MANAGEMENT OF AGRO-PROCESSING INDUSTRIES IN KARNATAKA - A CASE STUDY OF TUR DAL INDUSTRY

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CERTIFICATE

This is to certify that thesis entitled **"MANAGEMENT OF AGRO-PROCESSING INDUSTRIES IN KARNATAKA – A CASE STUDY OF TUR DAL INDUSTRY"** *submitted by* **Mr. MAHESH V. CHIDRI** *for the degree of* **MASTER OF AGRI-BUSINESS MANAGEMENT** *to the University of Agricultural Sciences, Dharwad, is a record of research work carried out by him during the period of his study in this university, under my guidance and supervision and the thesis has not previously formed the basis for the award of any Degree, Diploma, Associateship, Fellowship or other similar titles.*

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I INTRODUCTION

Pulses are commonly known as food legumes, which are secondary to cereals in production and consumption in India. Pulses are most valuable and naturally occurring sources of vegetable proteins, calories (energy), vitamins and minerals. Pulses restore soil fertility by fixing atmospheric nitrogen as green manuring crops, some pulses also have soil erosion resistant property and drought tolerant due to their deep root system. Because of these good characters pulses are called as 'Marvel of Nature'. Pulses provide proteinaceous grain and nutritious fodder. Grain husk can be used as feed concentrate for cattles. Pulses are the most important diet of vegetarians. Pulses play an important role in human and monogastric animal nutrition, since they are the richest source of proteins.

More than one third of the total area under pulses in the world is in India. India is the largest producer of pulses in the world with a share of 23 percent in the world's total production. Pulses are grown in both, the kharif and rabi seasons. While tur is the major kharif pulse, the principal rabi pulse is gram, other pulses like moong, urad, peas and beans are grown in both kharif and rabi seasons.

Tur(*Cajanus cajan* Linn.) also known as arhar or red gram or pigeon pea, which belongs to the family leguminaceae, is an economically important tropical and sub-tropical pulse crop. It is grown in a variety of soils ranging from the alluvial soils of the Indo-gangetic plains to the black soils. Tur accounts for 15

per cent of the area and 19 per cent of the total production of the pulses in the country. Tur is widely grown in Indian sub-continent, which accounts for 90 percent of world crop. The other regions where tur is grown are South East Asia, Africa and America. Substantial area is also found in Kenya, Uganda and Malawi in Eastern Africa.

The major tur growing states in India are Maharashtra, Uttar pradesh, Madhya pradesh, Gujrat, Karnataka, Orissa and Andhra pradesh. The tur cultivated area during 1997-98 in India was more than 35.6 lakh hectares with an annual production of 2.39 lakh MT of raw tur. Where in, Maharashtra occupies a maximum area of 10.47 lakh hectares under the crop with 0.636 lakh metric tonnes production which is followed by Uttar Pradesh with an area of 5.18 lakh hectares and 0.518 lakh MT production, Madhya pradesh with an area of 4.46 lakh hectare and 0.34 lakh MT production, Gujrat with an area of 3.90 lakh hectares and 0.30 lakh MT production, Karnataka with an area of 3.63 lakh hectares and 0.15 lakh MT production and Orissa with an area of 1.67 lakh hectares and 0.12 lakh MT production.

In India during 1996-97 there are about 10,000 processing units spread over in several states and nearly 90 percent of them are under small scale sector. Maharashtra possesess maximum number of tur processing units followed by Madhya pradesh, Uttar pradesh and Gujrat. In Karnataka, there were 160 tur processing units.

Tur is extensively used as dal (split seeds used for cooking in the Indian sub-continent). The dry seed is dehulled and the split cotyledons are cooked to make a thick soup primarily for mixing with rice. In Africa and Central America, the whole dry seeds without the seed coat are cooked alone or together with meat. The split dal can be stored for a longer period than the whole dry seeds. The by-products like bhusa is used as a cattle feed.

In Karnataka, it is largely grown in the northern parts of the state especially in Gulbarga, which is called as 'Red gram bowl of Karnataka'. Tur in Gulbaraga district occupies an area of 2,27,003 hectares during 1996-97 with a production of 1,22,706 tonnes. Tur constitutes an important crop in the agricultural economy of Gulbarga district occupying about 63 per cent of the total cropped area. In view of the dominance of the tur crop in the agricultural economy of the district, it is considered important to study the management of tur processing units in Gulbarga district. Although the production of tur in the country in general and Gulbarga district in particular has increased over the years, it is often reported that tur producers are not getting remunerative price for their produce, where as consumers have to pay very high price for the same. This is an indicative of ineffective management, which may be the result of inadequate marketing facilities for tur. For the success of an industry or firm, efficient management is a pre-requisite. The profit figure is one of the important index of managerial efficiency. Thus, a study on business performance of a processing units can provide an insight into the strength and weakness of the concerned processing units.

The agro processing sector has been rightly identified as thrust area under the new economic policy of the Government. However, sustained growth of this industry depends on the viability which is largely determined by the cost of production and management efficiency in processing.[1] The cost of production is one of the important variable influencing the profits which is also an indicator of management efficiency.

Owing to various problems, many tur-processing units have been closed down in India on one side, while on the other side many tur processing units are performing well. This difference in position clearly points out in effective management as one of the important reason among several other reasons. Management forms an important aspect of business, which calls for management appraisal of an industry. At present the information available on management aspect of tur processing unit is inadequate. In order to identify managerial lapses if any, and evolve appropriate managerial tools and techniques for improving efficiency in performance of tur processing units, this study was undertaken with the following specific objectives. It also attempts to compare different categories of tur processing units, to suggest for efficient and cost effective management of tur processing units in Gulbarga district.

Specific objectives of the study

1) To study the investment pattern in tur processing units.

2) To study the procurement management.

3) To evaluate the management of processing.

4) To study the cost and return structure in the production of tur dal.

5) To study the existing marketing management.

6) To study the problems faced by the tur processing units.

7) To suggest measures for effective functioning of tur processing units.

Limitations of the study

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

Presentation of the study

The entire study has been presented in six chapters. In the first chapter the nature and importance of present study and the specific objectives as well as limitation of the study have been indicated.

Chapter II, that follows, deals with the review of the relevant research studies connected with the objectives.

Chapter III outlines briefly the main features of the study area and study units, the nature and sources from which relevant data have been collected and the statistical tools and techniques employed in the study for evaluating the objectives.

Chapter IV, is devoted to the analysis of the data through a variety of tables into which relevant details have been compressed and summarized under appropriate heads and presented in tables.

Chapter V, provides the causal relationship between certain variables and the outcome which they produced.

In Chapter VI, the final chapter, a brief summary of the main findings of the study have been presented along with the policy implications that emerged from the findings of the study.

Review of Literature

II REVIEW OF LITERATURE

In this chapter, an attempt has been made to critically review the literature of the past research works in relevance to the present study. There are relatively few studies on the business management appraisal of processing units in India. The available literature on the subject has been reviewed and presented under the following sections.

2.1 Investment Pattern

2.2 Procurement Channels and Cost

2.3 Stages Involved and Cost of Processing

2.4 Marketing Channels and Cost

2.5 Problems and Suggestions

2.1 Investment Pattern

In the recent years, there is a phenomenal growth in the number of agro-processing units wherein, investment pattern becomes a basic item of importance. Hence, several studies have been undertaken to identify the investment patterns in various agro-processing units. Some important studies have been reviewed here under.

Gupta and George (1974) studied the stages of modernisation in the rice milling industry in Punjab state. The investment pattern of the modernized rice mills revealed that land, buildings, and machinery constituted 88 per cent of the

total investment followed by transportation, equipments and other fixtures and in their study further indicated that the fixed cost per mill increased with an increase in the size of the mill. The fixed cost was higher for modern mills than for traditional ones. The average variable cost for all the mills together was Rs.2.33 per quintal of paddy milled from the point of the view of operating cost (fixed and variable) alone, one tonne capacity mill appeared to be the most efficient mill size.

Singh and Sidhu (1974) studied the economies of scale in groundnut processing industry in Punjab and found that per quintal fixed cost in large, medium and small groundnut mills was Re.0.50, Rs.1.14 and Re.0.58 respectively. The variable costs per quintal of groundnut oil were Rs.118.72, Rs.119.74 and Rs.118.27 in large, medium and small mills respectively. The per quintal total cost in these mills were Rs.119.23, Rs.120.87 and Rs.118.85 respectively.

Muralidharan (1981) compared the establishment cost of the three processing units namely Sugar, Gur and Khandsari units in Mandya district of Karnataka. It was found that the establishment cost of the three processing units were in the order of Rs.4,02,83,292.03 for sugar unit (of 1250 tonnes per day crushing capacity), Rs.46,329.83 for gur unit and Rs.9,16,722.38 for khandsari unit.

Ipte and Borude (1982) in a study on economics of marketing and processing of cashewnut in Ratnagiri/Sindhudurg districts of Maharashtra State, analysed capital investment in different groups factories. It was Rs.18,54,710 of which 12.96 per cent was fixed capital. The important items of fixed capital were investments on building, roasting and machinery. While the items of working capital were rawnuts, wages and salaries, fuel, containers, packing and packing charges. The capital investment was lowest (Rs.5,20,611) in small factories and highest (Rs.71,69,548) in bigger size factories. It was also found that there was a positive relationship between the size of the factory and capital invested.

Nagesh (1990) in his study on investment in production and marketing of cashew in Karnataka, indicated that the capital investment of the processing unit was the highest on the buildings (72.81 %) followed by machinery and equipments (15.42 %) and land (11.77 %) at an overall level of the units. Further it was observed that the processing units utilized only 55.80 per cent of their capacity.

Veerkar and Borude (1990) compared the economies of scale in processing alphanso mango into pulp in Ratnagiri district (M.S.). It was observed that the capital investment worked out to be Rs.10.03 lakhs, out of which the share of fixed capital was 37.33 per cent (Rs.3.75 lakhs) and working capital was 62.67 per cent (Rs.6.29 lakhs). The study also indicated that as the scale of production increased the proportion of investment in the fixed capital decreased and working capital increased.

Dalvi *et al.* (1992) studied on economics of processing of cashewnut in Sindhudurg district of Maharashtra state. They observed that the overall total capital investment was Rs.40,44,898.54, which consisted Rs.45,444.84 fixed capital (11.01 %) and Rs.35,99,453.70 working capital (88.99 %). In the total capital investment, the share of land and buildings were 1.55 per cent and 4.09 per cent respectively. Finally, it was concluded that the processing of cashew was a capital intensive business.

Venkatasheshaiah (1992) evaluated the groundnut processing units in Andhra Pradesh. It was found that there was a direct relationship between the total capital invested and size of the oil mills. Again it was indicated that the capital invested per quintal of oil production was Rs.161.01 in Baby expeller mills, Rs.112.24 in 2-Chamber expeller mills and Rs.83.86 in 3-chamber expeller mills.

Amrutha (1994) studied economics of processing paddy into rice, poha, murmura and popped rice in Chitradurga and Dharwad districts of Karnataka State. The results showed that the capital investment on rice mills, poha mills, murmura mills and popped rice units were Rs.17,92,250, Rs.5,33,225, Rs.16,740 and Rs.20,786 respectively.

Maurya *et al.* (1995) in their study on economics of production and processing of aonla in Varanasi district of U.P. worked out the cost of aonla processing plant and its establishment. The total establishment cost (fixed cost) per quintal was Rs.8.00. It was highest for depreciation being Rs.3.40, followed

by interest on fixed capital Rs.2.50, insurance Rs.1.00, maintenance cost Re.0.60 and electricity and water charges Re.0.50.

Rachhpal and Darshan (1996), conducted the study to examine performance of co-operative sector infrastructure in Punjab markfed canneries. The study showed that the gross value of the fixed assets stood at Rs.152.77 lakhs. The depreciation accumulated was Rs.92.13 lakhs. The present value of fixed assets was compared at Rs.60.64 lakhs.

2.2 Procurement Channels and Cost

Procurement of raw material by different enterprises is necessary to produce the finished or value added products. In non-agro processing industries this function derives comparatively little attention as the raw material is available thoughout the year. But it is opposite in case of agro-processing industries due to seasonality nature of raw materials. Hence this function derives much attention. It also decides the number of days in a year the plant would run. Reviews of some researchers on this functions are presented below.

Kataria and Mehta (1969) studied the budget estimations for cotton procurement through co-operative society at Kotkapur. In their study they gave importance to the octroi (tax) and miscellaneous costs. And while calculating the cost of procurement, transport cost was ignored because the farmers brought the commodity to the society by themselves. At the same time, loading and unloading charges was not levied because of the presence of permanent labour of the society at the assembly point.

Jairath *et al.*(1981) evaluated Mandi milk supply scheme which collected milk from 100 villages, covering a distance of 50 kilometers, with five chilling centers. They found that the milk procurement cost worked out to 40 per cent of the total cost of marketing milk.

Singh *et al.*(1983) studied the management of milk procurement from three villages by co-operatives, private and public sectors in Karnool district of Andhra Pradesh. They found that monthly variation in milk prices was almost constant in case of co-operatives, where as private sector paid high prices during three months of study period, April to June while the public sector varied the price quarterly.

Gajja (1985) in the study on cost of milk processing in arid zone of Rajasthan, at Bikaner and Jodhpur indicated that the procurement cost was worked out by considering purchase price of the milk, cost of chilling, transportation and commission to milk collection societies.

Amrutha (1994) in her study on economics of processing paddy into rice, poha, murmura and popped rice in Chitradurga and Dharwad districts revealed that the total cost of procurement incurred by an average size rice mill was Rs.20.83 per quintal, of which Rs.10.54 (50.6 %) was spent on transportation and amount spent on gunny bags was Rs.2.46 (11.81 %). The market fee and commission accounted for 37.59 per cent of the total cost.

Balappa (1997) in his study on production, marketing and processing of red gram in Gulbraga district revealed that the purchase price of red gram by the

dal miller was Rs.1881.27 per quintal and the sale price was Rs.2277.04 per quintal of which cost incurred for purchasing red gram was Rs.81.27 per quintal.

Jaya Purushottam (1998) in his study on management appraisal of cashew industries in Uttara Kannada district revealed that overall average total cost of cashew nut procurement was Rs.354.16 per quintal. The total cost of procurement per quintal worked out to be higher through inter state imports - processer, that is, Rs.434.41 this was followed by grower- trader- processor, grower small dealer- processor, grower-processor and international imports-processor that is Rs.379.63, Rs.342.45,Rs.323.33 and Rs.290.99 per quintal respectively.

2.3 Stages Involved and Cost of Processing

Processing refers to the value addition for the commodity. In the process, it reduces the perishability of product, increases its shelf-life and makes it available for ready to consumable form. It also makes it possible to recover valuable by products. Processed products yield better returns to processors. In this section, it is proposed to review the results of earlier studies with reference to stages and cost involved in processing.

Shukla and Pandey (1966) analysed the cost and returns in processing of mustard and rapeseed in Hissar. The profit margin was observed to be Rs.3.43 per quintal in case of small sized units with traditional techniques. The profit per quintal was Rs.4.86 incase of medium sized units with modern techniques and Rs.7.02 per quintal in case of large sized units with improved techniques. It

was concluded that was considerable scope to reduce the unit cost of processing by adopting improved technology, which would eventually increase the operational efficiency and benefit to the consumers.

Gupta *et al.*(1971) in their study on modern rice mills in West Godavari district of Andhra Pradesh found that in the total cost, 92.69 per cent was raw material (paddy) cost, the fixed cost was 1.75 per cent, while processing and other variable costs accounted for 5.56 per cent.

Singh and Sidhu (1974) studied the economics of scale in groundnut processing industries in Punjab. It was found that the per quintal fixed cost in large, medium and small groundnut mill were Re.0.50, Rs.1.14 and Re.0.58 respectively. The variable costs per quintal of groundnut oil was Rs.118.72, Rs.119.74 and Rs.118.27 in large, medium and small mills respectively. The per quintal total cost in these mills was Rs.119.23, Rs.120.87 and Rs.118.85 respectively.

Muralidharan (1981) compared the processing of sugarcane into sugar, gur and khandsari in Mandya district of Karnataka. It was found that the processing cost per quintal was Rs.70.51, Rs.43.05 and Rs.116.66 for sugar, gur and khandsari respectively. Share of fixed cost in the total processing cost was 64.24 per cent in sugar units, 30.78 per cent in gur units and 17.29 per cent in khandsari units. Whereas, variable cost formed 35.76 per cent, 69.22 per cent and 82.71 per cent for sugar, gur and khandsari respectively.

Singh *et al.*(1981) in a study on economics of marketing and processing of arhar in Unnao district (Uttar Pradesh) observed that per quintal cost of processing of arhar dal was Rs.5.50.

Nandal (1985) studied the price structure of rapeseed and mustard in Haryana. He found that the processing cost of rapeseed and mustard was Rs.11.05 and Rs.16.55 per quintal respectively.

