A CASE STUDY OF FRUIT PROCESSING UNITS IN RATNAGIRI DISTRICT WITH SPEECIAL REFERENCE TO CASHEWNUT PROCESS UNITS IN DAPOLI

A THESIS SUBMITTED TO THE SRTM UNIVERSITY OF NANDED FOR AWARD OF THE DEGREE OF DOCTOR OF PHILOSOPHY IN THE FACULTY OF COMMERCE

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CERTIFACATE

I Certify that the thesis entitled **" A Case study of fruit processing Units In Ratnagiri District with special Reference To Cashewnut process Units In Dapoli,"** which is being submitted herewith for the award of the degree of Doctor of Philosophy in Commerce at SRTM University, Nanded is the result of original research work completed by **Shri. Suresh Tukaram Nimbalkar** under my supervision and guidance. Such material has been obtained from other sources has been duly acknowledged in the thesis.

Place :- Nanded

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DECLARATION

I hereby declare that the thesis entitled **" A case study of fruit processing Units In Ratnagiri District with special reference To Cashewnut Process Units In Dapoli.** Submitted by me for the degree of **Doctor of philosophy** in SRTM, University, School of commerce and Mangement Science Research centre, Nanded is wholly my own work unless otherwise referenced or acknowledged. The thesis has been submitted in whole or in part for qualification at any other academic institute .

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ABREVIATIONS

M.T.	Metric Ton
C.E.P.C.	Cashew Export Promotion Council
N.P.C.	Nominal Protection Coofficient
C.N.S.L.	Cashewnut Shell Liquid
M.S.C.P.	Multi State Cashew Project
C.P.C.R.I.	Central Plantation Crap Research Institute
R.B.I. Code	Reserve Bank of India Code
K.G.	Killo Gram
L.C.L	Large Container Load
F.O.B.	Free On Board
F.M.C.	Forward Market Commission
A.R.I.M.A.	Autoregressive Integrated moving Average Technique
A.R.	Auto Regressive
M.A.	Moving Average
N.M.A.	Nonlinear Moving Average
N.A.R.	Nonlinear Auto Regressive
V.A.R.I.M.A.	Victors & Autoregressive Integrated Moving Average Technique

S.A.R.I.M.A.	Seasonal Auto Regressive Integrated Moving Technique
F.A.R.I.M.A.	Fractional Auto Regressive Integrated Moving Technique
C.A.G.R.	Compound Annual growth Rates
A.D.F.	Augmented Dickey fuller
W.T.O.	World Trade Organization
V.R.L.S.	Venyhigh Rainfall Lateritic Sail

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INTRODUCTION

CHAPTER 1

INTRODUCTION

The wonder nut 'cashew means cash you!' is the slogan of cashew. It is a dollar-earning

Crop of our country as Indian cashew is highly preferred in the export market. Cashew nut is one of the agricultural produces of commercial importance.

Cashew (Anacardium occidentale L.) a native of Brazil was introduced in India by the Portuguese during 16^{th} century. In the early years , it was only a crop for afforestration and soil conservation. In fact only from the early part of the previous century its commercial value for export and foreign exchange earning was realized. Cashew is poor man's crop noted for its wide adaptability to both soil and climate and ecofriendly behaviour. Cashew nut is a versatile tree nut presently cultivated in more than ten countries . it is a highly preferred as delicious nut almost all over the world.

Portuguese explorers brought the cashew tree, Anacardium occdentale from its native Brazil to India, Africa, and Asia beginning in 1558. It has been cultivated for food and medicine for 400 years, and during World War II, became highly prized as the source of valuable oil drawn from the shell.

In the lands where cashew grow, the nut is only one of the products enjoyed by the local populations. The cashew "apple" or false fruit is an edible food rich in vitamin C. It can be dried, canned as a preserve, or eaten fresh from the tree. It can also be squeezed for fresh juice, which can then be fermented into cashew wine, a very popular drink in west Africa.

Cashews have served nutritional, medicinal, and wartime needs, and more recently have been used in the manufacture of adhesive, resins, and natural insecticides. The cashew is a hardy perennial tree, resistant to drought, unexacting as to soil (though it prefers deep, sandy soil), and capable of living 50 or 60 years. After producing clusters of flowers, cashews produce the edible apple, and nut encased in a heavy shell, which is the true cashew fruit.

The nut is high in protein, mineral salt, iron and fiber; while the tart apple provides vitamin C, calcium and iron. The root has been used as a purgative, and the leaves are used to strengthen fishing lines and nets, and as a vitamin supplement. The waterresistant wood is used for boats and ferries; while the resin, in addition to having industrial used as an expectorant, cough remedy, and insect repellent.

Today, about 96 per cent of cashew nuts are coming from Brazil, Africa and India, but most of them are processed in either India or Brazil. Major buyers of cashew kernels are countries with high incomes, where cashew kernels are regarded as a luxury food and quality is the prime determinant of price. Cottage-industry cashew processing is an excellent alternative to large-scale, capital-intensive processing – it permits closer attention quality and color , producing more unbroken kernels than machines can, and it permits the processors more independence in how they operate their home-based businesses.

The role of balanced diet for healthy life is a basic need. Cashew kernel obtained after processing of raw nut is the economical part known for its high nutritive value, delicious taste, rich in protein, fats and also good source of mineral and vitamins (Jayalakshumi, 2004). It is zero cholesterol nuts, as cashew kernels contain 21 per cent protein and 47 per cent of fat of which 82 per cent is unsaturated fatty acids, which are easy

to digest. Kernels are also rich source of minerals like calcium, phosphorus and iron. It contains 22 per cent carbohydrates with a right combination of amino acid and it is nutritionally at par with milk, egg and meat without disadvantages of the food of the animal origin. The shell contain high quality oil known as cashew nut shell liquid (CNSL). This has got wide industrial use. Cashew apple can be distilled to produce alcoholic drink (Fenni) and may be turned into various value added products like syrup, jam, chutney etc. (Mamatha, 2002).

The major cashew growing countries in the world includes India, Brazil, Vietnam, Indonesia and several African countries such as Tanzania,Mozambique, and Ivory cent of the total production followed by Brazil (13.50%), Nigeria (13.71%), Vietnam (9.39%) (www.dacannut.com). India has a creditable record of attaining good amount of foreign exchange by way of exports of cashew kernels. Among the agro-horticultural commodities getting exported from India, cashew ranks the 2nd position. During the year 2008-2009, India exported 1, 08, 131 M.T. of cashew kernals valued at Rs. 2, 95,024 million. USA, Netherland, U.K. , Japan, UAE, France, Canada, Saudi Arabia, Singapore, Italy, German Fed. Republic, Austria, Israel and Spain are the major international buyers of Indian cashews (http://dacnet.nic.in./cashew cocoa).

The main cashew growing and processing states in India are Kerala, Karnataka, Tamil Nadu, Andhra Pradesh, Maharashtra, Goa and Orissa. Cashew occupies an area of 893 thousand of 695 thousand M.T. (http//dacnet.nic.in/cashew cocoa)

With regard to area, Maharashtra ranks first with 1,70,000 ha closely followed by Andhra Pradesh 1,36,000 ha. Orissa occupy third position with 1,20,000 ha. area . Maharashtra ranks first in area and also

rank first in production with 2,25,000 M.T. Kerala and Andhra Pradesh ranked second with 70,000M.T. Maharashtra ranks first in productivity with 1.5 M.T./ha. closely followed by Kerala 0.9M.T/ha.

Industrialise or perish is the slogan of the day. It has a major role to play in the economic development of developing countries. It is also an essential ingredient of rapid and self sustained development of rural area. Agro-units play an important role in economic development which lead to an efficient decentralization of the economy. Agro-units help to increase agricultural prosperity and agril. Producton, support agricultural income, absorb surplus labour force in the rural area. Their development make smooth economic development possible by bringing about alround prosperity and improvement in the living standard in rural areas.

Processing is an important marketing function in the present marketing of agricultural produce. A little more than a century ago, it was relatively unimportant function. Large proportion of farm produce sold in an unprocessed form and great deal of the processing was done by customer themselves. Processing convert the raw material into the form in which it can easily be consumed by the consumers. Essentially processing concerned with addition of value to the product by changing its form mainly for horticulture products coming from the field.

1.3 A Plant of Oddities: the cashew trees

Cashew is a low speading evergreen tree of upto ten meters height. It can be cultivated only in topics preferby under warm and humid climate (25^0C to 35^0C and high humidity). It is not very selective with soils, and can be cultivated from the sandy seacost to laterite hill slopes upto 700m sea level. It requires a minimum of 500mm rainfall per year but can stands extremes of rainfall from 3000mm to 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 the tree. In India the cashew tree is grown mainly on laterie, red an coastal sands in the federal states of kerala, Karnataka, Maharashtra, Goa, Tamilnadu, Andra Pradesh, Orissa and West Bengal.

Cashew normally flower after three to five years of planting. Period of flowering starts from the end of November until the end of January depending on climate conditions. Flies, bees and ants as well as wind are the pollinating agents. After fertilization the ovary grows faster, the nut reaches to its maximum in thirty days. From the fifth week, the peduncle starts growing rapidly fully in sixth days.

The cashew tree is a hardy and drought resistant tree thriving well in variety of soil and climatic conditions. It was originally introduced into the coastal regions of East Africa and South West India for the purpose of checking soil erosion. In India it soon established itself all along the west coast and later in the east coast as well.

For several centuries cashew was merely regarded as a sturdy perennial tree yielding good soft wood and producing a rather delicious juicy apple. Nuts were thrown as its hard shell contained corrosive liquid known as cashewnut shell liquid. As years rolled by, interest in the nut slowly developed and extraction of kernel from the nuts after burning off the liquid was discovered. During the progress of the current century more and more people, the world over have been consuming this unique nut, making the cashew an economic product.

The cashewnut is about 2-4cm, long and kidney shaped grayish in color. It is attached to the fleshy peduncle (cashew apple). Its shell is about 3mm thick, having a soft leathery outer skin and a thin hard inner

skin between the walls of the sheel is a honey comb structure which contains phenolic material commercially known as cashewnut shell liquid. Inside the sheel the kernel is wrapped in a thin brown sking known as the testa.

Cashew kernel is known for its delicious, pleasant taste and nutritive value. The kernels are rich in fats, proteins, carbohydrates, minerals and vitamins. The fat content is 42.2 per cent and protein content is 20.8 per cent. Cashew kernels have all the fat soluble vitamins (A, D, E and K) (Rai, 1984). The cashew kernel is consumed either raw or roasted as it is rich in nutrients, crips and tasty. It can be consumned in a variety of a forms. In India it is mostly used in delicious foods, confectioneries and bakery foods, in foreign countries it is mostly consumed as cocktail snacks.

The by a products like cashewnut shell, contains sheel liquid which is used in units for preparation of water proofing agents, adhesive ingredients, pigments of gums, inks, oil paints, varnishes, cardboard finishing agents, typewriter rolls, automobile brake lining etc. while tasta, which known to contain tannin. It is used in leather unit.

Although cashew has been grown in several countries for a long time, the credit for initiating commercial production and export of cashew kernel goes to India where the business has grown to be a major economic activity in recent years. Between 1900 and

outbreak of the world war I, very small quantities of cashew kernels, still unpeeled were packed in wooden cases lined with newspaper and exported occasionally to London.

Shortly after the first world war a fe trial shipments were made to New York. It was in the early 1920's that a new method of packing cashew kernels to the containers infused with carbon dioxide was

introduced. This enhanced the storage life of the product and virtually eliminated the risk of the infestation and facliltated large scale exports of cashew kernels. Indias cashew export increased slowly but steadily until the beginning of the world war II, which caused the set back. The end of the world war II, saw the beginning of a phenomenal growth of Indian cashew unit. The progressive opening of new markets and expansion of existing once resulted in a greater spurt in exports. Too meet the growing demand for cashew kernels new processing unit were also established and raw cashewnut were imported from Tanzania, Mozabmbique, Kenya and other countries (Singh 1998).

Cashew to India in one of the major export earning crop which occurs nearly Rs. 2451 corers of export earnings which constitute around 1.51 per cent of total India export. It is an introduced crop brought by the colonial regimes, that persisted in India during the pre-independence era, which at present has attained the status of major Horticulture crop, overcoming all limitations of a crop which was mainly looked down upon for afforetation and soil erosion measures in the early years of its introduction. It is evergreen tropical crop with a variety of versatile exploitability acclimatized to the indian tropical coastal regions. Industrially, this crop facilitates running more than 1132 processing unit in the country providing employment for nearly 5 lakhs families in the industrial sector. Over 95 per cent of unit workers are women from the low income group belonging to socially and economically backward communities. At present in India. 7.68 lakhs hectares of cashew plantation providing 4.83 lakh MT of raw nuts (Balasubramanian 1997 and CEPC 2001).

The major constraint in the production of raw cashewnut in india is the larger extent of sensile plantations. New plantations are possible only in limited number of states like Maharashtra, Tamilnadu, Andhra Pradesh

and Orissa. Replanting therefore is a premier alternative to increase the production. The present level of productivity in the country is only 840 kg/ha whereas the sensile do not manifest more than 50 per cent of this level even.

It is estimated that 60 per cent of cashew kernels consumed in the world is in the form of snacks, while the rest is used by the confectionery unit. In the world edible nut market cashew competes with other tree nuts like almonds, hazelnuts, walnuts, Amazonian nuts, pecans, macadamia and pistachios. There has been increase in the demand for edible nuts globally. The recent awareness of the mineral and vitamin content of edible nuts have attracted health consciousness of consumers. Mediterranean Diet Pyramid developed by the World Health Organization placed tree nuts along with cereals and pulses at the base of the pyramid recommending daily consumption.

Indias export of cashew kernels had increased from 16.9 thousand MT in 1847 to 50.90 thousand MT in 1991.92. Further the export of cashew recorded for the year 2000 was 92.5 thousand MT.

1.4 World Scenario of Cashew Trade

The international scenario of cashew kernel trade keeps India still next to none but closely followed by Brazil with 30 per cent share captured.

India is the largest producer, processor and exporter of cashew in the world. Its share in the world production range between 39 to 62 per cent during 2001 to 2005. Vietnam is currently the second largest producer in Asia with 90,000MT. during 1995 and from the modest production of 35,000 MT. in 1991, it now captured around 11 per cent of the share of the world production. Brazil with 23.9 per cent is the second largest producer in the world and among the African countries, Tanzania

had a share of 8.4 per cent. While the Asian countries account for 54.6 per cent of the production, 24 per cent comes from Brazil and the rest from African countries. In the year 2006 the worlds trade was estimated to be around 1.13 million MT of which Indias share was about 62 per cent. The other major exports from Asia are Vietnam, Indonesia and China. Among the African countries, Mozambique is the only country with sizable export while the rest trade mostly in raw nuts. Even though exports are reported from Singapore, it is not actually a producer of cashew. The major consuming countries of cashew kernels in the world are USA accounting for about 60 per cent of the demand followed by Russia (9.7%), UK 6.25%), Canada (5%), Japan (5%), Germany and Holland (4.3%, respectively. In the recent years, there are changes in demand trends characterized by per per capita consumption in USA. Canada, Netherlands and the former USSR territories. India share in the world export of cashew, which was 98.8 per cent during 1950, remained above 90 per cent till 1965. after that the share continuously declined and was the lowest of 53 per cent during 1991. Indian cashew kernels are exported to more than 60 countries all over the worlds, the major markets being the United States, the Netherlands, Russia, United Kingdom, Japan, Australia, Canada, Germany, Hong Kong, Singapore, New Zealand and middle East Countries. The Indian Cashew kernel is acclaimed for its better quality, appearance and taste. World trade in cashew was increasing since 1950. But in late seventies, declining trend was observed. Subsequently , during eighties, it had been on the increasing trend. This fluctuation might be due to emergence of competition in the international market.

International cashew market is undergoing a disaffirmation mainly due to geodetic changes like break up of USSR into community of independent states and the economic changes like in Vietnam and

Indonesia. New consumer markets are also emerging like Taiwan & Korea. New western markets are likely to absorb large quantities of edible nuts especially cashew in particular. Arabian countries, which also have market for high quality products, may form lucrative market for tree nut. In the Latin American countries the urban areas with better purchasing power could also be potential markets. Taiwan, South Korea, Hongkong and Singapore with raising income have developed into potential markets.

However, the economic depression currently felt in Thailand, Indonesia, the Philippines and Malaysia, could also have effect on the Cashew trade. In order to consolidate and develop suitable markets in American zone. West European zone, East European zones and oceanic zone development of new products become imperative. Creating new recopies for snacks, fast food and diet food market sectors should enhance the demand for the cashew kernels thereby benefiting the farmers in cashew growing countries and also offering lucrative avenues for processing units in rural areas and prompting exports sectors.

The availability of relatively cheap and abundant skilled labour, easy access to raw materials (cashewnut) both form indigenous and import sources and tremendous growth in demand for kernels in the worlds markets helped the of this processing unit in India.

However the growth and development of processing unit in raw cashewnut exporting countries like South Africa countries in recent years, made serious inroads into the prospects for more imports of cashewnut. Unit is now faced with the imperative necessity of increasing indigenous production in order to sustain the production capacity and export potential.

The main cashew growing and processing states in India today are Kerala, Karnataka, Tamil Nadu, Andhra Pradesh, Goa, Maharashtra and Orissa. The cashew cultivation area in India during 1996-97 was 6.59 lakh hectares with an annual production of 4.30 lakh MT of raw nuts. Andhra Pradesh occupies a maximum area of 1.21 lakh hectares with 0.6 lakh MT production. It is followed, by Kerala with an area of 1.99 lakh hectares and 1.34 lakh MT production, Orissa with an area of 1.05 lakh hectares and 0.40 lakh MT production, Karnataka with an area of 0.85 lakh hectares, 0.52 lakh MT production, Maharashtra with an area of 0.80 lakh hectares, and 0.8 lakh MT production, TamilNadu with an area of 0.79 lakh hectares and 0.30 lakh MT production.

The important cashew growing countries other than India are Tanzania, Mozambique, Kenya, Brazil, Madagascar, Thailand, Malaysia, Indonesia, Nigeria, Senegal, Malawi, Angola and others.

The quantity of cashew kernels export from India if 60 per cent of global trade in cashew kernels. The rest in consumed within the country which is almost equal to one third of consumption of cashew kernels by any other kernels importing countries and hence attained a position of largest consumer of cashew kernel in the world. Therefore Indian, cashew unit had been enjoying the privilege as the largest exporter, besides catering almost equal quantity of export to domestic market.

The production, of cashewnut registered a growth of 10 per cent per annum from the commencement of fourth five year plan to the end of eight five year plan. Nearly 6.3 lakh MT of raw cashewnut processed annually in the India comes from indigenous and imported source to the tune of 4.3 lakh MT and 2.0 lakh MT respectively (2005-06), accounting for 14 lakh MT of kernels production.

The total global consumption of cashew kernels is 2.10 lakh MT of which India consumes almost one third and remaining two third is shared by the kernel importing countries, of this, united states alone accounts for 42 per cent.

The advantages status of India being the largest consumer of cashew kernels has to be viewed at the cost of imports and diminished rate of utilization of indigenous production to the same extent. Imports cost nearly 50 per cent of our export realization and the major part of dearer economy of ours is draining for import for having become the largest consumer.

Cashew unit in India is growing at the rate of 25 per cent per annum, hence it would demand more and more raw material. So a part of which will continue to get imported. The consumption is likely to grow to the level of 0.80 lakh MT in 2005-06. Therefore the unit requires 6.5 lakh MT of rawnuts for export and domestic consumption. But, the production may likely to touch 5 lakh MT. This will again warrant import to the extent of shortfall. Therefore, there is a need for rapid strategically approach in the development front.

The demand of the unit to process one million MT rawnuts by 2000 AD to become a reality, the development sector will have to pool all its opportunities to exploit all its resources available in the country. Indian cashew unit grew first by imports, then by exports and now by consumerism (Balasubramaniam, 1998)

1.5 Cashew In Maharastra

Status of cashew in Maharashtra

Maharashtra is a much advanced state for horticulture with nearly 10 lakhs ha. area under fruit crop of which, cashew constitute 1,70,000 ha. Covering nearly 15 per cent of total area under fruits. The

Konkan region of Maharashtra comprising of Thane, Raigad, Ratnagiri and Sindhudurga is the major tract of cashew cultivation in the state. In Konkan region 1,31,288.52 ha. area is under cashew production. Where in Ratnagiri district 45,000 ha area is under cashew and production is 30,000 million tonnes(http://dacnet.nic.in/cashew cocoa.)

Agro-units play an important role in economic development. Which lead to an efficient decentralization of the economy. Agro –units help to increases agriculture prosperity, agricultural production and agricultural income and absorb surplus labour force in the rural area. Processing is an important marketing function in the present market of agricultural produces. A little more than a century ago, it was relatively unimportant function. Large proportion of farm produce was sold in an unprocessed form and great deal of the processing was done by consumers themselves. Processing converts the raw material into the form in which it can easily be consumed by the consumers. Essentially processing is concerned with value addition to product by changing its form mainly for horticultural products coming from the field. Thus, apart from its economical significance, the cashew nut has potential to play a leading role in the social and financial upliftment of rural poor.

Maharastra, the economic power of the country had attracted a largest amount of Indian as well as foreign investment in the post liberalization era. Recent past has seen the significant change in farming pattern from subsistence a commercial. Maharashtra is endowed with the diverse agro-climate conditions accommodating cultivation of wide range of fruit crop.

Diverse agro-climate conditions, increasing irrigation potential, progressive researchers and innovative farmers, respective to new ideas,

and technologies are all the factors that combine to offer tremendous scope for commercial horticulture state. Maharashtra state is one of the leading fruit and vegetable growing states in the country contributing 12 per cent of the total fruit production of the country.

In order to harness the potential of the fruit production in the state, the state Government had launched an ambitious horticulture Development Programmed linked to the Employment Guarantee Scheme. The area under various fruit crops in the year 2005-06 was to the tune of 2.50 lakh ha. Covering mainly Alphonso Mango, Cashew Nut, oranges and a few other fruit crops. However, with the inception of massive horticulture development programmed in 1990-91, area under various fruit crops has now increased to 11.00 lakh ha.

Cashew cultivation which has been quite traditional in the coastal Maharashtra is also not an exception for area increase. Initial area under the cashew in the year 2001 was to the tune of 40,000 ha, which has now crossed, a level of 1.25 lakh hectares. Maharashtra now ranks second in the production and first in the productivity (1.5MT). Strong research back up from Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli through varietal improvement and the sound propagation technology, the State Department of Horticulture is propagating the imporoved varieties and the area cover under cashew in the recent past with the grafts of high yielding varieties. Area coverage of cashew in Maharastra has been more in Ratnagiri district as compared to other coastal district of the State. The district alone contributes to around 40,000 hectares area.

The cashew produced in Mahrashtra is mostly procured by the processors from Kerala. However, many low cost local processing unit are being set up to process raw cashew. Around 450 such small unit have been set up in Ratnagiri district alone.

India today is the largest producer, processor, exporter and also the consumer of cashew in the world. However, low productivity of cashew in various growing regions of the country has always been constraint for the processing unit. The unit has to import raw cashewnuts from various other sources. In years to come it is feared that the availability of the raw material will drastically be declined. Mainly because the developing countries would also enter in the processing sector. The inherent potential of this unit to generate large employment will attract other regions to exploit of these units. It is therefore, necessary to ensure adequate quantity of raw material for this unit within the country.

Maharshtra state in such situation will be playing an important role. The plantation that has been taken up so far, and the new area that would be brought under cashew in near future, Maharashtra will have an estimated production level of around 1.5 lakh MT by 2002 AD. This would demand more efforts in the areas of processing. This will not only help in employment generation in the rural areas, but also help in dispersal of units in the rural areas, prevention of migration of rural masses to urban areas and further help in import substitution.

In cashew processing units, over 95 per cent of the workers are women from the lowest strata of society mainly belonging to socially and economically backward communities. Thus, apart from its economic significance, the cashew unit has the potential to play a leading role in the social and financial upliftment of rural poor.

Owing to the various problems, many cashew processing units have been closed down in India on one side, while on the other side many cashew processing units are performing well. This difference in position clearly points out ineffective management as one of the important reason among several other reasons. Management forms an important aspect of

business, which cans for management appraisal of the unit. At present the information available on management aspects of cashew units is very inadequate. So in order to identify managerial lapses if any and evolve appropriate managerial tools and techniques for improving efficiency in performance of cashew processing units, to suggest for efficient and cost effective management of the cashew processing unit in the region.

Indias foreign debt position becoming increasingly adverse and continuously deteriorating. Under this circumstances, India could regain the predominate position in cashew export by dynamic orientation in export marketing strategies. The problem of inadequate domestic production has been in existence for many years. Therefore India imports raw cashewnuts from the countries like Tanzania, Indonesia, Benin, Mozambique etc.

In the context of growing domestic demand for cashew, an attempt has been made in this investigation to review the performance of cashew and economic analysis of cashew processing.

1.6 Importance :-

Cashew is a traditional crop of the konkan region. The soil and climate of this region are most suitable for growing cashew the merit of the cashew plant is that, it grows well under rainfed condition on hill slopes and light soil. Cashew requires processing before consumption.

Cashewnut (Anacardium occidentale L.) although a native of topical America, it became commercially important in its adopted homes in India, Tanzania, Mozambique, Kenya and Brazil. It was primarily introduced in India to check soil erosion. In was planted along the seashore in the western coast and then it spread in the interior area of southern India. Now it occupies as important position in india's export trade as one of the major foreign exchange earner.

Its anatomy presents a funny hint of oddity the nut beneath the fruit snuggling close to the plump flesh as if it wants to go back inside. Since its entry, cashewnut has captured the subcontinent in apart us by its sheer taste and caloric value. Though it was the Portuguese who had introduced it to the world, it was Indian who had made cashew kernels famous. Now a day cashew trees are a common sight in coastal India.

Ayurveda, the Indian medicine book has accepted the cashewnut as a potent remedy as well as nutritive food. Though a late comer, cashewnut have found their place in Ayurveda tests, and been attributed with qualities like aphrodisiac, rejuvenating and appetite increasing.

Harmony is the essence of human life and it is appropriately described by the ancient esoteric order, 'Tantra' as 'Laya' the concord of mind and nature into the harmonious heart of Ayurveda's charmed cycle came cashews. Ayurveda lists a quite a few unique curative properties of the Indian cashewnut: it's a good stimulant, rejuvenator, appetizer, and excellent hair tonic a restorative. The medicinal value of cashew kernel gave it more demand among the masses.

Cashew made into the medicines book of ayurveda with its debut in the 16^{th} century. The cashew was first introduced to India by the Portuguese, mainly of checking the soil erosion in coastal area, cashew-nuts seen became quite at home with the tropical climate. It was first described in gardens on the malhar coast by cristovao da coasta in 1578.0

The specific objectives of this study were,

1.7 OBJECTIVE OF THE STUDY:-

The study proposed has the following main objectives :

1) To study present fruit process units in the district.

2) To study the development of cashewnut process industry .

3) To study the employment and self- employment generation to the cashewnut process units.

4) To study cashew nut industry and market.

5) To measure / understand the process units in the district.

1.8 Limitation of the study

The study pertains to the owners of the private cashew processing unit who are generally suspicious of the motives of any investigation due to fear of taxation. Therefore, the investigator has confronted with various drawbacks in ascertaining accuracy of the data. Hence greater care was taken to collect the data as accurately as possible.

1.9 Scope and Utility

Findings of this study will be helpful to different agencies engaged in processing and export of cashew kernels for planning their future policies.

1.10 HYPOTHESIS:

1) Fruit process unit are the source of income of the people in district.

2) Fruit process units are the source of employment and self – employment generation in the district.

3) Export marketing cashew during the pre-liberalized period are higher in post liberalized period.

1.11 RESEARCH METHODOLOGY

1.11.1 General

For any scientific investigation standard or expressed procedure had to be followed to arrive at definite and precise conclusions. This chapter deals with the salient features of data collection and methodology adopted in the analysis. The methodology adopted to accomplish the objectives of the study is as under. For this investigation, all cashew processing units in the study area was selected. Since this study comprises of two parts I related with cashew processing and part II related with export.

PART I – PROCESSING

1.11.2 Background information

List of cashew processing units was obtained from D.I.C. of Ratnagiri districts. According to this information, there were 45 units were in Ratnagiri district. To obtain adequate sample size Ratnagiri district were selected purposively. At the time of data collection, it was observed that some of the units were not in existence as they were closed. To overcome this problem, personal discussion was made with officer bearer of the Konkan cashew processors and exporters association at Vengurla. According to them 28 units were in operation. All these units were selected and contacted personally. The information related to various aspects was recorded in a well designed schedule. The information so collected pertained to the year 2005-08

1.11.3 Nature and source of data

The detailed information required for the study was collected from primary and secondary sources in order to accomplish the various objectives of the study.

The primary data relating to the procurement and processing of cashew nut, marketing of cashew kernels and problems faced by the processors were collected through pretested schedule from the processors for the year 2005-06. The processors were personally interviewed to ensure the data made available by them were appropriate, comprehensive and reasonably correct.

The secondary data regarding capital investment and organization structure was obtained from the records of the processing unit. Similarly the data relating to performance of the processing units like current assets and liabilities, owned funds, fixed assets, liquid assets, inventory, total sales, borrowed capital and profits or losses were obtained from trading Account, profit and Loss account and balance sheet of each processing unit for 5 years, that is from 2004-05 to 2008-09

1.11.4 Analytical techniques employed

In order to fulfill the objectives of the study, the collected data were analyzed by using appropriate techniques.

1.11.4.1 Tabular analysis

The data collected were presented in tabular form to facilitate easy comparisons. The investment pattern, cost of processing, and overall cost and return structure in the processing business were presented in the form of tabular analysis. The data were summarized with the help of statistical tools like averages and percentage us to obtain meaningful results.

1.11.4.2 Financial ratio analysis

The financial ratio is considered as most useful technique in evaluating the performance of the different categories of cashew processing units. In this study the ratio analysis technique has been

heavily relied upon the test of solvency, liquidity, profitability and turnover of the cashew processing units (Ramadev 1999).

