

UNIVERSITY OF AGRICULTURAL SCIENCES, DHARWAD



ANALYSIS OF CASHEW VALUE CHAIN IN GOA

Final Draft Report

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**Directorate of Cashew & Cocoa Development
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Cashew stakeholder workshop held at ICAR Research Complex, Old Goa

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ANALYSIS OF CASHEW VALUE CHAIN IN GOA



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I. INTRODUCTION

Cashew (*Anacardium occidentale L.*) is called as the poor man's crop and the rich man's favourite snack food all over the world. Cashew tree is believed to be a native of Brazil, from where it has dispersed to different parts of the world primarily for soil conservation, afforestation and wasteland development. The term 'cashew' has originated from the Brazilian name 'acajaiba' and the Tupi name 'acaju', which the Portuguese converted into 'caju' and is commonly known as 'kaju' in India. It is known as 'Paragi Andi' in Kerala meaning foreign nut, 'Lanka Beeja' in Orissa assuming its introduction from Sri Lanka, and 'Mundiri' indicating the shape of the nut in Tamil Nadu. Cashew is cultivated mainly in the Asian, African and Latin American zones. The Asiatic zone includes India and Vietnam as the major producers, besides Indonesia, Philippines, Malaysia, Thailand and Sri Lanka. In the African zone, Nigeria, Côte d'Ivoire and Tanzania are the major producers, besides other countries like Benin, Guinea Bissau, Mozambique, Ghana, Senegal and Madagascar.

1.1 History of Cashewnut

It is interesting to note that cashew spread these countries with the aid of elephants that consumed the cashew fruit along with its nut. As the nut was too hard to digest, later, the undigested nut was expelled with the droppings and that resulted in the spurt of cashew plants throughout these countries. Subsequently, the tree spread to a number of countries in Africa, Asia, Latin America and West Indies. The Portuguese traders thus introduced the cashew tree into India and Africa to prevent soil erosion. Cashew is now widely cultivated for its kernel, fruit, cashew nut shell liquid and other products. However, it is mostly found in the coastal regions of South Africa, Madagascar, Tanzania, and South Asia, from Sri Lanka to the Philippines.

Cashew was introduced in other parts of the world since 16th century mainly with the intention of afforestation and soil conservation. From its humble beginning as a crop intended to check soil erosion, but the cashew has come out as a major foreign exchange earner in many countries. The Cashew tree though in existence for a long time was identified as a useful plant only in the early twentieth century. The earlier reports about cashew are from Brazil, French, Portuguese and Dutch observers. Thevat (1558) French naturalist, who visited Brazil during the period of French settlement, first described the plant being located in the north east. He saw some local people harvesting the cashew fruits and squeezing juice from them into a jar.

1.2. World cashewnut scenario

Cashew is predominantly grown in Asia, Africa and South America continents. Asiatic zones mainly include India, Vietnam and Indonesia as the major cashew producing countries followed by Philippines, Malaysia, Thailand and Sri-Lanka. African countries producing cashew are Nigeria, Tanzania, Mozambique, Kenya, Benin, Guinea- Bissau, Mozambique, Ghana, Senegal and Madagascar.

The major cashew producing countries in Latin America are Brazil, Columbia, Costa Rica, Honduras and Salvador. Though cashew is native of Brazil, it gained greater importance in countries like India, Vietnam, and other African countries. In 1960's, India was the major contributor to world cashew nut production followed by Mozambique and Tanzania. Later, East African countries like Tanzania, Mozambique and Kenya introduced cashew. In 1970's, the other Asian countries such as Indonesia, Malaysia and Cambodia, cashew cultivation became popular. Till 80's raw cashew nut production witnessed slow and steady growth (Hand book of cashew nut 2014). From 1990's global Raw Cashew Nut (RCN) production has seen a tremendous growth. Since 1990, Vietnam cashew industry has seen massive growth with respect to cashew nut production and processing. During 1999-2000 world production of raw cashew nut was 1359 tons and it has increased to 3049 thousand tonnes during 2016-17. At present, Vietnam is the largest raw cashew nut exporting country to India. From 2001-02 to 2015-06, area and production of cashew nut has increased at a rate of 2.29 percent and 3.02 percent respectively. India's production of raw cashew nut compared to the world production is estimated nearly to 34 percent. Production in other countries like Vietnam, Brazil, and Ivory Coast also illustrated that increased position in the study period.

1.3 Cashew scenario of India:

India is the largest producer, processor, consumer and exporter of cashew in the world. The current Cashewnut production in India accounts for 45 per cent of the global production. India being the leader in the world in raw Cashew nut production and is also the largest supplier of cashew kernels to the major world markets. A large number of small and marginal farmers, especially living on the coastal belts of India, depend on cashew for their livelihood. Cultivation of cashew in India confines mainly to the peninsular areas. It is grown in Kerala, Karnataka, Goa, and Maharashtra along the West coast and Tamil Nadu, Andhra Pradesh, Odessa and West

Bengal along the East-coast, occupies an area of 10.30 lakh hectares in the country with a production of 9.98 lakh metric tonnes. Even though strong competition from other countries has reduced India's share in the global cashew exports, India's advantage in terms of less percentage of broken kernels has brought European and US buyers to its proximity. To strengthen cashew exports, there is scope for increasing production by developing cashew as plantation crop on commercial basis, exploring new markets, and strengthening non-traditional markets, adding value to the product by introducing innovations in processing and branding them. Among the major states in the country, Maharashtra tops with respect to area, production and productivity of cashew nut. Over the years, the area under cashew cultivation has registered an increase in all the major cashew growing states, except in Kerala.

1.4 Cashew scenario of Goa

Goa with a production of 24,396 tonnes of raw cashew nuts from an area of 56735 hectares stands in sixth position both in area and production in India during 2016-17. The productivity of cashew trees in the state is 430 kg / ha which is less than the national average of 748 kg/ ha. The productivity is much lower than the all other cashew producing states in India. Cashew cultivation plays a significant role in the economy of Goa. Growth rates in area, production and productivity of Cashewnut in Goa state and for all India. Goa state recorded Compound Annual Growth Rate (CAGR) of 0.25 per cent and at all India level CAGR was 2.29 per cent which was significant at 1 per cent probability level. In Goa, a decreasing growth rate was observed for the area under cashew nut (-0.43 per cent). The productivity of cashew in India as a whole was growing at the rate of 0.71 per cent per annum with 10 per cent significance, while in Goa productivity was growing at the rate of -0.69 per cent per annum, which were Non significant.

1.5 Economic use of cashew products

Cashew kernel has a unique place in all functions and celebrations of both developed and developing countries. It is offered at wedding ceremonies as a token of fertility. In fact, it is considered as having aphrodisiac properties. Its place is very prominent at social and religious celebrations. It is offered to the guests and visitors and very important persons in educational, social, religions and political field. Three main cashew products are traded at the international market: raw cashew nuts, cashew kernel and cashew nut shell liquid. Cashew apple is another product which is generally processed and consumed locally. The raw cashew nut and cashew

kernel are the main commercial products. Raw nuts are exported and imported before or after processing the cashew kernel. Cashewnut shell liquid is an important commercial byproduct released from raw nuts at the time of processing. It has industrial and medical applications. Moreover, the skin of the nut is high in tannins and can be recovered and used in the tanning of hides. From Cashew apple or fruit, juice is extracted which has high vitamin content and it could be fermented to give a high proof. In fact cashew nut shell liquid is a valuable raw material for the preparation of oil paints, varnishes, pigments of gums, type writer rolls, automobile, break lining and lubricant in air craft. The cashew apple is used in the preparation of fruit juice, syrup, candy, jelly, pickles, cashew wine and fenny.

