



Examining Socio-Economic Impacts of Resource Distribution and Sustainable regional development of Kolhapur District: A Geographical Study

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INTRODUCTION:

The concept of resources encompasses both subjective and objective dimensions. Subjective resources refer to internal assets or capabilities, while objective resources denote external tangible or measurable entities. The term 'resource' represents an abstract concept, elucidating human valuation and its correlation with functional or operational attributes, thereby encapsulating statistical data pertaining to individual human needs or the attainment of societal goals. Furthermore, resources entail the symbiotic relationship between human activities and the environment. It can be deduced that resources must possess two fundamental characteristics: a) Functionality and b) Utility. Generally, resources are delineated into two primary classifications: a) Material resources and b) non-material resources. Human requirements, natural phenomena, and cultural influences constitute the generative factors, with their dynamic interplay culminating in the emergence of resources.

The present study endeavors to analyze the geographical distribution and observe the forest cover within the Kolhapur district. In ecological terms, a forest represents a multifaceted ecosystem characterized by a dense assemblage of trees, shrubs, and often exhibiting a closed canopy structure. Forest are storehouses of large variety of life forms such as plants, mammals, birds, insects and reptiles etc. the total forest cover of the country of India is 690899 km²

(21.02%) of the geographical area of this 2.54 % is very dense, 9.71% is moderately dense and 8.77 % is open forest cover. The Scrub accounts for 1.26%. The forest cover in the country is shown that Madhya Pradesh has got the largest forest cover followed by Arunachal Pradesh, Chhattisgarh, Maharashtra and Orissa, Maharashtra forests are rich and diverse in flora and fauna. There are about 3500 flowering plant species covering 1200 genera and 150 families. In Maharashtra, five distinct forest types are delineated based on the classification proposed by Champion and Seth, indicating the presence of diverse and unique ecosystems within the region.

Kolhapur District has been divided into 12 tehsils and 4 sub-divisions for administrative purpose. There are Karveer, Panhala, Shahuwadi and Kagal tehsils under Karveer sub kivision, Hatkanangle and Shirol tehsils under Ichalkaranji subdivision, Gadhinglaj, Chandgad and Ajara tehsils under Gadhinglaj subdivision and Bhudargad, RAdhanagri and Gaganbavada under Radhanagri subdivision. The forest areas of Kolhapur district lie between latitude 15°43' to 17°10' North and longitude 70°40' to 74°42' east. The division has eight forest ranges viz. Chandgad, Ajara, Gargoti, Radhanagri, Gaganbawada, Karveer, Panhala and Malkapur. The recovered forest area of the district including sanctuary areas is 1744.50 sq. km. which is 22.70 per cent of the geographical area of the district. The Kolhapur Forest division however has a forest area of 1389.71 sq.km. that



is spread over 8 forest ranges and all 12 tehsils and is 18.08 per cent of the geographical area. According to the State of Forest Report 2005 (SOFR), published by the Forest Survey of India, Dehradun, the “Actual Forest Cover” of Kolhapur district spans 1657 square kilometers, accounting for approximately 21.56% of the total land area.

OBJECTIVES :

1. To observe and categorize the spatial distribution of forests across the Kolhapur district.
2. To analyze the distribution of forests at the tehsil level within Kolhapur district, providing a granular understanding of local variations.
3. To investigate the significance of environmental factors within the Kolhapur district, emphasizing their role in shaping ecological dynamics, resource management, socio-economic and sustainable development.

DATA BASE AND METHODOLOGY :

The present study is mainly based on the secondary data collected from the economic survey of Maharashtra 2008-09, forest survey of India, Dehradun, (India state of Forest Report, 2009), India's Forest and tree cover contribution as a carbon sink, ministry of Environment and Forest (Government of India, August 2009), state Environment Report and Forest Government of India, Maharashtra Forest Policy, 2008 and electronic data have collected to the internet facility, similarly, local forest department, satellite imageries, books, Journals, Wikipedia the free encyclopedia etc. for the construction of per cent of various indices by applying statistical and mathematical formulas and graphical techniques are used.

STUDY AREA:

Geographically, the district of Kolhapur extends from 15°43' North to 17°10' North

latitude and 73°40' East to 74°42' East. It has an area of 7685 sq. km. and spread over 12 tehsils. The recorded forest area of the district including sanctuary areas is 1,744.50 sq.km., which is 22.70 per cent of the geographical area of the district. The Kolhapur Forest division however has a forest area of 1,389.71 sq.km. that is spread over 8 forest ranges and all 12 tehsils and is 18.08 per cent of the geographical area.

