Perspectives on Forest governance among the indigenous communities of India's Eastern Ghats

Anugu Amarender Reddy [a], Tek Maraseni [b,*], Souparna Lahiri [c], Sikha Karki [d], Upama Koju [e], Anita Shrestha [e], Tim Cadman [f]

[a] *Indian Council of Agricultural Research-Centre Research Institute for Dryland Agriculture, Hyderabad, India*
[b] *Centre for sustainable agriculture system, University of Southern Queensland, Toowoomba, Australia*
[c] *Global Forest Coalition, Netherlands*
[d] *Cities Research Institute, Griffith University, Southport, Australia*
[e] *Kathmandu Forestry College, Kathmandu, Nepal*
[f] *Institute for Ethics, Governance and Law, Griffith University, Nathan, Australia*

ABSTRACT

Forest plays a significant role in the rural economy. It contributes to food security and provides resources and enterprise opportunities for poor communities. By enabling sustainable local forestry enterprises, effective forest governance regimes have the potential to remove the barriers that prevent the forest from contributing to the livelihoods of poor people. At present, such opportunities seem remote, particularly for Indigenous communities. In this context, a study was conducted in the Eastern Ghats of northern Andhra Pradesh, covering 588 Indigenous villagers living on the forest fringe who were surveyed about the condition of the forest, the uses, and services they provide, and community perspectives on the current forest governance regimes. The data collected were statistically analysed using five participatory indicators of governance quality. The results suggest that although forests had multiple usages and were of high environmental, social, and economic value to the local community, the governance of the forest regimes investigated was not optimal. Low governance ratings, especially in transparency and accountability, indicate a lack of openness and responsibility in managing forest resources, revealing a major flaw in the current regime. This may demonstrate that both traditional and more recent approaches to forest governance are not especially suited to reduce deforestation and forest degradation properly. Consequently, there is a need to address limitations within each management regime and forest governance. Most importantly, it necessitates the full and effective participation of local Indigenous villagers in developing and implementing management regimes.

1. Introduction

Governance is the structure and processes for steering participants' interactions within an institution to ensure effectiveness and legitimacy, (Lockwood, 2010, Breakey et al., 2017) – providing stakeholders with opportunities to express views, be heard, and change decisions (Secco et al., 2014). Forest *governance* is the combination of both formal and informal, government and non-governmental regulatory frameworks related to the use and preservation of forests. This includes interactions between public and private actors and their impact on forests (Giessen and Buttoud, 2014). Effective forest governance involves coordinating stakeholders and managing forest resources for conservation and livelihoods. Still, challenges arise from growing demands for food, fuel, and other resources, mainly in developing nations with significant poverty concerns (Mohanty and Sahu, 2012; Stellmacher, 2007; Agrawal et al., 2008; Maraseni et al., 2006).

Strong governance has been linked to reducing deforestation, suggesting that enhancing forest governance quality could mitigate deforestation impacts in highly affected areas (Fischer et al., 2020; Fischer et al., 2021; Umemiya et al., 2010). Weak forest governance, on the other hand, results in poor enforcement of environmental rules and legislation, limited resource allocation for conservation activities, and negative perceptions of environmental protection (Miller et al., 2013; Harring, 2013; Sundström, 2015), eventually resulting in habitat loss and degradation (Amano et al., 2018). Poor governance poses a challenge to achieving Sustainable Forest Management and affects poverty, social development, and economic growth, prompting a focus on governance enhancement by organizations like the World Bank (World Bank, 2004). These and other governance challenges are explored and applied in this case study of forest-dependent communities in Eastern Ghats India.

Around 60 % of the country's forest cover[1] in India constitutes Indigenous areas (Government of India, 2018). Almost 46 % of the scheduled tribes (Indigenous people)[2] from rural areas live below the poverty line compared to around 36 % in urban areas (Bose, 2008). Indigenous communities near forest areas, traditionally managing resources (Bose, 2008), face significant disadvantages in income, literacy, health, and access to basic facilities (Government of India, 2013). Forest[3] plays a crucial role in the socio-economic and cultural lives of those in forest fringe villages or villages close to the forest (Government of India, 2019). The Indigenous people, or Adivasi, of India have had a long history of land- and forest-based conflict and dispossession, with both pre- and post-colonial authorities (Bijoy, 2003; Bijoy and Raman, 2003). Community or specific sectoral values are driven by collective, as well as individual values, including openness and resistance to change (Schwartz, 1994; Schwartz, 1992). Stakeholders, including owners, interest groups, and the public, vary in their perceptions of forest values like biodiversity, scenic beauty, recreation, culture, and production (Berninger et al., 2009; Eriksson, 2012). Therefore, how Adivasi prioritize, or value, forests may vary from others.

In India, forests are largely governed via the National Forest Policy, 1952, with priority for forest management for wood production and followed by agriculture for both national- and community-level interests (Maraseni et al., 2005). Despite decentralized forest management like Joint Forest Management (JFM), customary practices and rights are at times overlooked (Bose, 2008). This trend of state-controlled forestry at the expense of community interests continues (Colchester et al., 2006;

Poudyal et al., 2020). The Forest Rights Act (FRA) (Government of India, 2007) seeks to reinforce Sustainable Forest Management and community rights, yet its implementation faces inconsistencies and challenges (Sahu, 2021; Kjosavik and Shanmugaratnam, 2021; Mathew, 2019). Indigenous groups have pursued political autonomy and recognition of traditional rights, leading to the local self-government to the Indigenous areas of India by enacting Panchayats (Extension to the Scheduled Areas) Act, 1996 also known as PESA Act (Bijoy, 1996). The Act initially delegated powers to local communities, but in the mid-2000s, India's National Indigenous Policy shifted away from bottom-up approaches to top-down approaches like Tribal Sub-Plan (TSP) (India Ministry of Tribal Affairs, 2004). Strategies and plans for conservation and sustainable use of biological resources based on local knowledge systems and practices are enshrined in the Constitution of India (Article 48 A and Article 51 A (g)).[4] However, India's forest policy remains criticized for its limited community involvement and conservation constraints (Aggarwal, 2020). India's Indigenous peoples face social marginalization which is further exacerbated by poor governance and inadequate implementation of the Forest Rights Act (Jha et al., 2017; Mathew, 2019; Bhalerao et al., 2021; Priyadarshini and Abhilash, 2019).

The need for indigenous inclusion is globally acknowledged, but practices vary, calling for adaptive management, dialogue, stakeholder equality, and recognition of indigenous voices for effective participation (Carson et al., 2018). Governance and policy formation increasingly require inclusiveness, involving participatory processes and collaboration among diverse stakeholders and actors (Shackleton et al., 2019). Inclusiveness and participation of local people have been vital since the inception of Joint Forest management/Community based Forest Management. However, declining engagement has contributed to forest decline, notably in the Eastern Ghats, where they were once popular but waned due to reduced funding and forest department disinterest, leading to decreased community enthusiasm. Evaluating forest management systems from the perspective of local communities is crucial for understanding their effectiveness. Investigating stakeholder perception helps understand their views and behaviours in managing natural resources and assess the effectiveness of environmental governance and conservation efforts. This insight guides policy improvements for long-term biodiversity preservation and local welfare (Kearney et al., 1999; Abukari and Mwalyosi, 2020; Bennett et al., 2019; Bennett, 2016). Public perception of government forest policies gives it a nuanced image of its strengths and weaknesses, which aids in its reform (Chuang and Yen, 2017). This study aims to explore community members' perspectives on the quality of forest governance and their role in the management of forest in Inda's Eastern Ghats.

Consequently, the study explores, using a systematic framework of assessment, what Indigenous people think of the condition of their forest, its usage, and the services it provides. Focussing specifically on the different forest management regimes which govern community interactions with forests, this exploration determines which governance attributes are valued, or not, by local communities. It begins with an outline of the analytical framework adopted, discusses the materials and methods used, continues with an analysis of data collected, and discusses the implications of the findings. The study concludes that without the meaningful participation of Indigenous communities in forest management, forest management will continue to deliver sub-optimal outcomes for both local people, and the forest itself.

