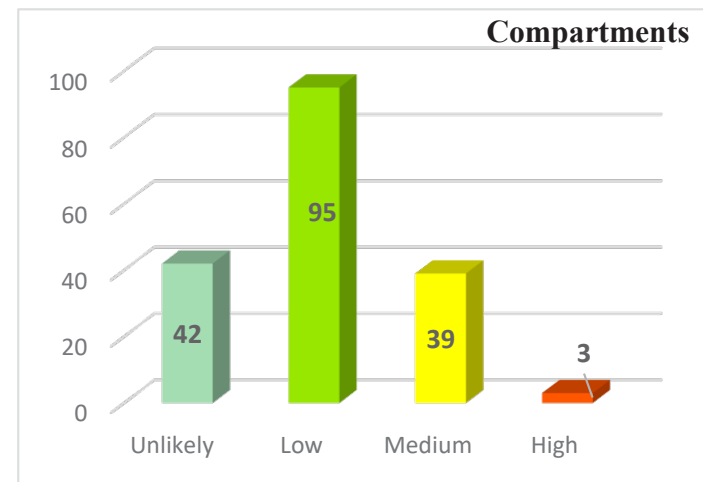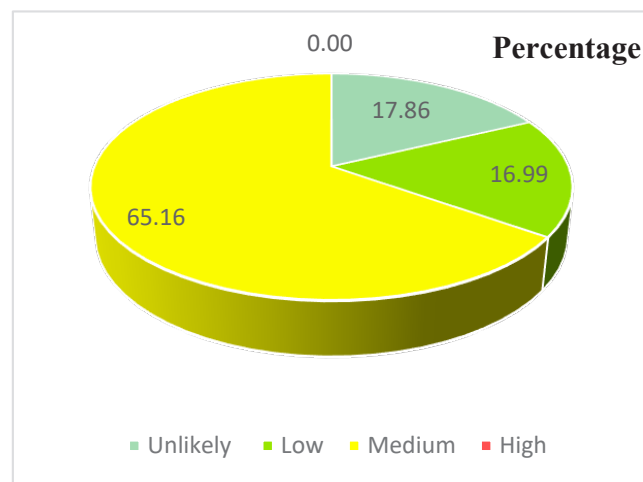### 3.3.8.2 Pahalgam Range

Fig. 124:Forest Fire Vulnerability Map of Pahalgam Range Lidder Forest Division Jammu & Kashmir

Table.117. Compartments of Pahalgam Range Lidder Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Pahalgam	Unlikely	26_27_28_22/Ac,29a/L,33b/L,32b/L,45a/L,Settlement, 15/Ac,16/Ac,17ab/Ac,45,47,40,39,34,33,32,28c/L,35,24 /Ac,18/Ac,23/Ac,25,10/Ac,6/Ac,8/Ac,37c/L,12/Ac,5/A c,11/Ac,9/Ac,13/Ac,48/Ac,49/Ac,50/Ac,44/L,36,37,38, 07/Ac,32a/L,33c/L,35c/L	42	542.22	67.52
	Low		0	0.00	0.00
	Medium	Wildlife,Area,23ab/L,25abc/L,24a/L,26c/L,48/L,46b/L, 47b/L,47a/L,27/L,31bc/L,30/L,40/L,46,44,43,42,41,Oth ers,41/L,21/Ac,39/L,20/Ac,42/L,43a/L,43b/L,30,31,29, 38a/L,49/L,3/Ac,4/Ac,1ab/Ac,2ab/Ac,14/Ac,36c/L,36b/ L,36a/L,35b/L,34c/L,46a,45b/L,19/Ac,28,22/AC,24b/L, 26b/L,26a/L,28a/L,28b/L,29c/L,29b/L,31a/L,32c/L,33a/ L,34b/L,34a/L,35a/L,37a/L,37b/L,38b/L,38c/L	63	260.83	32.48
	High		0	0.00	0.00
Total			**105**	**803.05**	**100.00**

Pahalgam Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	542.22
Low:	0
Medium:	260.83
High:	0
Total	**803.05**
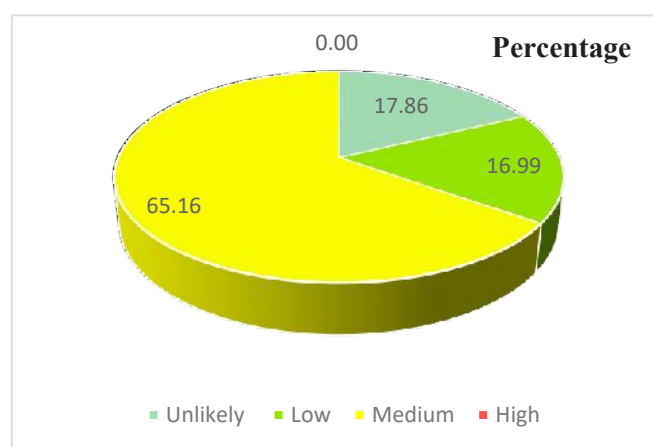
3.3.8.3 Tral Range

Fig. 125:Forest Fire Vulnerability Map of Tral Range Lidder Forest Division Jammu & Kashmir

Table.118. Compartments of Tral Range Lidder Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Tral	Unlikely	22/N,13/Lam,21/N, Conservation Reserve,2/K,12/	6	413.39	61.34
	Low	Lam	NA	NA	NA
	Medium	1c/K,17/lam,14/Lam,15/Lam,16/Lam,19/N, 20/N,23/N,7/P,6/P,8/Lam,9/Lam,5/K,43,Wildlife Area,42,40,41,44,32,28/P,24/N,39,25/N,37, 38,11/Lam,4/K,3/K,30,31,27/P,26/P,35,34,36,18/Lam,10/Lam,33,29/P,1a/K,1b/K,1d/K	43	260.57	38.66
	High		NA	NA	NA
Total			49	673.97	100.00

Tral Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	413.39
Low:	0
Medium:	260.57
High:	0
Total	673.97

Percentage

0.00
17.86
16.99
65.16

Unlikely Low Medium High

Compartments

42 95 39 3

Unlikely Low Medium High

3.3.9 PIRPANJAL FOREST DIVISION

The Forest Division is situated between 33° 42 ′ and 33° 58′ North Latitude and 74° 48′ and 74° 24′ East Longitude. The elevation lies between an elevation of 1820m to 4745mts. The division comprises of three ranges viz Budgam, Sukhnag, Doodhganga and Raithan. The total area (on GIS Platform) of 83 compartments of three territorial ranges is area 444.38 Km.[2]
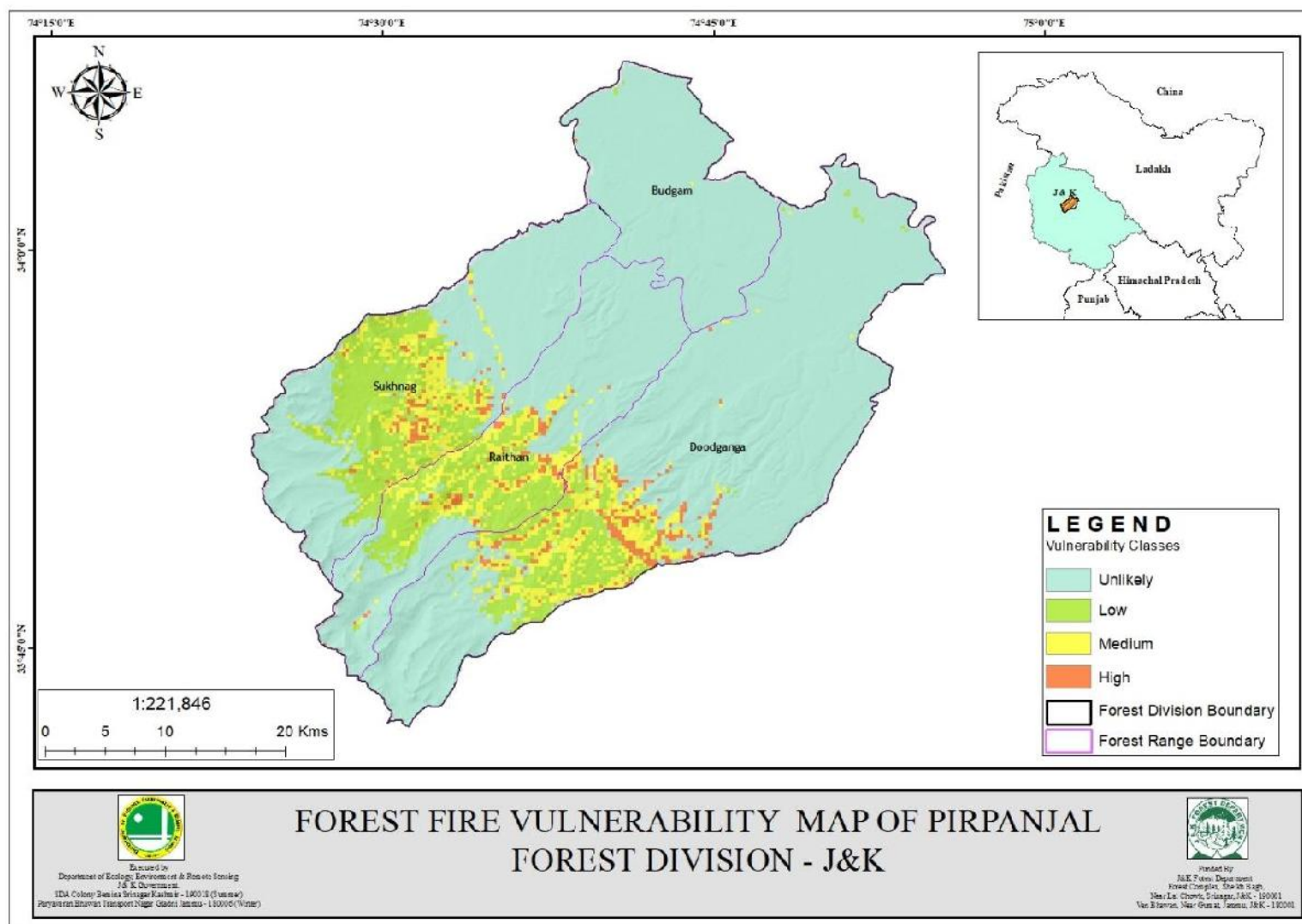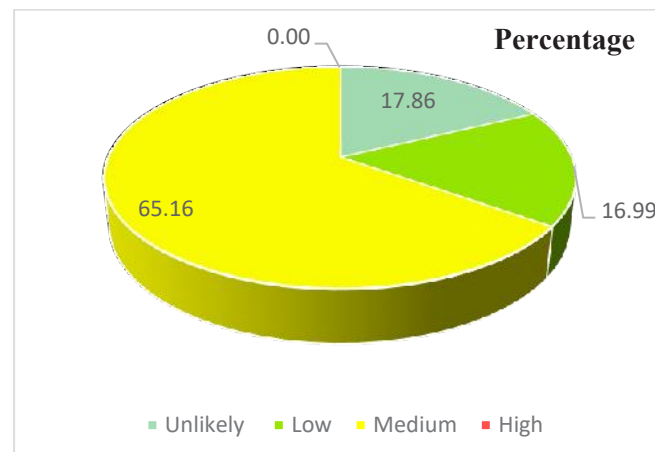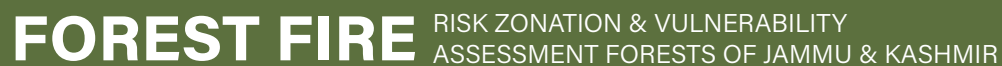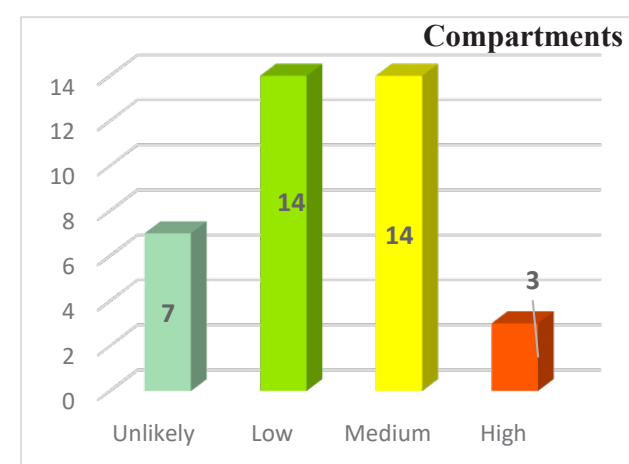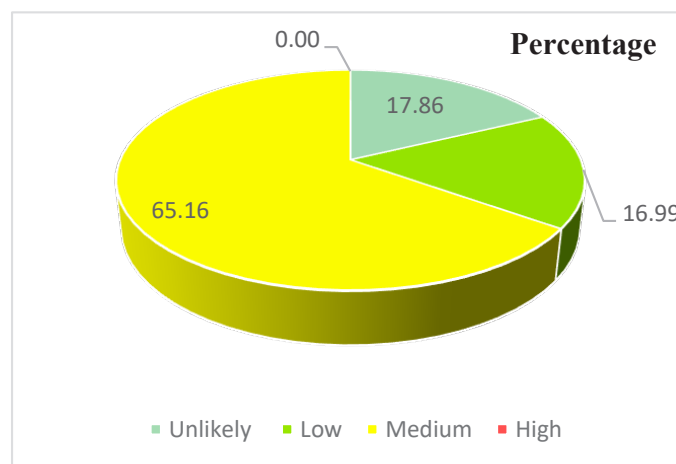

Fig. 126: Forest Fire Vulnerability Map of Pirpanjal Forest Division Jammu & Kashmir

Table.119. Compartments of Pirpanjal Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Pir Panjal Forest Division	Budgam	Unlikely	NA	NA	NA
		Low	NA	NA	NA
		Medium	NA	NA	NA
		High	NA	NA	NA
		Total	NA	NA	NA
	Doodganga	Unlikely	7	83.98	51.67
		Low	14	42.69	26.27
		Medium	14	31.38	19.31
		High	3	4.47	2.75
		Total	**38**	**162.53**	**100.00**
	Raithan	Unlikely	**2**	58.86	51.03
		Low	**13**	42.25	36.62
		Medium	**7**	14.25	12.36
		High	**0**	0.00	0.00
		Total	22	**115.36**	**100.00**
	Sukhnag	Unlikely	4	112.80	67.76
		Low	10	29.14	17.51
		Medium	9	24.54	14.74
		High	0	0.00	0.00

		Total	23	166.49	100.00

Pir Panjal Forest Division	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	255.64
Low:	114.08
Medium:	70.17
High:	4.47
Total	444.36

Percentage

0.00

17.86

65.16

16.99

■ Unlikely   ■ Low   ■ Medium   ■ High

Compartments

42

95

39

3

Unlikely   Low   Medium   High

FOREST FIRE RISK ZONATION & VULNERABILITY
ASSESSMENT FORESTS OF JAMMU & KASHMIR
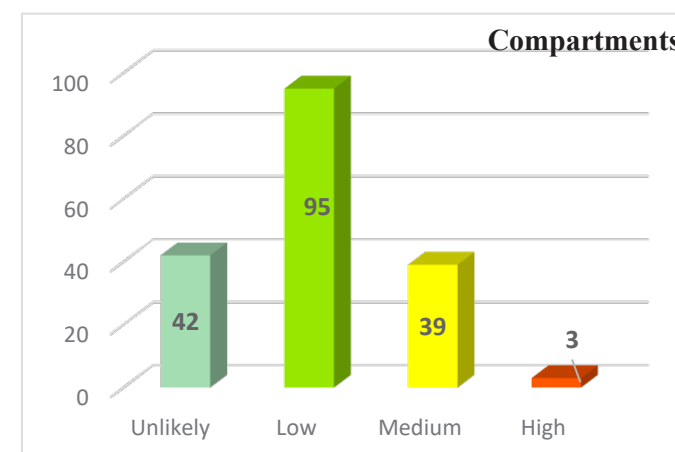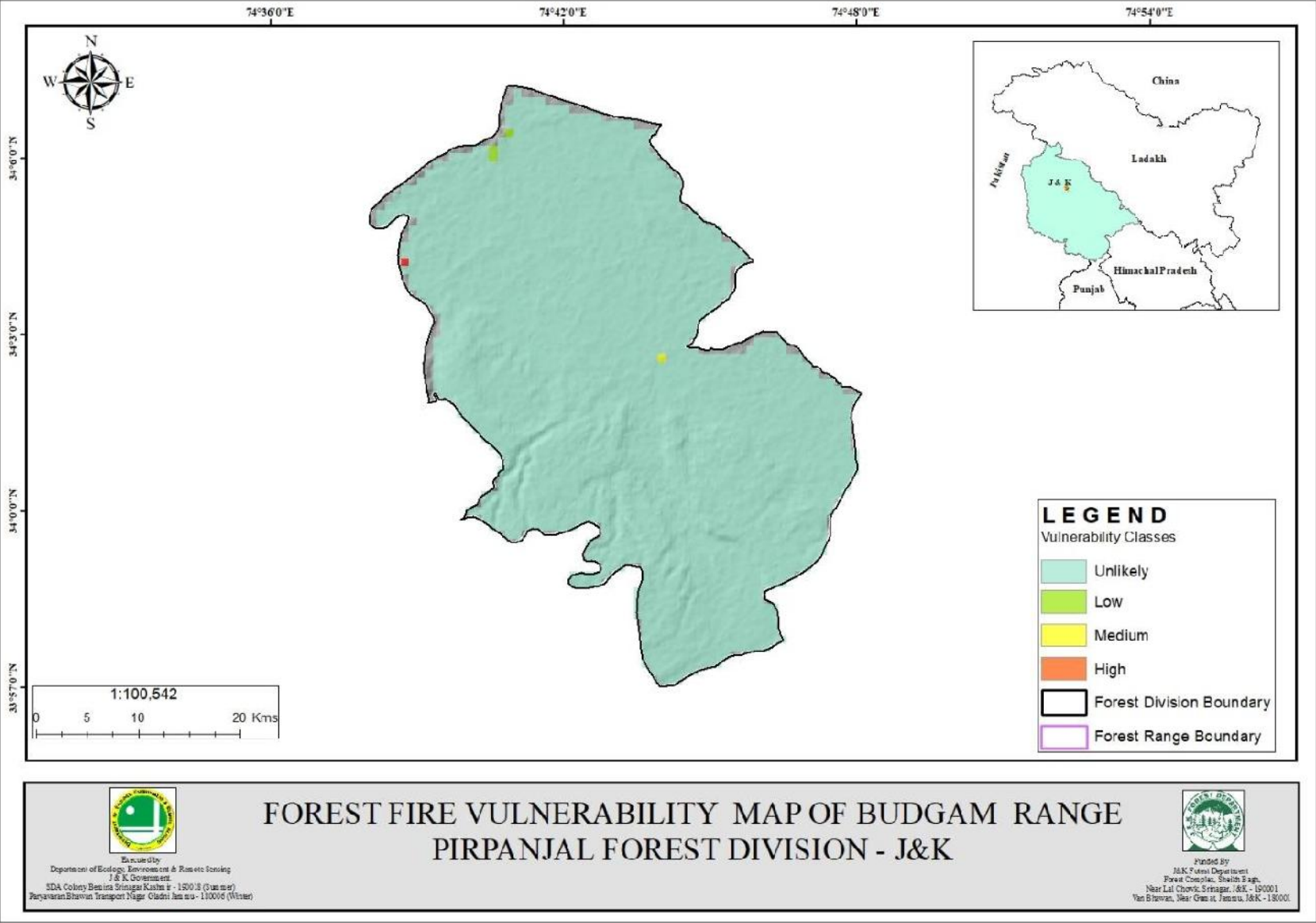
3.3.9.1. Budgam Range