Geology, Rock and Soil :

The Deccan Trap represents a prominent geological formation originating from the Upper Cretaceous to Eocene era, extensively covering the region except for the southern part where sandstone and quartzite ridges prevail. It primarily comprises basalt, amygdaloidal trap, vesicular trap, and clayey trap varieties, accompanied by inter-trapping sedimentary beds and numerous ferruginous clayey beds. The basal flows exhibit predominantly basaltic characteristics, while the intermediate flows alternate between basaltic and amygdaloidal compositions. The upper flows are predominantly basaltic, overlain by clay and laterite beds. In the Sahyadri region, the flow's position exhibits greater distinctiveness compared to areas further eastward. Upon careful examination from vantage points, these flows are observed to dip at shallow angles, generally towards the northeast. Due to their predominantly basaltic composition and tendency to form flat-topped structures, these lavas are referred to as plateau basalt.

Climatic Condition:

The climatic conditions prevailing in Kolhapur district are characterized by a moderate and pleasant climate, devoid of extreme weather events. The region experiences three distinct seasons: monsoons from June to October, winter from November to February, and a warm to hot summer from March to May. Temperature variations occur gradually throughout the year.



The mean annual maximum temperature is recorded at 31.5°C, while the mean annual minimum temperature stands at 19.2°C. Extreme temperatures are observed in April, with maximum temperatures reaching up to 40.7°C, and in January, dropping as low as 10°C.

The primary source of rainfall in Kolhapur district is the South-West Monsoon, which occurs between June and October. However, rainfall distribution across the district is not uniform. Mean annual rainfall varies significantly, ranging from 480 mm in the eastern Shirol tehsil to approximately 6000 mm along the Western Ghats in Gaganbawada Tehsil. Despite these variations, there are no significant north-south gradients within the district. Overall, Kolhapur district benefits from ample water resources. In addition to six major rivers and their tributaries, spring water is accessible at depths ranging from twenty to fifty meters below the surface. The high-water table contributes to adequate water levels in wells and tanks throughout the district.

The main rivers in the study region include Varna, Panchanga, Dudhganga, Vedganga, Hiranyakeshi, Ghatprabha, Kumbhi, Kasari, Tulsi, Bhogavati, and Krishna. These rivers flow both westward and eastward of the Western Ghats.

The abundant water supply has facilitated widespread development in agriculture and animal husbandry practices in the district. However, to ensure the sustainability of this development, it is imperative to protect and conserve the forest cover in the watersheds of all water sources. Therefore, sustained development in Kolhapur district hinges upon the implementation of effective measures for forest protection and conservation.

Natural Resources in India:

Forest is the second largest land use after agriculture in the state. The share of forest in GSDP of agriculture and allied activities sector

during 2011-12 was 1.7 per cent. The total forest area of the state is 61,358 sq. km. constituting about 19.90 percent of geographical area against the target of 33 per cent set under National Forest Policy 1988. A forest is a complex ecosystem, which is predominantly composed of trees, shrubs and is usually a closed canopy. Forest is storehouses of large variety of life from such as plants, mammals, birds, insects and reptiles etc. nearly 4 billion hectares of forest cover the earth's surface, roughly 30 per cent of its total area. Plants include the trees, shrubs, climbers, grass and herbs in the forest. Forest provides various natural services and products. Many forest products are used in day to day life. Besides these, forests play important role in maintaining ecological balance and contributes to economy also.

Classification of Forests:

Forest can be classified in different ways. The forest type depends upon the biotic factors such as climate and soil characteristics of region. Forest in India can be broadly divided into coniferous forest and broadleaved forest. It can also be classified according to the nature of their tree species-evergreen, deciduous, xerophytes or thorn trees, mangroves etc.

Forest Types in India and Maharashtra:

Champion and Seth system of classification (1988) provides an elaborate description of forest type of India in six major groups, which are further divided into 16 types groups, and finally into 200 types as like 1. Coniferous forests 2. Broad leaved forest 3. Evergreen Forest 4. Deciduous Forest 5. Thorn Forest 6. Mangroves Forest further divided in the 16 types, grows there were distribution of countries forest cover in different type Tropical Wet evergreen Forest 8.75 per cent, Tropical Semi evergreen Forest 3.35 per cent, Tropical Dry Deciduous 30.16 per cent, Tropical moist Deciduous 33.92 per cent, Littoral and Swamp 0.38 per cent, Tropical Thorn 5.11 per cent,



Tropical Dry Evergreen 0.29 per cent, Sub-tropical Broad Leaved Hill Forest 0.38 per cent, Sub-Tropical Pine Forest 5.99 per cent, Sub-tropical Dry Evergreen Forest 0.36 per cent, Mountain Wet Temperate 3.45 per cent, Himalayan Moist Temperate Forest 3.79 per cent, Himalayan Dry Temperate 0.28 per cent, Sub-Alpine and Alpine 3.79 per cent as per the India State of Forest Report, 2009, Forest Survey of India.