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[1] Forest cover includes area over one hectare in size with 10 % canopy density, irrespective of land ownership and legal status, constituting both planted and natural forest and cultivated species as bamboo, palm, and coconut, with a canopy cover of more than 10 %. GOVERNMENT OF INDIA. 2011. *Forests in India* [Online]. India: Ministry of Environment & Forests. Available: http://frienvis.nic.in/Database/Forest%20Cover%20in%20India_2240.aspx [Accessed 26 November 2021].

[2] According to Article 342 of Indian Constitution "Scheduled Tribes" means "such tribes or Indigenous communities or parts of or groups within such tribes or Indigenous communities which the President of India may specify by public notification." NATIONAL COMMISSION FOR SCHEDULED TRIBES., 2016. *Frequently asked questions* [Online]. India: National Commission for Scheduled Tribes, Government of India. Available: https://ncst.nic.in/content/frequently-asked-questions [Accessed 31/07/2024 Kaimovs and Skarupins, 2024].The authors have avoided the use of this term, unless citing a source.

[3] Forests or forest land in India is still considered as a statutory geographical area, recorded in the land revenue records, yet forests per se lack agreed definition. THE SUPREME COURT OF INDIA Bijoy, 1996. T.N. Godavarman Thirumulkpad vs Union Of India & Ors. Supreme Court of India interpreted that the word "forest" must be understood according to its "dictionary meaning" encompassing all statutorily recognised forests, whether designated as reserved, protected, or otherwise. GOVERNMENT OF INDIA. 2011. *Forests in India* [Online]. India: Ministry of Environment & Forests. Available: http://frienvis.nic.in/Database/Forest%20Cover%20in%20India_2240.aspx [Accessed 26 November 2021].

[4] These include, among others, Biological Diversity Act (BDA), 2002, National Wildlife Action Plan (NWAP) (2002–2016), National Environment Policy (NEP) 2006, National Biodiversity Action Plan (NBAP), 2008 and National Action Plan on Climate Change (NAPCC – 2008) GOYAL, A. & ARORA, S. 2009. India's fourth national report to the convention on biological diversity. *Ministry of Environment and Forests, Government of India, New Delhi,* 75**,** 143.

2. Analytical framework and approach

There have been several seminal studies of Indian forest management, which have covered a wide range of forest management regimes, market-related initiatives (Singh and Pandey, 2010; Singh et al., 2011; Vijge and Gupta, 2014), and governance challenges (Lele and Menon, 2014) – including from the perspective of Indigenous people (Banerjee, 2016). These studies have covered many of these elements individually (Chemmencheri, 2013; Kodiveri, 2021; Patnaik, 2017). Less attention has been paid, however, to systematically investigating the views of Indigenous communities on all these aspects of forest management and governance holistically as a system. Collectively, it is the who, what and how, as a set of governing values, that ultimately shapes a system's integrity (Huberts, 2014; Breakey et al., 2017). In the context of this study the *who* concerns the local community; the *what* refers to the different mechanisms, or regimes, used; and the *how* addresses, the quality, or legitimacy, of forest governance. Exploring these aspects analytically therefore helps determine that system's integrity, from an environmental, social, and economic perspective (Huettner, 2012; Kaimovs and Skarupins, 2024; Pimentel et al., 2013).

In this study, the authors focus on the perspectives of Indigenous forest-users in the Eastern Ghats concerning forest use, forest condition, and their participation in forest governance. This study applies analytical framework derived from the field of sustainable forest management (Lammerts van Bueren and Blom, 1997), and elaborated for application in the field (Cadman, 2011). Variations of this framework have been previously applied to a range of forest governance systems (Cadman et al., 2015) in different countries, and at different jurisdictional levels (national, provincial, district, local) (Maraseni et al., 2014).

The emphasis adopted in the Eastern Ghats was to explore in detail local communities' views around five specific indicators of their participation in forest management and governance: inclusiveness, equality, resources, accountability and transparency. Previous studies across the Asia Pacific have highlighted some expectations across the region (Table 1).

The innovation in the study of the Eastern Ghats lies in its application in the specific context of India's Indigenous people. The value of the framework, which has been widely applied, lies in its capacity for application in a range of contexts, and here specifically by affording a voice to a community who have been largely unheard (Cadman et al., 2016; Ambagudia and Mohanty, 2020; Kavitha and Alagan, 2021). The approach adopted here provides some fresh insights into perceptions of Indigenous stakeholders regarding their participation in forest governance in India.

Table 1
Systematic review of expectations for forest management & governance.

Indicator	Expectation
Inclusiveness	Stakeholders want adequate representation, with a focus on including and involving Indigenous and marginalised groups in forest management and governance.
Equality	Stakeholders are treated equally particularly marginalised groups and rights holders in all aspects and stages of forest management.
Resources	Stakeholders who rely on the forest for their existence are provided with financial, technical, and human resources for alternative means of subsistence and economic empowerment, including capacity building and training.
Accountability	Forest managers are held accountable for projects, programmes and activities associated with forest management.
Transparency	Management of local forests is transparent and stakeholders are informed about forest management programmes and activities.

Sources: (Cadman and Maraseni, 2012; Cadman et al., 2012; Cadman et al., 2017; Maraseni et al., 2019; Shrestha et al., 2022; Cadman et al., 2023).

3. Materials and methods

3.1. The study area

The Eastern Ghats region of India is a discontinuous range of mountains along India's eastern coast covering five states: Odisha, Andhra Pradesh, Tamil Nadu, and some parts of Karnataka and Telangana. The main study area selected for this study is the Eastern Ghats of Northern Andhra Pradesh, which runs through Srikakulam and Visakhapatnam districts. This region plays a key role in modulating climate and fostering biodiversity (The Hindu, 2020) and is affected by heavy anthropogenic pressures (Naidu and Kumar, 2015). Two mandals (sub-districts) of the Srikakulam district and eight mandals of the Visakhapatnam district, shown in Fig. 1 below, were selected for this study.

Although the forest in the Eastern Ghats constitutes a main natural resource in this region, it is highly prone to degradation and faces a serious threat due to climate change and temperature variations (Remya et al., 2015; The Hindu, 2020). There are different types of forest management regimes simultaneously co-existing in these areas with a significant overlap. The protected forest comprises more than 60 % of the forest areas in this region and is managed by the Forest Department with the help of the local community. Local communities agree to assist in safeguarding of forest resources through protection from fire, grazing and illegal harvesting in exchange for which they receive non-timber forest products and a share of the revenue from the sale of timber products. Some forest land is also under the Coffee Board, where coffee plantations are promoted for commercial purposes. The unclassified forests are mostly managed by the local community. Sometimes the community distributes land to individual households for shifting cultivation. The details of the types of forest management in the study region are presented in Table 2. Details of the management and decision-making mechanisms is provided in supplementary material.

3.2. Sampling

Among the five districts of the Eastern Ghats of Northern Andhra Pradesh, two contiguous districts, Vishakhapatnam and Srikakulam were selected with a predominantly poor Indigenous population for canvassing the questionnaires. Ten *mandals (*sub-districts) were purposively selected from these districts as a research site to conduct fieldwork. From the Vishakhapatnam district, eight mandals were selected (Manchingi Pattu, PedaBayalu, Hukumpeta, Gudemkotha veedhi, Paderu, G Madugula, Araku valley, and Dumbriguda). Two mandals were selected from Srikakulam district (Mandasa Moll and Neliyaputti). Sample sizes from each mandal were weighted equally by the proportion of population and extent of area under forest and randomly selected and sampled, with the heads of households involved in forest-related activities interviewed. If household heads were not available, household members responsible for forest-related affairs were interviewed. Survey questionnaires were pre-tested with selected communities prior to full-fledged administration.

