

SPATIAL DISTRIBUTION OF SANDALWOOD FARMING IN KOLAR-CHIKKA BALLAPUR DISTRICTS

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ABSTRACT

This research article analyzes the spatial distribution of sandalwood farming in kolar-chikkaballapur districts of Karnataka, which is currently extending in Karnataka. It study mainly the taluk wise distribution of sandalwood cultivation, the number of trees grown per acres under the cultivation and following methods of cultivation, short term and long term crops that bring profitable income with sandalwood and about the sandalwood protection measures in cultivation etc. It discusses the challenges faced by sandalwood cultivation in the districts of Karnataka and the steps taken by government to overcome these problems. For this study purpose, information has been collected through primary and secondary data. Based on this, the distribution of sandalwood cultivation in the district has been explained. This study suggests that sandalwood cultivation should expend and develop cultivation in the districts of Karnataka. For this, the government should formulate more programmes and encourage sandalwood growers, suggesting that technical methods should be adopted in sandalwood cultivation.

Key words: Santalum album L, Spatial Distribution, Kolar, Chikkaballapur, Gouribidanur, Chintamani, Bangarpet.

Introduction

Sandalwood is an economically valuable resource and has great cultural significance. It is used in the preparation of ayurvedic medicines, religious purpose, carvings, perfume, soap, powder, cosmetics etc. There are more than 47 spices of sandalwood, of these the santalum album L spices is superior quality, rich in aroma and has a high percentage of oil content. It is also known as East Indian sandalwood. It is widely found in India. Especially grown in the southern states of Karnataka, Tamilnadu and Kerala. Karnataka is famous for superior quality of sandalwood production so it is called as "land of sandalwood". The natural factors like climate, temperature, rainfall, soil, moisture, irrigation etc are suitable for the growing of natural sandalwood and sandalwood farming. Sandalwood is mostly grown in southern interior districts of Karnataka. Among those districts, kolar and chikka ballapur are also major sandalwood growing regions. Recently the government of Karnataka has changed its sandalwood policies and is giving more encouragement to sandalwood farming. Due to this, some progressive farmers of this district have started sandalwood farming in their private lands with mixed cropping system. Sandalwood cultivation is distributed in kolar, bangarpet, gouribidanur and chintamani taluks. Factors like weather, rainfall, irrigation, forest department guidance market facilities etc are influencing the distribution of sandalwood farming here. However, the lack of knowledge about sandalwood farming, complex harvesting of sandalwood process, protection of trees from theft etc have to be faced

cultivation is limited. The main purpose of this study is to understand the development and distribution of sandalwood cultivation in kolar and chikkaballapur district. It analyzes the economic benefits. This study will help in the development and expansion of sandalwood farming not only in this district, also in other districts in future. Improve the economic condition of the farmers. It will help in promoting sustainable cultivation in other districts of Karnataka.

Objectives

To understand the development and distribution of sandalwood farming in the districts of kolar and chikkaballapur of Karnataka.

