

IMPACT OF CLIMATE CHANGE ON SUSTAINABLE LIVELIHOOD AMONG PVTGS OF WEST BENGAL: A CASE STUDY OF LODHA AND BIRHOR

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Abstract

Climate change significantly threatens the sustainable livelihood of Particular Vulnerable Tribal Groups (PVTGs) in West Bengal. The Lodha, Toto and Birhor are three PVTGs mainly resides within West Bengal. These communities, who are deeply intertwined with natural resources and traditional practices, are particularly susceptible to the adverse effects of climate variability and change. Erratic rainfall patterns disrupt agricultural cycles, leading to unpredictable crop yields and soil degradation makes their lives a living hell. This instability undermines food security and economic stability, as agriculture remains a primary livelihood source for these groups. This study explores how alterations in climate patterns, such as rising temperatures, erratic rainfall, and increased frequency of extreme weather events, are impacting the agricultural practices, water resources, and overall socio-economic stability of these communities. This paper aims to identify the relationship between forest and the indigenous people, particularly the PVTG due to climate change. The study deals with socio-economic activities of the PVTGs to endure them on the basis of changing climate. This article also highlights about a comprehensive understanding of the challenges faced by the community during lean periods and second part indicates that climate change exacerbates existing vulnerabilities, leading to severe consequences such as decreased agricultural productivity, heightened food insecurity, and forced migration. These changes threaten the traditional knowledge systems and cultural heritage of the PVTGs, making them further marginalized. Lastly the authors highlight the urgent need for tailored adaptive strategies to mitigate the adverse impacts of climate change on PVTGs in West Bengal.

Keywords: Climate change, Sustainable livelihood, PVTG, Lodhas, Adaptive strategies

1. Introduction

The impact of climate change on sustainable livelihoods for Particularly Vulnerable Tribal Groups (PVTGs) in West Bengal is a critical issue at the intersection of environmental, social, and economic challenges. These tribal groups mainly depend on natural resources like forest products, agricultural lands to sustain their livelihood and meet their basic daily needs. But with the drastic change in the climatic condition especially in coastal and forested areas creates an adverse effect on the life of the PVTGs. Rising temperatures, irregular rainfall, droughts, and sea-level rise are jeopardizing the resources essential to PVTGs' survival, thus threatening their traditional ways of sustaining their lives.

Historically, these communities have relied on subsistence agriculture, forest resources, fishing, and hunting. However, climate change disrupts these traditional livelihoods, with unpredictable weather patterns, prolonged droughts, and sudden rains undermining crop productivity and food security. Many PVTGs depend on rain-fed agriculture in small plots, lacking sufficient irrigation and climate-resilient crop varieties, which makes them even more vulnerable to these changes.

Culturally, climate change's impacts on PVTGs are profound. Traditional knowledge systems that have helped these communities harmonize with their natural surroundings are becoming less effective as environmental conditions shift. The reliability of traditional methods is decreasing, and out migration among youth, who seek better opportunities in urban areas, is causing a decline in the transmission of indigenous knowledge and cultural values.

To address the complex challenges, climate change poses for PVTGs in West Bengal, a comprehensive approach is necessary. This includes community-based adaptation initiatives, improved access to climate-resilient agricultural practices, and targeted policies that recognize and support the unique needs of PVTGs. Such measures can foster sustainable livelihoods for PVTGs while helping to preserve their cultural heritage, strengthen resilience, and enhance adaptive capacity in the face of a changing climate.

According to the report, the PVTG's socio-economic operations must adapt the changing climate condition in order to survive. The three community's i.e Toto, Lodha and Bihor lives in deep forests. The PVTGs typically work in the following occupations: hunting, rope making, domestic animal care, poultry bird husbandry, day labor, and Forest Produce Collection (FPC). The primary traditional occupation that provides a means of subsistence throughout the six seasons is the harvesting of various kinds of forest products.

