

An Analysis of Coconut Cultivation in Kasaragod District, Kerala: A Geographical Study

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Abstract- The coconut palm is referred to as 'Kalpavriksha' the tree heaven as each and every part the palm is useful to mankind in one way or other. It provides food drinks, fuel and timber. Millions of families in India depend on coconut for their livelihood either directly or indirectly India ranks third in area and production of coconut in the world. The four southern state viz. Kerala. Tamil Nadu, Karnataka and Andhra Pradesh are the major coconut producing states in India accounting for more than 90 per cent of area and production. There is a great scope for enhancing the productivity of coconut through adoption of scientific cultivation technologies, which are described here under. The present study is based on primary and secondary data. Data collected from Central Plantation Crops Research Institute (CPCRI) Kasaragod, Kerala. - District census hand book, etc. This study focus on how geographical factors play an important role in production of coconut. An attempt has been made to analyze the coconut cultivation of the study region. Secondary data used for this study apart from primary data's and field observation is carried out in this selected agriculture field in the study area.

Keyword: Coconut, Problems, Geographical Analysis, Conditions.

Introduction

The word coco -- the botanical genus name for the coconut tree -- is a Portuguese corruption of an aboriginal word for monkey. Across the South Pacific, native peoples thought that the three black depressions on the coconut nut resembled the basic face of a small monkey. The precise origin of the coconut palm is obscure, since it was cultivated and spread around the tropical world so early in history. Botanists tend to agree it likely originated on the sea coasts in the extreme southwestern Pacific. Kerala or Keralam (as it is known in the region's Malayalam language) are called 'alam' meaning 'the land of', and 'kera' meaning 'coconut'. Jammed between the sea and coastal mountains, Kerala is subject to the monsoon rains that flood the land and the rice paddies on the subcontinent's southern tip. Long growing seasons yield a coconut crop every 40 days, with each tree producing 20 to 30 coconuts per harvest. Keralites, most of who seem to have at least four or five trees on their small plots of land, claim they are Kalpavriksham "the trees of heaven." They use the coconuts themselves for food, tender coconuts for water and spirituous toddy for drinking; the fronds for mats and roofs; the oil for cooking; and the husk fiber for a thriving rope industry. They are intrinsically tied to the culture and folklore well. It is a part of every Celebration —as an ingredient in the Keralan delicacies prepared, as offering to the gods and to mark an auspicious occasion (by breaking a coconut). Various terms like copra and coir are derived from the native Malayalam language. Among the leading coconut producing state in india. Kerala is rank first in area and second in production of coconut. Presently (2013-14), coconut is cultivated in the state in an area of 8.09 lakh ha with annual production of 5921 million nuts.

Study area

Kasaragod is, towards the north of Kannur District of Kerala and top most district of Kerala State, locate a land stretching down to the coastal Arabian Sea. Geographically Kasaragod is a northern coastal district of with an area 1992 sq.km. One of the 14 districts in the south indian state of Kerala. Its northern border Thalapady (Mangalore) is located just 10km south to Ullal, which is the southernmost portion of the major port city Mangalore, on the southwestern Malabar Coast of India.

Location and Geographical Area

Kasaragod town is located in the estuary where the Chandragiri River, which is also the longest river in the district, empties into Arabian Sea. The district is the northernmost district of the state of Kerala. Kasaragod is located at 12^o.5' N 75^o.0; E. It has an average elevation of 19 meters (62 feet) Ranipuram or Madathumala (1016 m) peak is the highest peak in the Kasaragod district of Kerala, located in the Ranipuram wildlife sanctuary.

Topography

Kasaragod district lies between 11^o 18' and 12^o 48' north latitudes and between 74^o 52' and 75^o 26' east longitudes. The Western Ghats which run parallel to the sea marks off the district from the adjoining areas outside the state and constitute an almost continuous Mountain wall on the eastern side. The Ghats dominate the topography. The coastline is fringed with low cliffs alternating with stretches of sand. A few miles to the interior, the scene changes and the sand level rises towards the barrier of the Ghats and transform into low pink laterite hills interspersed with paddy field and coconut gardens. Based on the physical features, the district falls into three natural divisions; the low land bordering the sea, the midland consisting of the undulating country and the forest clad highland on the extreme east.

Status of Agriculture in the District

Forests and hilly area comprise the eastern expanse. The forest comprises a variety of timber with teak and other plantations. The hilly areas are mostly cleared and put to private cultivation. Rubber, cashew and ginger are the important crops.

Coconut Development

The objective is to increase production and productivity through the activities such as integrated pests and disease management, integrated Nutrient Management, promotion of inters cultivation, improving irrigation facilities, promote value addition, and ensure availability of quality planting materials and employment generation. Application of lime, micro and secondary nutrients will be ensured

Objectives

- To know, how geographical factors play an important role of coconut cultivation.
- To know the problems of coconut cultivation and.
- To measure the examine, levels of horticulture differences between the regions.