Singh and Ali (1985) studied economics of mustard and rapeseed marketing and processing in western region of Uttar Pradesh. They found that the cost of processing was Rs.20.98 per quintal. They suggested for establishment of expellers on co-operative basis.

Hassan and Raghuram (1987) in a study on cashew processing and marketing in Prakasam district of Andhra Pradesh observed the following stages in processing. They were; drying of fruits, roasting of nuts, shelling of nuts, drying of shelled kernels, peeling of kernels, grading of kernels, conditioning of graded kernel and packing of graded kernels. The study reported that 80 kilogram of raw nuts when processed resulted in 22 kilogram of kernels (28 %) recovery. The processor incurred Rs.87.06 as processing cost of which labour constituted 56.6 per cent and material cost shared 42.5 per cent. In the total labour cost, shelling accounted for higher proportion followed by peeling.

Verma Anantram (1989) studied the economics of processing and marketing of gur in Indore (Madhya Pradesh) and found that the average cost of processing of sugarcane under power kohlu units of gur was Rs.6.80 per quintal.

Further it revealed that the cost of processing varied from mill to mill according to the level of capital investment and sugarcane crushed during the year by the mill.

Bawa and Kainth (1989) while analysing the cost and return of rice milling industry in Amristar district of Punjab found that dehusking of one tonne of paddy yielded a net profit of Rs.45.67. Expenses on raw material (86.00 %) constituted a major item. Running expenditure on machinery and repairs and maintenance cost constituted 1.96 per cent and 1.10 per cent respectively. Net returns of enterprise was 2.31 per cent of gross profit.

Jain Hemchand (1989) in a study on economics of processing unit of arhar pulse in Narasinghpur district (Madhya Pradesh) revealed that the fixed and variable costs accounted for 45 per cent and 55 per cent respectively. The cost of processing of arhar dal worked out to Rs.61.62 per quintal.

Dalvi *et al.*(1992) studied economics of processing of cashewnuts in Sindhdurg district of Maharashtra state found that the cost of processing per quintal of cashewnut was Rs.331.35 at an overall level. Out of the total cost, the major cost was the interest on fixed and working capital amounting to Rs.21.55 (6.51 %) and Rs.148.16 (44.72 %) respectively. The other items of costs were labour (13.74 %) and tin containers (15.84 %). The overall gross increase in the value to nuts worked out to Rs.500.70 (45.96 %) per tin and net increase was Rs.174.50. Net value added worked out to 29.64 per cent. This was possible due to processing of raw nuts.

Amrutha (1994) studied the economics of processing of paddy into rice, Murmura, Poha and Popped rice in Chitradurga and Dharwad districts of Karnataka. Wherein the per quintal fixed cost in large and small rice mills were Rs.16.68 and Rs.25.55 respectively. The variable cost per quintal in rice mill was Rs.477.89 and Rs.655.95 in small and large mills.

Singh *et al* (1994) in a study on economics of marketing and processing of pulses in Banda district (Uttar Pradesh) observed that per quintal cost of processing of arhar, gram and lentil was Rs.831.67, Rs.823.47 and Rs.752.05 respectively.

Balasubaramanian *et al.*(1996) in a study on pricing and transaction trend of raw cashewnut in India, observed that the cost of processing of kernel per quintal of cashewnut was maximum on raw cashewnut (70 %) followed by labour (10.50 %), purchase tax (5 %), handling charges (5 %) packing material (4.50 %). The minor item of cost was transportation cost, fuel, factory overhead, administrative over head and depreciation (0.10 %) each.

Kasle *et al.* (1996) in a study on agro-processing industries in Maharashtra revealed that the cost of machinery was the major item contibuting 61.43 and 59.12 per cent in dal mill and cotton ginning industry respectively. The total costs per oil industry, dal mill and cotton ginning industry per year were Rs.48.20, 69.04 and 5.03 lakhs respectively. The average net profit per oil industry, dal mill and cotton ginning industry was Rs.8.93, 3.32 and 1.43 lakhs per year with 1.19, 1.05 and 1.39 benefit cost ratio respectively. The average

capacity utilisation of oil industry, dal mill and cotton ginning industry was only 41.67, 71.20 and 43.79 per cent respectively.

2.4 Marketing Channels and Cost

The final function of any business enterprise is to market their finished products. These products are to be sold through shortest channel. The products of agro-processing units are perishable after a certain period. Hence they are to be disposed off from the processing units and made available to the consumer at the earliest date possible. Few studies undertaken on this aspect reviewed hereunder.

Singh *et al.*(1981) studied the economics of marketing and processing of arhar in Unnao district of Uttar Pradesh. They reported that marketing cost per quintal of arhar was Rs.4.00 while the producer share in consumer rupee was 80.90 per cent.

Mamle Desai (1983) studied the marketing of red gram in Gulbarga district of Karnataka State. He has identified three channels namely,

Channel I :Producer-> Commission agent-> Wholesaler -> Dal miller.

Channel II : Producer -> Dal miller.

Channel III : Producer -> Village Merchant -> Dalmiller.

The share of the producer in consumer's rupee was found to be 75.96, 96.74 and 80.41 per cents in Channel-I, Channel-II and Channel-III respectively.

Nandal (1985) examined the shares of producer's in the consumer's rupee for mustard and rapeseed in Hissar district of Haryana State. He identified the major channel as producer-> wholesaler -> oil expeller-> retailers-> consumers and observed that the producer's share in the consumer's rupee had not changed inspite of emphasis in the policy to ensure higher share to the farmers in the consumer's rupee.

Dalvi *et al.*(1986) studied the price spread in the marketing of coconut in Konkan region of Maharashatra State. They reported that the marketing margin (40.30 %) was high in the channel where wholesaler and retailers operated in marketing of coconut in Konkan district.

Dalvi *et al.*(1992) in their study revealed that the marketing cost incurred per tin by the factories was Rs.44.65. The commission to agent was the major cost which accounted for more than 50 per cent (Rs.22.75) of the total marketing cost. The next important costs were octroi (31.33 %), transportation (10.55 %) and loading and unloading costs (2.67 %). The net returns worked out to Rs.174.52 per tin.

Venkatasheshaiah (1992) studied groundnut processing units and marketing of its products in Cuddapah district, Andhra Pradesh. Where in he observed 3 channels for marketing of oil and 2 channels for marketing of oil cake.

Marketing of oil:

Channel I : Producer -> Wholesaler-> Retailer->Consumer.

Channel II : Producer ->Retialer->Consumer.

Channel III : Producer->Consumer.

Further found that 93.44 per cent of oil was sold through channel I.

Marketing of oil cake:

Channel I: Producer->Retailer->Consumer.

Channel II: Producer->Consumer.

Singh *et al.*(1994) studied the marketing costs and margins of arhar in Banda district of Uttar pradesh and found that the net share of the producer's (Rs.601.55 per quintal) in consumer's rupee (Rs.738.55 per quintal) was 81.44 per cent in the case of arhar marketing.

Rajesh and Joginder (1996) studied on marketing pattern of fruit and vegetable processing unit at Ludhiana city. It was observed that the large size units marketed their produce through all the three channels while medium unit marketed through retailer and consumer where as small size units marketed directly to consumers. The alternative channels commonly followed for selling produce to different market agencies were as follows.

Channel I : Processor->Wholesaler->Retailer->Consumer.

Channel II : Processor-> Retailer->Consumer.

Channel III : Processor-> Consumer.

2.5 Problems and Suggestions

Problems are found in all the business enterprises, but only their nature and intensity differ from one organisation to another. Some of the studies reviewed on the problems faced by the processors of different commodities are as follows:

Gupta *et al.*(1974) studied the stages of modernisation in the paddy milling industry. Millers mentioned three major problems in paddy procurement, viz., paddy was not available in the market at the prices fixed by the Government which resulted in loss in surrendering levy rice, there was a keen competition among millers to procure paddy and not enough paddy was available in market due to the drought situation.

Singh *et al.*(1981) suggested transport facilities, credit facilities, supply of electricity at cheaper rates to the processing units and storage facilities, for increasing the efficiency of arhar dal processing in the district of Unnao.

Rameshwar *et al.*(1986) in a study on the production, processing and marketing of linseed in Banda district of Uttar Pradesh suggested for reducing cost of linseed through establishment of co-operative oil crusher plants in the rural areas and the arrangement made for raw material for processing of linseed.

These activities helped to create an efficient marketing system and employment in the rural area.

Chadha (1989) observed the following constraints in the fruits and vegetable processing industries.

a) Non-availability or paucity of processing varieties of fruits and vegetables.

b) Short periods of raw material availability and

c) Excessive costs of raw material.

Jain Hemachand (1989) in his study on economics of processing units of arhar pulse in Narashinghpur district (M.P.) found that, main problems of arhar processor were inadequate availability of raw material, short supply of power leading to the under utilisation of plant, declining output and efficiency of machinery, labour and problems of transportation for disposal of processed material.

Nagesh (1990) found that the major problems faced by the cashew processor in Karnataka were, existence of large number of processing units, inadequate availability of raw cashewnuts, poor quality of raw cashewnuts, rise in prices of raw cashewnut, non-availability of skilled labour, increase in wage rate and high taxes. All these problems ultimately resulted in under utilisation of installed capacity.

Venkataseshaiah (1992) found that the major problems faced by groundnut processor were the high competition within the processing units for getting raw material, irregular power supply, high taxing for the commodities, low percentage of oil recovery due to lack of modernization machinaries and non-availability of sufficient raw materials for crushing. All these resulted in low returns and high cost of processing, leading to lower net profit margins.

Brahmprakash and Dineshkumar (1997) studied infrastructural requirements for the development of agro-processing industry in rural India and concluded that lack of market information, rapid and refrigerated transport system, storage facility, banking institutions, packing and post-harvest technology were the major constraints responsible for the slow growth of agro-processing industry.

Roy (1997) concluded that the low level of processing in India was mainly due to inadequate post-harvest technology, lack of transport and marketing infrastructure, absence of linkages between processing industry and the growers and lack of domestic demand for processed products. Majority of the processing units were in cottage and tiny sector, where research and development efforts were also most non-existent and new products were rare. Lack of sophisticated packing technology further added to these problems. Poor infrastructure was the single biggest problem that affecteds Indian agricultural processing sector.

Methodology

III METHODOLOGY

This chapter presents the agro-climatic and economic features of the study area, nature and source of the data collected, the analytical tools and techniques employed for evaluation of the objectives of the present study. These are presented under the following heads.

3.1 Description of the Study Area

Tur cultivation is scattered in many parts of Karnataka but the cultivation of this crop is mainly concentrated in North Eastern regions of the State, as the soil and climatic conditions of these tracts are conducive to its rich and luxuriant growth. In Karnataka, Gulbarga districts has higher area and production of tur with 100 tur processing units. Hence the area was purposively selected for the study. Gulbarga is one of the 27 districts in Karnataka. It has an area of 16,224 sq.km. with 25,82,000(1991) population. Of the total geographical area of 16,10,208 hectares, about 68,759 hectares is under forest accounting 4.3 percent.

Gulbarga is located at the northern part of Karnataka state, which is surrounded towards east by Andhra pradesh state, towards north-west by Maharashtra state, towards north by Bidar district, towards west by Bijapur districts and towards south by Raichur district towards south. Fig. 3.1 represents the map of Gulbarga district and the shaded area represents the area covered for study purpose.

Gulbarga is situated around 600 kilometers from Bangalore, the capital city of Karnataka State. There are 10 talukas and 3 revenue sub-divisions in the district comprising of 1,295 inhabited and 83 uninhabited villages and 17 towns. Moderate rainfall occurs during the three months, June, July and August, April and May are the hottest months with the mean daily maximum temperature of about 40^0C to 44^0C and minimum temperature of about 30^0 C to 35^0C.

The soils of this district are deep to very deep black, medium black, sandy loam and light textured soils. The important crops grown in this district are red gam, greengram, blackgram, bengalgram, bajra, wheat, groundnut, sunflower, sesamum and cotton. The agro-climatic conditions are best suited for pulse cultivation. The area under redgram crop during the year 1995-96 was 2,27,003 hectares, which accounted for 40 per cent of the total area under red gram in the state. Similarly, production of redgram being 1,22,706 tonnes accounted for 60.77 per cent of the total production of the state (DES 1996-97).

This district has 95 large-scale industrial units (10 Textiles, 14 chemicals and other industries) and 6,003 small scale industries of which, 100 are tur processing industries. These large and small-scale industries, employ 22,630 and

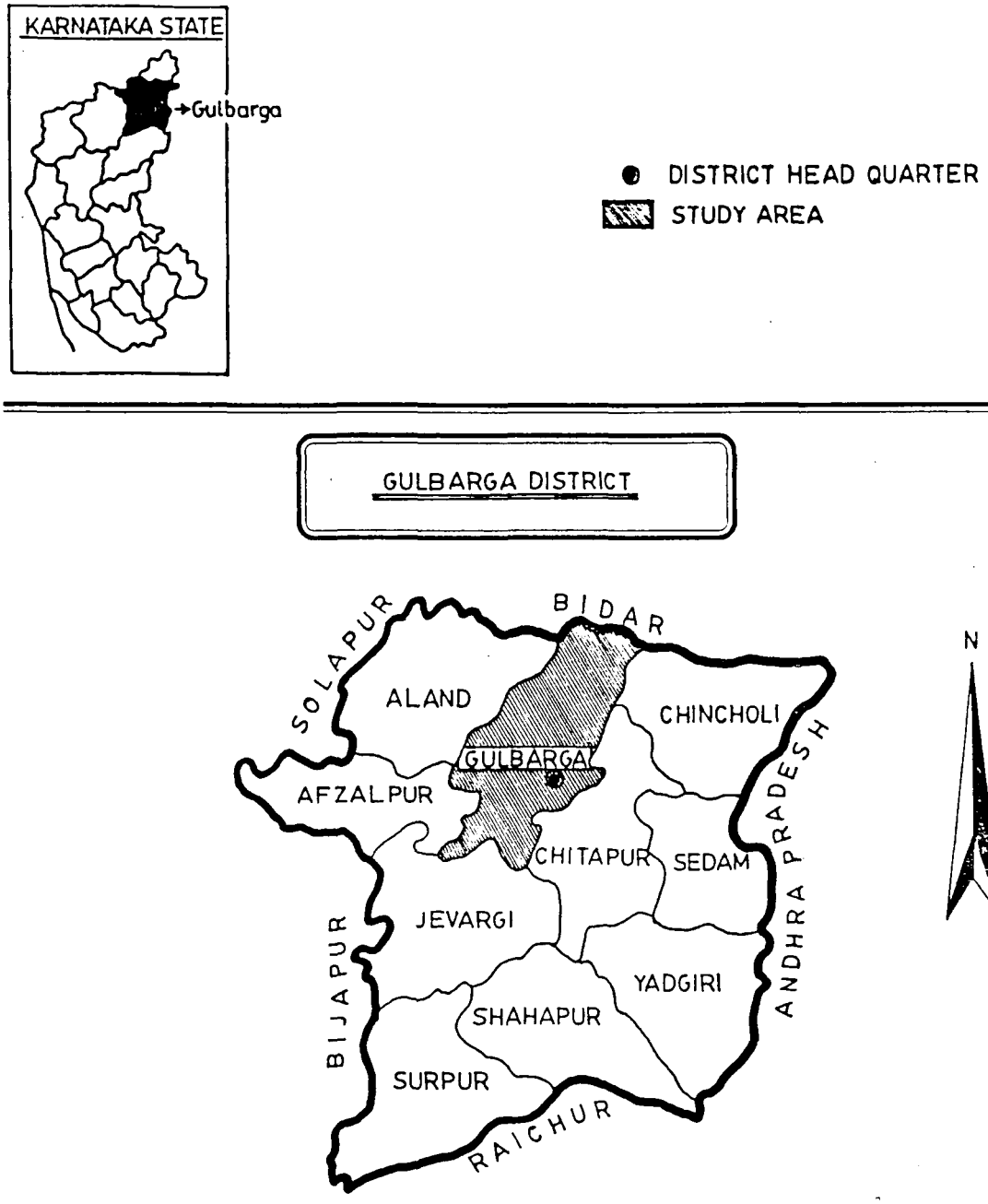

FIG.1-MAP SHOWING STUDY AREA INCLUDING TALUKS.

Table 3.1:General information about the study area.

Particulars	Gulbarga	Karnataka
Population ('000) 1991	2582(5.74%)	44977
Talukas	10 (5.71%)	175
Villages	1295 (4.78%)	27066
Per capita income(1994-95 price)	Rs.6710	Rs.8237
Textile industries	10(0.68%)	1464
Chemical factories	4(0.88%)	452
Engineering industries	14 (0.71%)	1962
Tur processing units	100 (62.5%)	160
Other industries	95 (2.00%)	4736
Rainfall (mm) Normal Actual	777 902	1139 1151

Figures in the parentheses indicate percentage to state total.