The recorded forest area of the country is 769512 sq. km. accounting for 23.41 per cent of the geographical area.

Maharashtra's forests are rich and diverse in flora fauna. There are about 3500 flowering plant species covering and 150 families. One of the valuable tree species teak is found to occur over an area of approx. 10.18 thousand sq. km. and Bamboo over 10.10 thousand sq. km. area. Maharashtra has five forest types as per the Champion and Seth's classification. These are the southern tropical, semi-evergreen, tropical moist deciduous, southern tropical dry deciduous, southern tropical thorn, littoral and swam forest. The state has 16 forest types, which belong to six forest type viz. tropical semi- evergreen forest 7.73 per cent, tropical moist deciduous 29.84 per cent and swamp 0.08 per cent, tropical dry deciduous 57.41 per cent, tropical thorn and sub-tropical broad leaved hill forest 1.54 per cent.

It is found that, as per the satellite data October-December 2006, the forest cover of Maharashtra state is 50650 sq. km. which is 16.46 per cent of the state's geographical area. The state has 8739 sq. km. (2.84%) very dense forest 20834 sq. km. (6.77%) moderately dense; 21077 sq. km. (6.85%) Open Forest and scrub 4157 sq. km. (1.35%) and non-forest are 252906 sq. km. (82.19%).

Zonal Classification of Forest in Kolhapur District:

This classification based on the rainfall which is received from the South-West monsoons between June to October months. It is observed

to the rainfall is not evenly distributed throughout district. It varies from a mean annual rainfall of 480 mm. in the Eastern Shirol Tehsil to around 6000 mm. along Western Ghats in GaganBawada Tehsil. However, the north-south variations within the district are not seen. Based on the east - west variation in the mean annual rainfall, Kolhapur district can be divided into four zones:

1. High Rainfall Zone
2. Moderately Rainfall Zone
3. Low Rainfall Zone
4. Drought Prone Zone

1. High Rainfall Zone:

It is observing that north-south strip of about 10-15 km width along the Western Ghats falls in this zone. The annual rainfall could be as high as 6000 mm with 90-95 per cent of the rain being received from the south west monsoon between June to September and of this, about 35-40 per cent of the rain is received in the month of July. The western portions of Shahuwadi, Panhala, GaganBawada, Bhudargad, Gadhinglaj and Chandgad tehsils in this zone. Mixed semi evergreen and moist mixed deciduous forests are found in this zone.

2. Moderately Rainfall Zone :

It is found that the Moist Mixed Deciduous Forest and Dry Mixed Deciduous forests are in this zone. Because of that the zone consists of north-south strip between 15-30 km. parallel to the Western Ghats fall in this zone. The mean annual rainfall is between 1450-2000 mm. received mainly from the south west monsoon. Of this about 30 per cent of the rain is received in the month of July and August. The eastern portions of Shahuwadi, Panhala, Bhudargad, Ajara and Chandgad tehsils and Western portions of Karveer, Kagal, Gadhinglaj tehsils fall in this zone.

3. Low Rainfall zone:

It is investigated to the found Dry Deciduous Forest in this zone. It comprises to the eastern



portion of Karveer, Kagal, Gadhinglaj tehsils and the Shirol and Hatkanangle tehsils fall in this zone. A north- south strip between 30 to 60 kms Parallels to the Western Ghats fall

4. Drought Prone Zone :

It is observed to the mean annual rainfall along eastern boundaries of the Shirol and Hatkanangle tehsils is only about 475 – 500 mm. This is received between June to September from the south-west monsoon and a few showers up to November end from the north east monsoons. However, the rainfall in this zone is very low and unreliable. Stunted scrub forests are found in this zone.

The geographical area of Kolhapur district is 7685 sq. km. and is spread over 12 tehsils viz. Chandgad, Gadhinglaj, Ajara, Kagal, Bhudargad, Hatkanangle, GaganBawada, Panhala, Shirol, RADhanagri, Karveer and Shahuwadi. The recorded forest area of the district including sanctuary areas is 1744.50 sq. km. which is 22.70 per cent of the geographical area of the district. The Kolhapur Forest divisions however has a forest area of 1389.71 sq. km. that spread over 8 forest ranges and all 12 tehsils and is 18.08 per cent of the geographical area.

