

✽ प्रज्ञा शील करुणा ✽



अधारात अडखळणाच्या  
 पावलांना ज्ञानरूपी प्रकाशाचा वाट दाखविणा-  
 री दिपस्तंभ माझे परम श्रद्धास्थान  
 माझ्या जडणघडणीत  
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 आदरणात गुरूणांच्या माथे पाहणे  
 माझ्या जीवनेत माझे माझे मोलाचे,  
 सदैव मनी जाणवत राहणाऱ्या ऋणांची  
 म्हणून

**PRODUCTION AND MARKETING  
MANAGEMENT OF PADDY IN KOLHAPUR  
DISTRICT**

By

**Mr. Kamble Goutam Shankar**  
(Reg. No.03/141)

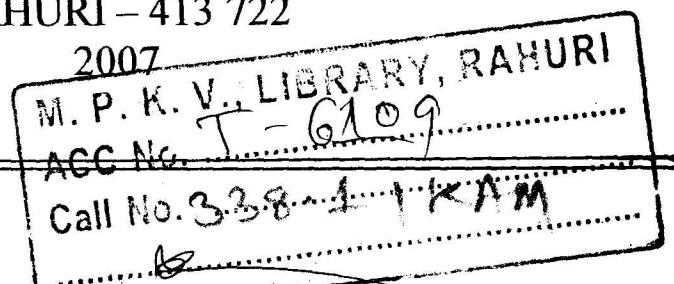
A thesis Submitted to the  
**MAHATMA PHULE KRISHI VIDYAPEETH,  
RAHURI – 413 722, DIST. AHMEDNAGAR  
MAHARASHTRA, INDIA**

in partial fulfillment of the requirements for the degree of  
**MASTER OF SCIENCE (AGRICULTURE)**

in

**AGRI.BUSINESS MANAGEMENT**

DEPARTMENT OF AGRICULTURAL ECONOMICS  
POST GRADUATE INSTITUTE  
MAHATMA PHULE KRISHI VIDYAPEETH,  
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APPROVED BY

  
**Prof. V.A. Shinde**

(Chairman and Research Guide)

  
**Dr. D.B. Yadav**  
(Committee Member)

  
**Dr. S.S. Bhosale**  
(Committee Member)

  
**Dr. A.V. Solanke**  
(Committee Member)

  
**Dr. D.P. Kaledhonkar**  
(Committee Member)

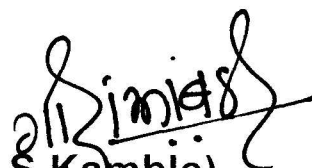
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RAHURI - 413 722**

2007

## CANDIDATE'S DECLARATION

I hereby declare that this thesis or part  
thereof has not been submitted  
by me or any other person  
to any other University  
or Institute for  
Degree or Diploma.

Place: MPKV, Rahuri.

  
(G.S.Kambale)

Date : 15/06/2007

**Prof. V.A. Shinde**

Assistant Professor,  
Department of Agril. Economics,  
Mahatma Phule Krishi Vidyapeeth,  
Rahuri - 413 722, Dist: Ahmednagar.  
Maharashtra (INDIA)

## **C E R T I F I C A T E**

This is to certify that the thesis entitled, "**PRODUCTION AND MARKETING MANAGEMENT OF PADDY IN KOLHAPUR DISTRICT**" submitted to the Faculty of Agriculture, Mahatma Phule Krishi Vidyapeeth, Rahuri, Dist. Ahmednagar, in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE (AGRICULTURE) in AGRI.BUSINESS MANAGEMENT**, embodies the results of piece of bona fide research work carried out by **Mr. KAMBLE GOUTAM SHANKAR**, under my guidance and supervision and that no part of this thesis has been submitted for any other University for Degree or Diploma or publication in other form.

Place: MPKV, Rahuri

Date : 15/06/2007



**(V.A. Shinde)**  
Research Guide

**Dr. A.S. Jadhav**

Associate Dean,  
Post Graduate Institute,  
Mahatma Phule Krishi Vidyapeeth,  
Rahuri – 413 722, Dist: Ahmednagar.  
Maharashtra (INDIA)

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Date : 15/06/2007 .

  
(A.S. Jadhav)

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Place: MPKV, Rahuri

Date: 15/06/2007



**(Goutam S.Kamble)**

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## **ABSTRACT**

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### **“PRODUCTION AND MARKETING MANAGEMENT OF PADDY IN KOLHAPUR DISTRICT”**

**By**

**Mr. Goutam Shankar Kamble**

**A candidate for the degree**

**of**

**MASTER OF SCIENCE (AGRICULTURE)**

**MAHATMA PHULE KRISHI VIDYAPEET,  
RHAURI - 413 722**

**2007**

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Research Guide : Prof. V.A. Shinde

Department : Agricultural Economics

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The present investigation intends to study the management aspects in production and marketing of paddy in kolhapur district. It therefore, examines cost and returns, resource use productivity of major inputs, marketing cost and constraints in production and marketing. Bhudargad and Radhanagri tahsil of Kolhapur district were selected purposively for the study considering area under paddy. The three villages from each tahsil were selected randomly. In all, 15 cultivators were selected from each village thus in all 90, sample cultivators were selected randomly. The data pertaining to agricultural year 2004-05 were collected by survey method with the help of specially designed questionnaire.

The data, so collected were analysed by tabular method for estimation of production cost, adopting Cobb- Douglas type of production function carried out the functional analysis.

For estimating resource use productivities of major inputs and significance of parameters, the above function was tested by using 't' test.

At the overall level, the average size of holding was 4.61 hectares. It was 1.76 ha in small, 3.93 ha. in medium and 8.14 ha. in large size groups. The per hectare input use reveals that, the average per hectare labour days required were 73.02. Farmers were using 93.24 kg of seed per hectare. The use of manure was 35.14 qtls. per hectare. All farmers were using fertilizers and the per hectare quantity of N, P and K used was 49.32 kg, 21.12 kg and 6.42 kg, respectively. At the overall level, 44.44 per cent paddy growers used the nitrogenous fertilizers as per the recommendation. Top dressing practice was followed by 27.78 per cent farmers as per recommendation.

The per hectare Cost 'A', Cost 'B' and Cost 'C' worked out to Rs. 11289.26, Rs. 15431.10 and Rs. 16649.31, respectively. The net return at Cost 'C' was Rs. 4262.44, Rs. 895.32 and Rs. 1825.88 in small, medium and large size group of paddy cultivators, respectively. This indicated that the paddy was more profitable on small group of farm than other two categories of farm. The production function of paddy has turned out to be highly significant. The use of human labour, FYM, nitrogen and potash have turned out to be positively significant, which indicate the scope to increase the use level of these resources.

The marginal value products of human labour, manures, nitrogen and potash were greater than their respective unit acquisition costs indicating thereby, the optimal use of these inputs. The marginal value product of bullock labour and phosphorous were less than their marginal costs which indicated the need for effecting reduction in their use from the existing use levels.

In case of varietal preference for production mostly preference was given to R-24 (48.89 %) variety. About the preference for consumption by the cultivators, mostly preference given to local varieties i.e. 61.11 per cent. The average per quintal cost of marketing was Rs. 61.95 of the total marketing cost.

The major problems faced by the cultivators in the production of paddy were non-availability of quality seeds at cheap rate, high fertilizer cost and high wage rate. The major marketing problems expressed by farmers were price variation in the market, high commission rate, high transportation cost etc.

The study conclude that the adequate and timely supply of credit is important for input management, steps may be taken at the government level to regularize the transportation charges for breaking the monopoly of transport agencies and marketing of paddy needs to be undertaken on co-operative basis in order to minimize the marketing cost and for setting remunerative prices.



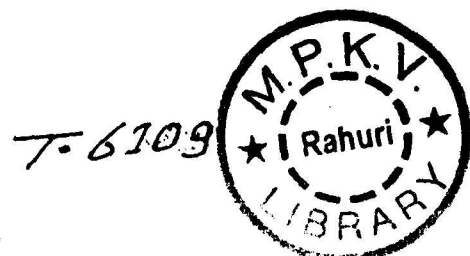


# ***INTRODUCTION***

# 1. INTRODUCTION

Rice is one of the most important food grains, which is produced and consumed all over the world. It is the major staple food crop of more than two billion people in Asia. Rice is more popular staple food of more than 80 per cent of world population. The world population is increasing at faster rate than the food production, particularly in developing countries. India has to achieve a food grain production target of 240 million tonnes by 2020 A.D. to provide food to a billion of population. Of the total food need, rice constitutes about 42 per cent. To sustain the present level of self sufficiency, about 2.5 million tonnes of rice has to be added annually which would be equivalent to about 3 to 3.5 per cent annual growth. It would be not an easy task to achieve the targeted rice production because there is very limited scope to increase the area under rice, the only way left is to increase productivity to achieve this target.

For achieving the target, there is necessity of increasing per unit yield of rice by adopting available technologies like high yielding varieties, plant density, integrated plant nutrient supply and management, integrated pest management, input use efficiency and overall management. The results of National Demonstrations conducted at farmer's field in different parts of the country have shown that the productivity of the most of the crops could be increased considerably by using the currently available improved technologies.



Basic elements of agriculture system are the production and marketing of agricultural product. As a link between producer and consumer, marketing plays very important role not only in stimulating production and consumption but also in increasing the pace of economic development.

### **1.1 Importance of Rice**

Rice is an important food crop contributing more than half of the daily requirement of calories. It contains 6 to 7 per cent protein and 2 to 5 per cent fat only. Grain contains calcium and vitamin-B. The byproduct of rice is used for cattle and poultry feed. Paddy husk is used in manufacture of insulation materials, cement and cardboard and either for poultry keeping.

### **1.2 Production Performance**

#### **12.1 Production Performance of the World**

Rice is main source of income for millions of people in the world, and is grown in all the continents of the world. The world production of rice in the year 2000-2001 was 592.83 million tones (Source-FAO). Nearly all Asian countries have a major source of livelihood in their rural economy. Asia contributes around 90 per cent of world's production most of which is consumed in the country where it is grown. Even though, only five per cent of worlds rice production enters international trade, Asia also dominates the international market accounting to 65 per cent of total imports and exports in the recent years.

India and China together produces around 53 per cent of total world production. In the production of rice China ranks first (30.61 %) in the world followed by India (22.24 %).

### **1.2.2 Production Performance of India**

As compared to other countries, the performance of India with regard to the production of rice per unit of land has not been so much encouraging. The average per hectare productivity of paddy in India was only 2,066 kg. The main reason of this low productivity is wide variation in per hectare yield of rice growing states of the country. For instance, the average per hectare rice yield in 2000-01 was 3,506 kg in Punjab, 2,842 kg in Andhra Pradesh, whereas it was 900 kg and 573 kg in Chhatisgarh and Madhya Pradesh, respectively. Rice is a major kharif crop of India. Besides, some states have an additional crop of rice. These states are Bihar, Orissa, Tamil Nadu, Kerala, West Bengal, Assam and Andhra Pradesh, which grow three crops termed as autumn, winter and summer in a year. In India as far as area under rice is concerned, Uttar Pradesh ranks first (58.39 lakh hectares) followed by West Bengal (54.36 lakh hectares) and Orissa (44.34 lakh hectares). In terms of production, West Bengal ranks first (124.28 lakh tones) followed by Uttar Pradesh (115.40 lakh tones) and Andhra Pradesh (114.48 lakh tonnes). (Ref. Indian Agriculture 2003)

### **1.2.3. Production Performance of Maharashtra**

Paddy is predominant cereal crop grown under diverse conditions in the state from almost sea level of Konkan to an elevation of 2000 feet in Malva tract and to an extreme east in

Bhandara and Chandrapur districts. It is cultivated under wide range of soil and climatic conditions from low rainfall of 75 cm in Marathwada to a high rainfall of 375 cm in Konkan. It is grown on coastal saline soil as well as heavy clay loam.

In Maharashtra rice occupies 16.17 lakh hectares of area with annual total production of 21.45 lakh tones, which is 4.31 per cent rice acreage of the country and 3.05 per cent to the total rice production. The average yield of rice is about 12.86 q/ha (2003-2004). The position of Maharashtra in rice production is comparatively poor. In the state rice is grown in all the districts with varying extent. However, the major rice growing districts are Thane, Raigad, Ratnagiri and Sindhudurg of Konkan region, Kolhapur district of Western Maharashtra region and Bhandara, Chandrapur and Gadchiroli of Vidharbha region. (Ref. Economic Survey of Maharashtra 2003)

#### **1.2.4. Production Performance of Kolhapur District**

Rice occupies 1.10 lakh hectares of area with annual total production of 2.79 lakh tones in Kolhapur district, which is 7.39 per cent of rice acreage of the state and 13.29 per cent to the total production in the state. The average yield of rice is about 25.25 quintal per hectare (2004-2005). This indicates that the rice crop play an important role in the economy of Kolhapur district.

While comparing districts wise data for the year 2004-05 in respect of area under paddy, it is obvious that Bhandara district ranks first in Maharashtra, however, in production it ranks 7<sup>th</sup>, Thane district ranks 5<sup>th</sup> in area under rice, but ranks first in

#### **1.4 Specific objectives**

1. To study different aspects related to production management of paddy
2. To study the varietal and consumers preference of varieties grown on sample farms.
3. To examine the various management practices followed in marketing of paddy.
4. To assess the problems related in production and marketing management of paddy.

#### **1.5 Scope and utility of the study**

This study intends to throw light on various problems involved in the production and marketing of paddy and the findings of the study will be useful to overcome the problems. The findings of study will help to increase the area under paddy by way of suggesting the profitability of the crop. The results of investigation on cost structure will provide a guideline to produce more with rational and optimal allocation of resources.

In the cultivation of paddy, no modern technology is adopted. Therefore, the study will be helpful to the extension development agencies and policy makers to motivate the farmers in adoption of improved practices of cultivation of this crop in the region.

The marketing aspects of the study will also be helpful in the Government planning for the development of paddy cultivation in the area under study, in particular and in the state in general.

## **1.6 Limitations of the study**

Due to limitation of time and other resources, the study was restricted to limited aspects. The data were collected from 90 paddy growers from selected six villages in Bhudargad and Radhanagari tahsils of Kolhapur district. Hence, the findings cannot be generalized beyond the limits of the area of the study. However, finding would be relevant and applicable in the areas where similar situations exist.



