

Geographical Analysis of Areca nut Cultivation in Dakshina Kannada District, Karnataka

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Abstract

Areca nut also known as betel nut or supari is the second most important plantation crop of Dakshina Kannada district after coconut it has been observed that wide differences in productivity of areca nut exist among the farmers with in a village due to socio-economic status. A survey based study was conducted to understand the knowledge level of areca nut growers and link to productivity based on geographical conditions. For this purpose, two areca nut farmers (Chikka Poojari and Nanu Poojari) from a village of edrubail and were randomly selected. Data collected were analyzed following standard statistical procedures. Dakshina Kannada district is located south western part of Karnataka state in India with a population of 20, 83,625 persons (census 2011). Geographically it lies between 13⁰ 50' and 14⁰ 30' north latitude, and 68⁰ .00' and 70⁰.10' east longitude. In this study, it is tried to provide an idea about the costs of areca nut cultivation, potential revenue, labor participation, scope of multi-cultivation, problem involves in cultivation and its potential solution, providing a special preference to the Dakshina Kannada district.

Keywords: Areca nut, Concentration, Harvesting, Multi cropping, and Cultivation.

Introduction

Areca nut or betel nut, as commonly referred in India is a seed of the Areca Palm tree that goes with the botanical name Areca **catechu**. Native to India, also known as supari, the word areca originated from multiple South Indian languages like '**Adike**' in Kannada, Ataykka in Malayalam and Adaikkay in Tamil. According to historians, it is believed that this hard nut with intense flavor was first introduced to European countries by Portuguese sailors. In India, areca nut is an indispensable part of the culture. It is often associated with good omen or fortune and is a must-have in 'tamboolam,' accompanying betel leaves as a part of customary exchange of gifts in functions like weddings, housewarming and even a dolu. For Hindus, chanting the verse Pungi Phala Samayuktam (along with areca nut) while making an offering to the God is an important part of a ritual, without which it is considered incomplete. Extending a spoonful of areca nut to the guests after a hearty meal or nibbling on the tiny bits of it, just to beat boredom is a common sight in the Indian households. Areca nut (Areca catechu L.) is one of the important commercial crops grown in parts of Karnataka, Kerala, Assam, Meghalaya, west Bengal and Andaman and Nicobar Islands. In our country, areca nut is being grown in an area of 3.96 lakh hectares with a production of 5.59 lakh tones in the year 2006-07. India is the largest producer and consumer of