Data Base and Methodology

The present study is based on primary and secondary data collected from Central Plantation Crops Research Institute (CPCRI) Kasaragod, Kerala. - district census hand book, etc. and also referred 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. An attempt has been made to calculate cropping patterns. Secondary data used for this study apart from primary data's and field observation is carried out in this selected agriculture field in the study area.

Climatic Requirements and Garden Establishments:

Agro Climatic Requirements: Coconut is essentially a tropical plant but has been found to grow under varying agro climatic conditions. The mean annual temperature for optimum growth and maximum yield is stated to be 27°C with a diurnal variation of 60°C to 70°C and relative humidity more than 60%. The coconut palm thrives well up to an altitude of 600 m above MSL. The coconut palm thrives well under an evenly distributed annual rainfall ranging from 1000 mm to 3000 mm. However, a well distributed rainfall of about 2000 mm is the ideal rainfall for proper growth and higher yield.

Soil: The coconut palm can tolerate wide range of soil conditions. But the palm does show certain growth preferences. A variety of factors such as drainage, soil Depth, soil fertility and layout of the land have great influence on the growth of the palm. The major soil types that support coconut in India are laterite, alluvial, red sandy loam, and coastal sandy and reclaimed soils with a pH ranging from 5.2 to 8.0.

Selection of Site: Soil with a minimum depth of 1.2m and fairly good water holding capacity is preferred for coconut cultivation. Shallow soils with underlying hard rock, low lying areas subjected to water stagnation and clayey soils should be avoided. Proper supply of moisture either through well distributed rainfall or irrigation and sufficient drainage are essential for coconut.

Preparation of the Land: Size of the pit depends on the soil type and water table. In laterite soils large pits of the size 1.2m x 1.2m x 1.2m may be dug and filled up with loose soil, powdered cow dung and ash up to a depth of 60 cm before planting. In loamy soils, pits of size 1m x 1m x 1m filled with top soil to height of 50 cm are recommended. While filling the pits, two layers of coconut husk can be arranged at the bottom of the pit with concave surface facing upwards for moisture conservation. After arranging each layer, BHC 10% DP should be sprinkled on the husk to prevent termite attack. In laterite soils, common salt @ 2 kg per pit may be applied, six months prior, on the floor of the pit to soften the hard pans.

Spacing: In general square system of planting with a spacing of 7.5m x 7.5m is recommended for coconut. This will accommodate 177 palms per hectare. However, spacing of 7.5 to 10 m is practiced in various coconut growing regions of the country.

Planting Material and Planning: Vigorous seedlings which are one year old, having minimum of six leaves and girth of 10 cm at the collar level should be selected for planting in the main field. Early splitting of leaves in the seedlings could be a criterion for selecting good seedlings. However, 18 -24 month old seedlings are preferred for planting in water logged areas. Planting the seedlings during May with the onset of pre-monsoon rain is ideal.

Verities: The tall varieties are extensively grown throughout India while dwarf is grown mainly for parent material in hybrid seed production and for tender coconuts. The tall varieties generally grown along the west coast is called West Coast Tall and along the east coast is called East Coast Tall. Benaulim is the tall variety grown in Goa and coastal Maharashtra. Laccadive Ordinary, Laccadive Micro, Tiptur Tall, Kappadam, Komadan and Andaman Ordinary are some of the tall varieties.

Problems of coconut cultivation

- 1. Attack of pests and diseases:** - the drop of control keys, premature nuts is because of infection of female panicles by virus phytop Hthrog spp. shedding of control keys was found to become principally because of the assault of moth, beetle and rats.
- 2. Nutritional deficiency:** - health insufficiency in soil is accountable for shedding of control keys. Manures application escalates the production of female plants rather than simply by decrease in burning off of switches.
- 3. Unfavorable soil and climate conditions:** - switch shedding develops because of debt of dampness as because of extra wetting.

Relating to pate (1938) the shedding of button was high during august/September and somewhat lessen during various on weighting soil thari on ideal soil.

4. Defective pollination and fertilization: - not perfect pollination of perhaps insufficient pollination is known as to make a difference point of switch shedding man-made pollination didn't minimize burning off.

5. Formation of abscission layer: - when the upsurge in shedding of central keys following a period an internal of drought it had been experienced that formula of abscission counting in the area of attachment to stack end.

To check on or perhaps minimize the switches burning off in coconut spraying of two 4-D for 60ppm focus by every week length on feminine plants following fertilization designed for per month showed very helpful and resulted in a lot more than double leg the environment of switches when compared with those of the neglected inflorescence and increased the yield of nuts.

