



A Quarterly Newsletter of **Odisha Forestry Sector Development Project, Phase-II** January-March, 2024, VOL-7, ISSUE-4



From Project Director’s Desk

Odisha Forestry Sector Development Project, Phase-II (OFSDP-II) is not just a project; it is a mission to mobilize resources and optimize fund utilization, with a focus on empowering community stakeholders. By strengthening their capacities and boosting income generation activities through dedicated support and convergence initiatives, the project has opened new avenues for prosperity of the forest fringe dwellers in the project areas.

One of the cornerstone achievements of OFSDP-II has been the mobilization of livelihood support to thousands of Common Interest Groups (CIGs), Self Help Groups (SHGs), and the Poorest of the Poor (PoPs). Through inter-sectoral convergence and project assistance, these groups have been able to showcase and sell their produce at prestigious platforms such as the Adivasi Mela, State Level Kalinga Herbal Fair, Adi Bazar, Pallishree Mela, and various district-level trade fairs.

As we continue our journey under OFSDP-II, the commitment to forest fire management remains unwavering. The collaboration between government agencies, community members, and various stakeholders is the bedrock of our success. Together, we are creating a future where forests are not only protected but also thrive as sources of biodiversity and livelihoods.

This edition of Banayana highlights forest fire management initiatives taken up by different DMUs under the project. It includes an analysis which is in the form of a Case Study involving various data, imagery and other inputs to offer insights into the frequency, intensity, and spatial distribution of forest fires in the selected VSS under OFSDP-II. The analysis also offers the rationale of provisioning of incentives to the VSSs which did not experience forest fires after the OFSDP-II initiatives. I am sure this analysis will reinforce our commitment to community participation in forest fire measures in a long way.

Dr Meeta Biswal, IFS
PCCF (Projects) & Project Director
OFSDS

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“What we are doing to the forests of the world is but a mirror reflection of what we are doing to ourselves and to one another”



SPECIAL FEATURE: FOREST FIRE MANAGEMENT

Forest Fire Management under OFSDP, Phase-II

Wildfires, left uncontrolled, can swiftly spread and devour the natural fuel present in forests, including dried biomass such as grass, weeds, brush, and trees. In the context of Odisha, forest fires predominantly arise from human interference, with occurrences due to natural causes like lightning being minimal. To mitigate the incidence of forest fires within the designated forest Joint Forest Management (JFM) area of different Forest Divisions under OFSDP-II the Vana Surakhya Samitis (VSSs) have implemented fire lines in their assigned forest areas under JFM mode. These fire lines are annually maintained by VSS members to deter fire incidents. In the Forest Divisions, fire line creation and maintenance activities spanning 1700 kms across the forest areas are managed by VSSs of 12 Forest Divisions under OFSDP-II. The fire line tracing and maintenance have been executed exhaustively in plantation areas during the 2023-24 period.

Efforts to raise awareness and sensitize stakeholders have been ongoing in all the Forest Divisions. All the 12 DMUs under OFSDP-II viz. Athamallik, Baripada, Boudh, Dhenkanal, Ghumsur (North), Gumsur (South), Jharsuguda, Karanjia, Rairangpur, Sambalpur, Sundargarh, Subarnapur had facilitated this activity through VSS meetings, Self-Help Group (SHG) gatherings, awareness rallies involving VSS and SHG members, cultural programs featuring local art forms of Pala, Daskathia etc. They had disseminated various posters and banners aimed at forest fire prevention.

Community involvement is integral to the OFSDP-II initiative in all its activities. There is concerted effort to encourage community participation in reducing forest fire incidents. This collaborative approach complements existing preventive measures and includes comprehensive sensitization efforts targeting stakeholder groups, particularly in identified fire-prone areas across the district. The initiative on forest fire management focuses on increasing the engagement of Vana Surakhya Samiti (VSS) members and instilling in them a sense of ownership regarding forest protection. Throughout the year, select members of the VSS have actively participated in fire suppression efforts near their respective areas. The provision of a no-forest fire incentive has effectively encouraged VSS members to exercise utmost

care in protecting the forests from fire incidents year-round. Staff at the Divisional Management Unit (DMU) and Forest Management Unit (FMU) levels diligently oversee forest fire control room operations using GIS-based tracking and monitoring. Immediate action is taken in response to any forest fire occurrences in the field. The prevention and protection of forest fires at the grassroots level are largely managed by Fire Squads, Gaja Sathi, Foresters, Forest Guards, PNGO teams, and Animators.

As of the current date, no forest fires or very less numbers of forest fires have been reported in most of the VSS-assigned areas under the Odisha Forestry Sector Development Project Phase-II (OFSDP-II). It is anticipated that such incidents will continue to be minimized in the future.

The collective effort and commitment from various stakeholders underscore the success of forest fire prevention and protection initiatives. Collaboration between different teams and the use of advanced technologies demonstrate a comprehensive approach to safeguarding forests. Ongoing vigilance and proactive measures will be crucial to sustaining this success and ensuring the continued well-being of forests, benefiting both the community and the environment.

Activities as outlined here are being implemented in the Divisions for regular forest fire management:

- Preparation of fire lines by the department in all VSS assigned areas and plantation areas to prevent forest fires.
- Conducting special awareness meetings at each VSS, panchayat, and block level through VSSs and SHGs to educate communities on fire prevention.
- Creating wall paintings on forest fire awareness in each VSS to sensitize VSS members.
- Performing street plays on the theme of forest fire in each VSS area and nearby villages to raise awareness and reduce forest fires.
- Organizing awareness rallies on forest fire prevention by VSS and SHG members to minimize forest fires in VSS areas and surroundings.
- Conducting awareness campaigns on forest fire awareness through Banagni Rath in VSSs and nearby villages.