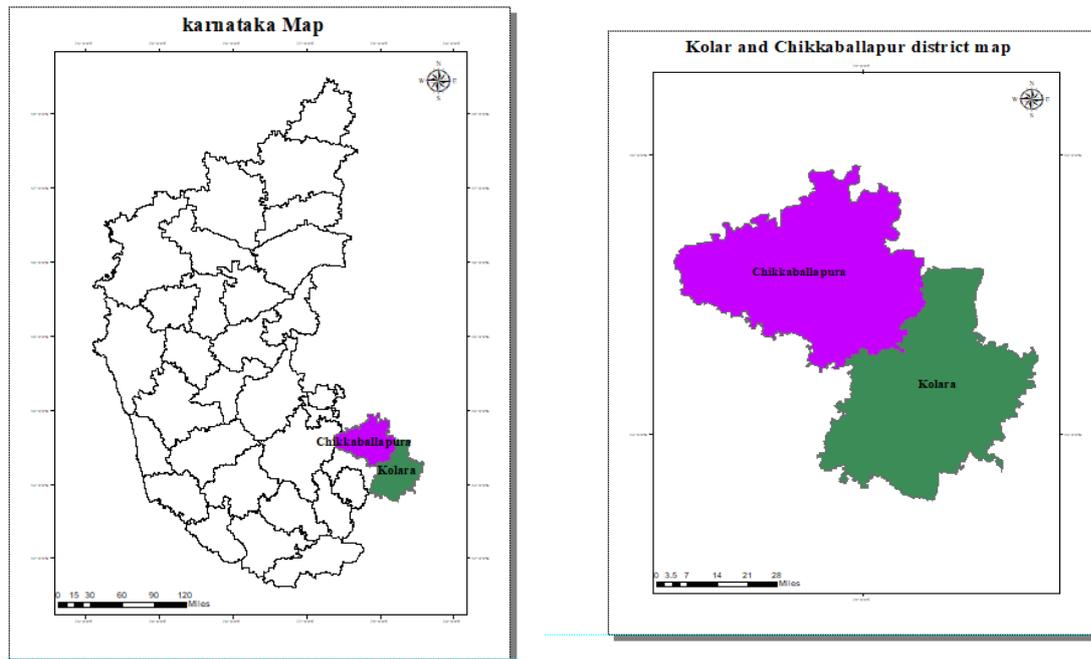
Study Methodology

In this study, descriptive method has been adopted. For this, primary data has been collected by visiting the study areas and secondary data has been collected from the reports of Karnataka forest department, institute of wood science technology (IWST), sandalwood society of India etc and document analysis has been done.

Study Area

Karnataka state has 31 districts. Among these kolar and chikkaballapur districts are one of them. Kolar district is famous for gold mining and is called as "land of gold". On august 23, 2007. Chikkaballapur is bifurcated from kolar district and formed a new district. Although administratively divided, they have similar physical features. These two districts are part of the southern plateau. They are located in the south-eastern part of Karnataka. kolar district is extend from 12°45'54"N to 13°35'47"N latitudes and from 77°50'29"E to 78°35'38"E longitudes. Chikkaballapur district extends from 12°45'N to 13°57' N latitude and from 77°24' E longitude to 78°35' E longitude. Kolar has a geographical area of 4012 sq.km. It has five taluks namely kolar, srinivaspura, bangarpet, malur and mulabagilu. Chikka ballapur has a geographical area of 4244sq.km. It has a six taluks they are chikka ballapur, gowribidanur, gudibande, bagepalli, shidlagatta and chintamani. The palar, north and south pinakini rivers flow through these districts and are the main water sources. These districts are located in the eastern dry climate zone. Dry deciduous forest and scrub forest are mostly distributed. kolar has 170519 hectares of cultivatable land and chikka ballapur has 1.99 lakh hectares of cultivable land. According to 2011 census the total population of kolar is 1536411 and chikkaballapur total population is 1255104.

Figure1: Study Area Map



Spatial Distribution of Sandalwood Farming In Kolar-Chikkaballapur Districts

Kolar district is called as the land of gold. In 2007, this district was bifurcated and chikka ballapur was formed as new district. These two districts are famous for mango cultivation and milk production. Apart from this, crops like, grapes, pomegranate chikko, guava, vegetables, millets, red grams, urad and sandalwood are grown. Kolar has a cultivated area of 170519 hectares and cultivation area of 1.99 lakh hectares in chikka ballapur. Most of its dry land. Mainly rain fed and irrigation farming is found in this district. These districts are located in the Deccan plateau region. It has a dry climate with an average temperature of 26.61°C, receives an annual rainfall of 735cm. Red loamy soil, red sandy soil and lateritic soil is largely distributed in this district. All these natural factors are favourable for growing of sandalwood.

The Karnataka forest act of 2001 was amended to the stringent sandalwood regulations of the forest act of 1963. Through this act, sandalwood growers are being encouraged to develop and expand sandalwood cultivation in the state. In this acts, rights of the owners of sandalwood trees, the processes of cutting and selling of sandalwood were simplified. Direct transactions were allowed between the growers and government. As results, progressive farmers from several districts of the state have started sandalwood cultivation. There are various types of sandalwood farming. Out of these, sandalwood growers can adopt the sandalwood farming types that is suitable for them and earn more income. It is given in the following table.