Source: Karnataka at a glance 1996-97.

32,796 employees respectively. There are 8 industrial estates and 1,225 industrial sheds. The above mentioned industries are well supported by better infrastructural facilities. The network of roadways (6,736 km. road length) and railways has together helped for the development of the area(DES 1996-97).

3.2 Description of the Study Units

As many as 100 tur processing units are reported in Gulbarga district. They are mostly sole proprietor and partnership firms coming under small scale sector. But their concentration is more in Gulbarga taluk accounting for 70 units followed by Chittapur and Sedam accounting 5 units each, 4 units in Yadgir, 4 units in Shahapur, 3 units in Chincholi, 3 units in Aland, 3 units in Jewargi, 2 units in Surpur and 1 unit in Afzalpur. Most of the tur processing units are situated in the town areas rather than in the villages of these taluks. They have been provided with moderate infrastructural facilities like road, water and electricity.

The tur processing units are operating with an installed capacity ranging between 40 and 150 quintals per day. On an average these units operate for about 225 to 255 days in a year. The tur processing units generally start from the end of December and close at the end of November next year. Their requirements of working capital is about 25 times than fixed capital. They procure tur from Gulbarga and Bidar district of Karnataka and from Maharashtra State. The units generally process the tur to produce the dal by employing mainly women workers. The processed tur dal are packed in gunny bags and

marketed locally or in distant markets like Delhi, Hyderabad, Solapur, Pune and Mumbai. The by-products like Chura (brokendal) and Bhusa (husk) are marketed locally or in distant markets.

3.3 Sampling Design

To fulfill the objectives of the study the multistage sampling was adopted. At the initial stage, Gulbarga district was selected as it emerged highest in area and production of tur as well as highest number of tur processing units (Table 3.2). At the Second stage, Gulbarga taluk in the district was selected for the study as it possessed maximum number of tur processing units. Out of 70 tur processing units situated in Gulbarga taluk, only 65 were working and 30 units are selected for the study.

At the third and final stage, based on the capacity created in each of these 65 processing units, they were categorized into large and small size units. For this purpose, the average processing capacity created for all the 65 units were worked out. Those processing units having capacity more than 70 quintals per day were considered as large sized units and having capacity less than 70 quintals per day have been considered as small sized units. After the classification, 15 processing units in each of the two categories were randomly selected to form a total sample of 30 processing units. The details are given in Table 3.3.

Table 3.2: Area, Production and Yield of tur in Karnataka during 1997.

Sl. No.	District	Area (hectares)	Production (tonnes)	Yield (kg/hectare)
1	Gulbarga	227003(53.56)	122706(60.78)	540
2	Bidar	49846(11.76)	36604(18.13)	734
3	Bijapur	17807(4.20)	6564(3.25)	368
4	Tumkur	12560(2.96)	5536(2.74)	440
5	Dharwad	14316(3.38)	5154(2.55)	360
6	Kolar	12383(2.92)	5141(2.54)	415
7	Raichur	33216(7.84)	4702(2.34)	141
8	Chitradurga	11320(2.67)	3699(1.83)	326
9	Bangalore (Rural)	5485(1.29)	2845(1.41)	518
10	Bellary	14944(3.53)	2712(1.34)	181
11	Belgaum	9093(2.14)	2177(1.07)	239
12	Mysore	7964(1.88)	1596(0.79)	200
13	Bangalore(Urban)	1145(0.27)	594(0.29)	518
14	Hassan	2807(0.66)	563(0.28)	200
15	Mandya	1929(0.46)	519(0.26)	269
16	Shimoga	1197(0.28)	375(0.18)	313
17	Chikmagalur	695(0.16)	331(0.17)	476
18	Uttar Kannada	146(0.04)	69(0.04)	472
19	Dakshina Kannada	- -	- -	-
20	Kodagu	- -	- -	-
		423856 (100)	201887 (100)	373

Figures in parentheses indicate percentage to the state total.

Source: Karnataka at a Glance.(1996-97), Directorate of Economics and Statistics, Govt. of Karnataka, Bangalore, 1998.

Table 3.3: Selected sample of tur processing units.

Sl.No.	Size of the processing units	Capacity (qtls/day)	Number of units
1.	Small	40-70	15
2.	Large	71-150	15
		Total	30

3.4 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 procurement and processing of tur, marketing of tur dal and problems faced by the processors were collected through pre-tested questionnaire from the processor for the agricultural year 1997-98. The processors were personally interviewed to ensure the data made available by them were appropriate.

The Secondary data regarding capital investment was obtained from the records of the processing units. Similarly the data relating to performance of the processing units like current assets and liabilities, owned funds, fixed assets, total sales and borrowed capital were also obtained from the records of the processing units.

3.5 Analytical Techniques Employed

In order to fulfill the objectives of the study the data collected was subjected to analysis through following appropriate techniques:

3.5.1 Tabular analysis.

3.5.2 Financial ratio analysis.

3.5.3 Break even volume analysis.

3.5.4 Investment analysis techinques.

3.5.1 Tabular analysis

The data collected was presented in tabular form to facilitate easy comparisons. The investment pattern, cost of procurement, cost of processing, cost of marketing and over all cost and return structure in the processing units were presented in the form of tables.

The data was summarized with the help of statistical tools like averages and percentages to obtain meaningful results.

3.5.2 Financial ratio analysis

The financial ratio analysis is considered as most useful technique in evaluating the performance of different categories of tur processing units. In this study the ratios have been heavily relied upon in respect to the test of solvency, liquidity, profitability and turnover of tur processing units.

3.5.2.1Test of solvency

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

a) Ratio of total liability to owned funds

This ratio would reflect the total commitments of the tur processing units owes to creditors as compared to its owned funds. Higher ratio would indicate higher dependence of the processing unit on the external funds. Ratio value over unity for non- banking institution would indicate poor financial structure.

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

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 steep increase in this ratio is no doubt a sign of progress, which results in rapid increase in production and sales.

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

3.5.2.2 Test of liquidity

The liquidity ratios were to measure the ability of the tur-processing unit to meet immediate maturing obligations. Two types of ratios were calculated in the study.

a) Ratio of liquid assets to total assets

This ratio shows the liquidity preference of the tur processing units. The minimum norm of this ratio is 0.5. Higher the ratio, higher will be the liquidity preference of the processing unit.

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

b) Ratio of current assets to current liabilities

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

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities.}}$$

3.5.2.3Test of profitability

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

a) Net profit to total assets ratio

This ratio indicates the rate of profit earned on the total assets employed. An increase in this ratio over the years showed improvement in the overall efficiency of 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 profit 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.

$$\text{Net profit to total assets} = \frac{\text{Net profits}}{\text{Owned funds}}$$

c) Net profit to fixed assets ratio

This ratio was computed by dividing net profit by fixed assets of the firm. A higher ratio indicates a better utilization of the fixed assets by the processing units and that they are in a better position to meet the long-term obligations.

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

3.5.2.4 Test of turnover

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

a) Working capital turnover ratio

The working capital turnover ratio is computed through dividing total sales by total working capital (fixed and variable capital). 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.

$$\text{Working capital turnover ratio} = \frac{\text{Total sales}}{\text{Total working capital}}$$

b) Fixed assets turnover ratio

Fixed assets turnover ratio is used to test the efficiency in utilising the fixed assets. Higher the fixed assets turnover ratio, higher would be the efficiency of the processing unit in utilisation of fixed assets to generate sales.

$$\text{Fixed assets turnover ratio} = \frac{\text{Annual sales}}{\text{Fixed assets}}$$

c) Total assets turnover ratio

This ratio indicates the efficiency in utilising the total assets of a business firm. A higher ratio would indicate increased efficiency of the processing units in utilisation of assets to improve the sales. This ratio is computed as,

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

3.5.3 Break-even volume analysis

Break-even volume analysis was used to know the minimum level of production required to recover the total fixed capital employed in tur processing units. This concept is important in any business as it indicates the minimum

amount of business necessary for operating the enterprise in the short term without loss. The formula which was used in this study is as follows.

$$Q = \frac{TFC}{P\text{-}TVC}$$

Where,

Q = Quantity at break-even point (volume) production.

TFC = Total fixed cost

P = Price per unit

TVC = Total variable cost per unit.

3.5.4 Investment analysis techniques

Investment analysis techniques was carried out to evaluate the feasiblity of investment in tur processing units. The discounted cash flow technique which has an advantage of reducing the cash flows to a single point of time was used to facilitate comparison.

Four conventionally used project evaluation techniques were adopted in the study to evaluate the feasibility of investment in tur processing units. They are as follows.

a) Net Present Value (NPV)

b) Benefit Cost Ratio (BCR)

c) Pay Back Period (PBP)

d) Internal Rate of Return (IRR)

a) Net Present Value (NPV)

This indicates the present value of expected or realized returns of a project over period of time when discounted at the opportunity cost of capital. The opportunity cost of capital considered in this study was 14.0 per cent per annum. The NPV was worked out as follows:

$$NPV=\sum_{t=1}^{n} \frac{Y_t}{(1+r)^t} - I$$

Where,

Y= Net returns in period 't'

t= 1-------20

r= discount rate

I= Initial investment

b) Benefit Cost Ratio (BCR)

The benefit cost ratio was worked out by discounting the net returns during the life period of the tur processing unit at a discount rate of 14 per cent per annum.

$$\text{B-C ratio} = \frac{\text{Discounted net returns}}{\text{Initial investment}}$$

c) Internal Rate of Returns (IRR)

Internal rate of return is the discount rate which makes the net present value of the project benefits equal to zero. It is usually determined by trial and error method. In this study also IRR was computed by trial and error method. For this a discount rate which was too low and which the NPV positive and another discount rate which was too high and which made the NPV negative were ascertained. Then the IRR was estimated as follows:

$$IRR = \text{Lower discount rate} + \frac{\text{Present worth of cashflow at lower discount rate}}{\text{Sum of the two NPV's ignoring the negative signs.}} \times \text{Difference between the two discount rates.}$$

The project is considered to be feasible if the IRR is higher than the prevailing interest rate.

d) Pay Back Period (PBP)

The pay back period indicates the number of years required to recover the initial investment made in tur processing unit. The method followed is to successively add the net returns from each production year until the investments are completely recovered. Since, the cash inflows from tur processing units

were not uniform, the pay back period was calculated by successively reducing the net cash inflows from the outstanding investments.

3.6 Definition of terms and concepts

3.6.1 Capital investment

a) Fixed capital

The items included under the fixed capital are the cost of land, building,. machinery and equipments, borewell and other fixtures.

b) Working capital

The working capital includes cost of tur, utilities (like power, oil and water charges), packing material (gunny bag) cost, wages, salaries, factory overheads (repairs and maintenance cost) and administrative overheads (like stationary expenses, office communications and insurance premium cost)

c) Investment on building

This included investment on building for processing, storage, office and drying yard.

d) Investment on machinery and equipments

Under this investment made on motar, elevator, huller, drier, filter, belt, roller, chunni grinder, sewing machine and weighing machine used in processing of tur were included.

e) Investment on other fixtures

It includes investment on fan, tube light and furnitures in the tur processing unit.

f) Economic life (n)

The economic life of tur processing unit is estimated to be 20 years. For the purpose of computing the cost and returns it was considered.

3.6.2 Procurement

a) Tur

It refers to the raw material (raw tur) used in the production of end product of tur dal.

b) Farmer

He is the one who owes tur field and earns from its economic yield.

c) Commission agent

Commission agent is a person who buys notified agricultural produce for himself or an agent of one or more persons for the purpose of selling manufacturing or for any purpose, except for the purpose of domestic consumption. He charges two percent commission on the value of tur marketed.

d) Trader

Trader is a person who buys notified agricultural produce for himself or an agent of more persons for the purpose of selling. In this process he charges Rs.40 per quintal of tur as found in study area.

e) Processor

Processor is a person who process the notified agriculture produce by mechanical means.

f) Cost of tur procurement

It was computed by adding the items of cost of transportation and handling, purchase and turnover tax, market fee, commission and packing material.

g) Transport and handling cost

This cost includes the cost involved in transportation of tur to the processing unit and cost of labour in loading and unloading material.

h) Tax structure

Purchase tax

It is taxed at the rate of one percent on the value of tur procured within the state as well as for interstate imports.

Turnover tax

It is charged at the rate of one percent on the value of tur procured with in the state as well as for interstate imports.

Market fee

It is charged at the rate of one per cent on the value of tur procured in the market.

i) Package

Tur are packed in gunny bags with 100 kilograms capacity. Each gunny bag costs Rs.13.50.

j) Inventory

It is defined as usable but idle resource.

k) Cost of carrying inventory

This is expressed in rupees per item held in stock per unit time. It is worked out by adding the items of cost as storage cost, maintenance charges and interest on working capital.

l) Storage cost

It includes the rental charges of the store room, where in the tur were stored.

m) Maintenance charges

In this variable cost of insecticide, white washing and cleaning were included.

n) Interest on working capital

It is worked out at the rate of 18 per cent. Part of the working capital used on tur procurement was computed separately to be included under the cost of carrying inventory. The remaining part of the working capital was computed separately to include under the cost of production.

3.6.3 Processing

a) Stages of processing

I) Soaking of tur

Soaking or sprinkling the tur with water helps to loosen binding action of the gum. Soften the seed coat and increases the out turn by reducing breakage in milling. The seeds are soaked for 6-10 hours.

II) Oil treatment of tur

Tur is treated with sesame or castor oil which helps to loosen the husk and release cotyledon layer binding from seeds.

III) Drying of tur

After oil treatment the seeds are heaped up and left over night, then spread out for drying either under sun for 1 to 2 days or by means of mechanical drier.

IV) Winnowing of tur

Winnowing is to remove the foreign matter before bringing to milling. Normally, it is done by mechanical winnower.

V) Splitting of tur

Removing the hull or seed coat from tur and splitting the tur into its dicotyledonous components.

VI) Polishing of dal

Polishing is the removal of membrane from the dal. It provides shining to split grains.

VII) Separating of dal

Separation of the parts of broken grains and husk from dal.

VIII) Packing of dal

The main product (dal) are packed in 100 kilograms capacity bag.

b) Cost of production

It was calculated by adding the items of cost of tur, cost of procurement, cost of carrying inventory, cost of processing, salaries, factory overhead, administrative overhead, interest on working capital and fixed capital and depreciation on building and machinery and equipment.

c) Cost of processing

This was computed by adding the costs incurred on utilities (power, oil and water costs), packing material (gunny bags) and wages.

d) Value addition

It is calculated by subtracting the purchase value of one quintal of tur from the sale of value of main product (dal).

3.6.4 Marketing

a) Consumer

He is a person who purchases the tur dal from the processor in little quantity for domestic consumption.

b) Traders

He is a person who purchase the tur dal from the processor and market it by bearing the prices of tur dal and cost of transportation and handling. He sells the tur dal at a price which includes all the costs incurred and his margin of profit.

c) Commission agent

He charges 2 per cent commission on the value of tur dal marketed and bears the transportation and handling cost.

d) Cost of marketing

It is calculated by adding sales tax and turnover tax, transport and handling and commission.

e) Tax structure

Sales tax

It is charged at the rate of 2 per cent and 4 per cent on the value of tur dal sold in Karnataka state and other states respectively.

Turnover tax

It is taxed at the rate of one per cent on the value of tur dal marketed in the state and outside the state.

f) Sales realisation

It is calculated by adding the sale value of main product, dal and by products, chura (broken dal) and bhusa (husk).

g) Benefit cost ratio

It is calculated by dividing gross returns with total cost. This indicates the actual benefit realised from one rupee investment on processing.

3.6.5 Financial Indicators

a) Total liabilities

It includes all the term loans borrowed from financial institutions.

b) Owned funds

It includes capital reserves fund and net profit.

c) Fixed assets

It includes value of land, building, plant and machineries, borewell and other fixtures.

d) Liquid (current) assets

It includes cash in hand, telephone deposits and fixed deposits at bank.

e) Total assets

It comprises of both fixed and current assets.

f) Current liabilities

It includes short term loan borrowed and net profit.

Results

IV RESULTS

For the purpose of evaluating the objectives the results of the study are presented under the following heads.

4.1 Investment Pattern in Tur Processing Units

4.2 Cost and Months of Tur Procurement

4.3 Processing of Tur

4.4 Cost and Return Structure in the Production of Tur Dal

4.5 Marketing of Tur Dal

4.6 Performance of Tur Processing Units

4.7 Problems faced by Processors of Tur Processing Units

4.1 Investment Pattern in Tur Processing Units

4.1.1 Capital investment pattern in tur processing units

The expenditure incurred for the establishment of the processing units was treated as investment. The details on the total capital investment in the small and large processing units are presented in the Table 4.1.