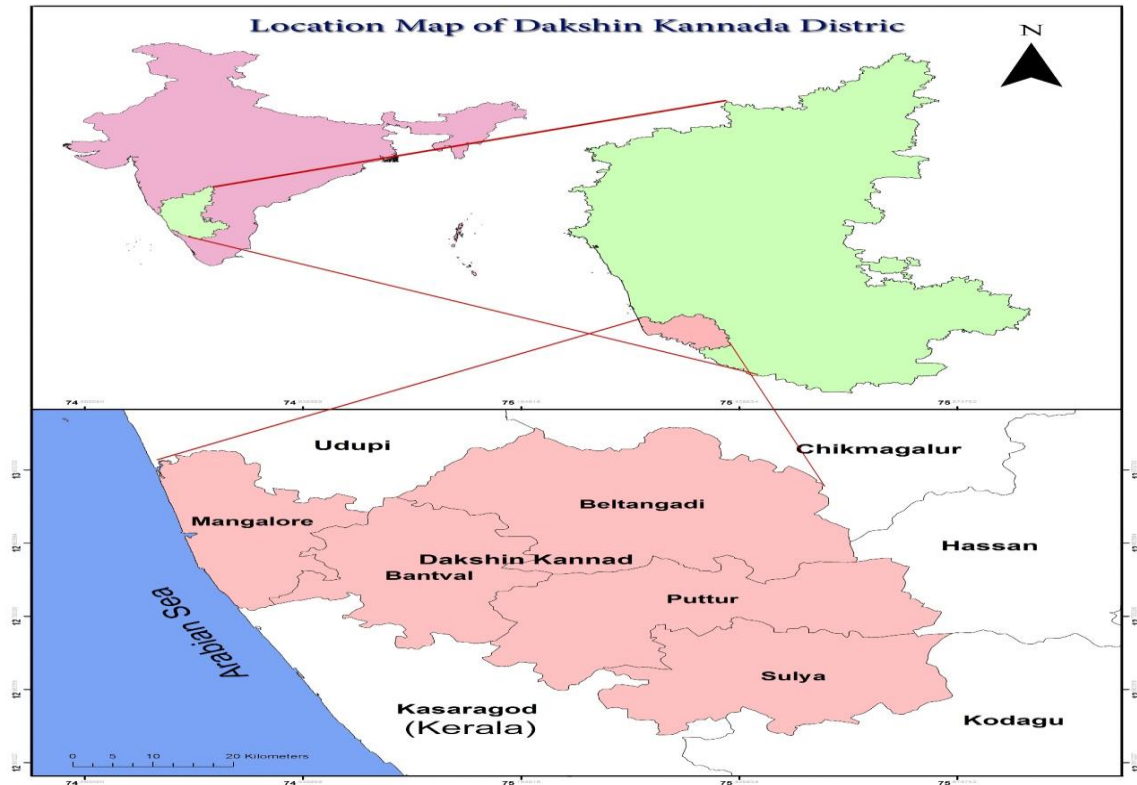
areca nut in the world holding 62% of the area and 60% of the production. The other major areca nut growing countries like Indonesia, Bangladesh, china, Myanmar and Thailand. Areca nut being profitable plantation crop, it is important to understand the package of practices and seasonal operations to be followed in the nursery, in young gardens and in old plantations to get maximum returns. To get additional income in the adverse periods, concept of cropping system is very important which is also documented here for the benefit of farmers and extension officials. The Areca nut is one of the major plantation crops in India, the annual production of which is 4, 15,000 tons per year. Over 7 million farming families are involved in Areca nut cultivation which implies that above 60 million people in our country are dependent on Areca nut for their livelihood by way of labor in Areca nut plantations. Areca nut cultivation has become a way of life, particularly in south India. The current production of Areca nut in the world is about 7.65 lakh tones.

Study Area

The assessment of physical position will result in an understanding of the changing impotence of the setting of the given geographical region and also suggest the likely potentialities of the situation for its development in future. Therefore, with this view an attempt is made in this chapter to know the physical background of the Dakshina Kannada district.

The district of Dakshina Kannada is situated on the western coast of India. About half way between Bombay and Cape Comorin. From north to south, it is a long narrow strip of territory and from east to west; it is a broken low plateau which spread from the western Ghats to the Arabian sea known in kannada 'paschim samudra' (western sea) the major parts of its length lies along the sea board. The area is intersected by many rivers and streams and presents varied and most picturesque scenery. Abundant vegetation, extensive forest, numerous groves of coconut palms along the coast and rice field in every valley, provides a refreshing greenness to the prospect. It is a most densely inhabited tract. Geographically, the Dakshina Kannada region is separated from the rest of south Indian peninsula by the towering heights of the Western Ghats; it spread from the Western Ghats towards the sea to the west. The length of the undivided Dakshina Kannada district's coast-line, which is almost straight, but broken at numerous points by rivers, rivulets, creeks and bays, is 76 nautical miles (140.8 km) now its coastal lines have been reduced to 42 kilometer after the formation of Udupi district. The district lies between $12^{\circ} 27'$ and $13^{\circ} 58'$ north latitude and $74^{\circ} 47'$ and $75^{\circ} 45'$ East longitude.

The district is bounded by Udupi and Karkalla taluks of Udupi district in the north, Mudigere taluka of Chikkamagalur district on the north east, Sakalespur taluk of Hassan district on the east, Madikeri and Somawarapet taluks of Kodagu district in the southeast and Kannur district of Kerala state on the south and is surrounded by the Arabian Sea on the west.



Objectives

- To know how geographical factors plays an important role in production of areca nut.
- To analysis the different systems of farming of areca nut and their operations and
- To measure and examine the levels of horticulture differences between the regions.