As per the 'SOFR 2005' published by forest Survey of India, Dehradun, the 'Actual Forest Cover' of Kolhapur district is 1657 sq. km. that is 21.56 per cent of the geographic area out of which, very dense forest cover is nearly 6 per cent while moderately dense is 57 per cent of the total forest cover. The open forest cover constitutes 37 per cent of the total area under forest cover. This means about 63 per cent of the actual forest cover within the district is moderately dense to very dense.

Distribution of Forest Area :

According to the SOFR 2005 forest cover 1389.77 sq. km. of area falling within the jurisdiction of Kolhapur Forest division. This area includes 65.34 sq. km. of Sheri Land which

is included in the register but only 11.77 sq. km. area is in actual possession of the Kolhapur division.

Remaining 53.57 sq. km. Sheri Land as well as 3.36 sq. km. forest area is still in the possession of the Revenue department. Therefore, actual forest area in possession of the Kolhapur Forest division is 1332.78 sq. km. while 351.42 sq. km. forest area falls within two wild life sanctuaries viz. Radhanagari Sanctuary (282.32 sq. km.) and is managed under the separate management plans by the Kolhapur wildlife division. Similarly 56.93 sq. km. forest area lies with the Revenue department which includes 53.37sq. km. of Sheri lands. The recorded forest area of Kolhapur district therefore, is 1744.50 sq. km. which is 22.70 per cent of the geographical area of the district.

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Above table shows Range wise distribution of forest area in Kolhapur division. It is found that the area of reserve forest cover is 33429.65 hectares out of 32.78 per cent area under section 20, 61.10 per cent under section 4 and 6.12 per cent under required area. It's observed that the (24.96 %)(250060.54 hectare) area of Chandgad tehsil it is highest forest cover followed by Gargoti and 18736 hectare (18.66 %), Panhala 15815 hectare (12.35 %), Karveer 7105.32 hectare (7.08%), Gaganbawada 4930.29 hectare (4.91 %) and Radhangari 797.03 hectare (0.79 %). These are the reserved forest cover become in deferent section. The protected forest cover in various range of forest area distributed of Kolhapur division. The highest region has shows range of Gargoti is 6575.82 hectare (19.67%). Followed by Ajara 6169.33-hectare (18.45 %), Gaganbawada 5845.23-hectare (17.49 %), Karveer 5715.30-hectare (17.10 %), Panhala 4053.73-hectare (12.13 %), Malkapur 3294.20-hectare (9.85 %) and Radhanagari 1776.04-hectare (5.31 %) Chandgad proportion of range shows negative of protected forest distribution.

**Table 1 : RANGE WISE DISTRIBUTION OF FOREST AREA IN KOLHAPUR DIVISION**

SR No.	RANGE	No. of COMP	RESERVED FOREST				PROTECTED FOREST	UNCLASSIFIED FOREST	TOTAL AREA (Hect)
			Sec. 20	Sec. 4	Acquired	total			
1	Chandgad	146	99.51	0.49	0.00	24.96	0.00	42.19	19.59
2	Ajara	172	8.39	88.62	2.99	12.35	18.45	2.62	13.46
3	Gargoti	176	0.00	86.21	13.79	18.66	19.67	0.75	18.24
4	Rad.nagari	27	58.56	41.44	0.00	0.79	5.31	0.00	1.85
5	Karveer	107	42.87	53.01	4.12	7.08	17.10	9.29	9.57
6	Gagn.bawada	91	69.40	21.75	8.85	4.91	17.49	15.76	8.34
7	Panhala	163	0.00	96.73	3.27	15.75	12.13	8.28	14.60
8	Malkapur	154	0.00	87.50	12.50	15.50	9.85	21.10	14.35
	Total	1036	32.78	61.10	6.12	100.00	100.00	100.00	100.00

Source: State of Forest Report 2005(SOFR), Forest Survey of India, Dehradun

Similarly, the same range has unclass forest, which is highest proportion of range of shows. Chandgad 2164.50 hectare (42.19 %) followed by Malkapur 1082.60 hectare (21.10 %), Gaganbawada 808.53 hectare (15.76 %), Karveer 476.55 hectare (9.29 %), Panhala 424.88 hectare (8.28 %), and Ajara 134.51 hectare (2.62 %). The lowest proportion of range shows of Gargoti 38.33 hectare (0.75 %) and negative shows of Radhanagari.