The overall average capital per processing unit was Rs.160.92 lakhs. The investment pattern of the tur processing unit revealed that there was a direct relationship between the total capital investment and the size of the processing units. In aggregate it was found that, in all the units the investment on working capital was more (96.60 %) than the fixed capital (3.40 %). The proportion of investment on working capital was more in large (96.60 %) than small (95.96 %) size processing units. Hence, in these tur processing units, the proportion of

Table 4.1: Capital investment pattern in tur processing units.

(Rs. in lakhs)

Sl. No.	Particulars	Small	Large	Overall average
1	Fixed capital	4.48	6.46	5.47
		(4.04)	(3.06)	(3.40)
2	Working capital	106.29	204.60	155.45
		(95.96)	(96.94)	(96.60)
3	Total	110.77	211.06	160.92
		(100)	(100)	(100)

Figures in parentheses indicate percentage to the total.

working capital is maximum as compared to fixed capital in the total capital invested.

4.1.2 Fixed capital investment pattern in tur processing units

The fixed capital investment in different sizes of tur processing units is presented in Table 4.2.

It includes the expenditure on land, building, machinery and equipment, borewell and other fixtures. It may be seen form the Table 4.2 that the total fixed capital investment was Rs.4.48 lakhs in case of small processing units. Similarly 6.46 lakhs was invested in large processing units. The overall average total fixed capital investment was found to be Rs.5.47 lakhs.

The investment on machinery and equipment (49.91%) accounted highest followed by building (31.99 %), land (14.63 %), borewell (2.74 %) and other fixtures (0.73 %). The proportion of investment on land in total fixed capital was higher in small size processing units (14.96 %) than in large size units (14.40 %). Similarly, the proportion of fixed capital invested on building was higher in large size units, that is, 34.37 per cent and lower in small size units, that is, 28.57 per cent. The proportion of investment on machinery and equipment was higher in small processing units (52.90 %) and lower in large size units (47.83 %) on borewell, it was higher in small units (2.90 %) and lower (2.63 %) in large units. In case of other fixtures it was higher in large units, that is, 0.77 per cent and lower in small units, that is, 0.67 per cent.

Table 4.2: Fixed capital investment pattern in tur processing units.

(Rs.in Lakhs)

Sl. No.	Particulars of investment	Small	Large	Overall average
1	Land	0.67(14.96)	0.93(14.40)	0.80(14.63)
2	Buildings	1.28(28.57)	2.22(34.37)	1.75(31.99)
3	Machinery and equipments	2.37(52.90)	3.09(47.83)	2.73(49.91)
4	Borewell or open well	0.13(2.90)	0.17(2.63)	0.15(2.74)
5	Other fixtures	0.03(0.67)	0.05(0.77)	0.04(0.73)
	Total	4.48(100)	6.46(100)	5.47(100)

Figures in parentheses indicate percentage to the total.

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

4.1.3 Cash flows in tur processing units

The cash flows obtained in small size processing units are presented in Table 4.3. From the table, it is seen that cash outflows in tur processing units increased from the first year to 20th year from Rs.98.59 lakhs to Rs.107.10 lakhs. The cash outflows increased continuously to reach a peak in the 20th year. It may be recalled here that, the cash outflows were changed annually by using the average annual increase in price of inputs.

The cash inflows on the other hand, increased from Rs.100.81 lakhs in the first year to Rs.113.37 lakhs during the 17th year. From the 18th year however, the cash inflows decreased annually because of the decreasing efficiency of the tur processing units.

The net cash flows in small tur processing units were Rs.2.22 lakhs during the first year increased to Rs.6.37 lakhs during the 17th year. From the 18th year the net cash flows decreased every year and reached as low as Rs.4.51 lakhs during the 20th year.

The cash flows obtained in large size processing units are presented in Table 4.4. From the table it is seen that the cash outflows in tur processing units

increased from Rs.185.53 lakhs in first year to Rs.201.55 lakhs in 20th year. The cash outflows increased continuously reached a peak in the 20th year.

The cash inflows on the other hand increased from Rs.191.01 lakhs during the first year to Rs.214.96 lakhs in 17th year. From 18th year the net cash inflows decreased every year and reached to Rs.211.61 lakhs during the 20th year.

The net cash flows in large tur processing units were Rs.5.54 lakhs during the first year increased to Rs.13.59 lakhs during the 17th year. From the 18th year the net cash flows decreased every year and reached to Rs.10.06 lakhs during the 20th year.

The cash flow parameter for overall average size units are presented in Table 4.5. The behaviour of cash flows were similar to those presented earlier.

From Table 4.5, it is seen that the cash outflows in tur processing units of an overall average size units increased from Rs.142.06 lakhs in first year to Rs.154.32 lakhs in 20th year. The cash inflows on the other hand, increased from Rs.145.94 lakhs in first year to Rs.164.12 lakhs during 17th year. The cash inflows started decreasing from 18th year and reached to a low of Rs.161.61 lakhs during 20th year. The net cash flows which was Rs.3.88 lakhs during the first year reached a peak of Rs.9.98 lakhs during the 17th year, then it was decreased to Rs.7.28 lakhs during 20th year.

Table 4.3:Cash flows in small size tur processing units.

Year	Cash outflow(Rs.)	Cash inflow(Rs.)	Net cash flow(Rs.)	D.F at 14%.	Net discounted cash flow (Rs.)
0	448000				-448000
1	9858882	10080828	221946	0.877	194646.6
2	9898688	10124920	226232	0.769	173972.4
3	9905889	10145045	239156	0.674	161191.1
4	9989978	10235011	245033	0.592	145059.5
5	10109841	10360588	250747	0.519	130137.6
6	10195862	10460655	264793	0.455	120480.8
7	10312755	10603799	291044	0.399	116126.5
8	10508798	10813958	305160	0.35	106806.0
9	10508950	10833986	325036	0.307	99786.05
10	10512222	10863985	351763	0.269	94624.25
11	10535998	10930888	394890	0.236	93194.04
12	10589758	11034957	445199	0.207	92156.19
13	10598587	11059515	460928	0.182	83888.89
14	10615842	11127865	512023	0.159	81411.65
15	10655874	11231485	575611	0.14	80585.50
16	10698568	11313982	615414	0.122	75080.50
17	10700014	11336578	636564	0.107	68112.34
18	10700544	11261586	561042	0.094	52737.94
19	10707875	11235256	527381	0.082	43245
20	10709877	11160558	450681	0.072	32449.03
				N.P.V.	15,97,692

Table 4.4: Cash flows in large size tur processing units.

Year	Cash outflow (Rs.)	Cash Inflow (Rs.)	Net cash flow (Rs.)	D.F at 14%.	Net discounted cash flow (Rs.)
0	646000				-646000
1	18553430	19100764	553634.3	0.877	485537.3
2	18628340	19190926	562585.9	0.769	432628.6
3	18641892	19229204	587311.9	0.674.	395848.2
4	18800139	19400318	600179.3	0.592	355306.1
5	19025709	19639165	613455.3	0.519	318383.3
6	19187592	19829491	641898.8	0.455	292963.9
7	19407573	20101750	694176.3	0.399	276976.3
8	19776506	20501470	724963.3	0.350	253737.1
9	19776793	29539563	762770.3	0.307	234170.5
10	19782950	20596621	813670.3	0.269	218877.3
11	19827694	20723870	876175.3	0.236	211497.3
12	19928865	20921808	992942.6	0.207	205539.1
13	19945480	20968517	1023036	0.182	186192.6
14	19979553	21098518	1120565	0.159	178169.8
15	20053289	21295602	1242313	0.140	173923.8
16	20133635	21452510	1318875	0.122	160902.8
17	20136356	21495488	1359131	0.107	145427.1
18	20137353	21352854	1215500	0.094	114257.0
19	20151149	21302774	1151624	0.082	94433.24
20	20154919	21160700	1005782	0.072	72416.34
				N.P.V	41,60,288

Table 4.5: Cash flows in overall average size tur processing units.

Year	Cash Outflow (Rs.)	Cash Inflow (Rs.)	Net cash flow (Rs.)	D.F at 14%.	Net discounted cash flow (Rs.)
0	547000				-547000
1	14206156	14593946	387790.1	0.877	340091.9
2	14263514	14657923	394408.9	0.769	303300.5
3	14273890	14687124	413233.9	0.674	278519.7
4	41295058	14817664	422606.1	0.592	250182.8
5	41567775	14999876	432101.1	0.519	224260.5
6	14691727	15145073	453345.9	0.455	206272.3
7	14860164	15352774	492610.1	0.399	196551.4
8	15142652	15657714	515061.6	0.35	180271.5
9	15142871	15686774	543903.1	0.307	166978.2
10	15147586	15730303	582716.7	0.269	156750.8
11	15181846	51827379	645532.6	0.236	152345.7
12	15259311	15978382	719070.8	0.207	148847.6
13	15272033	16014016	741982.2	0.182	135040.7
14	15296897	16113191	816294.1	0.159	129790.7
15	15354581	16263543	908962.1	0.14	127254.6
16	15416101	16383246	967144.9	0.122	177991.6
17	15418185	16411633	997847.9	0.107	106769.7
18	15418948	16307220	888271.2	0.094	83497.49
19	15429512	16269015	839502.9	0.082	68389.24
20	15432397	16160629	728231.7	0.072	52432.68
				N.P.V.	28,78,990

4.1.4 Evaluation of tur processing units

To evaluate the feasibility of investments in tur processing units, the criteria of Net present value, Benefit cost ratio, Internal rate of returns and Pay back period were used. Analysis were carried out for the three sizes groups of tur processing units presented in the Table 4.6.

Net present value

The annual net cash inflows were discounted at discount rate of 14 per cent to obtain the present value of net benefits in tur processing units. The initial investments were made in each size group of the units were then deducted from respective present value of net benefits.

It may be seen from the Table 4.6 that the net present value in small units was Rs.15.98 lakhs and Rs.41.60 lakhs in large units and Rs.28.79 lakhs for an overall average units. However, the results showed that the investments in tur processing units was a financially feasible proposal both in small and large units.

Benefit cost ratio

This criterion indicates the returns in the processing units. From the Table 4.6 it could be seen that the Benefit cost ratio as 4.56, 7.44 and 6.00 for small, large and overall average size units respectively. The results showed that investments in large units were more profitable than those in small units. However, since all the size groups had a benefit cost ratio of more than unity, it

can be concluded that the investment in tur processing units is financially and economically feasible.

Internal rate of returns

This criterion measures the rate of returns that can be earned by investing in tur processing units. It also considers the reinvestment opportunities which are absent in other techniques.

The Internal rate of returns was 76.60 per cent in small, 93.12 per cent in large and 84.86 per cent in overall average size processing units.

Pay back period

The time required to recover the initial investment made is indicated by the pay back period in a project. In tur processing units it was seen that the pay back period was 2.21 years in small, 1.32 years in large and 1.76 years in overall average size units.

4.2 Cost and Months of Tur Procurement

4.2.1 Existing channels

It was observed in the study that the tur processing units procure tur through following patterns, they are.

Channel I : Farmer→ Processor.

Channel II: Farmer→Trader→ Processor.

Channel III: Farmer→ Commission agent→Processor.

Table 4.6 : Evaluation of investment in tur processing units.

Sl. No.	Particulars	Small	Large	Overall average
1	Net present value (in lakhs)	15.98	41.60	28.79
2	Benefit cost ratio	4.56	7.44	6.00
3	Internal rate of returns (%)	76.60	93.12	84.86
4	Pay back period (Years)	2.21	1.32	1.76

4.2.2 Quantity and value of tur procured under different channels

As presented in Table 4.7 it was found that, at an overall average level, procurement of tur through the channel III was maximum, accounting to 54.86 per cent. The minimum was observed in the channel I, accounting 165.65 quintals, accounting to 2.27 per cent. Similarly the value of tur procured was maximum in channel III and minimum in channel I.

The small and large processing units procure the tur from all the three patterns. The small processing units procure tur through channel I, channel II and channel III accounting 2.59 per cent, 41.31 per cent and 56.10 per cent respectively. The total quantity and value of tur procured by small units was 4946.3 quintals and 103.02 lakhs respectively.

The large processing units procured maximum quantity of tur through channel III, that is 5218.4 quintals, accounting 54.22 per cent. These units procured minimum quantity through the channel I, that is 203.3 quintals, accounting 2.11 per cent. Similar was the case with reference to the value of tur procured. The total quantity procured was 9625 quintals valuing at Rs.200.45 lakhs.

4.2.3 Cost incurred in procurement

The per quintal cost of tur procured under different channels by different categories of tur processing units is presented in Table 4.8.

Table 4.7: Procurement channels in tur processing units.

Sl.No.	Channel	Quantity of tur procured (Qtls)	Price per quintal	Value of tur procured (Rs. in lakhs)
	SMALL			
1	Channel I	128.0 (2.59)	2050.0	2.62(2.54)
2	Channel II	20433(41.31)	2075.0	42.40(41.16)
3	Channel III	2775.0 (56.10)	2090.0	58.00(56.30)
	Total	4946.3 (100)		103.02(100)
	LARGE			
1	Channel I	203.3(2.11)	2050.0	4.17(2.08)
2	Channel II	4203.3(43.67)	2075.0	87.22(43.51)
3	Channel III	5218.4(54.22)	2090.0	109.06(54.41)
	Total	9625.0(100)		200.45(100)
	OVERALL AVERAGE			
1	Channel I	165.65(2.27)	2050.0	3.40(2.24)
2	Channel II	3123.30(42.87)	2075.0	64.81(42.71)
3	Channel III	3996.70(54.86)	2090.0	83.53(55.05)
	Total	7285.65(100)		151.74(100)

Figures in parentheses indicate percentage to the total.

At an overall average level, the average cost of tur procurement was Rs.127.60 per quintal. In this total cost, the purchase and turnover tax accounted for 32.47 per cent indicating highest among other items of cost on procurement. This was followed by commission, market fee, packing material, transport and handling and cleaning and weighing. Which accounted for 32.05 per cent, 16.24 per cent, 10.15 per cent, 5.56 per cent and 3.53 per cent respectively, The total cost of procurement per quintal worked out to be higher through channel III, that is Rs.128.95. This was followed by channel II and I, that is Rs.126.90 and Rs.78.95 per quintal respectively.

The small processing units incurred on an average Rs.128.05 for procuring one quintal of tur. The cost of procurement involved per quintal of tur was highest through channel III, that is Rs.129.40 followed by channel II and channel I accounting for Rs.127.35 and Rs.79.40 respectively. On an average, the major cost incurred was on purchase tax and turnover tax, that is Rs.41.43 (32.36 %). This was followed by commission, market fee, packing material, transport and handling and cleaning and weighing. Which accounted for Rs.40.90 (31.94 %), Rs.20.72 (16.18 %), Rs.13.40(10.46 %), Rs.7.10 (5.54 %) and Rs.4.50 (3.52 %) respectively.

The total cost of procuring one quintal of tur by the large processing units indicated that on an average it incurred Rs.127.15 while it was found to be highest in channel III, that is, Rs.128.50 and lowest in channel I, that is, Rs.78.50. On an average in the total cost, purchase and turnover tax constituted

for maximum cost, that is, Rs.41.43 (32.58 %) and cleaning and weighing constituted for minimum cost, that is Rs.4.50 (3.52 %) .

4.2.4 Months of procurement

The months of procurement of tur refers to the quantity of tur procured in each month, during the tur season, that is January to May is presented in Table 4.9.

At an overall average level the quantity of tur procured was highest in the months of February and March, that is, 1919.95 quintals (26.35 %) and 1801.65 quintals (24.73 %) respectively. In the months of January, April and May, it was 1555.80 quintals (21.35 %), 1229.15 quintals (16.87 %) and 779.05 quintals (10.70 %) respectively. The overall average total quantity procured was 7285.65 quintals.

With respect to the sizes of the tur processing units individually, it was found that the small processing units procured a maximum of 1256.6 quintals (25.40 %) during the month of February and minimum of 620.0 quintals (12.68 %.) in the month of May. Similarly, in case of large processing units, the quantity of tur procured was maximum, that is, 2583.3 quintals (26.84 %) in February and minimum, that is 938.1 quintals (9.75 %) during May. This indicated that the processing units procured maximum quantity of tur during February and March months.

Table 4.8: Cost incurred in procurement of tur under different channels.

(Rs. per qtl).