Data base and methodology

The present study is based on primary and secondary data collected from department of agriculture, Mangalore, district statistical office, socio-economic reviews of Dakshina Kannada district, district census hand book, etc. and also referred to and collected relevant information, statistical techniques have been used in this study. The district is considered as a real unit for investigation and analysis the study area poses five units. An attempt has been made to calculate cropping patterns. Secondary data used for this study apart from primary data's and field observations are carried out in this selected agriculture field in the study area.

Status of agriculture in the district

The net sown area is 1.31 lakh ha and forms 28% of the geographical area (4.77 lakh hecter). The gross cropped area stood at 1.57 lakh ha. The land holding pattern in the district indicates that small and marginal land holdings account for more than 90% of the total holding. Paddy is grown in 54633 ha. Cropping pattern shows that nearly one- third of the gross cropped area is under food grains and remaining under Plantation and horticultural crops like coconut, areca nut cashew etc.

Climatic Requirements

Agro climatic regions zone: western plain and Ghats as well as the north eastern hills. Thecultivation of

areca nut is mostly confined to 28° north and south of the equator.

Altitude: Areca nut grows in a wide range of temperature between a minimum of 4°C and a maximum of 40°C. However, the palm flourishes well within a temperature range of 14°C to 36°C.

Rainfall: Areca nut requires abundant and well distributed rainfall. It grows well in tracts, where annual showers may go up to or even more than 4500mm. but it also survives in low rainfall areas having 750mm annual precipitation. During prolonged dry spell should be irrigated.

Soil: Areca nut cultivation was predominant in gravelly laterite soils of red clay type of southern Kerala and coastal Karnataka. Laterite, red loam and alluvial soils are most suitable. In plain region or maiden part of Karnataka. It is cultivated in fertile clay loam soils, in areas, where tank irrigation is common practice, the soils may have admixture of tank slit. Soil pH range from 5.2 to 7.0 is suitable for cultivation.

Coastal sand and alluvial: This soil can be found all along the western ghat region. Soil particles size varies from the bigger size to loam and clay. Water holding capacity of this soil is poor. Generally this type of soil in alkaline/saline soil found here.

Laterite soil: This type of soil is found in the entire coastal area with the undulating topography. Alkalinity and silica are found in low level. Top soil is characterized by the presence of small gravels and big sized sand particles. Soil is acidic in nature with poor water holding capacity. The drainage capacity is more and phosphorous, potash and calcium are found in less quantity.

Red clay soil: These soils are found in moderately slope/undulating and in the foot hill region. Usually soil is red in color. In some places red mixed yellow color is also seen. Soil particle varies from sand to sand mixed with small stones in size. This soil is also acidic in nature with low level of phosphorous, potash, calcium.

The Concentration of Areca nut Crop in Dakshina Kannada district

The concentration of areca nut was found in all the taluks of the district. During 2000- 2001, Puttur and Sullia taluks were seen in high concentration. But two taluks noticed medium Concentration i.e. in Bantwal and Belthangady. Mangalore taluk was found as low concentration region in the district. During the year 2020-2021 high concentration of areca nut on the district were found in Puttur and Sullia. Whereas, medium concentration was noticed in two taluks i.e. Bantwala and Belthangady. Remaining one taluk Mangalore was noticed in low concentration region. During the 15 years period, there was not a single taluk found either in high or low concentration group in the district. No taluk shifted as high to medium, low to medium and medium to low and high. There are no changes in concentration of areca nut in the district.

In the following table we have shown the concentration of areca nut and paddy crops in Dakshina Kannada.