Table1: Income From Various Types Sandalwood Farming Methods

Sl.No	Farming Types	Total Expenditure	Gross Income	Net Profit
1	Sandalwood With Agriculturecrop Rainfed Condition	50,75000	1,29,13000	78,38,000
	Sandalwoodwith			

2	Agriculturecrop Irrigation Condition	51,00000	1,81,41,150	1,30,41,150
3	Sandalwood With Forestcrop Rainfed Condition	50,50,000	1,56,77,400	1,06,27,000
4	Sandalwood With Forestcrop Irrigation Condition	52,50000	2,12,94,900	1,60,44,900

source: apccf.karnataka forest department,doresani palya,banglore 2017

Kolar and chikka ballapur districts are also one of the important in sandalwood cultivation. At present, sandalwood farming is distributed more than four taluks they are.

Kolar Taluk

Sandalwood farming is started in 2018 in a 10 acre land in a village of arahalli in kolar taluk. About 2500 saplings have been planted and are currently seven years old trees. Drip irrigation system has been adopted to supply of water to the farming land. Since sandalwood is a long term crops. Hence medium and short term profitable crops are being grown along with sandalwood such as mango, papaya and horticultural crops etc. To protect the sandalwood trees, a thorn fence has been installed around the cultivation land, two guard has been appointed and four local breed dogs have been kept.

Bangarpet Taluk

In chikka akandahalli village of bangarpet taluk, a progressive farmer is cultivating sandalwood in one acre of his four acres of land. 250 sandalwood saplings were planted in 2021. Now they are 5 year old trees. Along with the sandalwood farming, short term profitable crops like cauliflower, potato, marigold, capsicum, Taiwan guava etc are grown. In additional, fish culture is being done in the agricultural pond. A thorn fence has been built to protect the sandalwood trees, a guard has been appointed and 3 local breed dogs have been kept.

Gouribidanur Taluk

Gouribidanur was earlier a part of kolar district. It is currently a part of chikka ballapur district. In bevinahalli village of this taluk a progressive farmers is cultivating sandalwood on his 19 acres of land. He started sandalwood farming in 2007. Initially, 1500 sandalwood sapling was planted and now they are 18 years old mature trees. It ready to harvested. Then in 2020, another 2500 sandalwood sapling were planted and now they are five year old trees. Sandalwood is being cultivated in plantation farming method. Drip irrigation is being followed to supply of water and along with this, agricultural pond is being constructed and rainwater is being collected and used for agricultural purpose. Along with sandalwood farming, sapota, papaya and guava are being grown as mixed crops and fish culture is being done as an additional occupations. To protect for the sandalwood, a solar electric fence has been installed around the farm, two gunmen have been hired and four manhole dogs have been kept.

Chinthamani Taluk

In chowdadena village of chintamani taluk, a progressive farmer is cultivating sandalwood on his 7.5 acres of land. Sandalwood farming is started in 2018 and 1750 sandalwood sapling have been planted and these have grown in to seven years old trees. Again 750 saplings have been planted in 2020. Now it's grown into fiver old trees. Sandalwood farming is being done

in agro forestry method. Sprinkler irrigation is being followed for the water supply. Along with sandalwood farming, crops like sapota, custard apple and neem etc are grown as mixed crops to get medium term profits. Along with farming, sheep and goat are being reared. An eclectic fence has been built around the farming land to protect the trees. Two guards have been appointed and four local breed dogs have been kept.