India is a land of diverse geographical features that attract people from all over the world. The country boasts six major relief features: the Himalayan Mountains, the Northern Plains, the Indian Desert, the Peninsular Plateau, the Coastal Plains, and the Islands. Each of these regions offers unique landscapes and contributes to India's rich biodiversity and cultural heritage. Forest sector is the second largest land use after agriculture. In remote forest fringe villages about 300 million tribal and other local people depend on forest for their subsistence and livelihood and about 70% of India's rural population depends on fuel wood to meet its

domestic energy needs.¹

The majority of tribal people especially the PVTGs resides in rural areas and were mostly dependent on agriculture, according to the 1971 Census Report. From an economic perspective, the tribes may be divided into three groups: semi-nomadic, jhum cultivators, and established cultivators. All of them rely entirely on forest products for their livelihood. Their primary means of subsistence are various types of forests products. They get their food from those forest products, build their homes out of bamboo or wood, gather firewood for cooking and for warmth in the winter, utilize grass for mats, brooms, and fodder, gather leaves for leaf plates, and use harrebehra for tanning and colouring. Even many non-tribal people also live in the forested areas, and they rely on the trees for food, fuel, and other necessities. Since independence, the forests of West Bengal have been a site of conflict between the forest department and local residents, most of who belong to tribal communities. The forest dwellers assert their right to use forest resources for their livelihood, as they have traditionally depended on them. One of their grievances is that the cattle trenches dug around the forest areas obstruct the natural flow of water, making the land unsuitable for irrigation.² India's national forest policy has not been successful in protecting the ecosystem. According to a UN estimate, 50 percent of the total land area in India is seriously affected by water and wind erosion. The displacement of fertile soil is estimated to be around 6 billion tons a year, thus depriving the country of vast amount of total plant nutrients. The past experience shows that the forest policy seeks to protect forest wealth from forest dwellers. The deforestation program gives top priority to quick-growing species that can be used as raw material for forest-based industries. Even ecological considerations are often overlooked.

On the other hand, the movements by the forest dwellers- Chipko, Bhoomi Sena, Silent Valley Movement, and Jharkhand Movement - are insisting on a planned strategy incorporating the needs of the local ecology, local economy and the national interests. Only a people-oriented forest policy and development strategy will be able to bring the forest dwellers in the mainstream of national life without adversely affecting the ecosystem.³

2. Particularly Vulnerable Tribal Groups (PVTGs)

¹Ministry of Environment, Forest and Climate Change, "Total Forest and tree cover increased by 2261squarekilometre in India as per the India State of Forest Report (ISFR) 2021",13 MAR 2023,PIB Delhi availableat <https://pib.gov.in/PressReleasePage.aspx?PRID=1906388> accessed on 24.02.2025

²NationalForestPolicy,1988,Govt.ofIndia,NewDelhi

³Chandramohan, B.P.Villalan, T.K.S.Munirathanam,Mr.J. 2010. 'Impact of Commercialisationon Tribal CultureandForestEcosystemSustainability'intheJournal ofHumanEcology, Vol.5(2)

Scheduled Tribes are referred to in Article 366 (25) of the Constitution of India as those tribal communities or parts of or groups within such tribes or tribal communities, who are scheduled in accordance with Article 342 of the Constitution. The essential characteristics (first laid down by the Lokur Committee) for a community to be identified as Scheduled Tribes are: – (a) Indications of primitive traits (b) Distinctive culture (c) Shyness of contact with the community at large (d) Geographical isolation (e) Backwardness.⁴

Tribal communities are often characterized by specific traits such as primitive customs, a distinct cultural identity, geographical isolation, reluctance to engage with the broader society, and socio-economic backwardness. Additionally, certain tribal groups—approximately 75 in number—exhibit unique characteristics, including reliance on hunting and gathering for sustenance, pre-agricultural technological practices, stagnant or declining populations, and exceptionally low literacy rates. These groups are classified as Particularly Vulnerable Tribal Groups (PVTGs).⁵

A tribal community is categorized under PVTGs based on the following criteria:

- i) Use of pre-agricultural technology
- ii) Extremely low literacy rates
- iii) Declining or stagnant population growth
- iv) Subsistence-based economy

2.1 Lodhas:

Lodhas who were designated by the British colonialists as a “Criminal Tribe” and later on this nomenclature underwent interesting evolution in the post-colonial period. This poor, marginalized community was later put under the category of “De-notified Community” and at present has been reclassified as a “Primitive Tribal Group” (PTG). The Lodhas and Birhor mainly resides at hilly rugged terrain covered with jungle. Traditionally, they were forest dwellers.