- Distributing leaflets in English and Odia languages in VSS and nearby villages to sensitize and create awareness on forest fire prevention among the community.
- Providing capacity-building training on forest fire prevention, mitigation, and safety precaution measures for fire squads.
- Carrying out regular patrolling in forest areas for immediate dousing of forest fires if any.
- Using various modern fire extinguishers and indigenous methods to douse forest fires by VSS members with the assistance of departmental staff and firefighters based on information received from villagers and Forest Survey of India.
- Imposing fines on those who set fire in forests for the purpose of collecting forest products like Mahua flowers and poaching, and taking punitive actions against habitual offenders as per the law.

GLIMPSES OF FOREST MANAGEMENT ACTIVITIES UNDERTAKEN IN VARIOUS FOREST DIVISIONS OF OFSDP-II



Sensitization programme of VSS members on Forest Fire Management at Divisions



Awareness programme on Forest Fire Management at different Forest Divisions



Forest fire put out by community and awareness programme on Forest Fire Management at Jharsuguda Forest Division



Fire line maintenance and creation at different Forest Division under OFSDP-II members in Subarnapur Forest Division





SPECIAL FEATURE: - CASE STUDY

OFSDS PARTICIPATED IN 16TH STATE LEVEL KALINGA HERBAL FAIR 2023-24

Analysing Forest Fire Occurrences in VSS Areas under the Odisha Forestry Sector Development Project Phase II

By Swayam Mallick, IFS, JPD, (CME&S), OFSDP-II

Introduction

The preservation and sustainable management of forests are critical for maintaining ecological balance, biodiversity, and mitigating climate change impacts. In India, the state of Odisha boasts of rich biodiversity and substantial forest cover, making it imperative to ensure effective forest management strategies. Under the Odisha Forestry Sector Development Project Phase II, efforts have been directed towards enhancing forest conservation, community participation, and sustainable forest management.

One significant aspect of forest management is understanding and mitigating the impact of forest fires, which pose a significant threat to both biodiversity and local communities. In this context, Vana Surakhya Samitis (VSSs) play a pivotal role as grassroots-level organizations actively engaged in forest protection and management activities. These committees, comprising local community members, are tasked with monitoring, reporting, and addressing threats to forest ecosystems, including forest fires.

This study focuses on analysing the occurrence of forest fires within the areas managed by ten selected Vana Surakhya Samitis (VSSs) of Odisha where interventions under Odisha Forestry Sector Development Project – II are being carried out. Leveraging geospatial data in the form of shapefiles representing these VSS areas, alongside satellite imagery and the Fire Information for Resource Management System (FIRMS) data, this study aims to provide insights into the frequency, intensity, and spatial distribution of forest fires in the selected VSS thereby confirming the provisioning of incentives to the VSSs which did not experience forest fires after the initiation of project activities under Odisha Forestry Sector development Project – II.

The integration of Google Earth Engine, a powerful geospatial analysis platform, enables the utilization of remote sensing data to monitor changes in forest cover and detect fire occurrences with high temporal and spatial resolution. By harnessing these technological advancements, this study seeks to identify patterns and trends in forest fire occurrences, assess the effectiveness of existing forest management strategies implemented by the VSSs, and propose recommendations for enhancing fire prevention and response measures.

Understanding the dynamics of forest fires within VSS areas is crucial for informing policy decisions, enhancing community-based forest management practices, and fostering resilience against future fire incidents. Through this study, we aim to contribute to the ongoing efforts of the Odisha Forestry Sector Development Project Phase II towards achieving sustainable forest management through community participation in the region. The study focusses on utilizing satellite imageries in Google Earth Engine to corroborate results of interventions for mitigating forest fires in VSSs areas. This would further justify the provisioning of incentives for fire protection to VSSs.

Methodology

The methodology that has been adopted in this study involves the following steps:

- I. Selection of the area of study within the VSS boundaries:
 - 10 Vana Surakhya Samitis were selected that have been reported to have performed well above the benchmark in fire protection activities so as to be categorised as “Inspiring”. The list of the said VSS is provided in Table 1.
 - Shapefiles delineating the geographical boundaries of VSS areas within 12 Forest Divisions under Odisha Forestry Sector Development Project - II were utilised as the spatial framework for the analysis.
 - These VSS boundaries provide a spatial reference for evaluating forest fire occurrences within specific community-managed forest areas, allowing for targeted analysis and interpretation.
- II. Accessing Google Earth Engine FIRMS Dataset:
 - Google Earth Engine provides access to the Fire Information for Resource Management System (FIRMS) dataset, which contains rasterized fire detection data derived from MODIS and VIIRS satellite observations. This dataset offers near real-time monitoring of active fire points globally. The Earth Engine version of the Fire Information for Resource Management System (FIRMS) dataset contains the LANCE fire detection product in

rasterized form. The near real-time (NRT) active fire locations are processed by LANCE using the standard MODIS MOD14/MYD14 Fire and Thermal Anomalies product. Each active fire location represents the centroid of a 1km pixel that is flagged by the algorithm as containing one or more fires within the pixel. The data are rasterized as follows: for each FIRMS active fire point, a 1km bounding box (BB) is defined; pixels in the MODIS sinusoidal projection that intersect the FIRMS BB are identified; if multiple FIRMS BBs intersect the same pixel, the one with higher confidence is retained; in case of a tie, the brighter one is retained.

- Leveraging Earth Engine’s functionalities, the FIRMS dataset was accessed within the platform, facilitating seamless integration with other geospatial datasets and analysis tools.

III. Preprocessing Earth Engine FIRMS Data:

- Preprocessing steps are crucial to ensure data quality and relevance to the analysis. Accordingly spatial and temporal filtering techniques were employed to focus the analysis on the study area and relevant time period, improving the specificity of the results..