Cashew kernel is smaller in size, higher in nutritional value, pleasant, tasty and one of the most important commercial product. It is known for its delicious, pleasant taste and for the balanced nutritive profile. It is estimated that 60 per cent of the cashew kernel is consumed in the form of snacks and the remaining 40 per cent included in confectionery. It contains protein, fat, carbohydrates and all the fat soluble vitamins A, D and K. It is also a source of minerals like calcium, magnesium, phosphorous, potassium, sodium, iron and others. In fact, cashew is a perfect food with zero per cent cholesterol. At present, the dry leaves are used as natural manure for other crops. Cashew also has medicinal value Cashew apple liquor is used for the ailments of worm, sickness, cold, body-ache, fever or flue, toothache, fresh wounds and cuts, cramps due to chilly weather, muscular pain, irregular movement of bowels, low blood pressure, loss of sleep for aged people, diarrhoea and cholera. The alcoholic produce 'Fenny' has laxative properties. Cashew apple is eaten as a remedy for scurvy. The kernels possess aphrodisiac qualities. Cardol and Anacardic acid possess powerful rubifacient and vesicant properties obtained from the shell by maceration in spirit and are applied to cure cracks on the sole of the feet. Root infusion is an excellent purgative. The dead branches and twigs are regularly collected for fire wood.

1.6. Value chain and value chain analysis

Value chain is a chain of activities in which products pass through all in order and through each activity, the product gains some value. Value Chain Analysis (VCA) deals with the examination of the value chain of an enterprise to ascertain how much and at stage value is added. Value chain improvements reduce inventories, wastage, cost, thus increase efficiency within the firm and in the market channel. Achieving these gains requires mobility and flexibility in the scheduling and location of production, processes, inventories and distribution. This can be

achieved through supportive and cooperative supplier-buyer relationships (Porter, 1985). Hence, in the present study, the value chain for cashew nut is studied tracing the value addition at different stage of the marketing channel of cashew nut.

A value chain or supply chain is a set of value creating activities in the production-distribution process and the explicit structure of linkages among these activities. Value chain is associated with quality differentiation and value added from the consumers perspective, while supply chain is a supplier perspective with a focus on efficiency and logistics and coordination aspects of moving products from 'farm to fork'. However, there is a need to integrate both the terms as food systems need to deliver both value and efficiency. On the other hand, food value chains 'comprise all activities required to bring farm products to consumers, including agricultural production, processing, storage, marketing, distribution and consumption. Various segments of value chain from production to consumption that includes production, processing, wholesaling and retailing have been undergoing rapid and unprecedented changes in recent times in the country. The present survey focus on these issues in cashew nut as is one of the most important food item of the human diet and also export earner for the nation.

Inspite of its several benefits for the Indian economy, in general and economy of major cashew growing states in the country in particular, the cashew sector facing many problems in production, processing, marketing and value addition of different stages. The market intermediaries enjoying all the benefits of the value addition and exploiting farmers on one hand and the consumers on the other end.

1.7 Present study

Keeping in view the importance of cashew in the India economy in general and its major growing states in particularly, the present study made an attempt to analyze the cashew value chain in Goa with following specific objectives;

Specific objectives:

1. To estimate the growth in area, production and productivity of Cashew nuts in Goa

2. To assess the financial feasibility and economic viability of investment in input supply (nursery), establishment of cashew plantation, cost and returns in cashew cultivation in the study area.
3. To analyse production, processing, value addition and marketing of cashew in Goa
4. To estimate cost and margins under different channels of cashew and its products marketing.
5. To assess the institutional support system for promoting cashew economy of Goa
6. To document constraints and opportunities in production, processing, value addition and marketing of cashew and its products and suggest suitable policy measures to promote cashew economy of India in general and Goa in particular.

II. METHODOLOGY

2.1. Description of the study area:

Goa is a state in India within the coastal region known as the Konkan in West India. It is bounded by Maharashtra to the north and Karnataka to the east and south, with the Arabian Sea forming its Western coast. It is India's smallest state by area and the fourth smallest by population. Goa has the highest GDP per capita among all Indian states, that is two and a half times that of the country. It was ranked the 'best placed State' by the "Eleventh Finance Commission" for its infrastructure and ranked on top for the 'best quality of life' in India by the National Commission on Population based on the 12 Indicators. Panaji is the state's capital, while Vasco da Gama is its largest city. Goa encompasses an area of 3,702 km² (1,429 sq mi). It lies between the latitudes 14°53'54" N and 15°40'00" N and longitudes 73°40'33" E and 74°20'13" E.

Goa is also known for its coconut cultivation. The coconut tree has been reclassified by the government as a palm (like a grass), enabling farmers and real estate developers to clear land with fewer restrictions. Rice is the main food crop, and pulses (legume), *Ragi* (Finger Millet) and other food crops are also grown. Main cash crops are coconut, cashewnut, arecanut, sugarcane and fruits like pineapple, mango and banana. Goa's state animal is the Gaur, the state bird is the Ruby Throated Yellow Bulbul, which is a variation of Black-crested Bulbul, and the state tree is the Asan.

The important forests products are bamboo canes, Maratha barks, chillar barks and the bhirand. Coconut trees are ubiquitous and are present in almost all areas of Goa barring the elevated regions. A large number of deciduous trees, such as teak, Sal tree, cashew and mango trees are present. Fruits include jackfruit, mango, pineapple and "black-berry" ("podkoam" in Konkani language). Goa's forests are rich with medicinal plants.

Goa has more than 33% of its geographic area under government forests (1224.38 km²) of which about 62% has been brought under Protected Areas (PA) of Wildlife Sanctuaries and National Park. Since there is a substantial area under private forests and a large tract under cashew, mango, coconut, etc. plantations, the total forest and tree cover constitutes 56.6% of the geographic area.

2.2 Sampling procedure

Multistage sampling technique was adopted in the selection of the districts, taluks, villages, cashew growers and markets and market intermediaries.

2.2.1 Selection of study area:

Keeping in view the objectives of the study, three taluks from North Goa district and three taluks from South Goa District were selected as these taluks accounts more than 70 percent of cashew plantation area in Goa state. From each selected taluks; two villages were selected based on highest area under cashew plantation.

As mentioned above Sattari, Permim, Bicholim, Sanguem, Quepem and Canacona Taluk of Goa were selected for producer's survey as they are the major cashew growing Taluks in North and South Goa. From each selected cashew cultivation village, 30 farmers were selected. In addition to cashew growers, the market intermediaries involved in input supply, processors and other marketing intermediaries add value to cashew were selected. Thus, in all 180 cashew growers, 48 market intermediaries including input suppliers and institutional support providers were selected to collect the required information. To study the consumer preference for cashew and its products, 20 consumers were selected. Well-structured and pre tested questionnaires were used for collection of information.



Fig: Study area map

Table- 2.1: Sampling frame

District	Taluk	Farmers	Commission Agents	Wholesalers	Retailers	Processors	Consumers
North Goa	Pernem	30	3	3	3	3	5
	Bicholim	30	3	3	3	3	5
	Sattari	30	3	3	3	3	5
South Goa	Sanguem	30	3	3	3	3	5
	Quepem	30	3	3	3	3	5
	Canacona	30	3	3	3	3	5
Total sample		180	12	12	12	12	20

2.2.2 Nature and sources of the data

The study utilized both primary and secondary data. The primary data relating to cost of production, price obtained by the farmers, channels followed in marketing of their produce, cost of marketing produce were obtained from the producers to study the cost of production, cost of marketing *etc.* Similarly, the data on costs incurred by the market functionaries in the marketing of the produce, price at which the commodity was purchased and sold *etc.* were collected in order to work out the margins obtained by each of them. The primary data was collected from the sample farmers and their awareness about marketing of cashew and market

functionaries with the help of pre-tested structured schedule. The some general information about the cashew cultivators, area under cashew, age of the cashew orchard, number of plants, spacing, input use *etc.* The relevant information on other aspects like fixed assets, land use, cropping pattern, establishment and maintenance cost, yields and returns, quantity sold, price received, the marketing costs incurred by him, profit margin recorded and the problems faced by him in the production. The farmers and various aspects of market intermediaries and the processors were personally interviewed to ensure that the data made available by them were clear, comprehensive and reasonably correct.

1. Selection of market intermediaries

In addition to farmer, as interaction with market intermediaries the other stakeholders includes in cashew survey such as Zonal agriculture officer (4), Agriculture Marketing Board (4), Bankers (1), Cashew grower association (1), Cashew processing association (1), and Cashew Fenni producer association (1). In all, interaction with 200 stakeholders in cashew and required information was collected for the study.