***REVIEW OF LITERATURE***

## **2. REVIEW OF LITERATURE**

The review of the past literature forms an integral part of any systematic research work. Moreover, it becomes imperative on the part of a research worker to have knowledge of research work carried out by previous researchers in a specific research area of interest so as to plan for his own research work on more systematic lines. This requires review of findings of closely related previous research studies from various sources. The knowledge obtained through such review of literature enables the researcher to gain insight in respect of the manner in which a given research problem has been tackled, the nature of results obtained and the conclusions drawn. Many a times, it may be true that previous research work might have been carried out under different set of conditions. Nevertheless such knowledge is always useful for improving efficiency and effectiveness of all relating to designing of research problem, adopting suitable methodology and interpreting research results.

This chapter reviews in brief the available literature on different methodological issues and empirical research results arrived at by various research scholars from similar studies. The reviews collected from the various sources have been grouped under the following major headings.

- 2.1 Production management of paddy
- 2.2 Varietal and consumer preference
- 2.3 Marketing management
- 2.4 Problems related to production and marketing.

per hill on yield and yield attributes of rice. Result indicated that 40 days old seedling transplanted crop gave higher yield than 30, 50 and 60 days old seedling transplanted crop. Transplanting 2 to 4 seedling per hill produced significantly higher yield than of six seedlings per hill.

Mahabari *et al.* (1996) observed that the application of half of 'N' whole 'P' and 'K' (50 kg/ha) at the time of sowing and remaining half of 'N' (50 kg/ha) after receding of flood (inundation) at optimum moisture level produced significantly superior yield of rice in sub-mountain zone of Kolhapur district of Maharashtra. Amongst the different 'N' source, ammonium sulphate proves to be better and give additional net profit Rs. 700/- per hectare as compared to application of urea. The 'N' use efficiency of ammonium sulphate was 52.57 kg of rice per kg of nitrogen as compared to 50.96 kg of rice per kg of 'N' applied through urea.

Siju and Kombairaju (2001) studied rice production in Tamil Nadu and found an increasing trend of production and productivity. This growth in production was solely due to increase in area under rice in state. In post green revolution period, area showed a decreasing trend even though the rate of decline is statistically not significant. In post green revolution period productivity shows a positive and significant growth. The decline in areas was more than compensated by increase in productivity and hence, production registered positive growth during post green revolution period. From this it could be

concluded that the green revolution has significantly contributed to increase production of rice in Tamil Nadu.

Shukla *et al.* (2003) in their study observed the wide variation in rice productivity in different rice producing states. The states of Assam which grow rice on 90.7 per cent total area allotted under food grain to the state yielded 1,394 kg/ha while Haryana with 24.12 per cent area produced rice at the rate of 2526 kg/ha during 1995-2000. In Bihar, per unit rice productively was marked 1411 kg/ha compared to 3170 kg/ha in Tamil Nadu during same period of time. The state of Punjab, which started rice cultivation in recent past, came up with yield potential of 3300 kg/ha. The wide variation in productivity is not only cause of instability in rice production but also yield so create poverty starvation and low farm income in traditional state which shared maximum area under rice and following rainfed agriculture.

The factor determining variation in rice productivity in different states have been identified to i) Abiotic consisting soil, water and nutrition influenced by drought and flood. ii) Biotic which includes insects, pests and weeds and iii) Socio-economic constraints like input supply, states of credit distribution, mechanization, marketing cost and returns.

Roy and Jain (2004) studied cost efficient yield levels of paddy in different states of our country and quadratic cost function was found to be more appropriate in Assam, Punjab and U.P. while in the rest states paddy cubic function was best fit. In Bihar, M.P. and Orissa even the cubic function could not

explain significantly the cost of production behavior. This indicated that it was not the yield but other factors, which affected the cost of production in these states. Among rest of the states Punjab had the highest cost-efficient yield level of 5134 kg per hectare followed by AP at 3883 kgs. Assam turned out to be the low yielding and low cost states for paddy while among other states Punjab had the lowest cost of production along with the highest production level.

Elamma Job and Nandamohan (2004) studied the trends in the area and production of rice in Kerala. The area under rice in Kerala showed a significant negative trend for each of the season and for all seasons put together. The decline in area was the highest in autumn (-3.49 %), followed by all season put together i.e. total rice area (-3.15 %) and winter (-2.84 %) production also showed negative growth rate for all the different seasons and all seasons put together, but decline was significant only during autumn season (-2.35 %). Though, the trend in production was positive during the period, it was not significant.

## **2.2 Varietal preference for production and consumption**

George (1973) studied the consumer's response towards high yielding varieties in Andhra Pradesh with a view understanding the factors influencing the choice of different paddy varieties for consumption purposes. The consumer's response is studied in terms of four different components perception, attitude, preference and actual use. The consumers in the state were classified into 4 groups as on the basis of their location. A sample of 304 consumers was selected, so rural

agricultural families and 100 semi-urban consumers from west Godawari district, 64 consumers from Vishakhapattanam district and 60 consumers from cosmopolitan urban areas of Hyderabad. The findings showed that the consumer's response to the newly evolved high yielding variety of IR-8 was very poor. It is concluded that the success or failure of IR-8 or other, high yielding varieties largely depend on remaining certain anomalies that exist at each stage of qualitative response components. These anomalies can be removed by joint efforts of the extension agencies and research workers.

Murshed and Alam (1978) In their study, investigated the farmers attitude towards varietal preferences, the factors causing the adoption of High yielding varieties of aman rice (HYV's), the per acre uses of seeds and chemical fertilizers for producing different HYV's and traditional varieties of aman rice (TV's) in an area of Bangladesh. Three selected indicators were used. Degrees of adequacy in the use of production inputs were estimated by comparing the levels of application with recommended doses per acre. The result of the analysis suggests that the farmers had strong preference for TVs over HYVs. The high yield per acre was the most important factor causing the adoption of HYV's, while the absence of government assistance was one of the major factors responsible for retarding the adoption of HYV's. The level of different input uses per acre was higher for HYV's than those of TV's and they were economically justified. The result of analysis further reveals that the farmers used high yielding and traditional variety of seed

adequately, while the degree of adequacy in the use of chemical fertilizers rose from 4 per cent to 17 per cent for different Varieties of aman rice.

Anonymous (1985) From the study on consumers preferences for rice in Thailand, Indonesia and Philippines found that abundant world rice supply has led to renewed interest in improving the grain quality of modern rice varieties. The implicit values for which consumers pay for grain quality characteristics are estimated for Thailand, Indonesia and the Philippines. Consumers in all three countries prefer better milling quality (Fewer broken and more polish) and aroma. Preferences for shape and chemical attributes vary but consumers generally prefer intermediate amylase content.

Suresh *et al.* (2005) estimated the growth rate of diffusion of HYV's of paddy in India and observed that, the long run equilibrium condition of adoption of HYV's in India was 78.65 per cent. This could be interpreted that at the present level of logistic growth rate, the source of HYV's in total cultivated area under paddy would be 78.65 per cent. Still almost 21 per cent area under paddy would be occupied by local varieties due to consumer tastes and preferences. The highest ceiling was reported by Himachal Pradesh (19 %) followed by Maharashtra (98 %). The states like Assam, Bihar, Haryana, Karnataka, Madhya Pradesh, Orissa and West Bengal would have less ceiling limit than the national average 78.65 per cent. The growth rate of diffusion of HYV's was higher in all these states than the national average.

### **2.3 Marketing management**

Goel and Gangwar (1978) worked out the marketing cost and margin of rice in Kurukshtra district and revealed that, in case of rice on an average marketing cost arrived at Rs. 18.80 per quintal for coarse variety Rs. 20.36 for medium variety and Rs. 21.08 for fine varieties when it was sold through private retailers. When it was sold through the fair price shop corresponding figures for the three respective varieties *viz.*, coarse medium and fine were Rs. 35.26, Rs. 46.35 and Rs. 45.84 per quintal, respectively, Producer's share in consumer's rupee was estimated as 56.72 per cent and 55.74 per cent in case of coarse and medium varieties of paddy, respectively.

Anonymous (1985) The study on price structure of rice and producers share in consumer rupee in Haryana found that, the share of marketing cost in consumer's price for the coarse and medium rice was 10.44 and 10.41 per cent in 1966-67 and increased to 15.41 and 14.13 per cent in 1982-83, respectively. However, in case of fine rice it declined from 9.68 per cent in 1966-67 to 7.82 per cent in 1982-83. Similarly the total profit margins in the marketing of the coarse and medium and fine rice in the consumer's price was 11.33, 11.30 and 10.48 per cent in 1966-67 and it increased to 12.86, 17.36 and 24.87 per cent in 1982-83, respectively.

Iqbal (1989) conducted a study on marketing of farm products in Asia and Pacific and concluded that, the agriculture marketing in Pakistan is largely a private sector activity Government involvement in promoting efficient marketing relates

mainly to the provision of price support for certain crops, marketing infrastructure and facilities and the enforcement of grades and standard, particularly for the export of Basmati rice, fruit and vegetable. The strengthening of co-operative marketing is receiving renewed attention from the government.

Gauraha and Verma (2002) studied marketing strategies of rice in Chattisgarh. They showed that there is a tendency on the part of farmers to sell their produce to retailer (In channel II) though they are aware that their share in consumer's rupee is high in Channel-I (Producer to consumer) efforts should therefore be made by Govt. to provide physical facilities in and around market including storage, transportation, processing, market intelligence facility etc. to facilitate efficient marketing of rice. A support price policy is helpful to farmer having marketable surplus and therefore it would provide same kind as protection to marginal and small categories of farmers.

Shaikh Rahman (2006) studied the marketing channel of rice and revealed that, there were six channels through which, the farmers sold their produce at different prices. The study found that polished rice selling to retailers was observed as most efficient alternative channels in terms of earning differences compared to any other channel in area but only 12 per cent of total farmers were using this channel for selling 3 per cent of total produce. The study emphasizes using the alternative marketing channel for selling polished rice and especially to retailers of polished rice instead of unpolished rice selling, which indicates the most efficient alternative marketing

channel that can raise income of farmers in area and it will ultimately be helpful to improve the living standard.

#### **2.4 Problems related to production and marketing**

Shaw (1985) studied the factors influencing the adoption of new high yielding rice in the essequibo coast region of Guyana. Frequency of crop failure, amount of agricultural chemicals used, availability of machinery and access to drainage and irrigation canals were the important factor influences the adoption. High yielding hybrids were considered to be economically justifiable on irrigated sites where the risk of crop failure was relatively low.

Parthusarthy and Rao (1986) studied the factors responsible for use of fertilizer and examined the response of fertilizer use to change in irrigation, HYV, cropping pattern and ratio of crop area in *rabi* season. The data were drawn from cost of cultivation study of Andhra Pradesh Agricultural University. Linear regression function was fitted to the data. The result showed that 10 per cent change in irrigation resulted in around three per cent change in total fertilizer use when HYV, cropping pattern and season effects were kept constant irrigation effects were more than HYV effect. Cropping pattern effects were most pronounced. Elasticities of fertilizer were higher for all cultivators as compared to fertilizer using cultivators only.

Yadav and Gangwar (1986) studied the cost of cultivation and returns from rice crop. They also studied the constraint in increasing production. Study was conducted in Darbhanga district of Bihar. The cost of cultivation (Cost 'C')

per ha of HYV and local varieties was estimated as Rs. 3876 and Rs. 2244, respectively. The yield obtained was 35.56 and 13.68 quintals per ha., respectively. The net return per hectare worked out to be Rs. 1636 and Rs. 185 HYV and local rice varieties, respectively. There was positive relationship between net returns per hectare of HYV rice and size of grain. However, in case of local rice no uniform trend was observed. Yield gap between potential farm yield and actual realized yield was observed quite high indicating potential for increasing in production of rice in the state. The reason for this yield gap was only partial adoption of new rice technology in rice area. There is need to immediately strengthen the extension and input supply services in the state.

Hemchandru and Nagabhushanam (1987) studied the introduction of new agricultural technology definitely contributed for higher production besides the development of complementary industries, such as fertilizer, chemical and pesticides. The stratified random sampling technique was adopted in East Godavari district, village as primary units and holding as ultimate sample. In all 237 farms from ten villages located in two talukas of east Godavari were selected for the detailed study. All the selected farms were regrouped into two classes, *viz.*, Technology-I farms and Technology-II farms.

It is concluded that the incomes of technology-I farms could be increased by reducing labour and technical inputs and by increasing cropped area in case of kharif paddy however, a reduction in labour use and increase in both area and technical inputs would result in higher farm income. On the other hand,

the farm income could be increased both in *kharif* and *rabi*, by increasing the existing levels of employment, area and by decreasing technology input in Technology-II situation.

Singh and Hashmi (1987) studied possibility of continuing success for the use of high yielding technology in Indian Agriculture. Taking food productivity as the depended variable and irrigation, fertilizer, HYV and farm implement as explanatory variable, a regression equation was fitted to assess the effects of each explanatory variable on food production. They found that in Aligarh district in last 10 years, all four explanatory variables together accounted for 63 per cent of food productivity. Factors accounting for the remaining 37 per cent for food production were not considered. The variable causing most variation in food production was the use of farm implement, whereas other factors were not found to contribute significantly in variation.

Grover *et al.* (1993) studied gaps between available technology and actual level of its adoption had been identified and an attempt had been made to find out the constraints in the adoption of recommended technology. The study indicated that more than 85 per cent of area under paddy crop was under recommended varieties and variety PR-106 occupied the Lion share of it in each of three holding size groups. The use of nitrogenous fertilizer was very much prevalent among farmers. However, phosphatic and potassic fertilizer was in scanty use, shortage of money and lack of awareness were found to be the major constraints in adoption of various recommended practices.

Study suggested for provision of adequate short-term credit at proper time to the farmer and emphasizes on evolution of short duration, disease free dwarf varieties of paddy.

Thakare (1995) conducted the study in Sindhudurg district of Maharashtra. Two tahsils namely, Malvan and Kankawali were selected. He studied the constraints regarding non-adoption of improved technologies in study area. Main reasons for non-adoption of improved method were lack of farmer's knowledge, poor economic condition and non-availability of different input at proper time.

Malik and Kumar (1995) in their paper studied the marketing problems of 120 farmers in Kurukshetra district of Haryana based on survey data relating to the marketing year 1992-93. It was concluded that small and marginal wheat and paddy farmers were more affected by marketing problems than medium and large farmers. The major problems identified were the pressing need for cash, transportation and communication. The absence of grading and standardization, lack of organization, delay in payment, high charges for cleaning and the untimely auction of produce.



# ***METHODOLOGY***

### **3. METHODOLOGY**

Scientific investigation of research problem requires adoption of appropriate methods and procedure for conducting investigation, analysis and interpretation. The research project starts with design of sampling, selection of area and cultivators for collection of data.

#### **3.1 Selection of area**

Kolhapur district is one of the major paddy growing district of Maharashtra. Bhudargad and Radhanagari of Kolahapur district are the major paddy growing tahsils, therefore, these tahsils were selected purposively for the present study.