IV. Spatial Analysis of Fire Occurrences:

- Earth Engine’s geospatial analysis capabilities enable the spatial overlay of the rasterized FIRMS data with the defined VSS area boundaries. Shapefiles of the VSS boundaries were uploaded to the code editor of the platform.
- This overlay facilitates the identification and mapping of active fire points within each VSS area,

providing insights into the distribution and intensity of forest fires

V. Temporal Analysis of Fire Trends:

- Time-series analysis of the FIRMS data was incorporated to examine temporal trends in forest fire occurrences within VSS areas. The analysis was done over the period from 2018 to 2023.
- Seasonal variations, long-term trends, and periodicity of fire events were analyzed to understand the temporal dynamics of forest fires.

VI. Visualization and Interpretation:

- The results of the analysis were visualized using Earth Engine’s interactive mapping tools, enabling interpretation of the spatial and temporal patterns of forest fire occurrences within VSS areas.
- Interactive maps, time-series graphs, and statistical summaries are generated to communicate key findings and insights effectively.

By employing a comprehensive approach to analyze forest fire occurrences using the Earth Engine FIRMS dataset, this methodology provides detailed insights into the spatial and temporal dynamics of forest fires within VSS areas under the Odisha Forestry Sector Development Project Phase II.

Results and Discussion

The list of VSSs under study is as shown below. VSSs in the category of “inspiring” has been chosen from different Divisions where project interventions are being implemented. Table 2 shows proposed incentives across all the VSSs based on the OFSDP-II developed criteria and evaluation methodology to evaluate forest fire protection activities undertaken by the VSSs.

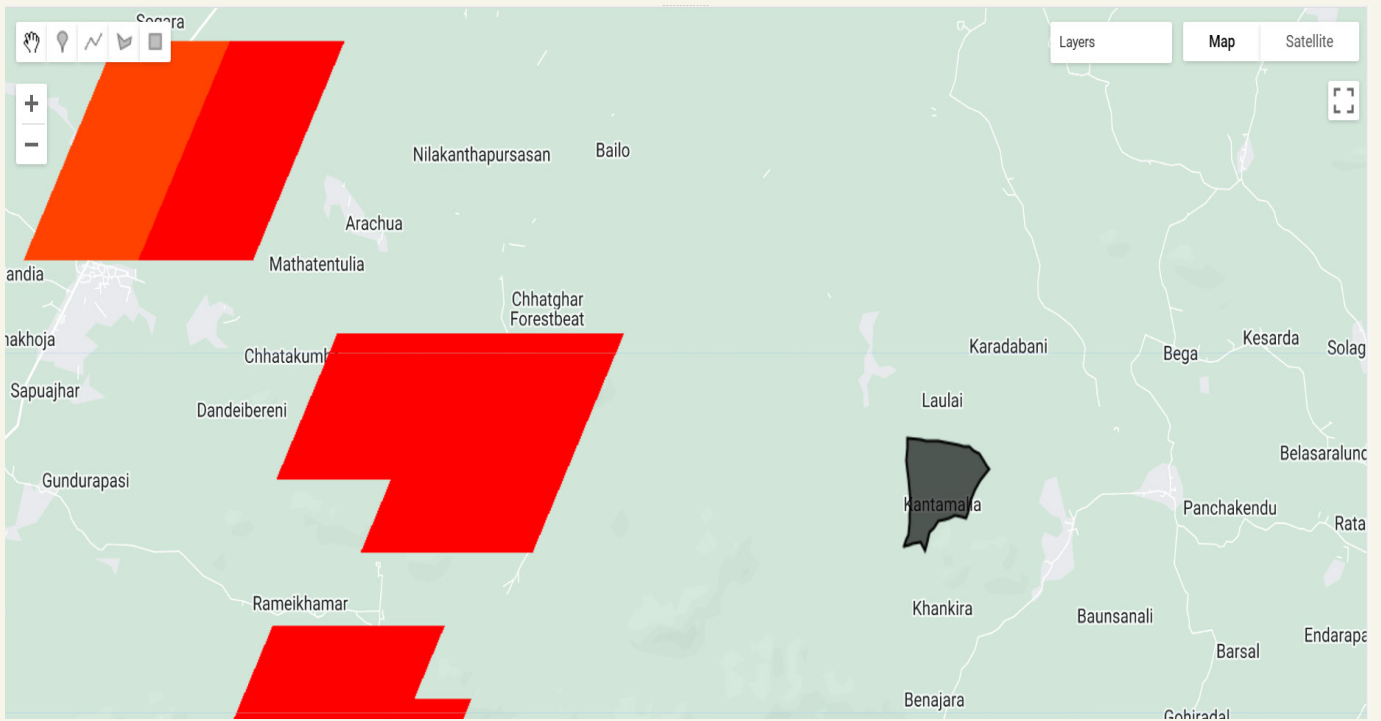
TABLE 1: VSS from different DMUs of OFSDP-II which have awarded for Fire Incentives under Inspiring Category for FY 2022-23

Sl	Name of Division	Range	Name of VSS	Batch	Grade	Score out of 100
1	Rairangpur	Badampahad	Baneikala	II	Inspiring	94
2	Dhenkanal	Sadangi	Singa	IV	Inspiring	95
3	Sambalpur	Padiabahal	Rantal	I	Inspiring	95
4	Dhenkanal	Sadangi	Maa Gramadebati	IV	Inspiring	97
5	Baripada	Dukura	Chenguamangalpur	I	Inspiring	100
6	Athamallik	Kamalpur	Athamallik	I	Inspiring	92
7	Athamalik	Athamallik	Ghodagadi	II	Inspiring	91
8	Rairangpur	Manada	Badasialinai-B	II	Inspiring	95
9	Dhenkanal	Sadangi	Shrichaitanya Jew	IV	Inspiring	96
10	Boudh	Manamunda	Dinabandhupur	III	Inspiring	91