Concentration of Coconut in Kasaragod District of Kerala

Kasaragod in Kerala is an agriculture oriented district and the leading crops are rice, coconut, areca nut, rubber, pepper, cashew nut, tapioca, ginger, banana and other plantains. They accounted about 92 percent of the gross cropped area. At present, the dominant crops are coconut, rubber, areca nut, cashew nut and pepper. Coconut, rubber and areca nut together constituted 80 percent of the total cropped area. Rubber is the second important crop while rice is in the sixth position. This transformation has demonstrated a shift from subsistence cropping to commercial cropping and leads to diversification in agriculture. The filling of paddy lands, expansion of rubber, ever-widening supply gap in food grains and the increasing conversion of paddy lands are main threat to the ecology of the state which is experiencing today. Diversification of crops and The continuous application of chemical fertilizers and pesticides lead to Depletion of inherent nutrients of the soil and problems of deterioration of Ground waters. Hence an analysis of diversification of crops, chemical pollution, Endosulphan issues and its consequences on the farm sector and the health of the farmers of Kasaragod district of Kerala are attempted in this study.

Improved variety of coconut released by ICAR-CPCRI

Variety	Nut yield/palm/year	Copra (yield kg/palm/year)	Oil yield (kg/palm/year)	Area for which recommended
Tall varieties				
Chandra kalpa	100	17.60	12.67	Kerala, Karnataka Tamil Nadu, Andhra Pradesh, Maharashtra
Kera chandra	110	20.79	13.72	Kerala, Karnataka, Konkan Region (Maharashtra) Andhra Pradesh, West Bengal
Kalpatharu	117	20.50	13.96	Kerala, Karnataka, Tamil Nadu
Kalpa prathiba	91	23.25	15.50	Kerala, Karnataka, Andhra Pradesh, Tamil Nadu, Maharashtra
Kalpa dhenu	86	20.81	13.63	Kerala, Tamil Nadu, Andaman & Nikobar Island
Kalpa mitra	80	19.25	12.80	Kerala & west Bengal
Kalpa haritha	118	21.25	14.13	Kerala, Karnataka
Kere kelalam	109	19.18	13.05	Kerala Tamil Nadu, West Bengal
Kalpa Shatabdi	105	28.65	18.34	Kerala, Tamil Nadu, Karnataka
Dwarf/Semi-tall varieties				
Chowghat orange dwarf	112	14.34	9.46	All Coco Nut growing areas
Kalpasree	90	8.64	5.75	Root (wilt) Disease Prevalent Tracts
Kalparaksha	87	11.94	7.83	Kerala & Root (wilt) Disease Prevalent Tracts
Kalpa surya	123	22.88	15.33	Kerala, Karnataka, Tamil Nadu
Kalpa jyothi	114	16.88	9.96	Kerala, Karnataka, Assam

Tall cultivation: The tall cultivars are most common cultivated in all coconut growing region of the worlds. The productive life span of tall cultivars is about 60 years. They grow to a height of 15 to 18m. Tall palms are predominantly cross pollinated and hence do not breed true to type. They produce crop of good quality with fairly high oil content. It takes around 5-7 years for the first bearing after planting. The tall cultivars commonly grown in India are the west coast tall, Tiptur tall and east coast tall.

Dwarf cultivars: Dwarf varieties are shorter in both structure and life span. They grow to a height of 5-7m with an average economic life span of about 40 year. It takes around 3-4 years for the first bearing after planting. They are predominantly self pollinated. The nuts are smaller and the copra is thin, leathery and low in oil content. The dwarf cultivars are generally grown for tender nuts and also used for hybrid seed production. The common dwarfs available in India are chowghat orange dwarf, chowghat green dwarf and gangabondam green dwarf.

Coconut Based Cropping System in Kasaragod

Intercropping and Mixed Cropping: Schedules for inter/mixed cropping may be drawn up based on the canopy size, age and spacing of palms. In general, palms in the age group of 8-25 years are not suitable for inter and mixed cropping. However, cereals and tapioca are recommended as intercrops in young coconut plantation up to 3-4 years. Since ginger and turmeric are

shade tolerant crops with shallow roots, they can be intercropped in coconut garden even in the age group of 15-25 years. It ensures better land utilization, solar energy harvesting, efficient water use, utilization of soil nutrient resources, more returns and an insurance against crop failure. Under conditions of wider spacing i.e. beyond 7.6 m, intercropping is possible irrespective of the age of the palms.

The following crops are recommended as intercrops. Cereals: Rice, maize

Legumes and pulses: Groundnut, horse gram, cowpea
Tubers: Tapioca, sweet potato, yams, colocasia

Spices and condiments: Ginger, turmeric, chilly, pepper, nutmeg, cinnamon, clove

Fruit plants: Banana, pineapple, papaya. (Banana variety Palayankodan is Recommended in the reclaimed soils of Kuttanad. Three suckers per clump have to be retained).