2. Nature and Sources of Data

For achieving the objectives of the study, both primary and secondary data were collected. Secondary data is collected from various sources like websites, Directorate of Agriculture, Goa, Taluk level Zonal Agricultural office and other authenticated Government Departments in Goa State. The secondary data for the study included time series data of district wise and taluk wise area, production and productivity under Cashew for selected Taluks, value addition, input supply, institutional support system, land utilization pattern, general information about selected taluks and village wise area under Cashew *etc.* Selling and purchase price of output by market intermediaries for the year 2016-17.

The primary data pertaining to the year 2016-17 is collected by using well structured and pre-tested schedule through a survey of sample respondents. The data relating to general information about the respondents, family size, age, education, occupation, sources of income, land holding is obtained from them. The method of personal interview is used to elicit the data

from the respondents regarding various inputs used, yields and returns from the intercrops during gestation period of the cashew. Details on the annual cost of cultivation during bearing period, yield level and returns, method of sale and cost of marketing, cost of processing, channels followed in marketing of cashew, marketing cost and margin, value addition, consumer preference *etc* is collected and it is ensured that the data made available by the respondents is relevant, comprehensive and reasonably correct and precise.

Description of crop

Cashew (*Anacardium Occidentale L.*), belonging to the *Anacardiaceae* family, native of tropical region of Brazil, was introduced to India by the Portuguese about five centuries ago as a means of controlling coastal erosion. It ranks third in the world production of edible tree nut. It has been well adapted to Indian conditions and is at home in the coastal regions of the country. Cashew as evergreen tree produces nuts and apples. It has attained much commercial importance, owing to the wide adaptability in varying agro climatic conditions. It has spread to some parts of tropical South and Central America, Mexico and the West Indies. Cashew is a spreading evergreen perennial tree grown up to 10-12 meter in height. It can be cultivated only in tropics preferably under warm and humid climate (25°C to 35°C and high humidity). It can be cultivated from the sandy seacoast to laterite hill slopes up to 700 m sea level. It requires a minimum of 500mm rainfall per year but can withstand extremes of rainfall from 3000-4000mm.

The major factor limiting the distribution of cashew is its inability to tolerate frost and extreme cold for a long time. The best-suited soil for cashews is the deep well drained with a PH value ranging between 6.30 to 7.31. Red sandy loams and light coastal sands are also well suited for this tree. In India, the cashew tree is grown mainly on laterite, red and coastal sands in the federal states of Kerala, Karnataka, Maharashtra, Goa, Tamil Nadu, Andhra Pradesh, Orissa and West Bengal. Cashew normally flowers after 3 to 5 years of planting. Flowering period starts from the end of November till the end of January depending upon the climatic conditions. Flies, bees and ants as well as wind are the pollinating agents. Cashewnuts contained corrosive liquid (oil) commercially known as cashew nut shell liquid (CNSL). It is a byproduct of the cashew industry having tremendous export potential. Inspire of this potential, a good portion of the CSNL still continues to be burnt as crude fuel in the local manufacturing units. The shell also contains an oily acidic liquid. In order to extract kernels, the raw nuts are either roasted or

steamed to the right level and then passed over to the shelling section. The shells were classified as waste and used to be purchased only for the purpose of being burnt as fuel mainly at bakeries. Later it was discovered that the shells thrown away also contain a product that too has precious foreign exchange. The product was called CSNL. As per the extraction statistics, the CSNL comprises one per cent of the weight of roasted shells and more than three per cent of the weight of steamed shells, though the volume of foreign exchange brought in by the CSNL is poor compared to that brought in by the kernels. The demand for CSNL remains much higher than kernels, especially from abroad, Because of its heat resistant and anti-corrosive nature, the CSNL is largely used in the paint industry and at some stage in rockets and also used in brake lining. At present, India has the capacity to export around 7,000 metric tons of CSNL and Each metric ton brings in foreign exchange worth Rs.10, 000.The U.S.A., Japan and South Korea are the major importers of the CSNL from India. Other major export destinations are Hong Kong, Malaysia and U.K. The cashew nut is about 2-4 cm long and kidney shaped grayish in color. It is attached to the fleshy peduncle (Cashew Apple) and thin skin between epicarp and endocarp wall of the shell is a honey comb structure which contains phenolic material commercially known as Cashew Nut Shell Liquid. Inside the shell kernel is wrapped in a thin brown skin known as the testa (Outer skin of Kernel).

Analytical tools

For the purpose of evaluating the objectives of the study, based on the nature and extent of data availability, the following analytical tools will be used for analyzing the data to draw meaningful results and conclusions.

1. Descriptive analysis
2. Compound annual growth rate analysis.
3. Financial feasibility analysis
4. Garrets ranking technique

III. MAJOR FINDINGS OF THE STUDY

1. Trends in area, production and productivity of cashew nut in India

1.1 States wise growth in area, production and productivity of Cashew nut in India

The growth in area, production and productivity of Cashewnut in major cashew growing states in India for the study period from 2008-09 to 2016-17 was estimated using the exponential function and results are presented in the Table 1. It could be observed from the table that, the growth of area under cashew nut was found to be highest in Orissa (4.80 %) followed by Kerala (3.51 %), Karnataka (1.93 %), Maharashtra (1.49 %), Tamil Nadu (1.33 %) and Goa (0.86 %), where as the cashew nut production growth was highest in Karnataka (5.70 %) followed by West Bengal (2.60 %), Goa (2.40 %), Maharashtra (1.90 %) and Kerala (1.80 %). The productivity growth rates of Cashew nut during 2008-09 to 2016-17 was found to be positive and significant in Karnataka (3.29 %) followed by West Bengal (2.62 %) and Goa (1.53 %).

1.2 Growth in area, production and productivity of Cashew nut in India and Goa

Growth in area, production and productivity of Cashewnut in Goa state and for all India level was estimated for the period from 2001-02 to 2016-17 and the results are presented in the Table 2. It can be observed from the table that the area under Cashewnut in Goa recorded 0.25 per cent Compound Annual Growth Rate (CAGR) and at all India level, a significant growth of 2.29 per cent was observed. In Goa, a decreasing growth rate was observed for the area under cashew nut (-0.43 per cent). The productivity growth of cashew nut in India was 0.71 per cent, while in Goa state, negative growth (-0.69 per cent) per annum was observed.

2. Socio-Economic Profile of Cashew nut growers

2.1 General characteristics of sample farmers

An understanding of general characteristics of sample farmers is expected to provide a bird's eye view of the general features prevailing in the study area. Therefore, an attempt has been made in the study to analyze some of the important characteristics of the cashewnut growers. The general characteristics of the respondent's with respect to age, family size and literacy levels are presented in Table 5.

2.1.1 Age of farmers

The study comprised of 180 Cashewnut growers spread over six taluks covering two districts of Goa. From the Table 5, it could be seen that, majority of the farmers are of old age (above 50 years) both in North (51.11 %) and South districts of Goa (57.78 %) followed by middle aged (ranged between 36-50 years in North (37.78 %) and South (26.67%) and it is also observed that, young aged respondents having age up to 35 year were 11.11 per cent and 15.56 per cent in North and South Goa respectively. However, in case of overall age groups, 54.44 per cent of respondents were old aged, followed by 32.22 per cent of middle aged and 13.33 per cent were young aged respondents.

2.1.2 Family size

The classification of sample households in Goa, based on family size (Table 5) showed that in North Goa large sized family were 41.11 per cent followed by medium sized family with 37.78 per cent and small sized family is 21.11 per cent. In case of South Goa, medium sized family was 52.22 per cent followed by large sized family with 31.11 per cent and small sized family is 16.67 per cent. However, in case of overall sample respondent's medium sized family were 45.00 per cent followed by large sized family with 36.11 per cent and small sized family is 18.89 per cent.

2.1.3 Education status

Table 5 revealed that the majority of the respondents in North Goa had secondary education (27.78 %) followed by primary education (25.56 %), PUC 18.89 per cent and illiterate 12.22 per cent, whereas in South Goa, education with PUC is 30.00 per cent followed by secondary education with 22.22 per cent, primary 21.11 per cent and degree 14.44 percent. Overall literacy status of sample households presented in tables 5 revealed that, majority of the respondents (49.44%) with secondary education, their education level ranging from Secondary to PUC level. The rest of the respondents (36.11%) were with primary and degree level education.