Fig. 127: Forest Fire Vulnerability Map of Budgam Range Pirpanjal Forest Division Jammu & Kashmir

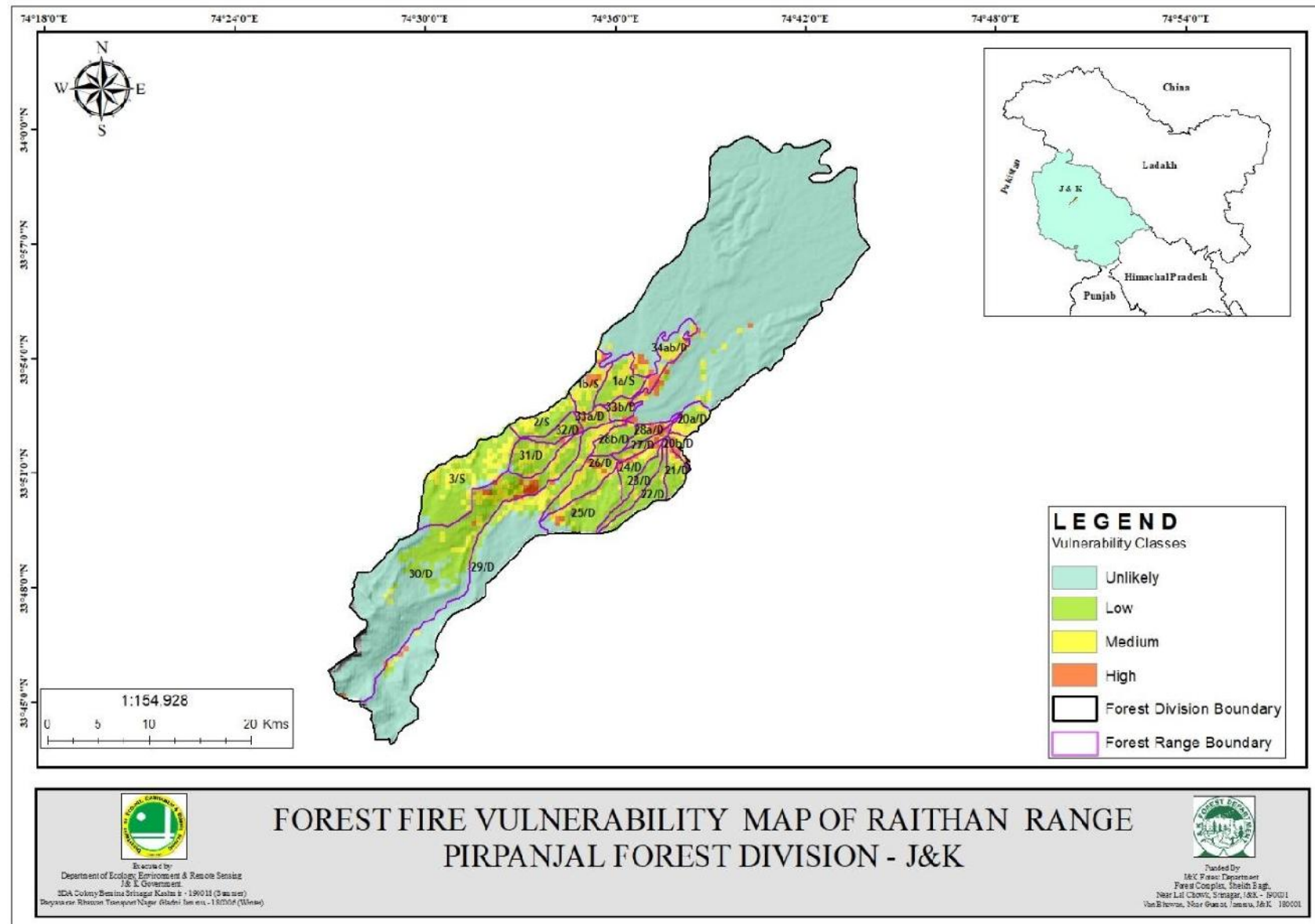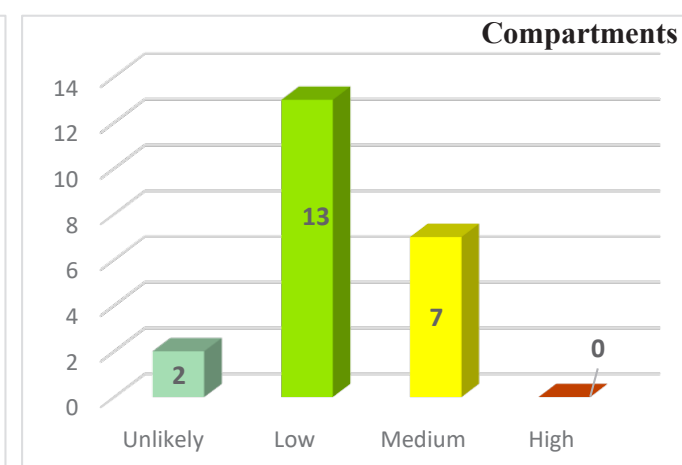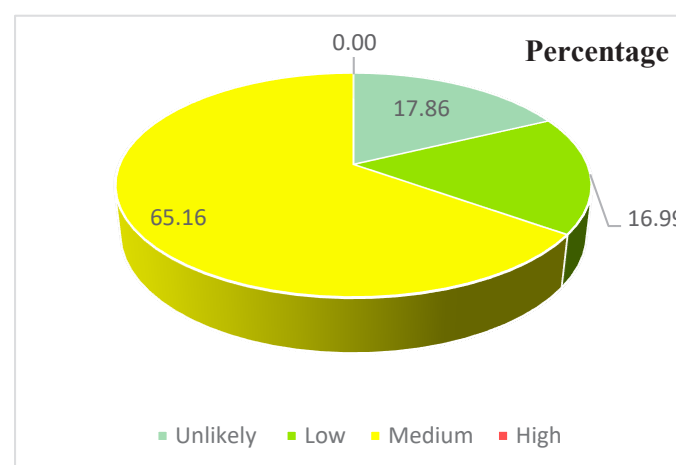### 3.3.9.2 Doodganga Range

Fig. 128: Forest Fire Vulnerability Map of Doodganga Range Pirpanjal Forest Division Jammu & Kashmir

Table.120. Compartments of Doodganga Range Pirpanjal Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Doodganga	Unlikely	11/D,10/D,16/D,13/D,12/D,2a/N,2b/N	7	83.98	51.67
	Low	6/D,09/D,18a/D,3/D,30/Ri,7/D,8/D,29/Ri, 28/Ri,19a/D,18b/D,15/D,4/D,27/Ri	14	42.69	26.27
	Medium	14a/D,19b/D,1/D,4/N,5/N,2/D,5/D,26/Ri, 17/D,14b/D,6/N,3/N,1b/N,25/Ri	14	31.38	19.31
	High	31/Ri,1a/N,32/Ri	3	4.47	2.75
Total			38	162.53	100.00

| Doodganga Range Area	
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	83.98
Low:	42.69
Medium:	31.38
High:	4.47
Total	**162.53**

3.3.9.3. Raithan Range

Fig. 129: Forest Fire Vulnerability Map of Raithan Range Pirpanjal Forest Division Jammu & Kashmir

Table.121. Compartments of Raithan Range Pirpanjal Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Raithan	Unlikely	30/D,29/D	2	58.86	51.03
	Low	3/S,32/D,31/D,25/D,1a/S,28a/D,28b/D,23/D,21/D,22/D,2/S, 24/D,33b/D	13	42.25	36.62
	Medium	26/D,34ab/D,1b/S,20a/D,20b/D, 33a/D,27/D	7	14.25	12.36
	High		0	0.00	0.00
Total			22	115.36	100.00

Raithan Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	58.86
Low:	42.25
Medium:	14.25
High:	0.00
Total	115.36

3.3.9.4 Sukhnag Range
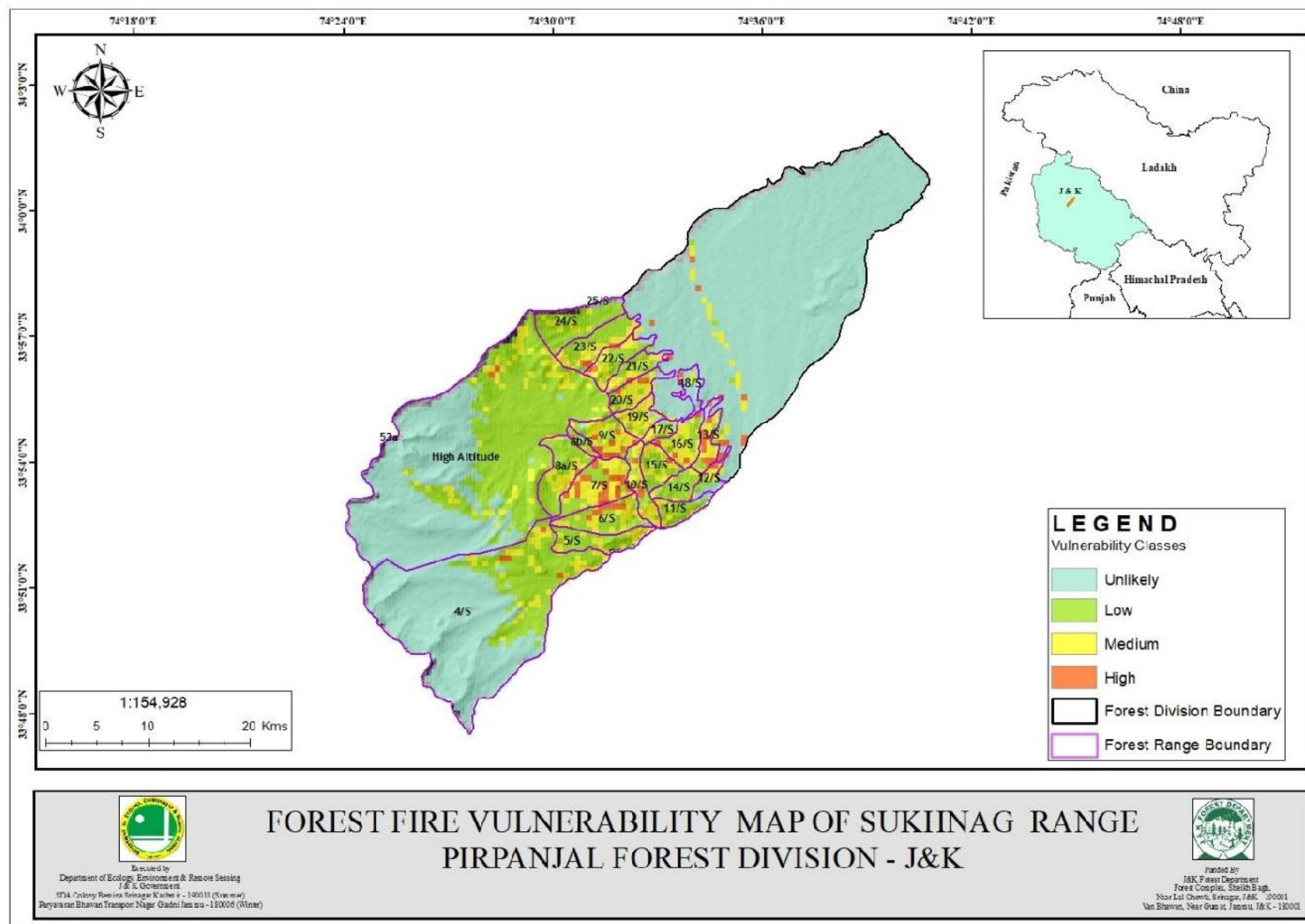
Fig. 130: Forest Fire Vulnerability Map of Sukhnag Range Pirpanjal Forest Division Jammu & Kashmir

Table.122. Compartments of Sukhnag Range Pirpanjal Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments		
Sukhnag	Unlikely	High Altitude,12/S,04/S,18/S	4	112.80	67.76
	Low	23/S,21/S,05/S,06/S,11/S,15/S,24/S,14/S,08a/S,08b/S	10	29.14	17.51
	Medium	22/S,20/S,10/S,07/S,09/S,13/S,17/S,19/S,16/S	9	24.54	14.74
	High		0	0	0
Total			23	166.49	100.00

Sukhnag Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	112.80
Low:	29.14
Medium:	24.54
High:	0
Total	166.49
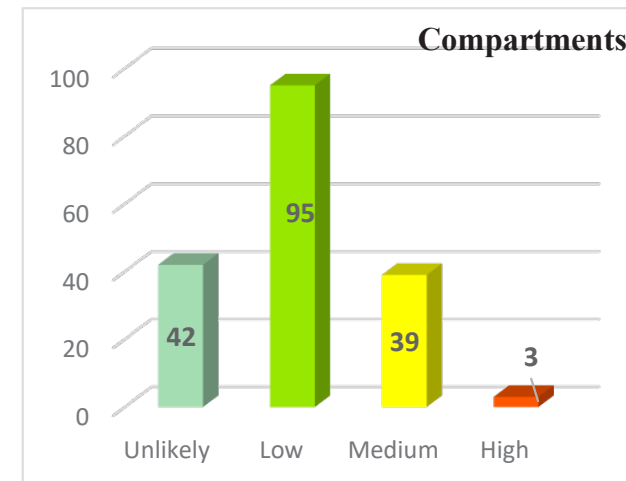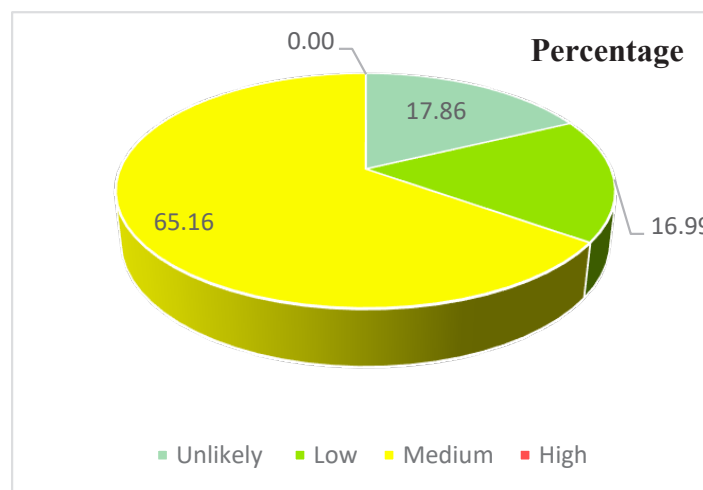
3.3.10 SHOPIAN FOREST DIVISION