1.11.4.2 a) Test of Solvency

The solvency ratios of the cashew processing units would indicate the ability of the unit to meet its medium term and short term obligations. Two solvency ratios were worked out.

a. Ratio of total liability to owned funds

The ratio would reflect the total commitments the cashew processor owners to creditors as compared to its owned funds. Higher ratio would indicate higher dependence of the processing unit on the external funds. Ratio values over unity for a non banking indicate poor financial structure.

$$\text{Total Liability to owned fund ratio} = \frac{\text{Total liability}}{\text{Owned funds}}$$

b. Fixed assets to owned funds ratio

This ratio would indicate the extent of owned funds invested in fixed assets. Here the ratio of 1:1 is considered to be in the acceptable limits. The steel increase in this ratio is not doubt a sign of progress which results in rapid increase in production and sales.

$$\text{Fixed assets to owned fund ratio} = \frac{\text{Fixed Assets}}{\text{Owned funds}}$$

1.11.4.2 b) Test of Liquidity

The liquidity ratios measure the ability of the cashew processing unit to meet immediate maturing obligations. Three types of ratios were calculated in the study. They are,

a. Ratio of liquid assets to total assets

The ratio shows the liquidity preferences of the cashew processing unit. the minimum norm for this ratio is 0.5 higher the ratio, higher will be the liquidity preferences of the processing unit.

$$\text{Fixed of liquid assets to total assets} = \frac{\text{Liquid assets}}{\text{Total assets}}$$

b. Ratio of current assets to current liabilities

This ratio is a barometer of the short term solvency of the working capital of the cashew processing unit. If this ratio happened to be greater than one, it should be presumed that the processing unit had sufficient current assets to meet its current obligations. A current ratio of around two is considered to be at satisfactory level.

$$\text{Current ratios} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

c. Acid test ratio

This ratio indicates the dependency of the cashew processing unit on inventory. The ratio of 1:1 could be considered as optimum and that less than 0.5 as most unsatisfactory situation.

$$\text{Acid test ratio} = \frac{\text{Current assets - Inventories}}{\text{Current liabilities}}$$

1.11.4.2 c) Test of Profitability

The profitability ratio is meaningful measurement used to diagnose the financial status of the cashew processing units and overall efficiency. Following ratios were adopted to study profitability.

a. Net profit to total asset ratio

This ratio indicates the rate of profit earned on the total assets employed. An increase in this ratio over years showed improvement in the overall efficiency of the processing unit. It was computed as under,

$$\text{Net profit to total assets} = \frac{\text{Net Profits}}{\text{Total assets}}$$

b. Net profit to owned funds ratio

This ratio indicates the profits earned by the processing unit on the owned funds invested in the business. Higher ratio would indicate higher percentage of income generated on the equity.

$$\text{Net profit to owned fund ratios} = \frac{\text{Net Profits}}{\text{Owned assets}}$$

c. Net profit to fixed asset ratio

This ratio was computed by dividing net profit by fixed assets of the firm. A higher ratio indicates a better utilization of fixed assets by the

processing units and that they are in a better position to meet the long term obligations.

$$\text{Net profit to fixed assets ratios} = \frac{\text{Net Profits}}{\text{Fixed assets}}$$

1.11.4.2 D) Test of Turnover

Turnover ratio is also known as activity ratio. It reflects the efficiency of the processing unit in managing its resources. These ratios express the relationship between the level of sales and investments in various assets.

a. Ratio of turnover ratio

Rate of turnover ratio measures the effectiveness of the processing unit in its sales efforts. Higher the turnover ratio, better would be the performance of the processing unit. This ratio is computed as follows,

$$\text{Rate of turnover ratio} = \frac{\text{Annual sales}}{\text{Average inventory}}$$

Where,

$$\text{Average Inventory} = \frac{\text{Opening stock + closing stock}}{2}$$

b. Working capital turnover ratio

The working capital turnover ratio was computed through dividing total sales by current assets. It helps in measuring the efficiency of the

employment of working capital. The higher the turnover, greater would be the efficiency and larger the rate of profit.

$$\text{Working capital turnover ratio} = \frac{\text{Total Sales}}{\text{Current Assets}}$$

c. Fixed asset turnover ratio

Fixed assets turnover ratio was used to test the efficiency in utilizing fixed assets. Higher the fixed assets turnover ratio, higher would be the efficiency of the processing unit in utilization of fixed assets to generate sales.

$$\text{Total assets turnover ratio} = \frac{\text{Annual Sales}}{\text{Fixed Assets}}$$

d. Total assets turnover ratio

This ratio indicates the efficiency in utilizing the total assets of a business firm. A higher ratio over a period of time would indicate increase efficiency of the processing units in the utilization of assets to improve the sales. This ratio is computed as,

$$\text{Total assets turnover ratio} = \frac{\text{Annual Sales}}{\text{Total Assets}}$$

1.11.5.1 Definition of terms and concepts

4.5.1 Capital Investment

a. Fixed Capital – The item included under the capital were the value of land, building, machinery and equipment, infrastructure facilities and other fixtures.

b. Working Capital – The working capital includes cost of raw cashew nut, utilities (like power, fuel and water cot), packing material (tin) cost, wages, salaries, unit overheads (like security, lighting, repairs and maintenance cost) and administrative overheads (like stationary expenses, office communications and insurance premium cost).

c. Investment on building – This includes investment on building for processing, storage, office and drying yard.

d. Investment on Machinery and equipment – Under this investment made on roaster. Hot chamber, cutter, grading table, packing machine, generator and utensils used in processing of cashew nut was included.

e. Investment on infrastructure facility – Here the investment incurred on providing roads, water, fencing and power supply to the cashew processing unit was considered.

f. Investment on other fixtures – In includes investment on fan, tube light and furniture in the cashew processing unit.

g. Interest on working capital – It is worked out at the rate of 16 per cent. Part of the working capital used on cashew nut procurement was computed while remaining part of the working capital was computed separately to include other operating cost of production.

1.4.2 a) Cost of processing – This is computed by adding the costs incurred on utilities, packing material and wages.

b) Cost of production – It is calculated by adding cost of raw cashew nut, cost of procurement, cost of carrying inventory, cost of processing, salaries, unit overhead, and administrative overhead, interest on working capital, fixed capital, and depreciation on building, machinery and equipment.

c) Value addition – It is calculated by subtracting the purchase value of one quintal of cashew nut from the sale value of two tins or cashew kernel. (Approximately two tins of cashew kernels are recovered from form one quintal of cashew nut).

d) Cost of marketing – It is calculated by adding sales tax, turnover tax, transport and handling charges, commission etc.

e) Sales realization – It is calculated by adding the sale value of main product, that is, kernel and by-products, that is, shell, test (husk) and rejection.

f) Benefit cost ratio – It is calculated by dividing gross returns by total cost. This indicates the actual benefits realize per rupee of investment.

1.5.3 Financial Indicators

a. Total liabilities – It includes all the terms loan borrowed from financial institutions, deposits received and sundry creditors except own funds.

b. Own Funds – It includes capital reserve fund and net profits.

c. Fixed assets – It includes value of land, depreciated value of building, plant and machinery, tools and vehicles.

d. Liquid (current) assets – It includes cash in hand, cash a bank, telephone deposit, fixed deposits at bank, value of closing stock, sundry debaters, bills and accounts receivable, deposits with other institutions.

e. Total assets – It comprises of both fixed and current assets.

f. Current liabilities – It includes short term loan borrowed, sundry creators, net profit and subsidy.

PART II – EXPORT

1.11.6 Collection of data

The study involved secondary data. The time series data were collected for the period from 1980-81 to 1999-2000. Further destination wise time series data on export of cashew kernels and cashew nut shell liquid viz. export quantity, value received, unit export price were collected from the office of the cashew export promotion council on India, Cochin. Also time series data on area, production, import of raw nuts, and domestic price of raw nuts, were collected from directorate of cashew nut development, Cochin.

In order to fulfill the first objective of the study, the information regarding the procedure of exporting cashew kernels was collected from internet website of WESTERN INDIA CASHEW COMPANY, Kochin (Kerala).

1.11.7 Analysis of data

The data so collected were processed for arriving at desired conclusions. The collected data were grouped into different zones and major countries from each zone, which were major and regular importers. These groups for cashew kernels are given below.

a) American Zone – U.S.A. and Canada

b) European Zone – East and west Europe, U.S.S.R., Netherlands, United Kingdom, Germany and France.

c) Asia Zone – (West Asian, South and Far East Asian Zone) Japan, U.A.E., Singapore, Hongkong and Saudi Arabia.

d) Oceanic Zone – Australia & New Zealand

e) Others – The export of cashew kernels of African zone were negligible and irregular, so it is grouped into 'others group'. In addition to this, different countries from different zones to which export was negligible and irregular were included in this group, these countries were

i. **American Zone** – Argentina, Bermuda, Jamaica, Trinidad, Colombia, Uruguay, Mexico etc.

ii **European Zone** – Bulgaria, Czechoslovakia, G.D.R., Hungray, Poland, Rumania, Yugoslavia, Belgium, Austria, Cyprus, Finland, Irish, Rep., Italy, Norway, Spain, Sweden, Switzerland and Denmark.

iii **Asian Zone** – Burma China Rep., Malaysia, Nepal, Philippines, Thailand, Afganistan, Baharain, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Syria, G.D.R., Yemenl Israel, Brunei and Sri Lanka.

iv. **African Zone** – This zone was fully included in this group. The countries from this zone are Ethiopia, A.R. Egypt, Malawai,

Somalia, Sierra Leone, Burundi, Cambia, Liberia, Zaire Rep., Seychelles, Libya, Tanzania Republic and Nigeria.

The collected time series data were analyzed for two deferent periods, viz. period I, Pre liberalization of economy i.e. 1980-81 to 1989-90 and period II Post liberalization of economy i.e. 1990-91 to 1999-2000 to observe effect of liberalization policy on export cashew.

External or international value of any currently is fluctuating over a period of time. Therefore, growth rates at current price received may not give the real picture. Hence by considering the year 1980-81 as base year the growth rates at constant prices were also worked out to have a real picture of export scenario.

For converting values of current prices received, into constant prices, suitable indices of export values have been constructed. The unit value index numbers of wholesale prices for 'Canning and preserving of fruits and vegetables were drawn from various Reserve Bank of India Publications (Monthly Bulletins).

The formula used for converting the values of current prices received into constant prices which were used by J.M. Talathi and R.P. Thakare (1995) is given below.

$$\text{Deflation factor} = \frac{\text{Wholesale prices indices of the base year}}{\text{Wholesale price indices of the current year}}$$

And,

Year value at constant price = deflection factor x actual price in the year

For calculating domestic consumption of cashew kernels, quantities of raw nuts of domestic production and imported were

considered. By considering 25.77 per cent kernels recovery, quantities of total kernel production were worked out. Then by subtracting the quantities of export from total kernel production in each year, the quantities of domestic consumption were worked out.

The data so collected and processed were subjected to analysis viz., trend analysis, simple growth rates and compound growth rates. For estimation of variability and instability indices for cashew export coefficient of variation (CV) were worked out.

In order to examine the performance of cashew export and factors affecting the export performance of cashew the multiple linear regression equation was estimated.

1.11.8 Trend analysis

In order to review the export performance of cashew i.e. second objective of the study the trend analysis were carried out.

1.11.8 a) Linear or simple growth rate

The growth in quantity exported, export-value, area production were worked out by using the following linear trend equation.

$$Y = a + bx + e$$

Where,

Y = Dependant variable for which growth rate is estimated.

A = Intercept or constant

B = Regression / Trend coefficient

X = Period in years, or Number of years.

E = Error term / with zero mean and constant variance.

1.8 b) Compound growth rate

Compound growth rates were worked out by using the exponential growth function of the form,

$$Y = ab^x e^u$$

Where,

Y = Dependant variable

A = Intercept or constant

B = Regression / trend coefficient

X = Number of years

E^u = error term with zero mean and constant variance.

And,

$$B = 1+r,$$

Where, 'r' is the compound growth rate given by,

$$R = (b-1) \times 100$$

1.11.9 Instability Analysis

In order to fulfill the third objective of the study, i.e. to study the instability in export trade of cashew, an index of instability was used as a measure of variability. The coefficient of variation (C.V.) was calculated by using the following formula.

$$C.V.(\%) = \frac{\text{Std. Deviation } (\partial)}{\text{Mean } (X)} \times 100$$

A linear trend was fitted to the original data on various components, of cashew export, i.e. cashew kernels and cashew nut shell

liquid. The trend coefficient was tested for its significance. Whenever, the trend coefficients of the series was found significant, trend rather than variation around mean was used as an index of instability. The formula suggested by cuddy and Della (1978) was used to compute the degree of variation around the trend.

$$\text{Degree of variation} = \frac{\text{Std. Deviation } (\partial)}{\text{Mean } (X)} \times 100 \times 1\text{-}r^2$$

Where,

r^2 = coefficient of multiple determination

1.11.10 Functional relationship

In order to examine the factors influencing the export performance cashew. The export function was estimated by filling multiple linear regression equation to the data. The function is as under.

$$\text{Export} = b_0 + b_1 \text{ CPRODN} + b_2 \text{ EXPRICE} + b_3 \text{ DPRICE} + b_4 \text{ DCON} + b_5 \text{ WEXP} + ut$$

Where,

EXPORT = Export of cashew ('OOO' MT)

CPRODN = Production of cashew ('OOO' MT)

EXPRICE = Export price of cashew Rs. Per quintal

DPRICE = Domestic price of cashew ('OOO' MT)

DCON = Domestic consumption of cashew ('OOO' MT)

WEXP = World export of cashew ('OOO' MT)

U_t = Error term

In addition to some other independent variables are also considered. They were area, production, import and productivity. In addition to individual redressers were also obtained.

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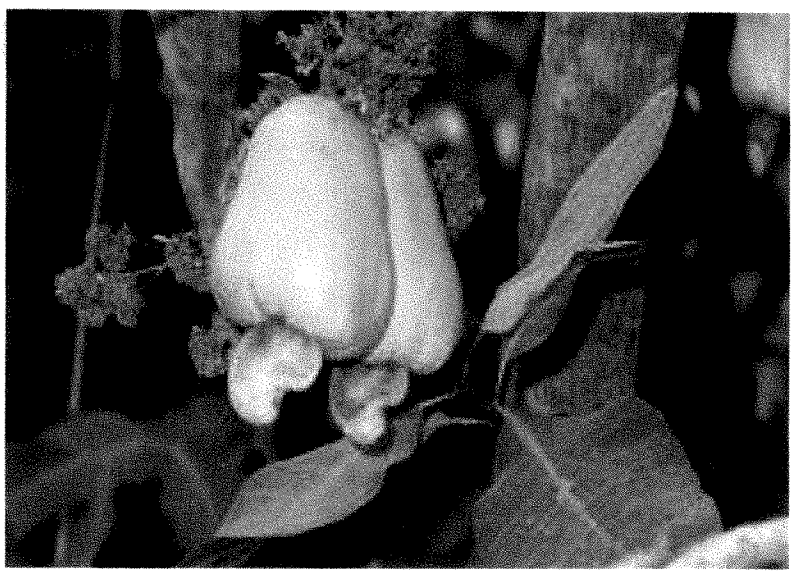
CHAPTER – II

REVIEW OF LITERATURE



CHAPTER II

REVIEW OF LITERATURE

Review of literature on relevant aspects under study forms an integral part of any systematic research work. This exercise helps in highlighting the methodology as results obtained by different research to be carried out; therefore this chapter was devoted to take a brief review of the research carried out by the other scholars in the same field of study.

It provides help in formulating the frame work of the study, deciding the objectives, method of approach to the problem and analyzing for collected data. It also helps to compare results of such studies and the reasoning for them. Some of the relevant work published in the scientific journals, periodical and and reports are presented in this chapter under following five subheads.

2.1 Investment pattern of cashew nut processing units

2.2 Cost, returns and profitability of cashew nut processing units

2.3 Financial performance of cashew nut processing unit

2.1 Investment pattern of cashew nut processing units:

Borude (1977) studied an economics of mango processing in Ratnagiri district (M.S) and observed that, total capital investment in mango pulp processing unit was Rs.75794.73, out of which 38.89 per cent was fixed capital and 61.08 per cent was working capital. The average total capital investment in the units preparing raw mango slices in brine was Rs.64402.22, out of which 22.21 per cent was fixed capital and 77.81 per cent was working capital. The average capital investment in pickle and chutney making units was Rs.96608.64, out of which 25.39 per cent was fixed capital and 74.61 per cent was working capital. This

indicated that the proportion of fixed capital investment was comparatively less than working capital investment.

Dalvi et al. (1992) conducted study in 'Economics of processing of cashew nuts in Sindhudurg district of Maharashtra State'. They reported that the overall total capital investment was Rs.4044898.54 which consisted of fixed capital of Rs.445444.84 (11.01%) and working capital of Rs.35,99,453.70(88.99%). In the total capital investment, the share of land and buildings were 1.55 per cent and 4.09 per cent, respectively. The shares of purchase of raw nuts was as high as 66.22 per cent, packing material was 17.85 percent and wages were 2.33 per cent, respectively.

Raut (1995) estimated processing cost and market margin for the processing of cashew apples and nuts while studying on 'Economics of processing of cashew apples and nuts in Goa state'. He analyzed capital investment per factory in processing of cashew apples and nuts in north Goa district. This study revealed that the major items of capital investment on vehicles, labour wages and investment in construction of processing units, about 62.52 per cent of total capital was utilized on investment was also high in the processing machinery. In the total capital investment, the fixed capital investment constituted 26.58 per cent, whereas working capital constituted 73.42 per cent.

Balasubramaniam (2000b) conducted study on cashew processing in Palasa in Andhra Pradesh. He observed that out of the total capital investment in the cashew nuts processing units, the major investment was in buildings (64.94%) followed by machinery and equipments (22.08) and land (10.00%) at an overall level. The high capital investment was due to the provision of workspace for processing units, at it was labour intensive.

Saravanan (2000) conducted study in ' An economic analysis of cashew industry in Tamil Nadu'. The study was conducted to know the capital investment pattern in land, buildings, machinery, and other accessories for the sample units. The mean investment of sample units in Kanyakumari district was found to be Rs. 7,89,591 and in Cuddalore district was Rs. 5,83,400. Out of the total investment, a lion's share was taken by building accounting for 55.46 per cent in Kanyakumari and 52.29 per cent in Cuddalore, 35.33 and 38.25 per cent of the total investment was made in machineries and equipments by the sample units in these two districts, respectively. The total mean investment in the district of Kanyakumari was higher by Rs. 2,03,191.17 compare to Cuddalore units, because the high cost of lands and buildings in Kanyakumari.

Wadkar (2010) conducted study on 'economic analysis of processing and exports of cashew' in Sindhudurg district of Maharashtra. He observed that the investment pattern of the cashew processing units revealed that there was the direct relationship between the total capital investment and the size of the processing units. The average aggregate capital investment per processing unit was Rs. 90.01 lakhs. In aggregate it was found that, from all the units investment on working capital was more (88.01%) than the fixed capital (11.99%), because of the heavy amount required on procurement of cashew nut (raw material). The proportion of working capital was more in medium size processing units as compare to large and small units, due to higher capacity utilization. However the proportion of fixed capital was invested more in small processing units than large and medium units, because of proportionately higher investment on land, machinery and infrastructure facilities.

Patil (2002) conducted study on 'Economic analysis of cashew processing at household level at South Konkan Region'. He recorded that

average aggregate capital invested per processing unit for Rs.2,97,072.74. the investment pattern of the cashew processing units reveled that, there was the direct relationship between total capital investment and size of the processing units. At overall level it was found that, the investment on operating capital was more (79.90%) than the fixed capital (20.10%). The proportion of investment on operating capital was more in large (84.35%) units than in medium (80.02%) and small (70.36%) size processing units.

Talathi conducted study in the economics of selected cashew processing units in Ratnagiri district of Maharashtra state in 2007, and observed that, the investment per processing units was Rs. 198069 comprising 29.95 per cent of fixed capital and 70.00 per cent of working capital.

2.2 cost, returns and profitability of processing units.

a) Cost

kane (1991) studied of economic of proportion of traditional products of mango and kokum at household level in Ratnagiri district. She workout the cost of processing of one quintal of mango fruit into pickle at household level. It was Rs. 2,375.78 of which share of spices alone was Rs. 779.42(32.8%). The net added value was Rs. 543.29 (88.67%) from processing. The cost of processing for one quintal of mango fruit into mango leather, Muramba, Amba, Mava and Mango jelly was worked out to Rs. 587.36, Rs. 2,462.95, Rs. 670. 40 and Rs. 2,504.5, respectively.

Srinivias et al. (1993) conducted study in 'Economics of processing of cashew nut' in Patana district of Bihar state. The observed that processors had to bear the processing cost of Rs. 124.44 per 80 kg of raw nuts. Out of this total cost, material cost of Rs.50.77was incurred which formed 40.89 per cent and labour cost Rs.72.81 which accounted

for 58.61 per cent indicating the major share of the labour cost in processing of cashew nuts which implies that the cashew processing was a labour intensive industry.

Dalvi (1995) studied an 'Economics of processing of cashew nut in Sindhudurg district if Maharashtra State'. They observed that cost of processing per quintal of cashew nut was Rs.325.3 in group I (small size units), Rs. 298.79 in group II (medium size units) and Rs. 338.95 in group III (large size units) with overall per quintal cost of Rs.331.35. Out of the total cost, the major cost was the interest on fixed and working capital, at overall level it was Rs.21.55 (6.51%) and Rs. 148.16 (44.72%), respectively. The other (4.15) The per tin total cost of marketing incurred by the factories was Rs. 44.65. The commission to agent was the major item of cost, which accounted for more than 50 per cent (Rs.22.75) of the total marketing cost. The next important items of costs were octroi (31.23%), transport (10.55%) and loading/unloading (2.67%).

Srinivas and Raju (1995) conducted survey in economics of processing of cashew nut at Mangalore district of Karnataka state. They found that the processing cost of 80 kg of raw cashew nut was Rs. 124.22. Out of this total cost, raw material cost of 50.77 was incurred, which formed 40.89 per cent and labour cost was Rs.72.81, which accounted to 58.61 per cent of the total processing cost indicating the major share of the labour cost.

Balasubrramanim (2000b) conducted study in ' Cashew processing and its economic feasibility in Kolar district of Karnataka state'. He recorded that overall total cost of processing was Rs.3,845 per ton of raw nut. Since, processing was a labour oriented process; wags of the employee become the major component in the total cost of processing constituting 59.52 per cent. The proportion of interest paid was 11.70 per

cent to the total indicated high rate of interest by commercial finance agencies.

Wadkar (2001) conducted study of 'Economic analysis of processing and exports of cashew'. And observed major cost on processing was interest on fixed capital (7.46%) at the overall level and about 30 per cent was found to be spanned on workers on various needs like salary wages, bonus etc. Cost of raw material had significantly influenced the behavior of the total cost of production.

Gupta and Prashant (2004) in their study on marketing and processing of cashew nut in Goa state observed that total marketing and processing cost was Rs. 1031.22 per quintal and Rs. 973.69 per quintal at small and large plants, respectively. The total marketing cost was Rs. 73.11 and Rs. 76.82 per quintal at these sizes of plants, respectively, which was 7.09 per cent of the total cost.

b) Returns

Veerkar (1988) conducted study on ' Economics of preservation of mango into different products in Ratnagiri district'. He works out the added values over the cost of fruits for different mango products. The net added value was Rs. 343.03 for mango pulp, Rs.355.82 in pickle, and Rs. 511.39 in chutney and only Rs. 21.19 in raw slices in brine. This indicates that processing of local type of mangoes into chutney was most profitable followed by pickle.

Kane (1991) studied ' Economics of preparation traditional products of mango and kokum at house hold level in Ratnagiri district'. She work out the net added value from processing of one quintal of mango fruit into pickle at house hold level which was Rs. 543.29 (88.67%) . the net added value was the highest from mango jelly

i.e. Rs. 1,995.50 (285.07%) and the lowest from Muramba i.e. Rs. 129 (22.49%).

Saravanan (2000) conducted study on ' An economic analysis of cashew net industry in Tamil Nadu'. He observed that total returns realized per ton of raw nuts amounted to Rs. 64,148.47 in Kanyakumari district and Rs. 63,635.34 in Cuddalore district. Returns included income from the sale of kernels, CNSL and shells and peels, mean net profit was found to be of Rs. 19,671.08 and Rs. 18,724.15 in the units of Kanyakumari and Cuddalore district, respectively.

Naik (2001) in his study on grading, processing and marketing of cashew nut in North district of Goa observed that, net returns in cashew processing units where Rs. 125.78 per quintal. On an average maximum quantity of cashew kernels where marked through distributor and the cost of marketing was high in the same (Rs. 98.36/ton).

Wadkar (2001) conducted study on ' An economics analysis of processing and exports of cashew'. He recorded that quantity of kernels received was 155.60 quintals , and 580.75 qtls. in small , medium and large processing units, respectively with the overall average quantity of 392.02 qtls. The net returns work out to Rs. 5.22 lakhs in small group, Rs 1,653 lakhs in medium group and Rs. 28.28 lakhs in large group the per quintal cost of production of kernel was work out. It was Rs. 21,726/- at overall level.

Gupta and Prashant (2004) studies 'Marketing and processing of cashew nut in Goa state'. They observed per quintal gross returns (Rs. 5204.60 per quintal) received by small processers where higher than the gross returns (Rs. 5165.00 per quintal) received by large processer, the net returns where estimated less at small plants by about Rs. 68 per quintal. Total cost incurred per quintal of raw cashew nut by small

processer was comparatively higher due to which the net returns realized by these processors was relatively less. Per quintal net returns was estimated as Rs. 123.38 and Rs. 191.31 at small and large size of plants, respectively. The input – output ratios were computed as 1:1.02 and 1:1.04 at those two size of plants showing bit more benefit realized by large processors over small processing unit.

Naik (2005) conducted study on an economic analysis of mango production, processing and export in South Konkan region of Maharashtra state and observed that per tin returns where Rs. 2.238 in home sale, Rs. 25.51 in cottage scale, Rs. 25.69 in small scale and Rs. 27.31 in large scale categories with overall net returns of Rs. 26.50.

c) Profitability

Dalvi (1989) studied economics of production, processing and marketing of cashew nut in Sindhudurga district of Maharashtra state. He found that overall average working season of processing factories was 257.7 days. The average quantity of nuts processed by factories where 2,06,751 kg per session and 802.29 kg per day. The capital investment per hundred rupees of gross income was Rs. 81.61 and overall input output ratio was 1:1.19.

Joshi (1997) in his study on 'Economic of processing of different mango products in South Konkan region (M.S.)' observed that overall rate of capital turnover was only 133.76 per cent. The returns on capital investment were 44.28 per cent. Capital per hundred rupees of gross income was Rs. 74.75and capital per worker was Rs.2.08 lakhs. The overall input-output ratio was 1:1.35. The capital efficiency was positively related to the scale of production. Labour efficiency was higher enlarge scale and lower in small scale. Per day per worker quantity

processed was 100.42 tins. Actual production was about 20 times more than breakeven point production.

Patil (2002) studied economic analysis of cashew processing at household level in South Konkan region of Maharashtra state. He studied breakeven point of production, which was 33.97 qtls., 44.50 qlts. and 56.47 qtls. in small, medium and large units, respectively.

Saravanana et al. (2002) in their study on the efficiency of cashew nut processing units in Tamil Nadu reported that technical efficiency of sample units in Kanyakumari district ranged from 72.45 per cent to 100 per cent with the maximum of 11 per units falling under the category of 86.90 per cent level. The range was narrow i.e. 80.53 per cent to 100 per cent from the units of Caddalore district.

Balsubramanyam (2003) studied cashew nut processing and its economic feasibility in Kolar district of Karnataka in 2003 and concluded that, the benefits cost ratio of this region was 1:1.28 and the profitability of the business was Rs. 88390 per units during season and value addition was Rs. 11.04 per kg of raw nuts which was 16 per cent more than existing system, it can be promoted to improve economic status and rural employment.

Minic and Jose Mathew (2005) in their study on 'Multi uses of cashew apple' have worked out the economics of processing cashew apple for syrup production. They have worked out that by processing one ton of cashew apple, a net profit of Rs. 10368 can be obtained.

Talathi (2007) in their study of economic of cashew processing units in Ratnagiri district of Maharashtra state, observed that, the per quintal cost and returns were Rs. 5001 and Rs. 5825 respectively, realizing net returns of Rs. 824. The benefits cost ratio in processing business was 1.16. the cost of processing per quintal in small processing

units was Rs. 1274. This revealed that, processing was costly in units of smaller capacity.

2.3 Financial performances of cashew processing units

In order to get clear and complete picture of financial performance of institutions, various techniques employed by researchers and reviewed.

Filink and Grunewald (1969), in their study in united state of America, examined solvency of the firms in terms of whether its total assets equal or greater than or less than the obligation of the firm to its creditors , the liquidity in terms of its ability to meet its current obligation and profitability in terms of its overall efficiency of business over and above the amount put into business for transaction purpose.

Page (1970) studied the financial position of agricultural cooperatives of the united state of America by using magnitude of current ratio as the test of liquidity. The total liability of the worth ratio and fixed assets to worth ratio were used to test the solvency position of worth ratio of cooperatives and net earnings to net worth in order to test profitability of the cooperatives.

Hopkin et al. (1973) stated the financial progress of business firm could be evaluated with the help of liquidity, solvency and profitability ratios. A relatively low volume of transaction might be offset by high efficiency performance and vice versa.

Natragen et al (1980) analyzed the working of consumers cooperatives in Andhra Pradesh, concluded that the current ratio of 2:1, quick ratio of 1:1, inventory ratio, net profit margin, returns on assets and return of share capital were the best standards of evaluation.

Ananth (1984) used financial ratios to analyzes the performance of Banglore grape Growers marketing and processing cooperative society,

Banglore. The study revealed that the society had a satisfactory financial structure. He indicated that the society indicated could go further by augmenting its infrastructural facilities for the grapes that are production from the farmers.

Rao (1985) studied the business performance of CAMPCO observed that the cooperative institution had sound financial structure, earning reasonable profits. He found that the major part of the assets was maintained as liquid assets in consonance with the need for trading activities.

Mahammed Ali (1992) used the financial ratios to analyze the performance of fruits and vegetables processing units under private and public sector. He revealed that the solvency position of the private sector was sound which supported by lower solvency value, but for public sector it was high. The liquidity sectors in general have revealed that the private sector unit were in better position than public sector. The profitability sector have indicated more efficient utilization of assets as well as owned funds in case of private sector units. The turnover ratios were also law in case of Public sector units when compared with private sector units.

Reddy (1994) studied the financial performance of Mulkanoor cooperative rural bank using liquidity, solvency profitability and turnover ratios. The study revealed that the liquidity position of the bank was found to be sound as revealed by the current (2.09) and quick ratios (1.74). the solvency ratios showed that the break has been following the policy of low capital gearing with regard to long term debt (0.17) and high capital gearing with regard to total debt (1.56). the performance of the bank in relation to its profitability (2.42 per cent) and turnover was

not up to expected level (2.58 times) in view of the size and volume of business.

Wadkar (2001) studied the financial performance of cashew nut processing units in south Konkan region. In the above analysis the combination of financial ratios was used to study the various phase of financial position and relative business performance in small, medium and large processing units. The ratios revealed something on its own and in conjunction with other ratios. It revealed the strong and weak points of the business and thus provided clues to the management of the problem occurring and to undertake suitable remedial measures for efficient functioning of industry.

From the above review of literature it was clear that most of the researchers employed the financial ratio involving solvency, liquidity, profitability, and efficiency and turnover ratios.

1) NPC (Nominal Protection Coefficient)

Gulati et al. (1994) concluded that the commodities like rice, banana, grapes, sapota, leeches, onion, tomato & mushroom were highly competitive with NPC less than 0.75, while wheat, mango, potato & tomato paste were moderately competitive with NPC ranging between 0.75 to 1.00.

Mamatha (1996) calculated the Nominal Protection Coefficient's (NPC) for Indian coffee by taking United States coffee price as the reference price. The NPC of coffee types namely plantation, Arabica & Robusta under the exportable hypothesis were 1.3, 1.3 & 1.85 respectively in 1995 indicating that Indian coffee exports were not competitive & it was not efficient exportable commodity.