Sl. No.	Size of the processing unit	Qunatity of tur procured (qtls)	Market fee	Commission	Packing material	Transport and Handling	Cleaning and weighing	Purchase and turnover tax	Total
	SMALL								
1	Channel I	128.0	20.50	-	13.40	-	4.50	41.00	79.40
2	Channel II	2043.3	20.75	40.00	13.40	7.20	4.50	41.50	127.35
3	Channel III	2775.0	20.90	41.80	13.40	7.00	4.50	41.80	129.40
	Average		20.72	40.90	13.40	7.10	4.50	41.43	128.05
			(16.18)	(31.94)	(10.46)	(5.54)	(3.52)	(32.36)	(100)
	LARGE								
1	Channel I	203.3	20.50	-	12.50	-	4.50	41.00	78.50
2	Channel II	4203.3	20.75	40.00	12.50	7.20	4.50	41.50	126.45
3	Channel III	5218.4	20.90	41.80	12.50	7.00	4.50	41.80	128.50
	Average		20.72	40.90	12.50	7.10	4.50	41.43	127.15
			(16.30)	(32.17)	(9.83)	(5..58)	(3.54)	(32.58)	(100)
	OVERALL AVERAGE								
1	Channel I	165.65	20.50	-	12.95	-	4.50	41.00	78.95
2	Channel II	3123.30	20.75	40.00	12.95	7.20	4.50	41.50	126.90
3	Channel III	3996.70	20.90	41.80	12.95	7.00	4.50	41.80	128.95
	Average		20.72	40.90	12.95	7.10	4.50	41.43	127.60
			(16.24)	(32.05)	(10.15)	(5..56)	(3..53)	(32.47)	(100)

Figures in parentheses indicate percentage to the total.

Table 4.9: Monthwise procurement of tur in processing units during the season.

(qtls).

Sl. No.	Size of the processing unit	Months of procurement					Total
		January	February	March	April	May	
1	Small	1048.3	1256.6	1170.0	851.3	620.0	4946.3
		(20.28)	(25.70)	(23.93)	(17.41)	(12.68)	(100)
2	Large	2063.3	2583.3	2433.3	1607.0	938.1	9625.0
		(21.44)	(26.84)	(25.27)	(16.70)	(9.75)	(100)
3	Overall average	1555.80	1919.95	1801.65	1229.15	779.05	7285.65
		(21.35)	(26.35)	(24.73)	(16.87)	(10.70)	(100)

Figures in parentheses indicate percentage to the total.
Note: The procurement in other months is either negligible or nil.

4.3 Processing of Tur

4.3.1 Cost incurred in carrying inventory of tur

Cost of carrying inventory by processing units is presented in Table 4.10. At the overall average level, the cost of tur stored worked out to Rs.282.41 per quintal. Interest on working capital accounted for a major portion of inventory cost, that is, Rs.264.13 (93.53 %). The other items of cost were that on maintenance and storage, which accounted for 3.61 per cent (Rs.10.20) and 2.86 per cent (Rs.8.08) respectively. The total cost of carrying inventory was more in large size units, (Rs.299.01) as compared to small size processing units, that is, Rs.265.80.

Hence, the rate of interest forms an important and major cost in carrying inventory of tur processing units.

4.3.2 Stages involved in processing

Processing can be defined as the recovery of dal from the tur, either by manual or mechanical means. The stages identified in the processing of tur, as followed by the processing units are,

Stage I: Soaking of tur

Stage II: Oil treatment of tur

Stage III: Drying of tur

Stage IV: Winnowing of tur

Table 4.10: Cost of carrying inventory by tur processing units.

(Rs. per qtl)

Sl. No.	Size of the processing units	Quantity of tur stored (qtls)	Price per quintal of tur stored (Rs.)	Value of tur stored (Rs.in lakhs)	Period of storage (days)	Storage cost	Cost of Maintenance of Stock	Interest on carrying inventory capital (at 18%)	Total
1	Small	2096.30	2071.60	43.43	240	7.60	9.60	248.60	265.80
2	Large	3657.50	2071.60	75.77	270	8.55	10.80	279.66	299.01
3	Overall average	2876.90	2071.60	59.60	255	8.08	10.20	264.13	282.41
						(2.86)	(3.61)	(93.53)	(100)

Figures in parentheses indicate percentage to the total.

Stage V: Splitting of tur

Stage VI: Polishing of dal

Stage VII: Separating of dal

Stage VIII: Bagging of dal

4.3.3 Cost incurred in processing of tur

The cost incurred in processing of tur is presented in Table 4.11. At an overall average level, the per quintal cost of processing worked out to be Rs.49.47. Among the items of cost, utilities constituted for higher proportion, that is, Rs.24.17 (52.57 %), among the utilities cost, expenditure on oil and fuel accounted for major proportion, that is, Rs.12.36 (24.98 %) and Rs.11.76 (23.77 %) respectively. It was followed by packing material and wages, that is, Rs.13.89 (28.08 %) and Rs..9.57 (19.35 %).

The per quintal cost on utilities was more in small processing units and less in large processing units, accounting for Rs.27.83 (54.21%) and Rs.24.19 (50.81 %) respectively. The per quintal cost incurred on packing material also was more in small processing units, that is, Rs.14.42 (28.09 %) and less in large processing units, that is Rs.13.36 (28.06 %) respectively. The costs on wages was more in large processing units, that is, Rs.10.06 (21.13 %) and less in small units, that is, Rs.9.08 (17.69 %).

Table 4.11: Cost incurred in processing of tur.

(Rs. per qtl).

Sl.No.	Particulars	Small	Large	Overall Average
I	Utilities			
	a. Power	12.68	10.84	11.76
		(24.70)	(22.77)	(23.77)
	b. Oil	12.46	12.26	12.36
	(sesame/castor)	(24.23)	(25.75)	(24.98)
	c. Water	2.69	1.09	1.89
		(5.24)	(2.29)	(3.82)
	Total	27.83	24.19	24.17
		(54.21)	(50.81)	(52.57)
2	Packing material	14.42	13.36	13.89
	(gunny bags).	(28.09)	(28.06)	(28.08)
3	Wages	9.08	10.06	9.57
		(17.69)	(21.13)	(19.35)
	Total cost of production	51.33	47.61	49.47
		(100)	(100)	(100)

Figures in parentheses indicate percentage to the total.

4.3.4 Custom milling in tur processing units

The processing units beside milling their own tur do custom milling also. The returns realised by tur processing units from custom milling are presented in Table 4.12.

There were 10 tur processing units among 30 units selected did take up custom milling services. Hence the results presented account for respective number of mills who did custom milling service. The total returns realised by the mills on an overall average size unit amounted to Rs.0.98 lakh and did custom milling of 631.0 quintals of tur charging Rs.155.0 per quintal of tur.

Among the small and large size processing units, 6 out of the 15 small size units took custom milling of 592.0 quintals of tur charging Rs.160 per quintal and realising the total returns of Rs.0.95 lakh. Four large units out of 15 processing units selected took custom milling of 670 quintals of tur and charged Rs.150 per quintal and realising the total returns of Rs.1.00 lakh.

4.3.5 Labour requirements and their wages in processing

The labour requirements at different stages as worked out for fifty quintals per day capacity, is presented in Table 4.13. The total number of male and female labour, required 5 and 8 respectively. Hence the processing activity required more number of female labour compared to male labour. Of the total female labour required, soaking and splitting operation need 2 labours each. This is followed by oil treatment, winnowing, polishing and separating

Table 4.12: Custom milling in tur processing units.

Sl. No.	Size of the processing unit	Number of mills	Quantity processed (qtls).	Amount charged (Rs./qtl)	Returns (Rs. in lakhs)
1	Small	6	592.0	160.0	0.95
2	Large	4	670.0	150.0	1.00
3	Overall average	5	631.0	155.0	0.98

accounted 1 labour each. Of the total male labour required, drying and bagging operation need 2 labour each, followed by soaking accounted for 1 labour.

The wages per day were high (Rs.45) for male labour who were engaged for drying and bagging operation. While this operation requires more mascular efforts. The wages paid to other operations were Rs.35 for female engaged in soaking, oil treatment winnowing, splitting, polishing and separating operations.

4.4 Cost and Return Structure in the Production of Tur Dal

4.4.1 Cost in production of tur dal

The cost of production of tur dal incurred for one quintal of tur is presented in Table 4.14.

At the overall average level, the per quintal cost of production of tur dal worked out to Rs.2664.12 per quintal of tur processed. Among the items of cost in production, cost of tur constituted for the major component of cost, that is, Rs.2071.60 (77.76 %). This was followed by the cost of carrying inventory, tur procurement cost, interest on working capital, cost of processing, interest on fixed capital, administrative overhead, depreciation on machinery and equipment, salaries, factory overhead and depreciation on building. They accounted for 10.60 per cent, 4.79 per cent, 3.84 per cent, 1.86 per cent. 0.44 per cent, 0.27 per cent, 0.15 per cent, 0.14 per cent, 0.10 per cent and 0.05 per cent of the total cost respectively.

Table 4.13: Labour requirements at different stages of processing and their wages.

Sl. No.	Stages of processing	Number of Labour		Total Wage (Rs.).
		Male	Female	
1	Soaking of tur	1	2	115
2	Oil treatment of tur	-	1	35
3	Drying of tur	2	-	90
4	Winnowing of tur	-	1	35
5	Splitting of tur	-	2	70
6	Polishing of dal	-	1	35
7	Seperating of dal	-	1	35
8	Bagging of dal	2	-	90
	Total	5	8	505

Note: Labour requirement at different stages of processing was worked out for fifty quintals per day capacity.

Wage rate of male labour Rs.45/- per day and

Wage rate of female labour Rs.35/- per day.

In the large processing units, the cost of production of dal worked out to be lower as compared to small size processing units, that is Rs.2655.96 per quintal of tur processed. While the cost of production in small processing unit was high (Rs.2672.27).

4.4.2 Quantity of main product and by-product

The quantity of main product and by-product per quintal of tur processed is presented in Table 4.15. Dal is the main product, while chura (broken dal), bhusa (husk) and foreign matter or rejection are the by-products of tur.

At an overall average level, one quintal of tur when processed would result in 78.25 kilograms (78.25 %) of dal, 4.75 kilograms (4.75 %) of chura, 15.00 kilograms (15.0 %) of bhusa and rejection of 2.0 kilograms (2.0 %).

Regarding out turn of main product, dal was less in small processing units, that is 78.0 kilograms (78.0 %) and more in large processing units, that is, 78.5 kilograms (78.5 %). Out of the by-products, bhusa and rejection was 15.0 kilograms (15.0 %) and 2.0 kilograms (2.0 %) respectively , in both small and large sizes of processing units, But the chura was high in small units, that is, 5.0 kilograms(5.0%) and low in large processing units, that is, 4.5 kilograms (4.5%).

4.4.3 Value addition by processing activity

Value added in processing of tur is presented in Table 4.16. It was observed from the table, that at an overall average level the value added as a result of processing of tur was Rs.637.36 per quintal of tur processed. This

Table 4.14 : Cost of tur dal production in tur processing units.

(Rs. per qtl)

Sl. No.	Particulars	Small	Large	Overall Average
1	Tur cost	2071.60 (77.52)	2071.60 (78.00)	2071.60 (77.76)
2	Tur Procurement cost	128.05 (4.79)	127.15 (4.79)	127.60 (4.79)
3	Cost of carrying inventory	265.80 (9.95)	299.01 (11.26)	282.41 (10.60)
4	Cost of processing	51.33 (1.92)	47.61 (1.79)	49.47 (1.86)
5	Salaries	4.13 (0.15)	3.35 (0.12)	3.74 (0.14)
6	Factory overhead	3.08 (0.11)	2.56 (0.10)	2.82 (0.10)
7	Administrative overhead	7.62 (0.29)	6.65 (0.25)	7.14 (0.27)
8	Interest on			
	a. Working capital at 18%	120.99 (4.53)	83.61 (3.15)	102.30 (3.84)
	b. Fixed capital at 15%	13.59 (0.51)	10.06 (0.38)	11.82 (0.44)
9	Depreciation on			
	a. Building at 5%	1.29 (0.05)	1.15 (0.04)	1.22 (0.05)
	b. Machinery and equipment at 10%	4.79 (0.18)	3.21 (0.12)	4.00 (0.15)
	Total cost of production	2672.27 (100)	2655.96 (100)	2664.12 (100)

Figures in parentheses indicate percentage to the total.

Table 4.15:Quantity of main product and by-product per quintal of tur Processed.

(Kgs)

Sl.No.	Particulars	Small	Large	Overall average
1	Dal	78.0	78.5	78.25
2	Chura (broken dal)	5.0	4.5	4.75
3	Bhusa (husk)	15.0	15.0	15.0
4	Rejection	2.0	2.0	2.0

worked out to 30.77 per cent of value addition. Similarly the value added was maximum in large units, that is, Rs.647.58 (31.26 %), followed by small units, that is, Rs.627.14 (30.27 %).

4.4.4 Sales realisation

Sales realisation by processing one quintal of tur is presented in Table 4.17. It showed that at the overall average level, the sales realisation by processing one quintal of tur was Rs.2856.26. Of the total sales realisation, the sale of dal amounted maximum, that is, Rs.2709.02 (94.85 %), followed by that of chura and bhusa, that is, Rs.76.00 (2.66 %) and Rs.71.25 (2.49 %) respectively.

The sales realisation in small and large units were Rs.2850.05 and Rs.2862.49 respectively. This indicated that the sales realisation was high in large processing units as compared to small processing units.

4.4.5 Cost and return structure in processing tur.

Cost and return from processing one quintal of tur is presented in Table 4.18. The total cost incurred by the tur processing unit was Rs.2802.60 at an overall average level. It was more in small units, that is, Rs.2810.67 than large processing units, that is, Rs.2794.52.

Net returns at an overall average level worked out to Rs.53.66. It was more in large units (Rs.67.97) than in small processing units, (Rs.39.40). It was observed that tur processing units at an overall average level earned profits to the

Table 4.16: Value addition per quintal of tur

Sl.No.	Particulars	Small	Large	Overall Average
1	Sale value of dal obtained per quintal of tur (Rs.)	2698.80	2719.24	2709.02
2	Purchase value of tur (Rs.)	2071.66	2071.66	2071.66
3	Value addition (Rs.)	627.14	647.58	637.36
4	Percentage of value added	30.27	31.26	30.77

Table 4.17: Sales realisation from one quintal of tur processed.

Sl.No.	Tur products	Quantity (kg)	Price per kg (Rs.)	Value (Rs.)
	SMALL			
1	Dal	78.0	34.60	2698.88 (94.70)
2	Chura (broken dal)	5.0	16.00	80.00 (2.81)
3	Bhusa (husk)	15.0	4.75	71.25 (2.49)
	Total			2850.05 (100)
	LARGE			
1	Dal	78.5	34.64	2719.24 (95.00)
2	Chura (broken dal)	4.5	16.00	72.00 (2.52)
3	Bhusa (husk)	15.0	4.75	71.25 (2.48)
	Total			2862.49 (100)
	OVERALL AVERAGE			
1	Dal	78.25	34.62	2709.02 (94.85)
2	Chura (broken dal)	4.75	16.00	76.00 (2.66)
3	Bhusa (husk)	15.0	4.75	71.25 (2.49)
	Total			2856.26 (100)

Figures in parentheses indicate percentage to the total.

Note: The rejection includes stones and chaff which is thrown out and it does not cost any amount.

tune of Rs.0.019, that is, 1.9 paise on every rupee of investment. Large processing unit gained higher profit as compared to small units.

4.5 Marketing of Tur Dal

4.5.1 Existing channels for marketing tur dal

Tur dal is marketed to consumers mainly through three channels, as observed in the study area, they are,

Channel I : Processor → Consumer

Channel II: Processor → Trader → Consumer

Channel III: Processor → Commission agent → Consumer

4.5.2. Quantity and value of tur dal marketed under different channels

The quantity and value of tur dal marketed under different channels are presented in Table 4.19. It could be seen from the table, that at an overall average level maximum quantity of tur dal marketed was through channel III, that is, 2823.6 quintals (49.48 %) valuing Rs.97.75 lakhs followed by channel II, that is, 2157.2 quintals (37.80 %) valuing Rs.74.68 lakhs. Low quantity of tur dal was marketed through channel I that is, 726.0 quintals (12.72 %) valuing Rs.25.13 lakhs. Hence the total quantity of tur dal marketed at an overall average level was 5706.8 quintals valuing Rs.197.56 lakhs.

Small processing units marketed maximum quantity of tur dal through channel III, amounting to 2029.7 quintals (52.61 %) followed by channel II, that

Table 4.18: Cost and return in processing of tur.

(Rs.per qtl)

Sl.No.	Particulars	Small	Large	Overall Average
1	Sales realisation	2850.07	2862.49	2856.26
2	Cost of			
	a. Production	2672.27	2655.96	2664.12
	b. Marketing	138.40	138.56	138.48
	Total	2810.67	2794.52	2802.60
3	Net returns	39.40	67.97	53.66
4	Benefit cost ratio	1.014	1.024	1.019

is 1361.4 quintals (35.29 %). While minimum quantity was marketed through channel I, amounting to 467.0 quintals (12.10 %). The total quantity marketed by small units, that is, 3858.1 quintals valuing Rs.133.49 lakhs.