3.3. Data collection and analysis

In total, 588 Indigenous villagers were interviewed, of which 65 % were male and 35 % were female; almost 90 % belonged to the working age population (15–65 years). Respondents were asked to rank (1–8, 8 being the highest) the personal use of the forest and community benefits from the forest, in terms of importance.

Respondents were also asked to rank (1–5, 5 being the highest) the most important value of the forest - economic, environmental, social, cultural, or spiritual. Respondents were asked about their perception of the forest conditions (Options included: Undisturbed, Good condition, Moderate condition, Somewhat degraded and Very degraded.

To determine perspectives on participation in forest governance the indicators of indicators of Table 1 were applied, also using a Likert scale
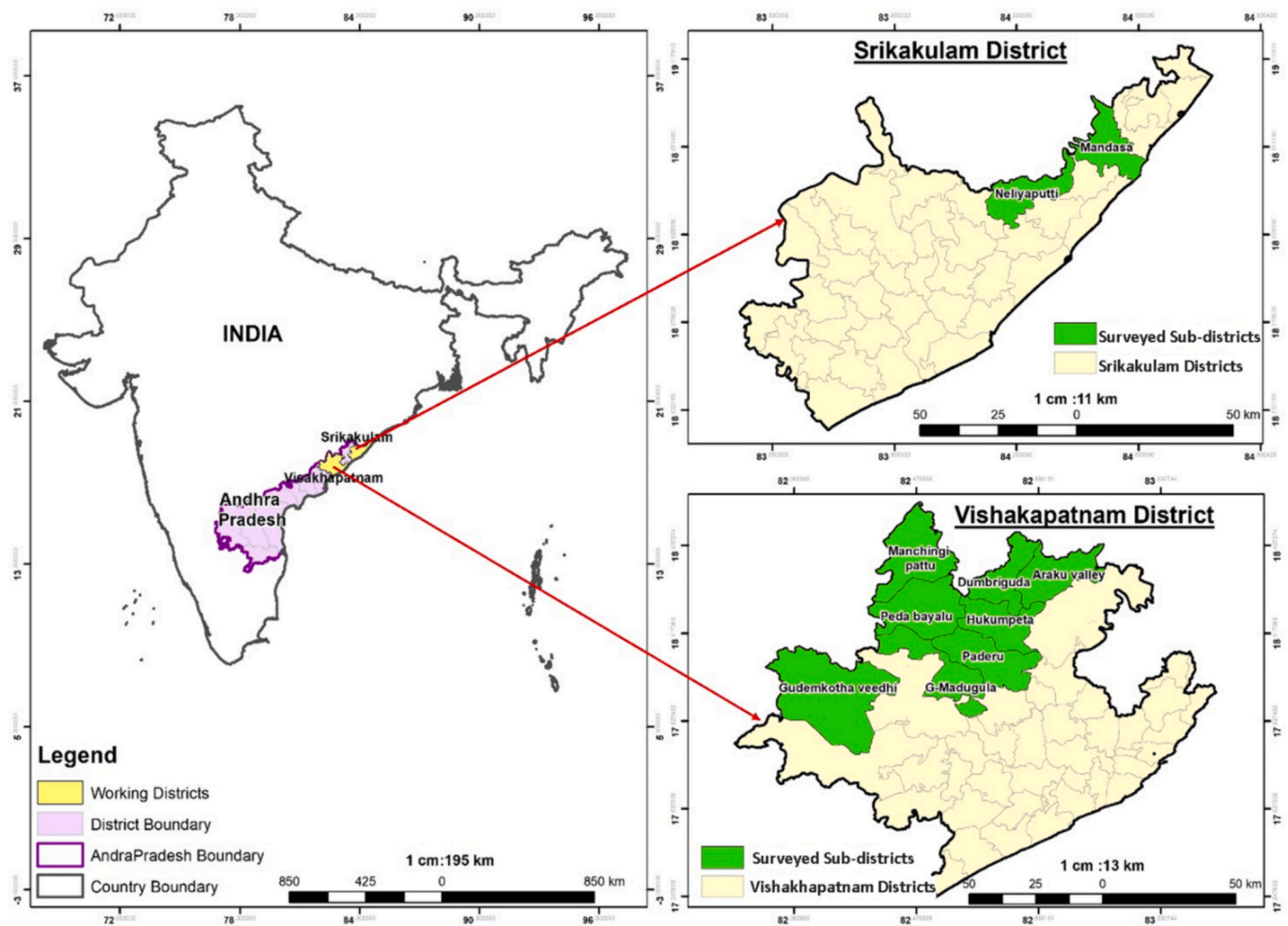
Fig. 1. Map showing the study area.

(Cadman, 2011). The indicator ratings were combined to determine overall performance, resulting in a general score, and combined weighted averages were also evaluated and compared to determine a general overview of perspectives. The data collected have been used as the basis for the quantitative analysis below. Additionally, respondents were asked to provide final opinions in the form of remarks. These comments from the respondents are presented in the results section to add value to the findings from the quantitative analysis.

4. Results

4.1. Major personal usages of the forest

Based on the participants' ranking in terms of importance, the forest was most used by the Indigenous communities for medicinal herbs, this was followed by hunting, grazing, other herbs, fodder, fuel, fruits, and 'other' (Fig. 2).

4.2. Community benefit provided by the forest ecosystem

About 35 %, 23 %, and 19 % of the total respondents suggested that 'food', 'habitat for plants and animals', and 'building materials', respectively, were the most perceived community benefits (rank 1) from their forest. Similarly, 34 %, 18 %, and 16 % of the total respondents suggested that 'habitat for plants and animals', 'building materials' and 'food' respectively, were their second most preferred perceived community benefits (Fig. 3). Considering the average score, plant and

animal habitat was top-ranked community benefits from the forest, followed by food, building materials, clean water, air, and recreation.

The study also found communities valued forest mainly for their environmental and social values, followed by economic, cultural, and spiritual values (Fig. 4). Over 36 % of respondents ranked environmental services as the most important service derived from the forest, and another 36 % and 19 % of the total respondents suggested this as second and third highest ranked services.

4.3. Forest ecosystem and forest condition

4.3.1. Type of forest ecosystem

The respondents were of the view that most of the forests covered under the study were tropical dry deciduous ($N = 416$), followed by tropical thorny shrub vegetation ($N = 86$), tropical dry evergreen ($N = 84$) forest, and tropical semi-evergreen ($N = 2$) (Fig. 5).

4.3.2. Condition of Forest cover and overall forest structure

Only 54 respondents gave the view that the forest was in good condition, while the remaining respondents considered the forest to be either somewhat or thoroughly degraded (Fig. 6).

One respondent added, "Our region is not a geographically dense forest." In addition, another respondent said, "Under the Forest Rights Recognition Act, there is a need to increase forest cover with community rights." Furthermore, one respondent added, "Forest should be protected."

A comparison of respondents' views on forest cover change in

Table 2

Types of forest management in the study region.