Figure 2

Sandalwood farming in the Kolar and Chikkaballapur districts

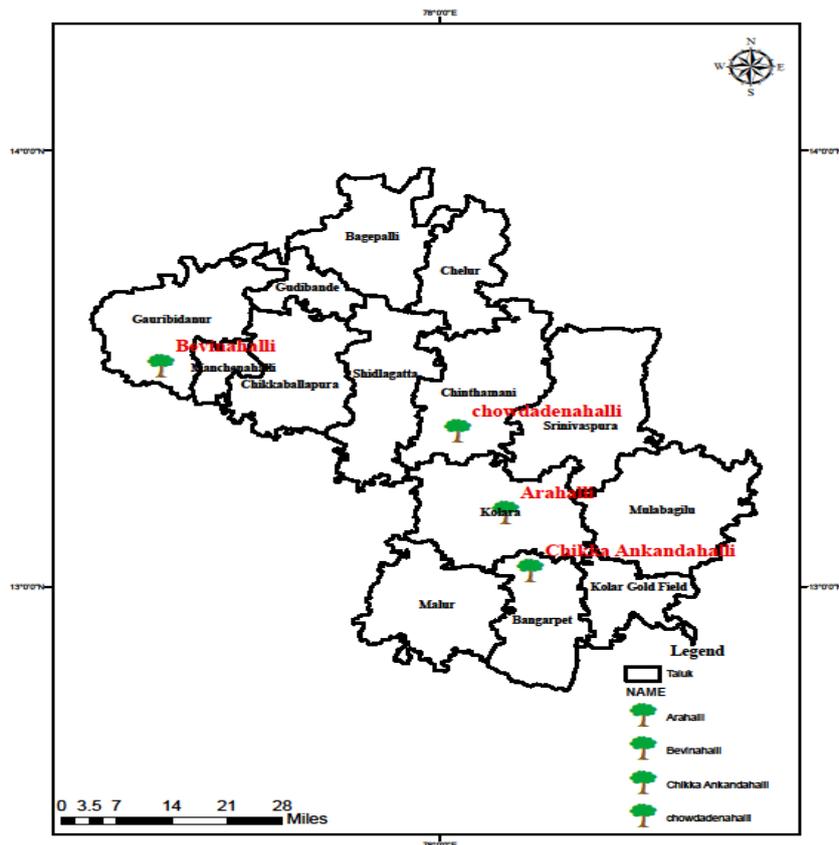


Table 2: Distribution Of Sandalwood Farming In Kolar District

Sl.No	Taluk	Village	Establishment Year	Area (In Acres)	No. of Plants	Farming Type	Adoption Irrigation	Other Crops Cultivated
1	Kolar	Arahalli	2018	10	2500	Plantation Farming	Drip Irrigation	Papaya Sapota Gauva
2	Srinivasapura	—	—	—	—	—	—	—
3	Bangarpet	Chikka Akankanda	2021	01	250	Mixed Farming	Drip Irrigation	Banana, Potato Cauliflower

		Halli				g		
4	Maluru	-	-	-	-	-	-	-
5	Mulabagilu	-	-	-	-	-	-	-

Source: Apccf Forest (Development), Karnataka Forest Department

Table 3: Distribution Of Sandalwood Farming In Chikkaballapur District

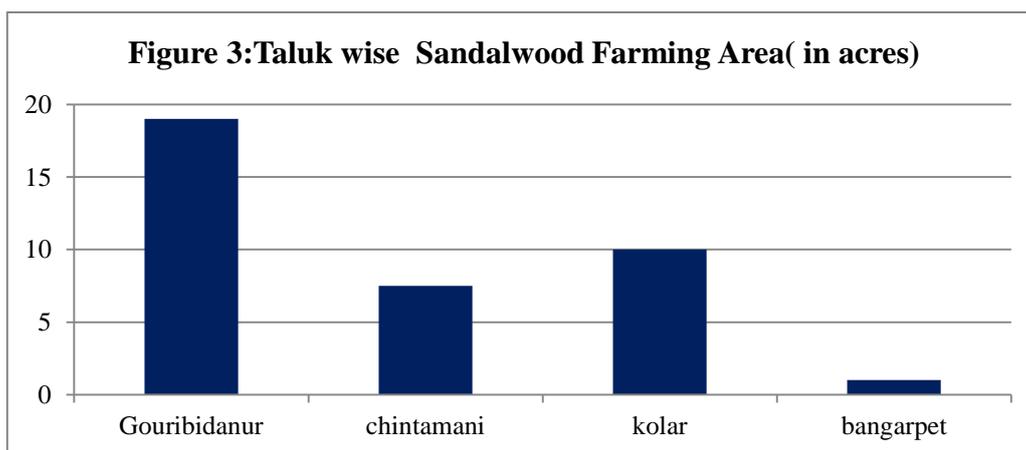
Sl.No	Taluk	Village	Establishment Year	Area (In Acres)	No. Of Plants	Farming Type	Adoption Irrigation	Other Crops Cultivated
1	Chikkaballapur	-	-	-	-	-	-	-
2	Gowribidanur	Bevinahalli	2007, 2020	19	4000	Plantation Farming	Drip Irrigation	Papaya Sapota Banana
3	Shidlaghatta	-	-	-	-	-	-	-
4	Chintamani	Chowda Dena Halli	2018, 2020	7.5	2500	Agro Forestry	Sprinkler Irrigation	Neem, Sapota Custurd Apple
5	Bagepalli	-	-	-	-	-	-	-
6	Gudibande	-	-	-	-	-	-	-