In volume III of the *People of India* (1994) edited by the Director General of the Anthropological Survey of India it was reported that the Lodhas are mainly concentrated in the western part of Midnapore district in West Bengal and their traditional rights of access to forest have been curtailed. The *People of India* volume added

⁴The Constitution of India, ss. Article 366 (25), Article 342

⁵Government of India, “Welfare of Particularly Vulnerable Tribal Groups” (Ministry of Tribal Affairs, 2019)

“.....they makes surreptitious forays into forests, which result in criminal cases being filed against them. Consequent to the colonization scheme, some have taken to agriculture. Besides, they supplement their income by working as daily-wage laboureres, when hunting or fishing yield little return (Singh, 1994).”⁶

In a paper written much later in the *Newsletter* of the Royal Anthropological Institute of Great Britain, Bhowmick explained the socio-psychological processes which created a vicious circle of underdevelopment, poverty and mistrust among the Lodhas.

“The chronic poverty and low aspiration level and lack of zeal of these people have created socio-cultural and economic constraints which, in turn, have made them lazy and lethargic. This has also made them unresponsive to any sort of change or innovation introduced for their uplift (Bhowmick, 1981).”⁷

2.2 Bihar:

Birhor means jungle people. ‘Bir’ means Jungle and ‘Hor’ means Sikari. Traditionally they are nomadic. The word Birhor means “forest-dweller” and as the name suggests this tribe is a foraging, hunting and gathering community who prefer to live in forests. They are primarily a semi-nomadic community whose most natural setup is in the forests. Birhor men and women are excellently skilled hunters specializing in hunting monkeys, rabbits and small birds called Titars. Birhors’ methods of hunting are markedly different compared to neighbouring tribal communities.⁸

3. Review of Literature

- ❖ According to Hegde .R et.al(2000) The primary goal of this study, which was conducted in the Mudumalai Wildlife Sanctuary and the nearby Sigur Plateau in the Indian state of Tamil Nadu, was to measure the local population's reliance on forests and measure the impact that restrictive biodiversity conservation measures would have on their standard of living.⁹
- ❖ According to Meher.R (2010), this paper examines the challenges posed by India's

⁶ Singh, K. S. (1994): ‘People of India’ The Scheduled Tribes. Oxford University Press: Anthropological Survey of India.

⁷ Bhowmick, P.K. (1981): Rehabilitaion of a ‘Denotified Community’ The Ex-Criminal Lodhas of West Bengal. Royal Anthropological Institute of Great Britain and Ireland.44: 6-8. Source: Stable URL: <http://www.jstor.org/stable/3032233>.

⁸ Ashim Kumar Adhikari ‘traditional economy and other socio-economic factors in the edited book “The Birhor Universe” edited by Asishkumar Sinha, 2014.

⁹ Uma Shankar, Ravi Hegd e& K.S.Bawa, Extraction of non-timber forest products in the forests of Biligiri Rangan Hills, India.6. fuelwood pressure and management options

economic liberalization, privatization, and globalization-driven development model, which has led to the displacement and deprivation of tribal communities and agriculture-dependent poor populations. The rapid, unregulated expansion of mineral-based industries in tribal regions has disrupted traditional, sustainable livelihoods, forcing these communities into economic vulnerability. While mining and other extractive industries exploit the natural resources of tribal ecosystems, they fail to offer these displaced populations viable, long-term alternatives for sustainable employment and economic stability.¹⁰

- ❖ Panda. S., (2015) The study examined the implementation of various developmental programs from the Central and State Governments among the Birhor and Lodha communities in the Purulia and Paschim Medinipur districts of West Bengal. The findings indicate that the main challenges in implementing these programs for both the Lodhas and Bihors stem from their landlessness and poverty. The study also emphasizes the failure of the developmental state to effectively execute its well-intentioned policies for these communities. Furthermore, the author illustrates the connection between the education of Particularly Vulnerable Tribal Groups (PVTG) and their overall development.¹¹
- ❖ Bhattacharyya, S. (2023) concluded her research paper stating about the Pandit Jawaharlal Nehru's Panchsheel principles which supports the growth and progress of the tribal community. From then until now, many plans have been made and put into action to help improve the lives of tribal people. People think that the tribal community can only progress by giving those lots of education. However, there are some difficulties in teaching them. The researcher also identified the specific challenges that need to consider in providing better education. Although the government is taking action, it is clear that the policies and actions they have taken so far are not sufficient for success. More strategies must be taken in future.¹²
- Panda. S. and Guha A., (2013) The study reveals that although the government's primary goal was to integrate the Lodhas into agriculture and settle them as farmers, the distribution