Management type	Description	Management authority	Legislation	Details of use
Joint forest management (JFM)	JFM started in 1990 as an all-India Initiative by executive order and not by legislation. Under JFM, communities in the villages are organised under Village Protection Committee or Vana Samrakshan Samiti (VSS) and they work with forest department personnel to manage and protect the forest. The communities are given user -rights on minor forest products except timber products.	Co-management by forest department and village community.	No Legislation - by Executive Order.	It is a project, initially supported by World Bank and has participatory mechanisms, developed through Civil Society Organisation processes. Joint forest Management (JFM) Committees were formed. JFM is a partnership among state forest departments and local communities in India. The policies and guidelines of the JFM were enunciated in the Indian National Forest Policy of 1988 and JFM guidelines of 1990 proposed by the Government of India. These guidelines were further revised in 2000.
Grazing and browsing lands	In the forest, it is the forest department's purview. If it is in villages, it is Panchayats/village communities that have control over them.	Forest Department in Reserved Forest; in villages the Panchayats and the community owns and controls them.	No Legislation. Only government regulations and customary practice.	Tradition in villages governed this. Land Use classification in land records recognises them. Livestock controlling communities had primary access.
Sacred groves	Communities/villages protect them.	Community's villagers and protection committees.	No Legislation, only customary practices/ conventions Government Orders	Mostly used in religious festivals/ functions related to local gods.
Plantation	Plantation of both roadside and avenue plantations, by the Forest Department and Panchayats.	Forest department and Village Panchayats		Plantations are used for shade for travellers, eco-tourism and also timber and non-timber uses.
Plantation by coffee board	This is done by the Coffee Board with the help of the Integrated Tribal Development Agency (ITDA) in the Indigenous/forest areas. There are also coffee/tea estates where private owners have the right to go for large-scale coffee/ tea plantations.	Coffee Board, Tea Board, Integrated Indigenous Development Agencies Private/Estate Owners.	No Legislation, only government regulations.	The coffee is sold in auctions to both national and international traders by the ITDA. There is a profit-sharing agreement between ITDA and community.
Protected forest	Protected forests are forests with some amount of legal and constitutional protection in certain countries. In India, this is controlled and managed by the forest department under The Wildlife (Protection) Act, 1972 and The Forest Rights Act (FRA), 2006. While conservation is also important in Protected Forests, the emphasis is more on sustainable utilization and management of forest resources for economic and social benefits, alongside conservation objectives.	Forest Department and Village Councils comprising all adults of the village. Protected Forests focus more on sustainable resource utilization while ensuring the maintenance of ecological integrity. They are managed to meet the demand for timber and other forest products while minimizing negative impacts on the environment.	Legislations. While Protected Forests also have legal protection, they may allow certain regulated activities such as timber harvesting, collection of non-timber forest products, and controlled grazing. However, these activities are subject to permits and regulations to prevent overexploitation and degradation of forest resources.	Forest Conservation Act. These forests are primarily meant for the production of timber and other forest produce. However, they are granted some level of protection from unauthorized activities such as encroachment, grazing, and unauthorized harvesting.
Reserved forest	Reserve forest is the designated forest with many other natural areas that enjoy judicial protection based on the legal systems under Indian Forest Act, 1927. This is a demarcated area and people's entry is also regulated under the Forest Rights Act 2006. Reserve Forests often include ecologically sensitive areas, critical wildlife habitats, and areas of high biodiversity value. Conservation of flora, fauna, and natural ecosystems is a primary focus in Reserve Forests.	Forest Department and Village Councils. The primary objective of Reserve Forests is conservation and protection of biodiversity and ecosystem services. These areas are managed to maintain ecological balance, protect wildlife habitats, and conserve forest resources for future generations.	Legislations Reserve Forests typically have a higher level of legal protection compared to Protected Forests. Unauthorized activities such as logging, grazing, and settlement are strictly prohibited, and forest departments enforce regulations to ensure compliance.	Forest Conservation Act. These forests are notified by state governments for conservation, protection, and sustainable management of forest resources.
Unprotected forest	This is in the form of shrubs and small plantation that exists on the fringes of the forest.	Forest Department	Forest department rules/government orders.	Mainly used by the local community for grazing and for collection of non-timber products.
Social forest	The social forest is managed by the forest department with the help of the communities both in the villagers and urban areas. The intention of developing social forest is to prevent people from going to the forest for their needs	Forest Department and Village Communities. Social forestry projects promote community participation, empowerment, and social cohesion by involving local communities in decision-making processes, project	Government Orders and forest department rules	Social forestry provides alternative livelihood opportunities for rural communities dependent on forests for their sustenance. Activities such as agroforestry, fuelwood plantation, and non-timber forest produce collection generate income

Table 2 (*continued*)

Management type	Description	Management authority	Legislation	Details of use
	such as fuel wood so that forests are protected.	implementation, and benefit-sharing mechanisms.		and employment opportunities, reducing dependency on traditional forest resources.
Forest diversion	This is undertaken by the government/private parties for the development projects such as power, irrigation, roads, and other function. They needs to get the permission from forest department/environment department.	Government departments/projects.	The Forest Conservation Act, 1980, and Ministry notification of August 2009 under the FRA 2006. This permission is granted based on the recommendations of the Forest Advisory Committee (FAC), which assesses the proposed diversion's impact on the environment, wildlife, and local communities.	Forest Diversion threatened forest dwellers and displace indigenous and local communities dependent on forests for their livelihoods.
Community-based forest management	Under community-based forest management, communities and forest protection committees manage the forest without the intervention of the forest department. Examples are Vananchals in Uttarakhand state and CFMs in Odisha state. Communities frame the rules for forest management to follow them.	Communities/forest protection communities.	Conventions and practices and no specific orders/rules.	If managed well communities benefits will be maximised, but government help is less.
Others	FRA – 2006 is an important right based legislation of conferring land rights (both individual and CFR) to the Indigenous and Other Traditions Forest Dwellers for their livelihoods and management in the form of protection and conservation of forest under Section 5 of the Act.	Forest Rights Committees, Village Councils.	Parliament Legislation was passed in 2006.	Forest use is limited to grazing, recreation, religious purpose.

Source: (Reddy et al., 2011; Reddy and Bandi, 2006; Art and Visseren-Hamdkers, 2012; Andhra Pradesh Government, 2013; Government of India, 2021) and (Prof. Gopinath Reddy, Rtd professor of Central Economic and Social Studies (CESS), personal communication, 2022).
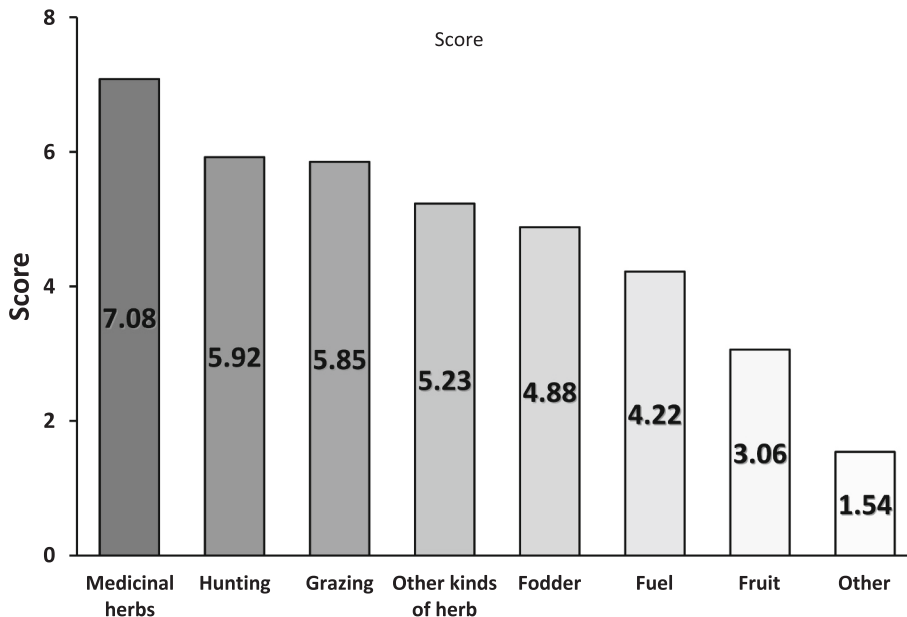

Fig. 2. Personal use of the forest in terms of importance (1–8).

Visakhapatanam district from 2000 to 2015 using imagery derived from Global Forest Watch shows some alignment with actual degradation (Fig. 7). While Global Forest Watch data indicates greater forest loss and degradation in the two tehsils of Srikakulam, this contrasts with respondents' observations. (Fig. 7) (Global Forest Watch, Undated). This difference may be due to seasonality and local cultural preferences (Neeff and Piazza, 2020).