##### **3.1.1 Selection of villages**

The list of villages from Bhudargad and Radhanagari tahsils was prepared in descending order on the basis of acreage under paddy in these villages. The three villages from each tahsil were selected randomly. These are *viz.*, Donwade, Tirawade and Nandoli from Bhudargad tahsil and Sarwade, Aknur and Malve from Radhanagari tahsil.

##### **3.1.2 Selection of cultivators**

The list of cultivators from the selected six villages were prepared from revenue records. For the purpose of analysis, these cultivators were categorized into three classes on the basis of operational holding.

- I. Small : below 2.00 ha.
- II. Medium : 2.01 to 4.00 ha.
- III. Large : 4.01 ha. and above.

From each group, five cultivators were selected randomly. In all 15 cultivators were selected from each village and thus 90 cultivators were selected from six villages. The size groupwise distribution of sample cultivators is given in Table 3.1.

**Table 3.1 Distribution of sample cultivators according to size in selected tahsil.**

<b>Sr. No.</b>	<b>Area under paddy crop</b>	<b>Size group of holding</b>	<b>Number of cultivators</b>
1.	Below 2.00 ha.	I	30
2.	2.01 to 4.00 ha.	II	30
3.	4.01 ha. and above	III	30

### **3.2 Method of collection of data**

The data relating to the cost and returns of paddy production, marketing of paddy and constraints in production and marketing of paddy were collected by survey method for the year 2005-06 with the help of specially designed questionnaire for the purpose. The questionnaire was pretested and data were collected by conducting personal interviews of the sample growers. The data thus collected were further processed and analysed for presenting the results.

### **3.3 Analysis of data**

Some of the important points in the analysis of data and the methodology adopted have been elucidated below.

### **3.3.1 Items of cost**

The total input costs of paddy production have been distributed under three heads, using the standard cost concepts 'A', 'B' and 'C'.

#### **Cost 'A':**

Cost 'A' includes the cost on account of hired human labour, hired plus owned bullock labour, seed value (Seed/seedlings), value of manure and fertilizers, insecticides and pesticides, irrigation charges, depreciation on implements and machinery, land revenue and cesses.

#### **Cost 'B':**

Comprises of Cost 'A' plus the imputed rental value of owned land and interest on owned fixed capital (excluding land).

#### **Cost 'C':**

Comprises of Cost 'B' plus imputed value of family human labour. Thus the Cost 'C' represents the total cost of cultivation.

The methodology adopted for valuation of different items of cost in estimation of cost of cultivation is discussed in subsequent paragraphs.

#### **1. Human labour**

It includes both hired and family labour. Most of the labour force engaged in crop production comes from cultivator's own family. However, cultivators have to engage hired labour from time to time for certain operations. The human labour cost comprises of

- a. Wages actually paid to the hired labour as also those paid to the labour obtained on contract for the whole year or part there of.
- b. Imputed value of labour put in by the family members.
- c. Wages paid to the attached farm servants for the different operations have been included in the hired labour.

The wages of male and female members of the family were calculated on the basis of wage rates of the casual labourers in force from time to time for different operations.

## **2. Bullock labour**

In the case of hired bullock labour, the prevailing rate of bullock labour in the village was considered. Charges on account of owned bullock labour were accounted on the basis of charges paid to the hired bullock pair.

## **3. Planting material**

Generally paddy growers obtained seeds from 'Krishi Seva Kendras' and their nurseries for multiplication of seedlings.

## **4. Manures**

The cost of farmyard manure or compost produced on the farm was evaluated on the basis of rates prevailed in the village. The cost of manure purchased was accounted for by considering to the actual price paid by the cultivators.

## **5. Fertilizers**

The cost on account of fertilizers was worked out at the actual price paid by the cultivators.

## **6. Insecticides and pesticides**

Insecticides and pesticides were charged at the actual price paid by the cultivators.

## **7. Irrigation charges**

Irrigation was mostly through wells. The estimation of irrigation charges should have been on the basis of the total

amounts spent on the maintenance and working of oil engine or electrical pump for irrigating crop, the depreciation and the hours of the use in case of irrigation through lift or well. In present study, the charges paid for oil engine/electrical motor taken on hire, for irrigation were considered.

### **8. Land revenue, cesses and taxes**

This item of cost includes land revenue and other relevant taxes and cesses, which were actually paid by the cultivator.

### **9. Depreciation on implements and machinery**

Farm assets like implements and farm buildings, machinery were evaluated, at the prevailing market prices taking into consideration the condition of assets.

Depreciation of these assets for the current year was calculated by using straight-line method. For this purpose, present value and the remaining useful life of assets were considered.

### **10. Interest on fixed capital**

Interest on present value of fixed assets (excluding land) such as farm building, implements and equipments was charged at the rate of 10 per cent per annum.

### **11. Interest on working capital**

Interest was charged at the rate of 13 per cent per annum for the period of six months on working capital viz., cash or kind expenditure (excluding items in respects of which payments are generally made after the harvest i.e. rent, land revenue, etc.) incurred during the period of cultivation.

### **12. Rental value of land**

In this investigation, it was found that all the farmers were cultivating their owned land, hence the rental value has been evaluated at the 10 per cent of the estimated current value



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of that land. Per hectare value of land was ascertained from the cultivators at the time of inquiry. The evaluated rental value has been allocated on the basis of the area occupied by the crop.

### 13. Plant protection

Expenditure on insecticides used includes the amount actually paid by the growers for purchase of such chemicals.

#### 3.3.2 Functional analysis

The data on production of paddy were also analyzed with the help of production function approach namely Cobb-Douglas type of production function. The factors affecting the production of paddy were included in the production function. The form of function used in the present study was of following type.

$$Y = aX_1^{b_1} X_2^{b_2} X_3^{b_3} X_4^{b_4} X_5^{b_5} X_6^{b_6} \dots \dots \dots e^u$$

Where,

Y : Yield (q/ha)

X<sub>1</sub> : Human labour in days

X<sub>2</sub> : Bullock labour in pair days

X<sub>3</sub> : Manures in qtls.

X<sub>4</sub> : Nitrogen in Kg.

X<sub>5</sub> : Phosphorous in Kg.

X<sub>6</sub> : Potash in kg.

e<sup>u</sup> = Error term

a = Constant

b<sub>1</sub> to b<sub>6</sub> :Elasticities of production of respective inputs.

#### 3.3.3 Estimation of marginal value product

In order to compare the marginal value products with

The marginal cost of the individual variables, the analysis was extended to work out marginal physical products (MPP's) and

marginal value products (MVP's) of the selected variables in the present study. The marginal physical products (MPP) of individual input used in the production of paddy was worked out with the help of the following equation.

$$MPP_{xi} = b_i \frac{Y}{X_i}$$

Where,

$b_i$  = Elasticity of production for  $X_i$

$Y$  = Geometric mean of output

$X_i$  = Geometric mean of input

The MPP of individual inputs was then converted into MVP with the help of unit price of output

$$MVP_{xi} = \frac{b_i Y}{X_i} P_Y$$

$P_y$  = Per unit price of output

### **3.3.4 Constraints in production and marketing of paddy**

The constraints faced at various levels of production and marketing were listed out and accordingly the data were collected.



***SALIENT FEATURES OF  
KOLHAPUR DISTRICT***

## **4. SALIENT FEATURES OF KOLHAPUR DISTRICT**

Besides economic factors such as marketing facilities, credit, transportation facilities, demand for agricultural produce and supply of farm inputs, the basic agro-ecological factors such as temperature, rainfall, soil type, land use pattern, cropping pattern, irrigation facilities, infrastructural development etc. have great influence in bringing about desirable change in agricultural development. The basic information of these factors would help in better understanding of the study area.

The purpose of this chapter is to explain briefly the background information of Kolhapur district. Soil type, topography and weather conditions are important factors directly influencing the crop growth besides other inputs such as seeds, fertilizers, irrigation and infrastructural development. The study of these factors in addition to land use pattern, cropping pattern and livestock would help in understanding the salient features of district.

### **4.1 Location**

Kolhapur district is located to the South-West of Maharashtra at 15° to 17° North latitude and 73° and 74° East longitudes. Giant Sahyadri ranges are towards the West while the Warna drifts down in the North. Krishna flows silently along the Eastern boundaries and the Belgaum district in the Southern region of Kolhapur district.

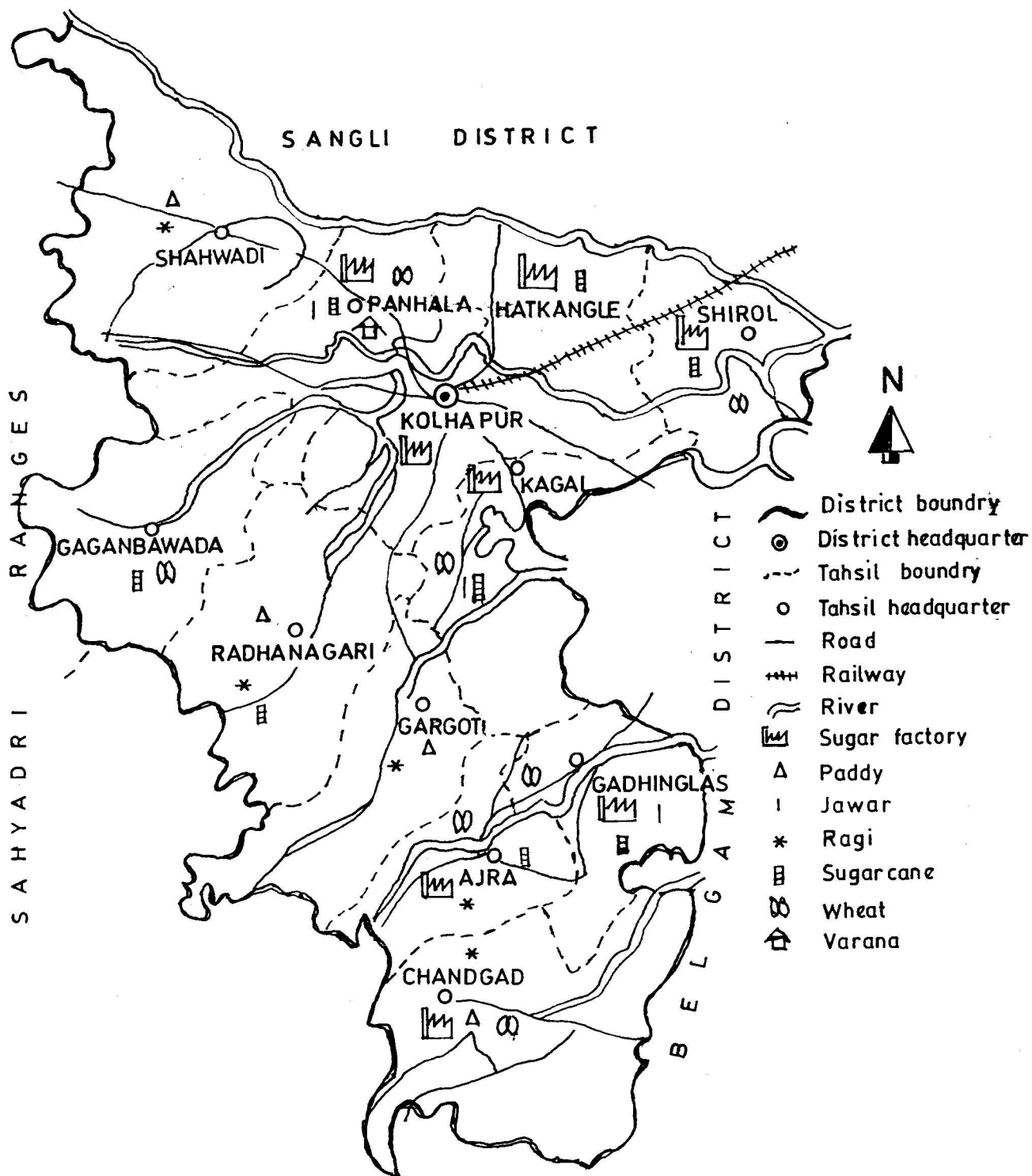


Fig. Map showing the major crop growing area in Kolhapur district.

## **4.2 Soil type**

The soils of Kolhapur district can be divided into three major geographical regions. The Western region comprises of hilly region with red soils covering the areas of Shahuwadi, Radhanagari, Bawada, Bhudargad, Ajra and Chandgad tahsils. The middle region is the area of fertile soils comprising Karveer and Kagal tahsils and the Eastern region is made up of medium soil comprising Hatkanangle and Shirol tahsils. The area along Bhogawati, Kumbhi, Kesari, Panchaganga, Hiranyakeshi and Vedganga are fertile with alluvial soils.

## **4.3 Rivers**

This is one of the most important sources of irrigation in Kolhapur district. The major rivers in Kolhapur district are Krishna, Warna, Panchaganga, Dudhaganga, Hiranyakeshi and Ghatprabha. Krishna rushes along the North-East border. Warna, Panchaganga, Dudhaganga, Vedganga and Hiranyakeshi enriches the soils from North-west to South-East. Warna is outpouring along the boundaries of Kolhapur district and Sangli district covering a distance of 120 km. Kasari, Kumbhi, Talshi and Bhogawati unite to Panchaganga, Dudhaganga is the main river to the West and Vedganga is the sub-sidiary. Panchaganga and Dudhaganga meet Krishna at Narsobawadi and on the outskirts of Kolhapur district, respectively. A river in the South, Tilari is the only westward flowing river.

#### **4.4 Rainfall and climate**

The western region of Kolhapur district covers the Sahyadri ranges with dense forests. Maximum rainfall is received in this area and hence there exists a cool climate. Rainfall decreases from West to East. Hence, rainfall is more in Gaganbawada, Radhanagari, Chandgad and Ajra. Rainfall is scarce in eastern tahsils of Shirol and Hatkanangle of Kolhapur district. Average rainfall in 2005-2006 was 2063.67 mm. Maximum rainfall of 6007 mm. was received in Gaganbawada tahsil and minimum rainfall of 593 mm in Shirol tahsil.

Maximum temperature of the district was recorded to be 36.9°C and minimum temperature was 14.0°C.

#### **4.5 Area and demography**

The total geographical area of Kolhapur district is 7685 sq.km. According to 2001 census, the total population of Kolhapur district was 35.15 lakhs. This district occupies ninth position with respect to population in the state. From the total population of Kolhapur district, maximum population (25%) was in Karveer tahsil and minimum (1%) in Gaganbawada tahsil. The annual population growth rate in last decade (1991-2001) is 1.76, the urban annual growth rate is 3.24 and for rural it is 1.23. According to 2001 census, the sex ratio of Kolhapur district is 949, urban sex ratio is 918 and rural 962.