¹⁰Rajkishor Meher, Globalization, Displacement and the Livelihood Issues of Tribal and

Agriculture Dependent Poor People: The Case of Mineral-based Industries in India, Vol:25 Issue 4 pp (457-480)

¹¹ Dr. Panda. S., "The Development of primitive tribal groups: A case of Lodha and Bihor of West Bengal," World Wide Journal of Multidisciplinary Research and Development, Vol 1 Issue 6 pp- 28-35, 2015 available at

<https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.jmr.com/upload/the-development-of-primitive-tribal-groups-a-case-of-lodha-and-bihor-of-west-bengal-.pdf> accessed on 12.11.2023

¹² Bhattacharyya, S., "West Bengal's Tribal Education, Challenges and NEP 2020", International Journal of Creative Research Thoughts, Volume 11, Issue 7 July 2023. accessed on 12.12.2023.

of land to landless Lodha families by the Land and Land Reforms Department remains largely incomplete. Despite various developmental initiatives, only 41 percent of the Lodha families surveyed received any form of government support. The nature of the developmental inputs provided indicated a focus on cash loans for house construction and advanced solar technology. Additionally, the research found that houses constructed by contractors were substandard and unsuitable for living. As a result, many families sold their high-tech solar cells to wealthier neighbors, such as the Santhals and Mahatas, at inflated prices.¹³

4. Climate Change: Effect and Fortitude of Primitive Tribal Groups

4.1 International View

The tribal population of a country is its native people, who, although part of society, are generally cut off from the rest of society. Historically and even now, they are subjected to marginalization and neglect by society as well as the government. Poor literacy and poor governmental support have resulted in their economies being highly dependent on traditional practices like hunting, gathering, fishing, and both settled and shifting cultivation, among other nature-based livelihoods. Nevertheless, industrialization, rapid population growth, and urbanization have greatly amplified pollution levels, leading to climate change. Paradoxically, these indigenous communities, which least contribute to environmental degradation, bear the brunt of its impact. Throughout the globe, their way of life is threatened by climate change, causing loss of lives, lives, and gradual degradation of their distinctive cultural traditions and practices.¹⁴

4.2 Indian View

The Indian tribal communities although constitute about 8% of the population of the country but are rich and diverse in their culture and traditional abilities. They have a special affinity with nature and have been surviving and flourishing in their natural geographical environment for centuries. The Indian subcontinent tribes are mainly found within and around the hill regions encompassing valleys and plane land, they are predominantly based on cultivation and

¹³ Panda.S and Guha. A., “Ground realities of development among the Lodhas in West Bengal”, *Journal of South Asian Anthropologist*, Vol. 13. 75-84 (2013) available at https://www.researchgate.net/publication/257221844_Ground_realities_of_Development_among_the_Lodhas_in_West_Bengal accessed on 02.01.2024

¹⁴ (Sengupta, 1988)

agriculture, whereas where agriculture has its drawbacks, there the hills offered alternative choices like grazing lands and forest producing bounteous resources to form different handicrafts and other products like wove baskets, etc. Similar to other tribes in the rest of the world, India's tribal communities too have faced discrimination and marginalization even when seventy-eight years have passed since independence the government has remained apathetic towards their fate. With pollution, greenhouse gas emissions, and global warming increasing and one of the most polluted and densely populated countries being India, there has been a rampant climate change process going on.

5. Objective of the Study

The objective is the root or way of any scientific research. The study is required to promote the true impact of the utilization of forest products by the indigenous people of West Bengal and the ways to preserve the resources by this indigenous people for the future.

1. To know the method of sustainable livelihood due to climate change of a forest dweller tribal people;
2. To study about the laws passed by the Government imposing the strict un-utilization of the forest products ;
3. To know relationship between tribal people and forest resources with preservation for future generations;
4. Finally, some policy-oriented suggestion has been made for the policy maker of government forest department for better sustainable livelihood.