4.4. Evaluation of forest governance

4.4.1. Various approaches to forest management

It is important to note that various forest management types can coexist in the same geographical area. Grazing and browsing lands for example may be under the JFM or social forestry or under community-based forest management etc. According to the respondents, the majority of the forestlands were managed as grazing and browsing land
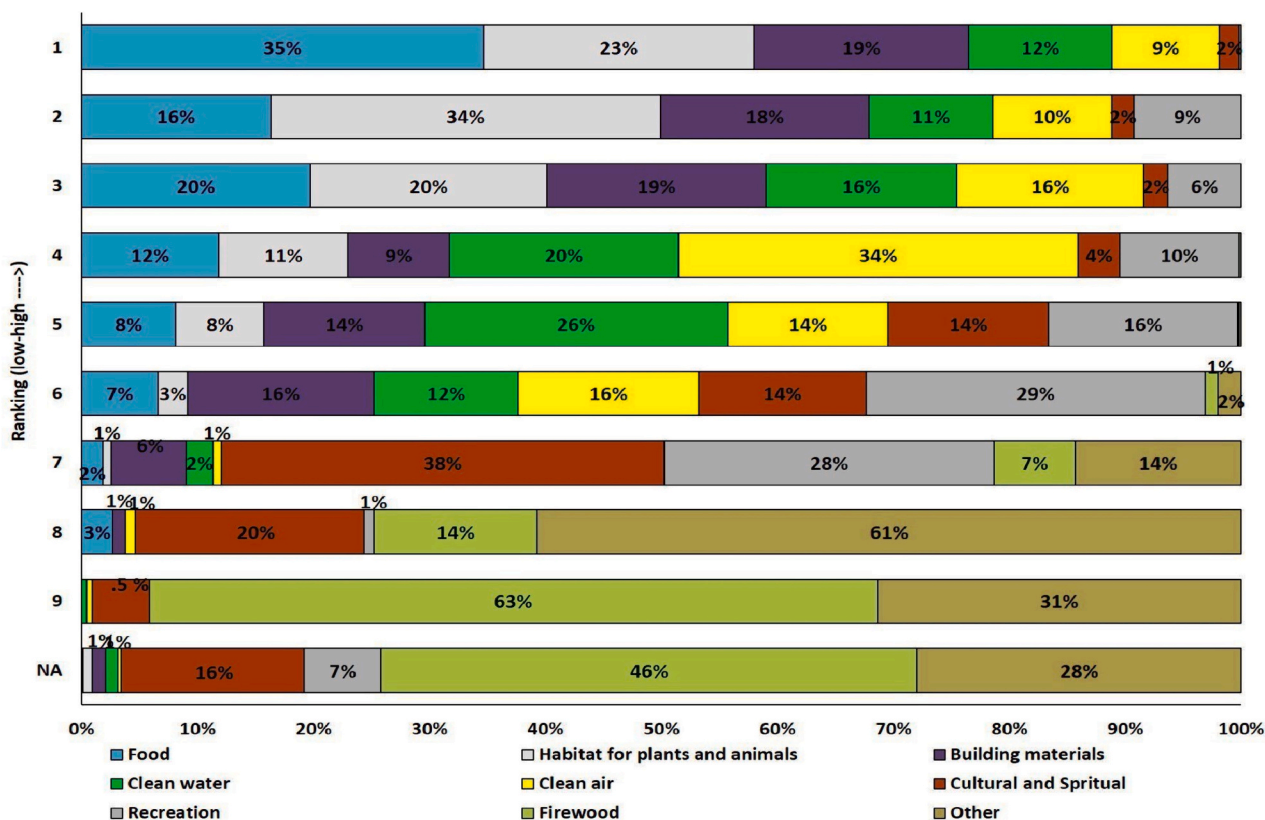
Fig. 3. Community benefits from the forest: ranked in terms of their importance.
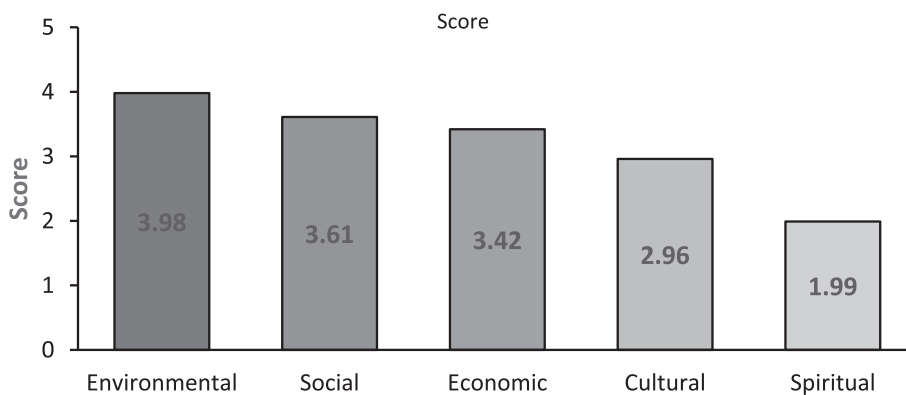

Fig. 4. Importance of forest in terms of economic, environmental, social, cultural, or spiritual values.

(almost 80 % of respondents mentioned they have this forest management type), followed by joint forest management (almost 75 % of respondents) and social forest (70 % of respondents) (Fig. 8).

4.4.2. General rating of Indian Forest governance (2021)

Table 3 below presents the general rating of forest governance, where the ratings from participants are converted in terms of scores from one to five and aggregated indicator-wise.

Table 3 shows the ratings for the five governance indicators. Overall, the highest ranking was given to *equality*, while the lowest was given to *accountability*. The average rating given to all the indicators was less than 50 % (2.5).

One respondent said, "Forest officers must be responsible." Another respondent suggested, "There should be the implementation of the Forest Rights Act". Similarly, respondent argued that "The problems of forest officials are non-accountability to poor, and they are unable to

communicate well with the public". Another respondent argued:

"The lack of proper management of the forest and the lack of proper awareness of the local Village Protection Committee members is causing the loss of valuable forest resources. Although the Swirok trees are now economically viable in a few acres of land, the trees are not visible in the forests due to the loss of rainforests."

However, it should be noted that the total weighted average score of *equality* is close to the indicator of *inclusiveness* (Table 3, last row). However, one respondent commented that "tribal people cannot fully share in forest management".

Based on the gender type, overall *equality* received the highest score whereas *accountability* and *transparency* received the lowest score. Both men and women gave a high ranking to *equality* and a low ranking to *accountability* and *transparency*. Within this, men gave higher ranking to *equality* than women while women gave the same ranking to both *equality* and *inclusiveness*. A female respondent said, "The authorities are
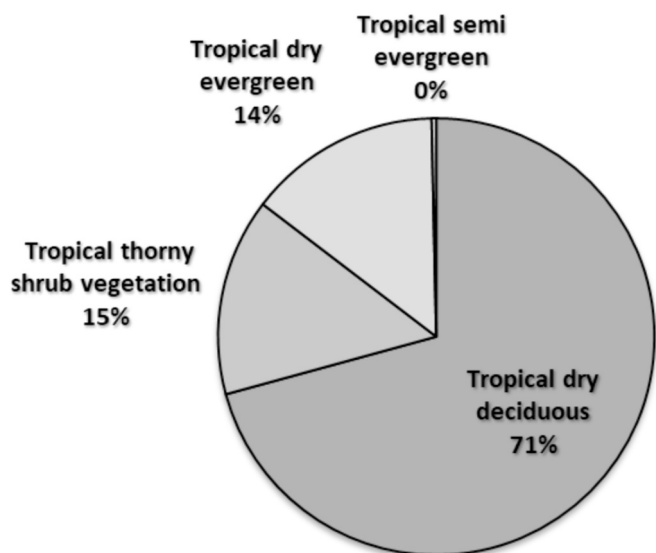
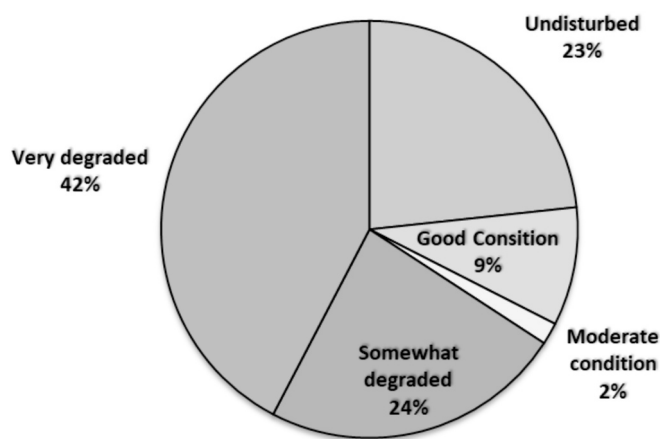**Fig. 5.** Forest type at respondents' location.