The large processing units marketed maximum quantity of tur dal through channel III, that is, 3617.6 quintals (47.88 %) followed by channel II, that is 2953.0 quintals (39.08 %). While minimum quantity was marketed through channel I, accounted 985.0 quintals (13.04 %). where in the total quantity marketed was 7555.6 quintals valuing Rs.261.72 lakhs.

4.5.3 Cost of marketing tur dal under different channels

The cost of marketing a quintal of tur dal under different channels is presented in Table 4.20. The total cost of marketing of a quintal of tur dal worked out to be Rs.138.48 at an overall average level. Of the total cost of marketing, sales tax and turnover tax and commission which accounted for 50.00 per cent (Rs.69.24) each. The cost of marketing at the overall average level was higher through channel III, that is, Rs.138.48 followed by channel II and channel I accounting Rs.69.24 each.

In the small processing units, the total cost incurred on marketing was Rs.138.40 per quintal of tur dal in channel III. The cost of marketing was found to be higher through channel III, by channel II and channel I accounting Rs.69.20 each.

In the large processing units, the total cost on marketing worked out to be similar in channel I and channel II amounting for Rs.69.28 each respectively.

Table 4.19: Quantity and value of tur dal marketed under different channels.

Sl.No	Intermediaries	Quantity of tur dal marketed (qtls)	Price per quintal (Rs.)	Value of tur dal marketed (Rs.in lakhs.)
	SMALL			
1	Channel I	467.0(12.10)	3460.0	16.16
2	Channel II	1361.4(35.29)	3460.0	47.10
3	Channel III	2029.7(52.61)	3460.0	70.23
	Total	3858.1(100)	3460.0	133.49
	LARGE			
1	Channel I	985.0(13.04)	3464.0	34.12
2	Channel II	2953.0(39.08)	3464.0	102.29
3	Channel III	3617.6(47.88)	3464.0	125.31
	Total	7555.6(100)	3464.0	261.72
	OVERALL AVERAGE			
1	Channel I	726.0(12.72)	3462.0	25.13
2	Channel II	2157.2(37.80)	3462.0	74.68
3	Channel III	2823.6(49.48)	3462.0	97.75
	Total	5706.8(100)	3462.0	197.56

Figures in parentheses indicate the percentage to the total.

Wherein the cost of marketing worked out to be higher through channel III, that is, Rs.138.56.

4.6 Performance of Tur Processing Units

4.6.1 Capacity utilisation in tur processing units

The installed and utilised capacity of the tur processing units is presented in Table 4.21. The overall average annual installed capacity of the tur processing units was 17662.5 quintals, but these processing units processed only 7285.6 quintals of tur. Thus the overall average picture of utilised capacity in relation to installed capacity indicated that, only 40.96 per cent of the total capacity utilised. On an average the processing units worked for 240 days in a year, their installed capacity per day was 72.5 quintals, but the utilised capacity per day was only 29.86 quintals.

The installed capacity was lower in small processing units, that is, 55 quintals per day. It was higher in large processing units, that is 90 quintals per day. Similarly the number of working days was minimum in small processing units with 225 days per year and maximum in large processing units with 255 days per year. This lead to an maximum annual installed capacity of 22950.0 quintals in large processing units, as compared to 12375.0 quintals in small processing units. Therefore, the quantity processed per day was higher, that is, 41.94 quintals in large processing units as compared to small units (21.98 quintals). However, the proportion of capacity utilisation by percentage was

Table 4.20: Cost of marketing tur dal under different channels.

Sl.No	Size of the processing unit	Quantity of tur dal marketed (qtls.)	Sales tax and turnover tax	Commission	Total
	SMALL				
1	Channel I	467.0	69.20	-	69.20
2	Channel II	1361.4	69.20	-	69.20
3	Channel III	2029.7	69.20	69.20	138.40
	LARGE				
1	Channel I	985.0	69.28	-	69.28
2	Channel II	2953.0	69.28	-	69.28
3	Channel III	3617.6	69.28	69.28	138.56
	OVERALL AVERAGE				
1	Channel I	726.0	69.24	-	69.24
2	Channel II	2157.2	69.24	-	69.24
3	Channel III	2823.6	69.24	69.24	138.48

Figures in parentheses indicate the percentage to the total.

higher in large processing units, accounting 41.94 per cent as compared to small processing unit, that is, 39.97 per cent.

4.6.2 Financial performance of tur processing units

The results pertaining to financial performance of the small, large and overall average size of tur processing units, which is assessed through different ratios is presented in Table 4.22

Solvency ratios

Here the ratios like liabilities to owned funds and fixed assets to owned funds were considered. The ratio of total liabilities to owned funds at the overall average level was found to be 0.99. For the small size processing the ratio was found to be 1.23 while in large processing unit the ratio during the period was 0.75.

The ratio of fixed assets to owned funds was found to be 1.04 at an overall average level. Similarly, the ratio of 1.36 found in case of small processing units. While the large processing units had a ratio of 0.72.

Liquidity ratios

Liquidity position of the processing units was examined using two ratios namely liquid assets to total assets ratio and current assets to current liabilities ratio.

Table 4.21: Capacity utilisation of tur processing units.

Sl. No.	Size of the processing unit	Installed capacity per day (qtls)	Number of days worked	Annual installed capacity (qtls)	Annual quantity processed (qtls)	Quantity processed per day (qtls)	Capacity utilisation (percentage)
1	Small	55.0	225	12375.0	4946.3	21.98	39.97
2	Large	90.0	255	22950.0	9625.0	37.74	41.94
3	Overall average	72.5	240	17662.5	7285.6	29.86	40.96

Note: Annual quantity of tur processed is considered as same quantity procured during the year.

The ratio of liquid assets to total assets was 0.46 for the study period at an overall average level. This ratio in case of small processing unit was 0.40. where as in case of large processing unit it was 0.52.

The ratio of current assets to current liabilities at the overall average level was 2.48 during the study period. The ratio of small and large processing units was 2.40 and 2.55 respectively.

Profitability ratios

The profitability of the tur processing units was assessed 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 indicate the net profits for each rupee of assets. The value of the ratio was 0.27 in small units during the study period. The value of this ratio for large processing units was 0.51. At the overall average level, the value of this ratio was 0.39.

The ratio of net profit to fixed assets, in the small processing units was 0.46 while this ratio in large and overall average level of processing units was found to be 0.97 and 0.72 respectively.

The ratio of net profit to owned funds at the overall average level was 0.55 during the study period. For the small processing units, this ratio was found to be 0.47 and in large processing units the ratio was 0.63.

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

Working capital turnover ratio indicated the relationship between sales and working capital. This ratio was 1.03 at the overall average level. It is found to be 1.02 and 1.04 in small and large processing units respectively during the study period.

Fixed assets turnover ratio was 30.79 and 41.74 for small and large processing units respectively. At the overall average level the ratio was found to be the value 36.27 for the study period.

Total assets turnover ratio indicating the intensity of utilisation of total assets by the processing units. This ratio for small, large and overall average units was found to be 18.44, 20.03 and 19.24 respectively.

4.6.3 Break-even volume of output in tur processing units

It is evident from Table 4.23 that, on an average, a minimum quantity of 11370.55 quintals of tur dal should be produced so as to continue the production process at an overall average level. Similarly, a minimum quantity of 9504.19 quintals of dal in the case of large size dal mills and 10193.81 quintals of dal in case of small size dal mills needs to be produced in order to cover the total fixed cost.

Table 4.22: Financial performance of the tur processing units during 1997-98.

Sl. No.	Ratios	Small	Large	Overall Average
	I Solvency ratios			
a.	Total liabilities to owned funds	1.23	0.75	0.99
b.	Fixed assets to owned funds	1.36	0.72	1.04
	II Liquidity ratios			
a.	Liquid assets to total assets.	0.40	0.52	0.46
b.	Current assets to current liabilities	2.40	2.55	2.48
	III Profitability ratios			
a.	Net profit to total assets	0.27	0.51	0.39
b.	Net profit to fixed assets	0.46	0.97	0.72
c.	Net profit to owned funds.	0.47	0.63	0.55
	IV Turnover ratios			
a.	Working capital turnover.	1.02	1.04	1.03
b.	Fixed assets turnover.	30.79	41.74	36.27
c.	Total assets turnover.	18.44	20.03	19.24

Figures in parentheses indicate percentage to the total.

Table 4.23 : Break-even volume of output in tur processing units.

Size of the processing unit	Total fixed cost (Rs.in lakhs)	Average variable cost per unit of output (Rs).	Average price per unit of output (Rs.)	Break even point
Small	4.48	2810.67	2850.07	11370.55
Large	6.46	2794.52	2862.49	9504.19
Overall average	5.47	2802.60	2856.26	10193.81

4.7 Problems faced by Processors of Tur Processing Units

Opinion of sample processors regarding problems associated with processing of tur were elicited and presented in Table 4.24.

Taxation was the major problem faced by the processors in tur processing. All the processors (100 %) expressed that the existing market fee, commission charges and taxation were very high and needs to be rationalized. Procurement of raw material formed another problem as more than 90 per cent of dal mill owners viewed it as a problem. The lack of suitable system to get the required capital for the tur processing unit was also continued as a problem by more than 83 per cent of tur processing units. The scarcity of labour formed another problem as more than 75 per cent of the tur processing units felt it. Inadequate power supply is one of the major problem faced by the processors in tur processing. Majority of the processors (76.67 %) including both small and large size units have complained about the poor supply of power. This has resulted in under utilisation of the capacity in the tur units.

The problems regarding repairs and maintenance and marketing were reported by 73.33 per cent and 70.00 per cent of the processors respectively. In addition to the above, the large unit processors felt that the transportation (53.33%) was very high. This was followed by problems regarding location of site (33.33 %), availability of land and processing which recorded 23.33 per cent each of the response.

Table 4.24 : Problems faced by processors of tur processing units.

Sl. No.	Particulars	Small units (n=15)		Large units (n=15)		Total units (n=30)	
		No.	%	No.	%	No.	%
1	Problems regarding availability of land	4	26.67	3	20.00	7	23.33
2	Problems regarding location of site	4	26.67	6	40.00	10	33.33
3	Problems regarding labour	10	66.67	13	86.67	23	76.67
4	Problems regarding transportation	5	33.33	8	53.33	13	43.33
5	Problems regarding procurement	15	100.00	13	86.67	28	93.33
6	Problems regarding processing.	3	20.00	4	26.66	7	23.33
7	Problems regarding power supply	10	66.67	13	86.67	23	76.67
8	Problems regarding taxation	15	100.00	15	100.00	30	100.00
9	Problems regarding getting finance	13	86.67	12	80.00	25	83.33
10	Problems regarding marketing	9	60.00	12	80.00	21	70.00
11	Problems regarding repairs and Maintenance.	12	80.00	10	66.67	22	73.33

Discussion

V DISCUSSION

The results presented in the previous chapter are discussed in this chapter. The discussion is presented under the following heads, for the purpose of analytical clarity.

1. Investment Pattern in Tur Processing Units
2. Cost and Months of Procurement
3. Processing of Tur
4. Cost and Return Structure in the Production of Tur Dal
5. Marketing of Tur Dal
6. Performance of Tur Processing Units
7. Problems faced by Processors of Tur Processing Units

5.1 Investment Pattern in Tur Processing Units

5.1.1 Capital investment pattern in tur processing units

Table 4.1 indicated that there was a direct relationship between the total capital investment and size of the processing unit. The total capital investment was high in large processing units than in small processing units. The requirement of capital investment increased with the increase in size of the units, because of the increased of requirement of land, building, machinery and other fixtures on one side (fixed capital) and on the other side the increased

requirement of working capital. This was also observed by Singh and Sidhu (1974) in case of groundnut processing.

It was observed that the proportion of working capital was much more than the fixed capital. The major part of the working capital was spent for procurement of tur, which was seasonal in nature. The proportion of fixed capital invested in the total capital was higher in small processing units (4.04 %), when compared to large processing units. This might be due to higher proportion of investment in the total capital on land and machinery by small units, as compared to large units. However the investment on working capital was higher in large units as compared to small size units because of higher capacity utilisation in large processing units.

5.1.2 Fixed capital investment pattern in tur processing units

It was observed from Table 4.2 that the fixed capital investment on the tur processing unit was higher on machinery and equipment (49.91 %) followed by building (31.99 %), land (14.63 %), borewell (2.74 %) and other fixtures (0.73 %). The heavy investment on machinery and equipment was (49.99 %) due to more number of machines installed, the different types of machines and the varied number of operations carried out. This is in accordance with the findings of Bawa and Kainth (1989) and Kasle *et al.*(1996). Comparatively more investment on land and building (46.62 %) was due to more working space required for processing units store room for storage of tur and drying yards for drying tur.

The investment on borewell was necessary as these tur processing units require large amount of water for soaking the tur. The fixed capital investment was lowest on other fixtures, due to less administrative staff required in these units.

5.1.3 Evaluation of investment in tur processing units

The evaluation of investments in tur processing units was carried out by using analytical techniques viz., the Net Present Value, the Benefit Cost Ratio, Internal Rate of Returns and Pay Back Period. These analyses were done for small, large and overall average size processing units separately presented in Table 4.6.

Net present value

As discussed earlier, the Net present value in large unit was higher than in small units, it was, Rs.15.98 lakhs for the small units, it was, Rs.41.60 lakhs for the large units and Rs.28.79 lakhs for the overall average size units. It was due to the combination of two factors in large processing units viz., lower maintenance costs and higher returns.

Benefit cost ratio

The Benefit cost ratio were 4.56, 7.44 and 6.00 for small, large and overall average size processing units respectively. The discounted benefit cost ratio indicates the net return on investment in project or enterprises. The magnitude of ratio also indicates the priority to be assigned for size of the unit.

Investment in large units should be first priority. However, since the ratios were greater than unity for all three categories of processing units under consideration, the investment in tur processing units, irrespective of the size group, was financially sound and economically feasible.

Internal rate of returns

The Internal rate of returns indicates the rates of returns that can be earned by reinvestment. The Internal rate of returns was 76.60 per cent in small units, 93.12 per cent in large units and 84.86 per cent in overall average units. The Internal rate of returns was higher than the discount rate (14 %) considered in analysis. Thus, this criterion also ranked the large processing units at the top in its profitability.

Pay back period

The Pay back period refers to the time to repay the initial investment in the processing units. In case of small units, the pay back period was 2.21 years, for large units it was 1.32 years and for overall size units was 1.76 years. The small units took higher time to recover the initial investment because of (a) higher initial investment and (b) lower annual net returns from tur processing.

Thus, all the three criteria of project evaluation indicated that irrespective of the size of the processing units investment in tur processing units was economically feasible and financially sound in Gulbarga district of Karnataka state. The inference drawn based on the several criteria for evaluation of investment, except the Pay back period revealed that the results are in

conformity with the general belief that the large processing units are more profitable than small units. This is obvious due to economy in scale.

5.2 Costs and Months of Procurement

5.2.1 Quantity and value of tur procured under different channels

As observed from the Table 4.7, at an overall average level, procurement of maximum tur through the channel III (Commission agent) and channel II (Trader) accounting 54.86 per cent and 42.87 per cent respectively. As the processor need large quantity of tur and which can not be fulfilled by one channel from the study area it is observed, that the processors will finance well in advance to their agents for procurement of tur for which commission agents and trader get commission. The minimum quantity of tur procured was through channel I (Farmer) accounting 2.27 per cent. As the processing units are located out of the city, the farmers sell maximum quantity of tur in the market without facing much problems of transportation and accomodation.

It was also observed that, both large and small processing units procure maximum tur through channel III (Commission agent) and channel II (Trader). As their capacity utilisation of the processing unit can be fulfilled and minimum quantity procure through channel I (Farmer). As the little quantity of tur available to procure from farmer.

5.2.2 Cost incurred in procurement

The procurement cost per quintal of tur procured was higher in channel III (Rs.128.95) at an overall average level, as observed from Table 4.8. The reason was heavy purchase and turnover tax and commission accounting to Rs.41.80 each, market fee (Rs.20.90), packing material (Rs.12.95), transport and handling (Rs.7.00) and cleaning and weighing (Rs.4.50) charges as compared to other channels. While the procurement cost per quintal of tur procured was lower through channel I (Rs.78.95) as a result of no commission charges and no transport and handling charges.

At the overall average level, the major cost incurred on a quintal of tur was on purchase and turnover tax, that is, 32.47 per cent, as it was calculated at 2 per cent of the price per quintal of tur. Similar observations were made by Amrutha (1994) and Kataria and Mehta (1969).

The procurement cost per quintal of tur procured was higher (Rs.128.05) in case of small processing units as compared to large units, due to maximum quantity of tur procured through channel III. The procurement cost per quintal of tur procured was found to be low in large units as they purchased packing materail at a cheaper rate in bulk quantity.