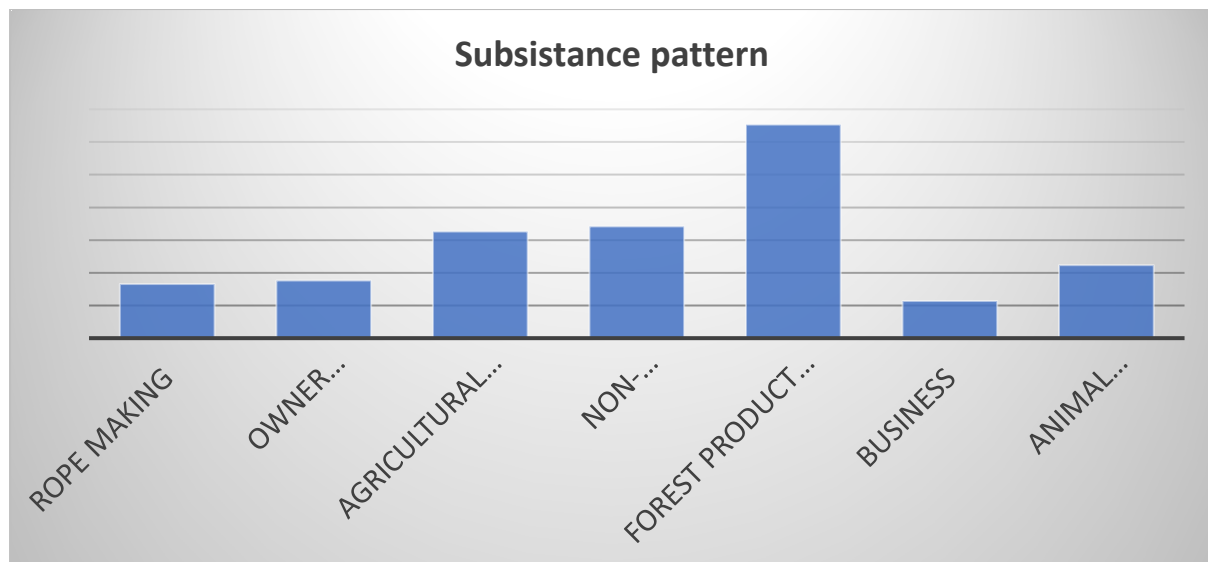
6. Methodology

It is a field based empirical study. The data has been collected from the various villages of the West Bengal. For this study, the methods like interview, case study, observations and focus group discussion has been applied. It is a short-term study; the qualitative or quantitative data has been collected to prove our thought or analysis. Some earlier studies have been followed to find out some previous knowledge through various literature. The study area was West Bengal Districts like Purulia, Bankura, Jhargram and Paschim Medinipur. The study unit was village, the sampling technique was random sampling and the criteria was those villages are situated vary vicinity to the forest. The first author conducted the fieldwork. Total household has been conducted 989.

Summer	Winter	Rainy	Spring	Throughout the Year
Hunting, Forest Produce Collection (Creepers, Honey, Wood, etc), Migrant Labour, Unskilled wage Labour.	Agricultural day labour, Non-agricultural Day Labour, Forest Produce Collection (Medicinal Plant)	Migrant Labour (AGL), Cultivating own land, collect local animal & insect for consumption.	Hunting, Forest Produce Collection (leaf, root, fruit, skin of tress, etc.), Unskilled wage labour	Livestock Rearing, Rope making, non-agriculture day labour

Table 1 Occupational pattern of the PVTG's with Percentages

Rope making	Owner cultivator	Agricultural labour	Non-agricultural labour	Forest product collection	Business & handicraft	Animal husbandry	Total
32(8.29)	34(8.81)	63(16.32)	66(17.10)	126(32.64)	22(5.70)	43(11.14)	386



Summer	Rainy	Winter	Spring	Whole Year
Hunting at forest, Forest Produce Collection (Creepers, Honey, Wood, insect, sal leaf, sal gum etc)	Forest Produce Collection (Medicinal Plant, Shak, creeper, fruit, leafs, mushroom, various roots-bawla alu, Khamalu etc)	Hunting at forest, Forest Produce Collection like Medicinal plant, sal leaf, Sal gum, wood for selling, fire wood, sal & peal fruit and seed, Mahul flower and fruits etc	Hunting, Forest Produce Collection (leaf, root, fruit, bark of tress, various shak and choir creeper etc.),	gathering like fire wood, creeper, roots, green leaf and dry leaf

7. Findings of the study

The study exposed that both are forest dweller tribe in India. The occupation opportunity and socio-economic existence depend on forest and environment. The Lodhas and Birhor are hunter gatherer community. The data shows that most of the family depend of forest produce collection. Various forest produce collection is the main traditional occupation as livelihood strategies around the six seasons. But due to change of climate they are depend on other source of economic activities. They are very much conscious about the geographical region and environmental situation. During summer they are depend on only non-agricultural activities like road construction work, building construction labour, worker as personal domestic work and cleaning work in the shop, home etc. day labourer. Some informants share their views ‘very

few persons or families got the job as daily labour, only one or two members received the day labour work. If we are not getting the work during summer, how we survive?