Concentration of Areca Nut Crop in Dakshina Kannada

For the clear cut picture of the study patterns of land utilization, patterns is made the help of secondary data obtained from social-economic abstract of Dakshina Kannada district. In order to determine the taluk wise concentration of areca nut crops Bhatia's method is used for the location quotient. The following formula is used to work out the concentration of areca nut crop in Dakshina Kannada district.

$$\begin{array}{l}
 \text{Area of crop 'A' in the} \\
 \text{Component areal unit (taluk)} \\
 \text{-----} \\
 \text{Area of all crops} \\
 \text{In the component} \\
 \text{Areal unit (taluk)} \\
 \hline
 \text{Area of crop 'A' in the} \\
 \text{Entire (district)} \\
 \text{-----} \\
 \text{area of all crops in the} \\
 \text{Entire region (district)} \\
 \hline
 \text{\%}
 \end{array}$$

Crop	High concentration	Medium concentration	Low concentration
Areca nut	Puttur-1.26 Sulya-1.73	Bantwal-0.84 Belthangady-0.89	Mangalore-0.31

Garden establishments

Selection of site and layout: Areca nut thrives well in humid areas protected well against hot sunburn and heavy wind. Aligning the rows in north-south direction with a deviation of 35° towards south-west lowers the incidence of sun scorch. Since the areca palm does not withstand either water logging or drought. The site selected should have proper drainage facilities. The soil depth and the depth of the water table are other two parameters to be considered while selecting the site. The soil should be deep (preferably not less than two meters) AND water table should be sufficiently low for better root development. Water logged condition favors root rotting and production of aerial roots.

Spacing: A spacing of 2.7m×2.7m is recommended for areca nut planting. When, areca nut is planted as mixed crop with other crops. Wider spacing of 3.3m×3.3m will be optimum. Dwarf areca cultivator and hybrids may be grown in 2.2m×2.2m spacing.

Depth of planting: Depth of planting is mainly decided by the soil type and the height of water. In laterite soil with good drainage, the seedlings are planted at 90cm depth to get vigorous, early bearing and high yielding palms.

Season of planting: In Dakshina Kannada the plantings can be done in the months of May- June.

Mulching is done immediately after planting, before end of monsoon, to avoid drying up of the top soil.

Drainage: For better growth and development of the plants, proper drainage is essential. The number of drainage channel depends upon the soil type. In light soils the number of channels may be less and in heavy soils the channels should be dug in each row and borders around the plot for proper drainage of the excess water. The channels should be at least 25-30 cm deeper than the depth at which the seedlings are planted.

Areca Nut Based Cropping System in Dakshina Kannada district

**Asked many farmers that why do you grow other crops as a mixed farming in areca plantation?*

They say the long pre period, low returns during the initial bearing stage, fluctuations in market prices, unexpected loss due to pests and diseases and natural calamities are some of the problems associated with areca nut cultivation. Approximately 60% of the light is intercepted by an adult areca palm and 65 percent of space in areca garden is not effectively utilized. To overcome these problems and to utilize the available resources farmers started growing crops like banana, betel vine, pepper, tapioca,

colocasia, dioscorea, pineapple and jack to realize some income during juvenile phase of areca nut. This practice of growing crops along with the areca nut palms is called inter/mixed cropping. These systems along with high density multi species cropping, increases productivity per unit area and maximize the economic returns. There was perceptible increase in areca nut yield (7-21%) with inter cropping, as they are responsible for creation of favorable microclimate and recycling of large quantities of organic matter, resulting in improved soil fertility.

Reasons for growing areca nut much in the districts

Paddy is the prominent cereal that was widely cultivated in the region under paddy cultivation during the pre-independent time. But now the situation brought changes in paddy cultivation. As now Farmers are concerned about the decline in the paddy cultivation. During the focus Group discussion, a paddy farmer Chikka poojary (Edrubail) expressed his apprehension about the present condition of farming and narrated factors that have contributed in the decline of paddy farming in both udupi and Dakshina Kannada. According to him, the introduction of land Reform Act in 1960s (he says, OOLUVAVANE HOLADA ODEYA) has contributed in the decline of paddy as Big land owners had to give away the land to laborers who were tenants in the paddyland. The long stretch of paddy fields from the village slowly disappeared and this change did not happen overnight but was continuous.

Why they are coming out from their paddy field?