2.2 Land holding

Table-5 represents the land holdings of sample Cashew nut growers. The average size of land holding of sample cashew growers in was 3.23 ha in North Goa and 2.82 ha in South Goa. The overall landholding was 3.08 ha.

2.3 Experience of sample farmers in Cashew nut cultivation

The experience of more than half of the sample farmers (57.78 %) in Cashewnut cultivation in north Goa ranging from 20 to 30 years, nearly 22.22 per cent of the farmers has 30 to 40 years and only 20 percent of the farmers had 10 to 20 years. In South Goa district also more than 50 percent of the sample farmers have 20 to 30 years of experience in cashew cultivation. The farmers with 30 to 40 years and 10 to 20 years experience in cashewnut cultivation were 34.44 per cent 14.44 per cent respectively.

2.4 Occupation pattern of sample respondents

The occupational pattern of sample respondents is presented in the Table 7. Majority of the sample respondent's main occupation both in South (85.56 %) and North Goa (75.56 %) was agriculture. Agriculture + business were the main occupation of 16.67 per cent of farmers in North Goa and 8.89 per cent of the farmers in South Goa. The rest of the sample farmers (5-7%) in both the study districts were engaged in various types of services in addition to agriculture. However, overall occupational pattern of sample respondents indicated that 80.56 per cent were involved in agriculture, 12.78 per cent in agriculture + business and 6.67 per cent in agriculture + service.

3. Establishment Cost of Cashew nut plantation

The establishment cost of Cashewnut plantation in North and South districts of Goa is presented in the Table 8. The cost of labour for establishment of cashew plantation was higher in South Goa which accounted for 26.67 percent (₹16,862 per ha) and it was 24.65 percent in (₹13,860 per ha) in North Goa. Similarly, the material cost was also higher (34.73 %) in South Goa (₹21,958 per ha) when compared to North Goa (₹18,572 per ha, 33.03 %). However, managerial cost incurred in South Goa was ₹3402 per ha (5.38) and ₹2893 per ha (5.15 %) in

North Goa The other important cost of investment were land revenue, rental value of land and depreciation which amounted to ₹20,995 per ha (33.21) in South Goa and ₹ 20895 per ha (37.17%) in North Goa districts. Thus, the total cost of establishment of cashew plantation during first year was ₹63,217 per ha in South Goa and ₹56,220 per ha in North Goa districts.

3.1. Maintenance cost of Cashew nut plantation during gestation period

3.1.1 North Goa district:

The maintenance cost incurred by the cashewnut growers in North Goa district during the gestation period is presented in the Table 9. The perusal of the table revealed that total maintenance cost during second year was ₹36,307 of which, the variable cost accounted to ₹6250 with a share of 17.21 per cent of total maintenance cost. The total variable cost comprised of two components *viz.*, material cost and labour cost. In the total variable cost, the share of labour component was found to be highest (17.21%) followed by material cost (17.08%), management cost (3.43%) and interest on working capital (2.91%). The total fixed cost in the second year contributed nearly 59.37 per cent of the total maintenance cost in second year.

Similarly in third year, the total maintenance cost per ha incurred by the cashewnut growers was ₹37,312 of which, the variable cost accounted to ₹15,904 with a share of 42.62 per cent of total maintenance cost. In the total variable cost, the share of labour component was found to be highest (18.19 %) followed by material cost (17.78 %), management cost (3.60 %) and interest on working capital (3.06 %). The total fixed cost in the third year contributed nearly 57.38 per cent of the total maintenance cost in third year.

However, in case of fourth year, the total maintenance cost per ha was ₹38,490 of which, the variable cost accounted to ₹17,082 with a share of 44.38 per cent of total maintenance cost. In the total variable cost, the share of labour component was found to be highest (19.03 %) followed by material cost (18.42 %), management cost (3.75 %) and interest on working capital (3.18 %). The total fixed cost in the fourth year constituted nearly 55.62 per cent of the total maintenance cost in fourth year.

3.1.2 South Goa district:

The maintenance cost incurred by the South Goa cashewnut growers during the gestation period are presented in the Table 9. The perusal of the table revealed that total maintenance cost in the second year was ₹37,670 of which, the variable cost accounted to ₹16,116 with a share of 42.78 per cent of total maintenance cost. The total variable cost comprised of two components viz., material cost and labour cost. In the total variable cost, the share of labour component was found to be highest (19.50 %) followed by material cost (16.60 %), management cost (3.61%) and interest on working capital (3.07 %). The total fixed cost in the second year contributed nearly 57.22 per cent of the total maintenance cost in second year.

Similarly in third year, the total maintenance cost per ha incurred by the cashewnut growers was ₹38,256 of which, the variable cost accounted to ₹16,848 with a share of 44.04 per cent of total maintenance cost. In the total variable cost, the share of labour component was found to be highest (19.87 %) followed by material cost (17.29 %), management cost (3.72 %) and interest on working capital (3.16 %). The total fixed cost in the third year contributed nearly 55.96 per cent of the total maintenance cost in third year.

However, in case of fourth year, the total maintenance cost per ha was ₹40,015 of which, the variable cost accounted to ₹18,607 with a share of 46.50 per cent of total maintenance cost. In the total variable cost, the share of labour component was found to be highest (21.87 %) followed by material cost (17.37 %), management cost (3.92 %) and interest on working capital (3.34 %). The total fixed cost in the fourth year constituted nearly s

3.2 Cost of cultivation of Cashewnut plantation (5th year onwards)

The cost of cultivation of Cashewnut in North and South districts of Goa is presented in Table 11. The cost labour was higher in South Goa which amounted to ₹16,747 per ha (33.04 %) and ₹14,351 per ha (28.79 %) in North Goa, followed by material cost of ₹8957 per ha (17.97 %) and ₹7095 per ha (14.00 %) respectively in North and South Goa districts. The other important cost of cultivation were land revenue, rental value of land, amortized establishment cost, depreciation and interest on fixed capital, these components put together amounted to ₹22,560 per ha (44.5 %) in South Goa and ₹ 22,347 per ha (44.83 %) in case of North Goa Thus,

the annual total cost of cultivation of cashewnut plantation after establishment of five year onward was ₹50,694 per ha in South Goa and ₹49,850 per ha in North Goa districts.

3.3 Yield obtained and returns realized in Cashewnut plantation during bearing period (5th year onwards)

The sample cashewnut growers harvested cashew fruits/nuts for a period of four months (February, March, April and May) in a year. The yields obtained and returns realized from the sale of Cashewnut are presented in the Table-12. It could be seen from the table that, per ha quantity Cashewnuts harvested in North Goa was 1035 kg and 1175 kg per ha in South Goa, whereas peak yield was harvested in the months of April and May. In view of harvesting of higher yield of cashewnuts, South Goa district farmers realized higher gross returns (₹1, 64,500) per ha as compared to North Goa district farmers (₹1,44,900) per ha. The total cost of production per ha in South Goa district was ₹53,135 per ha, whereas in North Goa district, it was ₹51,793. The net returns realized from the sale of Cashewnuts in South Goa was ₹1, 11,365 per ha, whereas it was ₹93,107 per ha in North Goa district.

4.1 Preference of farmers for a particular agency for marketing of cashewnuts

The results presented in the Table 15 revealed that Better price was the major preference of all most all the sample farmers in North Goa followed by Assured market, Low transportation cost, Low commission charge, Low cost of marketing , Credit facility in advance , Reliable market information, Less physical loss , Easy access to inputs and Influence by friends/relative/neighbors. Similarly, in South Goa district, the preference for marketing of cashewnuts was Better price followed by Assured market (Rank II), Low transportation cost (Rank III), Low commission charge (Rank IV), Low cost of marketing (Rank V), Reliable market information (Rank VI), Less physical loss (Rank VII), Influence by friends/relative/neighbors (Rank VIII), Credit facility in advance (Rank IX) and Easy access to inputs (Rank X).