Fig. 6. Forest condition at respondents' location.

biased towards some. Not looking at everyone as equal."

In terms of land rights, an overall low ranking was given by respondents with individual user rights, indicating that without ownership rights, governance of user rights on individual parcels of land is problematic. On the other hand, respondents with ownership rights and also user rights on community land gave higher overall rankings. Based on the forest management type, the indicator *transparency* and *inclusiveness* received the lowest overall score whereas the indicator *equality* received the highest overall score. Overall, respondents from unprotected forest and plantations gave the highest ranking to indicators, which may be due to their easy access for use, and their significance for subsistence, whereas respondents from forest diversion gave the lowest ranking to indicators. Based on the forest type, the indicator *inclusiveness* received the lowest ranking given by respondents from tropical dry deciduous forest. The indicator *equality* received the highest score as given by respondents from the tropical thorny shrub forest. Similar findings were revealed from the analysis of forest cover data, revealing that respondents from thick forest cover areas rated inclusiveness lowest, while those from thin forest cover areas ranked equality highest.

In terms of forest condition, the indicator *inclusiveness* received the highest score whereas the indicator *accountability* received the lowest score. Respondents seemed to be unsatisfied with forest management and forest officers. A respondent lamented: "The authorities and the

village president (Sarpanch) do not care about the forest. They are supporting those who are cutting trees." Similarly, another respondent claimed that "Forests are being destroyed by forest officials who do not manage the forest plantations properly, forests are being destroyed by local forest management authorities". Respondents stressed "Failure by local forest management" and suggested deteriorating forest condition "Local Forest management officials not involving the people in proper partnership mode. So, forest is reducing". One of the respondents lamented, "Office bearers of the Forest Conservation Committee are overly strict. Local authorities thus were not able to share in the management of wealth, hence valuable forest vegetation is now completely gone". However, a respondent also highlighted conservation efforts by villagers: "Even though the forest department did not pay any attention to the management of the forest, the villagers were conserving the forest by planting natural plants."

Based on the age group, overall, the age group 15–25 gave the highest ranking to governance indicators, while the age group 66–75 years provided the lowest ranking. The indicator *equality* obtained the highest overall score, while *transparency* and *inclusiveness* received the lowest overall score. Although the indicator *resources* received an average score overall, respondents mentioned the need for the provision, as one respondent stated for "adequate resources". Another respondent stated that "proper resources must be embedded". Others emphasized that "useful trees should be supplied, including a supply of "mango trees in large quantities" as well as "large quantities of Panasa plants".

5. Discussion

The study revealed that the ethnic communities in the region believe that they benefited most from the forest in terms of medicinal herbs and sources of food. A slightly higher ranking of direct use of the forest compared to the indirect use of forest demonstrates the reliance of indigenous communities on these ecosystem services for their livelihoods and sustenance. This finding concurs with findings from research conducted in Eastern India where Indigenous communities highly prioritised ecosystem services such as water, fuel wood, medicinal plants, followed by cultural and regulating (Das et al., 2022) and in Indonesia, Iran and Nepal (Muhamad et al., 2014; Dehghani Pour et al., 2023). Various challenges, including the absence of alternative income sources, a shortage of skills, and economic hardship, compel these Indigenous communities to rely directly on nature (Aziz et al., 2017).

However, it is important to note that indigenous communities placed the highest emphasis on the environmental values of the forest, over and above economic value (Result section 3.1 and 3.2). These results suggest that any projects, programmes, and associated management plans looking at alternative sources of livelihood from the forest, such as payments for ecosystem services, should give top priority to addressing the sustainability of these natural resources. The prioritisation of the environmental values of forests concurs with findings from a study conducted in Nigeria (Ihemezie et al., 2022; Koju et al., 2023). However, respondents prioritising environmental value in the study conducted by (Ihemezie et al., 2022) were forest staffs and experts. It is noteworthy that despite being poor and highly dependent on forest, these Indigenous communities in our study still prioritised the environmental values of forest over others. This indicates that the respondents are now cognisant of the importance of the ecosystem and the environmental value of forests (Koju et al., 2023). At the same time, these communities need alternative sources to meet their demand for material resources, or the forest will continue to be negatively impacted.