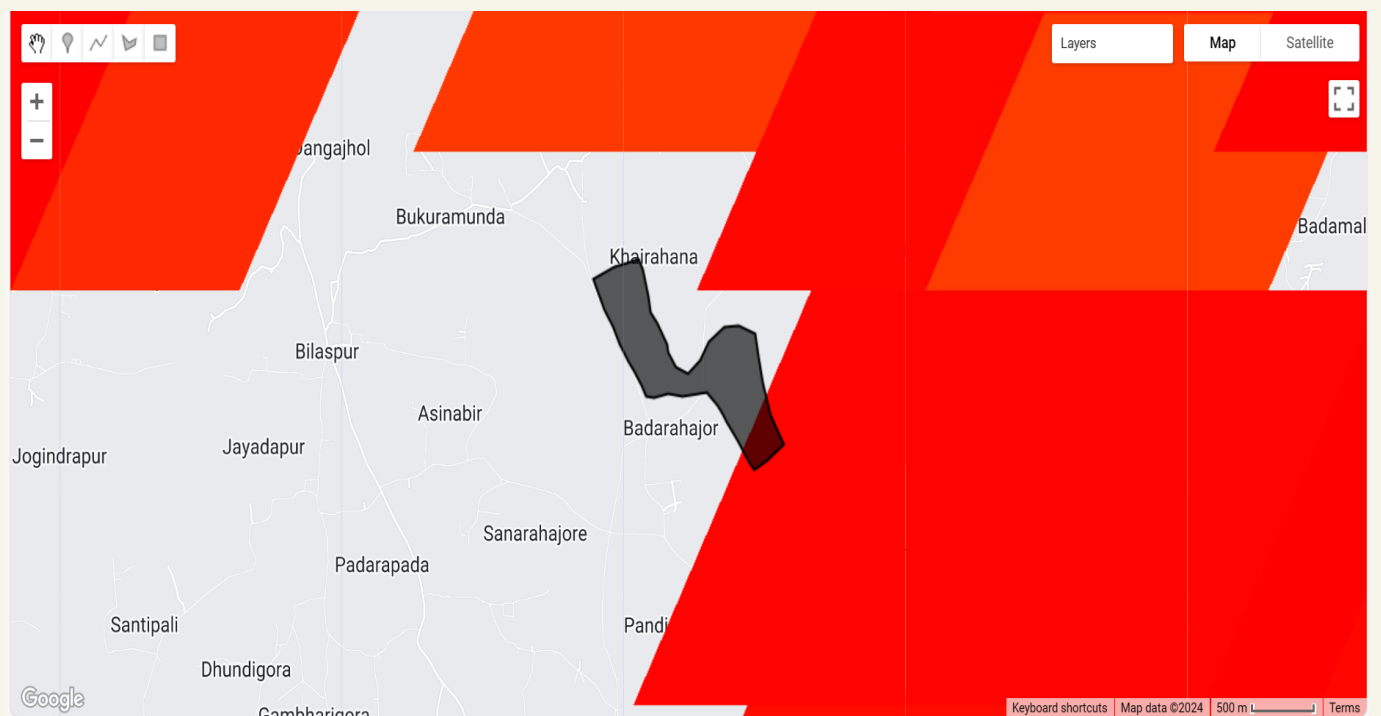


Proposed Incentive for VSS for No Forest Fire or effective Forest Fire Management in OFSDP-II VSSs for 2022-23													
Division	Range	No of VSSs	No of VSSs Nominated for Incentives	Inspiring @ Rs. 5500/-		Outstanding @ Rs. 4500/-		Excellent @ Rs. 3500/-		Needs Improvement @ Rs. 2500/-		Total	
				Nos	Amount	Nos	Amount	Nos	Amount	Nos	Amount	Nos	Amount
Athmallik	Athmallik	20	5	3	16500	2	9000	0	0	0	0	5	25500
	Madhapur	25	6	1	5500		0	5	17500		0	6	23000
	Bamur	30	7	0	0	7	31500	0	0	0	0	7	31500
	Total	75	18	4	22000	9	40500	5	17500	0	0	18	80000
Baripada	Dukra	22	6	6	33000	0	0	0	0	0	0	6	33000
	Kaptipada	24	6	0	0	0	0	6	21000	0	0	6	21000
	Bangriposi	20	5	0	0	2	9000	3	10500	0	0	5	19500
	Pithabata	25	6	6	33000	0	0	0	0	0	0	6	33000
	Udala	25	6	0	0	4	18000	2	7000	0	0	6	25000
	Betnati	19	6	6	33000	0	0	0	0	0	0	6	33000
	Total	135	35	18	99000	6	27000	11	38500	0	0	35	164500
Ghumsur North	Mujagada	25	12	0	0	12	54000	0	0	0	0	12	54000
	Jagannath Prasad	24	5	0	0	5	22500	0	0	0	0	5	22500
	Central	25	0	0	0	0	0	0	0	0	0	0	0
	Tarasingh	26	0	0	0	0	0	0	0	0	0	0	0
	Total	100	17	0	0	17	76500	0	0	0	0	17	76500
Jharsuguda	Belpahar	31	8	8	44000	0	0	0	0	0	0	8	44000
	Bagdihi	24	5	0	0	5	22500	0	0	0	0	5	22500
	Kolabira	33	8	0	0	1	4500	7	24500	0	0	8	29000
	Total	88	21	8	44000	6	27000	7	24500	0	0	21	95500
Karanjia	Dudhiani	20	4	0	0	4	18000		0	0	0	4	18000
	Dudhiani-Gurguria	20	5	0	0	5	22500		0	0	0	5	22500
	Karanjia	20	6	0	0	0	0	6	21000	0	0	6	21000
	Thakurmunda	20	5	4	22000	1	4500	0	0	0	0	5	26500
	Total	80	20	4	22000	10	45000	6	21000	0	0	20	88000
Rairangpur	Badampahar	26	6	4	22000	2	9000		0	0	0	6	31000
	Bahalda	21	4	0	0	4	18000		0	0	0	4	18000
	Bisoi	19	5	2	11000	2	9000	1	3500	0	0	5	23500
	Manada	14	4	1	5500	3	13500	0	0	0	0	4	19000
	Rairangpur	27	5	0	0	5	22500	0	0	0	0	5	22500
	Total	107	24	7	38500	16	72000	1	3500	0	0	24	114000
Sambalpur	Dhama	20	5	5	27500	0	0	0	0	0	0	5	27500
	Padiabahal	25	6	1	5500	5	22500	0	0	0	0	6	28000
	Rengali	25	6	1	5500	5	22500	0	0	0	0	6	28000
	Sadar	30	8	0	0	8	36000	0	0	0	0	8	36000
Total	100	25	7	38500	18	81000	0	0	0	0	25	119500	
Subarnapur	Sonepur	32	9	9	49500	0	0	0	0	0	0	9	49500
	Ulunda	34	14	14	77000		0	0	0	0	0	14	77000
	Binika	18	1	0	0	1	4500	0	0	0	0	1	4500
	Total	84	24	23	126500	1	4500	0	0	0	0	24	131000
Sundergarh	Ujjalpur	31	5	0	0	0	0	1	3500	4	10000	5	13500
	Hemgiri	31	7	0	0	0	0	4	14000	3	7500	7	21500
	Lephrpada	34	4	0	0	0	0	3	10500	1	2500	4	13000
	Sundergarh	30	9	0	0	0	0	0	0	9	22500	9	22500
	Baragaon	30	7	0	0	0	0	0	0	7	17500	7	17500
	Total	156	32	0	0	0	0	8	28000	24	60000	32	88000
Dhenkanal	Dhenkanal	25	7	1	5500	6	27000	0	0	0	0	7	32500
	Hindol	27	7	0	0	6	27000	0	0	1	2500	7	29500
	K- East	26	7	0	0	7	31500	0	0	0	0	7	31500
	K- West	26	7	0	0	6	27000	1	3500	0	0	7	30500
	Kapilash	18	6	0	0	6	27000	0	0	0	0	6	27000
	Sadangi	28	7	7	38500	0	0	0	0	0	0	7	38500
	Total	150	41	8	44000	31	139500	1	3500	1	2500	41	189500
Boudh	Boudh	20	5	0	0	4	18000	1	3500	0	0	5	21500
	Kantamal	24	6	0	0	0	0	6	21000	0	0	6	21000
	Manamunda	27	7	2	11000	5	22500	0	0	0	0	7	33500
	Total	71	18	2	11000	9	40500	7	24500	0	0	18	76000
Ghumsur South	Buguda	23	5	5	27500	0	0	0	0	0	0	5	27500
	Sorada	22	5	5	27500	0	0	0	0	0	0	5	27500
	Badagada	20	5	5	27500	0	0	0	0	0	0	5	27500
	Total	65	15	15	82500	0	0	0	0	0	0	15	82500
Grand Total		1211	290	96	5,28,000	123	5,53,500	46	1,61,000	25	62,500	290	13,05,000