The conversion of paddy fields into areca nut plantation in the commercializing the Agriculture sector is clearly visible, we asked many farmers in Edrubailu village during our field visit. After discussion with farmers on reasons for declining of paddy cultivation. We came to know the followings are the main causes behind this. Such as, Lack of laborers for plugging, transplanting, harvesting and crop related diseases have made farmers to opt out from this cultivation. Paddy farmer's chikka poojary, Nanu poojary and other farmers in edrubail village of bantwal, they say that increased cost of production for rice and low productivity of land led to poor performance. Village farmers say, disinterest of their children or housemates on growing paddy in their fields is also a reason behind this. Farmers say, their children's or family members want to be in cities like Bangalore, Mysore, and Bombay. Here we can get to know the youth itself discourages the agriculture now a day. As farmer chikka poojary said, women are moving away from agriculture and are engaging in small-scale industries, factories, beedi rolling or as agriculture wage laborers in the region. Fragmentation of the joint family into nuclear families resulted in fragmentation of the landholdings between family members. Size of the agriculture landholding among the individuals is decreasing because of fragmentation of joint families. Some farmers say, they cannot work much as earlier. (Intolerable temperature in the atmosphere by climate change (global warming), lack of nutrition in their food in taking. these are also two main reasons for getting back from paddy field. Many youngsters are migrating to town and city in search of education and better job opportunities. From post land reform phase (1970-80 onwards), both the districts (udupi and D.K) are experiencing the different types of migrations that could be identified as temporary, permanent, inter village, inter district, state, and international migrations. The situation is similar in, Edrubail villages where rural educated youths are migrating urban centers. A majority of them who have migrated are the Bunts and billavas to Bangalore, Mumbai, and Mysore respectively. Bunts community had maximum paddy land areas when compared to billava families in edrubailu village, but after land reform, they have migrated to Bangalore city in search of education and better job opportunities. Since 1970 onwards, they

started growing areca nut in their land as well as in their empty paddy field. So these are all the reasons for cultivating areca garden much in the district as we studied. Out of all these major problems lack of water (seasonal rainfall) in certain days is also a reason.

Benefits of Areca Nut

There is a lot of scientific research that is currently going on to establish the medicinal and therapeutic properties of betel nut. However, it is an undeniable fact that this nut can cause severe adverse side effects, if not used in moderation. The below are few home remedies or uses of areca nut. Boil betel nuts in hot water, let it cool down and gargle the concoction to beat mouth ulcers and for instant relief from bleeding gums Sipping on betel nut decoction flushes out tapeworms and other intestinal parasites in the gut Mix areca nut powder with sesame oil and apply it on the wounds for pain relief in joints Brush teeth with betel nut powder for removing dental plaque and for whitening teeth naturally consume 10 to 15 ml of areca nut decoction for regularizing periods and for relief from menstrual cramps Intake of betel nut powder mixed with 1 tsp of lime juice stimulates appetite and alleviates nausea.

Meetings to discuss the problems faced by Areca Farmers in areca cultivation

The Areca nut Research and Development Foundation[R] (ARDF); The CAMPCO Ltd., Mangalore and Vivekananda Engineering College, Puttur had jointly organized another Krishi Yantra Mela II 2012 at Vivekananda Engineering College Grounds, Nehru Nagar, Puttur- 574 203, Dakshina Kannada, Karnataka, from 2-11-2012 to 04-11-2012. It was inaugurated by Dr.Sri.D.Veerendra Heggade, Dharmadhikari, Shrikshethra, Dharmastala. In this program Sri.Yogish Bhat, MLA, Mangalore North; Sri. Nalin Kumar Kateel, Member of Parliament, Mangalore; Smt. Mallika Prasad, M.L.A. Puttur were present. About 156 exhibition stalls were arranged along with field demonstrations and Seminars. On the last day of the Mela Sri. D. V. Sadananda Gowda, Ex. Chief Minister, Government of Karnataka and Sri. Karunakaran, Member of Parliament, Kasaragod, and Kerala participated. About 1.5 lakhs of farmers and other stake holders of the farming community participated in it because of welfare of cropping areca nut in Dakshina Kannada district. In this meeting they have given the information about it. In this Mela, Manufactures of Agricultural Machineries, Innovators of new Agricultural Machines, Machineries manufactured and imported from China, Israel, etc., Farm irrigation and Plant protection equipment's, improved Areca Peeling Machines, Machines meant for Dairy technology, non-conventional energy, Agriculture/Horticulture concerned, multi-dimensional demonstrations and exhibitions were arranged. Farmers from 12 Areca growing districts of Karnataka and 5 districts of Kerala, altogether about one lakh Farmers had participated in this 3 days event. Provisions were also made for Seminars, Live demonstrations.