#### 4.6 Cropping pattern of Kolhapur district

The cropping pattern of Kolhapur district is presented in table 4.1 from the Table it is revealed that rice is

**Table 4.1 Cropping pattern of Kolhapur district for the 2001-2002 (Area 00 hectares)**

(Area in ha)			
Sr. No.	Crops	Area	% to GCA
<b>1.</b>	<b>Cereals</b>		
	Paddy	1063	32.17
	Wheat	85	2.57
	Kharif Sorghum	106	3.20
	Rabi Sorghum	112	3.38
	Other cereals	326	9.86
	<b>Total Cereals</b>	1692	51.18
<b>2.</b>	<b>Pulses</b>		
	Pigeonpea	24	0.72
	Chickpea	139	4.20
	Other pulses	132	3.99
	<b>Total Pulses</b>	295	8.91
<b>3.</b>	<b>Total Food grains</b>	1987	60.09
<b>4.</b>	<b>Cash crops</b>		
	Sugarcane	1019	30.84
	Cotton	1	0.030
	<b>Total Cash Crops</b>	1020	30.87
<b>5.</b>	<b>Oilseed</b>		
	Kharif groundnut	669	20.24
	Sunflower	2	0.06
	Summer groundnut	24	0.72
	Soyabean	622	18.82
	<b>Total Oilseed</b>	1317	39.84
<b>6.</b>	<b>Gross Cropped Area</b>	3304	100.00

(Source-Agricultural Statistical information Maharashtra state 2002, part-2.)

A principal kharif crop of district which occupies 1063 hectares of land (32.17% of GCA ). Total area under cereals was 1692 hectares (51.18%) and pulses were taken on 295 hectares (8.91%). The major pulses grown in the district were pigeon pea in kharif and chick pea in rabi season. The total area under food grain crops was 1987 hectares (60.99%). The area under Sugarcane was 1019 hectares (30.84%).



# ***RESULTS AND DISCUSSION***

## **5. RESULTS AND DISCUSSION**

### **5.1 General information about the sample household**

In this section an attempt has been made to examine some important aspects of sample farms and their organization in the selected area. The aspects examined were related to size of family and its composition, education status, land use pattern and capital investment etc.

### **5.2 Details of size of family, educational status and profession**

#### **5.2.1 Size of family**

In the present investigation, size of the family referred to the total number of individuals living together under a common roof and having economic activities for the welfare of the family. The composition of average sample families and their family size is given in Table 5.1.

It is seen from the table that, at the overall level, per family the average number of members was 6.02. Of the total family members, 38.70, 33.23 and 28.07 per cent were male, female and children, respectively. It has been observed that, the average size of families of small, medium and large size groups of farmers, was 4.90, 6.05 and 7.13, respectively. At the overall level in case of the total members, 38.70 per cent were male, 33.23 per cent were female and 28.07 per cent were children.

**Table 5.1 Average size of family, educational status and profession of the sample farmers**

Sr. No.	Particulars	Size groups			Overall (N=90)
		Small (N=30)	Medium (N=30)	Large (N=30)	
<b>1.</b>	<b>Family members</b>				
a.	Male	1.90 (38.78)	2.30 (38.02)	2.80 (39.27)	2.33 (38.70)
b.	Female	1.60 (32.65)	1.98 (32.73)	2.44 (34.22)	2.00 (33.23)
c.	Children	1.40 (28.57)	1.77 (29.25)	1.89 (26.51)	1.69 (28.07)
	Total	4.90 (100)	6.05 (100)	7.13 (100)	6.02 (100)
<b>2.</b>	<b>Educational status</b>				
a.	Illiterate	1.10 (22.45)	0.82 (13.55)	1.04 (14.51)	0.99 (16.45)
b.	Upto primary	0.57 (11.63)	1.07 (17.69)	0.97 (13.60)	0.87 (14.45)
c.	Upto secondary	2.65 (54.08)	3.53 (58.35)	3.85 (54.00)	3.34 (55.48)
d.	Graduate	0.58 (11.84)	0.63 (10.41)	1.27 (17.81)	0.82 (13.62)
e.	Total	4.90 (100)	6.05 (100)	7.13 (100)	6.02 (100)
<b>3.</b>	<b>Profession</b>				
a.	Farming	2.65 (54.08)	2.82 (46.61)	3.18 (44.60)	2.89 (48.00)
b.	Business	0.31 (6.33)	0.55 (9.09)	0.47 (6.59)	0.44 (7.31)
c.	Services	0.22 (4.49)	0.64 (10.58)	0.39 (5.47)	0.41 (6.82)
d.	Other	1.72 (35.10)	2.04 (33.72)	3.09 (43.34)	2.28 (37.87)
e.	Total	4.90 (100)	6.05 (100)	7.13 (100)	6.02 (100)

(Figures in the parentheses are the percentages to the total)

The average size of family was highest in case of large size group (7.13) followed by medium size group (6.05) and small size group (4.90). Incidentally, there were direct relationship between size of land holding and the size of family.

### **5.2.2 Educational status**

The educational status of the selected family members was also estimated. It was observed that, on an average 16.45 per cent of family members were illiterate, 14.45 per cent were educated upto primary level, 55.48 per cent upto secondary level and 13.62 per cent of total had completed college education.

It was observed that illiteracy percentage was more in small size group than the other two categories.

### **5.2.3 Profession**

In the study area farming was the main occupation of the farmers. Some farmers have to perform secondary occupation for meeting the financial needs. The occupational distribution of families is presented in Table 5.1.

It is seen from the table that, 54.08, 46.61 and 44.60 per cent of small, medium and large size farmers were engaged in farming, respectively. At the overall level, 48.00 per cent farmer were engaged in the farming, 7.31 per cent in business, 6.82 per cent in services.

### **5.3 Land use pattern**

The average holding size and other details about land use pattern of selected cultivators are given in Table 5.2.

It is seen from the table that, at the overall level, the total land holding possessed by the paddy cultivators was 4.61

hectares. Of the total land possessed 95.66 per cent was under operational holdings and 1.74 per cent as permanent fallow land.

**Table 5.2 Land utilization pattern of sample farmers  
(Area in ha)**

Sr. No.	Particulars	Size group			Overall
		Small	Medium	Large	
1.	Total land holdings	1.76 (100.00)	3.93 (100.00)	8.14 (100.00)	4.61 (100.00)
2.	Permanent fallow	0.01 (0.57)	0.01 (0.26)	0.21 (2.58)	0.08 (1.74)
3.	Net cultivable land	1.75 (99.43)	3.92 (99.75)	7.93 (97.42)	4.53 (98.26)
4.	Current fallow	0.01 (0.57)	0.03 (0.76)	0.32 (3.93)	0.12 (2.60)
5.	Operational holdings	1.74 (98.86)	3.89 (98.98)	7.61 (93.49)	4.41 (95.66)
i.	Irrigated land	0.12 (6.81)	0.42 (10.69)	1.75 (21.50)	0.76 (18.27)
ii.	Unirrigated land	1.62 (92.05)	3.47 (88.29)	5.86 (71.99)	3.65 (79.18)
6.	Gross cropped area	2.42	5.00	9.43	5.62

(Figures in the parentheses are the percentages to the total)

The proportion of net cultivated land to total land holding was 99.43, 99.75 and 97.42 per cent in small, medium and large size group, respectively. Land under irrigation was more in large size group (21.50 %) followed by medium size group (10.69 %) and small size group (6.81 %). Unirrigated land was more in small (92.05 %) followed by medium (88.29 %) and large size groups (71.99 %).

#### **5.4 Cropping pattern**

Cropping pattern is another vital factor influencing the level of expenses on farm and the returns from farm business.

**Table 5.3 Cropping pattern of sample growers****(Area in ha)**

Sr. No.	Particulars	Size group			Overall
		Small	Medium	Large	
1.	Cereals	1.34 (55.37)	3.26 (65.20)	6.03 (63.94)	3.54 (62.98)
	a. Paddy	0.92 (38.01)	2.53 (50.06)	4.43 (46.98)	2.63 (46.79)
	b. Fingermillet	0.23 (9.50)	0.48 (9.60)	1.12 (11.18)	0.61 (10.85)
	c. Wheat	0.19 (7.85)	0.25 (5.00)	0.48 (5.09)	0.31 (5.51)
2.	Pulses	0.42 (17.35)	0.63 (12.60)	1.30 (13.78)	0.78 (13.87)
	a. Pigeonpea	0.24 (9.91)	0.41 (8.20)	0.87 (9.23)	0.51 (10.14)
	b. Chickpea	0.18 (7.43)	0.22 (4.40)	0.43 (4.56)	0.28 (4.98)
3.	Sugarcane	0.26 (10.74)	0.39 (7.80)	0.73 (7.74)	0.46 (8.18)
4.	Oilseed	0.21 (8.68)	0.32 (6.40)	0.54 (5.72)	0.36 (6.40)
5.	Vegetables	0.02 (0.82)	0.08 (1.60)	0.35 (3.71)	0.15 (2.66)
6.	Fruit crops	0.04 (1.65)	0.14 (2.80)	0.45 (4.77)	0.14 (2.49)
7.	Miscellaneous crops	0.19 (5.37)	0.18 (3.60)	0.43 (4.56)	0.25 (4.44)
8.	Gross cropped area	2.42 (100.00)	5.00 (100.00)	9.43 (100.00)	5.62 (100.00)

(Figures in the parentheses are the percentages to the total)

Table 5.3 represents the information on area under different crops during the year 2004-05 on the farms of the sample cultivators. At the overall level, cereals occupied 62.98 per cent, pulses occupied 13.87 per cent, Sugarcane occupied 8.81 per cent and oilseed occupied 6.40 per cent area in the gross cropped area. The total area under paddy was 38.01, 50.06 and 46.98 per cent in small, medium and large size groups, respectively.

### 5.5 Information on capital assets of the sample farms

Total capital assets of the households in terms of value indicate the overall economic position of the sample farmers. The same has been estimated and presented in Table 5.4.

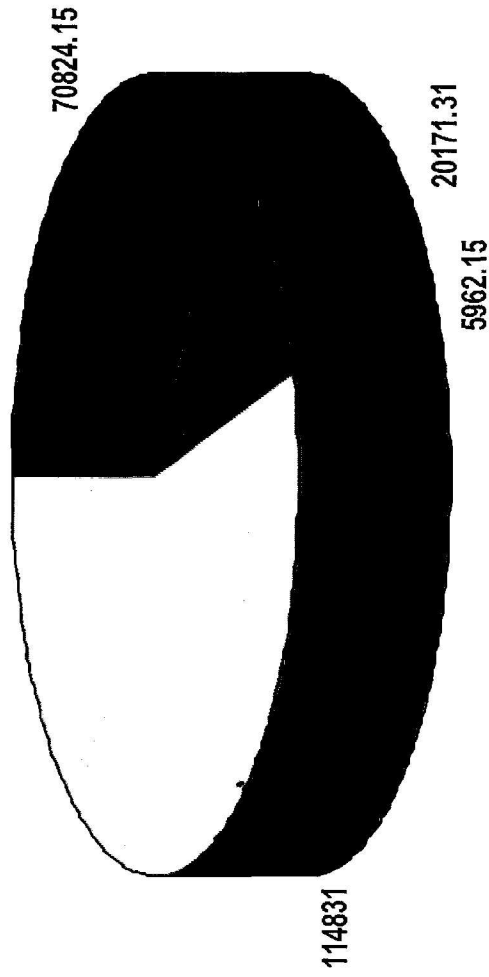
**Table 5.4 Average investment in capital assets of the sample farms**

( Rs.)					
Sr. No.	Particulars	Small	Medium	Large	Overall
1.	Residential buildings	38142.44 (51.86)	69230 (64.16)	105100 (64.46)	70824.15 (61.68)
2.	Wells and Bore well	17190 (23.37)	18932.80 (17.55)	24391.14 (14.96)	20171.31 (17.57)
3.	Implements and machinery	1628.40 (2.21)	1972.37 (1.83)	14285.67 (8.76)	5962.15 (5.20)
4.	Livestock				
a.	Bullocks	8740.16 (11.88)	9863.31 (9.14)	10497.00 (6.44)	9700.16 (8.44)
b.	Milch animals	7853 (10.68)	7896.52 (7.32)	8770.19 (5.38)	8173.23 (7.11)
	Total	73554 (100.00)	107895 (100.00)	163044 (100.00)	114831 (100.00)

(Figures in the parentheses are the percentages to the capital investment)

The capital investment on residential buildings was Rs. 38142.44 (51.86 %) on small farms, Rs. 69230 (64.16 %) on medium farms and Rs. 105100 (64.46 %) on large farmers. The capital investment on well and bore wells was Rs. 17190.00 (23.37 %) on small farms, Rs. 18932.80 (17.55%) on medium and Rs. 24391.14 (14.96 %) on large farms. The capital investment on implements and machinery was Rs. 1628.40 (2.21 %) in small, Rs. 1972.37 (1.83 %) in medium and Rs. 14285.67 (8.76 %) in large size farms. It was observed that, capital

Per hectare assesis



■ Residential buildings ■ Wells and Bore well ■ Implements and machinery □ Livestock

investment on implement and machinery made by the large farmers was more than other two categories. It was obvious because they have to manage the large size of land holdings. The small farms had relatively greater capital investment in livestock (22.56 %) than medium (16.46 %) and large (11.82 %) farms.

## **5.6 Different aspects related to production management**

### **5.6.1 Per hectare input utilization**

The input required for paddy cultivation includes labour, seed, manure, fertilizers and pesticides and per hectare input utilization is given in Table 5.5

**Table 5.5 Per hectare input utilization for rice cultivation**

<b>Sr. No.</b>	<b>Particulars</b>	<b>Small</b>	<b>Medium</b>	<b>Large</b>	<b>Overall</b>
1	Total Human labour (Days)	76	21	20	73
	a. Male	29	9	9	31
	b. Female	47	12	11	42
2	Bullock power (pair days)	12	14	14	14
3	Machine power in hrs.	0.00	0.00	0.00	0.00
4	Seed (Kg)	90.60	92.20	95.20	93.24
5	Manures (Qtls.)	30.70	32.90	38.90	35.14
6	Fertilizers (Kg)				
	N	50.38	48.30	49.90	49.32
	P	20.30	22.30	20.30	21.12
	K	4.30	5.80	7.80	6.42
7	Irrigation charges (Rs.)	1100	1230	1310	1244

It was observed that, the per hectare labour required was 73 days, while it was 76 days, 21 days and 20 days

in small, medium and large size groups, respectively. Bullock pair is important because the preparatory tillage operations like ploughing and puddling are performed with help of bullocks only.