The perception of the respondents towards many forests being degraded is seen in the degradation mapped by Global Forest Watch data, which could be due to the precarious livelihood situation of forest communities, who have restricted access to forest and forest products for their livelihood needs. Furthermore, there are some signs that poverty among forest communities is increasing. The risks posed by climate change on the forest are also expected to further impact poor households
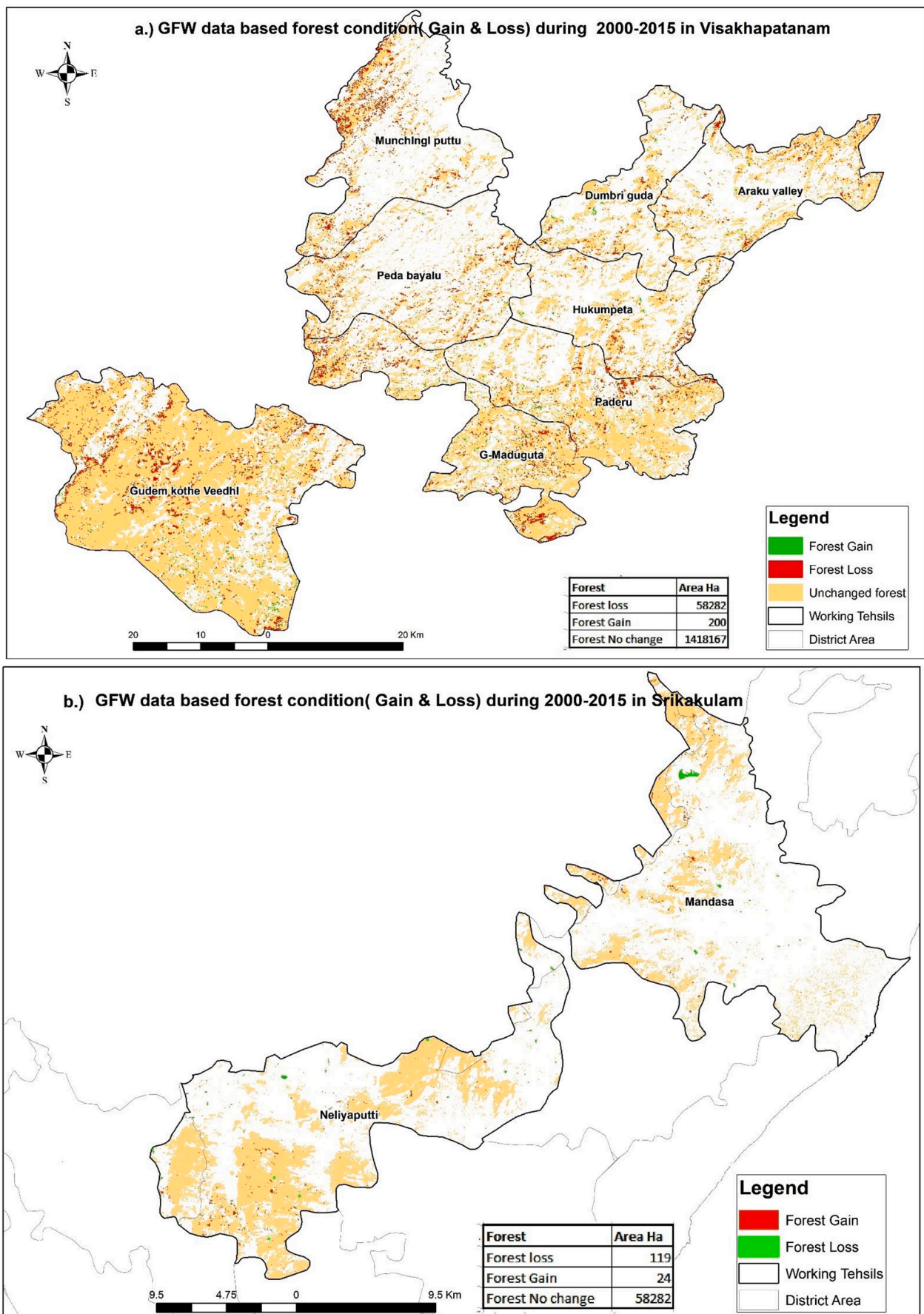
Fig. 7. Comparison of forest condition spatial distribution based on Global Forest Watch data and the respondents' perception.
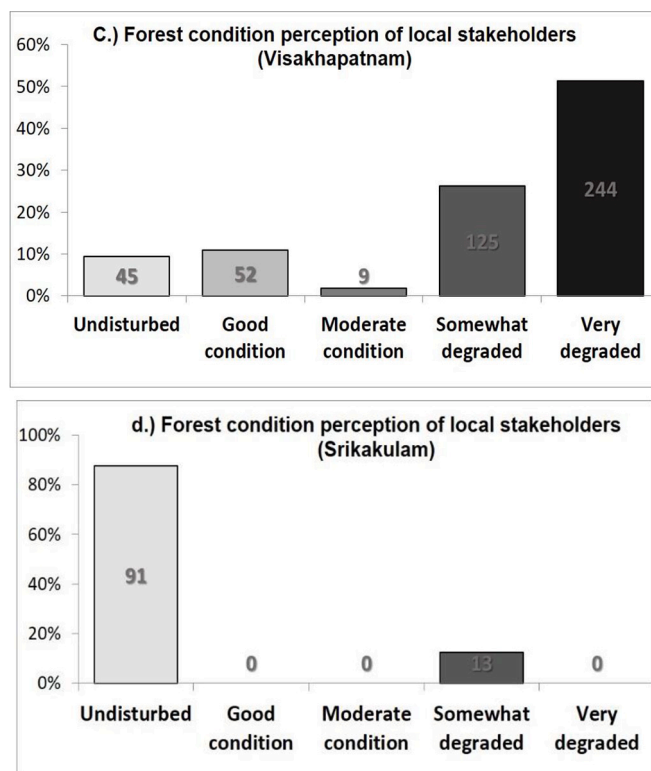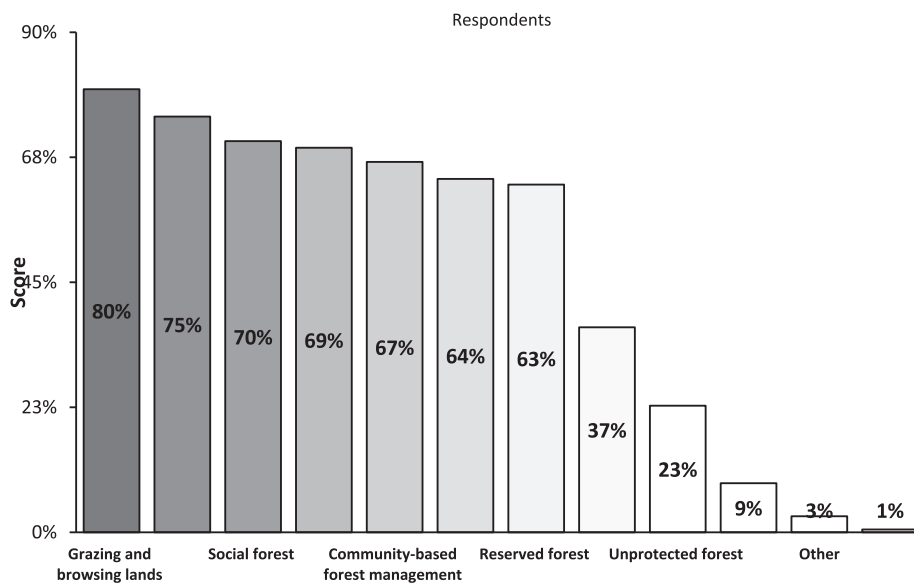
Fig. 7. (*continued*).

Fig. 8. Forest management approaches followed.

(Shyamsundar et al., 2021). The respondents of two tehsils of ten surveyed rated the forest condition as better than it is. This indicates that while respondents have very clear views about the forest governance quality, it appears that they did not actually know the true condition of the forest. This may be because of the poor transparency of reporting around forest conditions.

This study identified various forest management regimes in the study area (Fig. 7). Over time, forest governance in India has transitioned through various dominant approaches: conservation approach (focusing on forest maintenance), social forestry approach (providing fuelwood and fodder alternatives; late 70s), Joint Forest Management approach,

(emphasizing shared responsibility between communities and forest officials; early 90's) and Forest Right Act – 2006 (addressing historical injustices faced by forest-dependent communities; early 2000) (Tiwary, 2019). While each offers unique benefits there is the need for a more nuanced understanding of each regime's institutional framework and its influence on outcomes. This requires examining the specific governance structures within each regime (outlined in Table 1). Conservation generally emphasizes forest protection; social forestry on reducing pressure on natural resources through use of alternative fuel and fodder sources; JFM on co-management with communities; sacred groves on customary laws (Lata and Rashid, 2020) (Dutta, 2020). The research has

Table 3

General rating of forest governance.

Indicator		Inclusiveness	Equality	Resources	Accountability	Transparency	Total (out of 25)
Gender type	Female (205)	2.2	2.2	2.1	2.0	2.0	10.5
	Male (383)	2.2	2.4	2.0	1.9	1.9	10.4
	No rights (2)	3.0	3.0	3.0	2.5	3.0	14.5
	User rights on community land (57)	2.3	2.3	2.1	2.0	1.8	10.5
	Ownership Rights (562)	2.1	2.3	2.0	2.0	2.0	10.4
	Encroacher users (19)	2.1	1.9	1.9	1.8	1.8	9.5
	Inherited user rights (474)	1.9	2.2	1.8	1.7	1.6	9.2
Land Rights	Individual User Rights (446)	1.7	2.1	1.7	1.7	1.5	8.7
	Unprotected Forest (132)	3.3	3.6	2.3	2.3	2.1	13.6
	Plantations (374)	2.1	2.5	2.0	2.0	1.8	10.4
	Sacred groves (405)	2.0	2.2	1.9	1.9	1.8	9.8
	Protected Forest (3)	1.7	1.7	2.0	2.3	2.0	9.7
	Reserved Forest (369)	1.7	1.7	2.0	2.3	2.0	9.7
	Joint Forest Management (440)	1.7	2.1	1.7	1.7	1.5	8.7
	Grazing & Browsing Land (469)	1.7	2.1	1.7	1.7	1.5	8.7
	Social forest (414)	1.5	1.9	1.7	1.6	1.4	8.1
	Community-based forest (392)	1.5	1.9	1.7	1.6	1.4	8.1
	Others	1.4	1.9	1.6	1.6	1.4	7.9
	Coffee Board Plan (217)	1.3	1.8	1.7	1.6	1.3	7.7
Forest Management type	Forest Diversion (52)	1.1	1.9	1.8	1.5	1.1	7.4
	Tropical dry evergreen (84)	3.5	2.6	3.1	2.9	3.8	15.9
	Tropical thorny shrub (86)	4.0	4.4	2.5	2.5	2.1	15.5
	Tropical semi-evergreen (2)	4.0	2.0	2.5	3.0	4.0	15.5
Forest type	Tropical dry deciduous (416)	1.5	1.8	1.7	1.7	1.5	8.2
	Thin (438)	2.5	2.5	2.2	2.1	2.1	11.4
Forest cover	Thick (150)	1.4	1.7	1.6	1.5	1.5	7.7
	Undisturbed (137)	3.8	3.2	2.9	2.8	3.3	16.0
	Somewhat degraded (138)	2.2	2.5	1.9	1.9	1.8	10.3
	Very degraded (247)	1.6	1.9	1.8	1.7	1.5	8.5
	Good condition (54)	1.1	1.7	1.5	1.4	1.1	6.8
Forest Condition	Moderate condition (10)	1.1	1.3	1.3	1.0	1.4	6.1
	15–25 year (40)	2.7	3.1	2.0	1.8	1.9	11.5
	36–45 years (154)	2.4	2.5	2.2	2.1	2.2	11.4
	46–55 years (145)	2.3	2.3	2.2	2.1	2.1	11.0
	26–35 years (94)	2.3	2.6	1.9	2.0	1.8	10.6
	56–65 years (98)	1.9	2.0	2.0	1.8	1.8	9.5
	76–85 years (20)	1.2	2.1	1.6	1.5	1.2	7.6
Age group	66–75 years (35)	1.3	1.4	1.8	1.4	1.4	7.3
Total weighted average rating (out of 25)		**2.19**	**2.32**	**2.04**	**1.95**	**1.96**	**10.46**