The Forest Divisionof Shopian Forest Division are spread over a vast tract situated between 33° - 30' to 33° - 48' North Latitude and 74° -30' to 74° -50' East longitude. The average elevation of the division is 2057 meters. Shopian forest division comprises following ranges, Romushi, Shopian and Kakapora. The total area (on GIS Platform) of 89 compartments of three territorial ranges is area 556.47 Km.[2]
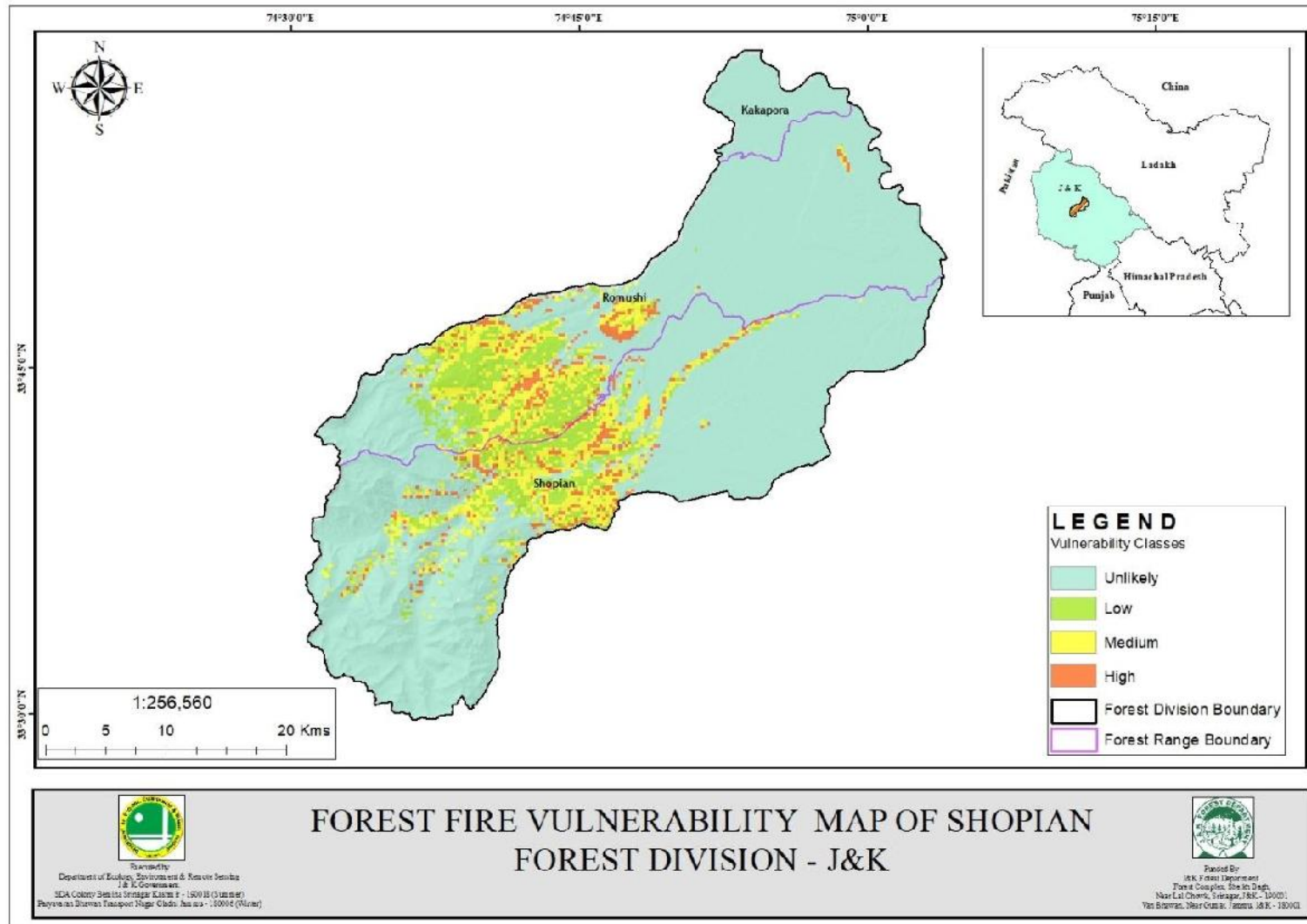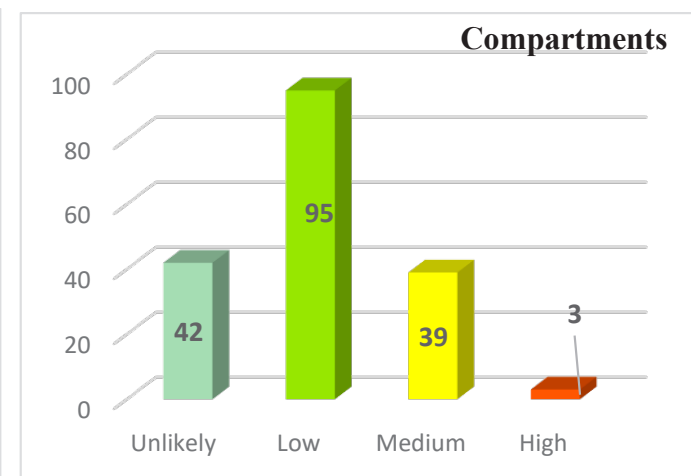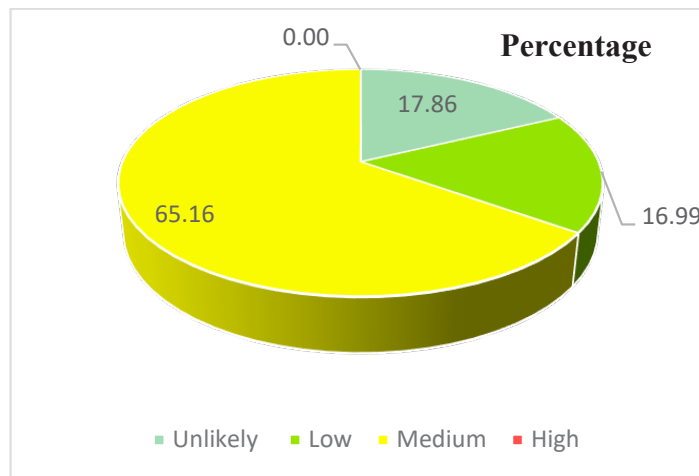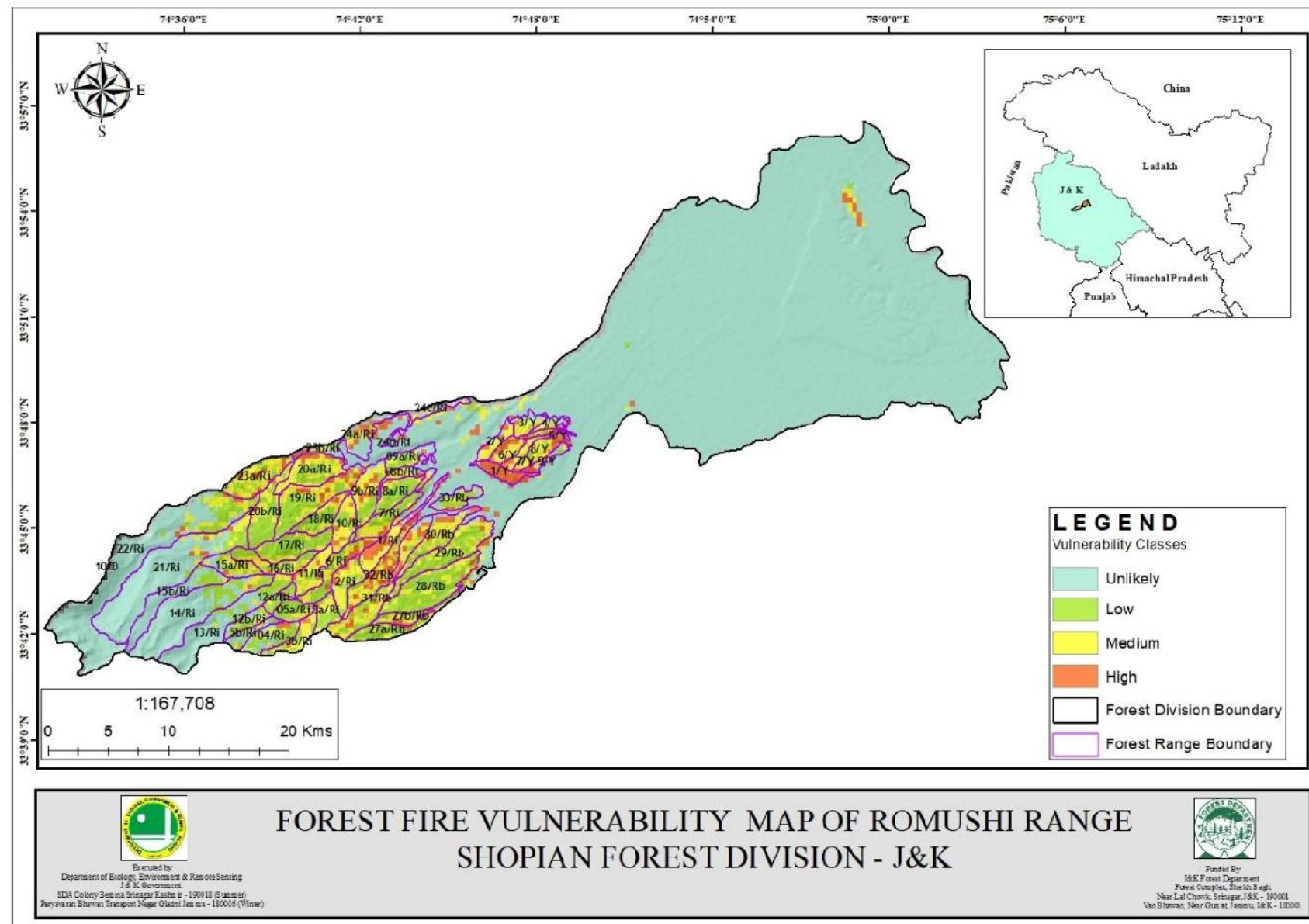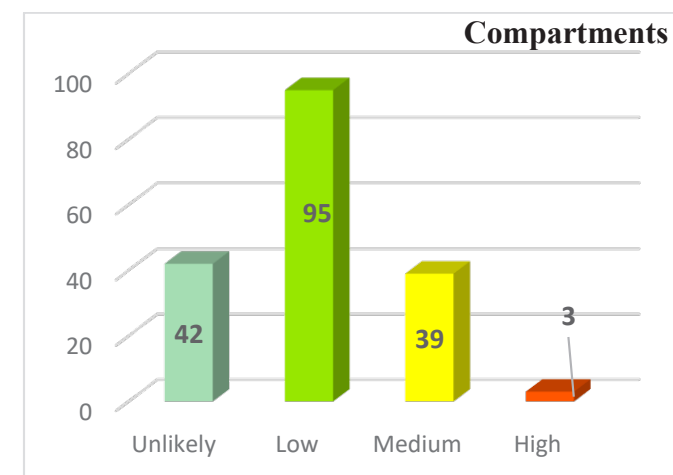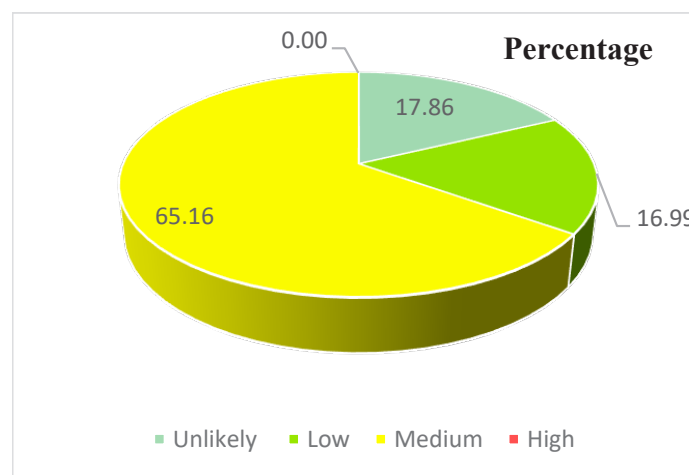

Fig. 131: Forest Fire Vulnerability Map of Shopian Forest Division Jammu & Kashmir

Table.123. Compartments of Shopian Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Shopian Forest Division	Kakapora	Unlikely	NA	NA	NA
		Low	NA	NA	NA
		Medium	NA	NA	NA
		High	NA	NA	NA
		Total	NA	NA	NA
	Romushi	Unlikely	13	71.67	39.29
		Low	16	53.34	29.24
		Medium	21	55.72	30.55
		High	1	1.67	0.92
		Total	**51**	**182.40**	**100.00**
	Romushi	Unlikely	13	71.67	39.29
		Low	16	53.34	29.24
		Medium	21	55.72	30.55
		High	1	1.67	0.92
		Total	**51**	**182.40**	**100.00**

Shopian Forest Division	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	380.24
Low:	84.67
Medium:	89.88
High:	1.67
Total	**556.47**

Percentage

- Unlikely: 17.86
- Low: 16.99
- Medium: 65.16
- High: 0.00

Unlikely ■ Low ■ Medium ■ High

Compartments

Unlikely	Low	Medium	High
42	95	39	3

3.3.10.1 Kakapora Range
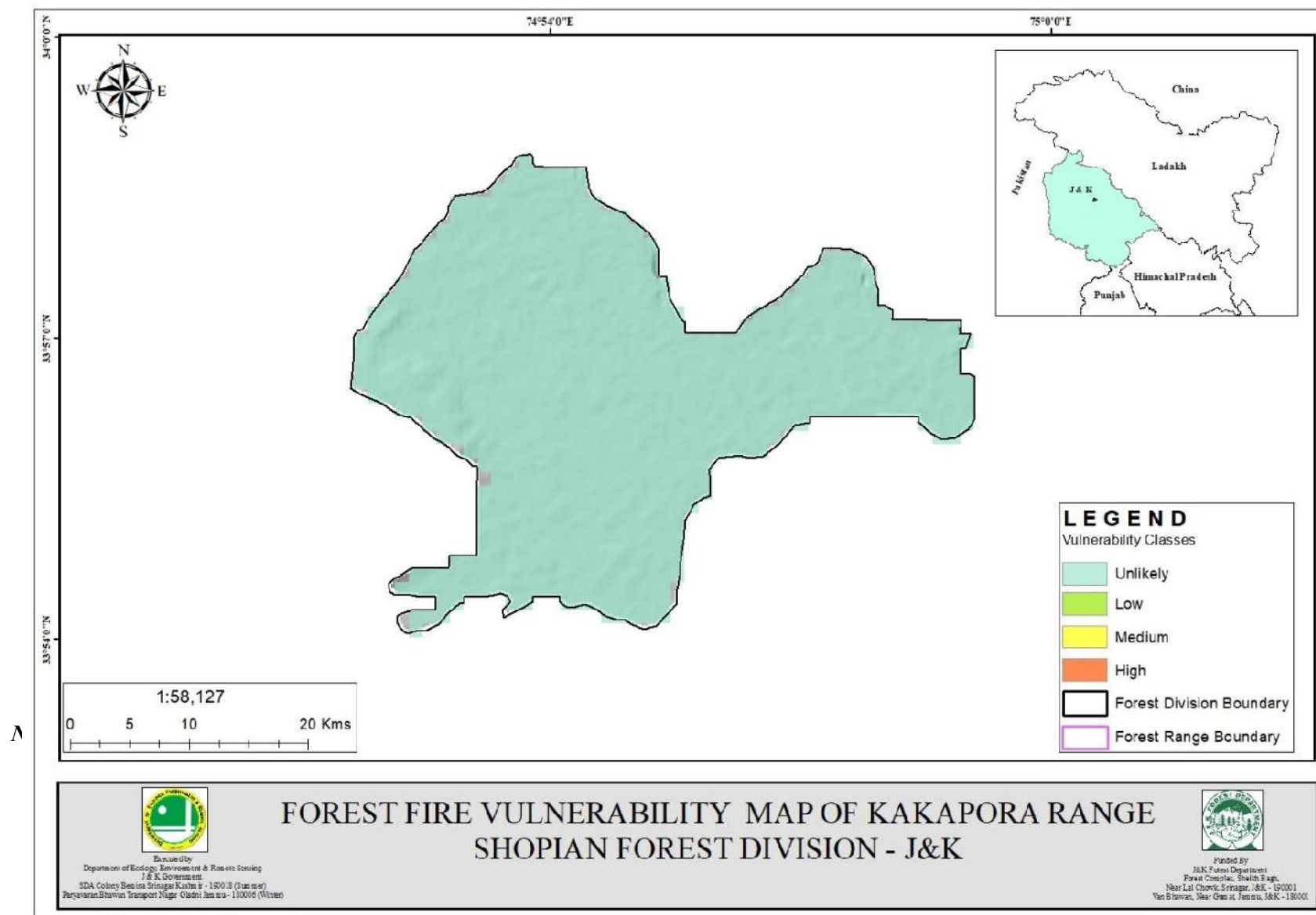
Fig. 132: Forest Fire Vulnerability Map of Kakapora Range Shopian Forest Division Jammu & Kashmir

3.3.10.2 Romushi Range

Fig. 133: Forest Fire Vulnerability Map of Romushi Range Shopian Forest Division Jammu & Kashmir

Table124. Compartments of Romushi Range Shopian Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Romushi	Unlikely	22/Ri,21/Ri,14/Ri,15b/Ri,9/Y,33/Rb,13/Ri,09a/Ri,24c/Ri,24a/Ri,23b/Ri,5b/Ri,24b/Ri	13	71.67	39.29
	Low	16/Ri,17/Ri,19/Ri,18/Ri,8a/Ri,7/Ri,12b/Ri, 05a/Ri,04/Ri,29/Rb,20b/Ri,3a/Ri,28/Rb,27b/Rb,27a/Rb,12a/Ri	16	53.34	29.24
	Medium	9b/Ri,2/Y,6/Y,3/Y,4/Y,7/Y,5/Y,8/Y,2/Ri,6/Ri ,10/Ri,11/Ri,32/Rb,31/Rb,30/Rb,20a/Ri,3b/Ri ,1/Ri,08b/Ri,23a/Ri,15a/Ri	21	55.72	30.55
	High	1/Y	1	1.67	0.92
Total			51	182.40	100.00

Romushi Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	71.67
Low:	53.34
Medium:	55.72
High:	1.67
Total	**182.40**