Mahesh (2000) indicated that under importable hypothesis, the NPC & DRC were 0.71 & 0.66, respectively & under exportable

hypothesis, the NPC & DRC were 0.98 & 0.93 respectively implying that Indian tea exports were competitive & also good import substitute.

Jayesh (2001) used the nominal protection coefficient technique for the export competitiveness of Indian pepper. Under the exportable hypothesis the nominal protection coefficient value were found to be lesser than unity (0.849) in Calicut & (8.817) in Sirsi markets, indicating that the Indian pepper is competitive in the international market & which is an efficient export oriented commodity.

Rameshchand (2002) observed that the pepper export from India have average NPC Value of 0.92 indicating its marginal competitiveness of pepper.

Mruthyunjaya & Chauhan (2003) indicated that the average NPC of cashew kernel export from India was found to be less than unity (0.79), which indicated that the cashew kernels export from India were marginally competitive.

Desai (2001) examined the export potentialities of mango from India by using nominal protection coefficients for the period 1990-1998 which is the ratio of domestic price to the border price. The findings of the study indicated that on an average the nominal protection coefficients value in fresh mango (0.89) & mango slices (0.45) were lower than one indication their competitiveness in international market.

Bhat (2004) reported that India's imports of raw cashew nuts has increased from 4.01 lakh tones valued at Rs.1231 crores in 2002-03 to 4.53 lakh tones valued at Rs.1401 crores in 2003-04. The major countries, which have supplied raw nuts to India during 2003-04, are Ivory Coast, Tanzania, Guinea Bissau, Benin, Indonesia, Mozambique & Ghana supplying 87.11 percent of total imports in terms of quantity & 88.81 percent in terms of value. The export of cashew kernels from India

was 1.01 lakh tones valued at Rs.1804.40 crores in 2003-04. USA was the biggest buyer of Indian cashew kernel with 48503 ton valued at Rs.881.6 crores followed by Netherlands (12237 tonnes values at 210 crores), UAE (6239 tonnes valued at Rs.102.4 crores), Japan (5522 ton values at Rs.101.9 crores) etc. during 2003-04 India had exported 6926 ton of cashew nut shell liquid valued at Rs.7.03 crores during 2003-04, USA was also the largest buyer of Indian CNSL, which accounts for 6600 ton valued at Rs.644.68 lakhs.

2) Co-integration Analysis:

Cummings (1967) opined that integration implied the association of prices between markets. Association of prices over time show seasonal integration of prices & association of prices between markets show spatial integration of prices.

According to Lee (1971) market integration was the interrelationship between price movements in the two markets. The degree of correlation can be taken as an indicator of the extent to which the markets were integrated.

Rao & Subbarao (1976) considered that the markets were integrated over space when the territorial price difference does not exceed the transport costs plus the remuneration for the services of the trader.

Brorsen et al. (1984) illustrated the use of uni variety & multivariate time series analyses in the integration of dynamic relationship among selected weekly import price of rice of the European community from the USA, Thailand & Argentina. The results revealed that Argentinean & UAS prices moved together & reacted quickly to changes in Thailand prices.

As per Granger (1986) when there is a pair of series X_t & Y_t each of which is 1 (1), a linear combination of these two series will also be 1

(1). However, if there exists a constant such that $Z_t = Y_t - \acute{\alpha} X_t$ is 1(0), then the pair of series X_t & Y_t are said to be co-integrated & a is called the co-integrating parameter. This means that there exists a long run equilibrium relationship between the two series. If Z_t is not 1(0) then the two series may diverge from each other indefinitely. Therefore, the basic idea behind co-integration of series it that the presence of co-integration ensures that the series will move closely together in the presence of co-integration ensures that the series will move closely together in the long run since the difference between them is stationary with well defined mean & variance. Z_t is often called the equilibrium error. The terms equilibrium is not used to imply anything about the behavior of economic agents but rather describes the tendency of an economic system to move towards a particular region of the possible outcome space, when disturbed from that region.

According to granger representation theorem (Engle & granger, 1987) if a set of variables Y_t & X_t are co-integrated then there exists a valid error correction representation of the variables, where the error tends to correct in the long runs & it acts as a means of reconciling the short-run behavior of the variables with its long run behavior.

The error correction model can be represented in the dynamic form as

$$\Delta Y_t = \acute{\alpha}_0 + \acute{\alpha}_1 + \Delta X_t + \acute{\alpha}_2 + Z_{t-1} + E$$

Multiple co-integration analysis (Johansen, 1988) enables the testing for & estimation of more than one co-integrating relationship in a multivariate framework & also permits testing for the validity of any restrictions on co-integrating relationships implied by economic theory.

Dolado et al. (1990) two variables are said to be co-integrated when three conditions are satisfied viz, (a) the variable must be integrated

of the same order. The order or integration is the number of times each variable has to be differenced in order to turn the series stationary, (b) there should be a linear relationship between them. That is in an equation $Y_t = ßX_t + U_t$ coefficient must be significant (c) The residuals (U_t) i.e., the extent by which the two variables deviate from the long run equilibrium relationship given by the equilibrium error (U_t) should be stationary.

Wholday Amha (1990) defined market integration as the inter-relation between the time series prices of different markets, which depends upon the nature & extent of competition in the market.

Arshad (1990) studied the applicability of the Ravallian method & causality tests in measuring market integration & ascertaining the nature of price relationships in the Malaysian crude palm oil market & found a highly integrated market in short run. Local factory were proved statistically insignificant. Pierce causality tests indicated an instantaneous or feedback relationship. This suggested each region absorbed new information as & when it becomes available. The season for this attribute was the setting up of palm oil futures market in Kuala Lumpur, which had increased the accessibility of market information.

Gemtessa (1991) analyzed the integration of Ethiopian coffee prices with world prices using correlation coefficient. The vicariate correlation coefficient between the two market prices of coffee revealed that they moved together in the same direction.

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CHAPTER – III

POST HARVEST MANAGEMENT AND CASHEW DEVELOPMENT IN INDIA

CHAPTER-III

POST-HARVEST MANAGEMENT AND CASHEW DEVELOPMENT IN INDIA

This chapter is especially devoted to give the technical information on post harvest management technology for cashew export, as the integration of post harvest management operations lead to the ideal approach in assuming quality success in the market place. Also emphasis has been given on the development of this crop in India. Main operation from export point of view include, harvesting, storage, grading processing, packing and transportation to destination markets. An integrated post harvest management technology will help in increasing the shelf life and reducing the post harvest loses of this precious fruits resulting into oriented production.

Therefore a major thrust is to be given on post harvest handling and management, so a brief account of technical information related to post harvest management technology is given to have a better understanding of the technical background of export of cashew. Further this information is also helpful for interpretation and implications of the findings of the study.

3.1 Harvesting

Harvesting of cashew crop is not done at once because the entire crop of outs does not ripen at one time.

3.1.1 Maturity signs

Nuts are harvested along with apples when they are fully mature. The use Fruit (apple) start ripening when the basic colour of outer skin turns yellow or red. The real fruit (nut) is ripe when it loses its green colour and on a gray brown on ash colour.

3.1.2 Method of harvesting

Fruits are harvested individually with the help of a long bamboo pole to which a hook like sickle is fitted at the top. Nuts are then separated from the apples by hand. Harvesting are done almost every day during the season.

3.1.3 Harvesting season

March-May is the peak season of harvest. The duration of harvest extends from 45 to 65 days.

3.2 Grading of raw nuts

One of the impediments to establish a suitable agency to undertake the collection and marketing of raw cashew nuts is the absence of any standard System of grading. Raw cashew nuts are not graded either by the producer or by trader.

The Directorate of Marketing and inspection in the Ministry of Agree- Culture Govt. of India formed grade standards for raw cashew nuts. The factors on which grade specifications are based, are moisture, void nuts, Number of nuts per kg., immature and damaged nuts.

Void nuts : Nuts in which there are no kernels.

Immature nuts : Nuts the kernels of which are shriveled.

Damaged nuts : Nuts containing discolored kernels and diseased nuts.

3.3 Packing of raw nuts

For purpose of packing of raw cashew nuts gunny bags 80 kg. Capacities are used. As the outer shell enclosing the kernel is quite hard, gunny cloth Packing is considered quite satisfactory.

3.4 Storage and transport of raw nuts

Since the producers and itinerant merchants sell the raw nuts to wholesale dealer or the processing units immediately after collection, storage is generally done only by the processing units. After drying of raw nuts, they are packed and stored in gunny bags in lots of 80 kg .each.

The growers and the itinerant merchant collect the nuts from the producers and transport them to assembling market, by head load, bullock carts, water barges, buses and trucks. The transport from assembling market to the processing units is generally by trucks or trains.

3.5 Processing

Processing of cashew nuts is nothing but the remove of the kernel (edible meat position) from raw nuts, by manual/mechanical method.

Normally the conversion of raw nuts into finished kernels involves following process.

3.5.1 Moisture conditioning or humidifying

The nuts brought from store are kept in heaps and thoroughly soaked in water by regularly spraying for 2 days covered with moist gunny bags and providing water to drain from floor immediately. (15.20% derived moisture level).

3.5.2 Roasting

The raw nuts are roasted to make the shell brittle and to loosen the kernels from the inside of the shell. Three different methods of roasting raw cashew nuts are generally employed.

a) Drum roasting.

b) Oil bath roasting.

c) Mild roasting.

In drum roasting, the dried nuts are fed into a pre-heated rotating drum which is rotated by hand for about 3-5 minutes.

In oil bath roasting, conditioned nuts are placed in wire baskets and immersed in a tank containing heated CNSL maintained constant temperature of about 200c in about 1.5 hour. During this, the shells get heated and the walls of the oil-bearing cells get ruptured, releasing shell liquid to the bath. The roasted nuts are then conveyed by a belt in to a basket intrigue where oil adhering to the surface of the shells is mostly removed. The nuts are then mixed with wood ash and send for shelling.

3.5.3 Shelling

This is carried out manually by women labour. The nuts are broken by heating them with wooden mallets or light hammers. This is a delicate job requiring skill. It is a time consuming process. One experienced women can separate 7 to 10 kg. Kernels / day (i.e.5000 kernels).

3.5.4 Drying the shelled kernels

Kernels after decortications from the shells are dried to reduce the moisture and also to loose the red skin adhering the kernel.

A crude through-flow tray drier, Known as BROMA drier is used for drying. The temperature maintained inside the BROMA is at 80-90 c.

The normal duration of drying varies from 6-7 hours.

3.5.5 Peeling of kernels

It is the operation of removal of tests from the kernels. The kernels when taken out of the drier are quite brittle and can be easily peeled off by hand, with the help of sharp bamboo devices. Shell quantities of kernels bits sticking to the skin are later removed by hand screening,

3.5.6 Sweating

The Kernels after peeling are further subjected to a process of sweating to prevent breakage.

3.5.7 Re-Humidification or conditioning of kernels

If the kernels become very dry during processing and if such kernels are packed in tins, there is possibility of breaking in to splits, bits etc. Which are less demanded in the market .Hence it becomes inevitable to recondition the nuts. Before the kernels are packed they have to be dehumidified up to moisture content of 5 per cent for which kernels may be placed in a special chamber with a humid atmosphere.

3.5.8 Grading of kennels

The kernels are manually sorted out into wholes, splits and broken. The wholes are further graded into different sizes on the basis of number of kernel per pound according to internationally accepted specifications.

The cashew export promotion council (CEPC) confirms grade specification and recognizes 24 different grades of kernels. The main 4 grades according to size and quality on the basis of visual characteristics are as follows,

First grade : Whole, good, big-sized kernels of export quality.

Second grade : Whole, good, medium –sized kernels of export quality.

Third grade : Halved and broken sized, sold locally.

Four grade : Rejected and spoiled, sold locally.

From export point of view, the kernels are graded into different 33 grades. These are into different 26 grades. These are commonly available and exported.

A) Wholes

a) White whole	b) Scorched wholes
W-180	SW-180
W-210	SW-210
W-240	SW-240
W-320	SW-320
W-450	SW-450
W-500	SW-500

C) Desert Wholes

SSW: (Scorched wholes second)

DW : (Desert Wholes)

B) Broken:

a) White pieces

B (Butts)

S (Splits)

LWP (Large White Pieces)

SWP (Small White Pieces)

BB (Baby Bits)

b) Scorched pieces

SB (Scorched Butts)

SS (scorched splits)

SP (Scorched Pieces)

SSP (Scorched small pieces)

C) Desert pieces

SPS (Scorched pieces seconds)

DP (Desert pieces)

3.5.9 Packing of graded kernels

The graded kernels are packed in four-gallon prime tins with a net content of 25 lbs (11.34 kg). The tins are then vaccumised and filled with carbon-di-oxide gas and sealed. Two such tins of the same grade are packed in a carton for export. This method of packing has been found to be effective and sati unit to both exporters as well as importers. Some manufactures also pack in tins of 10 Kg net to certain markets to suit the requirements of the buyer.

3.5.10 Transportation of kernels

For export, cashew kernels are transported mainly by sea than air.

There are regular shipping facilities from India to all parts of the word. Major shipments in India take place through Cochin port; other ports are Outscoring, Mangalore, Chennai and Mumbai.

Frequent shipping services are available from Indian ports on India, USA, India- UK/continent, India Japan, INDIA AUSTRELIA, India Middle East and India-Singapore routes.

CASHEW DEVELOPMENT IN INDIA

Cashew cultivation in India dates back to four centuries, when it was originally introduced by the Portuguese sometime during the 16 century. Now, the cashew unit has development on sound footings. A well woven network of cashew research and development has been developed by the central and state governments.

Establishment of central plantation crops research institute in 1970 and initiation of all India co-coordinated spices and cashew nuts improvement projects in 1971 has given impetus for research on cashew. It was further strengthened during 1982 to 1986 with the implementation of word bank Aided Multi-state cashew project (MSCP). The project centers under the all India co-ordinate spices and cashew nut improvement project worked on the identification of varieties which was realized by early 1980s and standardization of vegetative propagation under the MSCP are the two major achievements which have changed the status of cashew cultivation in India. During the past one decade there has been greater emphasis on the planting with only vegetative propagated material of realized varieties in cashew. The program of establishment of regional nurseries by the directorate of cashew nuts and cocoa development is yet another favorable development for the cashew cultivation in India.

The central plantation research institute, Kasargod (Kerala) has been responsible for cashew research .cashew research station were also developed in cashew growing states. In Maharashtra, the Konkan Kristi Vidyapeeth ,Dapoli has been catering the research and development needs through its research center at venture (Dist . Ratnagiri) this has given impetus to cashew nut production and processing unit the Maharashtra state.

In 1965-66, area under cashew was 2.41 lakh ha .with total production of 1.44 laky tones. The average productivity was 597 kg/ha,4.30 Laky MT and 610 kg /ha respectively .cashew nut production is dominant in Karalla, Karnataka , GAO, Konkan region of Maharashtra, Tamilnadu, Andhra Pradesh, Orissa and west Bengal. The statistics on area, production, productivity of cashew in different

states reveal the Maharashtra rank fourth in total area, but second in production. In productivity state has secured the first position.

In cashew export also we have made good progress as in case of cashew production. In 1965, total export of export of cashew kernels was to the tune of 51,000 tones. In 2000, it was 93,000 tones from this; the country received the foreign exchange of Rs. 2451 corers.

Table 3.11 State-wise growth under cashew in India (in lakh ha.)

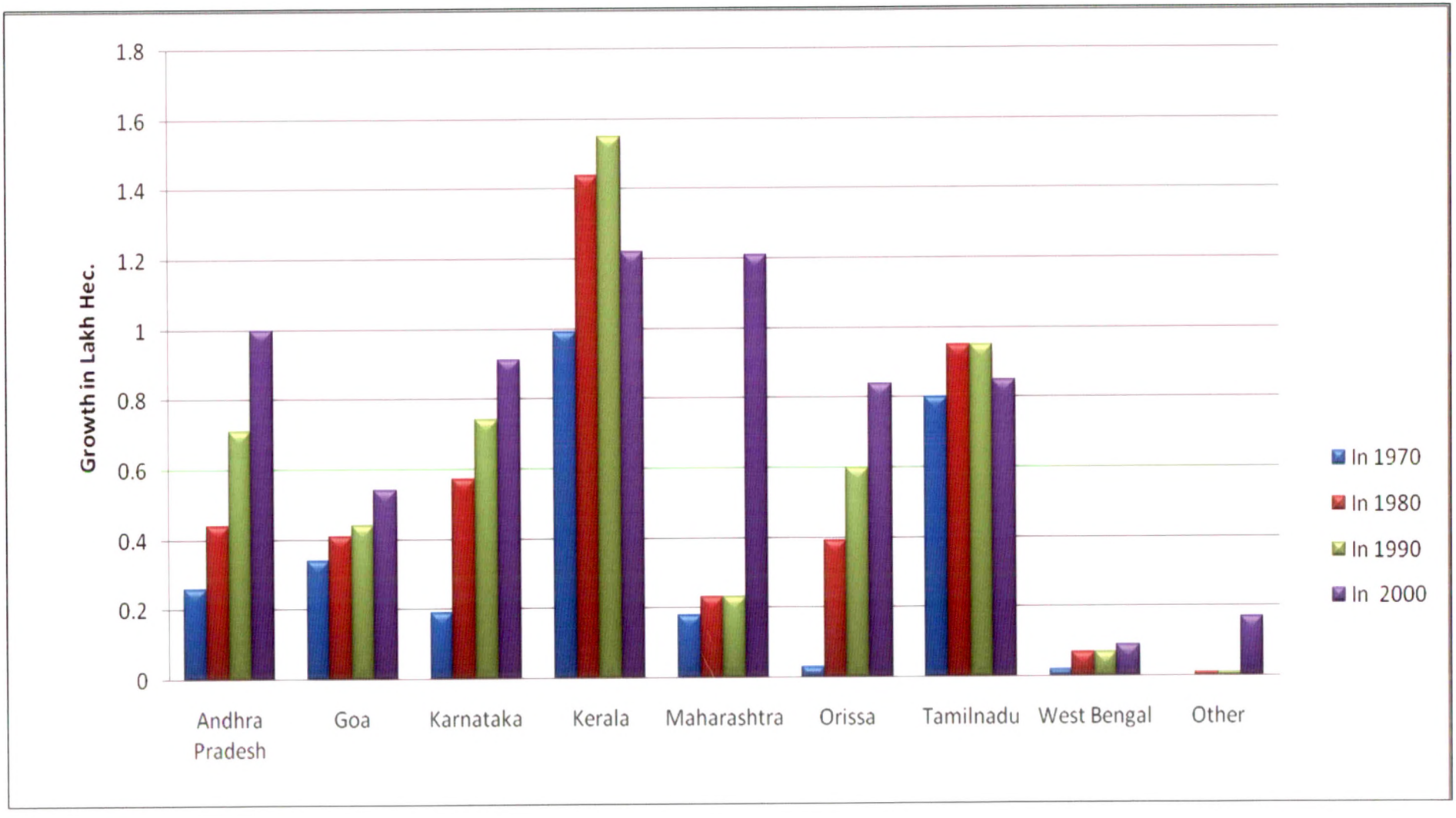
State	In 1970	In 1980	In 1990	In 2000	Increase/decrease Between 1990 & 2000(%)
Andhra Pradesh	0.26	0.44	0.71	1.00	40.84
Goa	0.34	0.41	0.44	0.54	22.72
Karnataka	0.19	0.57	0.74	0.91	22.97
Kerala	0.99	1.44	1.55	1.22	-21.29
Maharashtra	0.18	0.23	0.23	1.21	426.09
Orissa	0.03	0.39	0.60	0.84	40.00
Tamilnadu	0.80	0.95	0.95	0.85	-10.52
West Bengal	0.02	0.07	0.07	0.09	28.57
Other	–	0.01	0.01	0.17	1600.00
Total	**2.81**	**4.47**	**5.30**	**6.86**	**29.43**
Increase over previous period	**--**	**1.66**	**0.83**	**1.56**	

Table 3.12 Varietal wealth of Cashew in India

Sr. No	Name of varieties	Mean Yield (kg/tree)	Shelling %	Export grade	Recommended Region for Cultivation
1.	Anakkayam -1 (BLA 39-4)	12	28	W280	Kerala ,north East region
2.	Madakkathara- 1 (BLA 39-4)	14	27	W280	Kerala North East region
3.	Madakkathara -2 (NDR-2)	17	28	W280	Kerala North East region
4.	Kenaka (H-1598) 1608	13	31	W210	Kerala North East region
5.	Dhana (H-1598)	11	27	W280	Kerala
6.	Priyanka (H-1591)	17	27	W280	Kerala
7.	K-22-1	13	23	W280	Kerala
8.	Ullal-1(8/46)	19	30.7	W210	Karnataka
9.	Ullal-2(3/67)	18	30.5	W210	Karnataka
10.	Ullal-3	15	30	W210	Karnataka
11.	NRCC-1	10	28.8	W210	Karnataka
12.	NRCC-1	9	28.6	W210	Karnataka
13.	Chintamani-1	14	31	W240	Karnataka
14.		23	31	W240	Maharashtra

15.	Vengurla-1	14	31	W240	Goa & Orrisa
16.	Vengurla-4	21	30	W210	Maharashtra-Goa
17.	Vengurlla-6	18	30.5	W210	Maharashtra-Goa
18.	Vengurlla-7	16	28	W180	Maharashtra-Goa
19.	Vengurlla-8	7	28	W320	Maharashtra-Goa
20.	WRI-3(M10/4)	7	28.3	W320	Tamilnadu
21.	VRI-2(M44/3)	16	29.1	W210	National Variety
22.	Vri-3(M26/2)	17	27.5	W320	Tamilnadu
23.	BPP-1(H2/11)	16	28.1	W320	Andhra Pradesh
24.	BPP-2(H2/12)	16	28.1	W320	Andhra Pradesh
25.	BPP-3(3/3)	13	23	W320	Andhra Pradesh
26.	BPP-4(9/8EPM)	42	24	W320	Andhra Pradesh
27.	BPP-5(T.NO.1)	27	29	W320	Andhra Pradesh
28.	BPP-8(H.2/6)	16	25.6	W210	Andhra Pradesh
29.	BHP-1(WBDC-V)	10	31.7	W240	Andhra Pradesh
	Jhargram -1				Orissa
					West Bengal

Table 3.12 Varietal Wealth of Cashew in India



CASHEW IN MAHARASHTRA

Maharashtra, the economic power of the country has attracted a largest amount of Indians well as foreign investment in the post liberalization era. Recent past has seen the significant change in farming pattern form subsistence to commercial.

The area under various fruit crops has increased. Cashew cultivation, which has been quite traditional in the coastal Maharashtra, is also not an exception for area increase. Initial area under the cashew in the year 2001 was to the tune of 40,000 ha. Which has now crossed a level of 1.25 lakh hectares? Maharashtra now ranks second in the production and first in the productivity (1.5 MT) per hectare .strong research back up from the Dr. Balasaheb Savant Konkan Krishi Vidyapith through varietal Improvement and the sound production technology. The state department is now propagating only the improved varieties. Area coverage of cashew in Maharashtra has been more in Ratnagiri district as compared to other districts of the state. Ratnagiri district alone contributes to around 40,000 hectare area and many low cost local processing units are being set up to process raw cashew.

SIGNIFICANT CONTRIBUTIONS OF DR. BALASAHEB SAVANT KOKAN KRISHI VIDYAPITH,DAPOLI

Cashew is the monopoly of the Konkan region of the Maharashtra state. Besides, it is highly profitable crop under rained and less fertile soil conditions. Hence cashew nut research and development has been thrust area. The University has been making concerted efforts in improvement of this crop and has given momentum of this crop and has given momentum for its commercial cultivation in the region. The most significant contribution are as under

1. Varietal improvement
2. Standardization of grafting techniques
3. Package of practices
4. plant protection methods
5. Cashew apple processing
6. High density planting technique

Table 3.13 – Cashew variety

Sr.No	Particulars	Varieties							
		Vengrula 1	Vengrula 2	Vengrula 3	Vengrula 4	Vengrula 5	Vengrula 6	Vengrula 7	Vengrula 8
1	Parentage	Selection (Ankur-1)	Selection (WBDC-V)	Vengrula 1 (vet ore 56	Kidnaper Red X Vetore 56	Ansur Early x Mysur Kotekar	Vetore 56 x Vengural 1	Vengrula3 x VRI (M 10/4)	Vengrula 4 x M-10/4 (VRI-1)
2	Year of release	1974	1979	1982	1982	1984	1992	1997	2001
3	Av. Nut yield (kg/tree)	15.74	23.10	16.66	19.08	25.60	17.00	19.50	15.75

4	No. of nuts/kg	160	230	115	140	220	110	100	85
5	Av.nut wt. (g)	6.25	4,25	9.09	7.69	4.30	7.90	10.0	11.50
6	Shelling percentage	31	32	27	31	30	28	30.50	28.00
7	Colour of apple	Yellow	Red	Yellow	Pink-Red	Golden Yellow	Yellow	Yellow	Reddish
8	Av. Apple wt. (g)	60	37	78	45	30	70	60	100
9	Apple juice (%)	65	45	77	76	86	65	85	85
10	Per cent perfect	13	21	25	26	50	7.5	40	38.50

	flowers								
11	Kernel grade	240	320	210	210	320	210	180	180
12	Maximum nut yield (kg/tree)	20.33	45.52	23.58	27.34	31.26	26.28	33.50	22.47

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CHAPTER – IV

CASHEW PROCESS RESVLTS AND TEEIR IMPORTANCE

CHAPTER IV

CASHEW PROCESS RESULTS AND THEIR IMPORTANCE

Considering the objectives of the study, the necessary data collected from various sources were analyzed. In this chapter the major findings of the study are presented and discussed as per objectives. First part of the study deals with the processing of cashew and second part with export of cashew.

CASHEW PROCESSING

The cost of processing of cashew nut and other related aspects as stated in the objectives were studied and covered in this part. Accordingly 18 cashew processing units were selected from district. The quantity processed, employment created and capital invested in the units are the different aspects of measuring the size of factory. Similarly, the size of unit also dependents on working season. In the present study, working season was taken as basis for classifying selected cashew processing factories.

4.1.1 Classification of cashew units:

The selected cashew processing units were classified on the basis of their working season as given in Table 4.1.1

Table 4.1.1: Classification of cashew processing units according to working season

Group	Working Season (days)	No. of factories	Average Working Season (days)	Quantity Processed Per Season(q)	Quantity Of upper unit per day (q)
I. Small	Up to 225 Days	5 (27.78)	196.25	639.55	3.26
II. Medium	225 to275 Days	8 (44.44)	250.57	1702.70	6.85
III. Large	More than 275 days	5 (27.78)	307.35	2349.35	7.57
Over all	--	**18 (100.00)**	**251.18**	**1586.99**	**6.05**

(Figures in parentheses are percentages to total)

The selected units were classified as small having working season Up to 225 days, medium working season between 225 to 275 days and

large, working season above 275 days .The classification of the units on the basis of working season revealed that, five cashew processing units were in small group, eight cashew processing units were in medium group and five cashew processing units were in large group .The average working season was 196.25 days,250.57 days and 307.35 days in small, medium and large group respectively ,while average working season at overall level was 251.18 days . The per season quantity of nuts processed varied from 639.55 q. in small to 2349.38 q. in large group, while overall average quantity of nuts processed per season was 1586.99 q. The daily quantity of nuts processed by the unit in small, medium and large groups was 3.26 q., 6.85 q. and 7.57 q respectively with overall average of 6.05 q. This indicated that not only the per season quantity but per day quantity of nuts processed was also more in units which had longer working season.

4.1.2 General Information:

The general information of the processing units including average of establishment period, average working period, ownership and method of processing is given in Table 4.1.2

Table 4.1.2: General information of the processing factory

Sr.No.	Particulars	No.of factories
1.	Average establishment period	20.7
2.	(years)	251.18
3.	Average working period	
	(days)	5
	Ownership	13
4.	a) Partnership	
	b) Individual	2
	Method of processing	13
	1) Drum roasting	3
	2) Steam roasting	
	3) Both	

It is seen from Table 4.1.2 that, average establishment period was 20.7 year. The units were also classified on the basis of type of ownership as partnership and individual. There were 23 units (72.22 %) owned and managed by individual, while remaining 15 units (27.78 %) in partnership .Form he sample ,two units (11.11 %) were processing cashew by drum roasting method, while 23 units (83.33 %) were found to process cashew by steam roasting method " and remaining three units were using both these methods of processing.

4.1.3 Working season, employment and wage rate:

Providing employment opportunities to rural people is one of the objectives of starting agro-based industries. Therefore, employment created by cashew units and the wage rates paid to the workers were studied and the information regarding employment, wage rates and working season are given in Table 4.1.3

Table 4.1.3: Working season, employment and wage rates in processing factories.

Sr. No.	Particulars	Small	Medium	Large	Overall
1.	Working season	196.22	250.57	307.35	251.18
2.	(days)				
	Per day per unit				
	Employment (days)	2.5	4.3	3.3	3.5 (8.25)
	a) Male	18.6	41.6	51.9	38.9
	b) Female	**21.1**	**45.9**	**55.2**	(91.75)
3.					**42.4**

	Per season per unit				
	Employment (days)	490.55	1077.45	1014.26	
	a) Male	3649.69	10423.71	15951.47	879.13
4.	b) Female	**4140.24**	**11501.16**	**16965.73**	9770.90
		45.25	46.17	46.00	**10650.03**
	Wage rate (Rs.)	29.25	30.00	31.40	45.87
	a) Male				30.27
	b) Female				

(Figures in parentheses are percentages to total)

The working of the units is seasonal in nature .There is a great variation in the working season from unit to unit which is shown in table 4.1.3It was seen that average working season of unit in small, medium and large group was 196.22 days,256.57 days and 307.55 days, respectively .The per unit. Male employment was 2.5 days 4.3 days and 3.3days in small, medium and large group respectively, while per day female employment was 18.6 days, 41.6 days and 51.9 days in small, medium and large group, respectively. At the overall level, the per unit per day employment comprised of 3.55 days male and 38.9 days female with a total of 42.4 days. The indicated that out of total labour employment nearly 92 per cent were female labour. It was further observed that, the total employment per unit in a season was 4140 days in small group, 11501 days in medium group and 16966 days in large group with overall average employment of 10650 days. Thus, estimated labour as compared to female labour. The daily wage rate paid to male labour was Rs. 45.25 Rs 46.17 and Rs46.00 in small, medium and large group, respectively, while wage rate paid to female labour was Rs 29.25, Rs 30.00 and Rs 31.40by factories, respectively. It was observed that large

unit had given higher wage rate of their workers than small factories. The overall per day wage rate of male and female worker was RS 45.87 and Rs 30.27, respectively.