It is observed that the highest proportion of total forest range density of Chandgad of three categories means Reserve Forest, protected forest and unclassified forest account of 27225.04 hectares and lowest proportion.

It is observed that the total area distribution of forest density shows highest proportion in Chandgad 27225.04 hectare followed by Gargoti 25350.78 hectare (18.24 %), Panhala 20293.81

hectare (14.60 %), Malkapur 19945.10 hectare (14.35 %), Ajara 1870.98 (13.46%), Karveer 13927.17 hectare (9.57 %), and Gaganbawada 11584.05 hectare (8.34 %). And lowest proportion of area of range forest density area has a Radhanagari, which is 2573.07 hectare (1.85%).

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Above table shows that the Tehsil wise distribution of forest area in Kolhapur division and range also. It is observed that the highest proportion of total forest cover from Shahuwadi Tehsil 29312.29 hectare (21.09%) and lowest proportion of Shirol tehsil an account of 897.70 hectare (0.65%).

It is observed that the Kolhapur district has uneven distributed of forest cover of density. Herewith, classified into four categories of levels of density of forest cover of tehsil level.



Table-2 : TEHSIL WISE DISTRIBUTION OF FOREST AREA IN KOLHAPUR DIVISION

Sr. No.	Tehsils	Range	Resrvd Forest			Protected Forest Sec.29	Unclass Forest	Total %	Total Area %
			Sec.20	Sec.4	Acquir ed				
			1	Chandgad	Ch.gad				
		Ajara	90.17	9.83	0.0	15.81	0.00	100	0.84
	Total		99.16	0.84	0.0	0.65	7.62	100	20.43
2	Gadhinglaj	Ajara	34.63	0.00	65.37	74.99	0.00	100	1.26
3	Ajara	Ajara	0.00	99.23	0.77	29.60	0.85	100	11.35
		Gargoti	0.00	0.00	0.00	100.00	0.00	100	0.02
	Total		0.00	99.23	0.77	29.73	0.85	100	11.38
4	Bhudargad	Gargoti	0.00	86.21	13.79	25.71	0.15	100	18.19
5	Radhanagari	R.nagari	58.56	41.44	0.00	69.02	0.00	100	1.85
		Gaganbawada	100.0	0.00	0.00	61.78	4.60	100	0.39
		Karveer	51.75	48.25	0.00	24.48	3.01	100	2.79
	Total		55.52	44.48	0.00	43.78	2.03	100	5.03
6	Gaganbawada	Karveer	0.00	0.00	0.00	100.00	0.00	100	0.25
		Gaganbawada	68.22	22.59	9.19	49.90	7.10	100	7.94
	Total		68.22	22.59	9.19	51.40	6.88	100	8.19
7	Kagal	Gargoti	0.00	0.00	0.00	100.00	0.00	100	0.04
		Karveer	43.68	0.00	56.32	62.75	4.56	100	1.14
	Total		43.68	0.00	56.32	63.88	4.42	100	1.18
8	Karveer	Karveer	0.00	100.0	0.00	51.09	11.71	100	1.77
9	Shirol	Karveer	100.0	0.00	0.00	24.29	0.00	100	0.65



10	Hatkanangle	Karveer	100.0	0.00	0.00	67.22	0.00	100	1.51
11	Panhala	Karveer	0.00	100.0	0.00	26.85	0.00	100	1.47
		Panhala	0.00	99.46	0.54	17.94	2.82	100	7.86
	Total		0.00	99.54	0.46	19.35	2.38	100	9.34
12	Shahuwadi	Malkapur	0.00	87.50	12.50	16.52	5.43	100	14.35
		Panhala	0.00	93.43	6.57	22.34	1.24	100	6.74
	Total		0.00	89.37	10.63	18.38	4.09	100	21.09
Total of Kolhapur Division			32.78	61.10	6.12	24.06	3.69	100	100.00

Source: State of Forest Report 2005(SOFR), Forest Survey of India, Dehradun

Very High Dense Forest:

It is found that according to percentage of forest cover in different tehsils in Kolhapur district. The tehsils of Shahuwadi having a highest proportion of forest cover in Kolhapur district on account of 29312.29 hectare (21.09%), it is very high density of forest incorporate to Malkapur and Panhala range of forest, followed by Chandgad 28396.30 hectare (20.43%) incorporated for Chandgad and Ajara range, Bhudargad 25271.98 hectare (18.19%) incorporated Gargoti range. These are categorise in above 15 per cent means very high density of forest category. The tehsil and incorporated ranges are constituted at hilly and rugged terrain. Mixed semi evergreen and moist mixed deciduous forest are found in this category.