The per hectare bullock power use was 14 pair days at overall level. As far as seed rate is concerned, farmers were using 93.24 kg seeds per hectare. The use of manure was comparatively higher in 'large group (38.90 qtls) than other groups of farmers, it was 35.14 qtls. at the overall level. It was observed that most of farmers were using urea as nitrogenous fertilizer. Therefore, application of nitrogen was comparatively more (49.32 kg per ha.) than phosphorus (21.12 kg/ha) and potash (6.42 kg/ha). It can be concluded that, the farmers did not use proper recommended quantities of inputs, which resulted in low yields.

### **5.6.2 Resource use management**

The sample farmers were enquired about the adoption of different resource management practices. The information on this aspect was analyzed and results are presented in the Table 5.6.

It is revealed from the table that, even though the farmers know the importance of organic manure, they could not use it as per the recommendation. At the overall level, only 23.33 per cent paddy growers had applied FYM as per the recommendation. The large proportion of (56.67 %) paddy growers used manures below recommended dose.

**Table 5.6 Adoption of different resource management practices by different size groups of paddy growers**

Sr. No.	Particulars	Size group						Overall	
		Small		Medium		Large		No.	%
		No.	%	No.	%	No.	%		
1.	<b>Manures</b>								
	Recommended dose	8	26.67	7	23.33	6	20.00	21	23.33
	Above recommended	5	16.67	5	16.67	8	26.67	18	20.00
	Below recommended	17	56.67	18	60.00	16	53.33	51	56.67
2.	<b>Nitrogen</b>								
	Recommended dose	14	46.67	14	46.67	12	40.00	40	44.44
	Above recommended	10	33.33	10	33.33	14	46.67	34	37.78
	Below recommended	6	20.00	6	20.00	4	13.33	16	17.78
3.	<b>Phosphorus</b>								
	Recommended dose	8	26.67	8	26.67	12	40.00	28	31.11
	Above recommended	20	66.67	13	43.33	16	53.33	49	54.44
	Below recommended	2	6.67	9	30.00	2	6.67	13	14.44
4.	<b>Potash</b>								
	Recommended dose	16	53.33	3	10.00	2	6.67	21	23.33
	Above recommended	8	26.67	4	13.33	8	26.67	20	22.22
	Below recommended	6	20.00	23	76.67	20	66.67	49	54.44
5.	<b>Top dressing</b>								
	At recommended days	10	33.33	10	33.33	5	16.67	25	27.78
	After recommended days	8	26.67	13	43.33	20	66.67	41	45.56
	Before recommended days	7	23.33	7	23.33	2	6.67	16	17.78
	No top dressing	5	16.67	0	0.00	3	10.00	8	8.89
6.	<b>Seed rate</b>								
	Recommended dose	10	33.33	17	56.67	10	33.33	37	41.11
	Above recommended.	13	43.33	11	36.67	4	13.33	28	31.11
	Below recommended	7	23.33	2	6.67	16	53.33	25	27.78
7.	<b>Irrigation turns</b>								
	Recommended	15	50.00	8	26.67	5	16.67	28	31.11
	Above recommended.	5	16.67	2	6.67	9	30.00	16	17.78
	Below recommended	10	33.33	20	66.67	16	53.33	46	51.11

Among the size groups, the proportion of paddy growers using manures less than recommendation was more in medium size group. Sixteen per cent of paddy growers from medium size group used manures more than the recommendation.

It was noticed that, at the overall level, 44.44 per cent paddy growers used the nitrogenous fertilizers as per the recommendation. Whereas, 37.78 per cent paddy growers applied nitrogenous fertilizers more than recommendation. The phosphatic and potassic fertilizers adopters as per recommendation were 31.11 and 22.33 per cent, respectively. The majority of paddy growers applied phosphatic fertilizers more than the recommended level. Whereas, 54.44 per cent paddy growers applied potassic fertilizers below the recommended level. From above, it can be revealed that, the use of FYM and NPK was not as per recommendation.

Moreover, the variations in adoption behaviour of the paddy growers were noticed in various size groups of paddy growers.

The time of application of NPK was also studied and it was noticed that, in general large number of paddy growers used mixed fertilizers that too not as per the recommended time of application. The practice of top dressing in paddy was also noticed and it was seen that as per recommendation about 27.78 per cent farmers applied the fertilizers at overall level, whereas 45.56 per cent farmers applied the fertilizers after recommended days. Among the size groups, no consistency in time of application of fertilizers was noticed in paddy growers.

In the case of seed rate use, at the overall level, 41.11 per cent farmers used seed rate at par with the recommended level. The per cent of farmers that used seed rate above and below the recommended level was observed as 31.11 and 27.78 per cent, respectively at the overall level.

The study pointed out that majority of farmers has paid attention towards the layout management practices.

The information regarding irrigation management on sample farms showed that 51.11 per cent farmers could not irrigate their field as per requirements due to inadequate irrigation water supply and fluctuations in electricity.

### **5.6.3 Per hectare cost of cultivation**

Per hectare cost of cultivation of rice for all groups of holding was worked out and is presented in Table 5.7.

It is observed from the table that, overall cost of cultivation (Cost 'C') was Rs. 16649.31, which included Cost 'A' Rs. 11289.26 (67.81 %) and cost B Rs. 15848.21 (92.68 %) at overall level. Total cost was minimum (Rs. 16124.68) in medium group and maximum (Rs. 17334.12) in large group. The human labour (hired and family) was the important item of cost which accounted for 19.39 per cent of the total cost followed by rental value of land (18.24 %), other important item of cost was bullock labour (16.33 %) seed, fertilizer and FYM shared 4.48 per cent, 2.53 per cent, 10.55 per cent of total cost at overall level respectively. The interest on working capital was worked out to Rs. 643.92 (3.87 %), the depreciation was Rs. 695.61 (4.18 %) and interest on fixed capital was Rs. 1104.37 (6.63 %)

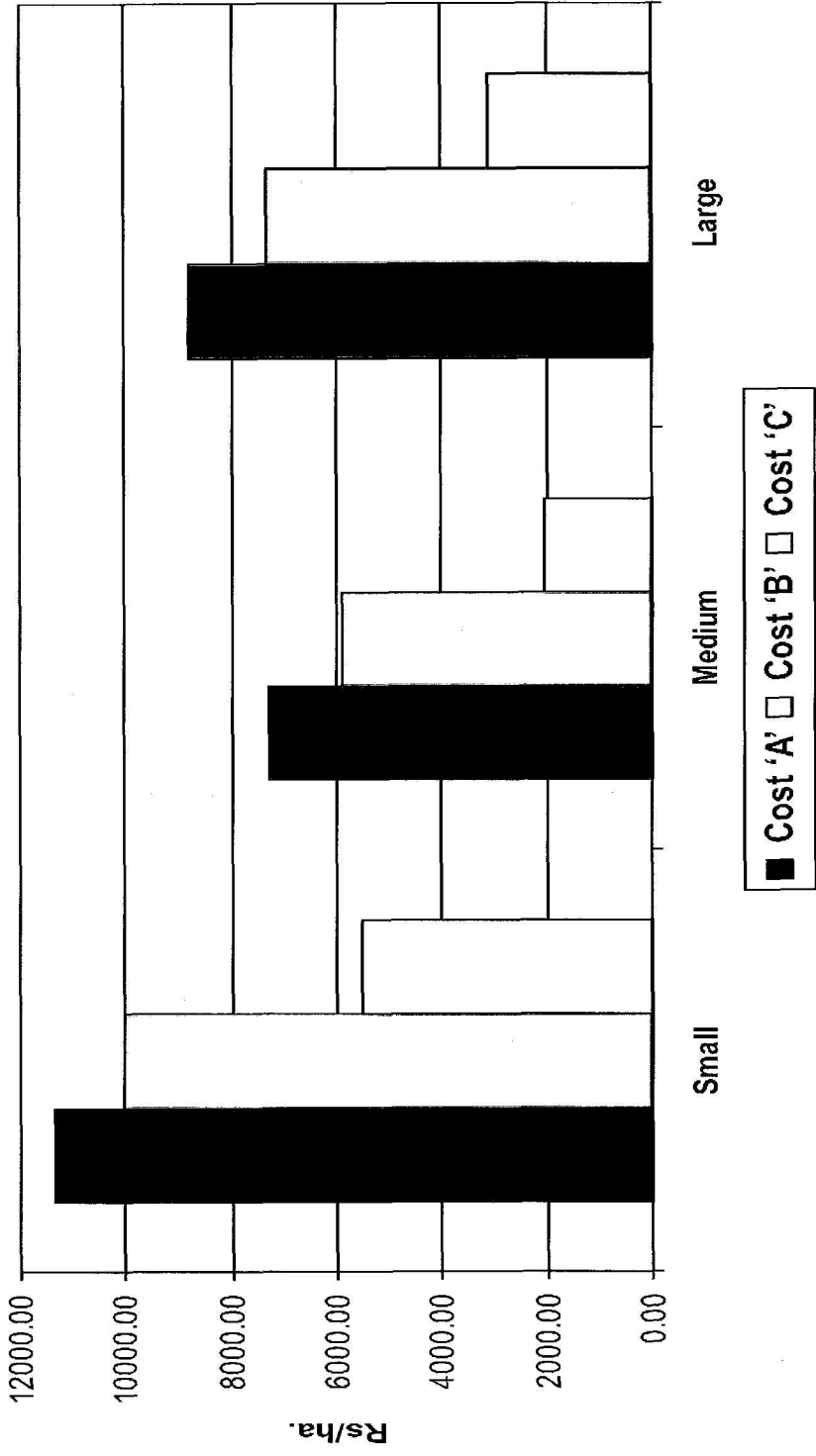
**Table 5.7 Per hectare cost of cultivation**

Sr.No	Particulars	Small N=30		Medium N=30		Large N=30		Overall N=90	
		Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value
1	Total Human labour a. Male @ Rs. 50 / day b. Female @ Rs. 40 / day	11.20 37.50	560.00 (3.47) 1500.00 (9.30)	12.20 36.70	610.00 (3.78) 1468.00 (9.10)	13.90 30.70	695.00 (4.01) 1228.00 (7.08)	12.77 34.24	638.75 (3.84) 1369.41 (8.23)
2	Bullock power (Pair days)@ Rs.200/ day	11.70	2340.00 (14.50)	13.70	2740.00 (16.99)	14.20	2840.00 (16.38)	13.60	2719.36 (16.33)
3	Machine Powers in hrs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	Seed (Kgs) @ Rs.8 / kg	90.60	724.80 (4.49)	92.20	737.60 (4.57)	95.20	761.60 (4.39)	93.24	745.93 (4.48)
5	Manures ( Qtls )	30.70	1535.00 (9.51)	32.90	1645.00 (10.20)	38.90	1945.00 (11.22)	35.14	1757.06 (10.55)
6	Fertilizers ( Kgs )								
	N	50.38	639.83 (3.96)	48.30	700.35 (4.34)	49.90	873.25 (5.04)	49.32	765.40 (4.60)
	P	20.30	263.90 (1.64)	22.30	245.30 (1.52)	20.30	284.20 (1.64)	21.12	265.08 (1.59)
	K	4.30	40.85 (0.25)	5.80	45.24 (0.28)	7.80	71.76 (0.41)	6.42	56.00 (0.34)
7	Irrigation Charges (Rs.)		1100.00 (6.82)		1230.00 (7.63)		1310.00 (7.56)		1243.81 (7.74)
8	Plant Protection Charges Rs.		0.00		0.00		0.00		0.00
9	Incidental Charges Rs.		110.00 (0.68)		115.00 (0.71)		120.00 (0.69)		116.00 (0.70)

<b>Table 5.7 contd</b>										
10	Repairs ( Rs.)							210.00 (1.30)	240.00 (1.38)	229.35 (1.38)
11	Working Capital ( 1 to 10 )							9746.49 (60.44)	10368.81 (59.82)	9906.49 (59.50)
12	Int.on working Capital							633.52 (3.93)	673.97 (3.39)	643.92 (3.87)
13	Depre.on farm Implements							690.00 (4.28)	710.00 (4.10)	695.61 (4.18)
14	Land revenue and other taxes							40.20 (0.25)	45.20 (0.26)	43.24 (0.26)
15	<b>Cost 'A'</b>							11110.21 (68.90)	11797.98 (68.06)	11289.26 (67.81)
16	Rental Value of land							2796.47 (17.34)	3148.13 (18.16)	3037.46 (18.24)
17	Int.on fix Capital							1070.00 (6.64)	1120.00 (6.46)	1104.37 (6.63)
18	<b>Cost 'B'</b>							14976.68 (92.88)	16066.12 (92.68)	15431.10 (92.68)
19	Family labour a.Male @ Rs. 50 / day b.Female @ Rs.40 / day							840.00 (5.21)	940.00 (5.42)	888.80 (5.34)
								308.00 (1.91)	328.00 (1.89)	329.41 (1.98)
20	<b>Cost 'C'</b>							16124.68 (100.00)	17334.12 (100.00)	16649.31 (100.00)

(Figures in the parentheses are the percentages at Cost 'C')

# Per hectare Cost A,B & C



### 5.6.4 Land Management practices

The information regarding land management is presented in Table 5.8 and it is revealed that majority of paddy growers (55.56 per cent) followed same crop sequence every year. There were 65.56 per cent paddy growers at the overall level

**Table 5.8 Percent distribution of sample cultivators according to land management**

Sr. No.	Particulars	Size group						Overall	
		Small		Medium		Large		No.	%
		No.	%	No.	%	No.	%		
1.	Same crop sequence is followed every year								
	Yes	20	66.66	16	53.33	14	46.66	50	55.56
	No	10	33.34	14	46.66	16	53.33	40	44.44
2.	Paddy is grown on same piece of land								
	Yes	24	80.00	18	60.00	17	56.66	59	65.56
	No	6	20.00	12	40.00	13	43.34	31	34.44
3.	Manures applied every year								
	Yes	12	40.00	14	46.66	20	66.66	46	51.11
	No	18	60.00	16	53.33	10	33.34	44	48.88
4.	Measures adopted to improve soil fertility								
i)	Crop rotation	16	53.33	22	73.33	24	80.00	62	68.88
ii)	Application of manures	7	23.33	12	40.00	22	73.33	41	45.55
iii)	Application of fertilizers	30	100.0	30	100.00	30	100.00	90	100.00
iv)	Soil testing	-		2	6.66	3	10.00	5	5.55
v)	Use of good seed variety	8	26.66	14	46.66	25	83.33	47	52.22

who used the same piece of land for paddy cultivation. Whereas 45.55 per cent paddy growers applied manures every year. The paddy growers were also enquired about the measures adopted to improve the soil fertility. The paddy growers of small size group were unaware about the soil testing while only 5.55 per cent paddy growers were known about soil testing.