4.1.4 Fixed capital invest pattern in cashew processing units:

The fixed capital investment in different categories of cashew processing units is presented in table in 4.1.4.The expenditure incurred on the establishment of cashew processing unit is treated as fixed capital investment. It includes the expenditure on land, building, machinery and equipment, infrastructure facilities and other fixtures. It is seen from the table 4.1.4 that the total fixed capital investment was Rs 5.49 lakh in case of small processing units. Similarly, Rs10.07 lakh and Rs 17.26 lakh was invested in medium and large processing units respectively. At the overall level, total fixed capital investment was found to be Rs 10.79 lakh. The investment in building accounted highest, that is, 35.50 per cent at overall level, followed by land (34.38%) machinery and equipment (13.53%), infrastructure facilities (15.29%) and other fixtures (1.30%) in the total fixed investment. The proportion of investment on land in the total fixed investment was higher in small size processing units (49.91%) followed by medium (38.33%) and large size (25.90%) units. Similarly the proportion of fixed capital invested on building was higher (39.75%) in large size units, and lower (25.86%) in small size unit. The proportion of investment on machinery and equipment was higher in small processing units (15.85%) and lower in large size processing units (12.80%).Investment on infrastructure was higher in large units (20.05%)and lower (6.92%)in small units. Regarding investment on other fixtures it was higher in large units that are 1.50 per cent lower in medium units that are 0.50 per cent.

The comparison between the small, medium and large size processing units revealed that, the total fixed capital investment increased with the increase in size of the cashew processing units. In all the three size groups the fixed capital investment on building and land accounted for a major share followed by machinery and equipment, infrastructure and other fixtures.

Table 4.2: Fixed capital investment in cashew processing units. (Rs. in lakh)

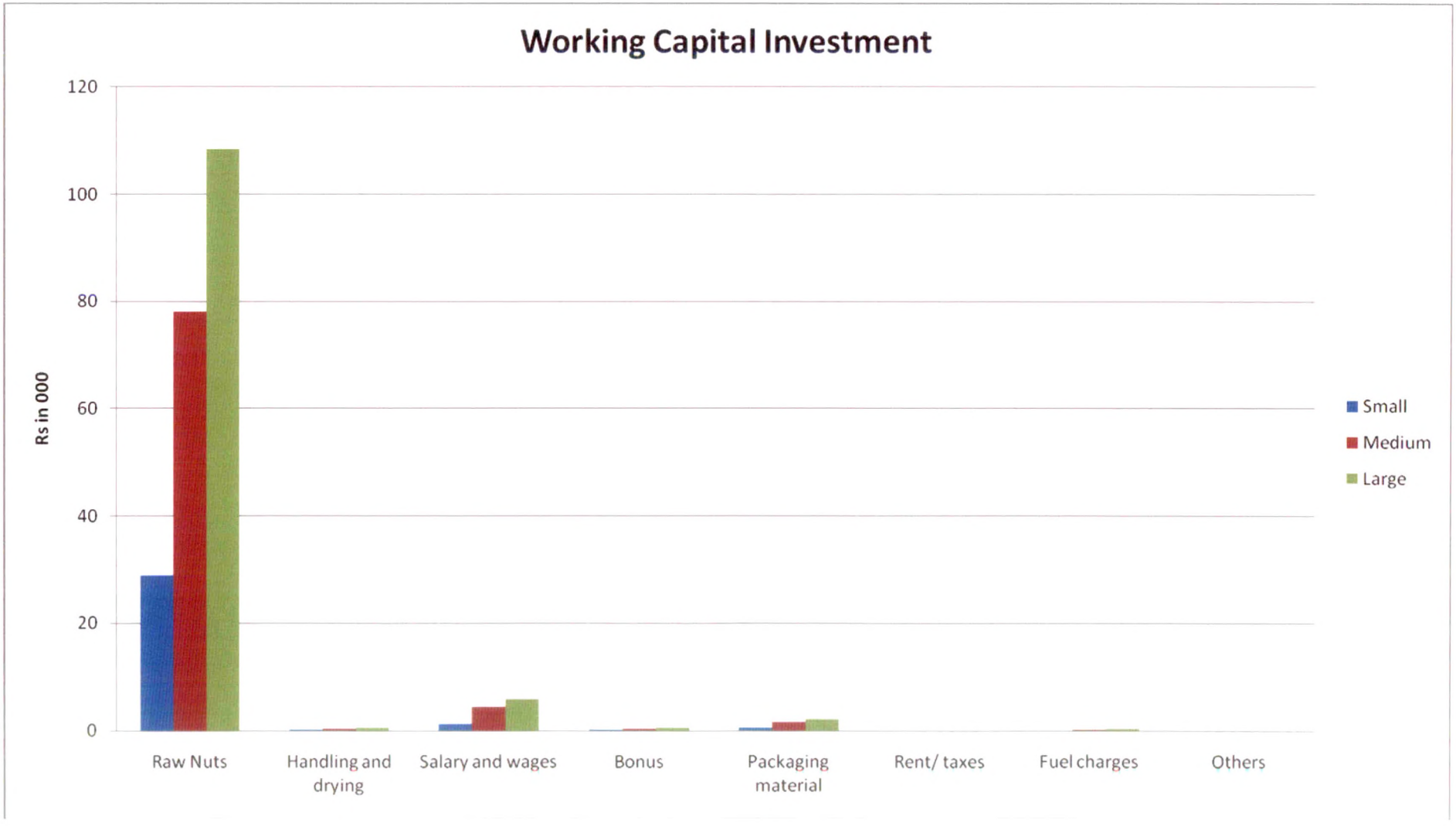
Sr. No.	Size of the processing unit	Particulars Of Investment					Total
		Land	Building	Machinery And Equipment	Infrastructure facilities	Other Fixtures	
1.	Small	2.74 (49.91)	1.42 (25.86)	0.87 (15.85)	6.383 (6.92)	0.08 (1.46)	**5.49 (100.00)**
2.	Medium	3.86 (38.33)	3.46 (34.36)	1.38 (13.70)	1.30 (13.11)	0.05 (0.50)	**10.07 (100.00)**
3.	Large	4.47 (25.90)	6.86 (39.75)	2.21 (12.80)	3.46 (20.05)	0.26 (1.50)	**17.26 (100.00)**
4.	Overall	3.71 (34.38)	3.83 (35.50)	1.46 (13.53)	1.65 (15.29)	0.14 (1.30)	**10.79 (100.00)**

(Figures in parentheses are percentages to total)

4.3 Working Capital Investment:

Sr. No.	Items of cost	Small	Medium	Large	Overall
1.	Raw Nuts	28.89	78.03	108.49	72.79
		(93.02)	(91.61)	(91.85)	91.89)
2.	Handling and	0.13	0.35	0.49	0.33
	drying	(0.42)	(0.41)	(0.41)	(0.42)
3.		1.30	4.53	5.96	4.03
	Salary and wages	(4.19)	(5.32)	(5.05)	(5.08)
4.		0.11	0.38	0.49	0.33
	Bonus	(0.35)	(0.44)	(0.41)	(0.42)
5.		0.49	1.63	2.19	1.46
	Packaging	(1.58)	(1.910)	(1.86)	(1.85)
6.	material	0.03	0.07	0.10	0.06
		(0.09)	(0.08)	(0.08)	(0.07)
7.	Rent/ taxes	0.09	0.16	0.36	0.19
		(0.29)	(0.18)	(0.31)	(0.23)
8.	Fuel charges	0.02	0.03	0.04	0.03
		(0.06)	(0.05)	(0.03)	(0.04)
	Others	31.06	85.18	118.12	79.22
		(100.00)	(100.00)	(100.00)	(100.00)
	Total	4856.54	5002.64	5027.77	4991.84
	Per quintal working Capital investment				

Table 4.3 working Capital Investment



Actual expenditure incurred on purchase of raw nut, salary, wages, packing material, taxes, rent, fuel etc. were included in working capital.

It is observed from the Table 4.3 that, at the overall level the per unit working capital investment was found to be Rs.79.22 lakh. Major amount was spent on the purchase of raw cashew nut, from the total working capital investment in running the cashew processing industry. It was found that, purchase of raw nuts shared Rs.28.89 lakh (93.02%) in small group, Rs 78.03 lakh (91.61%)in medium group and Rs 108.49 lakh (91.85%)in large group. AT the overall level, after purchase of raw nut, expenditure in other items of working capital investment were salary and wages Rs. 4.03 lakh (5.08%),packaging material Rs. 1.46 lakh (1.85%), handing and drying as well as bonus to employees Rs. 0.33 lakh (0.42%) each, fuel charges Rs.0.19 lakh (0.23%) etc. The working capital investment in different categories of cashew Processing unit is presented in table 4.3

The capital investment increased with the size of units, because of the increased requirement of fixed and working capitals. Similar results were also observed by late and Borude (1982) and Veerkar and Borude (1990). The major part of the working capital invested was for procurement of cashew nut (raw material) which was seasonal in nature.

4.4 Procurement of raw material:

As the production of raw nuts is seasonal in nature the processors have to purchase the nuts in that season and store them for processing. The month wise quantity of raw nuts produced by the units is given in Table 4.4

Table 4.4: Frequency of procurement of cashew nuts by cashew processing units.

(Figures in quintals)

Sr. No.	Size of the processing units	Month of procurement					Total
		April	May	June	July	August	
1.	Small	241.23	231.39	93.37	45.73	27.82	639.55
		(37.72)	(36.18)	(14.60)	(7.15)	(4.35)	(100.00)
2.	Medium	697.26	650.26	155.97	118.17	81.04	1702.70
		(40.95)	(38.19)	(9.16)	(6.94)	(4.67)	(100.00)
3.	Large	771.52	850.00	519.91	102.20	105.72	2349.35
		(32.84)	(36.18)	(22.13)	(4.35)	(4.50)	(100.00)
4.	Overall	599.90	588.47	226.47	99.52	72.63	1586.99
		(37.80)	(37.08)	(14.27)	(6.27)	(4.58)	(100.00)

(Figures in parentheses indicate percentages to the total)

Table 4.4 revealed that, at overall level on an average, the quantity of cashew nut procured was highest in the month of April and May, which was 599.90 q. (37.80%) and 588.47 q. (37.08%), respectively. In the month of June, July and August, it was 226.47 q. (14.27 %), 99.54q. (6.27 %) and 72.63q. (4.58 %), respectively. The total quantity procured was 1586.99 q. at the overall level.

When referred to the categories of cashew processing units individually, it was found that the small processing units procured maximum that is 241.23 q. (37.72%) during month of April and

minimum, that is 27.82 q. (4.35%) in the month of August. Similarly, in case of medium processing units, the quantity of cashew nut procured was maximum, that is 697.26 q. (40.95%) in April and minimum, that is 81.04 q. (4.76%) during August. In large processing units, maximum quantity of 850.00 was procured during the month of May and minimum quantity if 102.20 q. during the month of July. This indicates that all the processing units procured maximum quantity of raw cashew nut during April and May month for processing unit. This was because heavy arrival of cashew nut during the month of April and May and the arrivals of cashew nut decreased in the month of June, July and August. The same trend in frequency of procurement has been found in almost all the size of groups of processing units.

4.5 Cost of processing:

The cost of processing is the most important factor on which the success or failure of the unit is depends. More the cost of processing, lesser is the profit margin to the unit and vice –versa. The cost of processing per quintal of nuts incurred by the units is shown in Table 4.5

Table 4.5: Per quintal cost of cashew processing

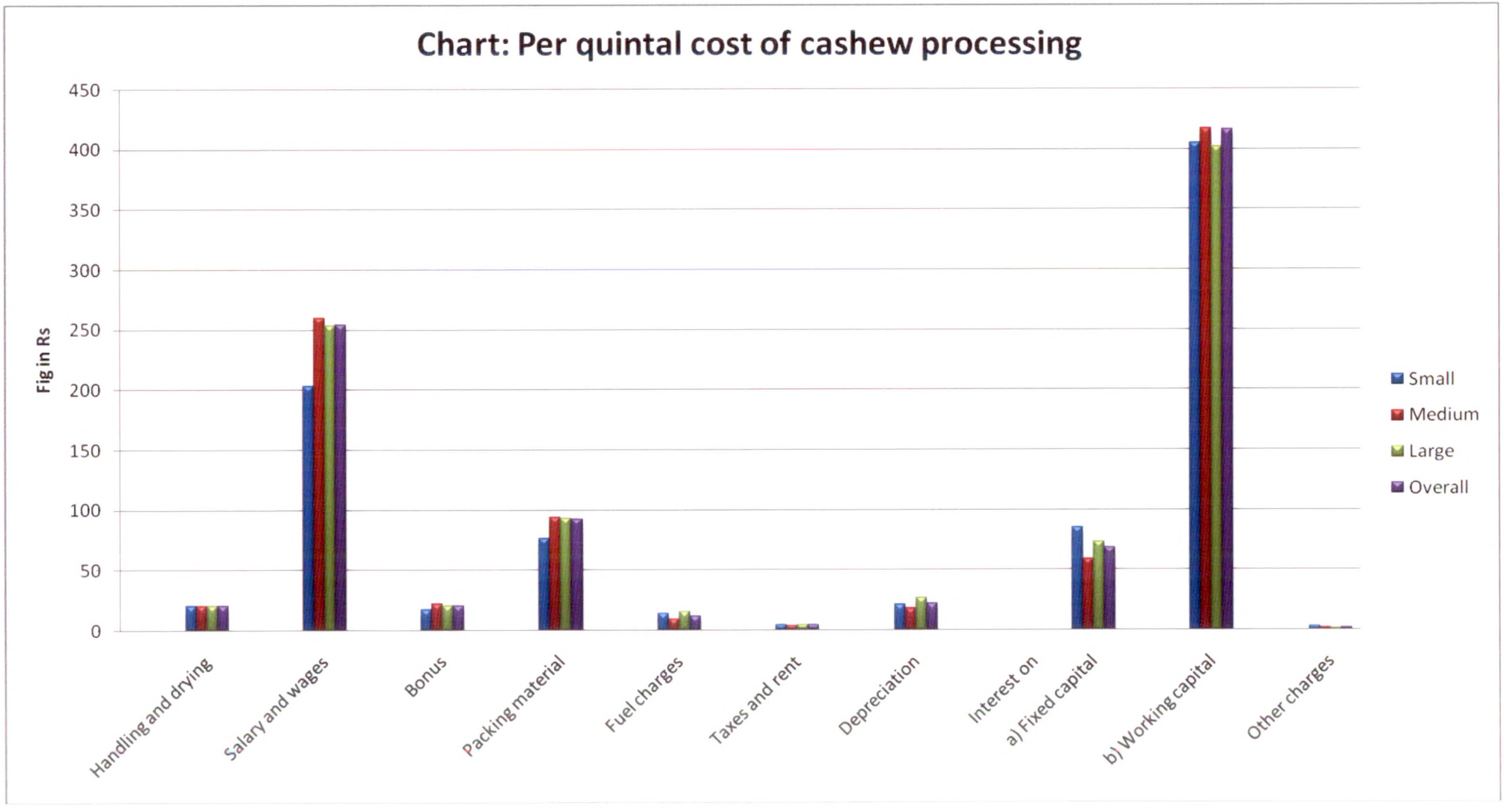
(Figures in Rs.)

Sr. No.	Item of cost	Small	Medium	Large	Overall
1.	Handling and drying	20.33 (2.38)	20.08 (2.22)	20.85 (2.26)	20.79 (2.28)

2.	Salary and wages	203.26	259.94	253.69	253.94
		(23.88)	(28.74)	(27.52)	(27.85)
3.	Bonus	17.19	21.80	20.86	20.79
		(2.02)	(2.41)	(2.26)	(2.28)
4.	Packing material	76.61	93.53	93.21	91.99
		(8.99)	(10.34)	(10.11)	(10.08)
5.	Fuel charges	14.07	9.18	15.32	11.97
		(1.65)	(1.01)	(1.66)	(1.32)
6.	Taxes and rent	4.69	4.02	4.26	4.27
		(0.55)	(0.44)	(0.6)	(0.4)
7.	Depreciation	21.50	18.24	27.22	22.27
		(2.52)	(2.02)	(2.95)	(2.45)
8.	Interest on				
	a) Fixed capital	84.84	59.14	73.47	67.99
		(10.08)	(6.54)	(7.97)	(7.46)
	b) Working capital	404.71	416.89	402.22	415.99
		(47.53)	(46.09)	(43.63)	(45.59)
9.	Other charges	3.13	1.72	1.70	1.89
		(0.40)	(0.19)	(0.18)	(0.22)
	Total	**851.33**	**904.54**	**912.80**	**911.89**
		(100.00)	**(100.00)**	**(100.00)**	**(100.00)**

(Figures in parentheses are percentages to total) (Rs. In lakh)

Table 4.5 Per quintal cost of cashew processing



Same trend of working capital investment was observed in all the groups. It also indicated that as the working season expanded, the requirement of working capital was observed to increase. The per quintal working capital investment was Rs.4856.54 in small group, Rs.5002.64 in medium group and Rs.5027.77 in large group with the overall per quintal average investment of Rs.4991.84.

4.6 Investment pattern and organizational structure of cashew Processing units

4.6 a) Capital investment patterns in cashew processing units:

The capital investment patterns in cashew processing unit is Presented in Table 4.6 the average aggregate capital invested per processing unit was Rs. 90.01 Lakh. The investment pattern of the cashew processing units revealed that, there was a direct relationship between total Capital invested and size of the processing units, in aggregate; it was found that, in all the units the investment on working capital was more (88.01%) than the fixed capital (11.99%). The proportion of investment on working Capital was more in medium (89.43%) units than in large (87.25%) and small (84.98%) size processing units. Table 4.6: Capital investment pattern in cashew processing units.

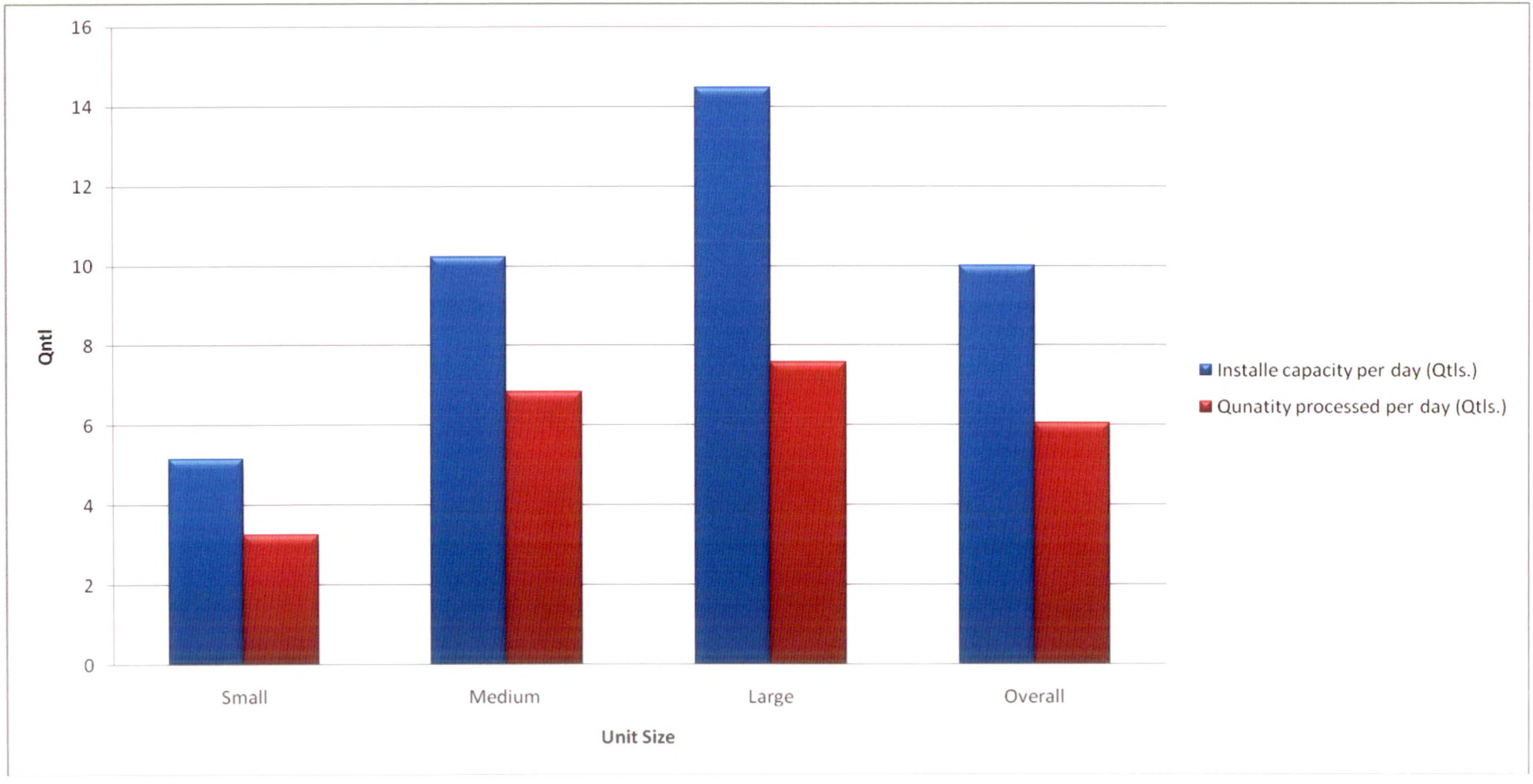
(Rs.in Lakh)

Sr. No.	Size of the Processing unit	Fixed capital	Working capital	Total
1.	Small	5.49	31.06	36.55
		(15.02)	(85.98)	(100.00)
2.	Medium	10.07	85.18	95.25
		(10.57)	(89.43)	(100.00)
3.	Large	17.26	118.12	135.38
		(12.75)	(87.25)	(100.00)
4.	Overall	10.79	79.22	90.01
		(11.99)	(88.01)	(100.00)

(Figures in parentheses indicate percentage to the total)

Handling charges, drying, salary, wages, bonus, packing material, fuel charges, taxes and rent depreciation, interest on fixed and working capital are the items of cost of processing per quintal of cashew nut was Ra.851.33 in small group, Rs.904.54 in medium group and Rs.912.80in large group whereas at overall level per quintal cost of processing was Rs.911.89. The per quintal cost of processing exhibited positive relationship with the scale of production. This revealed that processing was costly in the units of large capacities .The major cost was interest on working and fixed capital .At the overall level, it was Rs.415.99 (45.59 %) and Rs.67.99 (7.46%) respectively. The other important items were salary and wages (27.85%), depreciation (2.45%)

Table 4.0 6 Capacity utilization of cashew processing units (Capital Investment Pattern)



packing material (10.08%), bonus ,handling and drying (2.28% each) and fuel charges (1.32%).

4.7 Quantity of main product and by-product :

The quantity of main product and by-product per quintal of cashew nut processed is presented in Table 4.7. Kernel is the main product while shell, testa (husk) and rejection are the by-products received from cashew nut processing

At the overall level, one quintal of cashew nut when processed resulted in 24.70 kilograms of kernels (24.70%) 70.00 kilograms of shells (70.00%) and 3.00 kilograms of testa (3.00%) and 2.30 kilograms of rejection (2.30%).

Table 4.7: Quantity of main product and by-product per quintal of cashew nut processed

(Figures in kgs.)

Sr. No.	Terms of cost	Size of the processing unit			Overall
		Small	Medium	Large	
1.	Kernels	24.33	24.92	24.22	24.70
2.	Shells	70.00	70.00	70.00	70.00
3.	Testa (Husk)	3.00	3.00	3.00	3.00
4.	Rejection	2.67	2.08	2.78	2.30

Outturn of main product, was less in small processing units, that is 24.33 kgs. And more in medium processing units that is 24.92 kgs outturn of by-products, that is, shells and testa (husk) was 70 kgs. (70.00%) and

3kgs. (3.00%), respectively in all the sizes of processing units. However the rejections were high in large units, that is 2.78 kgs and low in medium processing units, that is 2.08 kgs.

It was noticed that a negative relationship existed between the outturn of kernels and rejection. While outturn of other two products is, shell and tests (husk) remained same, in terms of quantity in all the groups .

Similar observations were made by Hasan and Raghunathan (1987). The outturn of by products that is shell accounted for 70 kg., husk for 3 kg and rejection for 2.28 kg at overall level. The recovery level of 24.70 per cent was considered as fairly good. However, recovery was found to be relatively low as compared to 30 per cent recovery, given by central Plantation Crop Research Institute (CPCRI), Kasargod. Recovery was low due to poor quality of cashew nut procured. The outturn of shell and husk was similar in all the categories.

4.8 Quality parameters of cashew kernels

The Quality parameters considered by the cashew processors in grading
of cashew kernel are listed below,

a) Shape and size : Cashew kernel should be bigger in size and been shaped

b) Colour : Cashew kernel should have white, pale Ivory or light ash colour

c) Moisture percentage: It should not be more than 4 to 5 percent.

d) Wholeness : Cashew kernel should not be broken or Damaged either manually or by insects.

It should be compact and free from test.

e) Counts : It represents the number of cashew kernels Present per pound. Count of 180, is Considered as superior quality. Lower the count superior is the quality.

4.8 Recovery of kernels as per grade.

Table 4.8 indicators the recovery of kernels as per grade from one quintal of cashew nut. The kernels obtained from processing of cashew nut are sorted into different grades as per the specifications as mentioned in export text.

Table 4.8: Recovery of Kernels as per grade from one quintal of cashew nut processed

(In kgs.)

Sr.No.	Grade designation	Small	Medium	Large	Overall
	I. Wholes				
1.	W180	0.35	0.36	0.47	0.39 (1.58)
2.	W210	0.58	0.66	0.68	0.64 (2.59)
3.	W240	4.46	4.66	4.70	4.60 (18.62)
4.	W320	8.11	8.34	8.30	8.25 (33.40)
5.	SW 320	2.46	3.32	3.00	2.93 (11.86)

6.	SW	1.28	1.85	2.02	1.85 (7.49)
7.	SSW	0.41	0.29	0.84	0.51 (2.06)
8.	DW	0.41	0.63	0.42	0.49 (1.98)
9.	KW	0.42	0.28	----	0.27 (1.10)
	Wholes	18.48	20.49	20.43	19.93 (80.69)
	Splits	1.25	1.45	1.09	1.27 (5.14)
	Butts	2.08	0.53	0.25	1.02 (4.12)
	Pieces	2.52	2.45	2.45	2.48 (10.05)
	Grand Total	24.33	24.92	24.22	24.70 (100.00)

(Figures in parentheses indicate percentage to the total)

It is observed from the table that, at the overall level the whole kernels obtained, accounted for 80.60 percent (19.93 kilograms) which was more than pieces (10.05 percent), splits (5.14 percent)and butts (4.12 percent). Of the cashew kernel grades recovered from one quintal Of cashew

nut, W320 accounted to 8.25 kilograms (33.40 percent), followed by W240 accounting to 4.60 kilogram (18.62 per cent), SW 320 according to 2.93 kilogram (11.86 per cent) and SW accounting to 1.85 kilogram (7.49 per cent). Although there were several other grades, their percentage of recovery was very meager. Totally there were 26 grades of cashew kernels but only 12 grades were found to be used for the kernels sorting in the district.

4.9 Per unit cost and returns from processing of nuts

The items of cost included were working expenses, marketing charges, interest on capital and depreciation charges. It is seen form the table 4.9 that at the overall level per unit cost of processing was worked out to Rs. 91.14 lakh. Out of the total cost, Rs 79.22 lakh (86.93%) was incurred as working expenses. The next important item of cost was interest on working capital as well as fixed capital accounted for 6.95 per cent and 1.18 per cent, respectively. Marketing charges accounted for Rs. 4.16 lakh (4.55%) and share of depreciation was very negligible (0.38 per cent).

Regarding group wise per unit total cost incurred on cashew processing in small group, medium group and large group it was Rs. 35.87 lakh, Rs. 98.86 lakh and Rs. 136.09 lakh respectively. The share of different items of cost was more or less similar as that of the overall level. The quantity of kernels received was 155.60 q. 580.75 q. in small, medium and large processing units, respectively, with the overall average quantity of 392.02 q. the value received for kernels and value of by products was considered as total returns. The per unit total returns worked out to Rs. 41.09 lakh in small group, Rs 115.39 lakh in medium group and Rs. 164.37 in large group with the overall average returns of Rs. 108.30 lakh. The net returns worked out to Rs. 5.22 lakh in small group, Rs. 16.53 lakh in medium group and Rs. 28.28 lakh in large group. At the

overall level, the net returns worked out to Rs. 17.16 lakh. Considering the total cost of processing and quantity of kernels received, the per quintal cost of production of kernel was worked out. It was Rs. 21726 at the overall level, whereas it was observed that par quintal cost of production of kernel was found to be increase with increase in size of factory, which was Rs. 18906 in small group. Rs 21758 in medium group and Rs. 21911 in large group.

The per unit cost and returns from processing of nuts is given in Table 4.9

Table 4.9 : per unit cost and returns from processing of nuts

(Figures in lakh rupees)

Sr. No.	Particulars	Small	Medium	Large	Overall
A	**Cost**				
1.	Working expenses	31.06	85.18	118.12	79.22
		(86.59)	(86.16)	(86.80)	(86.93)
2.	Marketing expenses	1.65	4.49	6.15	4.16
		(4.50)	(4.55	(4.52)	(4.55)
3.	Interest on working capital @ 16 % for 6 months	2.48	7.87	9.45	6.34
		(6.91)	(7.96)	(6.94)	(6.95)
4.	Interest on fixed capital @ 10 %	0.55	1.01	1.73	1.08
		(1.54)	(1.02)	(1.27)	(1.18)
5.	Depreciation	0.13	0.31	0.64	0.35

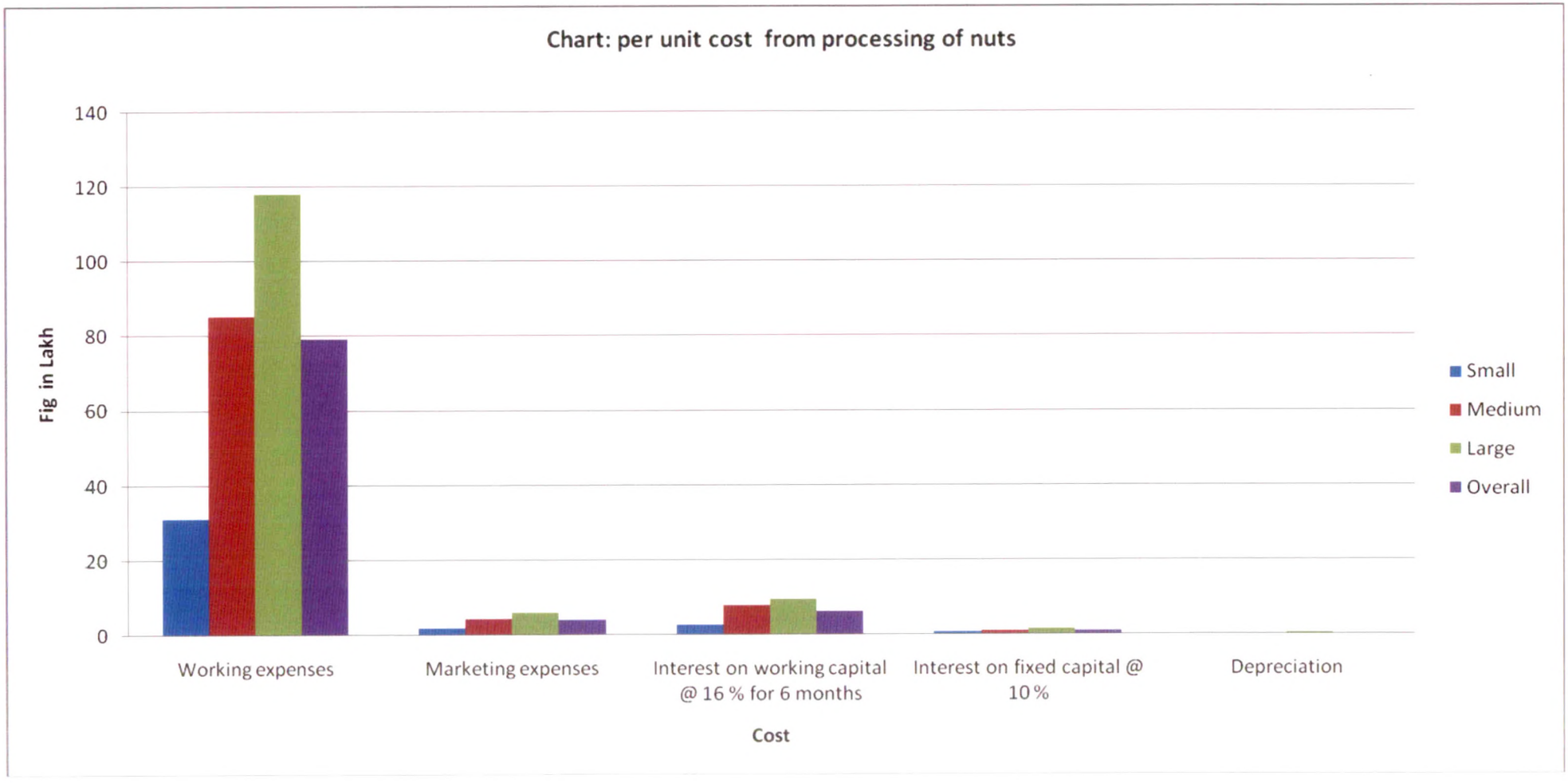
		(0.36)	(0.31)	(0.47)	(0.38)
	Total cost	**35.87**	**98.86**	**136.09**	**91.14**
		(100.00)	**(100.00)**	**(100.00)**	**(100.00)**

B	**Returns**				
6.	Quantity of kernels	155.60	424.31	580.75	392.02
		(24.33)*	(24.92)*	(24.72)*	(24.70)*
7.	Received (q)				
	Returns from (Rs.)	38.68	108.85	155.53	102.33
	a) Main Product	2.41	6.54	8.84	5.97
Total		41.09	115.39	164.37	108.30
	b) BY Product	5.22	16.53	28.28	17.16
8.	Returns	18906	21758	21911	21726
	Net return (Rs.)				
	Per quintal processing cost of kernels (Rs.)				