4.1.2 Marketing of cashewnuts by farmer

The results on marketing of cashewnut by growers in North Goa are presented in the Table 13. It is observed that, majority of the farmers sold their produce to Goa Bagayatdar Society (50.00 %) followed by Bhandra Maharashtra (16.67), Adarsh Co-operative society (14.44), Processing units (7.78%), Village traders(6.67%), Wholesalers in APMCs (4.44 percent). The method of sale was direct in all the cases of marketing.

The results on marketing of cashewnut by grower in south Goa is presented in the Table 14. It is noticed that, majority of the farmers sold their products to Adarsh Co-operative society (54.44) followed by Goa Bagayatdar (23.33 %), Wholesalers (12.22), Village traders (5.56%), and Processing units (4.44%), The method of sale was direct in all the cases of marketing.

4.1.3 Price spread in marketing of Cashewnut in Goa

The price spread, net producers share in consumers' rupee and margins of market intermediaries in Goa are presented in Table 4.22. The table Indicated that the net producer's share in consumer's rupee was found to be more in channel- V of marketing (89.35%) compared to channel-I, II, III and IV. Correspondingly net price received by the producer per Kg of Cashewnut was the highest in channel-V (₹151 per Kg) followed by channel-IV (₹144 per Kg), channel-III (₹142 per Kg), channel-II (₹141 per Kg) and channel-I (₹140 per Kg). The price spread was marginally more in case of channel-I (₹180/250gm cashew) followed by channel-II (₹179/250gm cashew), channel-III (₹178/250gm cashew), channel-IV (₹176/250gm cashew) and channel-V (₹169/250gm cashew).

5.1 Constraints faced by Cashewnut producers in Production

The results presented in the Table 16 revealed that wild animals intervention in the cashewnuts plantation during harvesting period was the major problem experienced by all the farmers in North Goa (Rank I), followed by non availability of water (Rank II) & good quality seedlings (Rank III), high wages of labour (Rank IV), pest and disease attack (Rank V), lack of improved harvesting techniques (Rank VI), power cuts/ shortage of electricity (Rank VII), lack of technical knowledge (Rank VIII), higher initial investment (Rank IX) and property rights (Rank X).

Table 16 revealed that damage of cashewnuts by wild animals was the major problem experienced by all the farmers in North Goa (Rank I), followed by non availability of water (Rank II), non availability of good quality seedlings (Rank III), labour shortage/ high wages of labour (Rank IV), pest and disease attack (Rank V), lack of improved harvesting techniques (Rank VI), power cuts/ electricity problem (Rank VII), lack of technical knowledge (Rank VIII), higher initial investment (Rank IX) and property rights (Rank X).

5.2 Constraints faced by Cashewnut producers in marketing

The results presented in the Table 17 revealed that Poor market intelligence was the major problem experienced by all the farmers in North Goa followed by Lack of storage facilities (Rank II), Non availability of market facility near farm (Rank III), Price fluctuation (Rank IV), Financial support for marketing (Rank V), Delay in payment after sale (Rank VI), High transportation cost (Rank VII), High commission charges (Rank VIII) and High market fee (Rank IX).

Similarly, in South Goa the problems reported were Poor market intelligence which was the major problem experienced by all the farmers (Rank I), followed by Price fluctuation (Rank II), Non availability of market facility near farm (Rank III), Lack of storage facilities (Rank IV), High transportation cost (Rank V), Financial support for marketing (Rank VI), High commission charges (Rank VII), High market fee (Rank VIII) and Delay in payment after sale (Rank IX).

IV. SUMMARY AND POLICY IMPLICATIONS

Cashew production provides excellent opportunities in raising the income of the farmers even in the dry tracts. A significant shift towards horticulture crop specially Cashew is evident in India and Goa state with an increase in area and production. Cashewnut provides higher unit productivity and offers a great scope for value addition and this sector is taking inroads throughout the length and breadth of the state. cashewnut is such a crop which would serve as a source of income in terms of both raw material and value added product. Keeping in view the importance of cashew in the Indian economy in general and its major growing states in particularly, the present study made an attempt to analyze the cashew value chain in Goa with following specific objectives;

4.1 Specific objectives:

1. To estimate the growth in area, production and productivity of Cashew nuts in Goa
2. To assess the financial feasibility and economic viability of investment in input supply (nursery), establishment of cashew plantation, cost and returns in cashew cultivation in the study area.
3. To analyse production, processing, value addition and marketing of cashew in Goa
4. To estimate cost and margins under different channels of cashew and its products marketing.
5. To assess the institutional support system for promoting cashew economy of Goa
6. To document constraints and opportunities in production, processing, value addition and marketing of cashew and its products and suggest suitable policy measures to promote cashew economy of India in general and Goa in particular.

4.2 Methodology

The study was based on the data collected from 180 Cashew growers from North and South districts Goa state. In order to study the marketing aspects, 60 market intermediaries (10 each of commission agent-cum-wholesalers, retailers and consumers) were selected randomly markets. The study was based on both primary and secondary data. The necessary primary data pertaining to agricultural year 2016-17 were obtained from the selected sample cashew cultivators and various market intermediaries through personal interview method with the help of pre-tested and structured interview schedule and the data.

Secondary data were collected from Directorate of Agriculture, Goa, Goa state marketing board, Goa and various official departments in Goa office. The secondary data collected for the study included time series data of State wise area, production and productivity under Cashewnut in Goa state and India. Selling and purchase price of output by market intermediaries for the year 2017-18.

For analysing the data collected during the study, tabular analysis, compound annual growth rate, financial feasibility analysis and Garret ranking tools were employed. The tabular presentation was employed for estimating the cost and returns structure in Cashewnut. Compound growth rate analysis was employed to know the growth rate in the area, production and productivity of Cashewnut. In order to know the financial feasibility of investment in acid lime, the measures of project evaluation techniques *viz.*, Benefit Cost Ratio (BCR) was employed. Garret ranking technique was used to rank the problems faced by the Cashewnut farmer in the study area on the basis of severity.

4.2. Major findings of the study

- The growth of area under cashew nut was found to be highest in Orissa (4.80 %) followed by Kerala (3.51 %), Karnataka (1.93 %), Maharashtra (1.49 %), Tamil Nadu (1.33 %) and Goa (0.86 %), where as the cashew nut production growth was highest in Karnataka (5.70 %) followed by West Bengal (2.60 %), Goa (2.40 %), Maharashtra (1.90 %) and Kerala (1.80 %).

- It was observed that, the area under Cashewnut in Goa recorded 0.25 per cent Compound Annual Growth Rate (CAGR) and at all India level, a significant growth of 2.29 per cent was observed.

- Majority of the farmers are of old age (above 50 years) both in North (51.11 %) and South districts of Goa (57.78 %) followed by middle aged (ranged between 36-50 years in North (37.78 %) and South (26.67%)

- The experience of more than half of the sample farmers (57.78 %) in Cashewnut cultivation in north Goa ranging from 20 to 30 years, nearly 22.22 per cent of the farmers has 30 to 40 years and only 20 percent of the farmers had 10 to 20 years. In South Goa district also more that 50 percent of the sample farmers have 20 to 30 years of experience in cashew cultivation.

- Majority of the sample respondent's main occupation both in South (85.56 %) and North Goa (75.56 %) was agriculture. Agriculture + business were the main occupation of 16.67 per cent of farmers in North Goa and 8.89 per cent of the farmers in South Goa.

- The total cost of establishment of cashew plantation during first year was ₹63,217 per ha in South Goa and ₹56,220 per ha in North Goa districts.

- The annual total cost of cultivation of cashewnut plantation after establishment of five year onward was ₹50,694 per ha in South Goa and ₹49,850 per ha in North Goa districts.

- The price spread was marginally more in case of channel-I (₹180/250gm cashew) followed by channel-II (₹179/250gm cashew), channel-III (₹178/250gm cashew), channel-IV (₹176/250gm cashew) and channel-V (₹169/250gm cashew).

- Poor market intelligence which was the major problem experienced by all the farmers, followed by Price fluctuation, Lack of storage facilities

- Non availability of water, good quality seedlings, high wages of labour, pest and disease attack, and lack of improved harvesting techniques were the major problem faced by farmer during production of cashewnuts.

4.3. Policy Implications

Based on the findings of the investigation the following policy can be suggested for promoting the cashew economy of Goa.