Percentage: 0.00, 17.86, 65.16, 16.99 — Unlikely, Low, Medium, High

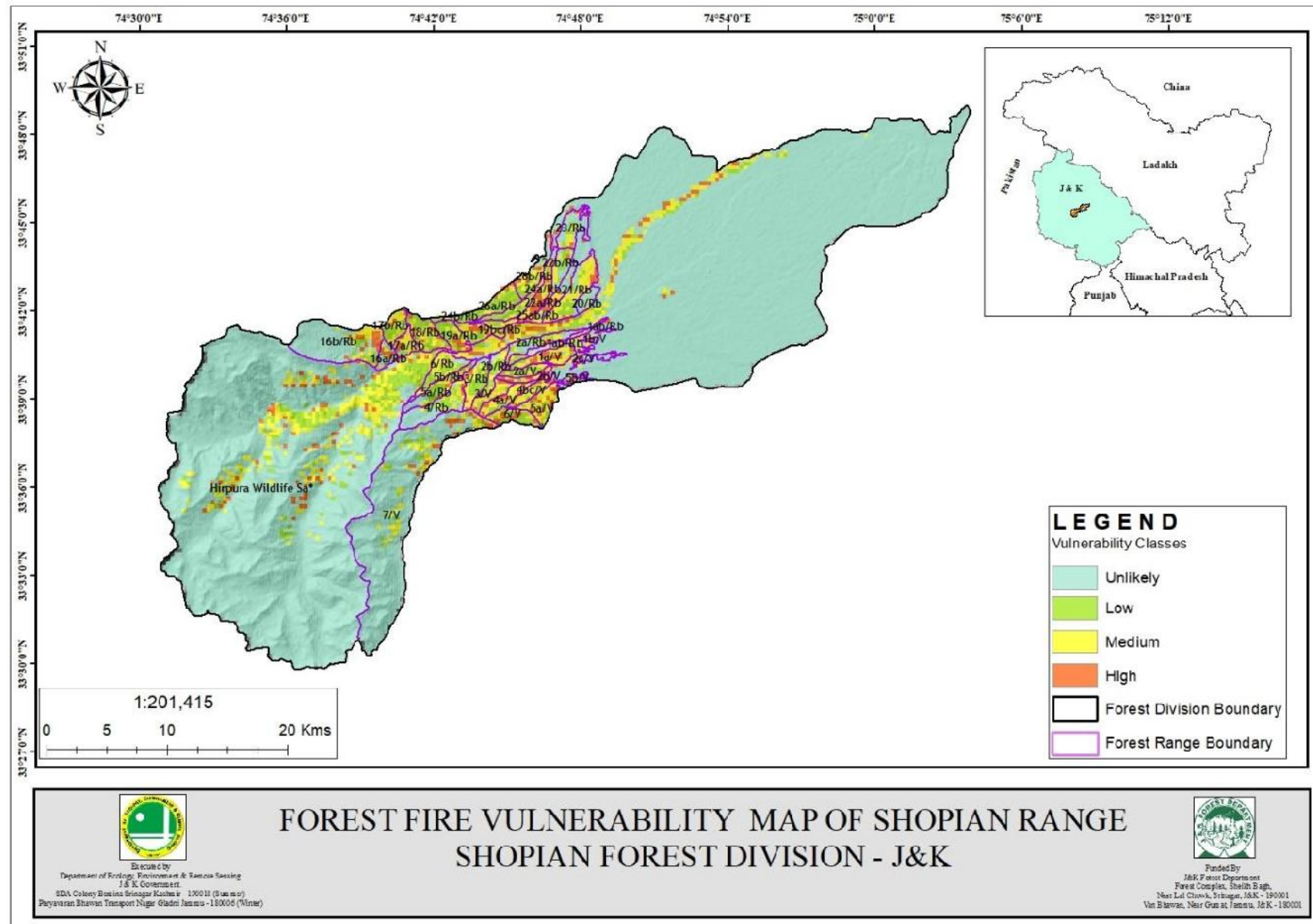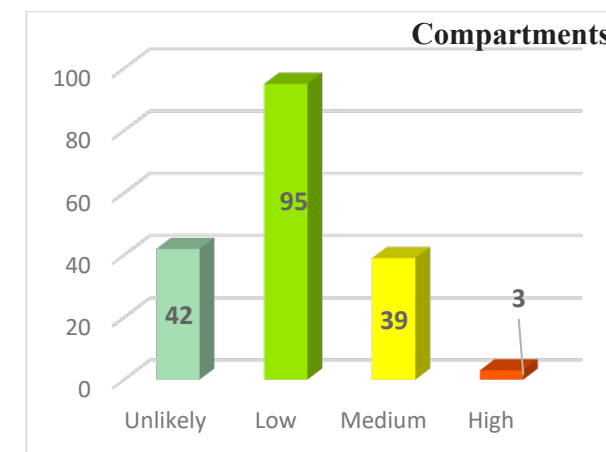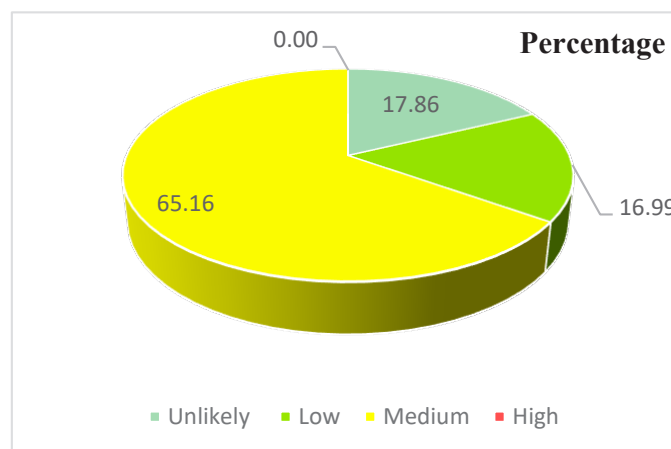Compartments: Unlikely 42, Low 95, Medium 39, High 3

3.3.10.3 Shopian Range

Fig. 134: Forest Fire Vulnerability Map of Shopian Range Shopian Forest Division Jammu & Kashmir

Table125. Compartments of Shopian Range Shopian Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Shopian	Unlikely	22a/Rb,23/Rb,20/Rb,5b/V,1ab/Rb,2c/V,7/V,4/Rb,16b/Rb,16a/Rb,Hirpura Wildlife Sa*,26b/Rb	12	308.57	82.49
	Low	26a/Rb,25ab/Rb,6/V,2a/V,2a/Rb,2b/Rb,3/Rb,5a/Rb,5b/Rb,19a/Rb,18/Rb,22b/Rb	12	31.33	8.38
	Medium	24b/Rb,24a/Rb,21/Rb,5a/V,4a/V,4bc/V,3/V,2b /V,1a/V,1b/V,6/Rb,19bc/Rb,17b/Rb,17a/Rb	14	34.16	9.13
	High	NA	NA	0.00	0.00
Total			38	374.07	100.00

Shopian Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	308.57
Low:	31.33
Medium:	34.16
High:	0.00
Total	374.07

Percentage

0.00
17.86
65.16
16.99

Unlikely   Low   Medium   High

Compartments

42   95   39   3

Unlikely   Low   Medium   High

3.3.11 SINDH FOREST DIVISION

The Sindh Forest division lies on the geographical coordinates of 34°7'0" to 34°28'0"N and 74°42'0" to 74°26'0"E in the mountainous and rugged terrain of Kashmir valley. The average elevation of the division is 1619 meters. Sindh Forest Division has following ranges, Sindh, Mansbal, Shalbugh and Urban. The total area (on GIS Platform) of 140 compartments of four territorial ranges is area 1268.45 Km.[2]
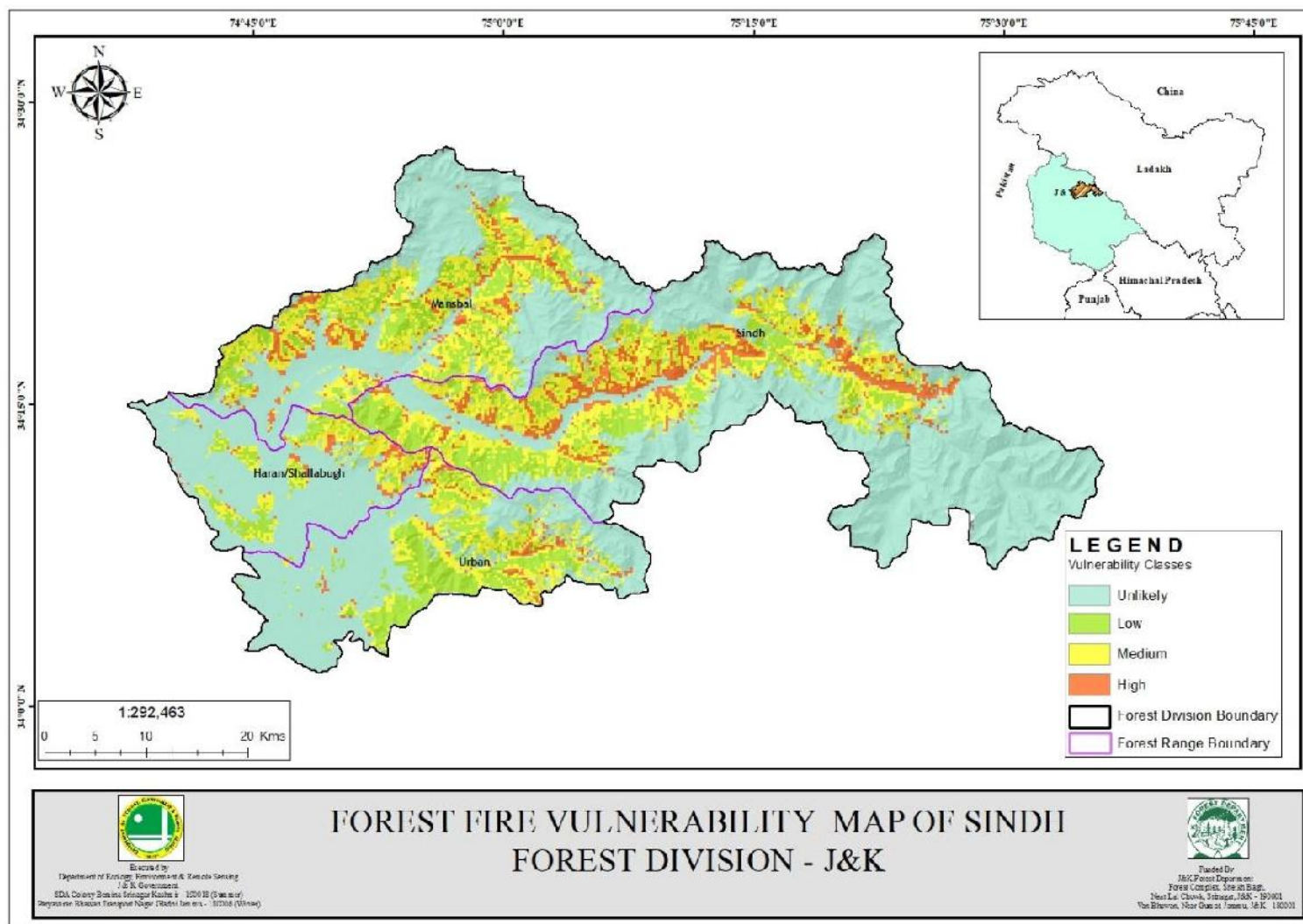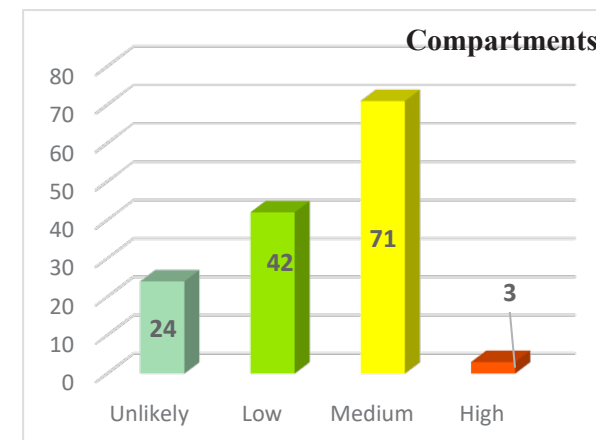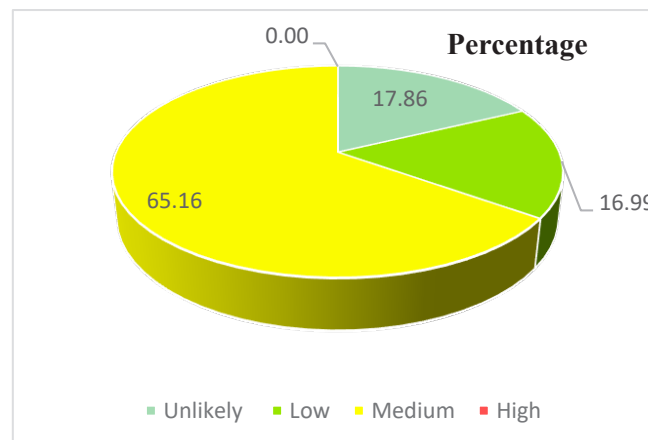

Fig. 135: Forest Fire Vulnerability Map of Sindh Forest Division Jammu & Kashmir

Table.126. Compartments of Sindh Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Sindh Forest Division	Harran Shalbugh	Unlikely	0	0.00	0.00
		Low	0	0.00	0.00
		Medium	2	31.24	100.02
		High	0	0.00	0.00
		Total	**2**	**31.24**	**100.00**
	Mansbal	Unlikely	3	249.09	60.10
		Low	13	36.37	8.77
		Medium	33	129.03	31.13
		High	NA	NA	NA
		Total	**49**	**414.49**	**100.00**
	Sindh	Unlikely	19	583.60	72.82
		Low	27	74.23	9.26
		Medium	34	139.98	17.47
		High	3	3.65	0.46
		Total	**83**	**801.45**	**100.00**
	Urban	Unlikely	2	6.00	27.64
		Low	2	6.31	29.06
		Medium	2	9.40	43.31
		High	0	0.00	0.00

		Total	6	21.71	100.00

Sindh Forest Division	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	838.69
Low:	116.91
Medium:	309.65
High:	3.65
Total	1268.69