(Figures in the parentthese are percentages to total)

* Fugures in parameters indicate recovery percentage in cashew nut processing

Table 4.9 Per unit cost and returns from processing units



4.10 Cost and return structure involved in cashew processing

Cost and return from processing of cashew nut is presented in table 3.10 the total cost incurred by the processing units was Rs. 91.14 lakh at the overall level. It was more in large units (Rs. 136.09 lakh) than medium (Rs. 98.86 lakh) and small processing units (Rs. 35.87 lakh)

Net returns at the overall level worked out to Rs. 17.16 lakh for cashew nut processed. It was more in large units (Rs. 28.28 lakh) than in medium (16.53 lakh) and small processing unit (Rs. 5.22 lakh). It was observed that cashew processing units at the overall level gained profits to the tune of Rs. 17.16 lakh that is, Rs. 1.19 on every rupee of investment. Large processing units gained higher profits, (Rs. 1.21) as compared to medium (Rs. 1.17) and small processing units (Rs. 1.14). This indicated profitability for higher scale of production.

Table 4.10 – Cost and return structure of cashew processing units.

(Rs. In lakh)

Sr. No.	Particulars	Size of the processing unit			Overall
		Small	Medium	Large	
1.	Sales realization	41.09	115.39	164.37	108.30
2.	Cost of	34.22	94.37	129.94	86.99
	a. Production	(95.40)	(95.46)	(95.48)	(95.45)
		1.65	4.49	6.15	4.16
	b. Marketing	(4.60)	(4.52)	(4.52)	(4.55)
		35.87	98.86	136.09	91.14

		(100.00)	(100.00)	(100.00)	(100.00)
3.	Net Returns	5.22	16.53	28.28	17.16
4.	Benefits cost ratio	1.14	1.17	1.21	1.19

4.11 Performance of cashew processing units.

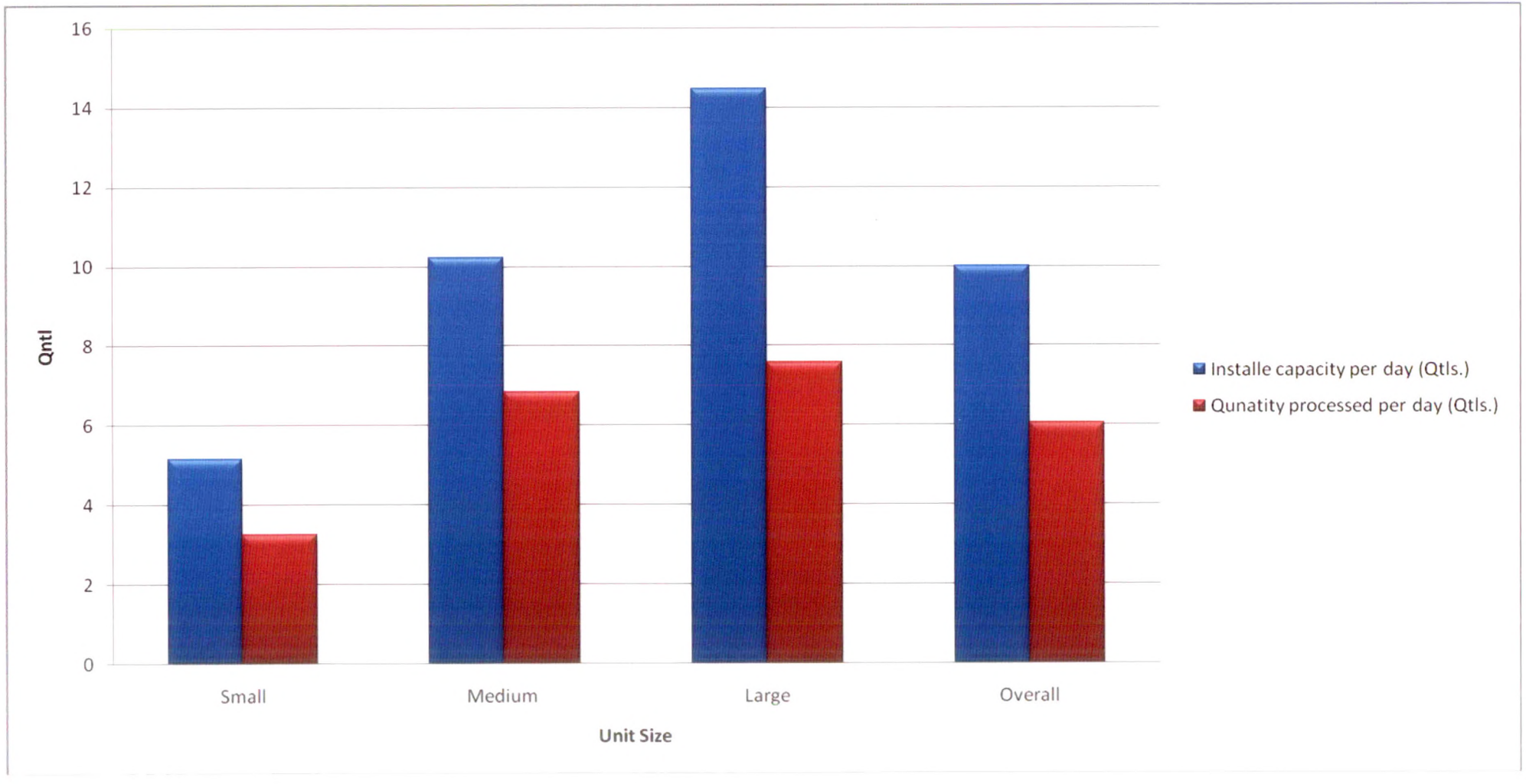
4.11.1 Capacity utilization in cashew processing units

The installed and utilized capacity of the cashew processing units of presented in table 4.11. The annual overall installed capacity of the cashew processing unit was 2510.54 q. but these processing units processed only 1507.08 quintals cashew nuts in the year. Thus, the overall picture of utilized capacity in relation to installed capacity during. 1999-2000 indicated that only 63.24 per cent of the total capacity was utilized. On an average the processing units worked for 251.24 days in a year. Thus, their installed capacity per day was 9.99 quintals, but the utilize capacity per day was only 6.05 quintals.

Table 4.11 – Capacity utilization of cashew processing units.

Sr. No.	Size of the processing unit	Installed capacity per day (Qtls.)	Number of working day	Annual installed capacity (qtls.)	Annual Quantity processed (Qtls.)	Quantity processed per day (Qtls.)	Capacity utilization (percentage)
1.	Small	5.16	196.22	1012.49	639.55	3.26	63.17
2.	Medium	10.22	250.57	2560.83	1702.70	6.85	66.49
3.	Large	14.47	307.35	4447.35	2349.35	7.57	52.82
4.	Overall	9.99	251.18	2510.54	1507.08	6.05	63.24

Table 4.11 Capacity utilization of cashew processing units



Capacity Utilization of Cashew Processing Units

The installed capacity was lower in small processing units, that is 5.16q. per day as compared to other size groups of processing units. It was higher in large processing units, i.e. 14.47q. per day. Similarly the number of working days were minimum in small processing units, that is 196.22 days per year and maximum in large processing units with 307.35 days per year. This lead to an maximum amount of annual installed capacity (4447.35 quintals) in large processing units, as compared to 2560.83 quintals and 1912.49 quintals in medium and small processing units respectively. Similarly the annual quantity of raw nut processed was comparatively higher in large size units, that is 2349.35 quintals as compared to 1702.70 quintals in medium units and 639.55 quintals in small units. However, the proportion of capacity utilization by percentage was higher in medium processing units, accounting 66.49 per cent of the installed capacity as compared to small and large processing units, that is 63.17 per cent and 52.82 per cent respectively. This revealed that capacity utilization was better in medium size processing units.

The installed capacity was high in large processing units and low in small processing units which was directly related to the amount of fixed capital invested.

4.12 Added Value

Due to processing of agricultural produce its sale value increases. This increases in value because of processing over its original value is called as added value. The added value in cashew processing is worked out and given in table 4.12

The per quintal gross added value is worked out by deducting cost of raw material charges from the gross value received and net value added is worked out by deducting processing cost by gross added value

received. The gross added value and net added value and net added value are given in percentage terms. It is seen form the table 4.12, the gross added value in cashew processing was 33.88 per cent, 39.49 per cent and 43.35 per cent in small, medium and large group respectively. Whereas net added value in cashew processing was 15.03 per cent 11.03 per cent and 23.16 per cent respectively. At the overall level the gross added value came to 40.55 per cent and net added value came to 14.06 per cent. It was observed from the table that, as the working season increased the gross added value was found to increase. The overall gross value added by processing unit was Rs.1860 per quintal of cashew nut processed, which accounted for 40.55 per cent. This was also observed by Ipte and Borude (1982) and Dalvi et al. (1992). When the percentage of value addition by processing activity in different sizes of processing unit was considered it was found to be in large units (43.35%) than in small units (33.88%). This may be because of higher sale value of cashew kernel obtained by large unit than other units.

Table 4.1: The value addition per quintal of cashew nut processed by the units.

Sr. No.	Particulars	Small	Medium	Large	Overall
1.	Sale value of kernel obtained per quintal of cashew nut (Rs.)	6049	6393	6620	6447
2.	Purcahse Vaule of cashew nut (Rs.)	4518	4583	4618	4587
3.	Gross value added	1531	1810	2002	1860

4.	(Rs.) Per quintal	851.33	904.54	932.40	911.89
5.	processing cost	679.59	905.19	1069.62	948.55
6.	Net value added				
	Added value (%)	33.88	39.49	43.35	40.55
	• Groaa	15.03	11.03	23.16	14.06
	• Net				

4.13 Financial performance of cashew processing units

The financial performance of the cashew performance of the cashew processing units was studied by using different ratios viz. solvency ratios, liquidity ratios, profitability ratios and the result are presented in table 4.13

Table 4.13 Financial structure of cashew processing units

A. Small processing units

Sr. No.	Ratios	1995-96	1996-97	1997-98	1998-99	1999-2000	Average
	1. Solvanct ratios						
a	Total liabilities to owned funds	3.48	3.87	4.19	4.34	4.64	4.10
b	Fixed assets to owned funds	1.36	1.56	2.03	2.36	2.07	1.88
	2. Liquidity ratio						

a	Liquid assets to total assets	0.46	0.49	0.36	0.35	0.43	0.41
b	Current assets to current liabilities	0.97	0.98	0.98	1.01	1.14	1.02
c	Acid test ratio	0.44	0.46	0.48	0.52	0.58	0.49
	3. Profitability ratio						
a	Net profit to total assets	0.11	0.10	0.11	0.12	0.14	0.12
b	Net profit to fixed assets	0.95	0.93	0.95	0.95	0.95	0.95
c	Net profit to owned funds	0.06	0.06	0.05	0.05	0.06	0.56
	4. Turnover ratio						
	Rate of turnover						
a	Working capital turnover	5.28	6.22	6.2	6.3	6.58	6.12
b	Fixed assets turnover	1.10	1.12	1.12	1.27	1.32	1.20
c	Total assets turnover	5.23	5.68		6.48	7.40	6.21
d		1.01	1.04	6.2	1.08	1.10	1.06
				1.06			

Sr. No.	Ratios	1995-96	1996-97	1997-98	1998-99	1999-2000	Average
b	**1. Solvanct ratios**						
	Total liabilities to owned funds	1.98	2.10	2.12	1.80	1.10	1.82
b	Fixed assets to owned funds	0.78	0.58	0.96	0.81	0.73	0.77
a	**2. Liquidity ratio**	0.58	0.55	0.61	0.61	0.72	0.61
b	Liquid assets to total assets	1.92	1.96	1.98	1.99	2.20	2.01
c	Current assets to current liabilities	0.72	0.87	0.92	0.86	0.97	0.87
a	Acid test ratio	0.15	0.16	0.16	0.17	0.17	0.16
b	**3. Profitability**	1.14	1.18	1.32	1.34	1.64	1.32

c	**ratio**						
	Net profit to total assets	0.04	0.03	0.04	0.04	0.04	0.038
a	Net profit to fixed assets						
b	Net profit to owned funds	7.97	6.98	9.82	9.28	10.02	8.81
	4. Turn over ratio	1.20	1.21	1.28	1.29	1.30	1.26
c	Rate of turnover	8.34	8.62	9.12	10.86	11.06	9.6
d	Working capital turnover	1.02	1.10	1.13	1.15	1.16	1.11
	Fixed assets turnover						
	Total assets turnover						

B. Medium processing unit.

C. Large processing unit.

Sr. No.	Ratios	1995-96	1996-97	1997-98	1998-99	1999-2000	Average
	1. Solvanct ratios						
	Total liabilities						

b	to owned funds	2.18	1.67	1.23	1.12	1.01	1.44
b	Fixed assets to owned funds	0.79	0.34	0.20	0.16	0.14	0.33
	2. Liquidity ratio						
a	Liquid assets to total assets Current assets to current liabilities	0.78	0.79	0.80	0.82	0.83	0.80
b	Acid test ratio	4.97	5.24	5.87	6.00	6.72	5.76
c	**3. Profitability ratio**	1.47	1.97	2.14	2.18	2.84	2.12
a	Net profit to total assets Net profit to fixed assets	0.18	0.10	0.20	0.20	0.21	0.20
b	Net profit to owned funds	1.28	1.35	1.46	1.54	1.64	1.45
c	**4. Turn over ratio**	0.12	0.11	0.19	0.16	0.12	0.14
	Rate of turnover Working capital turnover						
a	Fixed assets	6.28	7.22	7.58	8.22	8.38	7.54
b	turnover	1.20	1.28	1.33	1.36	1.39	1.31

c	Total assets turnover	6.92	7.28	7.96	8.92	9.52	8.12
d		1.10	1.18	1.70	1.71	1.22	1.18

D. Overall level

Sr. No.	Ratios	1995-96	1996-97	1997-98	1998-99	1999-2000	Average
	1. Solvanct ratios						
b	Total liabilities to owned funds	2.54	2.65	2.56	2.52	2.07	2.45
b	Fixed assets to owned funds	0.97	0.82	1.17	1.01	0.92	0.97
	2. Liquidity ratio						
a	Liquid assets to total assets Current assets to current liabilities	0.61	0.56	0.58	0.66	0.65	0.61
b	Acid test ratio	2.62	2.72	2.95	2.83	3.31	2.88
	3. Profitability ratio						
c	Net profit to total assets	2.15	1.11	1.19	1.20	1.46	1.42
	Net profit to fixed assets						

a	Net profit to owned funds	0.16	0.17	0.17	0.18	0.19	0.17
b	**4. Turn over ratio** Rate of turnover	1.28	1.20	1.32	1.52	1.59	1.37
c	Working capital turnover	0.03	0.06	0.09	0.07	0.07	0.06
	Fixed assets turnover						
	Total assets turnover						
a		6.32	6.58	6.70	7.22	8.95	7.49
b		1.20	1.22	1.16	1.29	1.35	1.26
c		8.37	8.22	8.28	9.86	10.04	8.95
d		0.94	0.96	1.10	1.12	1.20	1.11

A) Solvency ratios:

Here the ratios liabilities to owned funds and fixed assets to owned funds were considered. This ratio ranged from 2.07 to 2.65 during 2001-02 to 2006-07, with an average ratio of 2.45. For the small size processing units the average ratio was 4.10, which varied between 3.48 and 4.64 during same period. While in medium units is ranged between 1.10 and 2.12 and having an average ratio of 1.82 during the same period. In the large units it ranged between 1.01 and 2.18, with an average value of 1.44.

The ratio of fixed assets to owned funds range between 0.82 and 1.17 with an average value of 0.97 at an overall level. Similarly the ratio varied between 1.36 to 2.36 with an average value of 1.88 in case of small processing units. While the medium processing units had an average value of 0.77, with yearly variation between 0.73 to 0.96. The ratio of large processing unit ranged between 0.14 and 0.79, with an average of 0.33 in the study period from 1996-97 to 1999-2000.

To determine the solvency position of the cashew processing units, two ratios namely, total liabilities to owned funds. And fixed assets to owned funds ratio were worked out. The ratio of total liabilities to own funds reflected the amount of money the processing units owe to its creditors as against the money invested by the owners of the enterprise, that is, the extent of debts per rupee of owned funds. The ratio of total liabilities to owned funds on an average at the overall level, worked out to 2.45, which indicated that for every rupee owned funds, Rs. 2.45 worth of external funds was used. The average ratio was 4.10, 1.82 and 1.77 in small, medium and large processing units, respectively. Which indicated that large amount of external funds was borrowed by the small units as compared to medium and large units. This may be due to low financial strength, and individual ownership of the small units. Whereas medium and large processing units had comparatively more number of partners and hence capable of contributing more owned funds when compared to small units. The value of the ratio here, meant that the claims of the creditors on the fixed asset of the processing units were greater than that of the processors. Thus, it can also be said that the large and medium processing units have maintained the ratio below 2, indicating the units external liabilities were almost in accordance with the better business norms of 3:1 of total liabilities owned funds. Hence these unit have maintained good financial structure. While the small processing units,

owing to low volume of business depended heavily on external funds. Therefore, small processing units should try to generate funds internally by increasing the volume of business. This would help in improving their financial strength.

To know the extent of owned funds tied up in fixed assets, the ratio of fixed assets to owned funds was worked out. This ratio at the overall level was 0.7, which was within the acceptable limits of 1:1 it indicated that in 0.97 rupee of fixed assets, owned funds to the extent of the rupee were tied up. In small, medium and large processing units, the average of this ratio was 1.88, 0.77 and 0.33 respectively. The ratio was relatively high in small units, because of low net profits and equity participation by partners. Similarly it was low in medium and large units, because of high net profits and equity participation by partners. Hence the small processing units should try to increase their owned funds.

B) Liquidity ratios:

Tests of liquidity were framed to test the ability of the processing units to meet the current financial obligations. Liquidity plays a prominent role in any business enterprise through this sensitive characters of meeting immediate financial demands. Thus the test of liquidity was worked out by using three ratios viz. liquid assets to total assets, current assets to current liabilities and acid test ratio.

At the overall level, the liquid assets to total assets the ratio of 0.56 to 0.66, was acceptable for a processing industry, which indicated that they maintained 56 to 66 per cent of their total assets in the liquid form during the study period, in order to meet immediate financial requirement, for purchase of raw materials, payment of wages and other expenses. The average of this ratio in small units was 0.41, indicating only 41 per cent of liquid assets maintained in liquid form. However,

medium and large processing units maintained 61 per cent and 80 per cent of their total fixed assets in the form of liquid assets. Hence, the performance of medium and large units with respect to liquidity was found to be satisfactory. So, the small processing units should increase liquid assets to meet the immediate financial requirement to achieve higher level of production.

The current condition of the business is indicated by the current ratio, that is, the ratio between current assets and current liabilities. Average of this ratio at an overall level worked out to be 2.88, which indicated that for every rupee of current liability, the amount of current assets available was Rs. 2.88. This showed that the processing units are not much dependent on short term borrowings and hence possessed a good liquidity position. Natarajan (1980) considered that a current ratio of 2 was ideal. However, the ratio was very low, that is 1.02, in small units, which indicated that these units were highly dependent on short term borrowings. Hence there was a need to improve the liquidity position in small processing units for sound performance. Whereas, medium and large processing units had the ratio more than 2, indicating better performance.

The acid test ratio of quick ratio, which does not include inventories, was used to study the ability of the processing units to pay their obligations without relaying on sale of inventories. Flink & Gunewald (1969) and Natrajan et.al. (1980) were of the opinion that the ratio of 1:1 is a standard norm. the result indicated that at the overall level, the average of this ratio was found to be 1.42. This showed that the processing units at the overall level had enough assets to meet their current obligations without depending much on sale of inventories. However, the small and medium processing units had this ratio less than unity, that is 0.49 and 0.87 respectively, which indicated that both were

highly dependent on sale of their inventories to meet their obligation, which was considered to be unsatisfactory position whereas, the large processing units, had this ratio of 2.12, implying satisfactory position. Hence the velocity of conversion of current assets into cash was good in case of large units.

The ratio of liquid assets to total assets from 0.56 to 0.66 having an average of ratio of 0.61 for the study period at the overall level. This ratio in case of small processing unit ranged between 0.35 and 0.49 having and average value of 0.41 while for medium processing unit, it varied from 0.55 to 0.72 having an average ratio of 0.61. The large processing unit having an average value of the ratio of 0.80, which ranged between 0.78 and 0.83 during the study period.

The ratio of current assets to current liabilities at the overall level ranged between 2.62 and 3.31, with an average of 2.88 during the study period. The average ratio for small, medium and large programmed units were 1.02, 2.01 and 5.76 respectively. Wherein the ratio ranged between 0.97 and 1.14, 1.92 and 2.20, 4.97 and 6.72 in small, medium and large units respectively, during the study period.

The acid test ratio on an average was found to be more than unity, that is 2.12 in large processing units during the study period. Whereas it was less than unity in medium and small processing units, that is 0.49 and 0.87 respectively. However, it was found to be more than unity at the overall level (1.42).

c) Profitability ratios:

The profitability of the cashew processing units was assessed by using three ratios namely, net profit to total assets, net profit to fixed assets and net profit to owned funds.

The ratio of net profit to total assets indicated the net profits for each rupee of assets. The average value of the ratio was 0.12 in small units, this ranged between 0.11 and 0.14 during the study period. The average value of this ratio for medium processing units was 0.16 and ranged between 0.15 and 0.17. in the large processing unit, the average value of this ratio was 0.20 and in ranged between 0.18 and 0.21 at the overall level, the average value of this ratio was 0.17, and ranged between 0.16 and 0.19 over the study period.

The ratio of net profits to fixed assets ranged between 0.93 and 0.95 over the years in the small processing units having an average ratio of 0.95. while the average of this ratio in medium, large and at overall level of processing units found to be 1.32, 1.45 and 1.37 respectively, it ranged between 1.14 and 1.64 in medium units, between 1.28 and 1.64 in large units and between 1.20 and 1.59 at the overall level, respectively.

The ratio of net profit to owned funds at the overall level, ranged between 0.03 and 0.09, with an average of ratio of 0.06 during the study period. For the small processing unit, this ratio ranged between 0.05 and 0.06, with an average value of 0.056. in the medium processing units this ratio ranged between 0.03 and 0.04 having an average value of 0.038. The large processing units had an average ration of 0.14, which ranged between 0.11 and 0.19.

The liquidity analysis of the processing units reveals the ability to meet its financial obligation and as such do not reflect the profitability aspect. Hence the profitability ratios were used to analyze the overall profitability or efficiency of the business organizations. Three different profitability ratios, namely, net profit to total assets net profit to fixed assets and net profit to owned funds ratio were worked out and compared for different sizes of processing units.

Net profits to total asset ratio was used to examine the extent of net profit gained for each rupee of investment. At the overall level the average ratio for the processing units was found to be, 0.17, indicating 17 per cent rate of return on assets. It meant that the processing units at the overall level were able to generate 17 per cent profit on total assets. however, the rate of return on assets in small, medium and large units was 12 per cent, 16 per cent and 20 per cent, respectively. This indicated that the net profits were very low in general and particularly in small units. This called for efficient use of total assets as well as increasing profits by decreasing expenditure.

To determine the income yielding capacity of the fixed assets, the ratio of net profits to fixed assets were worked out. At the overall level, average of ratio was found to be 1.37 this per cent on fixed assets. While the capability of the different categories of cashew processing units to generate, on an average income of 137 per cent on fixed assets. While the capability of the different categories of cashew processing units to generate, on an average income on fixed assets was 95.00 per cent in small, 132.00 per cent in medium and 145.00 per cent in large processing units. This showed that the large processing units were better off in utilization of fixed assets as compared to both small and medium units. As a result the medium and the large processing units were in a better position to meet the long term obligation, while small units were not in a better position to meet the long term obligations.

The ratio of net profits to owned funds, at overall level was positive (0.06). Similarly it was positive in all the size group of processing units. It was 0.056 in small, 0.038 in medium and 0.14 in large processing units. This indicated that all the processing units were in a position to protect their equity and generate income on equity.

d) Turnover ratios

The operational efficiency of the processing units was compared using the indicators such as rate of turnover, working capital turnover, fixed assets turnover and total assets turnover ratio.

The rate of turnover ratio in small units ranged between 5.28 and 6.58 and similarly in medium units and large units ranged between 6.98 and 10.02, and 6.28 and 8.38, respectively during the study period. This ratio ranged between 6.32 and 8.95 at overall level. The average of this ratio for the study period was found to be 6.12, 8.81, 7.54 and 7.49 for small, medium, large and at overall level of processing units, respectively.

Working capital to turnover ratio indicated the relationship between sales and working capital. It ranged between 1.20 and 1.35 having an average ration of 1.26 at overall level. It ranged between 1.10 and 1.32, 1.20 and 1.30 and 1.20 and 1.39 in small, medium and large processing units, respectively, for the years during the study period.

Fixed assets turnover ratio ranged between 5.23 and 7.40, 8.34 and 11.06 and 6.92 and 9.52 having an average of ratio of 6.21, 9.6 and 8.12 for small, medium and large processing units, respectively. At the overall level the ratio ranged between 8.22 and 10.04 having an average value of 8.95 for the study period. Total assets turnover ratio indicating the intensity of utilization of total assets by the processing units, ranged between 1.01 and 1.10 in small processing units. Similarly, it varied from 1.02 to 1.15 in medium processing units and 1.10 to 1.71 in large processing units. At the overall level it varied between 0.94 and 1.20 their average values of the ratio were found to be 1.06, 1.11, 1.18 and 1.11, respectively.

In order to study the operational efficiency of the processing units, turnover ratio namely, rate of turnover or inventory turnover, working capital turnover, fixed assets turnover and total assets turnover ratios were worked out. The rate of turnover helped to evaluate the effectiveness of the processing units in their sales, working capital and inventory management.

To study the relationship between sales and working capital, the net working capital turnover ratio was worked out. This ratio measured the efficiency with which the working capital was employed in the processing units. Generally, higher the turnover, greater will be the efficiency and rate of the profits. At the overall level, on an average this ratio was 1.26, indicating that average turnover to working capital was high (1.31) in large units as compared to medium and small units. This may be because of high rate of turnover due to more proportion of working capital, in the total assets held by them. Whereas the ratio was little low (1.70) in small processing units due to less proportion of working capital in the total assets held by them. Hence, the small processing units try to increase the proportion of working capital in the total assets.

Fixed assets turnover ratio was used to study the utilization of fixed assets to generate sales. The ratio at an overall level, on an average was 8.95. This showed that the cashew processing units at an overall level generated a return of Rs. 8.95 for every rupee of fixed assets held. The average ratio was higher (9.6) in medium processing units as compared to large and small size units, that is 8.12 and 6.21, respectively. It indicated higher efficiency in utilization of fixed assets to generate sales in medium processing units as compared to large and small units. Hence the small processing units should utilize the fixed assets efficiency to generate sales.

In order to analyze the relationship between sales to total assets, the ratio of sales to total assets was worked out. This ratio indicated the velocity of sales to total assets. It was observed that, at the overall level of cashew processing units the total assets to turnover ratio was 1.11. It was low 1.06 in small units, compared to 1.11 in medium units and high (1.18) in large processing units. It indicated an increased efficiency in utilization of assets to improve sales. Effective utilization of total assets, to improves sales, especially in small and medium processing units was necessary as compared to the efficiency of the large units.

In the above analysis a combination of financial ratios was used to study the various phases of financial positions and relative business performance in small, medium and large units. The ratios invaded something on its own and in conjunction with other ratios. It revealed the strong and weak points of the business and thus provided clues to the management of the problems occurring, and to undertake suitable remedial measures for efficient functioning of the industry.

4.14 Problems:

The frequency distribution of sample units according to the problems encountered is given in table 4.14.

Table 4.14: Frequency distribution of sample units according to the problems faced by them.