### 5.6.5 Calendar of operations for cultivation of paddy

The paddy growers were further enquired regarding their planning about the cultivation operations while taking the decision of growing the crop.

**Table 5.9 Percent distribution of sample cultivators according to planning of cultivation**

Sr. No.	Particulars	Size group						Overall	
		Small		Medium		Large		No.	%
		No.	%	No.	%	No.	%		
1.	<b>Making calendar operations for paddy cultivation</b>								
	Yes	14	46.66	20	66.66	24	80.00	58	64.44
	No	16	53.33	10	33.33	6	20.00	32	35.55
2.	Working as per calendar	N = 14		N = 20		N = 24		N = 58	
	Yes	9	64.28	12	60.00	14	58.33	35	60.34
	No	5	30.76	8	40.00	10	41.66	23	39.65
	<b>If No, reason</b>	N = 5		N = 8		N = 10		N = 23	
	i. Unfavourable climate	1	20.00	4	50.00	2	20.00	7	30.43
	ii. Non availability of labour	2	40.00	1	12.5	2	20.00	5	21.73
	iii. Non availability of inputs	2	40.00	3	37.5	6	60.00	11	47.82

It was noticed from the Table 5.9 that 64.33 per cent of paddy growers prepared the calendar for the paddy cultivation and majority of them follow the calendar. The non-followers of the calendar of operation were further enquired about not following the calendar of operation and the reasons reported were unfavorable climatic conditions, non-availability of labour and non-availability of inputs.

#### **5.6.6 Information about seed and variety**

Since, paddy is one of the important crop in the study area, the knowledge and adoption behaviour regarding recommended varieties were studied and presented in the Table 5.10.

It was observed that, the majority of farmers (66.66 %) had knowledge and adopted the varieties recommended for paddy cultivation. Further, the farmers were enquired about the source of seed and it was found that majority of farmers could get the information from Krishi Seva Kendra (58.88 %) and from relatives and friends (25.55 %) which affected the purchase of seed from later sources.

**Table 5.10 Percent distribution of sample cultivators according to source of seed**

Sr. No.	Particulars	Size group						Overall	
		Small		Medium		Large			
		No.	%	No.	%	No.	%	No.	%
<b>1.</b>	<b>Knowledge about varieties</b>								
	Yes	16	53.33	18	60.00	26	86.66	60	66.66
	No	14	46.66	12	40.00	4	13.34	30	33.34
<b>2.</b>	<b>Seed</b>								
	Purchased	13	43.34	17	56.66	26	86.66	56	62.22
	Produced on own farm	17	56.66	13	43.33	4	13.34	34	37.77
<b>3.</b>	<b>Source of information of seed</b>								
	Kishi Seva Kendra	18	60.00	16	53.33	19	63.33	53	58.88
	Agril. Dept.	5	16.66	8	26.66	6	20.00	19	21.11
	Relatives/ friends	6	20.00	10	33.33	7	23.33	23	25.55
	Newspaper	16	53.33	16	53.33	14	46.66	46	51.11
	Agril. Univ.	7	23.33	9	30.00	4	13.34	20	22.22
	Radio/ T.V.	1	3.33	1	3.33	2	6.66	4	4.44
	Innovative farmers	-	-	-	-	1	3.33	1	1.11
<b>4.</b>	<b>Seed purchased from</b>	N = 11		N = 17		N = 23		N = 51	
	Krishi Seva Kendra	9	81.81	12	70.58	13	56.52	34	66.67
	Farmers/ friends	1	9.09	2	11.76	6	26.08	9	17.65
	Agril. Univ.	-	-	2	11.76	2	8.69	4	7.84
	None of these	1	9.09	1	5.88	2	8.69	4	7.84

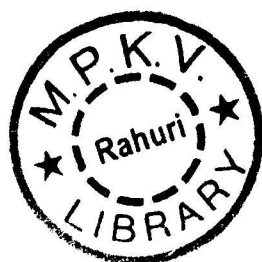
### 5.6.7 Nursery management

Almost all the cultivators practice the nursery management usually. The information regarding nursery management and transplanting of paddy is presented in the Table 5.11, which indicated that in nursery management about 68.88 per cent sample farmers adopted sowing in the rows.

These farmers adopted line distance or 5 cm as well as more than 5 cm and applied FYM and fertilizers. Plant protection practices were also adopted in the nursery management.

**Table 5.11 Percent distribution of sample cultivators according to Nursery management and transplanting of paddy crop**

Sr. No.	Particulars	Size group						Overall	
		Small		Medium		Large		No	%
		No.	%	No	%	No	%		
<b>A. Nursery management</b>									
1.	Seedlings are raised on								
	Raised beds	30	100	30	100	30	100	90	100
2.	Seeds is								
	Sown in rows	24	80	16	53.33	22	73.33	62	68.88
	Broadcasted on beds	6	20	14	46.66	8	26.66	28	31.11
3.	If sowing in rows, distance between lines	N = 24		N = 20		N = 22		N = 66	
	Five cm	23	95.83	17	85.00	20	90.90	60	90.90
	More than five cm	1	4.16	3	15.00	2	9.09	6	9.09
4.	Width of seed bed	N = 24		N = 20		N = 22		N = 66	
	One meter	7	29.16	11	55.00	9	40.90	27	40.90
	More than one meter	17	70.83	9	45.00	13	59.09	39	59.09
5.	While preparing seed bed, material used								
	FYM	25	83.33	25	83.33	28	93.33	78	86.66
	Fertilizer	26	86.66	24	80.00	30	100	80	88.88
	lindane powder	7	23.33	9	30.00	8	26.66	24	26.66
	Use of insecticide	24	80.00	20	66.67	24	80.00	68	75.55



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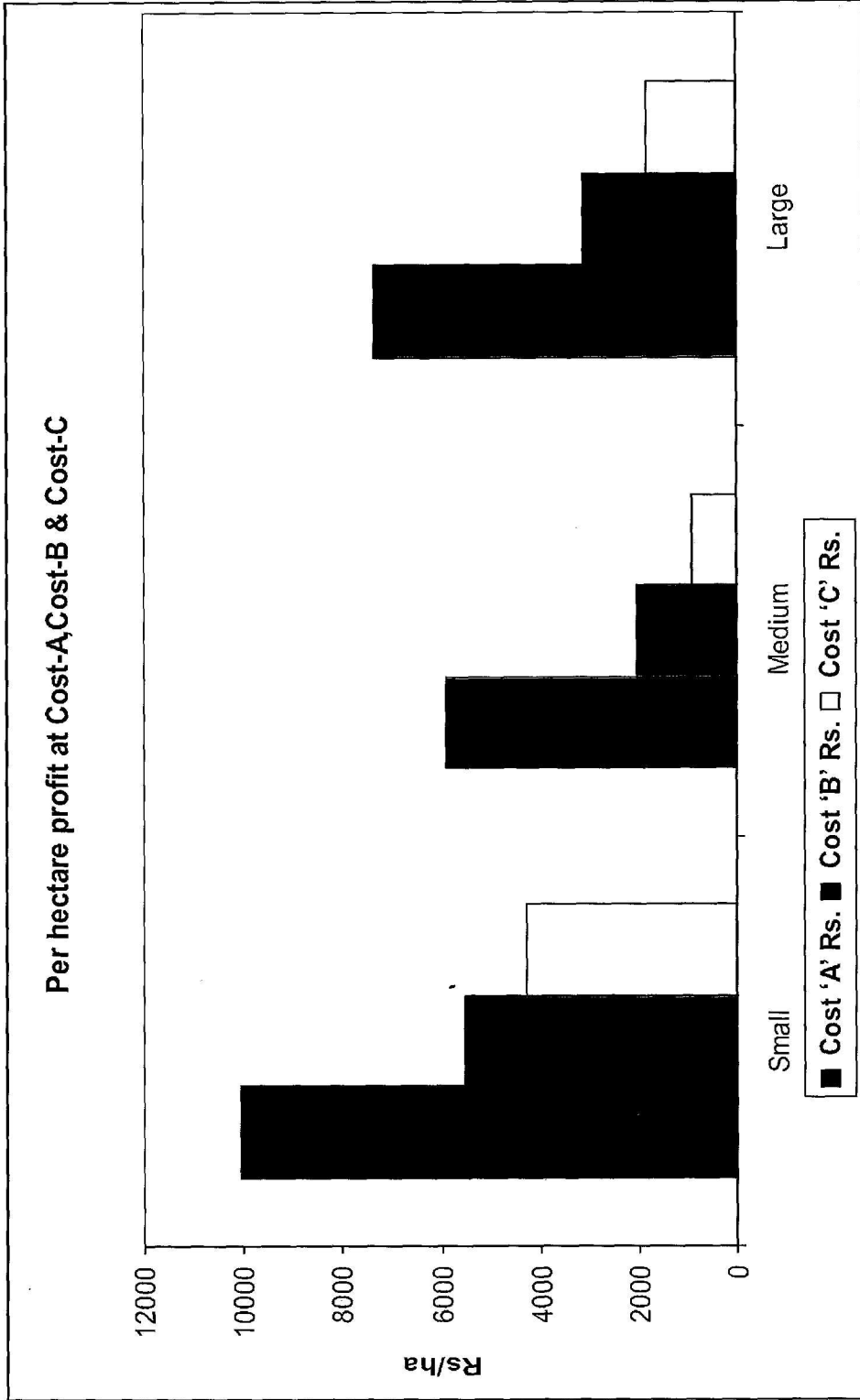
### 5.6.8 Per hectare cost, returns, gross income, and B.C.ratio

It was observed from the table that, the per hectare gross returns were worked out to Rs. 18484.20. Per hectare gross return at different item of cost were Rs. 11289.26 (Cost 'A'), Rs. 15431.10 (Cost 'B') and Rs. 16649.31 (Cost 'C') at overall level. The net returns were maximum (Rs. 4262.44) in small size group and it was minimum in medium size group (Rs. 895.32).

**Table 5.12 Per hectare cost, returns, gross income, and B:C ratio.**

Sr. No.	Particulars	Size groups				
		Unit	Small	Medium	Large	Overall
1	Total cost					
	i) Cost 'A'	Rs.	10370.26	11110.21	11797.98	11289.26
	ii) Cost 'B'	Rs.	14874.56	14976.68	16066.12	15431.10
	iii) Cost 'C'	Rs.	16137.56	16124.68	17334.12	16649.31
2	Profit at					
	i) Cost 'A'	Rs.	10029.74	5909.79	7362.02	7194.94
	ii) Cost 'B'	Rs.	5525.44	2043.32	3093.88	3053.10
	iii) Cost 'C'	Rs.	4262.44	895.32	1825.88	1834.89
3	Production	Qtls	30.00	25.00	28.00	27.09
4	Gross income	Rs.	20400.00	17020.00	19160.00	18484.20
5	B:C ratio					
	i) Cost 'A'		1.97	1.53	1.62	1.64
	ii) Cost 'B'		1.37	1.14	1.19	1.20
	iii) Cost 'C'		1.26	1.06	1.11	1.11
6	Per qtl.cost	Rs.	457.92	544.19	524.79	520.23

Per hectare profit at Cost-A, Cost-B & Cost-C



The benefit cost ratio and cost per quintal was also worked out to evaluate the profitability of paddy cultivation. It was observed that at overall level, benefit cost ratio was 1.11 and cost per quintal was Rs. 520.23. The benefit cost ratio was maximum in small size group (1.26) and minimum in medium size group (1.06).

At overall level, the rice cultivation was profitable as indicated by benefit cost ratio (1.20).

#### **5.6.9 Per hectare production and its value**

Per hectare yields (main and by product) with their values are shown in Table 5.13.

The total value of paddy and straw was Rs. 18484 at overall level with average grain yield 27.00 qtl/ha and by-product of 42.54 qtl/ha. The market rate of grain and straw was Rs. 588.09 per quintal and Rs. 60.00 per quintal, respectively. The highest yield and gross value was observed in small sizegroup and minimum in medium sizegroup.

**Table 5.13 Per hectare production and its value**

<b>Particulars</b>	<b>Small</b>	<b>Medium</b>	<b>Large</b>	<b>Overall</b>
<b>Yield (q/ha)</b>				
Main Produce	30.00	25.00	28.00	27.00
By-Product ( qtl.)	40.00	42.00	44.00	42.54
<b>Rate/q</b>				
Main (Rs/q)	600.00	580.00	590.00	588.09
By (Rs/q)	60.00	60.00	60.00	60.00
Total value (Rs.)	20400.00	17020.00	19160.00	18484.20

**Table 5.14 Results of estimated Cobb-Douglas production function for paddy**

Sr. No.	Particulars		Regression coefficient
1.	Constant		1.5303
2.	Human labour	X <sub>1</sub>	0.4591*** ( 0.2321)
3.	Bullock labour	X <sub>2</sub>	0.0834 (0.0640)
4.	Manures	X <sub>3</sub>	0.2291*** ( 01148 )
5.	Nitrogen	X <sub>4</sub>	0.2684* ( 0.1214 )
6.	Phospharous	X <sub>5</sub>	0.0150 ( 0.0557 )
7.	Potash	X <sub>6</sub>	0.0453*** ( 0.0231 )
	Coefficient of multiple Deter mination	R <sup>2</sup>	0.65
	Number of observation	N	90
	D.F.		83
	'F' value		12.29

(Figures in parentheses are standard errors)

\*\*\*: Significant at 10 per cent level of significant

\*\* : Significant at 5 per cent level of significant

\* : Significant at 1 per cent level of significant

The production elasticity of nitrogen is 0.2684, which was significant, this means that 1 unit increase in the use of nitrogen, and other things being held constant would result into an increase in gross output of paddy by 0.2684 per cent.

The selected six independent variables have explained 65 per cent of the total variation in the production of paddy on sample farm. It is observed from the table that the sample farms, the Cobb-Douglas type of production function turned out to be a good fit, since R<sup>2</sup> and 'F' values were found significant.

### 5.6.11 Resource use efficiency in paddy production

The estimated production function underlying crop production activity enables us to evaluate the efficiency of prevalent factor proportions in agriculture in a given region.