5.2.3 Months of Procurement

As presented in Table 4.9, the months of procurements of tur by tur processing units ranged from January to may, which is the harvesting season of

tur. It was found that the quantity procured by processing units was maximum in February and March (50 %). This was because of heavy arrivals of tur, during these months. And in the later months the arrivals decreased. The similar trend has been observed in all the size group of processing units. This is in corroboration with the studies of Singh *et al.*(1983).

5.3 Processing of Tur

5.3.1 Cost incurred in carrying inventory of tur

It is observed from Table 4.10, that the processing units on an average stored the tur for 255 days, and the cost of carrying inventory was found to be Rs.282.41. Of the total cost of carrying inventory, which is considered as necessary evil with respect to most of the agro-processing units, the interest on carrying inventory accounted for 93.53 per cent. This was because of high rate of interest paid by the processing units.

The differences in cost incurred on carrying inventory by different processing units was due to the difference in number of days it was stored. Hence, there is need to reduce the rate of interest on carrying inventory capital.

5.3.2 Cost incurred in processing of tur

The major cost component of processing one quintal of tur was the utilities (power, oil and water) cost which accounted for 54.21 per cent. For drying operation, the power requirement was more than the other operations, followed by oil. It is necessary to loosen the husk and release cotyledon layer

binding and it provides shining to split dal and water is necessary for soaking of tur. It was followed by packing material cost, which worked out to be 28.09 per cent as the tur were to be protected from insect damage. The wages accounted for 17.69 per cent of the total processing cost, the reason for less labour requirement and the processing units was semi-mechanised nature of processing activity.

The cost of processing one quintal of tur was higher in small processing units, as compared to large unit, because of high price paid for packing material and power cost. Similar observations were made by Jain Hemchand (1989).

5.3.3 Custom milling in tur processing units

The tur processing unit apart from processing tur purchased on their own also processed tur brought to their units on custom service basis. It was ascertained that, processing units considered input cost, labour cost, electricity cost and some margin while fixing the custom service rate. The custom service charge varied form Rs.150.00 per quintal to Rs.160.00 for tur milling amongst, the sample tur processing units. Six, out of the 15 small size units did take up custom milling of 592.0 quintals of tur and thus realising Rs.0.95 lakhs. The reason for doing custom milling by almost all mills in small size category was the non-availability of raw material in the market and small size had to depend mainly on local market for raw material. But in case of large units they procured the tur from local market as well as distant markets. Therefore, to utilize the idle capacity of the units, and to secure high returns, the small units resorted to

custom milling. The custom milling charge was higher in small size mills than large mills. The reason for higher custom service charges by small size mills was that small size units did custom milling regularly as against the large size mills who did custom milling whenever they fell short of raw materials and charged lower custom charges.

5.3.4 Labour requirement and their wages in processing

It can be observed from the Table 4.13, that 70 per cent of the total labour engaged in processing were female. This undoubtedly indicated that, there is a high employment potential particularly to female labour in rural areas. The reason is high labour requirement for soaking, drying, splitting and bagging operation. However, the wages paid for male labour are higher than the female labour. The male labour are engaged in soaking, drying and bagging operation, because it required mascular efforts. The soaking oil treatment, winnowing, splitting, polishing and separating required less mascular efforts and female labours are engaged in such activities.

5.4 Cost and Return Structure in the Production of Tur Dal

5.4.1 Cost in production of tur dal

Table 4.14 indicated that the cost of tur was the major component in the production of tur dal, which constituted 77.76 per cent of the total cost. It was because of high price per quintal of tur procured. This was followed by cost of carrying inventory which accounted for 10.60 per cent. The higher interest rate paid on the capital blocked in carrying inventory. The cost of procurement

constituted for 4.79 per cent of the total cost of production, as a result of high rate of taxation, commission, market fee, transport and handling expenses. The Interest on working capital was 3.84 per cent, it is due to higher interest paid by them. The other items of cost, as the processing cost, salaries to staff, factory, overhead, administrative overhead, interest on fixed capital and depreciation on building and machinery and equipment constituted for least cost.

Thus the study found that the raw material cost itself accounted for about 78 per cent of the total cost of production of tur dal. Therefore it could be stated that the cost of tur, had significantly influenced the behaviour of the total cost. This was in accordance with the observations of Bawa and Kainth (1989).

5.4.2 Quantity of main product and by-product

It is observed form Table 4.15, that one quintal of tur when processed resulted in 78.25 kilograms of main product (dal). The out turn of by-products, that is chura (broken dal) accounted for 4.75 kilograms, 15.00 kilograms of bhusa (husk)and rejection of 2.00 kilograms at the overall average level. The recovery level of 78.00 per cent was considered to be fairly good recovery per cent. Relatively low percent of recovery was due to poor quality of tur procured.

The bhusa and rejection was similar in both categories of processing units. But the out turn of dal and chura varied in both size units. This was because the large units will take intensive care while processing in order to avoid high per cent of chura out turn and the labour employed is relatively more. As

a result of out turn of main product was more in large units as compared to small units. This is corroboration with the studies of Hassan and Raghuram (1987).

5.4.3 Value addition by processing activity

Table 4.16, depicted that, the value added by processing function was Rs.637.36 per quintal of tur at the overall average level. This accounted for 30.77 per cent. When the percentage of value addition by processing activity, by different sizes of processing units was considered, it was found to be higher in large units (31.26 %) than small (30.28 %) processing units. This difference was mainly because of higher sale value of tur dal in some and high purchase value of tur in some. The large processing units, due to the achievement of economices of scale in their operation, increased the percentage of value addition as compared to other size group of processing units.

5.4.4 Sales realisation

Sales realisation from one quintal of tur (Table 4.17) was Rs.2856.26 at an overall average level. Which mainly constituted the sales realisation from dal (94.85 %), as it is the main product of tur. Sales realisation was more in large processing units. Due to higher percent of dal out turn, lower per cent of chura and relatively higher prices obtained.

5.4.5 Cost and return structure in processing of tur

Table 4.18 showed that, the total cost incurred by tur processing unit was Rs.2802.60 at an overall average level. It was more in small units, that is,

Rs.2810.67, due to relatively higher cost of production than large processing unit. The net returns per quintal of tur produced was higher (Rs.67.97) in large processing units as compared to small units, due to high sales realisation and low cost incurred on production. This is because of large scale operation similarly for the same reasons the benefit cost ratio was more in large processing units as compared to small units. Similar were the observations of Kasle *et al* (1996).

5.5 Marketing of Tur Dal

5.5.1 Quantity and value of tur dal marketed under different channels

It could be observed from Table 4.19, that at the overall average level, maximum quantity of tur dal was marketed through channel III (Commission agent) which accounted for 49.47 per cent. This is in accordance with the observations of Dalvi et al (1992). This is mainly because, for marketing dal outside the state, Commission agent was obligatory. Least quantity was marketed through channel I (Consumer) which accounted for 12.72 per cent. The consumers directly buy little quantity of dal from the processors for domestic consumption.

The small and large processing units follow all the three channels, but the maximum quantity is sold through channel III (commission agent) that is 52.61 per cent and 47.88 per cent respectively of the total quantity marketed. When they did not go in for exports, they were only left with huge market for tur dal outside the state. Hence, resorted to sell through commission agent.

5.5.2 Cost of marketing tur dal under different channels

The marketing cost was (Table 4.20) worked out to Rs.138.48 per quintal of tur dal, at an overall average level. Among the different items of cost, sales tax and turnover tax and commission was the major cost item constituting 50.0 per cent each of the total cost of marketing, because of high rate of taxation and commission. Hence there is a need to reduce the tax rateand commission charge in order to encourage the small scale industry.

The cost of marketing per quintal of tur dal marketed at the overall average level, found to be higher through channel III (Commission agent), that is Rs.138.48. Similar were the observations of Dalvi *et al* (1992). As a result of high rate of taxation and commission. Marketing cost was similar through channel I (Consumer) and channel II(Trader), as a result of no commission incurred. The cost of marketing per quintal of dal was high in large processing units than small units.

5.6. Performance of Tur Processing Units

Capacity utilisation and several other ratios were worked out to analyse the business performance of the tur processing units. These ratios were also used to compare the performance of different sizes of tur processing units. Break even volume of output was worked out to know the minimum level of production required to recover the total fixed capital.

5.6.1 Capacity utilisation in tur processing units

As indicated in Table 4.21, the annual total installed capacity at the overall average level of tur processing unit was 17662.5 quintals, but they processed only 7285.6 quintals of tur, that is, only 40.96 per cent of the total installed capacity. This may be because of low production and productivity of tur in the areas, which led to scarcity of tur, and also due to the establishment of more number of tur processing units in the area. Hence there is need to increase the area under tur.

The installed capacity per day was higher in large processing units (90.0 quintals) and less in small processing units(55.0 quintals), which was directly proportional to the amount of fixed capital invested. Accordingly, the capacity utilised was more in large processing units (41.94 %), as compared to small units. Because of more working capital invested to fixed capital by the large processing units Hence, the small units need to invest more on working capital in order to increase their capacity utilisation.

5.6.2 Financial performance of tur processing units.

Various financial ratios were worked out and presented in Table 4.22 to assess the financial performance and are discussed below. They are Solvency ratios, Liquidity ratios, Profitability ratios and Turnover ratios.

To determine the solvency position of the tur processing units, two ratios namely, total liabilities to owned funds and fixed assets to owned funds were worked out. The ratio of total liabilities to owned 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 at an overall average level worked out to be 0.99, indicating that for every rupee of owned funds, Rs.0.99 worth of external funds was used. The ratio was 1.23 and 0.75 in small and large processing units respectively. Which indicated that an large amount of external funds were borrowed and used by small units as compared to large units. Due to low financial strength, as they had no partners or had one partner at the most. But in large units partners were comparatively more in number. The values of the ratio here, meant that the claims of the creditors on the fixed assets of the processing units were greater than that of the processors. Thus it can also be said that the small and large processing units showed the ratio below 2, indicating that the external liabilities of the units are almost in accordance with business norms. And hence have maintained good financial structure. The small units owing to low volume of business have heavily depended on external funds. Therefore, the processing units should try to generate funds internally by increasing the volume of business and by increasing equity participation by its partners.

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 an overall average level was 1.04. It indicated that one rupee of owned fund was tied up in 1.04 rupee of fixed assets. In small and large processing units the ratio was found to be 1.36 and 0.72 respectively. The ratio was relatively high in small units because of low net profits and equity participation by partners. Similarly, it was low in large units because of high net profits and equity participation by partners. Hence the small processing units should try to increase the owned funds.

Liquidity ratios

Test 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 its sensitive characters of meeting immediate financial demands. Hence the liquidity was worked out by using two ratios viz., liquid assets to total assets and current asset to current liabilities.

At an overall average level, the liquidity assets to total assets ratio was 0.40 which indicated that they maintained 40 per cent of their total assets in the liquid form during the study period in order to meet immediate financial requirement (purchase of tur, payment of wages and other expenses). This ratio in small units was found to be 0.40, indicating that only 40 per cent of liquid assets were in liquid form as compared to large (52 %) processing units. Hence, the performance of large units with respect to the ratio was found to be

satisfactory. But the small processing units was not satisfactory. So, the small units should increase liquid assets to meet the immediate financial requirement.

The current position of the business is indicated by the current ratio, that is the ratio between current assets and current liabilities. This ratio at an overall average level worked out to be 2.48 and indicated that for every rupee of current liability, the amount of current assets available was Rs.2.48. This showed the low dependence of processing units on short term borrowings and than possessed a good liquidity position. In small (2.40) and large (2.55) processing units, the ratio was more than 2, indicating lower dependence on short term borrowings.

Profitability ratios

The liquidity analysis of the processing units revealed that the ability of the unit to meet its financial obligations and as such do not reflect the profitability aspect. Three different profitability ratios, namely, net profit to total assets, net profit to fixed assets and net profit to owned funds ratios were worked out.

Net profit to total asset ratio was used to examine the extent of net profit gained for each rupee of investment. At an overall average level, the ratio for the processing unit was found to be 0.39 indicating 39.0 per cent rate of return on assets. It means that the processing units at an overall average level were able to generate 39 per cent on total assets. However, the rate of return on assets in small and large processing units was 27 per cent and 51 per cent

respectively. This showed that their was an efficient use of total assets, but in case of small units there was a need for an efficient use of total assets and efforts to be made to increase profits.

To determine the income yielding capacity of the fixed assets, the ratio of net profit to fixed assets was used. At an overall average level, the ratio was found to be 0.72. This indicated that the processing units were able to generate an income of 72.0 per cent on fixed assets. While the capability of different sizes of tur processing units to generate an income on fixed assets was 46.0 per cent in small and 97.0 per cent in large processing unit. Which showed that the large processing unit were better off in utilisation of fixed assets as compare to small unit.

The ratio of net profit to owned funds at the overall average level was 0.55 . It was 0.47 in small, and 0.63 in large processing units. This indicated that all the processing units were in a position to protect their equity and that they generated income on the equity.

Turnover ratios

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

To study the relationship between sales and working capital. the net working capital turnover ratio was worked out. This ratio measures the

efficiency with which the working capital was employed in the processing units. Generally higher the turnover greater will be efficiency and rate of profits. At an overall average level, this ratio was 1.03 indicating the average turnover per rupee of working capital was Rs.1.03. The rate of turnover to working was high (1.04) in large units as compared to small units (1.02). This might be because of high rate of turnover due to more proportion of working capital, in the total assets held by them. Hence the small processing units should try to increase the proportion of working capital in the total assets.

Fixed assets turnover ratio was used to study the utilisation of fixed assets to generate sales. The ratio at an overall average level, was found to be 36.27. This showed that the tur processing units at an overall average level generated of 36.27 for every rupee of fixed assets held. The ratio was higher (41.74) in large processing unit as compared to small size units, that is, 30.79 indicating higher efficiency in utilisation of fixed assets to generate sales in large processing units as compared to small units. Hence, the small processing units should utilise the fixed assets efficiently to generate sales.

In order to analyse the relationship between sales to total assets, the ratio of sales to total assets was worked out. It was observed that at the overall average level of tur processing units the ratio was 19.24. It was high (20.03) in large units and low (18.44) in small processing units. Effective utilisation of total assets, to improve sales, especially in small processing units was necessary as compared to the efficiency of large units.

5.6.3. Break-even volume of output in tur processing units

Table 4.23 revealed that quantity of dal required to reach break-even point was 10193.81 quintals of output (dal) in overall average size dal mills, whereas, it was 11370.55 quintals and 9504.19 quintals of output in case of small and large size of dal mills. However, sample processing units of small size and large size produced 3858.1 quintals and 7555.63 quintals tur dal respectively. This shows that both small and large size units have not been able to achieve the break-even volume of output. Further, the variations in break-even volume of output of these tur processing units was due to variations in the fixed cost and the quantity of output produced.

5.7 Problems faced by Processors of Tur Processing Units

The prevalence of problems of tur processing units is quite common and these units are no exception. The opinion of sample processors on different problems are discussed in Table 4.24.

The main problem faced by the processor of tur processing unit was the problem of high taxation of the commodity which constituted major share in total cost. The market fees, commission charges and taxes at the time of procurement and marketing constituted the bulk of the price of the commodity.

The major problem faced by processors was procurement of tur, it required heavy finance to meet the off-season demand. Hence the huge amount of capital was blocked in procurement and had to pay high rate of interest for the same.

Another problem of the tur processors were short supply of power leading to under utilization of the plant which affected their production capacities. The problem of getting adequate finance was also major problem because the tur procurement need high expenditure. The problem of labour led to failure to achieve the target, this might be because of low wages paid to labour.

Another major problem was the cost incurred in repairs and maintenance which was reported to be high. It is due to the decreasing efficiency of plant and machinery. The machinery and equipment looses its efficiency, over a period of time, hence repairs and maintenance costs come into picture. Similar were the observations of Jain Hemchand (1989).

Lack of adequate marketing facilities was also one of the major problem faced by the processors. The processors were unable to sale entire produce in the local market and they have to incur high marketing costs to dispose of dal in distant markets.

The major constraints in tur processing units were high taxing, high procurement cost, irregular power supply, inadequate finance, irregular labour supply, inadequate marketing facilities and repairs and maintenance.

Summary and policy implications

VI SUMMARY AND POLICY IMPLICATIONS

Pulses are commonly known as food legumes, which are secondary to cereals in production and consumption in India. Pulses are most valuable and naturally occurring sources of vegetable proteins, calories, vitamins and minerals, because of these good character pulses are called as 'Marvel of Nature'. More than one third of the total area under pulses in the world is in India. India is the largest producer of pulses in the world with a share of 23 per cent in the world's total production. Pulses are grown in both rabi and kharif season. Tur is the major kharif pulse.