Source: apccf forest (development), Karnataka forest department

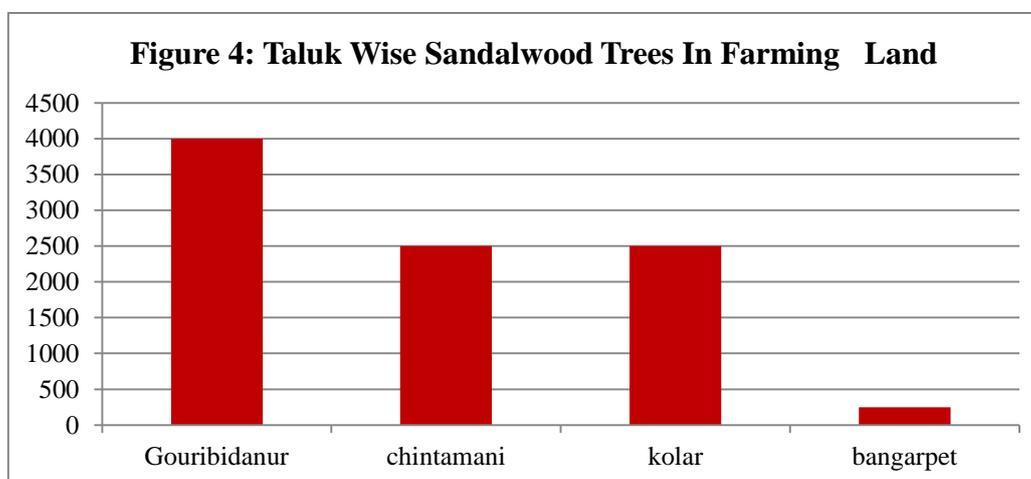
When looking at the distribution of sandalwood farming in kolar-chikkaballapur districts, a total of 37.5 acres of sandalwood cultivation is distributed. Out of this, 26.5 acres are distributed in chikkaballapur and 11 acres in kolar respectively. A total of 9750 sandalwood trees are grown. Out of this maximum 6500 sandalwood trees are grown in chikkaballapur and 2750 sandalwood trees are grown in kolar. the distribution of sandalwood farming by the taluk wise, a total of 4000 sandalwood trees are grown in a area of 19 acres in bevinahalli village of gawribidanur taluk and 2500 sandalwood trees are grown in area of 7.5 acres in chowdadenahalli village of chintamani taluk. 2500 sandalwood trees are grown in a area of 10 acres in arahalli village of kolar taluk and 250 sandalwood trees are grown in an 01 acre of land in chikka ankadahalli village of bangarpet taluk.

Table 4: Taluk wise sandalwood farming area and numbers of plants

Sl. No	Taluk	Area (In Acres)	No.Of Plants
1	Gowribidanur	19	4000
2	Chintamani	7.5	2500
3	Kolar	10	2500
4	Bangarpet	01	250
	Total	37.5	9750