Percentage

0.00
17.86
65.16
16.99

■ Unlikely ■ Low ■ Medium ■ High

Compartments

24   42   71   3

Unlikely   Low   Medium   High

FOREST FIRE RISK ZONATION & VULNERABILITY
ASSESSMENT FORESTS OF JAMMU & KASHMIR

3.3.11.1 Harran Shalbugh Range
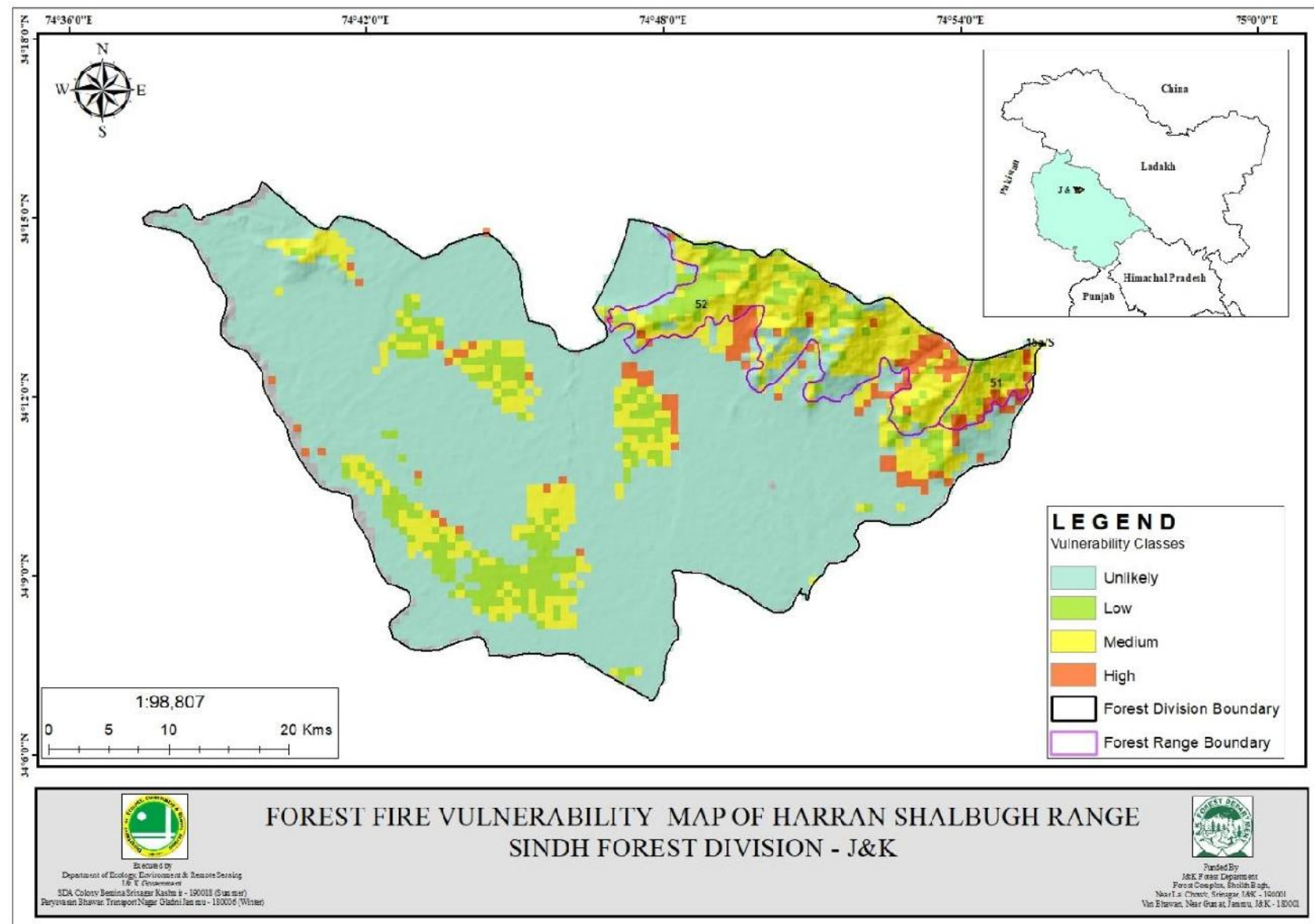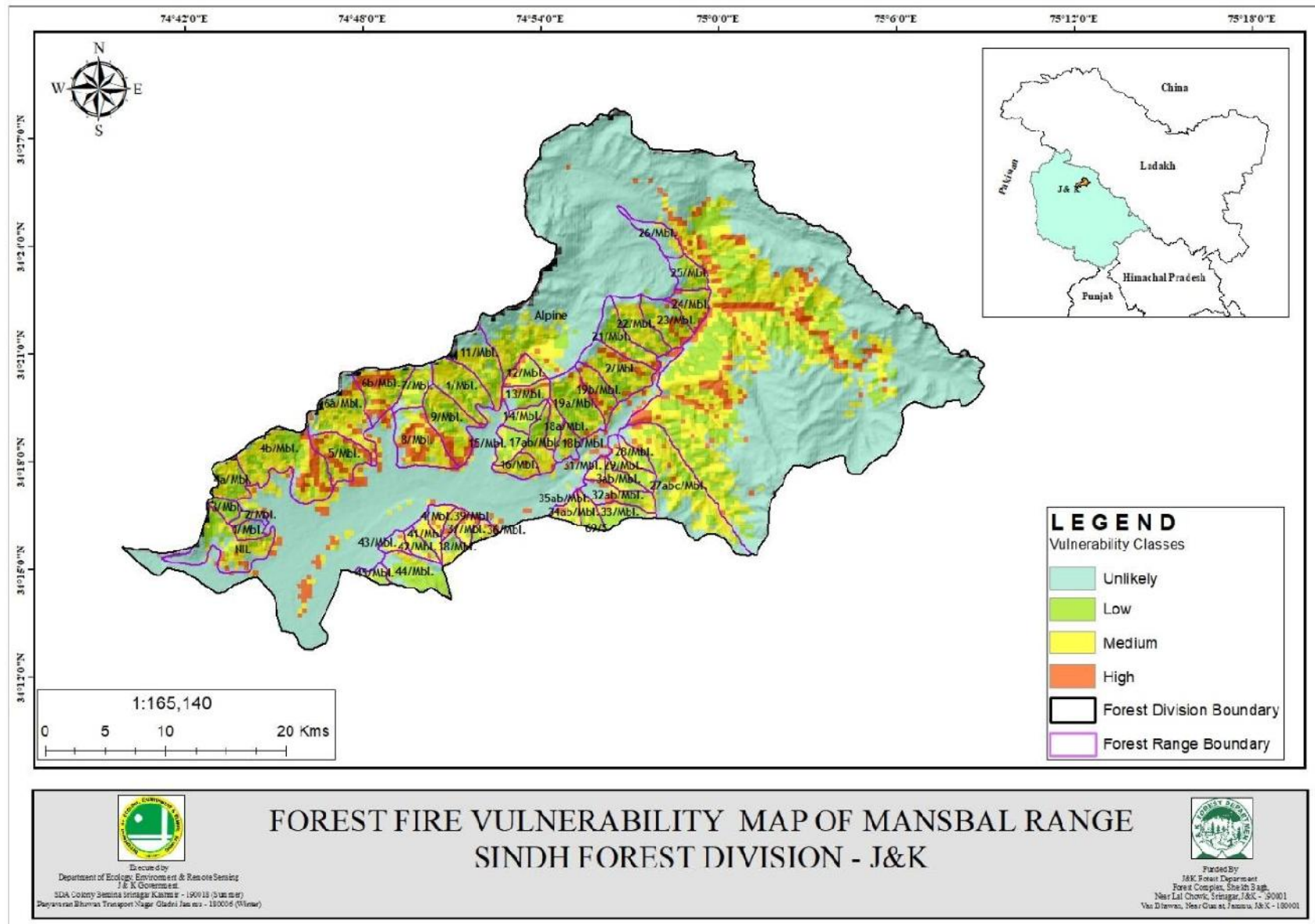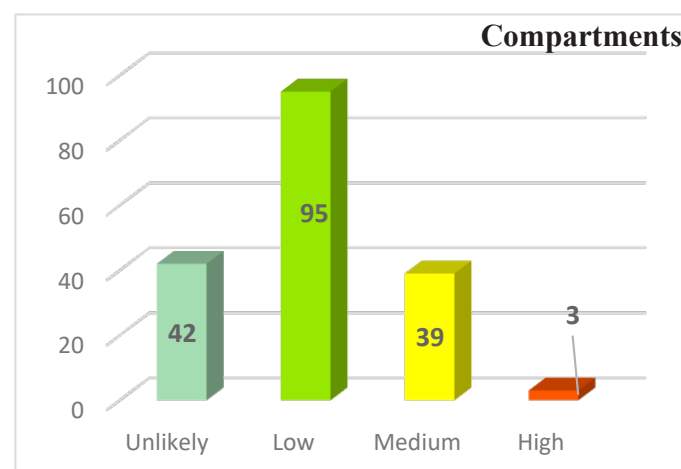

Fig. 136: Forest Fire Vulnerability Map of Harran Shalbugh Range Sindh Forest Division Jammu & Kashmir

Table127. Compartments of Harran Shalbugh Range Sindh Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Harran Shalbugh	Unlikely		NA	NA	NA
	Low		NA	NA	NA
	Medium	51,52	2	31.24	100.00
	High		NA	NA	NA
Total			2	31.24	100.00

Harran Shalbugh Range   Area

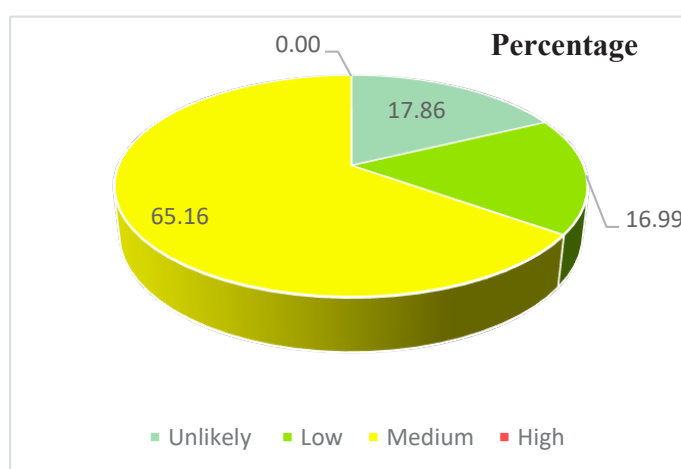| Vulnerability Classes	Area(Sq Kms)
Unlikely:	0.00
Low:	0.00
Medium:	31.24
High:	0.00
Total	**31.24**
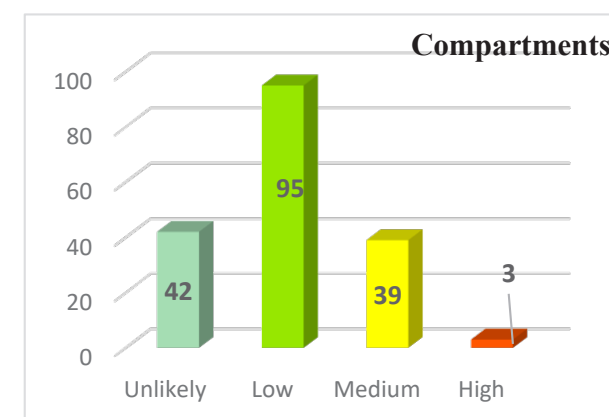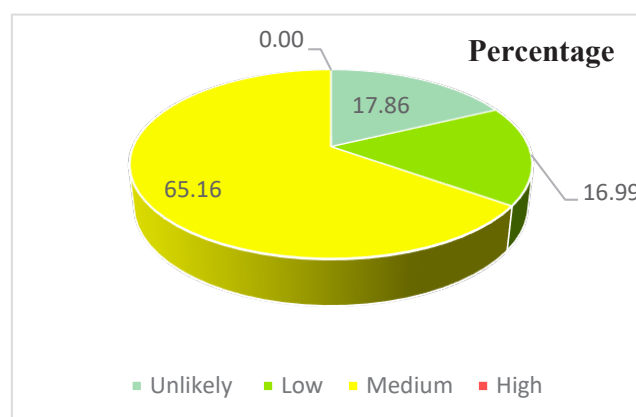
3.3.11.2 Mansbal Range

Fig. 137: Forest Fire Vulnerability Map of Manasbal Range Sindh Forest Division Jammu & Kashmir

Table128. Compartments of Manasbal Range Sindh Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Mansbal	Unlikely	26/Mbl.,45/Mbl., Alpine	3	249.09	60.10
	Low	19a/Mbl.,25/Mbl.,3/Mbl.,44/Mbl.,17ab/Mbl.,3ab/Mbl.,33/Mbl.,21/Mbl.,13/Mbl.,18a/Mbl.,15/Mbl.,14/Mbl., 42/Mbl.	13	36.37	8.77
	Medium	4b/Mbl.,5/Mbl.,9/Mbl.,8/Mbl.,6a/Mbl.,11/Mbl.,18b/Mbl.,23/Mbl.,24/Mbl.,4a/Mbl.,43/Mbl.,4/Mbl.,41/Mbl.,39/Mbl.,38/Mbl.,36/Mbl.,37/Mbl.,31/Mbl.,28/Mbl.,29/Mbl.,32ab/Mbl.,35ab/Mbl.,34ab/Mbl.,12/Mbl.,2/Mbl.,22/Mbl.,7/Mbl.,1/Mbl.,16/Mbl.,NIL,27abc/Mbl.,6b/Mbl.,19b/Mbl.	33	129.03	31.13
	High		NA	NA	NA
Total			**49**	**414.48**	**100.00**

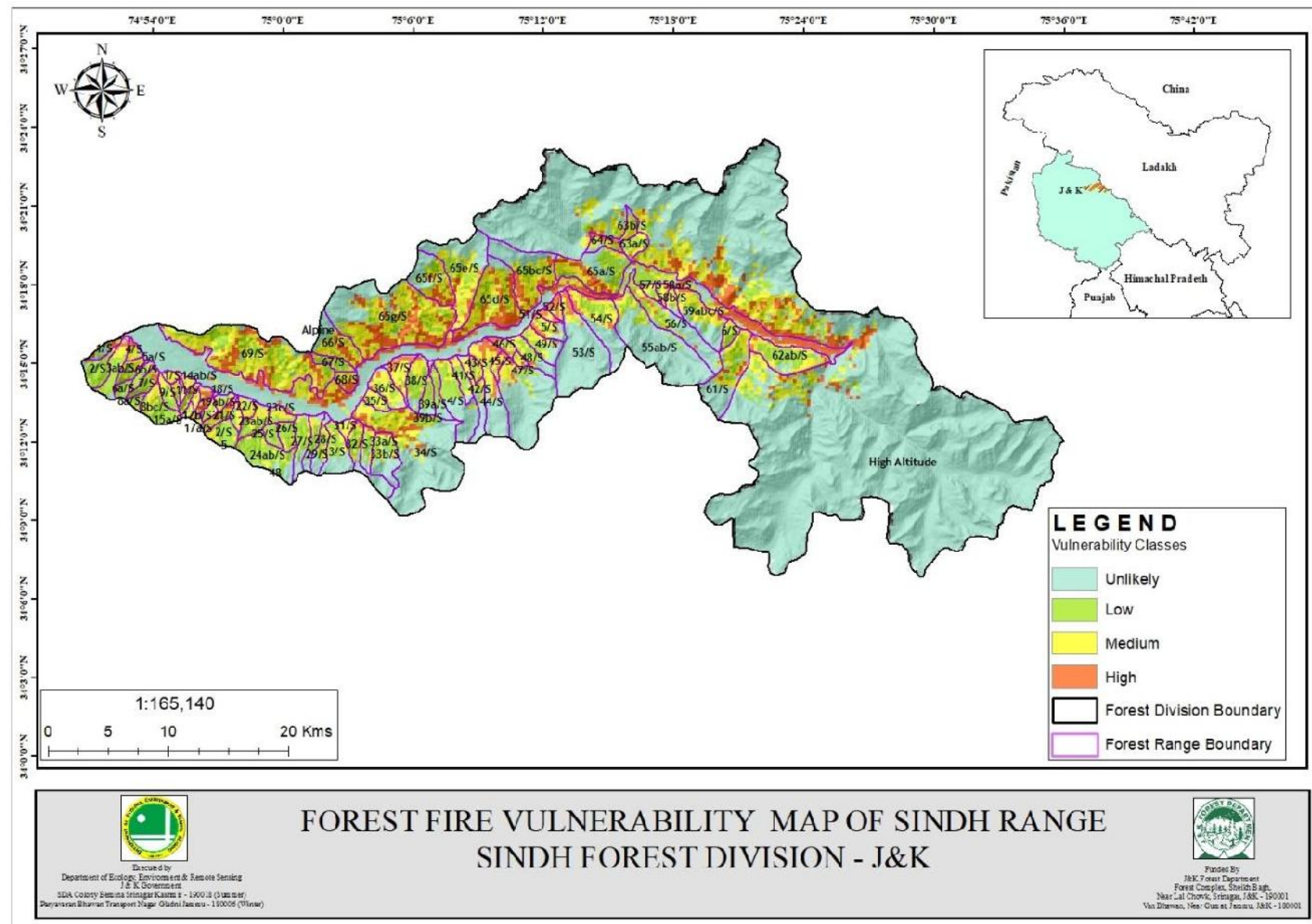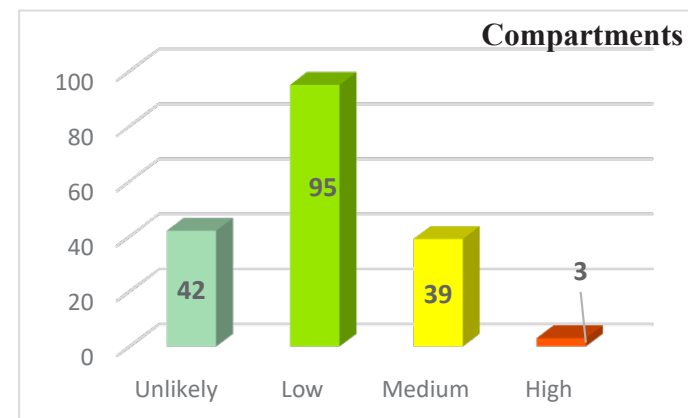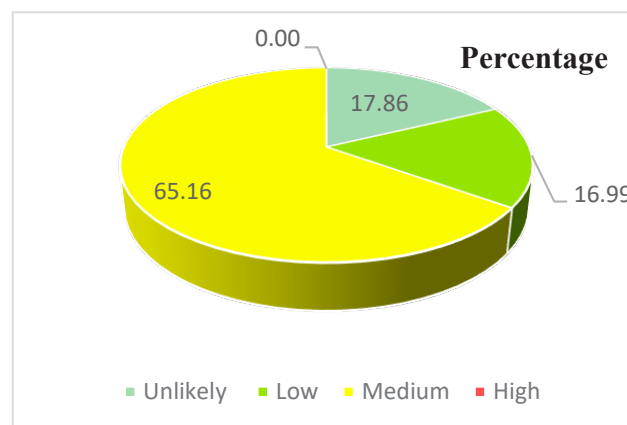| Mansbal Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	249.09
Low:	36.37
Medium:	129.03
High:	0.00
Total	**414.48**

3.3.11.3 Sindh Range

Fig. 138: Forest Fire Vulnerability Map of Sindh Range Sindh Forest Division Jammu & Kashmir

Table129. Compartments of Sindh Range Sindh Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Sindh	Unlikely	28/S,29/S,3/S,32/S,4/S,34/S,59abc/S, HighAltitude,53/S,54/S,55ab/S,56/S,44/S,42/S,33b/S, 61/S,65f/S,65e/S,65bc/S	19	583.60	72.82
	Low	24ab/S,2/S,3ab/S,6a/S,6b/S,7/S,8bc/S,9/S,14ab/ S,15b/S,17b/S,25/S,26/S,27/S,41/S,39a/S,38/S, 5b/S,67/S,49/S,57/S,15a/S,8a/S,33a/S,39b/ S,48 /S,62ab/S	27	74.23	9.26
	Medium	18/S,23ab/S,21/S,19ab/S,1/S,5a/S,11/S,12ab/S,13/ S,16b/S,17a/S,22/S,31/S,43/S,37/S,36/S,35/S,68/ S ,64/S,65a/S,6/S,47/S,45/S,5/S,58b/S,66/S,63a/ S,2 3c/S,69/S,16a/S,58a/S,65g/S,65d/S,63b/S	34	139.98	17.47
	High	46/S,51/S,52/S	3	3.65	0.46
Total			83	801.45	100.00

Sindh Range	Area
Vulnerability Classes	Area(Sq Kms)
Unlikely:	583.60
Low:	74.23
Medium:	139.98
High:	3.65
Total	**801.45**