Tur (*Cajanus cajan* Linn.) also known as arhar or redgram or pigeon pea, which belongs to the family leguminaceae, is an economically important tropical and sub-tropical pulse crop. Tur is widely grown in Indian sub-continent and accounts for 90 per cent of the world crop.

Tur is extensively used as dal (split seeds used for cooking in the Indian sub-continent). The dry seed is dehulled and the split cotyledons are cooked to make a thick soup primarily for mixing with rice.

Tur constitutes an important crop in the agricultural economy of Gulbarga district occupying about 63 per cent of the total cropped area. In view of the dominance of the tur crop in the agricultural economy of the district, it was considered important to study the management of tur processing units in Gulbarga district. It is often reported that tur producers are not getting remunerative prices for their produce, while consumer are paying very high

prices for the same. This is an indicative of ineffective management, which may be the result of lacuna in tur marketing.

Tur industry in India is growing at a faster rate as a huge demand exists for its products. Ineffective management along with scarcity of tur has led to the failure or poor performances of many tur industries. Hence, the present study is aimed at identifying managerial lapses and problems faced by them, if any, and evolve appropriate policies for improving efficiency in working of the tur processing units. The study was undertaken with the following objectives;

1) To study the investment pattern in tur processing units

2) To study the procurement management

3) To evaluate the management of processing

4) To study the cost and return structure in the production of tur dal

5) To study the existing marketing management

6) To study the problems faced by the tur processing units

7) To suggest measures for effective functioning of tur processing units

Methodology

In Karnataka, Gulbaraga district had ranked highest in area and production of tur with 100 processing units. Hence the district was selected for the study. At the second stage, Gulbarga taluk in the district was selected for the study as it possessed maximum number of tur processing units. Out of 70 units

situated in Gulbarga taluk, only 65 are working. Of these working units, 30 units were selected for the study.

At the third stage, based on the capacity created in each of these 65 processing units, they have been categorised into small and large size units. The capacity having more than 70 quintals per day has been considered as large and having the capacity less than 70 quintals per day has been considered as small units. The primary data was collected for the year 1997-98 by personal interview method with the help of the pre-tested schedule with respect to procurement and processing of tur, marketing of tur dal and problems faced by the tur processors. Similarly, secondary data was collected regarding capital investment, assets, liabilities, net profits and total sales from the records maintained by the tur processing units.

Tabular analysis was employed for assessing the investment pattern, cost of procurement, cost of processing, cost and return structure in production of tur dal and cost of marketing in tur processing units. Investment analysis technique was used to know the financial feasibility of investment in tur processing units. Different financial ratios were used to analyse and compare the business performance of selected categories of processing units. The break-even volume analysis was used to know the minimum level of production required to recover the total fixed capital invested in tur processing units.

Findings of the study

The investment pattern of the tur processing units revealed that there was a direct relationship between the total capital investment and the size of the processing unit. The overall average capital invested per processing unit was Rs.160.92 lakhs. In aggregate it was found that working capital investment was more (96.60 %) than the fixed capital (3.40 %) in all the units. The proportion of working capital was more in large units as compared to small units due to higher capacity utilisation. However, the proportion of fixed capital was more in small units as compared to large units because of higher proportion of investment on land, machinery and equipment and borewell. The investment on building constituted a major part of the fixed capital.

A discount factor 14 per cent was employed in cash flow technique. It was found that, Net Present Value of the investment was Rs.15.98 lakhs for small units, Rs.41.60 lakhs for large units and Rs.28.79 for the overall average units. The Benefit Cost Ratio in three sizes of processing units worked out to 4.56, 7.44 and 6.00 respectively. The Internal rate of returns was higher in large units than in small units. The Internal Rate of Returns was worked to 93.12 per cent in large units, 76.60 per cent in small units and 82.46 per cent in overall average units. The Pay Back Period was found to be 2.21 years in small units, 1.32 years in large units and 1.76 years in overall average size units. Hence, it was found that the investment proposal in tur processing units was financially feasible, though investment in large units was more profitable than that of small units.

Totally, three channels of procurement of tur were identified. At the overall average level, the quantity of tur procured was maximum (54.86 %) through channel III (Commission agent) and minimum (2.27 %) through channel I (Farmer). The tur processing unit procure maximum quantity of tur through channel III (Commission agent) compared to other channels, because the tur processing units require large quantity of tur, which cannot be fulfilled by one channel. The procurement cost per quintal of tur procured was higher through channel III (Rs.128.95) because of high rate of taxation, commission and market fee, but it was lower through channel I (Rs.78.95) as it involved no commission, transportation and handling. Hence, the channel I was found to be efficient channel of procurement for the tur processing units. The procurement cost per quintal of tur was more (Rs.128.05) in small units than in large (Rs.127.15) units as the former procured large quantity of tur through channel II and III. Among the different items of costs incurred on procuring, purchase and turnover tax constituted the major proportion, that is, 32.47 per cent followed by commission (32.05 %) on account of heavy taxation and market fee. Procurement of tur was maximum during the months of February and March the peak harvest months of tur.

The cost of carrying inventory per quintal of tur was higher in large units than in small units due to the number of days for which they were stored. Among the various items of cost incurred in carrying inventory, the interest on blocked capital accounted for 93.53 per cent of the total cost due to high rate of interest paid by the processing units. Hence, there is a need to reduce the rate of

interest on the blocked capital to increase the returns of the industry. There are eight stages in processing of tur. The processing cost per quintal of tur was more (Rs.51.33) in small units than in large units as a results of high costs of power, water and packing material cost. Custom milling was done by both small and large units. For the overall average size tur processing unit, the quantity of tur processed was 631.0 quintals charging Rs.155.0 per quintal thus realising a return of Rs.0.98 lakhs. Requirement of female labour was more than that of male labour. The female labours were engaged only in oil treatment, winnowing, splitting, polishing and seperating which require less mascular efforts; the male labours were mainly engaged in drying and bagging, which require more mascular efforts.

The production cost per quintal of dal was more in small units, as compared to large ones, because of high interest on working capital. Tur cost accounted for major portion (77.52 per cent) of the cost of production.

One quintal of tur when processed result in 78.25 kilogram of dal, 4.75 kilogram of chura, 15.00 kilogram of bhusa and 2.00 kilogram of rejection at the overall average level. The out turn of dal depends on the quality of tur and the intensive care during the splitting operation. The value added as a result of processing activity, at an overall average level was Rs.637.36 per quintal of tur processed.

Sales realised form one quintal of tur processed was more in large processing units, due to higher per cent of dal out turn and higher prices per unit

realised. And the higher net returns in large processing units were due to higher efficiency achieved in production and marketing of their products.

The processed dal was marketed to consumer, mainly through three channels. At the overall average level, maximum quantity of tur dal, was marketed through channel III (Commission agent), since commission agent was obligatory for marketing tur dal outside the state and minimum quantity was marketed through channel I (consumer). The small and large units marketed maximum quantity of tur dal through channel III (Commission agent) and minimum quantity through channel I(Consumer). The consumer would purchase only a little quantity of dal directly from the processor for his domestic consumption. The small and large units marketed through all the three channels. The marketing cost per quintal of dal was high through channel III (Rs.138.48) as compared to other channels of marketing, because of high rate of taxation and commission paid. Among the various items of cost incurred on marketing of tur dal, sales and turnover tax and commission accounted for 50.00 per cent each of the total cost of marketing.

Efficiency of tur units in terms of capacity utilisation, the industry on an overall average basis, utilised only 40.96 per cent of the installed capacity. This lower per cent of capacity utilisation was due to scarcity of tur. Large units have higher capacity utilisation than small processing units; it may be due to higher proportion of working capital invested by the former.

The business performances of the tur processing units as observed through the financial ratios such as solvency, liquidity, profitability and turnover ratio, showed that the large processing units are more efficient than the small units, possibly because of large economies of scale in operation and management. Solvency positions of large 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 poor solvency position because of poor financial strength. The liquidity ratios in general have revealed that the large processing were in a better position to meet the short term financial obligations, and hence did not suffer from want of working capital. However, the small processing units projected relatively weak liquidity position, indicating poor financial management because of high amount of current liabilities as compared to large units. Hence, there is a need to reduce their current liabilities for increasing their efficiency. The test of profitability, as indicated by the profitability ratios were high in case of large processing units as compared to small units. Hence, large processing units, efficiently utilised their assets as well as owned funds.

The velocity with which the capital invested was turned over in the business, was low in small units as compared to large units and thus was one of the cause for inefficiency in utilising their owned funds. The low turnover ratio in small units was due to low sales. Hence, there is a need to promote their sales.

Break even quantity of output in small and large size dal mills was 11370.55quintals and 9504.99 quintals respectively. However, both the categories of tur processing units were unable to reach the break-even level of output. So there was a need to increase utilisation of the capacity.

The major problems faced by the processors of tur processing units are heavy taxation, high procurement cost, inadequate power supply, labour problem, lack of availability of finance, repairs and maintenance and marketing. Therefore, there is a need to reduce the taxation rate, the processors has to pay high taxes and commission charges. The processors were not getting adequate finance for procurement of tur. Few processors expressed the problems regarding availability of land, location of site and processing.

Policy implications

1) Tur processing activity is capital intensive. The rate of interest charged on working capital was higher. Hence, there is a need to provide the required working capital at a low rate of interest so as to promote the tur processing units.

2) Shortage of tur is a serious problem faced by the tur processors. This can be solved by increasing the productivity of tur, through adoption of better management practices in existing fields.

3) Procurement of tur through channel I (Farmer) worked out to be cheaper. So, it is economical for the tur processing units to procure their requirement of tur directly from farmer.

4) The higher operational expenditure coupled with poor capacity utilisiation of tur processing units resulted in their poor performance, especially in small units. Therefore, in order to improve their efficiency, modernisation of processing units with the adoption of improved technology needs to be taken up.

5) Though marketing of tur dal through commission agent is costlier, most of the tur dal was marketed through it, because of huge demand for tur dal in the distant domestic market. At present there are no institutional net work for marketing it. Hence, there is a need for an organisation of co-operatives which would undertake marketing of tur dal with minimum marketing cost.

6) Another serious problem faced by the processors is the method of taxation. Multi-point taxation accounted for major item of cost, both in procurement and marketing. Hence, value added taxation should be followed rather than multi-point taxation.

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Appendix

APPENDIX

SCHEDULE

I General Information

1. Name of the Respondent (Processor) :
2. Name and address of the unit :
3. Year of establishment :
4. Main occupation :
5. Subsidiary occupation/s :
6. Installed capacity :
7. Utilised capacity :
8. Type of dal mill :
9. No. of working days in a year :
10. Sources of power supply :
11. Total investment :

II. Investment on processing units

A. Fixed costs

Items	Year of purchase/ estd	value (Rs.)	Economic life period (Yr)	Annual depreciation (Rs./Yr).
1. Land				
2. Building				
a) Processing unit				
b) Storage / godown				
c) Office				
d) Any other				
3. Bore well /open well				
a) Cost of motor/pumpset				
b) Cost of pipes				
c) Any other				
4. Machinery and equipments				
a) Motar				
b) Elevator				
c) Huller				
d) Drier				
e) Filter				
f) Belt				
g) Roller				
h) Chuni grinder				
i) Any other				
5. Salary to permanent employees (Rs)				
6. Borrowed capital (Rs.)				
7. Interest on borrowed capital (Rs.)				
8. Licence fee (Rs.)				
9. Corporation taxes (Rs.)				
10. Insurance premium (Rs.)				
11. Any other				

B. Variable costs

Items	Qty./No.	Rate(Rs/unit)	Amount (Rs.)

1. Power charges
2. Repairs and maintenance
3. Raw material cost (Red gram)
4. Oil cost
5. Fuel charges
6. Borrowed working capital (Rs.)
7. Interest on working capital (Rs.)
8. Commission charges
9. Telephone charges
10. Sales tax
11. Office maintenance
12. Wages to casual labour
13. Marketing costs

a. Gunny bags
b. Transport
c. Handling
d. Market fee

14. Any other

III. Procurement in processing unit

A. Procurement of redgram

Agency	Qty Proc(Q)	Price (Rs/Q)	Cost of procurement					Total Cost
			Clean. & weigh.	Trans port	Loading/ unloading	Bag	Commission	
Farmer								
Commission agent								
Co-op. Society								
Village merchant								
Itinerary trader								

B. Storage of redgram (Monthwise)

Months	Purchased	Used	Stored
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

C. **Storage cost (Rs/q)** :

a. Labour :

b. Insurance :

c. Fumigation of any other protection measures :

d. No. of months stored :

e. Warehouse charges (If stored in warehouse) :

f. Storage losses :

g. If any other :

IV A. Cost involved in each stages of processing.

Stages of processing	Cost of Processing												Packing material cost	Any other
	No. of labour		Wage rate/day		Power		Fuel		Water		Oil			
	M	F	M	F	Q	C	Q	C	Q	C	Q	C		
a. Soaking b. Oil treatment c. Drying d. Winnowing e. Splitting f. Polishing g. Separating h. Bagging														

Note: M denotes male labour and F denotes female labour
Q denotes Quantity and C denotes Cost

B. Separate sheet enclosed

B. Redgram processed and sold

Months	Commodity proceed (Q)		Main product		By product				Qty sold on its own a/c	Price		
	OW (Q)	CM (Q)	OW (Q)	CM (Q)	OW (Q) Ch.	OW (Q) Bh.	CM (Q) Ch.	CM (Q) Bh.		Main	Chura	Bhusa
January												
February												
March												
April												
May												
June												
July												
August												
September												
October												
November												
December												

Custom hiring charges : Rs/Q--------

Note: OW. denotes On its own account.

CM. denotes Custom milling.

Ch. denotes Chura

Bh. denotes Bhusa

C. Returns per quintal

Particulars	Quantity(Q)	Price (Rs/Q)	Total value (Rs)
Main product			
By product			
Chura			
Bhusa			

V Marketing cost of Dal through different channels.

Intermediaries	Qty	Price/Q	Market fee	Commission	Sales tax & turnover	Export exp	Any other
a. Directly to Consumer							
b. Trader							
c. Commission agent							
d. Export houses							
e. Direct export							
f. Any other							

VI. Problems faced by the Dal miller

1. Location of site	: Appropriate	Less appropriate	Not appropriate
2. Availability of land	: Available	Scarcely available	Not available
3. Infrastructure facility	:		
a. Raod	: Good	Average	Bad
b. Electricity	: Regular	Moderately regular	Irregular
c. Water	: Regular	Moderately regular	Irregular
d. Any other	:		
4. Procurement			
a. Availability of tur	: Abundant	Scarce	Not available
b. Price of tur	: High	Average	Low
c. Quality of tur	: Good	Average	Poor
d. Availability of transport vehicles	: Easily available	Scarcely available	Not available
e. Transportation cost	: High	Average	Low
f. Any other	:		
5. Processing			
a. Cost effective technology	: Available	Scarcely available	Not available
b. Availability of labour	: Abundant	Scarcely available	Not available
c. Maintenance of machinery	: Easy	Bit difficult	Difficult
d. Any other	:		
6. Marketing	:		
a. Availability of transport vehicle	: Easily available	Scarcely available	Not available
b. Transportation cost	: High	Average	Low
c. Availability of packing material	: Easily available	Scarcely available	Not available
d. Commission to intermediaries	: High	Average	Low
e. Market fees	: High	Average	Low
f. Tax charges	: High	Average	Low
g. Any other	:		

MANAGEMENT OF AGRO-PROCESSING INDUSTRIES IN KARNATAKA-A CASE STUDY OF TUR DAL INDUSTRY

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ABSTRACT

Tur being most important pulse crop of tropical and sub-tropical regions of the world, ranks second next to bengalgram in India. In India there are about 10,000 (1996-97) processing units spread over in several states and nearly 90% of them are under small-scale sector. In Karnataka, there are 160 tur processing units working.

Ineffective management on the part of the processors has led to the failure or poor performance of many tur-processing units. Therefore the present study attempts to identify the managerial lapses and the problems faced by them in order to evolve appropriate policies for improving efficiency. Thirty tur processing units in Gulbarga district of Karnataka were selected. Further they were categorised into small and large based on their installed capacity. The primary data was collected for the year 1997-98.

The investment in both category of tur processing units is financially viable and economically feasible. Totally Three patterns of tur procurement were noticed Procurement of tur was maximum during the months of February and March. The cost of carrying inventory per quintal of tur was higher (Rs.299.01) in large size units than in small processing units (Rs.265.80). The average production cost of tur dal per quintal of tur processed was Rs.2664.12.

The average value added by processing activity was Rs.637.36 per quintal of tur processed. Maximum quantity of tur dal was marketed through channel III (Commission agent). The marketing cost per quintal of dal was high through channel III (Rs.138.48). Taxes and commission charges accounted for 50 per cent each in the total cost of tur dal marketing.

The average capacity utilised by processing units was 40.96 per cent of the installed capacity. The financial ratios showed that the large processing units were more efficient than small processing units.