1. The results of estimation of Compound Annual Growth Rates (CAGR) in area, production and productivity of cashew nut in Goa over other major cashew nut growing states and at all India level revealed that the CAGR of cashew nut area was declined substantially and CAGR of cashew nut production and productivity was found to be negative. Efforts should be made to bring fallow and uncultivable lands under cashew plantation by providing financial support to the cashew growers.
2. In south Goa district, major cashew plantation is under forest lands, which is not recorded in the cashew plantation area in Goa state and majority of the farmers are following traditional methods of cultivation that resulted in low productivity and low production of cashewnuts. To enhance productivity as well as total production cashew nuts, efforts should be made to create awareness among the farmers regarding new methods of cultivation by timely providing good quality sampling and adoption of scientific methods of cultivation.
3. Majority of the farmers expressed the problem of stem borer when the cashew nut plants attained the bearing age. This reduced the plant population of the cashew plantation and also substantially reduced the yield which in turn results in reduction in the income of the farmers. To overcome this problem, efforts should be made by the concerned departments to advice the farmers to take appropriate control measures to save the plant. And also arrangements have to be made to supply stem borer resistant varieties.
4. Attack of wild animals in the cashew plantations during harvesting period of cashew fruits and also damage of seedlings after plantation. Efforts should be made to support the farmers by the forest Department or support the farmers to create solar fencing facility in the cashewnut plantation fields.
5. Majority of the farmers selling raw cashewnuts directly to the traders at low prices, devoid of the opportunity of value addition to the cashewnut. The private processing units are enjoy the

major share in the consumer's rupee. To improve the producers share in the consumers rupee, efforts should be made to create awareness among the farmers to organize Farmer Producer Groups to take up processing of the cashew nuts in to cashew and cashew apple in to juice/ Ura/Fenny, which not only increased the value addition to the cashew nut but also increase the producer share in the consumer's rupee.

6. Cashewnut farmers are facing legal problem with regard to land property rights. Most of the cashew growers in general and South Goa cashew growers in particular are facing the problems from the forest department, which results in disinterest in maintenance and management of the cashew plantations. Efforts should be made to define the land demarcations to through proper measurement of land boundaries.
7. Majority of the farmers are considering the agriculture as the secondary occupation. As a result they are not taking up appropriate scientific methods of cultivation in cashewnut plantation, which in turn reduced the yield and income of the farmers. Efforts should be made to advise the farmers by demonstrating scientific methods of cultivation to realize the yield and income potentiality of cashew plantation to double their farm income.
8. Wide fluctuation in prices of cashew nuts is another major obstacle faced by the cashew growers to expand area under cashew plantations. Efforts should be made to announce Minimum Support Prices well in advance and initiate procurement operations to protect the interest of the farmers in respect of price fluctuations.
9. Department of Agriculture, Goa implemented various schemes for the benefit of agriculturists in general and cashew growers in particulars. In view of non availability of required information regarding implementation various schemes for the benefit of cashew growers, it is not possible to suggest policy implications.
10. The scientists of ICAR Complex (CCARS) have developed various cashew bye products. Efforts should be made to enhance the income of the cashew growers by popularizing and commercializing of the products.

Table - 1: States wise Growth in Area, Production and Productivity of Cashew nut in India during 2008-09 to 2016-17)

Sl. No	Major States	Area	Production	Productivity
1	Kerala	3.51**	1.8**	-1.69*
2	Karnataka	1.93**	5.7**	3.71**
3	Goa	0.86*	2.4**	1.53
4	Maharashtra	1.49**	1.9**	0.44*
5	Tamil Nadu	1.33**	-0.1	-1.40
6	Andhra Pradesh	0.32*	-0.6	-0.96
7	Orissa	4.80**	-0.7	-5.29
8	West Bengal	0.12	2.6*	2.62*
9	Others States	6.31**	10.5**	3.95*
10	All India	2.14***	1.7**	-0.44

Note: *, ** & * indicate significant levels at 1, 5 and 10 per cent respectively**

Table - 2: Area, production and productivity of Cashew nut in India (2001-02 to 2016-17)

Sl. No	Year	Area in ha	Production in MT	Productivity in Kgs/ha
1	2001-02	770	472	613
2	2002-03	770	506	657
3	2003-04	780	535	686
4	2004-05	820	544	663
5	2005-06	837	573	685
6	2006-07	854	620	726
7	2007-08	868	665	766
8	2008-09	893	695	778
9	2009-10	923	613	664
10	2010-11	945	653	691
11	2011-12	979	725	741
12	2012-13	991	752	759
13	2013-14	1011	753	745
14	2014-15	1023	745	728
15	2015-16	1037	671	647
16	2016-17	1041	779	748
	CAGR	2.29***	3.02***	0.71*

Note: ***, ** & * indicate significant levels at 1, 5 and 10 per cent respectively

Table-3 Marketwise arrivals and value of Cashewnut in Goa

(Quantity in tonnes and value in Lakh rupee)

SN	Year	Ponda		Sanquelim		Mapusa		Curchorem		Canacona		Valpoi		Pernem	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
1	2004-05	862.28	388.6	523.62	243.6	154.48	68.81	1806.67	821.8	367.15	165.2	69.88	31.24	61.89	23.97
2	2005-06	402.66	159	897.97	365	164.87	65.05	1091.98	429.7	335.79	131.2	90.79	35.72	123.89	47.67
3	2006-07	353.6	134.6	732.87	286.9	106.48	41.12	882.68	341.1	244.21	93.11	54.14	20.4	81.39	30.69
4	2007-08	435.06	203.1	359.04	168.7	183.08	86.4	1150.7	535.7	343	158.6	75.01	34.89	109.02	51
5	2008-09	357.03	170.2	281.2	141.7	113	54.97	1068.14	532.4	442.58	215.2	77.62	37.65	84.02	41.42
6	2009-11	477.6	247.1	142.03	80.62	122.07	71.62	1100.75	638.9	442.93	261.5	102.39	60.4	124.65	76.19
7	2011-12	28.95	224.9	277.71	224.8	148.63	117.9	1087.45	874	622.62	496.7	136.92	108.9	135.33	109.2
8	2012-13	403.57	307.8	300.57	234.5	114.24	87.67	788.83	621.8	506.41	390.3	173.68	134.3	135.25	104.5
9	2013-14	317.67	243.3	309.18	232.9	186.79	141.8	760.79	639.7	538.07	405.3	162.47	122.1	299.98	229.3
	Correlation co efficient	0.60		0.87		0.62		0.45		0.97		0.99		0.97	

Table - 4: Area, production and productivity of Cashewnut in Goa (2002-03 to 2016-17)

Sl. No	Year	Area in Ha	Production in Tonnes	Productivity in Kgs/ha
1	2002-03	54373	23109	425
2	2003-04	54668	23233	425
3	2004-05	54858	25556	466
4	2005-06	55021	27070	492
5	2006-07	55302	24380	441
6	2007-08	55612	21942	395
7	2008-09	55672	13165	236
8	2009-10	55732	17556	315
9	2010-11	55732	23138	415
10	2011-12	55737	23240	417
11	2012-13	55747	23804	427
12	2013-14	55936	24332	435
13	2014-15	56079	25011	446
14	2015-16	56609	17549	310
15	2016-17	56735	24396	430
	CAGR	0.25****	-0.43 NS	-0.69 NS

Note: ***, ** & * indicate significant levels at 1, 5 and 10 per cent respectively

Table - 5: Growth in area, production and productivity of Cashew nut in India and Goa (2001-02 to 2016-17)

Sl. No	Particulars	India	Goa
1	Area	2.29***	0.25***
2	Production	3.02***	-0.43 NS
3	Productivity	0.71*	-0.69 NS

Note: ***, ** & * indicate significant levels at 1, 5 and 10 per cent respectively

Table – 6: Socio-Economic characteristics of Cashewnut growers in North and South districts of Goa state