Sr. No.	Problem	Small	Medium	Large	Overall
1.	Shortage of labour	1	7	5	13 (72.22)

	Bank finance was not readily available	5	8	5	18 (100.00)
	Highest interest rate of bank	5	8	6	18 (100.00)
	Graded and good quality raw material was not available	2	8	5	15 (83.33)
	Non inposition of purchase tax	1	6	5	12 (66.67)
	Frequent failure of electric supply	5	8	3	16 (88.89)
	Non availability of skilled labour	4	6	4	14 (77.78)
	Rate for raw material not as per grade	3	4	3	10 (55.56)
	Non availability of subsidy from government	4	-	-	4 (22.22)
	Heavy investment for purchase of raw material	2	4	4	10 (55.56)

Regarding the problems of processing factories, the bank finance was not easily available and high interest of bank were the most prominent. Shortage of labour, non availability of good quality raw material, frequent failure of electricity, non availability of skilled labour were the major problems. It is observed from the table that, non availability of bank finance and high interest rate on loan were the major problems faced by all the sample factories. Frequent failure of electricity supply and graded and good quality raw material was not available were the problems faced by majority of the sample processing units (more than 80.00%). Non availability of skilled labour was one of the problems faced by 77.78 per cent units while shortage of labour was the problem expressed by one unit in small group. Seven units in medium group and five units from large group of processing unit. Ten units (55.56%) express that when there was heavy demand in the market for raw material, the rates for raw material rate were not appropriate as per grades, and therefore acute loss occur due to less recovery. About two third units expressed that purchase tan was not imposed by the government in Maharashtra. Therefore, traders and processors (out of the state) purchase the raw material at lower rate and without tax in Maharashtra. When processors from our state visit markets in Goa and Karnataka State purchase raw material they had to pay purchase tax. Therefore imposition of purchase tax would safe ground the interest. Four units expressed that the subsidy was not available easily and timely. More than fifty per cent processors expressed that heavy investment in regards for purchase of raw material was required and because of high interest cost, the business become non attractive in some cases.

4.15 Suggestions:

The frequency distribution of units according to the suggestions made by the unit owners is given in Table 4.15

Table 4.15: Frequency distribution of units according to suggestions made by processors of cashew nut.

Sr. No.	Suggestions Made	Small	Medium	Large	Overall
1	Reasonablt and gradewise price for raw nut to be fixed by govt.	4	4	5	13 17.22
2	Bank finance should be easily available	5	8	5	18 (100.00)
3	Interest rate should be low	5	8	5	18 (100.00)
4	Imposition of purchase tax by govt.	1	6	5	12 (66.67)
5	Training on cashew processing especially for grading and breaking of nuts be given	4	6	4	14 (77.78)
6	Retail shops at APMC washi be made available	-	2	1	3 (16.67)
7	Tax relief be given	2	4	4	10 (55.56)
8	Subsidy be given in time	4	-	-	4 (22.22)

(Figures in parentheses ae percentages of total factories)

From table 4.15, it is seen that, all the sample unit owners suggested that bank finance should be made easily available and interest rate should be low. Training on cashew processing especially on breaking of raw nuts and grading need to be arranged by the concerned institute were the suggestions made by 14 processing units (77.78%). Reasonable price for raw nut should be fixed by the government and imposition of purchase tax were the suggestions made by 13 units (72.22%) and 12 units (66.67%) respectively. The suggestions regarding tax relief be given was expressed by 10 units (55.56%). Whereas timely payment of subsidy was the suggestions made by four units (22.22%).

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CHAPTER – V

EXPORT MARKETING OF CASHEW

CHAPTAR V

EXPORT MARKETING OF CASHEW

5.1 The existing procedure of exporting Cashew kernel

Buyers and sellers are most essential and vital elements of an economy. While trading or doing, transaction locally in domestic market is one sided only, since it benefits the buyer and sellers within the country. Trading in an international market in between three parties i.e. buyer (importer), seller (exporter) and seller's country (exporter's country). In an export trade, not only importers and exporters are benefited, but the exporting country also derives benefit out of it. Foreign exchange earnings is the backbone of economy in the sense that the country's economy has more buying power for meeting its import requirements.

5.2 Pre- requisite for export marketing

A beginner, who wants to enter into export business, he has to complete various formalities. He has to obtain RBI code number, IMPORT- EXPORT code number. A beginner may be a federation or an institution. The RBI code IMPEX code are necessary, since these code numbers have to be necessarily mentioned on shipping documents of all consignments offered to CUSTOMS or at PORTS are identified with the help of these code numbers.

5.3 Specifications for cashew kernels

Standard specifications for Indian cashew kernels for export have been laid down by the government of India under the Export (quality control and inspection) Act 1963. The Act prescribes 33 different grades of cashew kernels, of which, 26 grades are commercially available and

exported. The information related to trade name, colour, count and broken maximum is given in following table 5.3

Table 5.3 : Specifications for cashew kernels

Sr. No.	Grade Designation	Trade Name	Colour/ Characte-ristics	Count/454 gms size description	Max. moisture %	Brokn Max. %
1	2	3	4	5	6	7
1	W-180	White wholes	White/ pale ivory/light ash Characteristic shape.	170-180	5	5
2	W-210	do	do	200-210	5	5
3	W-240	do	do	220-240	5	5
4	W-280	do	do	260-280	5	5
5	W-320	do	do	300-320	5	5
6	W-400	do	do	350-400	5	5
7	W-450	do	do	400-450	5	5
8	W-500	do	do	450-500	5	5
9	SW	scorched wholes	kernels may be scorched/slightly darkened due to over-heating while roasting or drying	N.A.	5	5

			in drier/broma			
			do			
			do	170-180		
10	SW-180	do	do	200-210	5	5
11	SW-210	do	do	220-240	5	5
12	SW-240	do	do	260-280	5	5
13	SW-280	do	do	300-320	5	5
14	SW-320	do	do	350-400	5	5
15	SW-400	do	do	400-450	5	5
16	SW-450	do	kernels may be	450-500	5	5
17	SW-500	do	over-	N.A.	5	5
18	SSW	scorched wholes	scorched,immature, shriveled,speckled, discoloured and light blue		5	5
19	DW	Dessert wholes	kernels may be deep scorched,deep brown, deep blue, speckled, deep blue, speckled discoloured and black spotted	N.A.	5	5
			white pale ivory or light ash kernels broken crop wise (evenly or	N.A.		

20	R	Butts	unenvenly) naturally attached white / pale ivory or light ash. Kernels split naturally lengthwise	N.A.	5	5
21	S	Splits	white pale ivory or light ash		5	5
22	DWP	Large while pieces	White pale ivory or light ash	Kernels broken into more than two pieces and not passing through 4 mesh 16 SWG sieve/4.75 mm.I.S. sieve	5	Nil
23	SWP	Small white		Broken kernels smaller than those described	5	Nil

		pieces		on LWP but not passing through 6 mesh 20 SWG sieve/2.80 mm I.S. sieve		
			Do	Plemules and broken kernels smaller than those described		
24	BB	Baby bits		as SWP but not passing through a 10 mesh 24 SWG sieve/1.70 mm I.S. sieve	5	Nil
			Kernels broken crosswise (evenly	N.A.		

			or unevenly) and naturally attached.			
25	SB	Scorched butts	Kernels may be scorched/slightly darkened due to over heating while roasting of drying in the drier broma	N.A.	5	5
26	SS	Scorched splits	Kernels split naturally lengthwise kernels may be scorched slightly damaged due to over-heating while roasting or drying in drier/broma		5	5
27	SP	Scorched pieces	Kernels may be scorched slightly darkened due to over-heating while roasting or drying in drier/broma	Pieces not passing a mesh 16 SWG sieve/4.75 mm I.S. sieve	5	Nil

28	SSP	Scorched small pieces	Kernels may be scorched slightly darkened due to over-heating while roasting or drying in drier/broma Kernels may be over-scorched, immature, shriveled, speckled (Karaniram), discoloured and light blue	Pieces smaller than SP but not passing Through a 6 mesh 20 SWG sieve/2.80 mm I.S. sieve Kernels broken into pieces but not passing through a 4 mesh 16 SWG sieve/4.75 mm I.S. sieve	5	Nil
29	SPS	Scorched pieces Seconds	Kernels broken crosswise (evenly or unevenly) naturally attached. Kernels may be	N.A.	5	Nil

			deep brown, discoloured, deep blue and black spotted			
30	DB	Dessert butts	Kernels may be deep scorched, deep brown, deep blue, speckled, discoloured and black spotted	N.A.	5	5
			Do			
31	DS	Dessert splits	Do	Kernels broken into pieces but not passing through a 4 mesh 16 SWG sieve/4.75 mm I.S. sieve	5	5
32	DP	Dessert Pieces		Kernels broken into pieces but not passing through a 6 mesh 20 SWG	5	Nil

				sieve/2.80 mm I.S. sieve		
33	DSP	Dessert small pieces			5	Nil

5.4 Quality control and pre-shipment inspection

Quality has become the vital criterion for all item for seeking entry into international market. In the emerging food markets, price no longer is the governing edge in the trade. The emphasis has shifted to Quality, encompassing the aspects of safety, reliability and acceptability of the product to the final consumer.

Export of cashew kernels from India is subject to voluntary Quality control and pre-shipment inspection. Inspection of cashews is being conducted either under the consignment –wise inspection or under in-process quality control scheme. It is ensured that the product is processed and packed as per the standards prescribed by drawing samples from the finished product.

5.5 Packaging and standard weight

The graded cashew kernels as per the specifications in bulk are packed in four-gallon prime tins with a net weight of 11.34 kg. in each tin. The filled tins are then vacumised and filled with carbon-di-oxide gas and sealed. Tow such tins of the same grade is packed in a carton for

export. The net weight of a carton is thus 22.68 kgs. (50 lbs). Some manufacturers also pack in tins of 10 kgs net to certain markets to suit the requirements of buyers. The cashew unit has started using lead-free solders in tins used for packing and export of cashew kernels as of January 2004 flexible packaging systems, which are safe, chemically neutral, environmental friendly and recyclable are also in trial stages.

Shipping specifications and facilities

The overall dimensions of a carton are given as:

Length	:	490 mm
Breadth	:	240 mm
Height	:	350 mm
Overall volume	:	0.041 Cu.m/carton

Cashew shipments from India are mainly in containers of size 20 ft. which carry about 680/700 cartons. Orders for less than a container load are also accepted. Freight is charged per cubic meter (volume basic). Freight for full container load is fixed. It is more economical than freight for part container load (LCL). There are regular shipping facilities from India to all parts of the world. Major shipments in India take place through cochin port. Other ports are Tuticorin, Mangalore, Chennai and Mumbai. Frequent shipping services are available from India ports on India – USA, India – UK / continent, India- Australia, India-Japan, India-Middle East and India – Singapore routes.

Contract terms

i. contracts are normally made on FOB (Free on board) and C and F (cost and Freight) basis

ii. Pricing in international trade in cashew is in U.S. Dollars per 1 b Quotations in other currencies are also available on request from the exporters of cashew kernels.

iii. Business in cashew is done on an offer and acceptance basis by telephone, internet, telex or fax since the prices are subject to frequent fluctuations.

iv. Cost of insurance is to be borne by the buyer.

v. At the time of contract, the month of shipment, grade/s and price/s are to be clearly indicated. Sometimes, shipments are offered up to six months in advance.

vi. Payment is usually made by 100 per cent irrevocable letter of credit in favor of shipper through his bank. The letter of credit is opened immediately on execution of contract or one month prior to shipment.

5.6 Export performance of cashew

In this subtopic, attempt was made to know the per cent share of India in the world market in terms of export of cashew kernels and raw nut production. Also proportionate share of cashew exports in the country's total exports and agricultural exports has been worked out for the period under consideration.

At the same time, trends in export of cashew were studied with simple growth rates and compound growth rates for volume and value at current prices as well as constant prices.

To study the effect of liberalization policy the data period was divided and the growth rates for period's viz. pre- liberalization and post liberalization period were also worked out.

Methodology

In the South Africa region, Ratnagiri district constituted maximum area, production and productivity of cashewnut with 45 cashew processing units of different sizes. Hence this district was selected for the study. At the second stage, out of 45 units, only 28 units were in operation as per the Konkan Processors and Exporters Association and hence and hence all the 28 units were selected. At the third stage, all selected cashew processing units were categorized into three groups namely, small, medium and large, based on basis of their working season. The number of units grouped under each size group were 5, 8 and 5, respectively. The primary data was collected for the year 2008-09 by personal interview method, with the help of pre-tested schedule on the various aspects of processing of cashew nut, and problems faced by processors. Similarly, secondary data was collected regarding capital investment, organization at structure, assets, liabilities, net profits and total sales from the relevant records maintained by the cashew processing units from 2004-05 to 2008-09.

Tabular analysis was employed for assessing the investment pattern cost of processing, cost and return structure in production of kernels. Different financial ratios were used to analyze and compare the business performance of selected categories of processing units. The problems faced by cashew processors were also discussed and frequency distribution regarding problems encountered and suggestions thereof were collected and interpreted.

The second part of the study was an attempt to understand the pattern of export procedure and to review the export performance, to study the country wise trade, trend and instability in cashew export trade.

The study period considered for the analysis of growth rates and instability in export of the cashew was from 1990-91 to 2000-01. For analyzing the effects of liberalization policy on export of cashew, the original data was divided into two periods namely pre-liberalization and post liberalization period. The external value of Indian rupee is subject to wide fluctuation, therefore, the growth rates at current prices are not fact finder. Hence, by considering the year 1990-91 as base year the growth rates at constant prices were also worked out, to give the real picture of export scenario. For studying the factors influencing the export performance of cashew, the export function was employed, by considering export as dependant variable and production, export price, domestic price and domestic consumption and world export as independent variables. Instability indices for various countries and price of cashew kernel were also calculated.

Findings

A) Processing

The investment pattern of the cashew processing units revealed that there was direct relationship between the total capital investment and the size of the processing units. The average aggregate capital invested per processing unit was Rs. 90.01 lakh, aggregate it was found that, in all the units investments on working capital was more (88.01 per cent) than the fixed capital (11.99 per cent) because of heavy amount required on procurement of cashewnut (raw material). The Proportion of working capital was more in medium sized processing units as compared to large and small units, due to higher capacity utilization. However, the proportion of fixed capital invested was more in small processing units than large and medium units because of proportionality, higher investment on land, machinery and infrastructure facilities. The

investment on building constituted for major part of the fixed capital because of more work space required for processing. Due to less administrative staff required, the investment on other fixtures was low. The cashew units followed line organization type of structure, as it is simple. Wherein the number of employees and the salaries/wages rapid to them increased with the increase in the size of processing units, because of larger installed capacity. The major part of working capital (91.89%) was required for procurement of cashew nut.

Procurement of cashew nut was maximum during the moments of April and May, as they were the peak harvest months of cashew. Important parameter considered, to assess the quality of cashew nut was the count, which mainly determined its price. Due to recovery of superior grade cashew kernels from the low count cashew nuts. Per quintal cost of processing was costlier in large units. The major cost was interest on working capital (45.59%) and interest on fixed capital (7.46%) at the overall level and about 30 per cent was found to spent on workers in various way like salary, wages, bonus etc. cost of raw material had significantly influenced the behavior of the total cost of production. One quintal of cashew nut when processed resulted in only 24.70 kilogram of kernels, 70.00 kilogram of shells, 3.00 kilograms of test (husk) and 2.28 kilogram of rejection, at the overall level. It was mainly due to poor quality of cashew nut available to them. The outturn of kernels grades depend on the quality of cashew nut and the larger finger skills of women labour in shelling and peeling operation. The value added as a result at processing activity, at the overall level was Rs. 1860.44 per quintal of cashew nut processed. This was low, (40.56%) due to higher purchase value of cashew nut. Sales realization from one quintal of cashew nut processed was more (Rs. 5550.40) in large processing units, due to higher percent of kernel outturn and higher prices realized. The higher net

returns in large processing units were found due to higher efficiency achieved in marketing large scale production. Net added value was more in large units (23.16).

Efficiency of cashew processing units in terms of capacity utilization, was to the extent of 63.24 per cent of the installed capacity. This lower per cent of capacity utilization was due to scarcity of cashew nut financial stringency. Capacity utilization was more in medium processing units (66.49%), than large (52.82%) and small processing units (63.17%).

The business performance of the cashew processing units as observed through the financial ratios as solvency, liquidity, profitability and turnover ratios, showed that the large processing units were more efficient than the medium and small processing units. It may because of large economies of scale in operation and management. Solvency positions of the large and medium processing units were sound and well within the acceptable norms, that is, 1:1, while the solvency ratios were higher than the acceptable norms in case of small processing units, which indicated a weal solvency position. Due to of poor financial strength, wherein the solvency position of large processing units were better than the medium and small units because of better financial strength. The liquidity ratios in general, have revealed that the large processing units were in a better position to meet the short term financial obligations, and hence did not suffer from want of working capital. However, the medium and small processing units projected relatively weak liquidity position, indicating poor financial management, because of high amount of current liabilities in these units as compared to large units. Hence there was need to reduce their current liabilities for increasing their efficiency. The test of profitability as indicated by the profitability ratios was high in case of large processing units as compared to medium and small processing

units. It revealed that large processing units, efficiency utilized their assets as well as owned funds. However, these ratios were low in medium and small processing units, indicating inefficiency in utilization of their assets as well as owned funds. The turnover ratios of different size group of processing units, indicated that the velocity with which the capital invested was turned over in the business was low in small units as compared to large and medium units. Which was also cause for inefficiency in utilizing their owned funds. This low turnover ratio in small units was due to sales. Hence, there was need to promote their sales. The operational efficiency in medium processing units was more than large processing units because of higher capacity utilization.

The major problem to processing units faced were, bank finance, interest rate, quality raw material availability, failure of electricity supply. Non availability of skilled labour, shortage, of labour, and heavy working capital investment for purchase of raw material. The same trend was observed in all the units except few problems. The owners of processing units suggested there opinion to improve existing situation by the way of easy availability of loan, low interest rate, training to labours to improve efficiency, imposition of purchase tax, and subsidies etc.

B) Marketing of cashew specially export –

For sporting of cashew kernels, an exporter has to obtain the RBI code and IMPEX code. The cashew kernels shall be obtained through unit processing. According to the standard specifications laid down by the Government of India under export (quality control and inspection). Act 1963, the cashew kernels are internationally graded into 33 suitable grades under each white whole, scorched wholes, split and butts. The graded kernels as per the speciation, in bulk are packed in four-gallon prime tins with a net weight of 11.34 kg. in each tin. Or 10 kg tin. The filled tins are

then vacumised and filled with carbon-di-oxide gas and sealed. Two such tins of the same grade are packed in a carton for export. While shipping, freight in charged per cubic meter. Freight for full container load is also fixed. Contracts are normally made on free on board and cost and freight basis. Pricing in international trade in cashew is in U.S. Dollar per Ib. Quotations in other currencies are also available. The cashew business is done on an offer and acceptance basis. Cost of insurance is to be borne by the buyer. Payment is usually made by 100 per cent irrevocable letter of credit in favor of shipper through his bank.

India had efficiency used the production for export as it was indicated from the fact that as compared to other countries, Indian utilized production for exports and earned valuable foreign exchange. In the international market of cashew, India occupied dominant position by exporting above 60 per cent share to total world export of cashew, which was followed by Brazil i.e. 36 per cent share of total world export. India had long and glorious tradition of growing and exporting the cashew kernels of the finest quality. Cashew export constituted about 6 to 9 per cent of total export earnings from agricultural and allied products. In country total exports earning cashew constituted around 1.5 per cent share considering the cultivation and processing. It played vital role getting valuable foreign exchange.

The compound growth rates of area and production was 5.65 per cent and 4.56 per cent, respectively. However, the quantity off cashew kernels exported grew by 6.08 per cent. The positive growth rates in respect of production and export of the cashew was due to the increased domestic production and increased demand for cashew was due to the increased domestic production and increased demand for cashew kernels in the international market. The increased domestic production and exports were due to the several measures by the Directorate of cashew

nut development. Cashew Export Promotion Council and State Agricultural Universities on improved methods of production, assistance for export by setting up facilities for upgrading quality and technical advice on scientific post-harvest operations and processing. The simple growth rates were 1160.60 MT and 4140.94 MT for the periods I and II, respectively. This indicated that, the quality exported has increased more in period II than period I.

Thus we may conclude that liberalization policy has affected the cashew export on positive line. The growth rates as constant prices were lower than growth rates at current prices. This indicated that the value received at current prices was much more than the real value received at constant prices. This was due to the fluctuation of Indian rupee in international market.

As regard to the export of CNSL, the quantity decreased significance by 207.50 MT or by 6.43 per cent. This was due to the processing factor and change in import policies of Korean countries. For maintaining the quality of cashew kernels in international market, drum roasting method was used, and this has resulted into less extraction of CNSL. Which adversely affected the export of CNSL. Also our traditional market for CNSL, the Korea Rep. reduced its imports. These two factors have resulted into fall of CNSL export.

In case of Canada, the growth rates of quantity exported and value realized at constant price were statistically not significant, also at the overall level, the growth rates of value received at current prices were significant. The liberalization policy has shown positive impact in the export both quantity and value.

U.S.A. in India's big market for export of cashew kernels. The quantity exported, values received at current and constant prices showed

the growth rates which were statistically significant, for both periods and at the overall level. The growth rates for the period II were much more than period, the export of cashew kernels to U.S.A. has increased in all terms i.e. quantity and value received at current prices as well as constant prices.

U.S.S.R. was also the good market for Indian cashew kernels during earlier period. But at the overall level, the quantity exported has decreased by 619.14 MT (7.95%) this may be due to the geodetic changes like break-up of USSR into several independent states.

The Netherlands is another traditionally major market for Indian cashew. Like U.S.A. the growth rates of quantity exported and value realized at current prices and constant prices, for both periods and at the overall level were positive and statistically significant. It was found that the growth rates of value received at constant prices were much less than the growth rates of value at current prices. Like other countries the post liberalization period has also a positive effect on cashew export to the Netherlands.

As regards U.K., the growth rates were positive and significant. In U.K., it has been observed that demand for cashew kernels was increasing in this country. The post liberalization period has shown positive effect on quantity exported and value realized in the cashew trade.

Cashew export to Germany also exerted positive and significant growth rates. At the overall level the quantity increased by 46.12 per cent, however the value realized at current and constant prices increased significantly by 30.56 per cent and 17.07 per cent. In case of Germany the growth rates of quantity exported were 225.18 MT and 1.63 MT for the periods I and II, respectively. This indicated that after liberalization

policy. There was considerable decrease in the export of cashew kernels to Germany.

As regards France, during period first, the exported quantity deceased by 0.13 MT per annum, but during period II the quantity increased by 321.09 MT. The comparison of growth rates explained the effect of liberalization. At the overall level, the demand increased by 33.71 per cent per annum. Like other countries the value at current and constant prices increased significantly.

Japan is a major importer of Indian cashew in the Asian zone. Growth rates were positive and significant for quantity exported and value realized in period I. however, in respect of the quantity exported to Japan, the growth rates were negative in second period which showed negative influence of post liberalized period. This indicated that the post liberalization period affected adversely on the export to Japan. It may be due to economic depression in Japan in last decade.

Like Japan, the policy of liberalization has also affected the export to Singapore. During period I, the quantity increased by 218.88 per cent, however, during the second period, the quantity decreased by 3.02 per cent. U.A.E. had shown significant effect of liberalized policy both in term of quantity as well as at current and constant prices the growth rates were higher during period II.

As regards, the quantity exported value realized at current and constant prices to Hong Kong the growth rates were also positive and statistically significant. However, the liberalization policy has affected negatively on export but the growth rates of value at constant were much lesser than the growth rates of value at current prices.

In case of Saudi Arabia at the overall level the quantity has increased by 12.84 per cent per annum. Also the growth rates were higher during post-liberalization period.

In the oceanic zone, the quantity exported to Australia increased significantly during period I and comparatively decreased in period II and at the overall level. Liberalization policy has affected adversely the export of kernels and value received.

In case of New Zealand, at the overall level, the quantity increased in the period II as compared to period I. The growth rates of value at current and constant prices were positive.

The groups others, at the overall level, the quantity and value increased significantly both in period I and period II indicating positive effect of liberalization policy.

The trend analysis indicated that the growth rates of quantities exported and value realized at current as well as constant prices were positive and significant export to U.S.S.R. The main reason behind this was the effect of break-up of USSR into community of independent states. Remaining almost all the countries showed positive growth rates. This may be due to increasing demand for cashew kernels in those countries.

It was also cleared that liberalization policy has affected positively on quantity exported and value received at current and constant prices. It can also be seen that during the post-liberalization period, the growth rates of quantity exported to Asian countries like Japan, Singapore, Hong Kong were lower growth rates during pre-liberalization period. As regards the export of CNSL, at the overall level, Japan U.S.A. and U.K. showed negative growth rates while Korea has shown positive effect. The growth rates of quantity exported to U.S.A. were negative but non-

significant. This was because of processing factor. In oil bath process extraction of CNSL leads to scorching and breakage of nuts, thus reducing their market value. In drum roasting process, the nuts were not damaged much, but the entire quantity of shell liquid got burnt. Thus to maintain quality of nuts, the quantity of shell liquid was lost. This resulted into the less production of CNSL, and ultimately fall in export quantity of CNSL.

The instability analysis for cashew exports showed that the total quantity exported and value received at current and constant prices were stable during the study period. Regarding the quantity of cashew kernels exported, the export stable to the countries like USA, Australia, Germany and U.K. was moderately stable. However, the export to the countries like France and Saudi Arabia and others was instable.

As regards the value received at current prices, the value received from Germany and Netherlands was stable. However, the countries like others, U.K., UAE, Australia and New Zealand showed moderate stability. In case of countries like Japan, France, Saudi Arabia, the value received was instable.

In case of the value received at constant prices, the Saudi Arabia, Netherlands showed stability. However, the countries like Germany, UAE and Australia showed moderate instability. Further the value received from the countries like U.K. were moderately stable. As regards the other countries the value received were not stable. In case of USSR, France the value received were highly instable during period under consideration.

The export of CNSL was not stable during under consideration. The major countries and total export showed either moderate stability, instability or higher instability.

It was revealed from the export function that, the variables like export price, and world export significantly influenced the cashew export. As regard to the average price received per kg, UK was the important country. The maximum average price received was from U.K. followed by New Zealand and Australia. The average price per kg received during 1999-2000 was approximately same for the countries like UAE, Canada, Japan, Hong Kong, Netherlands, India got fair price from these countries. Per cent change in price was comparatively same for many countries except USSR, Hong Kong, Singapore etc.

Conclusions –

1.The cashew processing unit in the region had provided 1.92 lakh day employment. Out of the total employment, nearly 92.00 per cent was female labour employment.

2. The average capital investment per unit was Rs. 90.01 lakhs. The investment on working capital was more (88.01%) than the fixed capital (11.99%) of the total working capital invested, the purchase of raw nuts shared about 90.00 per cent.

3. The per quintal cost of processing was around Rs. 900 and exhibited positive relationship with the scale of production.

4. One quintal of cashew nut when processed resulted in 24.70kgs of kernels. The gross and net value added came to 40.56 per cent and 14.06 per cent, respectively. The picture of utilized capacity in relation to installed capacity was to the ton of 63.24 per cent of the total capacity utilized. The cost-benefit ratio for unit was 1.19.

5. Major problems faced by the unit were mainly related with finance, followed by quality of raw material, labour, electricity supply etc.

6. Cashew was one of the major commodity constituting nearly Rs.2451 (1.57%) corers of total Indian export earnings.

7. India's export of cashew kernels had increased from 16.9 thousand MT in 1947 to 93 thousand MT in 2000. India's cashew kernels were exported to more than 60 countries all over the world. India has been the principal source of supply of cashew in global market of late, this is being, threatened by stiff competition from other countries like Brazil, Vietnam, Mozambique.

8. The increased growth rates of production and export of cashew over last 20 years were due to increased domestic production and increased demand for this commodity in the international market. The increased domestic production and exports were due to several measures taken by directorate of cashew nut development, SAUs and Research institute and cashew export promotion council etc.

9. The simple growth rates for export of cashew kernel were 1160.60 MT and 4140.94 MT for the period I and period II, respectively. This indicated that the quantity exported has increased more in post liberalization period than before. So we can conclude the favorable policies by the Government during post liberalization period have hastened the growth more rapidly than before (1980-90).

10. The growth rates at constant prices were lower than the growth rate of current prices. This indicated that the value received at current prices was much more than the real value received at constant prices.

11. Export of CNSL, the quantity exported decreased significantly by 207.50MT (6.43%) This was due to processing factor and reduced demand for CNSL from Korea.

12. USA was the India's biggest market for export of cashew kernels. The growth rates for export for period II were much more and had

increased in all terms. i.e. quantity and value realized at both constant and current prices. In view of this, the Indian market share of cashew export to USA would increase in coming years.

13. The instability analysis for cashew export showed that the total quantity exported and value received at current and constant prices was stable during the study period and the export of CNSL was not stable.

14. In all terms i.e. quantity exported, value received at current and constant prices, the cashew exports was stable to UAE and Netherlands, moderately stable to USA, Australia, U.K. and the export to France and USSR was highly instable.

15. The world cashew export and export price had significantly influenced the cashew export.

16. The maximum average price was received from U.K. followed by Japan, Hongkong. From the countries like Australia, UAE, Netherlands, Indian got factor price. From the remaining countries India received comparatively less price.

Policy implication

On the basis of analysis made in the previous chapters and its recapitulation in this chapter, some policy implications had drawn for progress of this industry. This will useful to see working of the cashew processing units at micro perspective and put them on the path of balanced and rapid development leading to overall development and prosperity in rural areas and consequential reduction in urban problems. Development of this unit on massive scale is essential for bridging up the widening gap between rural and urban areas.

1. This unit requires huge amount of raw material and gives around go per cent of female employment in the region. The rapid growth of this unit need to be encouraged. In view of this, wasteland in the region need to brought under plantation crops by inducing large scale cultivation and processing operation as well. It is essential also to promote productivity level also. Due to his benefits that could be derived are import substitution, development of waste land, improvement of ecology, prevention of soil erosion, employment generation etc.

2. Grading and sorting of raw nuts should be done at the production site. Since grading in vogue is importer. This could help the processors to procure superior quality cashew nut to recover higher percentage of superior grade cashew kernel. It will also reduce the cost incurred on drayage and facilitate to earn more return.

3. All the unit owners are facing the problem of credit. The credit is not available in adequate quantity and at proper time. Because of this problem, they cannot purchase sufficient quantity of raw material which is available in nearby area. To overcome this problem, it is necessary to make modifications in lending policy of financing institute. Another important aspect related with credit is that reduction in the interest rate. This may give good encouragement to the industry.

4. The Maharashtra Government has not imposed any purchase tax on cashew. Therefore, processors of southern neighboring states purchase raw nuts dorm this district by offering higher price to the producers. In such situation, processors are forced to purchase raw material for higher prices whereas processors from this state go for purchasing raw cashews in adjoining states they have to pay four per

cent purchase tax. So there is need to impose 4 per cent purchase tax by the state government so it will help to increase Government revenue as well as safeguard the processors interest.

5. Low capacity utilization by the cashew processors in hindering the progress of this industry. To overcome this problem, Government may improve electricity supply failure; revise credit policy by way of providing easy credit availability and lower interest rate.

6. Co-operative cashew processing units are required to be established in this area for getting additional benefit in income and employment.

7. In the global agrarian sector, India is largest producer, largest processor, and exporter and also largest area. By the ever increasing trend in exports, there has been an increased trend in import as well, but increase in domestic production had helped in reducing the imports but the import has helped to increase domestic consumption only. Though there was marginal reduction in imports, they continued to play a major role in export, their ay around half of the export earnings were drained towards import. Also the development of cashew processing in improving countries was bound to affect the availability of raw nuts for impress by India. Hence extension services should be geared for further strengthened and to ensure the adequate supply through increase in production. The findings of the research institutions in modern technologies in production generated should reach the farmers without time lag.