Interaction between CIAE Scientists and innovative Areca Farmers

As the areca farmers are facing acute shortage of manpower for carrying out field as well as post-harvest operations in Areca nut cultivation, the ARDF, along with the CAMPCO had arranged an interactive meeting between the Scientists of the Central Institute of Agricultural Engineering, Coimbatore and progressive and innovative Areca Farmers at CAMPCO Mangalore on 21-7-2014 to project the requirements of Areca Farmers in the field of mechanization. The Principal Scientist and Head of the Station of CIAE, Dr. S.J.K. Annamalai along with another Senior Scientist Dr. Ravindra

Naik and an Industrialist Sri N. R. Natarajan, from Coimbatore gave a power point presentation on mechanization in the field of Agriculture and Agriculture commodities. About 30 innovative farmers had participated in the meeting.

Harvesting and Processing

I visited some villages in Dakshina Kannada district, there we asked many farmers about Harvesting of nuts. They said "Harvesting of nuts at correct stage is very important for obtaining the produce of better quantity and quality. It should be ensured that fully ripe nuts alone are harvested for profession of chali and kottapak. Unripe or under ripe nuts leads to more of lower grade nuts which ultimately fetches lower prices in the market. The harvested nuts will have to be sun dried for about 45 days in the flat surfaces. It is essential to spread to nuts uniformly in a single layer for drying. Turning of the nuts once in a week may be done for ensuring uniform drying and better quality of produce proper drying of the nuts is important to prevent fungal infection of the nuts in the drying yard. Mechanical flow driers are available for marketing chaali in such system drying takes place for 60-70 hours. Dehusking and grading is practiced thereafter. A dehusking device has been developed to remove husk from drying areca nuts by CPCRI. The cost of dehusker is Rs 10 per kg. Developing on size of quality, grades are made and marketed. The well-known grades are Moti, shrivardan, Jamnagar and jinny. The out turn of patora and koka will be more if unripe or under ripe nuts are harvested. As a byproduct utilization measure areca nut left sheaths are being used in preparation of eco friendly and biodegradable plants with the help of left sheaths plate making mechanic.

Conclusion

Writing, observing, or even criticizing the village is a difficult task because of the inbuilt complexities. Dakshina Kannada villages are complex in their character, as they are rather modern in comparison to other Indian villages and often give the image of small town. Majority of the villages in the district are socially and economically advance; people are politically conscious and aware of development activities. Commercial agriculture has created capital among farmers and importance given to education has brought divergent group of youths into trade, commerce and service sector. The idealistic visions of Indian village has provoked questions about the Dakshina Kannada economy which critically engages with the diverse socio-cultural factors commercial oriented crop productions that have horizontal and vertical relationships in the social, cultural, economic and political Conditions of the district. Land that was a fundamental factor for the production and economic growth of the farmers is losing its value as majority of the youth are showing disinterest in the practice of farming. Many youngsters are migrating to town and city in search of education and better job opportunities. From post land reform phase (1970-80 onwards), the district is experiencing different types of migrations that could be identified as temporary, permanent, inter-village, inter- district, state, and international migrations. The agriculture plantation is one of the important features, in this region as majority of the farmers in the region have plantation crops in their land, like areca nut, coconut; cashew, banana, cocoa, rubber, black pepper and more recent addition is the Vanilla farming. In plantations, people grow perennial crops, which are of commercial use. There is an increasing shortage of agriculture labor every year. During my fieldwork, farmers reported that skilled agriculture labor was not easily available. We were aware of the laborers crisis in the Dakshina Kannada but were shocked when we saw the gravity of the problem. It is observed that small farmers usually engaged their entire family in the agriculture and

big landholders employ wage laborers to carry out farming in the field. Increased literacy and migration has reduced the supply of agriculture labor.

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