provided some insights into how these frameworks function. Grazing and browsing lands appear on the basis of stakeholder perceptions to be ineffectively regulated and managed, leading to overgrazing. JFM requires transparency, equitable benefit sharing, and addressing power dynamics within committees. In the case of social forestry, programs to ensure sustainable resource utilization are essential. The management of sacred groves indicates the importance of traditional governance structures. The study highlights the need for a nuanced understanding of how each regime's institutional framework shapes both the quality of forest governance, and ecological outcomes. A closer look at JFM, for example, should assess how power dynamics and benefit-sharing mechanisms influence community participation and forest protection efforts. Good governance is not evident if a country fails to provide a livelihood to its citizens, or tenure use and rights are denied (Roy and Choudhury, 2022). Further research is therefore required to look more closely into these aspects, to gain a more comprehensive understanding of the strengths and weaknesses of each regime. This will pave the way for targeted recommendations to improve the effectiveness of sustainable forest management in India.

In terms of specific indicators of governance, the results of Table 3 indicate limited perceptions of community involvement (10.46 out of 25). This highlights a significant gap, and concurs with findings elsewhere regarding the need for enhanced measures to ensure equitable participation, particularly for women, within community-based forest governance structures (Rout, 2018). The study also indicates a need for improving the *inclusiveness* of Indigenous communities in the management of the local forest. However, it is worth noting the indicator *equality* performed well out of the five indicators assessed, which is a

positive note that despite evidence of elite capture, gender, and economic inequality in developing countries people believe that there is equality in forest governance. The governance indicators, transparency, and *accountability* were the low rated. This reflects a lack of openness and responsibility in the management of forest resources, highlighting a significant shortcoming in the current regime. The research further reveals that local Indigenous communities have limited access to resources and need to be included in forest management if the forest is to survive over the longer term. Although respondents mentioned the need for adequate resources, the average ranking provided to the indicator *resources* is marginally higher than in other governance studies conducted in India and other countries (Maraseni and Cadman, 2015; Maraseni et al., 2019; Cadman et al., 2016) where *resources* have received lowest scores and been considered a barrier to effective forest governance. The low scores for indicators such as *transparency* and *accountability* are also in contrast to other governance studies of community-based forest management systems in Asian countries including India. Lack of *transparency* and *accountability* of management is also of concern (Maraseni et al., 2019) indicating the presence of high bureaucracy in Indian forest governance in the area and a tendency towards top to bottom approach rather than promoting bottom up approach. Illegal logging and corruption are also more likely when there is a risk to accountability and openness, which undermines institutional integrity (Cadman et al., 2017; Kishor and Damania, 2007; Minang et al., 2017). Furthermore, there is an immense deficiency of responsibility among forest managers towards the maintenance of common rights under the Forest Rights Act, 2006. Therefore, to promote meaningful participation in decision-making processes, it is imperative to implement effective institutional

and legal frameworks, increase information availability and financial accountability and implement anti-corruption measures. But it is alarming that no indicator passed the threshold rating of 2.5 for the general weighted average, demonstrating the need for continual improvement in forest management overall.

Furthermore, another concerning aspect is the dissatisfaction among stakeholders regarding forest management and the performance of forest officers. This discontent is a cause for alarm as it signifies a lack of confidence in the system, raising questions about the effectiveness and fairness of the governance framework in place. These highlight the need to enforce proper institutional and legal frameworks forest laws, improve information access, financial accountability, and anti-corruption measures to ensure meaningful participation in decision-making processes. Discussion with the villagers also revealed that there are ongoing conflicts regarding the marketing of forest products, stone mining and non-impartiality of forest officers. But the management mechanisms do not appear to have that much potential for the effective solving of community problems regarding the forest. While the biodiversity of trees and crops in the managed forest is often more important to poor people than those in protected areas (Mayers and Vermeulen, 2002), due to the lack of enthusiastic local forest officers and ineffective joint forest management committees, forest areas are neglected, rejuvenation and reforestation activities are not undertaken, and there is smuggling of timber and other forest products. These have all resulted in a decline of the biodiversity of the forest.

6. Conclusion

This study assessed the condition of the forest, the usage, and services provided by the forest to the Indigenous communities and ascertained their views on the governance regime. The study revealed that hunting, plants (extractive uses) and grazing are the primary services derived from the forest. However, at the same time, there is recognition that the forests are degraded, and although the environment is rated quite highly as a value, the livelihood requirements are seen to be coming into conflict with the requirement for habitat for plants and animals. This highlights the tension between supporting the livelihoods of forest-dependent communities and preserving crucial forest ecosystems. Unsustainable resource extraction has the potential to impact numerous traditional practices, and presents a substantial risk to deforestation and ecosystem degradation. Addressing this challenge requires a multifaceted approach. Sustainable resource management practices and fostering alternative income opportunities can empower communities to reduce their dependence on directly extracting resources from the forest. Strengthening community participation in decision-making processes is also paramount. Integrating local needs and traditional knowledge into forest management plans fosters a sense of ownership and fuels collaborative conservation efforts.

The analysis of forest management regimes undertaken in the Eastern Ghats calls for a more comprehensive understanding of decentralized resource governance and its inherent challenges. By addressing limitations within each regime, fostering collaboration between stakeholders, and incorporating successful models from other regions, could all help pave the way for more robust management systems. These should prioritize both ecological preservation and the well-being of forest communities.

From a legislative perspective, the FRA 2006 needs to be better implemented. Simply recording the rights of the communities and strengthening the Gram Sabha (village council), would vastly improve forest management and governance. Forest degradation will continue where there is no clear community ownership (both conceptual and actual) or any recognition of community rights. To balance environmental and economic imperatives, the increased recognition of Indigenous communities in regulatory frameworks is critical to preventing further forest degradation.

Participation has been hailed as a cornerstone of democracy, without which the exercise of power is both empty and frustrating (Arnstein, 1969). It is therefore important to privilege the voices of those historically struggling to be heard, in this, the largest democracy on earth. Future studies with increased key informant interviews, and more focus group discussions, as well as larger research cohorts, will help determine whether the perceptions of participation are the same across other Adivasi communities.

CRediT authorship contribution statement

Anugu Amarender Reddy: Writing – review & editing, Writing – original draft, Investigation, Formal analysis, Data curation, Conceptualization. **Tek Maraseni:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization. **Souparna Lahiri:** Writing – review & editing, Writing – original draft. **Sikha Karki:** Writing – review & editing, Writing – original draft, Formal analysis. **Upama Koju:** Writing – review & editing, Writing – original draft, Formal analysis. **Anita Shrestha:** Writing – review & editing. **Tim Cadman:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.forpol.2024.103350.

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