**Table 5.15 Marginal value products of farm resources with their Prices**

Sr. No	Particulars	MP	MVP	MC	MVP/ MC
1	Human labour in days	0.1721	101.22	40.00	2.5304
2	Bullock labour in pair days	0.1749	102.83	200.00	0.5142
3	Manures in Q.	0.1859	109.35	50.00	2.1870
4	Nitrogen in Kg	0.1496	87.95	15.51	5.6706
5	Phosphorous Kg	0.0197	11.60	12.55	0.9243
6	Potash Kg	0.2158	126.92	8.72	14.5548

The production function analysis has been generally used to determine economic efficiency of resource use, which requires estimation of marginal value products of different resources. A resource or input is considered to be used more efficiently if its marginal value product just offsets its unit cost. Equality of marginal value product with factor cost is, therefore, the basic condition that must be satisfied to obtain efficient resource use. Therefore, the marginal value products so obtained from the estimated production function at the geometric mean level of their use in the production of paddy crop of sample farms are presented in Table 5.15

The table indicates that, the marginal value products of human labour, manures, nitrogen and potash were greater than their respective unit acquisition costs in the case of paddy crop; indicating thereby the optimal use of these inputs. The marginal value product of bullock labour and phosphorous were less than their marginal costs which indicated the need for effecting reduction in their use from the existing use levels.

## **5.7. Varietal preference given by paddy cultivators for production and consumption**

### **5.7.1 Varietal preference given by paddy cultivators for production**

The data pertaining the varietal preference on sample farm are presented in Table 5.16.

It is observed from table that, paddy cultivators on sample farm prominently grew IR-8, R-24, Karjat-184, Jaya, Sahydri and local varieties. Among this, small farmers gave more preference to local varieties (76.67 %) followed by Karjat-184 (56.67 %). In medium size group R-24 (60.00 %) variety prominently grown by farmers followed by IR-8 (53.33 %). In case of large group farmers the sahydri (80.00 %) which is hybrid variety of paddy grown by cultivators followed by IR-8 (76.67 %). At the overall level, mostly preference given to R-24 (48.89 %).

**Table 5.16 Varietal preference for cultivation on sample farm**

Sr. No.	Varieties	Size groups			Overall (N = 90)
		Small (N = 30)	Medium (N = 30)	Large (N = 30)	
1.	IR-8 Preference	6 (20.00)	16 (53.33)	23 (76.67)	45 (50.00)
	Non-preference	24 (80.00)	14 (46.67)	7 (23.33)	45 (50.00)
2.	R-24 Preference	12 (40.00)	18 (60.00)	14 (46.67)	44 (48.89)
	Non-preference	18 (60.00)	12 (40.00)	16 (53.33)	46 (51.11)
3.	Karjat-184 Preference	17 (56.67)	14 (46.67)	12 (40.00)	43 (47.78)
	Non-preference	13 (43.33)	16 (53.33)	18 (60.00)	47 (52.22)
4.	Jaya Preference	8 (26.67)	13 (43.33)	20 (66.66)	41 (45.56)
	Non-preference	22 (73.33)	17 (56.67)	10 (33.33)	49 (54.44)
5.	Sahydri Preference	2 (6.67)	11 (36.67)	24 (80.00)	37 (41.11)
	Non-preference	28 (93.33)	19 (63.33)	6 (20.00)	53 (58.89)
6.	Local Preference	23 (76.67)	9 (30.00)	3 (10.00)	35 (38.89)
	Non-preference	7 (23.33)	21 (70.00)	27 (90.00)	55 (61.11)

(Figures in the parentheses indicate percentages to the respective total)

Critically examination of results showed that, the small farmers gave most preference to local varieties and in

medium and large R-24 and sahyadri varieties were mostly preferred, respectively.

### 5.7.2 Preference for consumption given by paddy cultivators

The data pertaining to the consumer preference are presented in Table 5.17.

**Table 5.17 Varietal preference for consumption of paddy cultivators**

Sr. No.	Varieties	Size groups			Overall (N = 90)
		Small (N = 30)	Medium (N = 30)	Large (N = 30)	
1.	Local Preference	26 (86.67)	22 (73.33)	7 (23.33)	55 (61.11)
	Non-preference	4 (13.33)	8 (26.67)	23 (76.67)	35 (38.89)
2.	Jaya Preference	12 (40.00)	18 (60.00)	23 (76.67)	53 (58.89)
	Non-preference	18 (60.00)	12 (40.00)	7 (23.33)	37 (41.11)
3.	IR-8 Preference	13 (43.33)	10 (33.33)	15 (50.00)	38 (42.22)
	Non-preference	17 (56.67)	20 (66.67)	15 (50.00)	52 (57.78)
4.	Karjat-184 Preference	7 (23.33)	16 (53.33)	14 (46.67)	37 (41.11)
	Non-preference	23 (76.67)	14 (46.67)	16 (53.33)	53 (58.89)
5.	Basmati Preference	0 (0.00)	7 (23.33)	21 (70.00)	28 (31.11)
	Non-preference	30 (10.00)	23 (76.67)	9 (30.00)	62 (68.89)

(Figures in the parentheses are the percentages to the total)

It is observed from table that, paddy cultivators prominently consumed Local, Jaya, IR-8, Karjat-184 and Bas mati varieties. Among this, small farmers gave more preference for consumption to Local varieties (86.67 %) followed by IR-8 (43.33). In medium size group also, local varieties (73.33) followed by Jaya (60.00 %) mostly preferred. In large group farmers Jaya (76.69 %) followed by Bas mati (70.00 %) were most preferred. And in the overall level, mostly preference given to Local varieties (61.11 %) followed by Jaya (58.89 %).

Critical examination of results showed that the small and medium farmers gave most preference for consumption to Local varieties and in large size group preference was to Jaya.

### **5.8 Marketing management followed by sample farmers**

The agricultural produce has to undergo a series of functions before it finally reaches to the consumers. The cost of production, quality production, proper marketing are the key management factors, which have direct bearing on the returns to the producers. The important management practices followed by farmers are grading, packaging, transportation etc. Those practices, which are followed by the farmers, are described below.

### 5.8.1 Grading management

It defines the quality of produce generally, grading practice was not followed by the cultivators. The grades are given according to the variety and the content of foreign materials like soil, dried leaves, stalks etc.

### 5.8.2 Packaging management

It was another important marketing function followed by the cultivators. It reduces losses in handling of produce. Packaging maintains the quality, which fetches better market prices. Generally, the cultivators have used gunny bags for packaging.

### 5.8.3 Transportation management

In selected area, transportation means used by cultivators are bullock carts, tempo and jeep for local market, for distant market trucks, tempo, and tractors were used as transportation means.

The information relating to transportation means used by sample paddy cultivators is presented in Table 5.18.

**Table 5.18 Transportation means used by the sample paddy cultivators**

Size group	Bullock carts	Truck	Tempo	Other (Jeep, Tractor)	Total
Small	7 (23.33)	-	10.33 (33.33)	13 (43.33)	30 (100.00)
Medium	3 (10.00)	3 (10.00)	15 (50.00)	9 (30.00)	30 (100.00)
Large	2 (6.67)	5 (16.67)	17 (56.66)	6 (20.00)	30 (100.00)
Overall	12 (13.33)	8 (8.89)	42 (46.67)	28 (31.11)	90 (100.00)

(Figures in the parentheses are the percentages to the total)

It is observed from the table that, at the overall level nearly 47 per cent cultivators transported their produce by tempo followed by other vehicles (31.11 %) i.e. jeep and tractor. Nearly 13 per cent producers transported the produce by bullock carts only for local market.

#### **5.8.4 Selling**

Open auction method of sale was followed in regulated market, Auctions are held on the basis of grade, quality and variety. Farmers having same grade, quality and variety produce get the same rate.

#### **5.8.5 Marketing cost**

The cost of marketing has an important significance for producers and consumers for any agricultural commodity. The producer's share in price paid by consumer was ultimately determined by marketing cost.

The information on cost of marketing incurred by the farmers on different items of cost of marketing and prices received by them is presented in Table 5.19.

At the overall level, per quintal cost of marketing of paddy was Rs. 61.95, on account of commission charges, marketing cost incurred was the highest i.e. Rs. 29.21, which was 47.15 per cent to the total marketing cost. The transportation was the another major item of marketing cost which was Rs. 14.47 (23.36 %) per quintal of total marketing cost. The packaging charges also constituted 21.10 per cent of total marketing cost. The cost incurred on Octroi, weighing,

hamali and other charges (postage, telephone etc.) worked out to be Rs.0.97 (1.56 %) Rs. 0.49 (0.79 %), Rs. 2.76 (4.46 %) and Rs. 0.98 (1.58 %) per quintal of the total marketing cost, respectively.

**Table 5.19 Per quintal marketing cost of paddy of sample farmers**

Sr. No.	Particulars	Size groups			Overall
		Small	Medium	Large	
1.	Packaging material	12.55 (22.51)	13.20 (21.19)	13.47 (19.87)	13.07 (21.10)
2.	Transportation charges	13.13 (23.55)	14.54 (23.34)	15.73 (23.21)	14.47 (23.36)
3.	Octroi	0.60 (1.08)	0.94 (1.51)	1.37 (2.02)	0.97 (1.56)
4.	Commission charges	25.71 (46.10)	29.65 (47.59)	32.26 (47.60)	29.21 (47.15)
5.	Weighing charges	0.42 (0.75)	0.57 (0.91)	0.50 (0.74)	0.49 (0.79)
6.	Hamali	2.68 (4.81)	2.89 (4.64)	2.70 (3.98)	2.76 (4.46)
7.	Other charges (Postage, telephone etc.)	0.67 (1.20)	0.51 (0.82)	1.75 (2.58)	0.97 (1.58)
	Total cost	55.76 (100.00)	62.30 (100.00)	67.78 (100.00)	61.95 (100.00)

(Figures in the parentheses are the percentages to the total)

The results revealed that the marketing cost increased as the farm size increased. Small farmers incurred the marketing cost of Rs. 55.76, medium farmers Rs. 62.30 whereas larger farmers incurred Rs. 67.78 per quintal. The small farmer sold their large quantity of produce in village market, so that they

pay less on transportation, packaging, weighing, octroi and hamali resulted into less cost incurred on marketing as compared to medium and large size group of holding.

## **5.9 Problems in production and marketing management of paddy with remedial measures**

### **5.9.1 Problems in production management of paddy**

Paddy was one of the main cereal crop of selected tract the farmers are facing many problems regarding management of production of paddy. The problems faced by cultivators are presented in Table 5.20 from the Table It is seen that, the non-availability of loans at cheap rate at the time of sowing was one of the problem, which was reported, by nearly 49 per cent of farmers.

From the table it is also observed that high yield can not be expected without sowing good quality seed. About 86 per cent farmers complained that despite their best efforts they are not able to procure good quality seed. High seed prices were also a common complaint reported by nearly 78 per cent of farmers. Another major problem was fertilizers cost where 66 per cent farmers complained about it.

**Table 5.20 Problems faced by paddy cultivars in production management**

Sr. No.	Particulars	Size groups			Overall (N = 90)
		Small (N = 30)	Medium (N = 30)	Large (N = 30)	
1.	Non availability of loan in time	21 (70.00)	14 (46.67)	9 (30.00)	44 (48.89)
2.	Non-availability of quality seeds	27 (90.00)	26 (86.67)	24 (84.00)	77 (85.55)
3.	Non availability of labour	16 (53.33)	14 (46.67)	11 (36.67)	41 (45.58)
4.	Difficulty of getting bullocks and implements on hire for different operation	14 (46.67)	12 (40.00)	10 (33.33)	36 (40.00)
5.	Lack of technical knowledge about paddy cultivation	13 (43.33)	11 (36.67)	7 (23.33)	31 (34.44)
6.	New varieties are not available in time for sowing	17 (56.67)	15 (50.00)	12 (40.00)	44 (48.89)
7.	High fertilizer cost	23 (76.67)	19 (63.33)	17 (56.67)	59 (65.56)
8.	High seed cost	26 (86.67)	23 (76.67)	21 (70.00)	70 (77.87)
9.	High wage rate	19 (63.33)	15 (50.00)	9 (30.00)	43 (47.78)
10.	Non availability of pesticide and insecticides at cheaper rate	15 (50.00)	10 (33.33)	8 (26.67)	33 (36.67)
11.	Difficulty in pest and disease control	21 (70.00)	15 (50.00)	12 (40.00)	48 (53.33)
12.	Total number of farmers	30 (100.00)	30 (100.00)	30 (100.00)	90 (100.00)

(Figures in the parentheses are the percentages to the total number of farmers)

About 40 per cent of the farmers expressed the difficulty of getting hired bullock and implements for performing different operations in time. The non-availability of pesticides

and insecticides at cheap rate was put forth by 37 per cent of farmers.

It is observed that, about 46 per cent of farmers expressed the difficulty of getting labour for doing different operations. A high wage rate was also complained by 48 per cent farmers. The difficulty of non-availability of technical knowledge and new varieties in time was put fourth by 35 per cent and 49 per cent, respectively.

Critical examination of results showed that, the small farmers face more problems than other two categories of sample farmers.

### **5.9.2 Problems faced by paddy cultivators in marketing management of paddy**

Paddy cultivators also faced many problems in marketing management of paddy. The problems faced by the paddy cultivators in marketing management of paddy are presented in Table 5.21.

Transportation was a major problem in efficient marketing management of paddy. About 65 per cent farmers complained that transportation charges were high. The price variation emerged as important problem as 81 per cent farmers complained about it. About 50 per cent farmers faced the problem of transportation facilities.

**Table 5.21 Problems faced by paddy cultivars in marketing management**

Sr. No.	Particulars	Size groups			Overall (N = 90)
		Small (N = 30)	Medium (N = 30)	Large (N = 30)	
1.	High commission charges	24 (80.00)	21 (70.00)	19 (63.33)	64 (71.11)
2.	Faulty measures and weights	16 (53.33)	13 (43.33)	9 (30.00)	38 (42.22)
3.	Problem of price variation in the market	27 (90.00)	25 (83.33)	28 (93.33)	80 (80.88)
4.	Problem of transportation	17 (56.67)	15 (50.00)	13 (43.33)	45 (50.00)
5.	High transport cost	25 (83.33)	22 (73.33)	11 (36.66)	58 (64.44)
6.	Payment are not made quickly	23 (76.67)	17 (56.67)	13 (43.33)	53 (58.89)
7.	Lack of storage facilities in producing area	16 (53.33)	13 (43.33)	10 (33.33)	39 (43.33)
8.	Total number of farmers	30 (100.00)	30 (100.00)	30 (100.00)	90 (100.00)

(Figures in the parentheses are the percentages to the total number of farmers)

The farmers are also facing problems regarding proper storage facilities. About 44 per cent farmers complained about lack of storage facilities in the producing area. The paddy growers were very critical about malpractices adopted by middlemen in various markets such as deduction of more

charges and multiplicity of market charges, faulty measures etc. About 42 per cent of the farmers complained about it.