Map showing spatial extent of Shrichaitynajew VSS in Sadangi Range of Dhenkanal Forest Division vis a vis rasterized firepoints from FIRMS data during the period from 01.08.2017 to 10.08.2023

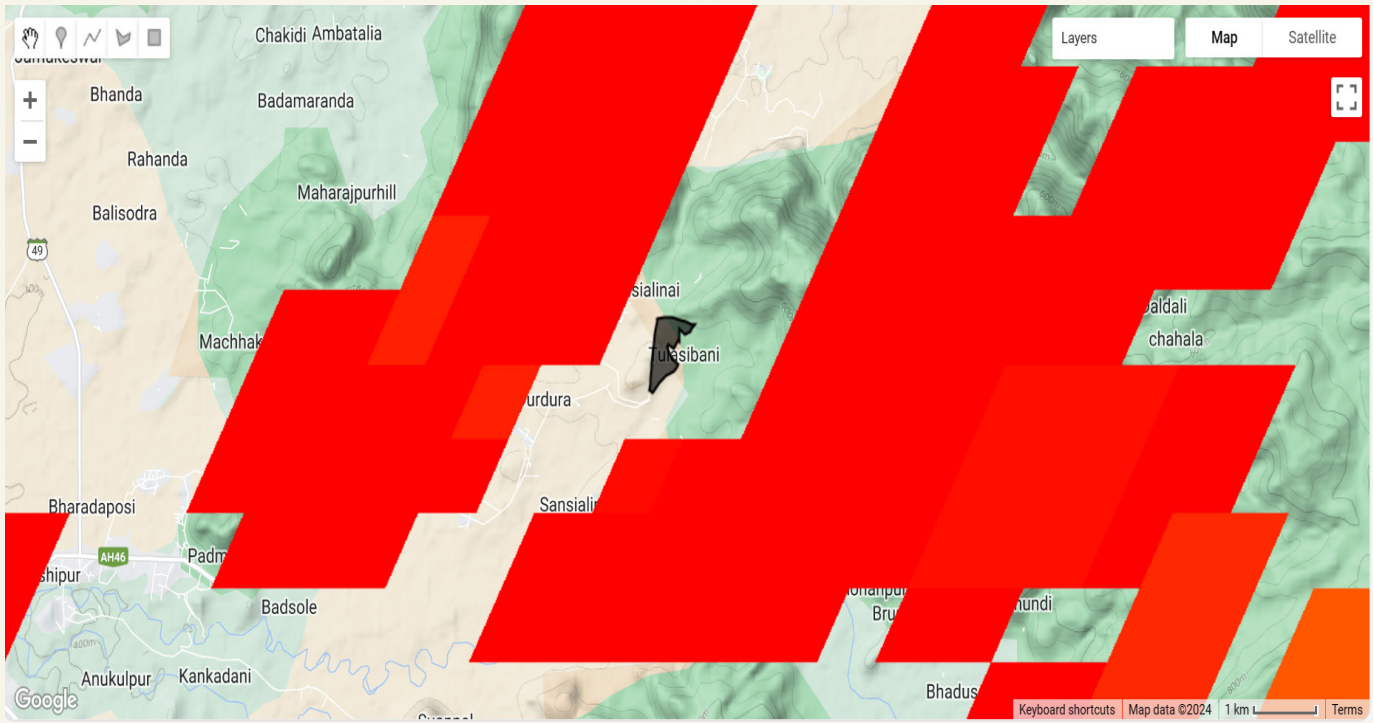


Map showing spatial extent of Dinabandhupur VSS in Sadangi Range of Dhenkanal Forest Division vis a vis rasterized firepoints from FIRMS data during the period from 01.08.2017 to 10.08.2023