8. In four southern state of Andhra Pradesh, Karnataka, Tamil Nadu and Karalla together have nearly 61000 sq. km. of wasteland (Nayar 1999). If our of these areas at least 10.00 per cent of additional could be brought under cashew plantations and dependence on import could be decreased. Central Wasteland Development Board has also

included cashew as one of crop for waste land development. Considering the cashew as plantation crop, the step should be taken by the Government to exempt it from land ceiling act. Sufficient number of grafts should be made available to farmers to help them to meet their replanting and area expansion programmers. The states should need to initiate cultivation of cashew on large scale in the public sectors. Some states have also initiated such steps.

9. India had a near monopoly in seventies, however with increasing competition from cashew processing and producing countries in recent years, had affected our exports. Our exports scenario showed that over dependence on USA and Netherlands. Such type of dependence on two-three countries for export market is not desirable in international trade. This had put certain limitations on capacity to bargain for better price. The prime marketing strategy should be to strengthen non-traditional markets and explore new one and also it is a time for promotion of value added products from cashew kernels.

10. India is a signatory to the world trade organization agreement. As per the terms and conditions of this agreement, liberalization import has been announced under EXIM policy of Government. Liberalized import under OGL is helping in acquiring more nuts by imports but the economy getting drained for import hence the unit should consider a balancing approach to meet on export and domestic need. So efforts like development and applications of grade regulation, ISO-9002 would be helpful in future. To face the competition from the newly emerging cashew growing countries, it is need of time to accelerating for the overseeing and formulating the development programmers for promotion of export.

11. The instability in export earnings from the selected countries is mainly due to fluctuation in production in other producing production and increased value of Indian cashew in world market however there is a need to maintain this upsurge because of the emerging threat from other processing countries of the world.

Methodology

In the South Africa region, Ratnagiri district constituted maximum area, production and productivity of cashew nut with 50 cashew processing units of different sizes. Hence this district was selected for the study. At the second stage, out of 50 units, only 28 units were in operation as per the Konkan Processors and Exporters Association and hence and hence all the 28 units were selected. At the third stage, all selected cashew processing units were categorized into three to the countries USA, Australia, Germany and U.K. was moderately stable. However, the export to the countries like france and Saudi arebia and others was instable.

As regards the value received at current prices, the value received from Germany and Netherlands was stable. However, the countries like others, U.K., UAE, Autralia and New Zealand showed moderate stability. In case of countries like Japan, France, Saudi Arabia, the value received was instable.

In case of the value received at constant prices, the Saudi Arabia, Netherlands showed stability. However, the countries like Germany, UAE and Australia showed moderate instability. Further the values received from the countries like U.K. were moderately stable. As regards the other countries the value received were not stable. In case of USSR, France the value received was highly instable during period under consideration.

The export of CNSL was not stable during under consideration. The major countries and total export showed either moderate stability, instability or higher instability.

It was revealed from the export function that, the variables like export price, and world export significantly influenced the cashew export. As regard to the average price received per kg, UK was the important country. The maximum average price received was from U.K. followed by New Zealand and Australia. The average price per kg received during 1999-2000 was approximately same for the countries like UAE, Canada, Japan, Hongkong, Netherlands, India got fair price from these countries. Per cent change in price was comparatively same for many countries except USSR, Hongkong, Singapore etc.

5.7 STATISTICAL AND TABULAR ANALYSIS

This chapter deals with the description of the study area, nature & sources of data & various tools & techniques employed for analyzing the data.

5.7.1 Description of the study area

5.7.2 Nature & sources of data

5.7.3 Analytical tools & techniques employed

5.7.4 Definition of terms & concepts used in the study

5.7.1 Description of the Study Area:

The area under consideration for analyzing of various compositions of cashew whole of India was taken into consideration at aggregate level so as to facilitate data compilation & prices in the international market.

5.7.2 Nature & Sources of Data:

In view of cashew emerging as in important plantation crop & its increased utilization in the industrial application, is traded both in domestic & also in the international market. The market for cashew kernel & cashew nut shell liquid (CNSL) has become more speculative & hence cashew is purposively selected for the study about the export competitiveness & direction of trade for Indian cashew.

5.7.2 a) Selection of Commodities:

Cashew kernels & cashew nut shell liquid (exportable product) have been selected for the study.

5.7.2 b) Collection of Data:

The nature of data used for the study is entirely based on secondary source of data. The yearly data on export quantity, value & were compiled from various published journals, periodicals & websites for the period of 20 years (1978-79 to 2007-08).

The secondary data were collected on spot prices & volume of trade in exchanges will be collected from the official web site of forward market commission (FMC), Mumbai & respective web sites of the National Level Commodity Exchanges in India (NCDEX, MCX) APEDA, other publications & official reports of the GOI, GOK etc for the period of 20 years.

5.7.3 Analytical Tools & Techniques Employed:

To fulfill the specific objective of the study based on the nature & extent of availability of data, the following analytical tools & techniques will be adopted.

1. Growth & Coppock's Instability Index

2. Autoregressive Integrated Moving Average (ARIMA) Technique
3. Markov Chain Analysis
4. NPC (Nominal Protection Coefficient) &
5. Co-integration Technique

5.7.3 a) Growth & Coppock's Instability Index:

Analysis of Growth:

For estimating compound growth rate & Coppock's instability index the data used was divided into two periods viz., pre liberalization & post liberalization periods. This grouping was done to compare the export performance of the cashew kernel & cashew nut shell liquid in the pre & post liberalization periods. Growth rates were used to measure the past performance of the economic variables. The growth in quantity exported, export value & unit value realized from export were analyzed by using the exponential growth function of the form.

$$Y = a\, b^t\, e_t$$

Where, Y = Dependent variable

t = Time variable

e_t = Error term

a and b are unknown constants to be estimated

The unknown constants a and b were computed by applying methods of least squares by transforming the equation into logarithmic form

$$\text{In } Y = \text{In } a + t \text{ In } b$$

Where In Y is natural logarithm of Y, In a and In b are similarly defined. The compound growth rate 'r' was computed by using the relationship

$$r = \text{(Antilog of (In b) x 100)}$$

where

$$\text{In } b = \frac{\Sigma (t \text{ In } Y) - (\Sigma t \, \Sigma \text{ In } Y) / n}{\Sigma t^2 - (\Sigma t)^2 / n}$$

and n is number of times points

the significance of In b was tested by t-ratio.

$$t = \frac{[\text{In } b]}{SE (\text{In } b)}$$

Where $SE (\text{In } b) = (SS_{\text{In } Y} (\text{In } Y)^2 SS_t) / ((n-2) SS_t)$

Where, $SS_{\text{In } Y} = \Sigma (\text{In } Y)^2 - (\Sigma \text{ In } Y)^2 / n$

The critical value is t- table value for n-2 degrees of freedom.

Export Instability:

Instability in export is expected to hamper the process of economic development. This analysis was used to find out the fluctuations in export of cashew during pre & post liberalization periods as done for growth analysis. To study the export instability, Coppock's instability index (Coppock's, 1962) was used to estimate the variation in the export of cashew which, algebraically is expressed as the following estimable form.

$$V = \frac{1}{N}\left[\log\frac{X_t + 1}{X_t} - m\right]^2$$

The instability index is = (Antilog of $\sqrt{v} - 1$) x 100

Where

X_t = Value or volume of exports in year t

n = Number of years

N = n-1

$$m = \frac{1}{N}\sum_{t=1}^{n-1}(\log X_{t=1} - \log X_t)$$

Steps in Construction of Instability Index:

i. Logarithm are obtained for each annual value of variable for example for year 1, year 2 etc,

ii. The logarithm for the value for year 2 subtracted from logarithm of the value for year 1 etc, in order to get the first differences of logarithms.

iii. The arithmetic mean of the logarithmic fist difference is obtained.

iv. The logarithmic mean then subtracted from each year to year logarithmic first differences in order obtain logarithmic difference between the actual & average year to year logarithmic differences.

v. Logarithmic difference from the trend some positive & some negative are then squired summed up and divided by the

number of year minus one. The resulting number is referred to as the "log variance".

The next step is to take the square root of the log variance & obtain the antilog of the square root value. Unity is then subtracted from anti-log & decimal moved two places to the right. The resulting instability is a close approximation of the average year to year percentage variation, adjusted for trend.

Coppock's instability index was estimated for export quantity value & unit value realized for two period viz., pre liberalization period & post liberalization period.

5.7.3 b) ARIMA Technique:

In statistics autoregressive moving average (ARMA) models, sometimes called box Jenkins models after iterative box Jenkins methodology usually used to estimate them, are typically applied to time series data.

Given a time series of data X_t the ARMA model is a tool for understanding & perhaps predicting future values in this series. The model consists of two parts, an autoregressive (AR) part & a moving average (MA) part. The model is usually then referred to as the ARMA (p, q) model where p is the order of the autoregressive part & q is the order of the moving average part.

The model is generally referred to as an ARIMA (p, d, and q) model where p, d and q are integers greater than or equal to zero & refer to the order of the autoregressive, integrated, & moving average parts of the model respectively.

Given a time series of data X_t where t is an integer index and the X_t are real numbers, then an ARMA (p, q) model is given by

$$\left[1 - \sum_{i=1}^{p} Øi\, L^i\, X_t\right] = \left[1 + \sum_{i=1}^{q} \theta i\, L^i\right] \Sigma_t$$

Where L is the lag operator, the φ_i are the parameters of the autoregressive part of the model the θ_i are the parameters of the moving average part and the Σ_t are error terms. The error terms are generally assumed to be independent, identically, distributed variables sampled from a normal distribution with zero mean.

An ARIMA (p, d, q) process is obtained by integrating an ARMA (p, q) process. That is,

$$\left[1 - \sum_{i=1}^{p} Øi\, L^i (1-L)^d\, X_t\right] = \left[1 + \sum_{i=1}^{q} \theta i\, L^i\, \Sigma_t\right]$$

Where d is a positive integer that controls the level of differencing (or, if d = 0, this model is equivalent to an ARMA model). Conversely applying term-by-term differencing d times to an ARIMS (p, d, q) process gives an ARMA (p, q) process. Note that it is only necessary to difference the AR side of the ARMA representation because the MA component is always I (0).

It should be noted that not all choices of parameters produce well-behaved models. In particular, if the model is required to be stationary then conditions on theses parameters must be met.

Some well- known special cases arise naturally. For example, an ARIMA (0, 1, 0) model is given by:

$$X t = X_t - 1 + \Sigma_t$$

This is simply a random walk.

Generalizations:

The dependence of X_t on past values & the error terms Σ_t is assumed to be linear unless specified otherwise. If the dependence is nonlinear, the model is specifically called a nonlinear moving average (NMA), nonlinear autoregressive (NAR), or nonlinear autoregressive moving average (NARMA) model.

A number of variations on the ARIMA model are commonly used. For example, if multiple time series are used then the X_t can be thought of as vectors & a VARIMA model may be appropriate. Sometimes a seasonal effect is suspected in the model. For example, consider a model of daily road traffic volumes. Weekends clearly exhibit different behavior from weekdays. In this case it is often considered better to use a SARIMA (seasonal ARIMA) model than to increase the order of the AR or MA parts of the model. If the times series is suspected to exhibit long-range dependence the d parameter may be replaced by certain non-integer values in a fractional ARIM (FARIMA also sometimes called ARFIMA) model.

Introduction to ARIMA

ARIMA (p, d, and q) : ARIMA models are, in theory, the most general class of models for forecasting a time series which can be stationeries by transformations such as differencing and logging. In fact, cheesiest way to think of ARIMA models is as fine-tuned versions of random-walk and random-trend models the fine-tuning consists of adding lags of the differenced series and/or lags of the forecast errors to the prediction equation, as needed to remove any last traces of autocorrelation from the forecast errors.

The acronym ARIMA stands for "Auto-Regressive Integrated Moving Average". Lags of the differenced series appearing in the

forecasting equation are called "auto- regressive" terms, lags of the forecast errors are called "moving average" terms, and a time series which needs to be differenced to be made stationary is said to be an "integrated" version of a stationary series. Random-walk and random-trend models, autoregressive models, and exponential smoothing models (i.e., exponential weighted moving averages) are all special cases of ARIMA models.

A non seasonal ARIMA model is classified as "ARIMA (p, d, q)" model, where:

- P is the number of autoregressive terms,
- D is the number of non seasonal differences, and
- Q is the number of lagged forecast errors in the prediction equation.

To indent the appropriate ARIMA model for a time series, you begin by identifying the order (s) of differencing needing to stationeries the series and remove the gross features of seasonality, perhaps in conjunction with a variance- stabilizing transformation such as logging or deflating. If you stop at this point and predict that the differenced series is constant, you have merely fitted a random walk or random trend model. (Recall that the random walk model predicts the first difference of the series to be constant, the seasonal random walk model predicts the seasonal difference to be constant, and the seasonal random trend model predicts the first difference of the

5.7.4 RESULTS

The results of the analysis are discussed in this chapter under the following heads.

4 a) Growth and instability in the export of cashew during pre and post liberalization period

4 b)Price trend and forecast export of cashew

4 c) Export competitiveness and direction of trade

4 d) Integration between domestic and international prices of cashew

5.7.4 Growth and instability in the export of cashew during pre and post liberalization period

Growth Analysis of cashew kernels Export

The exponential function was employed to arrive at arrive at the growth rates in quantity value and unit value of exports of cashew kernel in per-liberalized (1978-79 to 1990-91), post-liberalized (1991-92 to 2007-08) periods and overall period (1978-79 to 2007-08).

The compound growth rates in quantity, value and unit value of cashew kernels exports from India clearly indicated that there was a significant increases in pre and post liberalized periods as well as overall period for the said variables.

It could be seen from the table 5.7.4 that during pre –liberalization period, the quantity of export of cashew kernel recorded a compound growth rate of 2.89 per cent per annum. While the export value registering a growth rate of 12.13 per cent per annum. Likewise the unit value of cashew kernel exports has represented a compound growth rate of 8.9 per cent per anomy. The coefficients of value and unit value of cashew kernel exports were statistically significant at 1 per cent level of probability and that of quantity exported exported was significant at 5 per cent level of probability.

The exports of quantity of cashew kernel have increased at the rate of the 5.18 per cent per annum. The value of export of cashew kernel also increased at a compound

Table 5.7.4 a): Compound Growth Rates in Export of Indian Cashew Kernels

Description	Period – I (1978-79 to 1990-91)	Period – II (1991-92to2007-08)	Whole period (1978-79to2007-08)
Export Quantity (M.T.)			
Intercept	10.299	10.915	10.121
Slope	0.0285	0.0505	0.055
	(0.0103)*	(0.0070)**	(0.0035)**
R^2	0.435	0.837	0.916
CAGR (%)	**2.895**	**5.183**	**5.712**
Export Value (Rs. 000)			
Intercept	13.734	15.924	13.648
Slope	0.115	0.078	0.136
	(0.0130)**	(0.0157)**	(0.0065)**
R^2	0.885	0.713	0.949
CAGR (%)	**12.134**	**8.176**	**14.624**
Export Unit Value (Rs. /M.T.)			

Intercept	10.342	11.917	10.436
Slope	0.086	0.028	0.081
	(0.0131)**	(0.0126)*	(0.0058)**
R^2	0.812	0.329	0.894
CAGR (%)	**8.979**	**2.845**	**8.431**

Note: **and* significant at 1 and 5 per cent level respectively.

Figures in Parentheses indicate standard error

CAGR –Compound Annual Growth Rates

Growth rate of 8018 per annum. The export of unit value realized in terms of rupee registered a growth of 2.28 per annum. The coefficients of quantity and value were significant at 1 per cent and that of unit value of cashew kernel exports were statistical significant at 5 per cent level of probability during post liberalization period.

During overall period, the quantity of export of cashew kernel registered a growth of 5.71 per cent per annum. While the value of exports increased with annual average growth rate of 14.62 per cent per annum. The export unit value realized registering a compound growth rate of 8.43 per cent per annum The coefficients for quantity, value and unit value of cashew kernel exports were statistically significance at 1 per cent level of probability. The growth rates in export value of cashew kernel during overall period and pre-liberalized period are higher in post liberalized period were found to be higher those during post-liberalized period.

5.7.4 b) Growth rate in export of cashew nut shell liquid

The exponential growth function used for estimation of compound growth Rates in export of cashew nut shell liquid from India is presented in Table

The export quantity and value of cashew nut shell liquid registered a negative growth rate of-8.72 and -6.23 per cent annum, respectively. The export of unit value showed a positive growth rate of 2.73 per cent per annum during pre-liberalization period (1978-79 to 1990-91). The coefficient for quantity exported was significant at 5 per cent level, while coefficients of value and unit value of cashew nut shell liquid exports were statistically non-significant.

The quantity of cashew nut shell liquid export increased at a compound growth rate of 2.35 per cent per annum. The value of export of cashew nut shell liquid increased at a highest compound growth rate of 8.37 per cent per annum and growth was significant at 10 per cent level. The growth rate of export per unit value registered moderate growth of 5.88 per cent per annum during post-liberalization period. The coefficients for quantity and unit value of cashew nut shell liquid exports were statistically non-significant.

Table 5.7.4 c): Compound growth rates in export of Indian cashew nut shell liquid

Description	Period-1 (1978-79 to 1990-91)	Period-2 (1991-92 to 2007-08)	Whole period (1978-79 to 2007-08)
Export Quantity (M.T.)			
Intercept	9.1233	7.6634	8.7591
Slope	-0.0913	0.0232	-0.0435

	(0.0384)*	(0.0645)^{NS}	(0.0174)*
R^2	0.3613	0.0128	0.2130
CAGR(%)	-8.72	2.35	-4.26
Export Value (Rs.000)			
Intercept	10.7940	9.8836	10.2352
Slope	-0.0644	0.0804	0.0123
	(0.0643)^{NS}	(0.0400)***	(0.0181)^{NS}
R^2	0.0911	0.2868	0.09197
CAGR(%)	-6.23	8.37	1.24
Export Unit Value (Rs,./M.T.)			
Intercept	8.5785	9.1279	8.3839
Slope	0.0269	0.0571	0.0558
	(0.0335)^{NS}	(0.0338)^{NS}	(0.0106)**
R^2	0.0606	0.2217	0.5447
CAGR(%)	2.73	5.88	5.74

For the overall period, the export quantity of cashew nut shell liquid registered a negative growth of rate of -4.26 per cent, while value of export increased at the growth rate of 1.24 per cent per annum. However, they were statistically non-significant. The export of 5.74 per cent per annum. The coefficients for quantity and unit value of cashew nut shell liquid exports statistically significant at 5 and 1 per cent level of probability, respectively.

5.7.4 d) Growth rate in imports of raw cashew nut

The exponential growth function was used for estimation of growth in import of raw cashew nut into India is depicted in Table 4.3 indicates that quantity imported and value of imports have increased at a positive and significant growth rate of 19.13 and 31.26 per cent per annum, respectively, while unit value of imports per metric ton have accelerated at a positive compound growth rate of 10.18 per cent per annum during pre-liberalization period. The coefficients for value and unit value of raw cashew import realized were statistically significant at one per cent.

During post-liberation period, the quantity of import of raw cashew nut showed a positive and significant growth of 8.81 per cent per annum. The value of import of raw cashew nut decreased at the rate of -11.12 per cent per annum and statistically significant at 5 per cant level. The growth rate of import per unit value realized register at a highest negative compound growth rate of -18.41 per cent per annum. The coefficients for quantity and unit value of raw cashew nut imports were statistically significant at one per cent probability level.

The quantity of imports of raw cashew nut had registered a growth rate of 17.69 per cent per annum. The value imports decelerated at a negative and significant growth of -4.46 per cent per annum for the entire study period.

Table 5.7.4 d): Compound growth rates in imports of raw cashew nut

Description	Period-I (1978-79to1990-91)	Period-II (1991-92 to2007-08)	Whole Period (1978-79 to 200 08)
Import Quantity (M:T.)			

Intercept	8.88773	11.8069	9.04972
Slope	0.1750 (0.0741)*	0.0844 (0.0112)**	0.1629 (0.01743)**
R^2	0.36	0.85	0.79
CAGR (%)	**19.13**	**8.81**	**17.69**
Import Value (Rs.000)			
Intercept	10.4771	15.0832	11.7699
Slope	0.2719 (0.06823)**	-0.1189 (0.05752)*	0.1173 (0.0288)**
R^2	0.61	0.29	0.41
CAGR (%)	**31.26**	**-11.21**	**12.44**
Import Unit Value (Rs./ M.T.)			
Intercept	8.49718	10.1840	9.6280
Slope	0.0969 (0.01939)**	-0.2034 (0.054256)**	-0.0457 (0.02051)*
R^2	0.71	0.58	0.61
CAGR (%)	**10.18**	**-18.41**	**-4.46**

Note: ** and * significant at 1 and 5 percent level respectively.

Figures in parentheses indicate standard error

CAGR – Compound Annual Growth Rates

Table 5.7.5: Coppock's instability index for export of cashew kernel and Cashew nut shell liquid from India.

(Values in Percentage)

Sr. No	Commodities	Export Quality			Export Value			Unit Value		
		Pre li Perio	Post li Period	Overa Period	Pre li Perio	Post lit Period	Overa Period	Pre li Perio	Post li Period	Overa Period
1.	Cashew kernel	24.24	40.03	34.89	49.04	56.16	52.46	28.01	33.71	29.88
2.	Cashew nut sh Liquid	24.77	21.88	06.39	35.22	31.93	15.57	16.84	16.30	16.47

Pre lib. Period - Pre liberalization Period (1978-79 to 1990-91)

Post lib.Period – Post liberalization Period (1991-92 to 2007-08)

Overall Period – (1978-79 to 2007-08)

Table 5.7.6: Instability in export

India is major producer and exporter of cashew kernel and cashew nut shell liquid and earned more foreign exchange through export of cashew kernel and Cashew nut shell liquid. There was a fluctuation in quantity and value of cashew kernel and cashew nut shell liquid exported, and unit value realized through out of the study.

The export performance of a country for any commodity during any given period is measured not only from the point of view of increase in quantity exported, value and unit value but also on extent of fluctuations tacking place in the above aspects.

Hence the Coppock's instability index was constructed to understand the behavior of cashew kernel and cashew nut shell liquid

Table 5.7.5 Coppocks's instability index for export of cashew Kernal and Cashewnut shell liquid from India

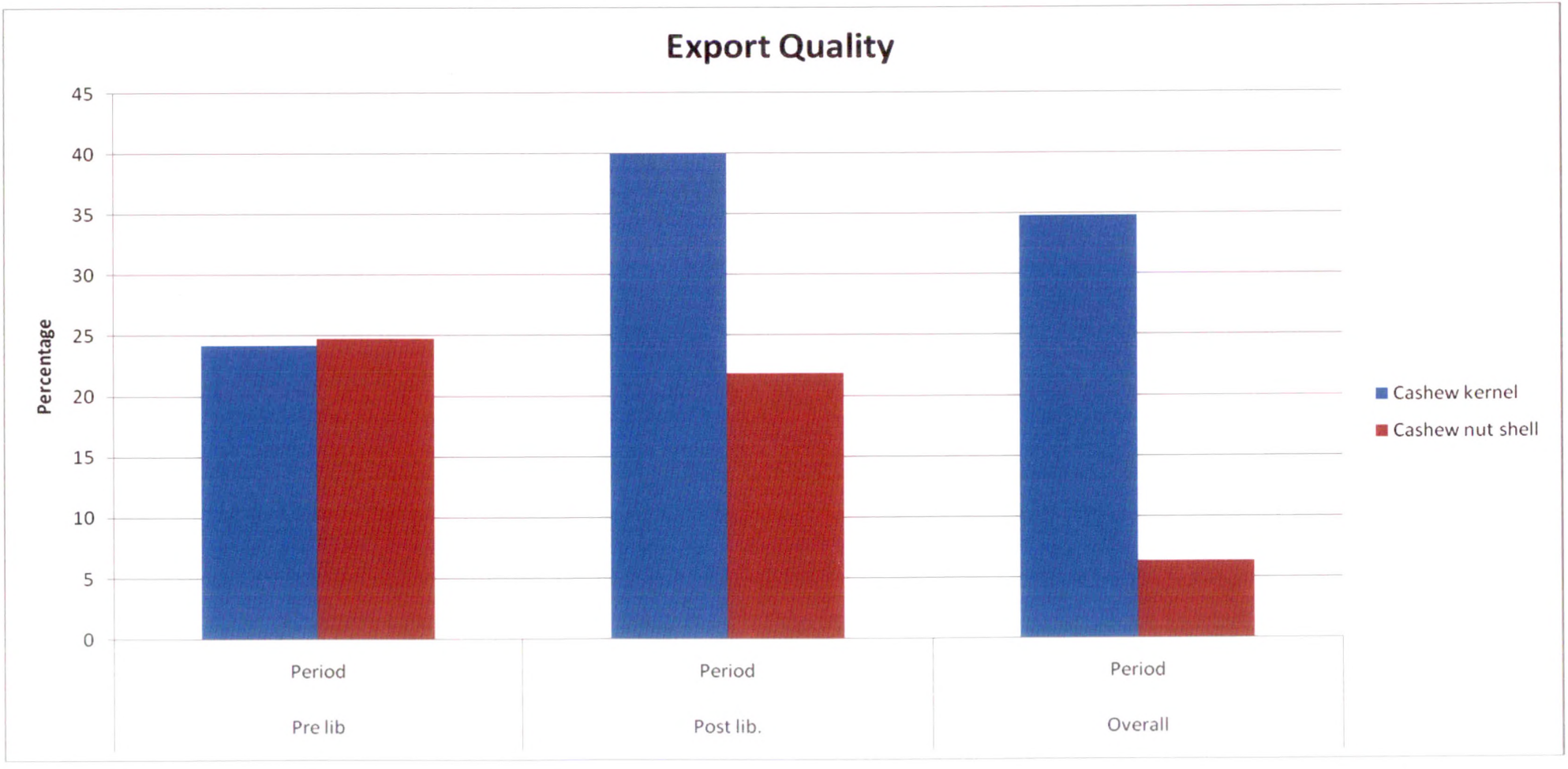


Table 5.7.5 Export Value

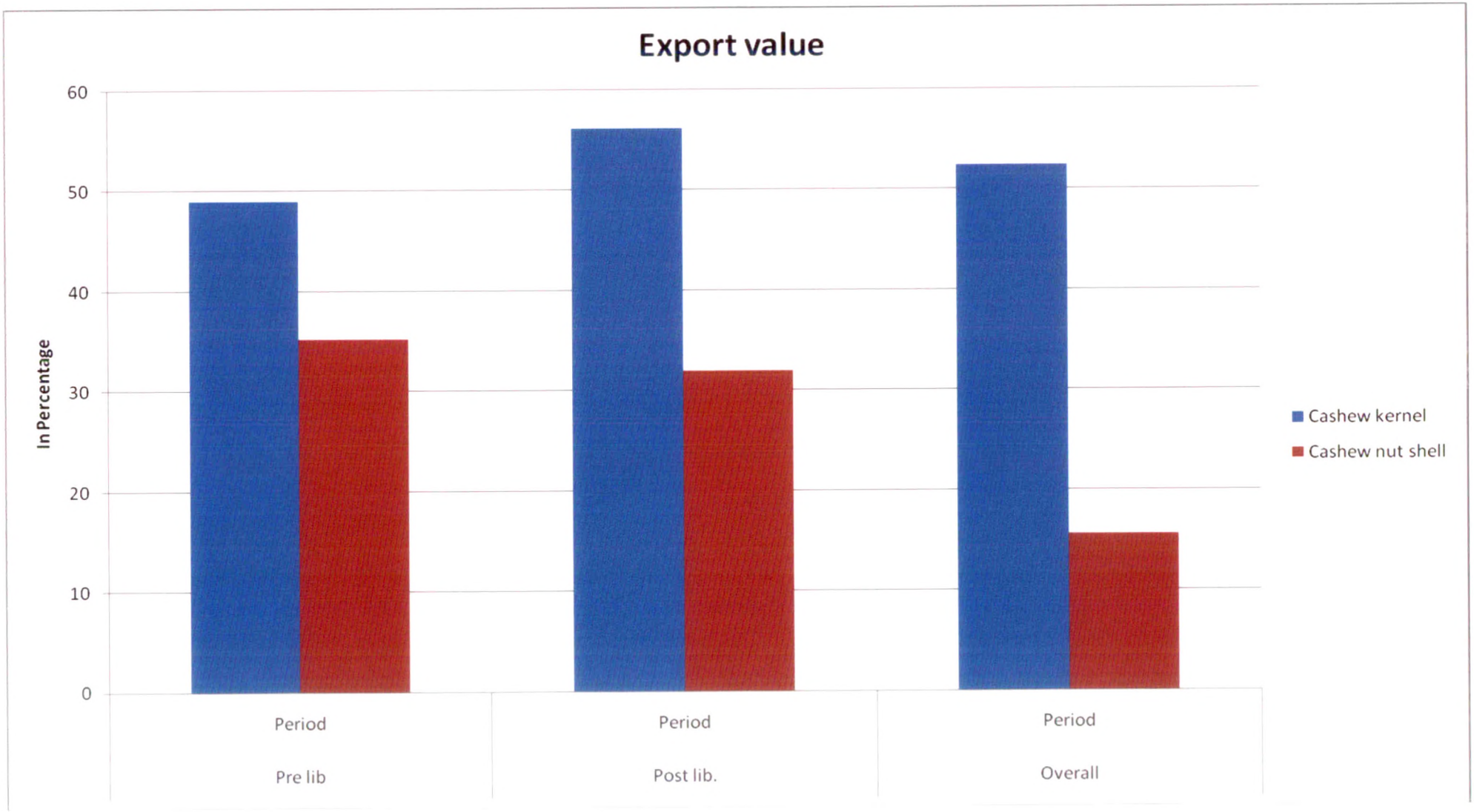
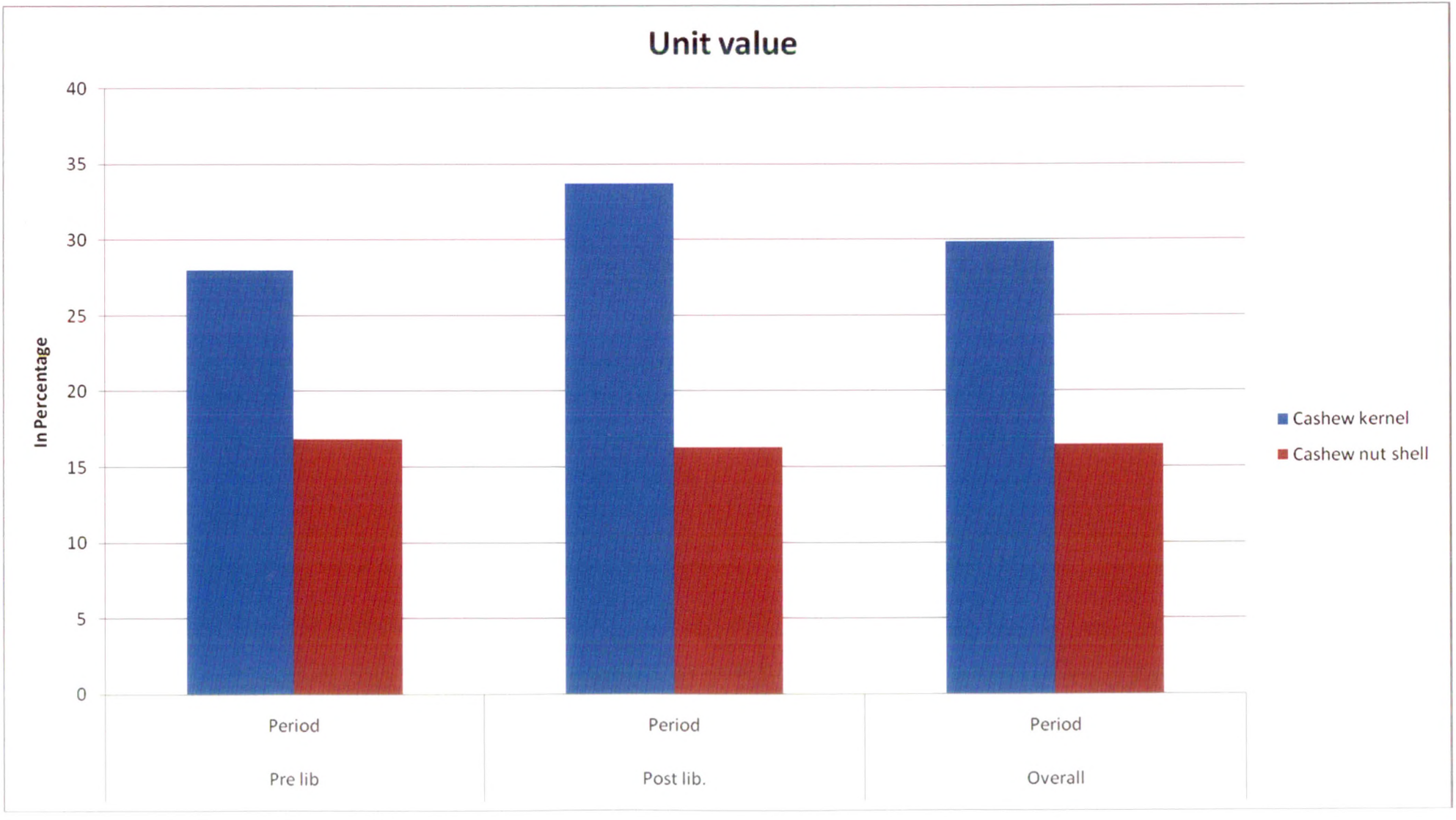


Table 5.7.5 Unit Value



exports during pre liberalization period (1978-79 to 1990-91) and post liberalization period (1991-92 to 2007-08). The instability indices were constructed for export quality, value of export and unit value of cashew kernel and cashew nut shell liquid and the results are presented in table 4.4.