- During this time forest has been fully dry'. So, they are moved here & there to collect raw material for preparing the tradition handicraft product.
- During spring and winter, they are fully depending on forest produce like new sal leaf, kendu leaf, various creeper, fruits and various medicinal plant. They have no right to cut the tree or firewood without the permission of forest protection committee. This is also an accepted fact that 'Joint Forest Management' affects their livelihood. With that scheme, these peoples are slightly benefited but the scheme execution process needs to be robust.
- During rainy season they are depend on agricultural day labour and rest of the time they went to forest to collect Potato, mushroom, fruits, roots, seeds and medicinal plant etc.
- Only in winter they are fully depending on forest produce collection. That-time they are collected timber and firewood without any permission (Table 3).
- During autumn they were faced lean period, most of them have not got work and they did not enter the forest. So, in the hilly terrain most of the time is summer, during that time they are moved here and there to collect various raw materials to prepare handicraft product.

In this study we have found eight types of occupational activities among the Lodhas and seven types of occupational activities among the Birhor. Most of the population depends on forest produce collections. Season wise their occupational activities has been changed due to climate change. The Lodha and Birhor did not entire forest throughout year due to climate change and restriction of the forest department (Table 3&4). They are collecting various items from forest season wise. Seasonal forest produce collection is not fruitful for them because forest is the only source of income for most of the people. In the rainy season they are unable to get fire wood only collect food items. This season is their lean period to earn something those are depending on forest (32.64 %). Due to climate change like during winter and spring rain is coming so they are faced treble situation.

8. Conclusion

The influence of climate change on sustainable livelihoods for Particularly Vulnerable Tribal Groups (PVTGs) in South Bengal is a critical issue at the intersection of environmental, social, and economic challenges. It is concluding that, with very strange note climate change affects the substantive issue of the socio-economic, educational and health status of tribal communities are an integral part of the development agenda that the State has been pursuing for its citizens. With respect to tribal development, there were two prominent colonial discourses which have continued into the postcolonial period.

In one of the conversations, the overall condition of tribal people, including their poverty, is attributed to their social and geographical isolation. This social and geographical isolation keep on affecting the livelihood. Climatic effect also leads with the economic aspects of PVTG's of West Bengal. They are under the radar of climate which needs to revisit with government support. Poor implementation of programmes is offered as another explanation for the issue of lack of social development of PVTG's.

In this view, the solution lies in effective implementation of State-sponsored development programmes and schemes, whether these pertain to livelihood and income-generation activities, and/or communication facilities. However, the problem of ineffective implementation in tribal areas remains inadequately addressed. Forest degradation also poses a significant threat, as many PVTGs rely on forest resources to sustain their livelihoods. Rising temperatures and altered rainfall patterns reduce the availability of non-timber forest products (NTFPs) such as honey, firewood, medicinal herbs, and fruits, which are vital for household needs and income. Biodiversity loss impacts both their economic resilience and cultural practices, as many PVTGs have spiritual connections to the forest and specific plant and animal species. Climate-induced shifts in local biodiversity disrupt ecological balance and erode the cultural heritage that PVTGs have preserved for generations.

Moreover, water scarcity, amplified by climate change, presents another major issue. With groundwater sources dwindling and rainfall patterns shifting, access to drinking water and irrigation has become more challenging for PVTGs, who often depend on natural water sources. Coastal communities face the added problem of saline intrusion from rising sea levels, contaminating freshwater supplies and complicating agriculture. Poor water quality and increasing health risks from vector-borne diseases further threaten the productivity and well-being of these communities, reducing their ability to cope with environmental changes.

Though, the Lodha and Birhor are hunter gatherer community but they are surviving themselves agriculture and non-agricultural day labourer due to encroachment of forest and law of joint forest management. The climate change, rights to enter the forest and encroachment of forest are the main disturbance of livelihood opportunity of the PVTGs in West Bengal.