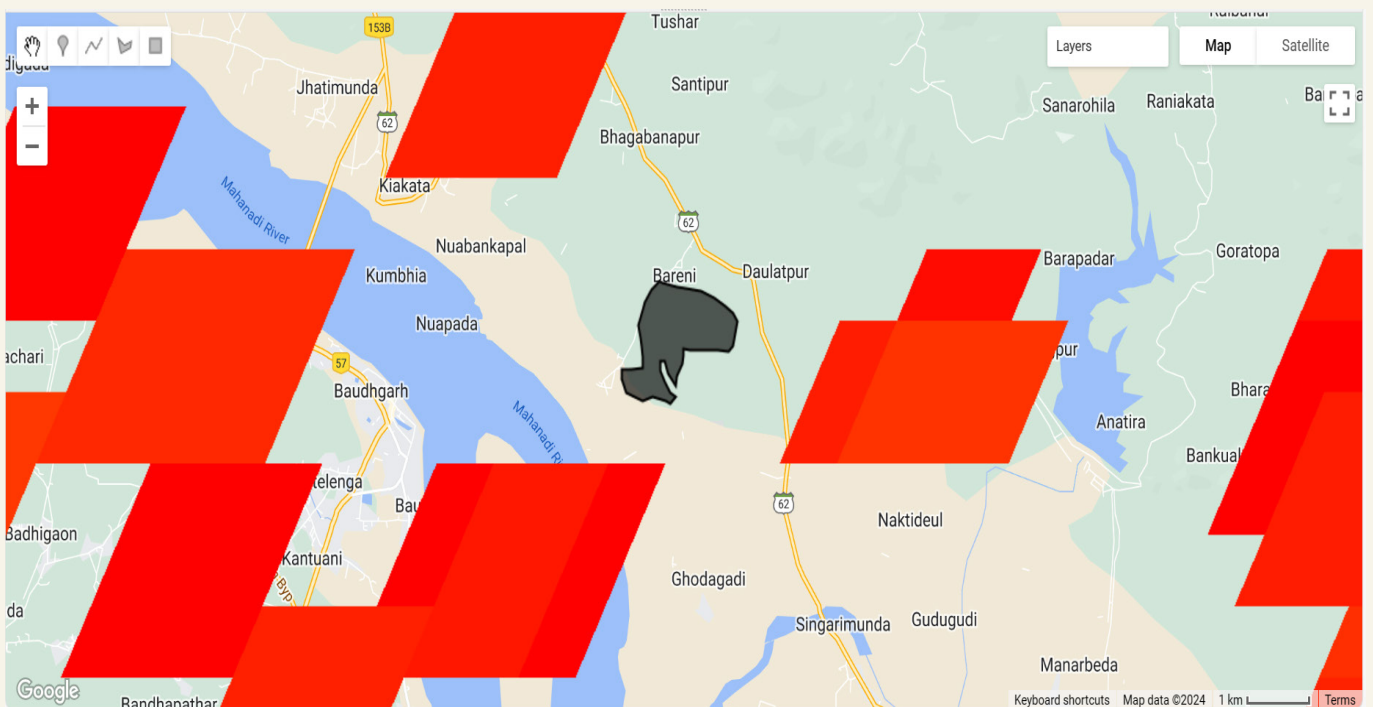




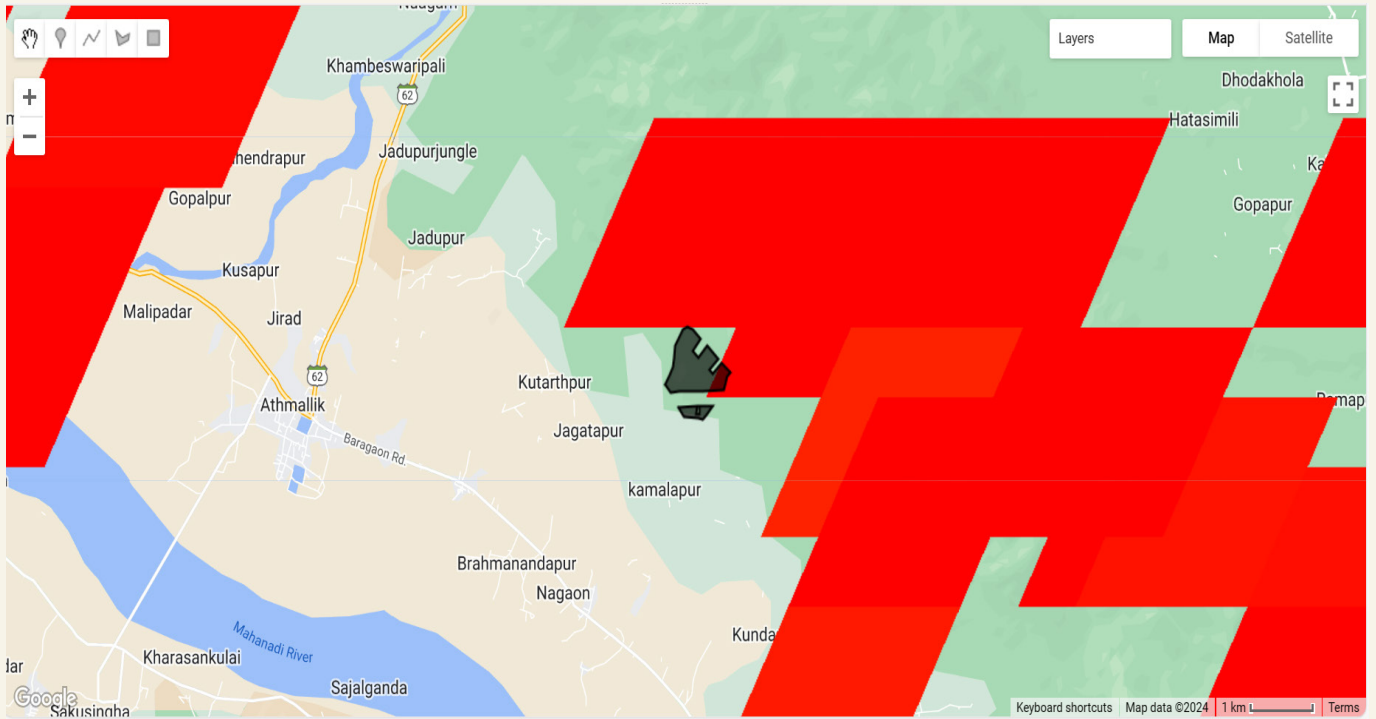
Map showing spatial extent of Badasialinai B VSS in Manada Range of Rairangpur Forest Division vis a vis rasterized firepoints from FIRMS data during the period from 01.08.2017 to 10.08.2023