Cashew Kernel

It could be seen from the table 4.4 that for cashew kernel, instability indices for export quality, export value were 24.24 percent, 49.04 percent and 28.01 percent, respectively during pre liberalization period These were high during post liberalization period i.e. were 40.13 percent 56.16 percent and 33.71 percent for export quality, export value and unit value. This showed that cashew kernel trade in terms of quality and unit value was stable in pre liberalization period compared to post liberalization period where as export value was not stable in both the periods.

Cashew nut shell liquid

The instability indices for cashew nut shell liquid showed that there was a stable situation for India during post liberalization period as compared to pre liberalization period in quantity exported and value of export. The instability index for export of quantity was very stable (21.88 percent) during post liberalization period as

5.7.7 Integration between domestic and international prices of Cashew Co integration for cashew kernel prices

To estimate the long run equilibrium disturbances that stem form the perception of non stationary of macro economic time series data defined in terms of time variant mean and variance, Co integration technique was used. Non stationary variables derived form "stochastic trends" which include seasonal components, are called integrated variables. Two integrated variables can be co integrated when they converge in the long run despite short period divergences. This notation

of the long run convergence was verified between domestic and international prices for both cashew kernel and cashew nut shell liquid considering monthly prices for the period sixteen years using Co integration methodology. This exercise was carried out in two stages. The first stage involves the verification of stationary of the price series. The monthly average international and domestic price series of cashew kernel were verified for stationery in terms of Augmented Dickey Fuller (ADF) unit root test. The international and domestic price series of both cashew kernel and cashew nut shell liquid was found to be stationary at the first difference, implies order of integration is one.

It indicated that the critical value for ADF value was found to be -5.5775 and -4.8789 for price series of cashew kernel domestic and cashew kernel international respectively. After testing the hypothesis that domestic and international price series are co integrated at 10 per cent level is greater -2.57 (ACV) compared to ADF.

5.7.8 Co integration for cashew nut shell liquid

The co integration analysis was carried out for working out ADF and ACV values for cashew nut shell liquid both domestic and international prices. The critical values were found to be -4.4634 and -4.2399 respectively for cashew nut shell liquid domestic and cashew nut shell liquid international prices. The ADF values are found to be less than ACV as revealed from the study for both domestic and international prices of cashew nut shell liquid.

Summary

The cashew (Anacardium occidentale Linn.)which belong to the family Anacardiaceae, is an economically important tropical tree crop. It ranks second only to Almond, among the nine tree nuts of importance in the world trade. A native of Brazil, where it flourished as a wild growth

in the jungles cashew was brought to east Africa an Indian by the early Portuguese settlers more than 400 years ago. In India it soon established itself all along the west coast and later in the east coast. For several centuries cashew was merely regarded as a sturdy perennial tree yielding good soft wood and producing a rather delicious juicy apple. Nuts were thrown as its hard shell contained corrosive liquid. India is the largest producer of raw cashew nut in the world and accounts for 43 per cent of world production. As years rolled the interest in the nut slowly developed and extraction of kernel was discovered. More and more people world over have been consuming unique nut, making the cashew an economics product.

Cashew nut processing on commercial basis was initially started in Mangalore, in Karnataka. in 1927 the business started in quilon of Kerala, later it became the center of trade-in India during 1999 there were 1132 cashew processing units spread over several states employing 3.5 lakh workers. Cashew kernel is the main product, and shell and testa (husk) are the by-products of cashew nut. This unit provides employment to more than 5 lakh workers, 95 per cent of them are labours. The Indian cashew unit had export 0.93 lakh MT of cashew kernels. Export of cashew kernels and cashew nut shell liquid has earned 2453 corers to the Indian exchequer in 1999.2000.

India is largest producer, processor, exporter and second largest consumer of cashew kernel and due to the hugs demand that exists for its products, both in domestic and export market. Ineffective management along with scarcity of cashew nut has led to the failure or poor performance of many cashew industries. Hence the present study is aimed at identifying, recent information both on export and processing and to evolve appropriate policies for improving efficiency in working in working of the cashew processing industries.

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CHPTER – VI

FINDINGS CONCLUSION AND SUGESTIONS

CHAPTER VI

FINDINGS CONCLUSION AND SUGGESTIONS

FINDINGS

Agriculture exports have been remained as backbone of India's export & continued to be the bacon for future export growth. Agriculture exports potential is quite high in India. Agriculture exports are contributing around 18.18 percent to India's total export earning & also play a significant role in employment generation, particularly in the rural sector. In India, after achieving self-sufficiency in food grain production & globalization of agricultural trade, production of export oriented crops is given priority. Presently India is exporting about 7500 commodities to 190 countries & importing almost 6000 commodities from 140 countries of the world. India is determined to raise its trade share in world trade to one percent. The total value of world trade exports is expected to be around US $ 75 trillion in 2007. for India to achieve one percent share it requires a total export figure of US $ 75 billions from the current levels of US $ 34.8 billion.

There is an imperative need India to enlarge its share of world trade, which has been gathering increasing momentum through the cascading effect of trade reforms & paid integration of the world economy. With changing consumption pattern & rise in income levels, the demand for cashew is being increased in domestic as well as export market.

Over the years, the share of India's agro exports in total exports declined from 43.34 percent in 1960-1961 to 30.60 percent by 1980-1981 & it further declined to 12.36 percent by 200607. This is mainly attributed to the absence of diversification & lack of concerted efforts to tap the international markets. The New Agricultural Policy, Emphasize

diversification of agriculture & promotion of farm exports. In this context, the production & export potential of plantation crops, especially cashew needs to be highly emphasized.

A plantation crop assumes importance in foreign exchange earnings from exportable items. More than 30 percent of the agriculture land is under various horticultural & plantation crops. Ample scope still exists to widen the plantation crop enterprises in India, contributing more than 50 percent of the total foreign exchange. In the wake of WTO, the country has to concentrate more on quality exportable products due to sanitary & phyto-sanitory measures. The export potential of a country also depends upon the comparative advantage it possesses. India being an agrarian economy has earned a foreign exchange of Rs.8,605.01 crores in 1999-2000from the export of major plantation crops & cashew gets a lion's share in the foreign exchange earning basket & cashew ranks first (28.51%) in export earnings of total major plantation crops during the period 1999-2000, which was decrease to 25.09 percent in 2004-2005.

Indian productivity in plantation sector (2,865 kg/ha) is better than the world average. In 2003, the total area harvested under plantation crops in India was 4.3 million hectares, producing 12 million tones of this, cashew nut (7.8 lakh) ha accounts for 18.14 percent the total plantation area.

Present Status of Cashew:

Cashew nut occupies a prime place in the Indian economy, accounting for 16.95 percent of the total area under plantation crops, which stood second position after coconut & production of cashew nut accounts to q8.14 percent of total production of selected plantation crops in India during 2007-2008.

Area under cashew nut accounts for 5.20 percent of the total horticultural crop area & production of cashew nut accounts to 0.38 percent horticultural crop production in India. Area under major horticultural crops is 17.30 million ha of land in 2006-07, occupying 8.5 percent of the gross cropped area of the country, with production of 156.2 million tones in 2006-07; the cashew sector contributed 30 percent of gross domestic product from India. This sectors targeted growth rate during the tenth plan is 6 to 7 percent.

Cashew nut has gained impetus in the post liberalization period. The export earning from cashew increased from Rs.749.30 crores in 1992-93 to Rs.1811.45 crores in 2006-07. The export of cashew from Karnataka has decreased from Rs.251.55 crores in 1999-2000 to Rs.163.54 crores in 2007-08.

In Karnataka the percentage share of cashew nut crop in total cropped area has increased from 0.3 in 1973-76 to 0.8 in 2004-05. Whereas in India, the percentage share of cashew nut in total cropped area has increased from 0.20 in 1973-76 to 0.40 in 2007 (Agricultural, CMIE, GOK, February 2008). India's share in world export of horticulture products was hardly less than two percent. In the wake of WTO regime, the country has to concentrate more on good quality exportable products. The exports potentials of a country depends upon the comparative advantage it possesses. India is still an agrarian economy & has gained a foreign exchange of Rs.8605.01 crores in 2007-08 against Rs.7098.07 crores in 2004-05 from the exports of major plantation crops including tea, coffee, cashew nut, cardamom, spices, rubber, tobacco & coconut of which cashew gets a lion's share in the foreign exchange earning basket.

Economic Use & Importance of Cashew:

Raw nut, cashew kernels & cashew nut shell liquid (CNSL) are the three main cashew products while the fourth product, the cashew apple is generally processed & consumed locally. The skin of the nut contains high tannin, which can be recovered & used in the tanning of hides.

Cashew kernel is known for its delicious, pleasant taste & for balanced nutritive profile. 100 gms. of cashew kernels of contributes about 600 calories. The nutritive values present in cashew kernels are protein, fats, and carbohydrates & have all the fat soluble vitamins (A, D, E & K). It is also a source of minerals like calcium magnesium, phosphorous, potassium, sodium, iron & other minerals, which help to prevent anemic & nervous ailments, cashew is a perfect food with zero percent cholesterol. Worldwide it is considered as a item. Its importance as a food is gaining importance. At present the dry leaves are used as natural manure for the few other crops. The dead branches & twigs are regularly collected for firewood. The fat & protein content are 42.2 & 20.8 percent, respectively. It is consumed as either raw or roasted as it is rich in nutrients & also crisp & tasty. A kernel particle is also used as an excellent poultry food. The consumption of kernels does not lead to obesity & diabetic patients can also take without any problem.

The kernel contains 40% oil, which resembles almonds, & it is used in the treatment of leprosy, warts, worms & ulcers. It can also be substituted for iodine. Cashew nut oil can be used in creams, massage oils for skins & lip balms. The byproducts like cashew nut shell liquid contains 35% of a viscous liquid called CNSL which is a valuable raw material used in a number of polymer based units/ industries for preparation of oil paints, varnishes, water proofing agents, adhesive ingredients, pigments of gums, indelible inks, cardboard finishing

reagents, typewriter rolls, automobile break lining & lubricants in air planes. Wood is used in building, boats & ferries, fixing poles, false ceiling etc. Cashew test contains 40% tannin, which is used in large quantity as an auxiliary material for the manufacture of commercial tannin extract unit. The cashew apple is used in preparing fruit juice, syrup, candy, jam, jelly, chutney & pickles of different recipes & also alcoholic drink. Cashew wine is prepared from cashew apple in many countries throughout Asia & Latin America & India particularly in Goa, popularly known as fenni. The cashew kernels supply about 6000 calories of energy per kg as against 3600 by cereals, 1800 by meat & 650 by fresh fruits. The cashew apple is very rich in vitamin C (262 mg/ 100 ml of juice) & contains 5 times more vitamin C than an orange. A glass of cashew apply meets an adult individual's daily vitamin C (30 mg) requirement. Cashew also plays prominent role in the medicinal industries as a curative of disorders in the human beings such as scurvy, stomachache, diarrhea & cholera etc.

World Scenario:

Cashew is indigenous to South & Central America & was discovered by Portuguese missionaries in the 15th century. There is a growing market for cashew in Europe & USA, with new market opening up in the other parts of the world, for example, Russia & Japan. On the other hand, Vietnam is currently increasing their supply of cashew nuts for the international market.

Total area under cashew in the world is 30.54 lakh hectares with production of 20.34 lakh tones in 2005-06. at percent, Vietnam is the single largest producer (28%) in the world production, followed by India (25%), Nigeria (10%), Brazil (8%), Tanzania (6%), Indonesia (4%), (Samyukta Karnataka, 2007). Cashew area and production in Asia during

2005 accounts for about 33.40 percent & 40.98 percent of global area & production respectively. Cashew production takes place mainly in the Central & South American Zone, Asia, Oceanic, & African Zone. There are 28 countries now involved in the production of cashew.

The major producers of raw cashew nuts in Asiatic Zone are India (4.5 lakh tones) & Vietnam (1.4 lakh tones). The total area under raw production is around 1.8 million tones from an area of 4.00 million hectares. The productive area is likely to be around 3.6 million hectare. The average global productivity is only around 500 kg per hectare.

The Asiatic & African Zones together produce 1.256 million tones of raw nuts (68%) of the global production, of which 0.338 million tones (27%) take part in kernel, 0.246 million tones takes part in raw trade & the remaining 0.72 million tones (53%) goes for local consumption. The unprocessed raw nuts export amounts to 0.246 million tones mainly from India.

The cashew industry is an important foreign exchange earner for many African countries & also a major source of jobs & income earner in rural communities. In Mozambique alone, cashew growing & harvesting is a primary source of income for estimated 9.4 lakh poor small scale farming families. Among the African countries, Tanzania is the world's second largest producer of raw cashew nut. The other major exporters from Asia are Indonesia & China. The major consuming countries of cashew kernels in the world are USA accounting for about 31.25 percent of the world cashew consumption followed by EU (22.73%), India (19.89%), China (10.23%) & Japan (2.84%) during 2004-05.

Indian Scenario:

India is the largest processor, consumer & exporter in the world, accounting for about 26.40 percent & 46.09 percent of the world output

& export respectively during 2006-07. It is an important plantation crop in wasteland development programmed due to its utility in soil & water conservation & to buildup of balanced ecosystem. In India nearly 40 lakh tones of cashew apples is being available, but major portion is being wasted. About 50,000 tones of 'fenni' is prepared from 72,500 tones of cashew apple in Goa. Apart from the economic significance, cashew industry has the potential leading role in the social & financial upliftment of the rural poor. Cashew is generally described as 'poor man's crop & rich man's food.' The total consumption of cashew kernels is 2.10 lakh MT, of which India consumes almost one third & remaining two third is shared by the kernel importing countries of this, the United States alone accounts for 42 Percent. Cashew earns valuable foreign exchange of Rs.1811.45 crores in 2006-07. Among the agricultural commodities exported from India, cashew held the third position by contributing 0.58 percent of the total export earning of the country during 2006-07. Cashew kernels are exported to more than 60 countries & India is the world's largest converter of raw cashew nuts into cashew kernels, which was being imported from over 25 countries. It stood third in position amongst the agricultural commodities imported into India after cereals & pulses & accounts for 9 percent of the total agricultural imports during 2007-08. Foreign exchange earned by country through export of cashew kernels was Rs.2709.24 crores (2006-07), while cashew nut shell liquid was Rs.7.03 crores during 2003-04. In addition to this about Rs1.53 crores worth of foreign exchange was also earned by export of salted & roasted cashew. The industry providing gainful employment opportunities to more than 5 lakh peoples engaged both at the farm & factory level.

India is the largest producer of raw cashew nut in the world as well as in Asia accounting 26.40 percent of world cashew production in 2006 & its share in the world production ranges from 37.75 to 34.00 percent

during 1997 to 2001 & nearly 44.92 percent of the worlds of the export of cashew kernels in 2006-07.

Indian cashew is known for its quality, appearance & taste in the international market. It adds taste to ice creams, sweets, chocolates, dishes & people enjoy it more when eat plain & roasted cashew. It is also rich in minerals & vitamins, which are essential for human health.

The Indian cashew industry is almost export oriented. It provides employment to more than 5 lakh people both directly & indirectly particularly in the rural areas & it thus plays a very role vital role in the economy. Today nuts constitute an important part of diet in several countries of the world. In Indian cashew processing factories over 95 percent of the workers are women.

Today, the major cashew producing States in India are Kerala, Karnataka, Tamil Nadu, Andhra Pradesh, Goa, Maharashtra & Orissa. India produced 5.35 lakh tones of cashew nut from an area of 7.80 lakh hectares (2005-06). The average yield in India is around 1.5 kg nuts per tree. The productivity is below national average (800 kg/ha) in many states such as Karnataka, Andhra Pradesh, Tamil Nadu & West Bengal. Maharashtra had the highest cashew nut acreage (1,48,000 hectares) & also ranks first in production, with 1,20,000 MT in 2005-06. Andhra Pradesh accounted for 17.44 percent of the area & 18.00 percent of the production. Orissa ranked third with respect to area & ranked fourth with respect to production of raw cashew nut in 2005-06. The output of raw cashew nut in Kerala during 2005-06 was 95,000 MT. Maharashtra & Kerala state had the higher yield levels compared to other states. The processing & exporting activities are largely concentrated in Kerala followed by Tamil Nadu & Karnataka.

Indian cashew is consumed across the world by as many as 60 countries, the major markets being the United State (48.85), the Netherlands (11.92), UAE (5.68), Japan (5.62), United Kingdom (5.30), France (2.42), Saudi Arabia (1.83) & Canada (1.26) during 2007.

India does not produce sufficient quantities of raw cashew required for export demand & has to resort to import to the tune of 250 lakh tones of raw cashew nut estimated for both the periods showed that China was the only stable imported of Indian Cotton with retention probability values of 0.0832 & 0.3155 during pre & post reforms periods, respectively. The other traditional importing countries such as Bangladesh, Germany, Indonesia, UK, Japan & Korea had recorded low retention probabilities in both the periods.

In this study Markov Chain analysis was used to estimate the transition probability matrix which explains the retention power of each country & export share distribution among the countries. Data used was quantity of cashew kernel & cashew nut shell liquid exported to major countries for the period 1995-08 of imports recorded a positive growth rate of 12.44 per cent per annum. The coefficients for quantity and value of imports were statistically significant at one per cent.

SUMMARY AND POLICY IMPLICATIONS

An agricultural export has been remained as backbone of India's export basket and continues to be the bacon for future export growth. Agricultural exports are contributing around 18.18 per cent to India's total export earnings (2007-08) and also play a significant role in employment generation, particularly in the rural sector. The new agricultural policy, therefore, emphasizes diversification of agricultural and promotion of farm exports. In this context, the production and export potential of plantation crops, especially cashew needs to be highly

emphasized. Among the export-oriented crops, cashew is one of the major export earning crops and continues to hole a significant potential share in the export basket of the country.

Indian productivity in plantation sector (2,865 kg/ha.) is better than the world average. In 2007, the total area harvested under plantation crops in India was 4.3 million hectares, producing 12 million tonnes. Of this, cashew accounts for 18.14 per cent of the total plantation crops area.

Area under cashew nut accounts for 5.20 per cent of the total horticultural crop area and production of cashew nut accounts for 0.4 per cent of major horticultural crop production in India (2007-08)

Cashew nut occupies a prime place in the Indian economy, accounting for 16.95 per cent of the total area under plantation crops, which attained second position after coconut, and production of cashew nut accounts to 16.57 per cent of total production of selected plantation crops during 2007. Cashew nut has gained impetus in the post-liberalization period. The export earnings from cashew increased from Rs. 749.30 crores in 1992-93 to Rs. 1811.45 crores in 2007. The export of cashew from Karnataka decreased from Rs. 251.55 crores in 1999-2000 to Rs. 163.54 crores in 2007. As a plantation crop, cashew ranks first (31.08%) in export earnings during the period 1999-2000 against 21.36 per cent in 1987-88.

India is the largest producer, processor, consumer and exporter of cashew in the World, accounting for about 26.40 per cent and 46.09 per cent of the world output and export respectively during 2007-08.cashew kernels obtained from raw cashew nuts are exported to more than 60 countries and India is the world's largest converter of raw cashew nuts into cashew kernel which imported from over 25 countries. It stood third in position among the agricultural commodities imported into India after

cereals and pulses which accounts for 9 per of total agricultural imports during 2007-08.

The Indian cashew industry is almost export oriented. It provides employment to more than 5 lakh people both directly and indirectly, particularly in rural areas and it thus plays a very vital role in the economy. Today nuts constitute an important part of diet in several countries of the world. In cashew processing factories, over 95 per cent of the workers are women.

India produced 5.35 lakh tones of cashew nut from an area of 7.80 lakh hectares (2007-2008).The average yield in India is around 1.5 kg nuts per tree. The productivity is below national average (800kg/ha) in many states such as Karnataka, Andhra Pradesh, Tamil Nadu and West Bengal. Maharashtra had the highest cashew nut acreage (1,48,000ha)and ranks first in production, with 1,20,000 metric tones. Andhra Pradesh accounted for 17.44 per cent of area and 18.00 per cent of production, orissa ranked third with respect to area and ranked fourth with respect to production of raw cashew nut in 2003.04.The output of raw cashew nut in Kerala in 2007.2008 was 95,000 metric tones. Maharashtra and Kerala State had the higher yield level compared to other state. The processing and exporting activities are largely concentrated in Kerala Followed by Tamil Nadu and Karnataka.

Although India is the global leader in the production and export of cashew, but now, we are not in a produce a required and quantum of raw cashew nut to meet the installed capacity of domestic processing units in country. This was mainly due to the fact of low productivity compared to other producing countries and this crop is susceptible to pests and diseases. Further, this crop is mainly cultivated on senile/marginal soil and it is also neglected crop unlike other plantation crop such as tea,

rubber etc and lack of domestic production policies in the major cashew growing states in India. On the marketing side, this crop is subjected to wide price fluctuation in the domestic as well as in international market. India held a virtual monopoly position in the production and export trade of cashew prior to eighties. However, since eighties India is losing its monopoly to other new entrants like Vietnam, Brazil and Tanzania. International market for cashew becomes increasingly competitive exerting threat to India's export prospects. Further, the export market is exposed to increased risk because of trade liberalization and complex and continuously changing market environment.

Therefore, it is imperative for us to study the market opportunities and to plan for appropriate export marketing strategy and policy so as to strengthen the export trade in cashew. Apart from this, in the world market, at present, we are facing stiff competition from Vietnam, Brazil and other tree nuts. Looking into the importance of this crop for the Indian economy and their problems is export front; the present study was undertaken with the following specific objectives.

1. To measure the growth and instability in the export of cashew during pre and post liberalization period.

2. To analyze the femoral variation in price and forecast export prices of cashew.

3. To analyze the export competitiveness and the direction of trade of cashew.

4. To study the movement of domestic and international prices of cashew.

Methodology

The area under consideration for analyzing of various compositions of cashew, whole of India was taken into consideration at aggregate level so as to facilitate data compilation and prices in the international market. In view of cashew emerging as an important plantation crop and its increased utilization in the industrial application, is traded both in domestic and also in the international market. The market for cashew kernel and cashew nut shell liquid (CNSL) has become more speculative and hence cashew is purposively selected for the study about the export competitiveness and direction of trade for Indian cashew. Cashew kernels and Cashew Nut Shell Liquid (Exportable product) have been selected for the study.

The nature of data used for the study is entirely based on secondary source of data. The data on export quantity, value and unit value were compiled from various published journals, periodicals and website for the period of 20 years (1978-79 to 2007-08). The secondary data will be collected in spot prices, and volume of trade in exchange will be collected from official web site of Forward Market Commission (FMC), Mumbai and respective web sites of the National Level Commodity Exchanges in India. (NCDEX, MCX), APEDA, other publications and official reports of the GOI, GOK, etc.

In the present investigation, Growth and Instability Analysis, Markov Chain Analysis, NPC, ARIMA model and Co-integration analytical tools were used.

Finding of the study

1. The growth of cashew kernel export between pre and post liberalization and overall periods in terms of quantity, value and unit value shows the increasing trend, but highest growth was observed in

pre-liberalization (12%) as well as overall periods (14.60%) in terms of value. This was mainly due to increase in unit value realization.

2. The growth in export of CNSL in pre-liberalization period both in terms of quantity and value showed declining trend. This was attributed to declining in the prices of CNSL in the world market during 1980-1990. The growth rates in export quantity of CNSL were statistically significant during period I and overall period.

3. The import growth of rates of raw cashew in pre-liberalization period in terms of quantity, value and unit value shows increasing and positively significant as compared to post-liberalization and overall periods. This was attributed to increase in the unit prices of imported raw nuts as well as increase in imports of raw nuts. The value of imports of raw nuts has been declining at the rate of -11.21% and -18.41% in terms of value and unit value respectively, but in quantity terms increasing at the rate of 8.81% per annum during post-liberalization period. The main reason attributed to the declining trend of raw cahsewnut imports was that Mozambique, Tanzania, Vietnam and Kenya, the major sources of raw nut suppliers have taken up large scale mechanized processing of raw nuts during post-liberalization period. They were less content to export raw nuts to India because they lacked the large Labour force required to do the processing manually.

4. Both Ex-ante and Ex-post forecast were done and it was compared with actual values of observation. The forecast was done up to Dec.2010

5. There were narrow variation between actual and forecast prices of both cashew kernel and cashew nut shell liquid. Forecast values of

both cashew kernel and cashew nut shell; liquid prices showed an increasing trend.

6. USA Australia and Netherlands were found to be highly loyal markets for Indian cashew kernel as indicated by the retention of their previous share of cashew kernel export from India by more than 70,50 and 30 per cents, respectively. In case of cashew nut shell liquid. USA, Japan and Korea Rep. were found to be most loyal markets.

7. The export earnings will be expected to increase to Rs.3866.97 crores in 2008 and Rs.7651.63 crores in 2015.The export projection using the Markova chain model put the revenue from cashew kernel exports at a modest level of Rs.1804.4. crores by 2008.

8. The nominal protection coefficient was less than unity (0.98)indicating that cashew kernels was competitive for its export to other countries India, while NPC of raw cashew nut imports by India from abroad (east and west African countries)was also less than unity (0.88) reveals that raw cashew nut was a efficient import substitute.

9. The co-integration test integrated by the higher value of ADF. It is observed that the cashew has become a highly price sensitive crop due to high fluctuation in demand & supply. The study reveals strong integration between domestic and international prices.

Policy Implication

1. The results of the study on the compound growth rates during rates during the study periods have shown positives and significant values indicating vast potential for the export of cashew from India. The growth in the imports of cashew also indicate similar phenomenon. This shows that India as still vast potential for export of processed cashew kernels. Hence there is need to evolve policies directing higher yield level of raw cashew through development of quality and

high yielding cashew resulting from improved varieties and production methods.

2. The result indicating a narrow difference in the export prices and forecast prices for cashew indicating advantage on the part of the cashew trade. However through development of good market intelligence and information the margins of differences could still be narrowed.

3. The study of competitiveness indicating NPC less than 1 show that Indian cashew export are more competitive and have edge over cashew export from other countries .There is need to develop and implement policies directing cashew industry in encouraging higher production to take advantage of the situation.

4. The direction of trade reveals that India has an edge export cashew kernels to USA, Australia, Netherlands, Japan, and UK. Hence the good policies need to be directed towards meeting the specification and quality of cashew kernels of between these countries through cordial relation and good terms of trade.

5. The co integration analysis reveals that the prices in the domestic market are integrated with international prices thus indicating healthy terms of trade in the cashew industry. However it still needs to provide incentives and subsidies for the better growth of industry to provide scope for higher quality and quantity production of cashew in the domestic too.

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APPENDIX – I

QESHTIONNAIRE

APPENDIX: I

Questionnaire for Fruit Processing Industry

(Cashew Process Industry)

1) Name of the factory_____

2) Village _____

3) Tahasil _____

4)Name of the Owner 1) _____

2) _____

5) Types of ownership (if more than owner) _____

(Sole trader/Partnership/Co-op./Other)

6) Year of formation _____

7) Capital Investment of factory.

Sr. No.	Item	Purchase Year	Purchase Price	Pre-value
1)	Land			
2)	Building			
3)	Machinery			
	a) Roasting			
	b) Shelling			
	c) Drying			

	d) Grading			
	e) Packing			
4)	Furniture			
5)	Vehicle			
6)	Phone			
7)	Other			

8) Working season

Month _____ Days_____

9) Details about processing charges (Rs.)

a) Handling Charges

b) Wages

c) Factory Salaries

d) Bonus

e) Fuel charges

f) Cost of Packing material

g) Lables and stepping

h) Packing

i) Transportation

j) Other

10) Raw material required during the season and month wise.

Material Quantity No. Value Rs.

Cashewnut

11) Details about labour employed

Sr. No.	Particulars	Permanent lab.		Casual lab.	
		Total hours	Wages Rs.	Total hours	Wages Rs.
1)	Male				
2)	Female				

12) Quantity processed during the season (Final product)

Grade	Quantity	Value Rs.	Shell		Skin	
			Qty.	Rs.	Qty.	Rs.

13) Details about local cashew nut purchased

Mont	Qty.	Rs.

14) Cost of Marketing.

Sr. No.	Cost item	In India	Outside India
1)	Packing		
2)	Loading and unloading		

3)	Transport		
4)	Sales Tax		
5)	Custom duty		
6)	Other		

15) By Product of cashew.

Items	**Qty.**	**Rs.**
1) Shells		
2) Fenny		
3) Syrup		
4) Other		

16) What problems do you face in processing?

About getting raw material _____

Marketing, transport, storage _____

Any other

17) What suggestions do you wish for improving processing of cashewnut in Ratnagiri district?

_____

_____

_____

_____

18) Government incentives and subsidy _____

_____

_____