Percentage

0.00
17.86
65.16
16.99

■ Unlikely ■ Low ■ Medium ■ High

Compartments

100
80
60
40
20
0

42 95 39 3

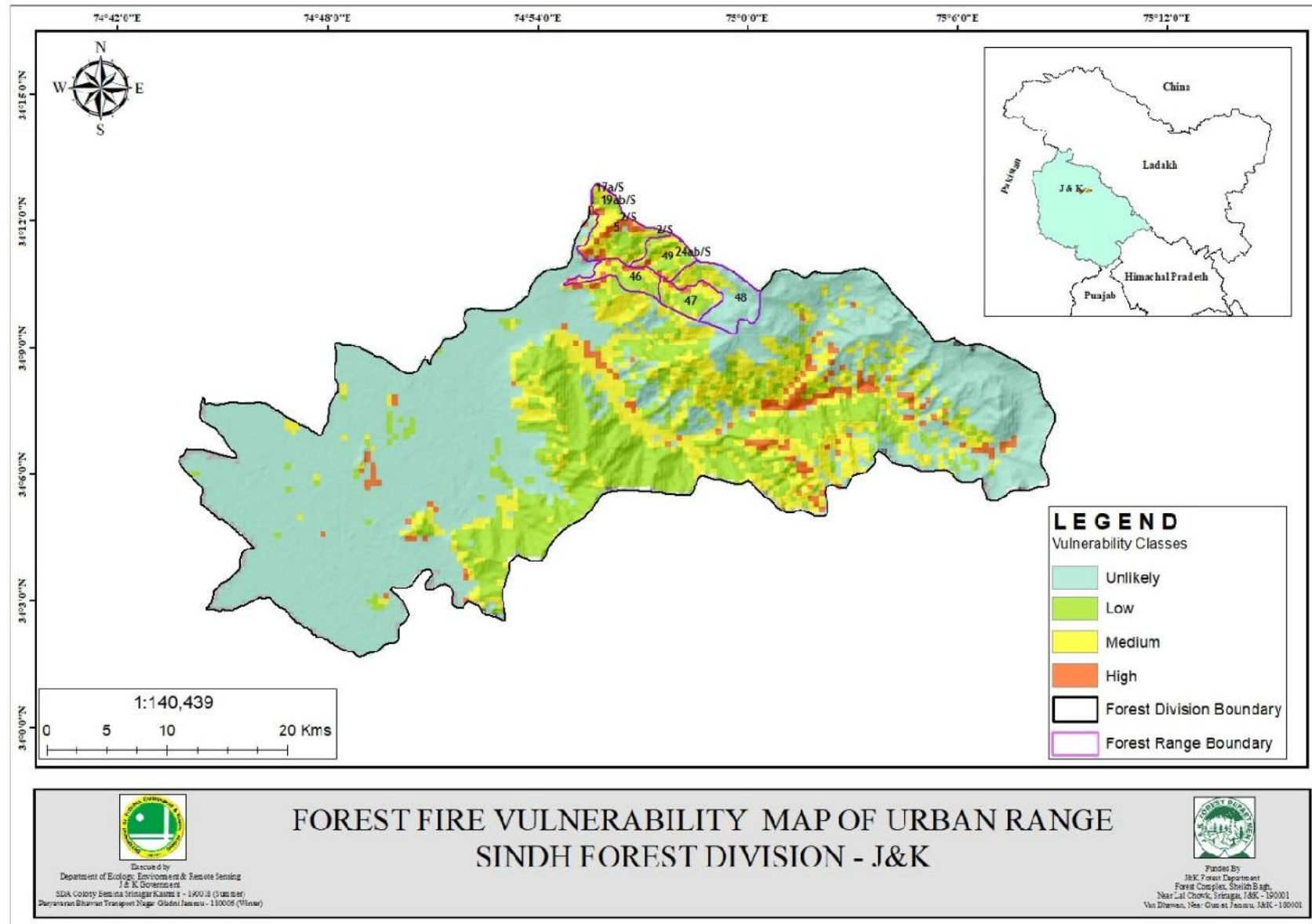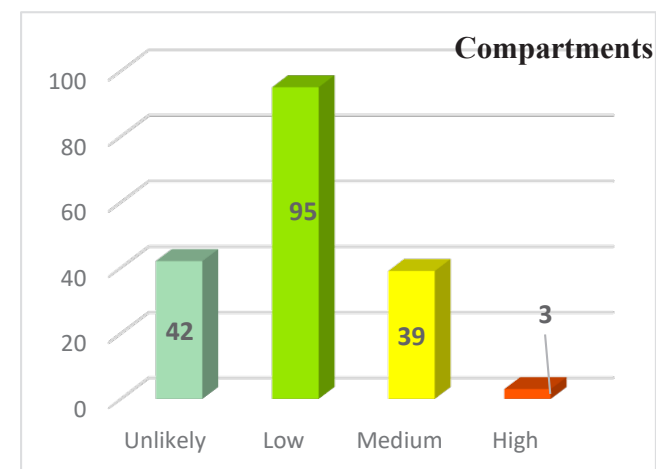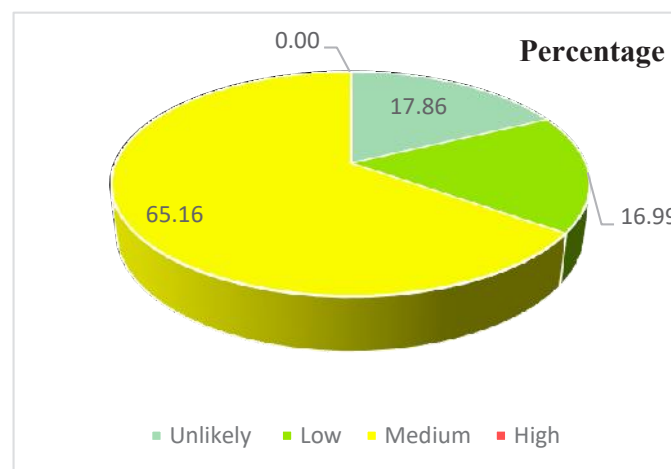Unlikely Low Medium High

3.3.11.4 Urban Range

Fig. 139: Forest Fire Vulnerability Map of Urban Range Sindh Forest Division Jammu & Kashmir

Table130. Compartments of Urban Range Sindh Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Urban	Unlikely	48,24ab/S	2	6.00	27.64
	Low	47,49	2	6.31	29.06
	Medium	51,52	2	9.40	43.31
	High	5,46	0	0.00	0.00
Total			6	21.71	100.00

Urban Range — Area

Vulnerability Classes	Area(Sq Kms)
Unlikely:	249.09
Low:	36.37
Medium:	129.03
High:	0.00
Total	414.48

Percentage

- Unlikely
- Low
- Medium
- High

0.00, 17.86, 16.99, 65.16

Compartments

Unlikely 42, Low 95, Medium 39, High 3

3.3.12 TANGMARG FOREST DIVISION

Tangmarg forest division is situated between74°25'28"E 34°03'.33"N. The division has an elevation of 1569 meters. Forest division Tangmarg comprises three ranges, Gulmarg SPSP/ Shri Pratab Singh Pora and Pattan. The total area (on GIS Platform) of 89 compartments of three territorial ranges is area 309.39 Km.[2]
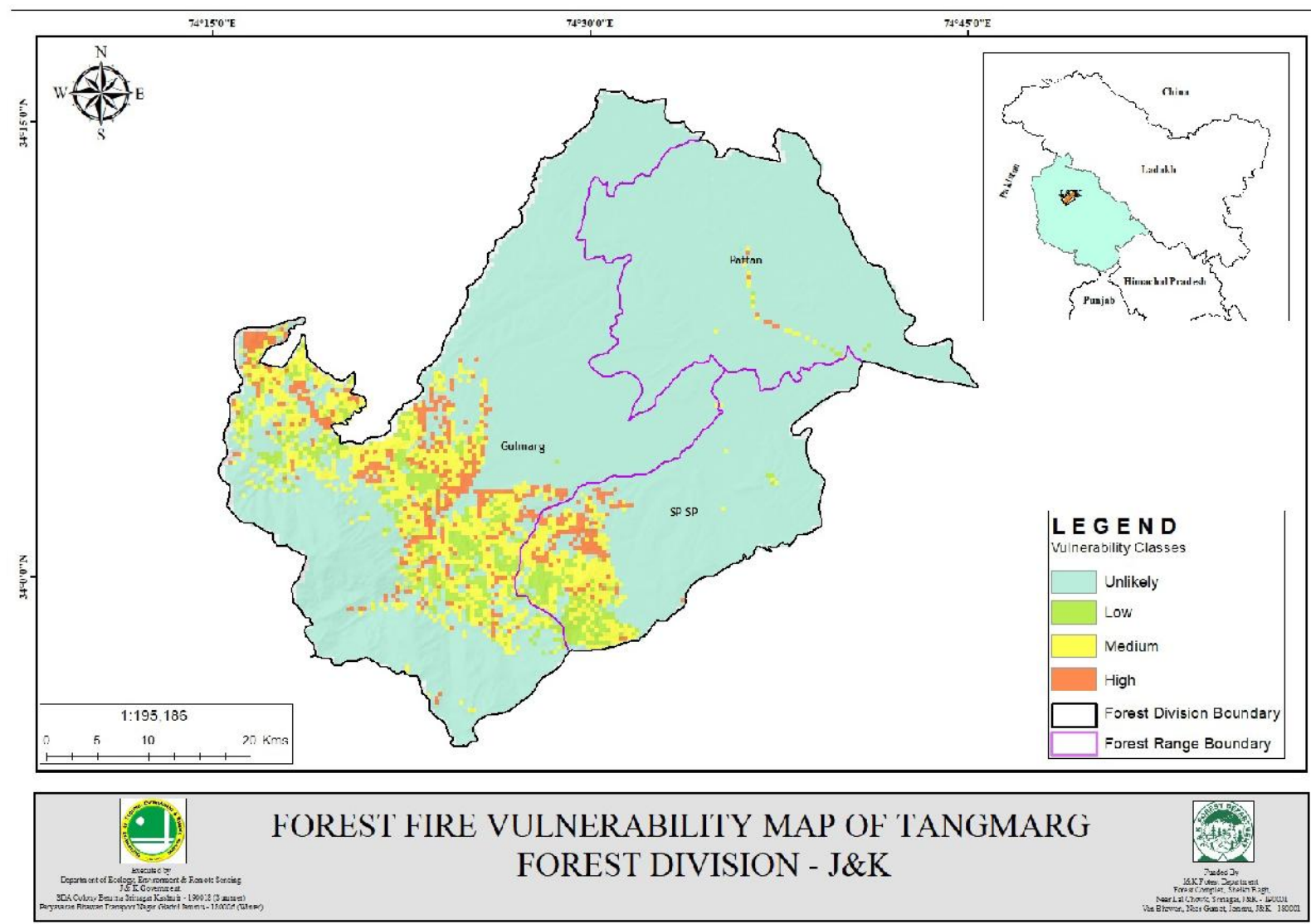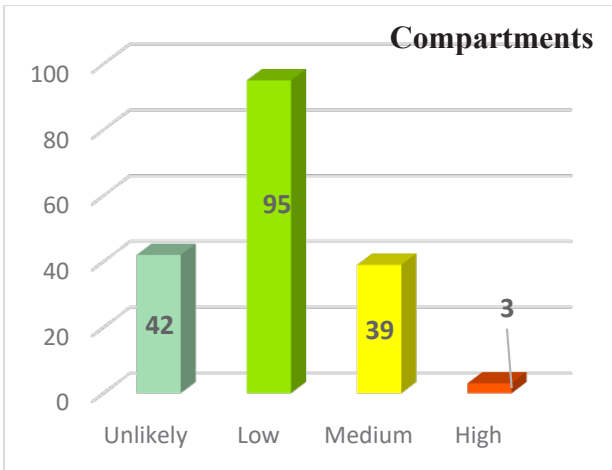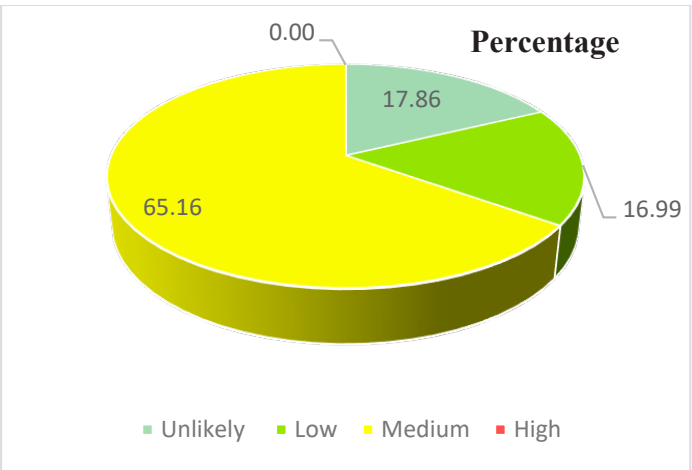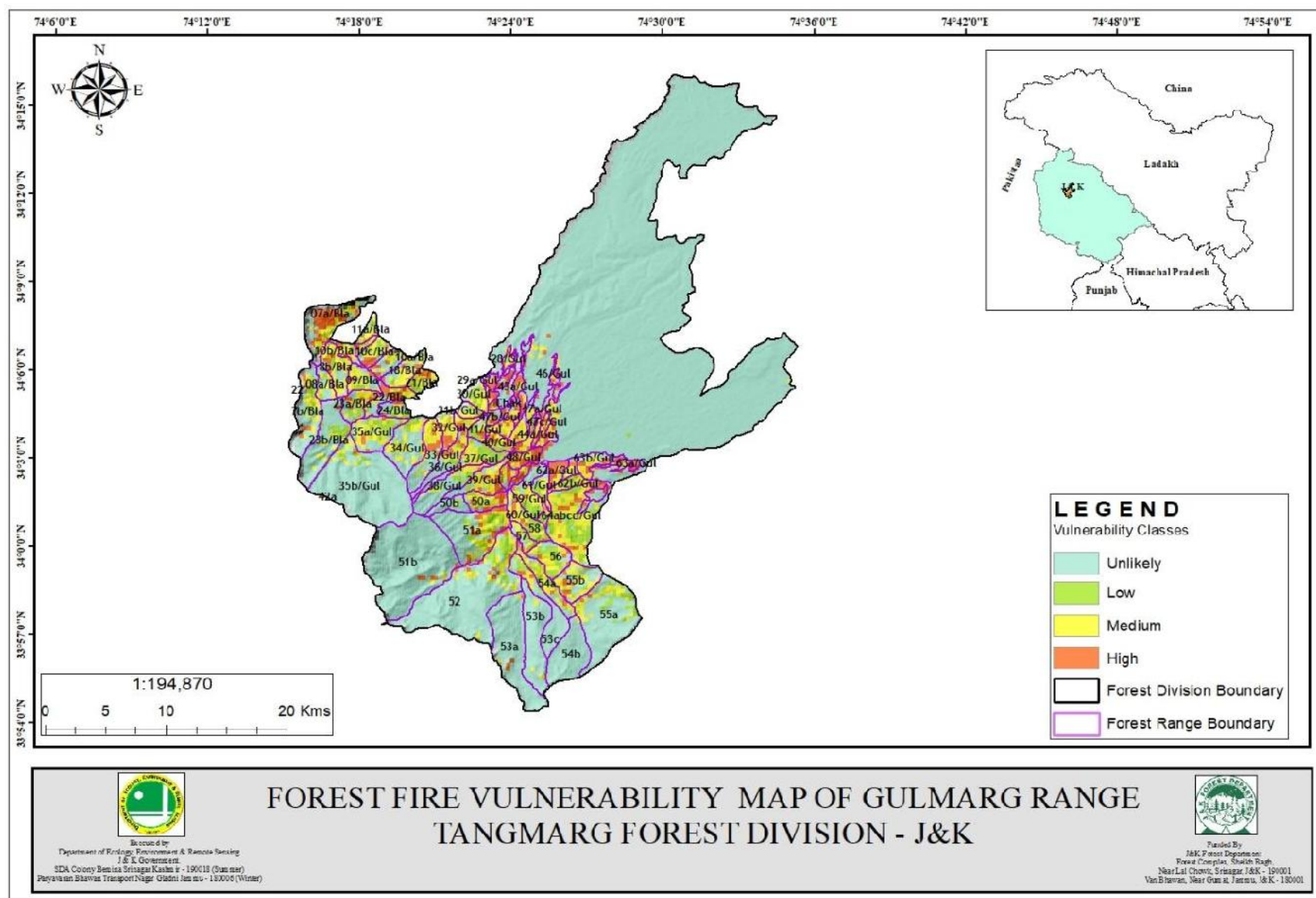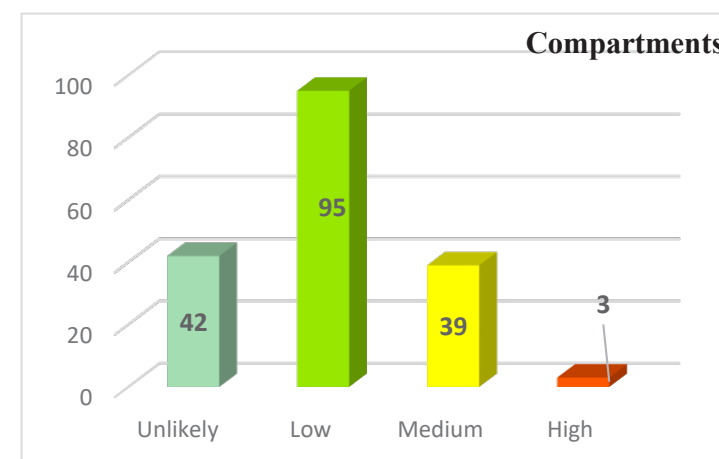

Fig. 140: Forest Fire Vulnerability Map of Tangmarg Forest Division Jammu & Kashmir

Table.131. Compartments of Tangmarg Forest Division under Different Vulnerability Classes.