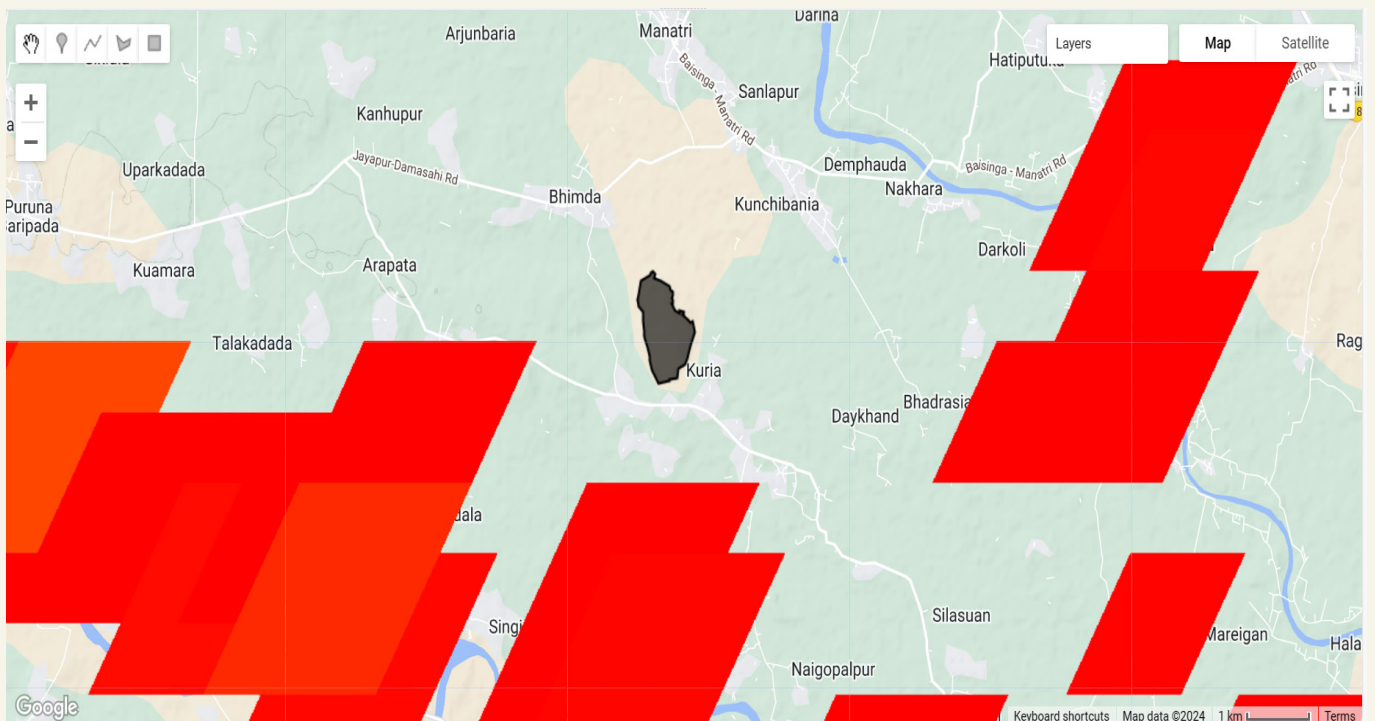
Map showing spatial extent of Ghodagadi VSS in Madhapur Range of Athamallik Forest Division vis a vis rasterized firepoints from FIRMS data during the period from 01.08.2017 to 10.08.2023



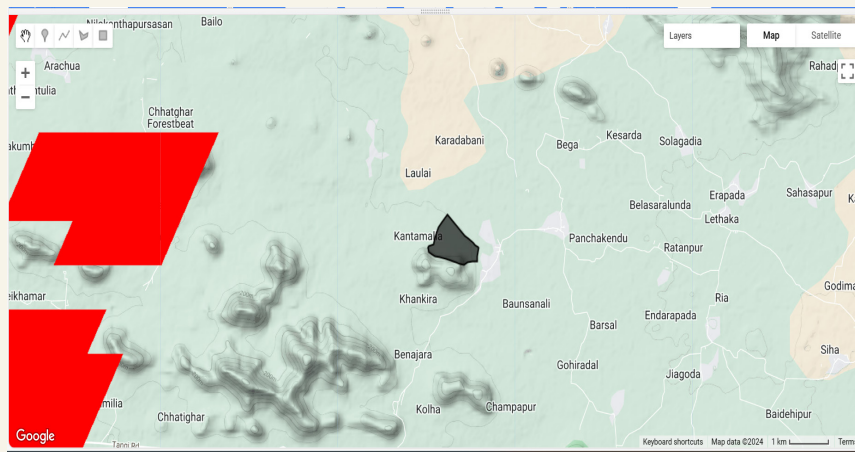
Map showing spatial extent of Kamalpur VSS in Athamallik Range of Athamallik Forest Division vis a vis rasterized firepoints from FIRMS data during the period from 01.08.2017 to 10.08.2023