Sl. No	Particular	North Goa (n=90)	South Goa (n=90)	Pooled (N=180)
I	Age group (No.)			
A	Upto 35 years	10 (11.11)	14 (15.56)	24 (13.33)
B	35-50 years	34 (37.78)	24 (26.67)	58 (32.22)
C	Above 50 years	46 (51.11)	52 (57.78)	98 (54.44)
	Average age (year)	52	54	51
II	Education Status			
A	Illiterate	11 (12.22)	8 (8.89)	19 (10.56)
B	Primary	23 (25.56)	19 (21.11)	42 (23.33)
C	Secondary	25 (27.78)	20 (22.22)	45 (25.00)
D	PUC	17 (18.89)	27 (30.00)	44 (24.44)
E	Degree	10 (11.11)	13 (14.44)	23 (12.78)
F	Postgraduates	4 (4.44)	3 (3.33)	7 (3.89)
III	Family size			
A	Small (upto 4)	19 (21.11)	15 (16.67)	34 (18.89)
B	Medium (4-6)	34 (37.78)	47 (52.22)	81 (45.00)
C	Large (>6)	37 (41.11)	28 (31.11)	65 (36.11)
IV	Land holding (No)			
A	Small farmers(upto 2ha)	42 (46.67)	51 (56.67)	93 (51.67)
B	Medium farmers(2 to 5ha)	28 (31.11)	24 (26.67)	52 (28.89)
C	Large farmers(>5 ha)	20 (22.22)	15 (16.67)	35 (19.44)
D	Average land holding in ha	3.23	2.82	3.08

Table - 7: Experience of sample farmers in Cashewnut cultivation

Sl. No	Experience (Years)	North Goa (n=90)		South Goa (n=90)	
		No of farmers	Per cent	No of farmers	Per cent
1	10-20	18	20.00	13	14.44
2	20-30	52	57.78	46	51.11
3	30-40	20	22.22	31	34.44
	Total	90	100.00	90	100.00

Table - 8: Occupation pattern of sample respondents in North and South Goa

Sl. No	Particulars	North Goa		South Goa		Overall	
		No.	Per cent	No.	Per cent	No.	Per cent
1	Agriculture	68	75.56	77	85.56	145	80.56
2	Agriculture +Business	15	16.67	8	8.89	23	12.78
3	Agriculture+ Service	7	7.78	5	5.56	12	6.67
	Total	90	100.00	90	100.00	180	100.00

Table - 9: Establishment Cost of Cashewnut plantation in North and South Goa**(Per ha)**

Sl. No	Particulars	North Goa		South Goa	
		Cost (₹)	Per cent	Cost (₹)	Per cent
A.	Labour Cost				
1	Land leveling	6360	11.31	7982	12.63
2	Opening of pits and filling of pits	2550	4.54	2959	4.68
3	Manures (FYM) application	1000	1.78	1080	1.71
4	Planting	1250	2.22	1415	2.24
5	Staking	750	1.33	1254	1.98
6	Filling Pits	1250	2.22	1515	2.40
7	Fencing	700	1.25	657	1.04
	Total labour cost	13860	24.65	16862	26.67
B.	Material cost				
1	Manures (FYM) – (t)	1260	2.24	1518	2.40
2	Fertilizers (Kg)	2892	5.14	3484	5.51
3	Seedlings (No.)	10500	18.68	11750	18.59
4	Staking (sticks) (including transportation cost) – (No.)	420	0.75	406	0.64
5	Fencing	3500	6.23	4800	7.59
	Total material cost	18572	33.03	21958	34.73
	Sub total (A+B)	32432	57.69	38820	61.41
C.	Managerial cost (10% @ VC)	2893	5.15	3402	5.38
	Total – I (A+B+C)	35325	62.83	42222	66.79
D.	Land revenue	45	0.08	45	0.07
E.	Rental value of land	20000	35.57	20000	31.64
F.	Depreciation	850	1.51	950	1.50
	Total – II (D+E+F)	20895	37.17	20995	33.21
	Total cost (I+II)	56220	100.00	63217	100.00

Note: 215 plants/ ha in North Goa and 235 plants/ha in South Goa

Table - 10: Maintenance cost of Cashewnut plantation during gestation period in North district of Goa

(Cost ₹/ha)

Sl. No	Particulars	II year		III year		IV year	
		Cost	Per cent	Cost	Per cent	Cost	Per cent
I.	Variable Cost						
A	Labour cost						
1	Inter-cultivation	700	1.93	700	1.88	700	1.82
2	Earthing up of soil around trunk	1050	2.89	1137	3.05	1225	3.18
3	Application of FYM	650	1.79	815	2.18	900	2.34
4	Application of fertilizers	1000	2.75	1071	2.87	1175	3.05
5	Application of PPC	700	1.93	700	1.88	700	1.82
6	Weeding	1000	2.75	1075	2.88	1162	3.02
7	Gap filling/ Pruning	650	1.79	737	1.98	812	2.11
8	Miscellaneous	500	1.38	550	1.47	650	1.69
	Total labour cost (A)	6250	17.21	6786	18.19	7325	19.03
B	Material cost						
1	Manure	2000	5.51	2200	5.90	2320	6.03
2	Fertilizers	2700	7.44	2835	7.60	2970	7.72
3	PPC	1500	4.13	1600	4.29	1800	4.68

Table - 10 : Contd.....

Sl. No	Particulars	II year		III year		IV year	
		Cost	Per cent	Cost	Per cent	Cost	Per cent
	Total material cost (B)	6200	17.08	6635	17.78	7090	18.42
	Subtotal (A+B)	12450	34.29	13421	35.97	14415	37.45
	Interest on working capital @ 8.5%	1058	2.91	1141	3.06	1225	3.18
	Management cost (10 % on variable cost)	1245	3.43	1342.1	3.60	1441	3.75
	Total Variable Cost	14753	40.63	15904	42.62	17081.78	44.38
II	Fixed cost						
1	Land revenue	45	0.12	45	0.12	45	0.12
2	Rental value of owned land	20000	55.09	20000	53.60	20000	51.96
3	Depreciation of machinery, implements and farm building	680	1.87	540	1.45	540	1.40
4	Interest on fixed capital @4%	829	2.28	823	2.21	823	2.14
	Total fixed cost	21554	59.37	21408	57.38	21408	55.62
	Total cost (I+II)	36307	100.00	37312	100.00	38490	100.00

Table – 11 : Maintenance cost of Cashewnut during gestation period in South district of Goa

(Value in ₹/ha)

Sl. No	Particulars	II year		III year		IV year	
		Cost	Per cent	Cost	Per cent	Cost	Per cent
I.	Variable Cost						
A	Labour cost						
1	Inter-cultivation	850	2.26	800	2.09	800	2.00
2	Earthing up of soil around trunk	1320	3.50	1252	3.27	1350	3.37
3	Application of FYM	803	2.13	841	2.20	1859	4.65
4	Application of fertilizers	1187	3.15	1265	3.31	1295	3.24
5	Application of PPC	951	2.53	1011	2.64	1090	2.72
6	Weeding	1284	3.41	1331	3.48	1378	3.44
7	Gap filling/ Pruning	450	1.19	552	1.44	480	1.20
8	Miscellaneous	500	1.33	550	1.44	500	1.25
	Total labour cost (A)	7345	19.50	7603	19.87	8753	21.87
B	Material cost						
1	Manure	2000	5.31	2080	5.44	2160	5.40
2	Fertilizers	2754	7.31	2835	7.41	2889	7.22
3	PPC	1500	3.98	1700	4.44	1900	4.75

Table – 11 : Contd.....