Beverage crop: Cocoa
Fodder grasses: Hybrid Napier, guinea grass –KAU
In all cases, separate application of adequate fertilizers and manures to the individual crop is essential. Mixed Farming by raising fodder grasses such as Hybrid Napier or Guinea grass along with leguminous fodder crops such as Stylosanthes has been found to be profitable. Raising the above crops in one ha of coconut garden can support three to four dairy animals. The animals supply large quantities of cattle manure which when applied to the soil will improve its fertility status. This sort of mixed farming will improve the yield of the palm.

Multiple Cropping System

Coconut + Banana + Sirukizhangu + Bhenidi is suitable system for the eastern region. Crops like banana, pepper, cocoa, nutmeg, vanilla can be tried under multiple cropping systems in suitable areas in the western region. In all the systems, apply recommended quantity of water and manures and fertilizers to the intercrops separately.

Perennials: Cocoa, Nutmeg, Pepper, Clove, Lemongrass and Cinnamon.
Annuals:

(a) Kharif: Rice, Maize, Groundnut, Ginger, Turmeric, Chilli, Yams, Colocasia, Red gram, Vegetables, Sweet potato, Tapioca, Banana, Pineapple, Papaya and Fodder grass.

(b) Rabi: Sesame, Horse gram, Red gram, Vegetables, Cowpea, Sweet potato and Banana.

(c) Summer: Vegetables

Benefits of Coconut: Coconuts have remained popular in tropical regions for more than 4,500 years, and Indian households have been using coconuts in different forms for generations now.

- Coconut enhances weight loss
- Keeps you hydrated
- Improves skin health
- Coconut fight bacteria
- Ensures healthy teeth and bones
- Eliminates scalp infections

Consuming Coconuts also: Boosts the immune system since, coconuts are anti-parasite, antibacterial, anti-viral and antifungal. Provides quick energy and improves athletic and physical performance. Considerably reduces the risk of heart diseases. Protects against bladder infection and kidney disease. Restores and maintains thyroid functionality. Makes you look young by preventing age spots, sagging skin and wrinkles. Fortunately, there are a ton of recipes out there for ways you can cook various foods using coconut, so there is no way you will get bored with them.

Components of Coconut: Every bit of the coconut is used so, coconuts are called the “Tree of Life” and produce and give drink, fiber, food, fuel, utensils, musical instruments, and much more.

Coconut in Traditional Medicine: In traditional medicine around the world coconut is used to treat a wide variety of health problems including the following: abscesses, asthma, baldness, bronchitis, bruises, burns, colds, constipation, cough, dropsy, dysentery, earache, fever, flu, gingivitis, gonorrhea, irregular or painful menstruation, jaundice, kidney stones, lice, malnutrition, nausea, rash, scabies, scurvy, skin infections, sore throat, swelling, syphilis, toothache, tuberculosis, tumors, Typhoid, ulcers, upset stomach, weakness, and wounds.

Harvesting and Processing of Coconut Cultivation:

About Harvesting: Twelve months old nuts are harvested at the interval of 30-45 days for seed as well as copra making and culinary purposes. For household use keep the nuts in vertical direction. However, for tender nut purposes 7 to 8 months old nuts are harvested. The nuts can be harvested using coconut climbers. Nuts which are 11 months old give fiber of good quality. This is suitable for coir fiber. In case of tall variety, the nuts harvested for seed purpose can be stored for 2 to 3 months period before sowing, whereas in case of dwarfs and hybrids, nuts should be sown with in a period of 10 –15 days of harvest. On an average, we can have eight harvests, though the coconut palm produces inflorescence every month. For oil extraction, nuts are generally sun dried for copra making. In this case there is a chance of dirt accumulation followed by oil quality deterioration, nuts can be dried in various types of driers available (Kiln, electric and solar driers) and also sun drying. Good quality copra can be obtained in short time by using these driers. Moisture content in copra for final use should be around 5-6%. Store the copra in polythene tar coated gunny bags. The oil yield of WCT palms under rain fed condition will be around 1.7 to 2 tons/ha. Harvesting methods climbing
Power tiller operated ladder climbing cycle / equipment

Conclusion:

Coconut sector in Kerala state faces challenges of various dimension and effective steps are to be taken up on a priority basis to region the past glory of coconut prosperity. Strategies emphasizing implementation of comprehensive coconut rejuvenation programme, enhancing productivity through better technology integration and value addition through product diversification are needed besides a congenial policy environment. Community action should be facilitated among the small and marginal coconut growers are grass root of level to revitalize the coconut sector in the state. As well developed sectoral innovation system of coconut in the state wherein effectively coordinated research and development activities with favorable policy outcomes along with participatory farmer initiatives, would certainly place the coconut sector of the state in forefront position among plantation crops.

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