Division Name	Range Name	Vulnerability Classes	No of Compartments	Area	Percentage
Tangmarg Forest Division	Gulmarg	Unlikely	22	166.59	60.91
		Low	4	9.39	3.43
		Medium	35	83.26	30.44
		High	11	14.27	5.22
		Total	**72**	**273.50**	**100.00**
	Pattan	Unlikely	NA	NA	NA
		Low	NA	NA	NA
		Medium	NA	NA	NA
		High	NA	NA	NA
		Total	**NA**	**NA**	**NA**
	SP SP Range	Unlikely	0	NA	NA
		Low	5	13.63	37.99
		Medium	9	18.83	52.48
		High	3	3.42	9.54
		Total	**17**	**35.89**	**100.00**

Tangmarg Forest Division	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	166.59
Low:	23.02
Medium:	102.09
High:	17.69
Total	309.39

Percentage

- Unlikely
- Low
- Medium
- High

0.00
17.86
16.99
65.16

Compartments

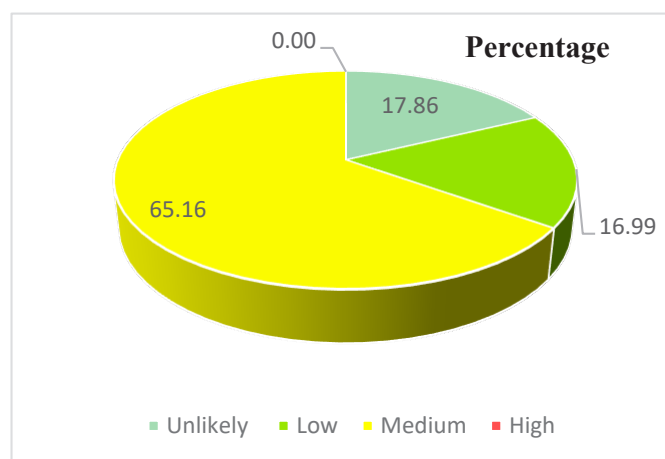|	Unlikely	Low	Medium	High
	42	95	39	3

3.3.12.1 Gulmarg Range

Fig. 141: Forest Fire Vulnerability Map of Gulmarg Range Tangmarg Forest Division Jammu & Kashmir

Table132. Compartments of Gulmarg Range Tangmarg Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
Gulmarg	Unlikely	23b/Bla,24/Bla,35b/Gul,34/Gul,33/Gul,36/Gul,53a, 51b,55a,52,54b,42a/Gul,38/Gul,46/Gul,7b/Bla,51a, 50b,10a/Bla,53c,53b,08a/Bla,42b/Gul	22	166.59	60.91
	Low	37/Gul,41/Gul,58,60/Gul	4	9.39	3.43
	Medium	18/Bla,21/Bla,8b/Bla,22/Bla,10c/Bla,11a/Bla,32/Gul,30/Gul,09/Bla,56,50a,64abcd/Gul,43a/Gul,47c/Gul,44a/Gul,59/Gul,61/Gul,63b/Gul,62b/Gul,39/Gul,57,40/Gul,31b/Gul,35a/Gul,47b/Gul,47a/Gul,23a/Bla ,10b/Bla,11b/Bla,55b,54a,44b/Gul,42c/Gul,31a/Gul ,62c/Gul	35	83.26	30.44
	High	07a/Bla,29a/Gul,28/Gul,48/Gul,49b/Gul, Chak,63a/Gul,49a/Gul,29b/Gul,43b/Gul,62a/Gul	11	14.27	5.22
Total			62	273.50	100.00

Area

Gulmarg Range

Vulnerability Classes	Area(Sq Kms)
Unlikely:	166.59
Low:	23.02
Medium:	102.09
High:	17.69
Total	**309.39**

Percentage

0.00
17.86
65.16
16.99

■ Unlikely ■ Low ■ Medium ■ High

Compartments

100
80
60
40
20
0

42   95   39   3

Unlikely   Low   Medium   High
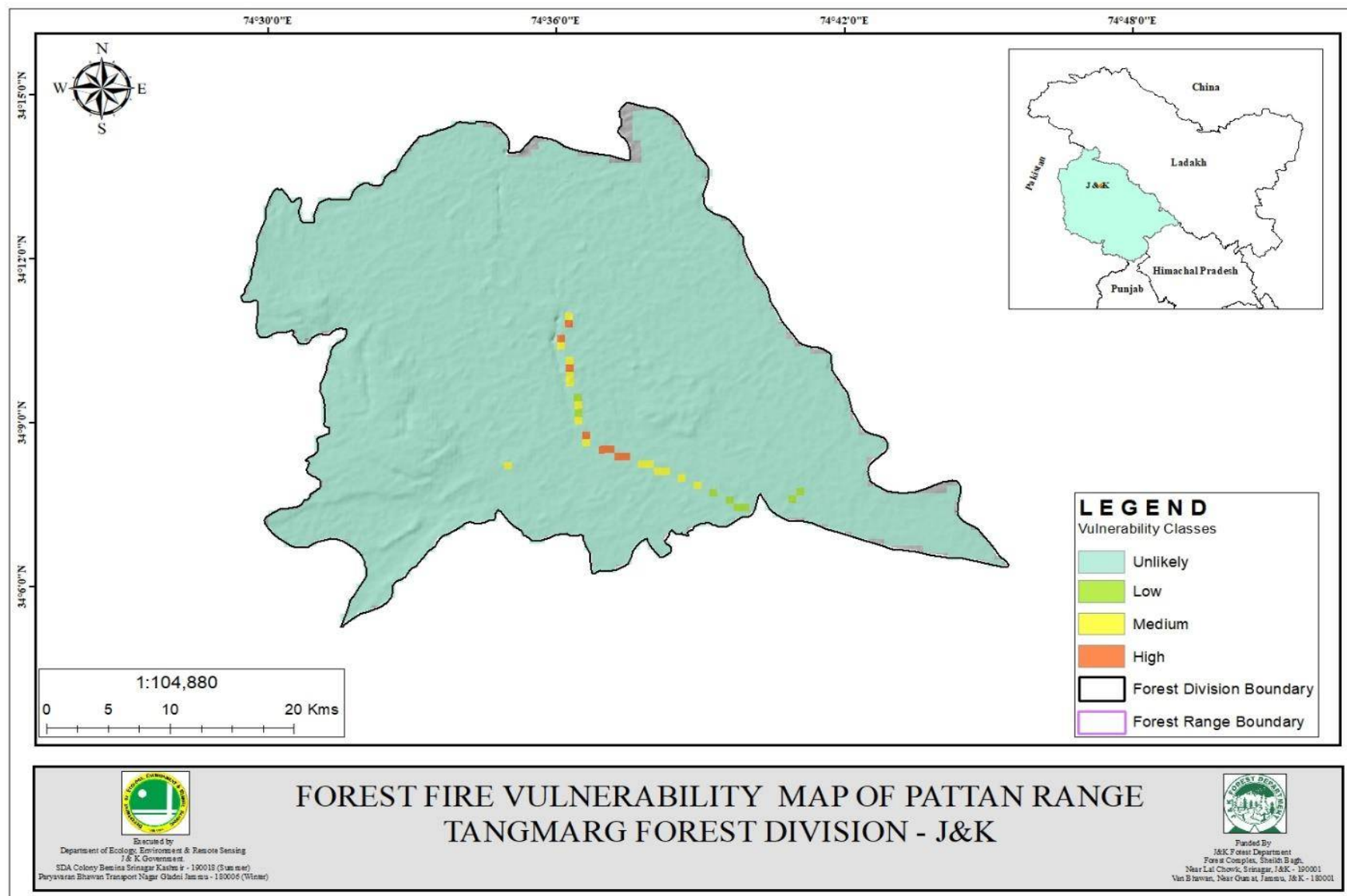
3.3.12.2 Pattan Range

Fig. 142: Forest Fire Vulnerability Map of Pattan Range Tangmarg Forest Division Jammu & Kashmir
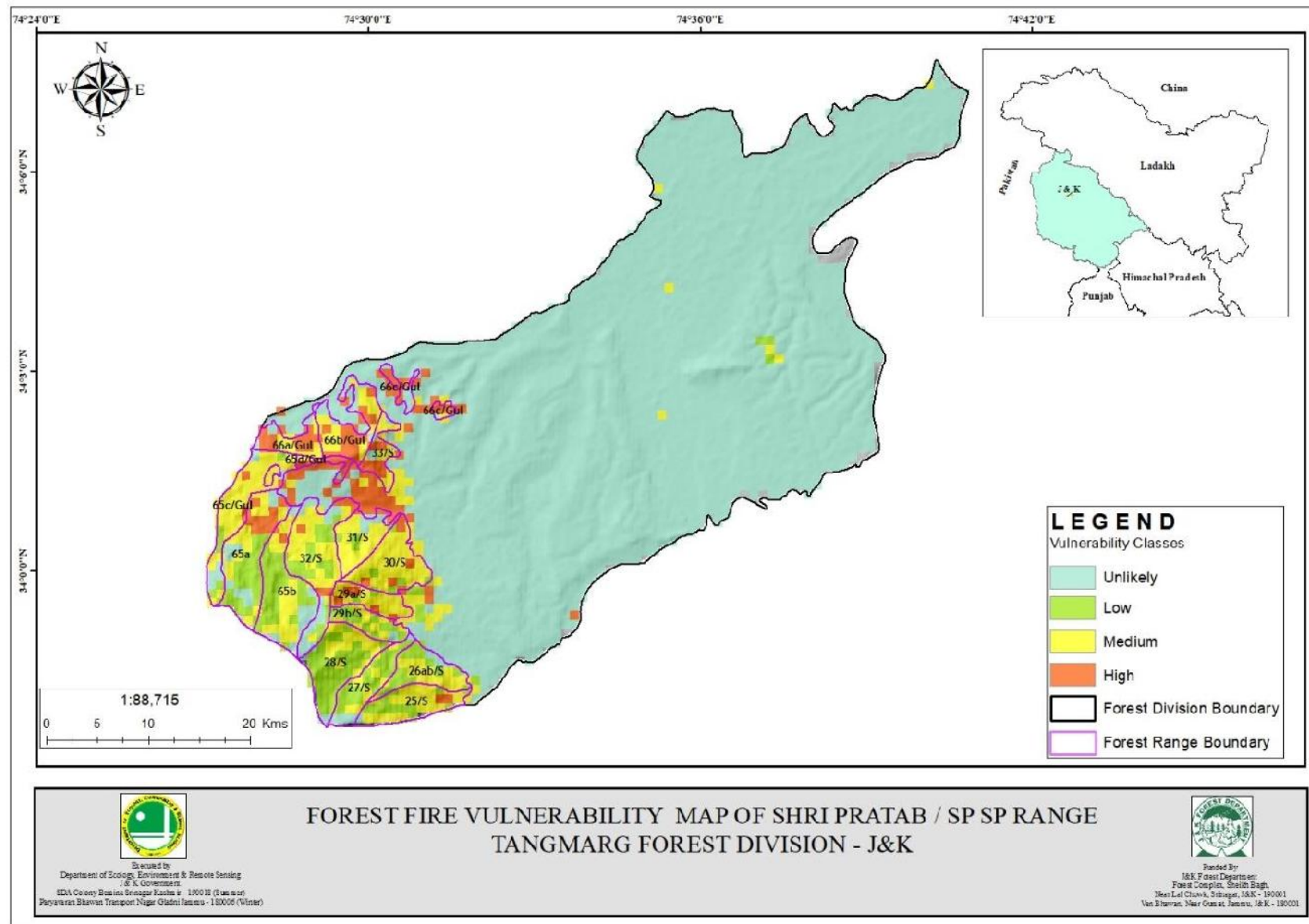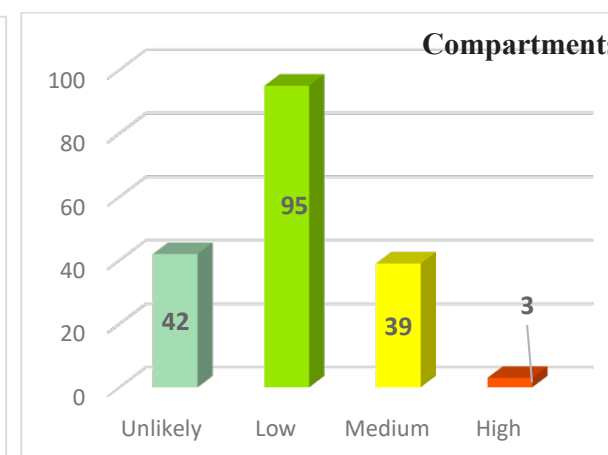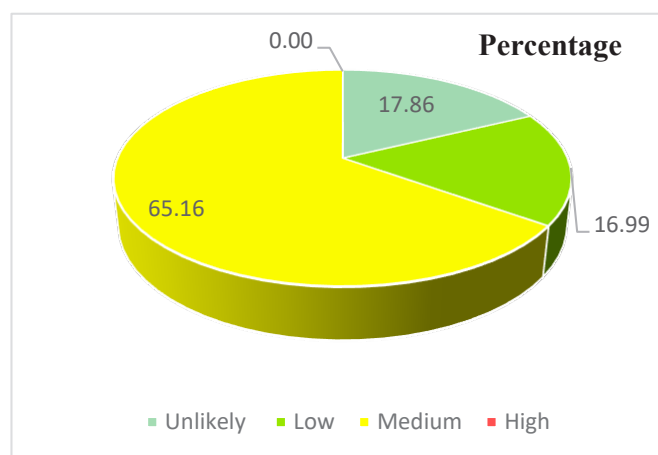
3.3.12.3 SP SP Range

Fig. 143: Forest Fire Vulnerability Map of Shri Pratab/ SP SP Range Tangmarg Forest Division Jammu & Kashmir

Table133. Compartments of SP SP Range Tangmarg Forest Division under Different Vulnerability Classes.

Range Name	Vulnerability Class	Compartment Name	Number of Compartments	Area	Percentage
SP SP	Unlikely		NA	NA	NA
	Low	65a,27/S,28/S,29b/S,65b	5	13.63	37.99
	Medium	25/S,26ab/S,29a/S,30/S,31/S,32/S,33/S,65c/Gul,66a/Gul	9	18.83	52.48
	High	66c/Gul,66b/Gul,65d/Gul	3	3.42	9.54
Total			**17**	**35.89**	**100.00**

Gulmarg Range	Area
Vulnerability Classes	**Area(Sq Kms)**
Unlikely:	0.00
Low:	13.63
Medium:	18.83
High:	3.42
Total	35.89

Percentage

0.00
17.86
65.16
16.99

Unlikely   Low   Medium   High

Compartments

42   95   39   3

Unlikely   Low   Medium   High

3.4 Validation of Results

In order to validate the overall fire vulnerability map of Jammu and Kashmir, the data (locations of forest fire incidents from year 2002 to 2018) of Jammu and Kashmir were used. Locations of Field fire data was converted to vector point shape file format. The vector point shapefile of fire data was overlaid on the final fire vulnerability maps of Jammu and Kashmir Province (figure 144). It is observed that 9.08% of total Forest Fire Incidents have occurred within high and medium vulnerability zones whereas only 8.91% of Forest Fire Incidents have occurred within low & unlikely vulnerability zones.
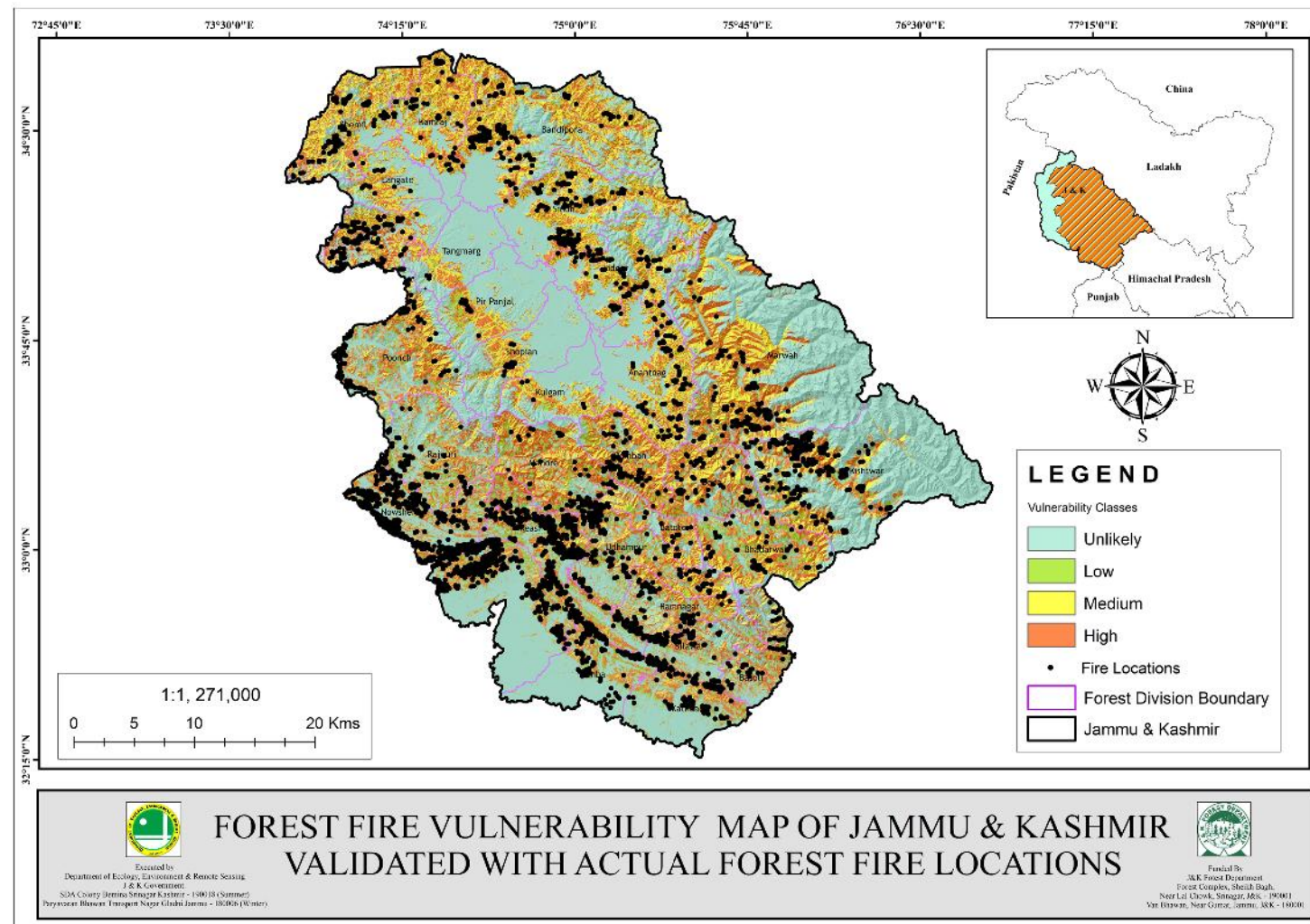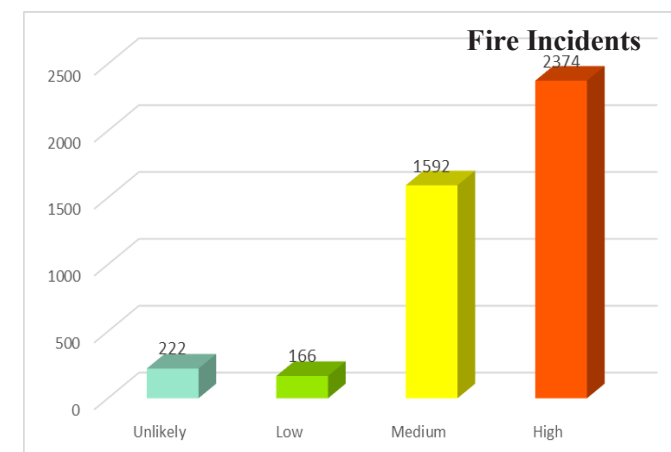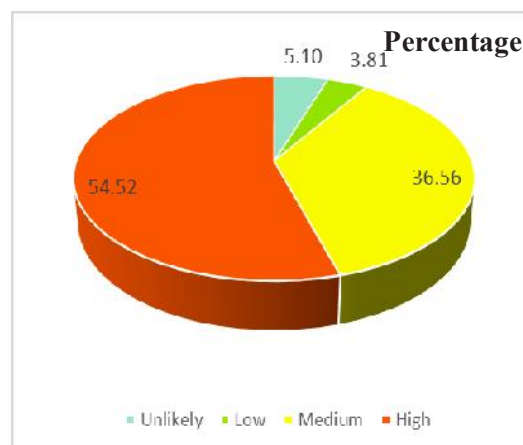

Fig. 144: Forest Fire Vulnerability Map of Jammu & Kashmir Validated With Actual Forest Fire Locations.