Sl. No	Particulars	II year		III year		IV year	
		Cost	Per cent	Cost	Per cent	Cost	Per cent
	Total material cost (B)	6254	16.60	6615	17.29	6949	17.37
	Subtotal (A+B)	13599	36.10	14217.5	37.16	15701.87	39.24
	Interest on working capital @ 8.5%	1156	3.07	1208	3.16	1335	3.34
	Management cost (10 % on variable cost	1360	3.61	1422	3.72	1570	3.92
	Total Variable Cost	16116	42.78	16848	44.04	18607	46.50
II	Fixed cost						
1	Land revenue	45	0.12	45	0.12	45	0.11
2	Rental value of owned land	20000	53.09	20000	52.28	20000	49.98
3	Depreciation of machinery, implements and farm building	680	1.81	540	1.41	540	1.35
4	Interest on fixed capital @4%	829	2.20	823.4	2.15	823.4	2.06
	Total fixed cost	21554	57.22	21408.4	55.96	21408.4	53.50
	Total cost (I+II)	37670	100.00	38256	100.00	40015	100.00

Table - 12: Cost of cultivation of Cashewnut plantation in North Goa and South Goa (5th year onwards)

Sl. No	Particulars	North Goa		South Goa	
		Cost	Per cent	Cost	Per cent
I	Variable Cost				
A.	Labour Cost				
1	Inter-cultivation	750	1.50	850	1.68
2	Loosening of soil around trunk	672	1.35	730	1.44
3	Application of FYM	360	0.72	450	0.89
4	Application of fertilizers	652	1.31	785	1.55
5	Application of PPC	1582	3.17	540	1.07
6	Weeding	2200	4.41	2850	5.62
7	Harvesting	6,850	13.74	8940	17.64
8	Gap filling/ Pruning	735	1.47	852	1.68
9	Miscellaneous	550	1.10	750	1.48
	Total Labour Cost	14,351	28.79	16747	33.04
B.	Material cost				
1	Manure	3,850	7.72	2785	5.49
2	Fertilizers	4,657	9.34	3960	7.81
3	PPC	450	0.90	350	0.69
4	Irrigation cost	0	0.00	0	0.00
	Total Material cost	8,957	17.97	7095	14.00
	Subtotal (A+B)	23,308	46.76	23842	47.03
	Interest on working capital @ 8.5%	1,865	3.74	1907	3.76
	Management cost (10 % on VC)	2,331	4.68	2384	4.70
	Total Variable Cost	27,503	55.17	28134	55.50
II	Fixed cost				
1	Land revenue	45	0.09	45	0.09
2	Rent value of owned land	20,000	40.12	20,000	39.45
3	Amortized establishment	1,124	2.25	1,264	2.49
4	Depreciation	320	0.64	385	0.76
5	Interest on fixed capital @ 4%	857.76	1.72	866	1.71
	Total fixed cost	22,347	44.83	22560	44.50
	Total cost (I+II)	49,850	100.00	50694	100.00

Table -13: Yields obtained and Returns realized in Cashewnut Cultivation (5th year onwards)

Sl. No	Particulars	Per ha	
		North Goa	South Goa
1	Yield obtained in nuts (Kg/month)		
	a) February	75	95
	b) March	120	125
	c) April	355	375
	d) May	485	580
	Total yield (Kg/ Ha)	1035	1175
3	Gross returns (Rs)	144900	164500
4	Cost of cultivation (₹)	49843	50685
5	Marketing costs (₹)	1950	2450
6	Total Cost cultivation (₹)	51793	53135
7	Net returns (₹)	93107	111365
	B-C Ratio	2.79	3.24

Table – 14: Preference for marketing of cashew nuts to a particular agency

Sl. No	Particulars	North Goa (n=90)		South Goa (n=90)	
		Average garret score	Rank	Average garret score	Rank
1	Better price	89.39	1	63.48	1
2	Assured market	88.41	2	64.64	2
3	Low transportation cost	78.76	3	65.30	3
4	Low commission charge	75.30	4	67.42	4
5	Low cost of marketing	44.22	5	68.25	5
6	Credit facility in advance	69.15	6	87.01	9
7	Reliable market information	68.82	7	73.01	6
8	Less physical loss	66.61	8	74.35	7
9	Easy access to inputs	63.12	9	88.62	10
10	Influence by friends/relative/neighbors	61.57	10	77.13	8

Table – 15: Constraints faced by farmers in cashew nut production

Sl. No	Factors	North Goa (n=90)		South Goa (n=90)	
		Average garret score	Rank	Average garret score	Rank
1	Wild animals problem	89.93	1	78.92	3
2	Non availability of water	87.5	2	88.61	1
3	No availability of good quality seedlings	79.74	3	68.92	5
4	Labour shortage/ high wages of labour	77.65	4	77.02	4
5	Pest and disease attack	74.59	5	87.21	2
6	Lack of improved harvesting techniques	69.87	6	67.86	6
7	Power cuts/ Electricity problem	68.85	7	63.21	9
8	Lack of technical knowledge	67.23	8	66.92	7
9	Higher initial investment	64.82	9	64.71	8
10	Property rights	63.13	10	61.68	10

Table – 16: Constraints faced by farmers in cashew nut marketing

Sl. No	Factors	North Goa (n=90)		South Goa (n=90)	
		Average garret score	Rank	Average garret score	Rank
1	Poor market intelligence	77.65	1	78.42	1
2	Lack of storage facilities	72.16	2	69.86	4
3	Non availability of market facility near farm	68.47	3	72.41	3
4	Price fluctuation	66.85	4	77.92	2
5	Financial support for marketing	64.32	5	66.52	6
6	Delay in payment after sale	63.81	6	55.09	9
7	High transportation cost	61.72	7	67.33	5
8	High commission charges	58.77	8	65.22	7
9	High market fee	54.82	9	59.48	8

Table - 17: Marketing of cashewnut by producers in North Goa

Sl. No.	Particulars	No. of farmers	Per cent	Price (Kg of nuts	Method of Sale
1	Village traders	6	6.67	140	Direct
2	Wholesalers of APMC	4	4.44	130	Direct
3	Processing units	7	7.78	155	Direct
4	Societies: Goa Bagayatdar	45	50	140	Direct
5	Adarsh Co-operative society	13	14.44	140	Direct
6	Bhanda Maharashtra	15	16.67	130	Direct

Table - 18: Marketing of cashewnut by producer in South Goa

Sl. No	To whom sold	No. of Farmers	Per cent	Mode Price/Kg of nuts	Method of Sale
1	Village traders	5	5.56	130	Direct
2	Wholesalers	11	12.22	135	Direct
3	Processing units	4	4.44	142	Direct
5	Societies: Goa Bagayatdar	21	23.33	140	Direct
6	Adarsh Co-operative society	49	54.44	140	Direct

Table - 19: Price spread in marketing of Cashewnut in Goa

	Particulars	Channel – I	Channel – II	Channel – III	Channel – IV	Channel – IV
I	Producers					
	Price received	140	141	142	144	151
	Marketing costs	1.88	1.88	1.88	1.88	1.88
	Cost of cultivation	48.15	48.15	48.15	48.15	48.15
	Net price received	140	140	140	140	140
II	Village merchants					
	Purchase price	140				
	Costs	0.4				
	Margins	1.6				
	Sale price	142				
III	Wholesalers					
	Purchase price	142	141			
	Costs	0.5	0.5			
	Margins	1.5	1.5			
	Sale price	144	144			
III	Cooperative societies					
	Purchase price		144		144	
	Costs		0.5		0.55	
	Margins		3.5		5.45	
	Sale price		148		150	
III	GSAMB traders					
	Purchase price			142		
	Costs			0.5		
	Margins			2.5		
	Sale price			145		
III	Processors					
	Purchase price	144	148	145	150	151
	Costs of processing	32	32	32	32	32
	Margins	31.5	27.5	30.5	25.5	24.5
	Sale price	207.5	207.5	207.5	207.5	207.5
III	Wholesalers					
	Purchase price	207.5	207.5	207.5	207.5	207.5
	Costs	21.25	21.25	21.25	21.25	21.25
	Margins	15	15	15	15	15
	Sale price	243.75	243.75	243.75	243.75	243.75
IV	Retailers					
	Purchase price	243.75	243.75	243.75	243.75	243.75
	Costs	31	31	31	31	31
	Margins	45.25	45.25	45.25	45.25	45.25
	Sale price	320	320	320	320	320
	Price spread	180	179	178	176	169
	Net Producer's share in consumer's price	77.78	78.77	79.78	81.82	89.35

Channel-I

Producer-village traders-raw Cashewnut wholesalers-processors-cashew wholesalers-retailers-consumers

Channel-II

Producer- raw cashew nut wholesalers-Cooperative societies-processors- cashew wholesalers-retailers-consumers

Channel-III

Producer-GSAMB traders-processors-cashew wholesalers-retailers-consumers

Channel-IV

Producer- Cooperative societies-processors- cashew wholesalers-retailers-consumers

Channel-V

Producer-processors- cashew wholesalers-retailers-consumers