High Dense Forest:

Only Ajara tehsil and incorporated Ajara and Gargoti ranges are tall ink this category. An account of 15809.42 hectare (11.38%) area covered, which divided ranges maximum of Ajara range having a minimum of 29.42 hectare forest hold. Moist mixed deciduous and Dry mixed deciduous forest are found in this category.

MODERATELY DENSE FOREST :

The Panhala 12974.11 hectare (9.34%), Gaganbawada 11378.10 hectare (8.19%) and Radhanagari 6996.00 hectare (5.03%) are fell moderately dense forest category. These are situated in medium and high rainfall zone means above 1500 mm. rainfall zone. Mixed semi evergreen, moist mixed deciduous and dry mixed deciduous forests are found in the zone. The ranges of Panhala, Karveer, Gaganbawada and Radhanagari are incorporated in the three tehsils.

LOW DENSE FOREST:

It is found the tehsils of Karveer 2454.64 hectare (1.77%), Hatkananglae 2092.25 hectare (1.51%), Gadhinglaj 1750.72 hectare (1.26%), Kagal 1637.49 hectare (1.18 %) and Shirol 897.70 hectare (0.65 %) fall in low dense forest category. These are situated in low rainfall zone, which are a north-south strip between 30 kms to 60 kms parallel to the Western Ghats, fall in this zone and has low rainfall. The mean annual rainfall is between 400-900 mm. and 80 per cent of this is received from the south west monsoons between June to September. Dry deciduous forests are found in this tehsils. However, the



Table 3 : DISTRIBUTION OF FOREST AREA IN KOLHAPUR DISTRICT

Sr. No.	Area in Charge of	Reserve Forest in%	Protected Forest in %	Unclass Forest in %	Total in %
1	Kolhapur Forest Division	72.69	23.56	3.75	100.00
2	Wild Life Division	65.87	14.39	19.74	100.00
3	Revenue Dept.	61.95	35.66	2.39	100.00
	Total	70.96	22.10	6.93	100.00

rainfall in Shirol and Hatkanangale very low and unreliable. Stunted scrub forests are found in those tehsils.

The above chart show that the highest area is under R.F. in Kolhapur Forest Division is 72.69 per cent. And lowest is under U.F. which counts only 3.75 per cent. Wild Life Division is having R.F., P.F., U.F., 65.87%, 14.39 % and 19.74 % respectively. The Revenue Department estimates 61.95% under R.F. 35.66% under P.F. and U.F. 2.39 %. Obviously, the highest total area is under R.F. and lowest is under U.F.

CONCLUSION AND SUGGESTIONS :

In conclusion, the research findings reveal that the current forest cover in Kolhapur district spans 1657 sq km, representing 21.56% of the geographic area, as documented in the State of Forest Report (SOFR) 2005. This forest cover comprises 'very dense' (6%), 'moderately dense' (57%), and 'open forest cover' (37%). Aligning with the National Forest Policy of 1988, which emphasizes environmental stability, ecological balance restoration, and forest preservation, efforts must be directed towards increasing the forest and tree cover to 33% of the country's land area. Presently, the recorded forest area in Kolhapur district, including sanctuary areas, encompasses 1,744.50 sq km (22.70%) out of

the total geographical area of 7,685 sq km, distributed across 12 tehsils. To achieve this goal, it is imperative to enhance the forest cover in moderately and least dense areas, particularly in tehsils such as Karveer, Hatkanangle, Gadhinglaj, Kagal, and Shirol, through the plantation of fast-growing trees and sustainable management practices. Additionally, the protection of natural and man-made forests on hill slopes in catchment areas of rivers and lakes is crucial for maintaining ecological balance and environmental stability. Regulatory measures should be implemented to monitor saw mills and prevent their adverse effects on forest protection. Surveying and demarcating forest land, along with updating forest maps and land records, are essential steps to prevent encroachment. Furthermore, raising public awareness about the significance of national parks and sanctuaries and fostering community engagement in conservation efforts are vital. Encouraging the use of environmentally friendly public transportation and promoting bicycle tracks can contribute to minimizing human-induced impacts on forest ecosystems. These proactive measures are imperative for sustaining the ecological integrity and biodiversity of Kolhapur district's forests, ensuring their long-term viability for future generations.

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