Map showing spatial extent of Chenguamangalpur VSS in Dukura Range of Baripada Forest Division vis a vis rasterized firepoints from FIRMS data during the period from 01.08.2017 to 10.08.2023



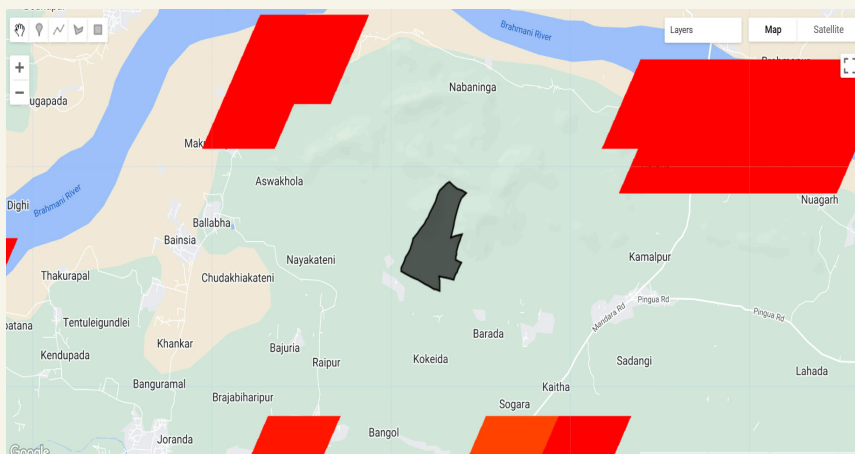
Map showing spatial extent of Maa Gramadebati VSS in Sadangi Range of Dhenkanal Forest Division vis a vis rasterized firepoints from FIRMS data during the period from 01.08.2017 to 10.08.2023



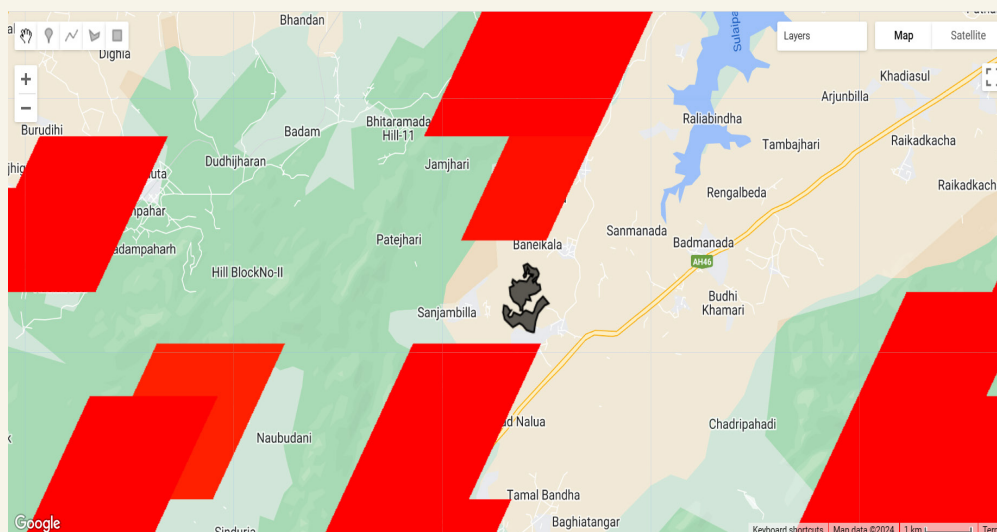
Map showing spatial extent of Rantal VSS in Padiabahal Range of Sambalpur Forest Division vis a vis rasterized firepoints from FIRMS data during the period from 01.08.2017 to 10.08.2023



Map showing spatial extent of Singa VSS in Sadangi Range of Dhenkanal Forest Division vis a vis rasterized firepoints from FIRMS data during the period from 01.08.2017 to 10.08.2023



Map showing spatial extent of Singa VSS in Sadangi Range of Dhenkanal Forest Division vis a vis rasterized firepoints from FIRMS data during the period from 01.08.2017 to 10.08.2023



Maps showing VSS areas vis-à-vis the rasterized firepoints from FIRMS data set during the period from 2018-2023 were prepared. These maps showed that the VSSs that have categorized in the “inspiring” category for forest fire protection by the communities under OFSDP – II have been successful in preventing forest fires in the VSS areas as compared to the adjoining areas during the period under study. This satellite data corroborates the field realities reflected in the provisioning of the incentives for the communities for fire prevention and protection.

Conclusion

The analysis conducted on forest fire occurrences within Vana Surakhya Samiti (VSS) areas under the Odisha Forestry Sector Development Project Phase II provides valuable insights into the dynamics of forest fires and the effectiveness of current management strategies. Through the utilization of Earth Engine FIRMS dataset and advanced geospatial analysis techniques, this study has shed light on the spatial and

temporal patterns of forest fires, contributing to informed decision-making and proactive fire management efforts.

In conclusion, this study underscores the importance of leveraging geospatial data and analytical tools to enhance forest fire management in VSS areas. By integrating Earth Engine FIRMS dataset with VSS boundaries, this analysis has provided actionable insights for stakeholders, including Forest Department, local communities and policymakers to improve fire prevention, response and overall forest management practices. Collaboration between government agencies, NGOs, and local communities will be crucial in implementing effective fire management initiatives and safeguarding the biodiversity and ecological integrity of forest ecosystems.

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