Scale: 1cm= 5acres of Land



Scale: 1cm=500 Sandalwood Trees

Sandalwood is cultivated in a total area of 37.5 acres in four taluk of these districts. Sandalwood is long term cultivation. It requires a long wait to earn more income from it. It takes an average of 20 to 25 years for a mature sandalwood tree to harvest. Sandalwood growers in these districts follow the irrigation based mixed farming systems. According to the cost per hectare and net profit that can be obtained from various sandalwood farming methods given by the Karnataka forest department report in 2017. There is a total area of 37.5 acre of sandalwood farming in these districts. Accordingly, there is $37.5/2.471$ (1 hectars) =15.17 hectars of sandalwood farming areas. In irrigation based farming method, a net income of rs 13041150 can be earned per hectare. Thus the income is $15.17 \times 13041150 = 197834245.5$. The maximum sandalwood trees are grown in an area of 19 acres (7.6 hectars) in gowribidanur taluk is worth rs 99112740. The value of rs 39514684 sandalwood trees grown in an area of 7.5 acres (3.03hectars) in chintamani taluk.the sandalwood trees grown in a worth of rs 52616460 in an area of 10acres(4.04 hectars) in kolar taluk and sandalwood grown in a worth of rs 5216460 in an area of 1acres(0.04 hectars) in bangarpet taluk. The value is estimated on the basis of 2017 report of Karnataka forest department. But the demands of sandalwood is increasing year to years both internal and international market. Hence, it can be estimated that the opportunities for the economical value of sandalwood to increase in future years.

In Karnataka, after the simplification of sandalwood policy in 2001, progressive farmers in several districts of the state have started sandalwood farming. Similarly, in kolar and chikkaballapur districts, a few farmers are growing of sandalwood. However, its area is less compare to other framings. The main reasons are sandalwood is long term crops and maintenance cost is high. On an averge, it takes 20 to 25 years to get a high income. Due to this, economically poor conditions farmers are not able to cultivate sandalwood. Only a few numbers of economically well-off farmers have practice sandalwood farming. In kolar and chikkaballapur district, economically strong farmers are also cultivating sandalwood. The area under the sandalwood is less compared to other crops growing areas. However it is moving towards progress. These districts are the part of Deccan plateau, have a semi arid to dry sub humid climate, receive sufficient rainfall, suitable soil for growing of sandalwood. Rain fed and irrigated farming systems are more prevalent in these districts. All these factors are helpful to the development of sandalwood farming in these districts. Bangalore city is nearby, there is availability of good market facility for the farmers sell the sandalwood. Karnataka soap and detergent ltd and Karnataka state handicraft Development Corporation directly purchase sandalwood from the sandalwood growers through the agreements and provide necessary incentives for growing of sandalwood. All these factors is favourable for the development of sandalwood cultivation and a greater numbers of farmers may became interested to cultivating sandalwood in future. Sandalwood is a high income crops for sandalwood growers. Because it has high demand in the international market and locally. But there is a scarcity of sandalwood in the world. It is grown only in few countries of the world include India. Hence farmers can earn more income by growing of sandalwood.

Sandalwood farming is facing several problems, the most important of which are theft and smuggling of sandalwood trees. Apart from this, sandalwood plants are susceptible to diseases, there is a lack of technical knowledge among farmers, they have to wait for a long duration to get benefits, the maintenance cost is expensive, the process of harvesting sandalwood is difficult etc are the problems of this farming

The government of Karnataka has taken several steps to address these challenges. The main ones are coordination between government and sandalwood growers, strengthening the sandalwood conservation system, encouraging sandalwood grower to growing of more

sandalwood, supplying saplings at subsidized rates, providing credit facilities, development of training programmes on sandalwood farming, providing free access to sandalwood sales etc. through these programmes, the government is encouragement to the development and expansion of sandalwood cultivation. Due to this, it's working to expand further not only in kolar and chikkaballapur district, it also in other districts of the state.

CONCLUSION

Sandalwood farming is highly profitable crop. It is developing more in semi-arid climatic regions of karnataka.sandalwood cultivation is progressing in kolar and chikkaballapur districts. In recent years, the government of Karnataka has amended the sandalwood policies and Karnataka forest department has implemented the siri chandana yojan. Through this, farmers are being encouraged to grow sandalwood in their private land. Due to this, progressive farmers have taken interest to growing sandalwood in kolar and chikkaballapur districts like other districts of the state and have started sandalwood cultivation. But the area under the sandalwood is less. Only a few numbers of farmers are cultivating sandalwood. But their chances that a large numbers of farmers will start sandalwood farming in coming years. Sandalwood cultivation brings more income to farmers and strengthens the economy of districts. For this, it is necessary to formulate programmes to expand sandalwood cultivation in all taluks of this district. In addition, it needs to be expended to other districts of the state. This will help in the economic development of the state and maintain the sustainable cultivation balance.

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