For Jammu & Kashmir, the overlay analysis of fire vulnerability maps and point shape file of forest fire locations (Table 134) revealed that out of the total fire incidents of 4354 of field fire locations data, 2374 fire incidents has occurred in the high vulnerable zone, 1592 fire incidents in the medium vulnerable zone and 166 fire incidents in low vulnerable zone. It is also observed that least fire incidents 222 have occurred in unlikely vulnerability zone.

Table134. Showing Number of Forest Fire Incidents of Jammu & Kashmir within each vulnerability zones

Vulnerability Classes	Number of Forest Fire Incidents	Percentage (Forest Fire Incidents)
Unlikely	222	5.10
Low	166	3.81
Medium	1592	36.56
High	2374	54.52
Total	**4354**	**100.00**

Fire Incidents

Jammu & Kashmir

Vulnerability Classes	Number of Fire Incidents
Unlike:	222
Low:	166
Medium:	1592
High:	2374
Total:	**4354**

In case of Jammu Province (Figure 145), it is observed that above 92% of total Forest Fire Incidents have occurred within high and medium vulnerability zones whereas only 7.81% of Forest Fire Incidents have occurred within low & unlikely vulnerability zones.
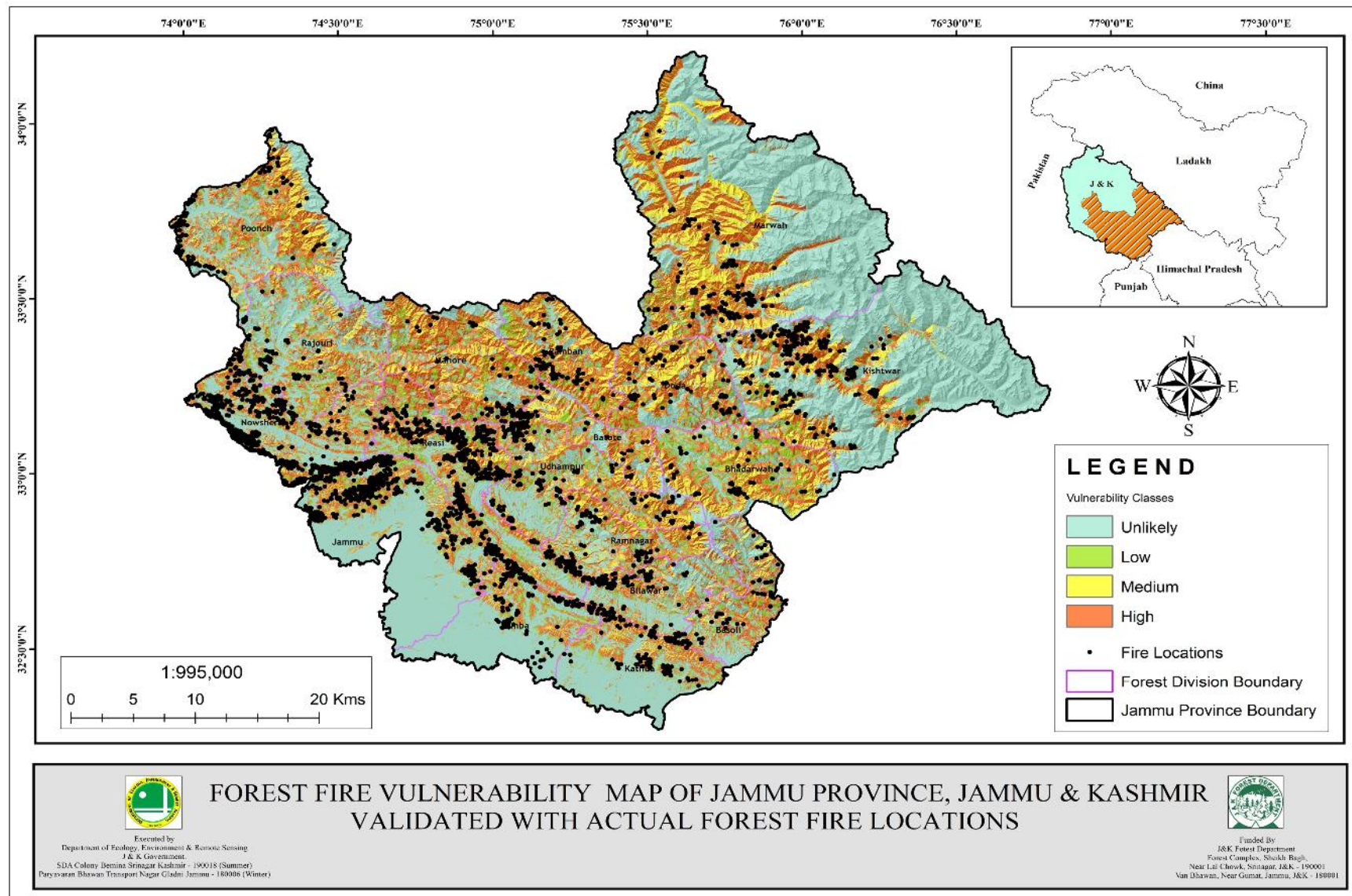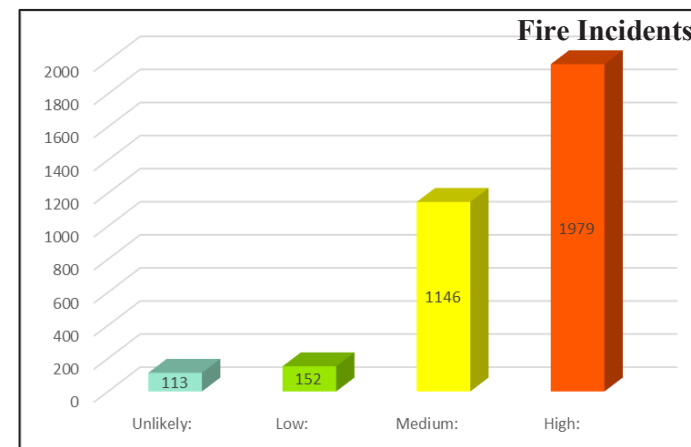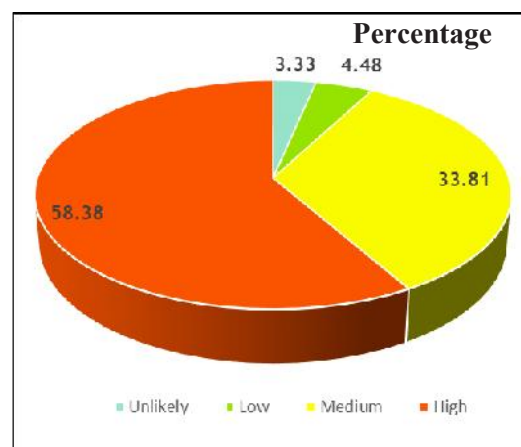

Fig. 145: Forest Fire Vulnerability Map of Jammu Province Jammu & Kashmir Validated With Actual Forest Fire Locations.

For Jammu Province, the overlay analysis of fire vulnerability maps and point shapefile of forest fire locations (Table 135) revealed that out of the total fire incidents of 3390 of field fire locations data, 1979 fire incidents has occurred in the high vulnerable zone, 1146 fire incidents in the medium vulnerable zone and 152 fire incidents in low vulnerable zone. It is also observed that least fire incidents 113 have occurred in unlikely vulnerability zone.

Table135. Showing Number of Forest Fire Incidents of Jammu Province within each vulnerability zones

Vulnerability Classes	Number of Forest Fire Incidents	Percentage (Forest Fire Incidents)
Unlikely	113	3.33
Low	152	4.48
Medium	1146	33.81
High	1979	58.38
Total	**3390**	**100.00**

In case of Kashmir Province, it is observed that above 87.25% of total Forest Fire Incidents have occurred within high and medium vulnerability zones whereas only 12.76% of Forest Fire Incidents have occurred within low & unlikely vulnerability zones (figure 146).
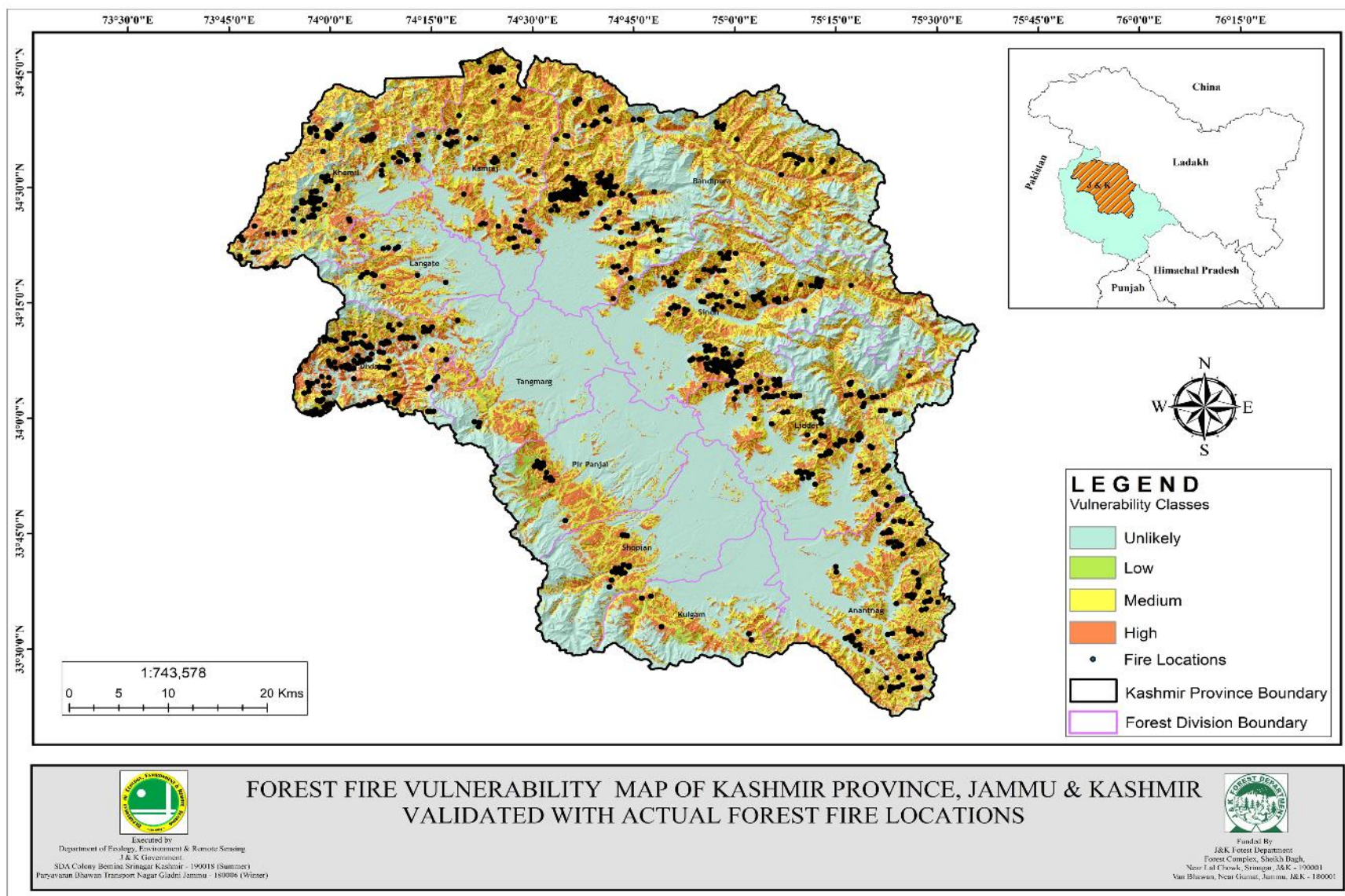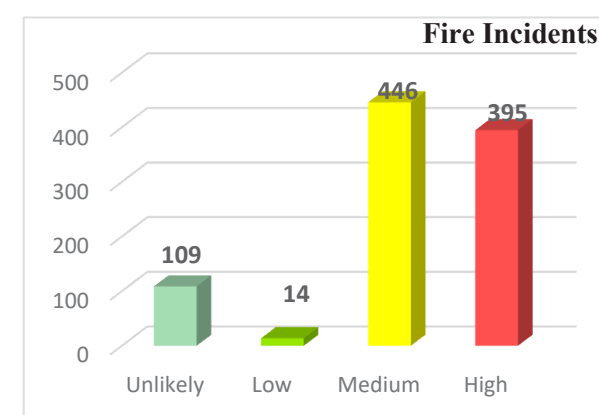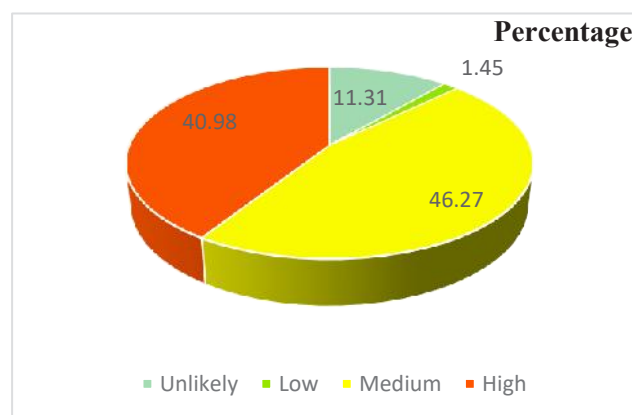

Fig. 146: Forest Fire Vulnerability Map of Kashmir Province Jammu & Kashmir Validated With Actual Forest Fire Locations.

For Kashmir Province, the overlay analysis of fire vulnerability maps and point shape file of forest fire locations (Table 136) revealed that out of the total fire incidents of 964 of field fire locations data, 395 fire incidents has occurred in the high vulnerable zone, 446 fire incidents in the medium vulnerable zone and 14 fire incidents in low vulnerable zone. It is also observed that least fire incidents 109 have occurred in unlikely vulnerability zone.

Table136. Showing Number of Forest Fire Incidents of Kashmir Province within each vulnerability zones

Vulnerability Class	*No of Forest Fire Incidents*	*Percentage (Forest Fire Incidences)*
Unlikely	109	11.31
Low	14	1.45
Medium	446	46.27
High	395	40.98
Total	964	100.00

3.5 Conclusion

The present study used the integration of different layers (land use, wind, slope, aspect, proximity to roads and proximity to settlements), AHP and multi criteria analysis in the GIS environment for the assessment of forest fire risk zonation and vulnerability of forests of Jammu & Kashmir. The study was designed to prioritize the forests on the basis of vulnerability to fire so that necessary steps can be taken to minimize the damage caused by forest fires. The result of study according to the final forest fire vulnerability maps shows that, out of total area of 27869.87 km2 of 6646 compartments of forest divisions of Jammu & Kashmir, 4286.21 km2 fall in the high vulnerable zone and needs immediate attention to minimize the damage, 9490.15 km2 falls in the medium vulnerable zone, 4636.47 km2 falls in the low vulnerable zone of forest fire and 9457.04 km2 fall in unlikely vulnerable zone. It is also observed that out of the total 4354 forest fire incidents occurred in the earlier years in Jammu and Kashmir, 2374 fire incidents has occurred in the high vulnerable zone, 1592 fire incidents in the medium vulnerable zone and 166 fire incidents in low vulnerable zone. It is also observed that least fire incidents 222 have occurred in unlikely vulnerability zone. The present study will not only be useful in better preparedness for the forest fires. It could be very helpful to the concerned authorities and policy makers to develop strategies and make plans in order to minimize the frequency of forest fires incidents and help to minimize the damage caused by the forest fires.

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Study Under **CAMPA**
J&K Forest Department
Government of Jammu and Kashmir

Executed by:
Department of Ecology, Environment & Remote Sensing
Government of Jammu and Kashmir

Design & Print: associatedmedia