The farmers also reported that, the middlemen do not take consent of farmers while selling their produce and also quote price lower than actual prices. High commission rate also a common complaint and was put fourth by nearly 71 per cent of farmers. About 59 per cent of farmers complained that payment are not made in time.

### **5.9.3 Remedial measures**

Following are the some of remedial measures to overcome the problems faced by paddy cultivators in production and marketing management of paddy.

1. The transportation cost forms a major part of the marketing cost to the producer. Steps may be taken at the Government level to regularize the transportation charges. For this purpose, the monopoly of the transportation agencies will have to be broken.
2. There should be adequate and timely supply of inputs like quality seeds, fertilizers, pesticides etc. at reasonable price, which requires stream linking of distribution channels provision may also be made for supply of credit to purchase the above inputs.
3. Market information with respect to the price in consuming markets should be made available to the farmers. Availability of information on prices will enable the farmers to adjust to bring the produce in market.

4. To control the price variation, regular supply will have to be ensured as per demand.
5. Payment from the commission agents are received late which causes inconvenience to the growers. Marketing management of paddy has not been done on co-operative basis. Therefore, needs to be undertaken on co-operative basis.
6. The farmers should be provided with better storage facilities, so that genuine price for their produce they can fetch.



**SUMMARY**

**AND**

**CONCLUSIONS**

## 6. SUMMARY AND CONCLUSIONS

Paddy is an important cereal crop grown during kharif season, considering the importance and vital role played by paddy in farming system and farm economy of farmers of Bhudargad and Radhanagari tahsil of Kolhapur district, the present study entitled "Production and marketing management of paddy in Kolhapur district" has been taken up with the following specific objectives.

1. To study different aspects related to production management of paddy.
2. To study the varietal and consumer preference of the varieties grown on sample farms.
3. To examine the various management practices followed in marketing of paddy.
4. To assess the problems in production and marketing management of paddy.

Bhudargad and Radhanagri tahsil of Kolhapur district have been purposively selected for study, because these tahsil are having maximum area under paddy cultivation in the district. The lists of cultivators from the selected six villages were prepared from revenue records at village level. Then they were categorized into three groups on the basis of operational holding *viz.*, small farm (below 2.00 ha) medium farm (2.01 to 4.00 ha.) and large farm (4.01 ha and above).

From each group, five cultivators were selected randomly. In all, 15 cultivators were selected from each village then in all 90, sample cultivators were selected from six selected village.

The data were analysed and presented mostly by way of tabular method. The information on marketing has been collected from Bhudargad and Radhanagri tahsil from Agricultural Produce Market Committee as well as intermediaries involved in marketing of paddy. The data pertaining to a complete agricultural year 2004-05 were collected by survey method with help of specially designed questionnaire. The data, so collected were analysed by tabular method for estimation of production cost the functional analysis was carried out adopting Cobb-Douglas type of production function. For estimating resource use productivities of major inputs and significance of parameters of the function was tested by using 't' test. The result of the analysis are briefly summarized as below.

### **6.1 Summary**

1. At the overall level the size of family was 6.02 members. The size of family for small, medium and large was 4.90, 6.05 and 7.13 members, respectively. The literacy percentage of family was 83.55. At the overall level, 48.00 per cent farmers were engaged in farming, 7.13 per cent were engaged in business, 6.82 per cent were doing services and remaining 37.87 per cent were engaged in

other type of professions such as dairy and poultry. The number of farmers engaged in farming was found to be more in small size group (54.08 %).

2. At overall level, the average size of holding was 4.61 hectares. It was 1.76 ha in small, 3.93 ha. in medium and 8.14 ha. in large size groups.
3. At the overall level, the area under paddy was 2.63 hectares. The area under paddy was relatively more in large size group (4.43 ha.). finger millet and wheat also important crops than paddy in selected tract.
4. The average per farm value of investment in various farm assets owned by paddy growers was Rs. 73554, Rs. 107895 and Rs. 163044 in small, medium and large size categories, respectively.
5. Regarding the per hectare input utilization, average per hectare labour days required were 73.02. Farmers were using 93.24 kg of seed at the overall level. The use of manure was 35.14 Q. per hectare. All farmers were using fertilizers. Per hectare quantity of N, P and K used was 49.32 kg, 21.12 kg and 6.42 kg, respectively. At the overall level, only 23.33 per cent paddy growers had applied FYM as per the recommendation. It was noticed that, at overall level, 44.44 per cent paddy growers used the nitrogenous fertilizers as per the recommendation. The majority of paddy growers applied phosphatic fertilizers more than the recommended level. The time of

application of NPK was also studied and it was noticed that, in general large number of paddy growers used mixed fertilizers that too not as per the recommended time of application. The practice of top dressing in paddy was also noticed and it was seen that as per recommendation 27.78 per cent farmers applied the fertilizers at the overall level. In the case of seed rate use, at overall level, 41.11 per cent farmers used seed rate at par with the recommended level. Majority of paddy growers (55.56 %) followed same crop sequence every year. The paddy growers of small size group were unaware about the soil testing while only 5.55 per cent paddy growers were known about soil testing. The 64.33 per cent of paddy growers prepared the calendar for the paddy cultivation and majority of them follow the calendar. The majority of farmers (66.66 %) have knowledge and have adopted the varieties recommended for paddy cultivation. In nursery management about 68.88 per cent sample farmers adopted sowing in the rows.

6. The per hectare overall Cost 'A', Cost 'B' and Cost 'C' worked out to Rs. 11289.26, Rs. 15431.10 and Rs. 16649.31, respectively. The total value of paddy and straw was Rs. 18484.20 with the average grain yield 27.00 qtl/ha and by product of 42.54 qtl/ha. The market rate of

grain and straw was Rs. 588.09 per quintal and Rs. 60 per quintal respectively. The highest yield and gross value was observed in small size group and minimum in medium size group. The net returns at Cost 'C' was Rs. 4262.44, Rs. 895.32 and Rs. 1825.88 in small, medium and large size group of paddy cultivators. That mean, paddy was more profitable on small group of farm than other two categories of farm.

7. Among the varietal preference for production, small farmers gave most preference to local varieties (76.67 %) and in medium and large R-24 (60 %) and Sahyadri (80 %) varieties were mostly preferred, respectively. At the overall level, mostly preference was given to R-24 (48.89 %). About the preference for consumption, small (86.67 %) and medium (73.33 %) farmers gave more preference to local varieties and in large size group preference was to Jaya (i.e. 58.89 per cent) and at overall level, mostly preference was given to local varieties i.e. 61.11 per cent.
8. Marketing practices followed by paddy cultivators were grading, packaging and transportation. The grading was not followed strictly based on the variety and the content of foreign materials like soils, dried leaves, stalks etc. for packaging, generally gunny bags were used. Mainly transportation was carried out by bullock cart, truck and tempo etc.

9. Cost of marketing affects the producer's net share in the consumer rupee. At the overall level, the average per quintal cost of marketing was Rs. 61.95. Of the total marketing cost, the item such as transportation, packaging and commission were observed to most important items of the cost, which accounted 23.36, 21.10 and 47.15 per cent, respectively.
10. The major production problems faced by the cultivators were non-availability of quality seeds at cheap rate (85.55%), high fertilizer cost (65.58 %) and high wage rate (47.48 %), Other difficulties expressed by the farmers were non-availability of labour in time (48.56 %) non availability of pesticides and insecticides at cheap rate (36.67 %).
11. The major marketing management problems expressed by the farmers were problems of price variation in the market (88.88 per cent), high commission rate (71.11 %), and high transportation cost (64.44 %). Other difficulties expressed by the farmers were regarding payment, which was not made quickly by commission agent (58.89 %), faulty measure and weights (42.22 %) and lack of storage facilities (43.33 %) in producing area.
12. The Cobb-Douglas production function was adopted for estimating resource utilization. The production function of paddy has turned out to be highly significant. The use of human labour, FYM, nitrogen and potash have turned out to be positive result with significant performance,

which indicate the scope to increase the use level of these resources. The bullock labour and phosphorus are found non-significant.

13. The marginal value products of human labour, manures, nitrogen and potash were greater than their respective unit acquisition costs indicating thereby the optimal use of these inputs. The marginal value product of bullock labour and phosphorus were less than their marginal costs which indicated the need for effecting reduction in their use from the existing use levels.

## **6.2 Conclusions**

1. The per hectare human labour requirement for paddy cultivation was found to be 73.02 mandays. Among the different inputs the cost incurred on human labour was maximum.
2. The per hectare use of manures, fertilizers seeds and plant protection was less than recommended level. The majority of farmers (66.66 %) have knowledge and had adopted the varieties recommended for paddy cultivation.
3. The cost of cultivation was Rs. 16649.31 (Cost 'C'). The major items of cost of cultivation were human labour, bullock labour, rental value of land and fertilizers.

The profit at Cost 'A', Cost 'B' and Cost 'C' was highest on small size group. The benefit cost ratio was maximum in small size group (1.26)

4. Among the varietal preference for production, at the overall level mostly preference was given to R-24 (48.89 per cent). The small, medium and large farmers preference was given to local (76.67 per cent), R-24 (60.00 %) and Sahyadri (80.00 %) variety, respectively. At the overall level, preference for consumer by the cultivators mostly was given to local varieties (61.11 %). Small and medium farmer gave preference to local varieties and in large size group preference was given to Jaya (58.89 %).
5. The marketing practices followed by farmers are grading, packaging, transportation and selling. The cultivators not carried out the practice like grading effectively. The grades are given on the basis of variety and foreign material like soil, and dried leaves in the produce.
6. Per quintal cost of marketing was Rs. 61.95. Of the total marketing cost, the item such as transportation (23.36 %), packaging material (21.10 %) and commission (47.15 %) were observed to be most important items of the cost. Per quintal cost of marketing increased with increase in size groups of holdings.
7. The major constraints faced by the paddy cultivators in production and marketing management were non-availability of quality seed at cheap rate and non-

availability of adequate labour in time. In marketing management major difficulties expressed by farmers were price variation, high commission rate and high transport cost.

### **6.3 Policy implications**

On the basis of findings of the study, the following policy implications are suggested.

1. There should be adequate and timely supply of inputs like quality seed, fertilizer, pesticides etc. at reasonable rate.
2. The transportation cost forms a major part of marketing cost of the producer. Steps may be taken at the Government level to regularize the transportation charges. For this purpose, the monopoly of the transportation agencies will have to be broken and controlled rate be enforced.
3. Marketing of paddy should be done on co-operative basis.



**LITERATURE CITED**

## 7. LITERATURE CITED

- Anonymous. 1985. Price structure of Rice and Producers share in consumer's rupee in Haryana Indian Jour. of Agril. Economics. 40(3): 395.
- Anonymous. 1985. Consumers preferences for rice in Thailand, Indonesia and Philippines, IRRI-Research paper series, Inter. Rice Res. Institute, 1985, No. 116, 20 pp. UPLB.
- Duhan, B.S., A.P. Khera, and Ramkala 1989. Effect of different level of fertilizer, plant population and weeding on grain yield of paddy. Crop Research. 2(1): 8-11.
- Elamma Job and V. Nandamohan, 2004. Rice production in Kerala, trend and instability analysis. Agril. Situation in Indian. Vol. LXI No. 3: pp.135:139.
- Gauraha, A.K. and P.K. Verma, 2002. Marketing strategies of rice in Chattisgarh. Indian. Jour. of Agril. Sci. 30 : 104.
- George, P.S. 1973. Consumer's response towards high yielding varieties of paddy in Andhra Pradesh. Community-Development-and-Panchayat-Raj-Digest, 4 : 3, 127-138.
- Goel, R.C. and A.C. Gangwar, 1978. Marketing cost and margin of rice in Kurukshetra district. Agricultural situation in India. 35(5) : 297.

- Grover, R.K., K.N.Rai and K.K.Sharma, 1993. Study on adoption pattern and constraints analysis in paddy. Indian J. Agric. Res. 26(2) : 96-112.
- Hemchandru, K. and J.D.J. Nagabhushanam, 1987. Impact of new Agricultural Technology on farm income of rice farming in east Godawari district of Andhra Pradesh. Agricultural situation in India Vol. 41(2) : 953-956.
- Iqbal, M. 1989. Commercial Agricultural marketing and storage Ltd. Islamabad-Pakistan. Marketing of farm product in Asia and the Pacific : 295-318.
- Kamdi, J.K., K.G.Hatwar, G.N.Bobde, and S.M.Patil, 1991. Effect of age of seedling at transplanting on the yield of rice varieties. J. Soil and Crops. 1(2) : 154-156.
- Mahabari, M.B., D.S. Patil, and S.D. Kalke, 1996. Yield and uptake of nutrient as influenced by the method and time of application of nitrogen fertilizer under flood prone rice. J. Soil and Crops. 6(1) : 27-30.
- Malik, D.P.and N. Kumar, 1995. Agril. Science Digest Karnal 15 : 4, 201-204; 3 ref.
- Murshed-SMM and Alam, 1978. An investigation of the farmers varietial preferences of aman rice in Bangladesh, Bangladesh Journal of Agricultural Economics, 1:1, 114-122; 5 tab.
- Naik, D. and S.C. Patnaik, 1982. Marketing and price spread of potato in Orissa. Agril. Marketing Journal. 26(3): 9.

- Parthusarthy, G. and B. Chinnar Rao, 1986. Determinant of fertilizer use in Andhra Pradesh, Agricultural situation in India. XII (7) : 555.
- Roy and K.K. Jain, 2004. A study into cost efficient yield level for paddy in India. Agril. Situation in India, 2004. Vol. LXI No. 8 : pp. 531-535.
- Shaikh Moksadur Rahman. 2006. Marketing channel of rice. Indian Journal of Marketing. Vol. XXXVI (10): 8:17.
- Shaw, A.B. 1985. Constraints on agricultural innovation adoption. Rice Abstract, Vol. 8: 250.
- Shukla, N.D., S.K. Sharma, and Krishna Murari 2003. Determinants of Inter-State Disparities in Rice Production. Agril. Situation in India. Vol. LX No. 9 pp. 565-574.
- Siju, T. and Kombairaju. 2001. Rice production in Tamilnadu. Indian Jour. of Agril. Econ. 24(2) : 1-18.
- Singh, A.L. and S.N.I. Hushmi, 1987. Technical determinant of food production in Aligarh district. Annuals of the National association of Geographers, India. 7(1) : 9-14.
- Singh, G.N. and O.P. Singh, 1992. Effect of age and number of seedlings per hill on yield and yield attributes of rice under rainfed lowland. Crop research. 5(3): 417-419.
- Suresh, A., Puran Chand and Shiv Kumar. 2005. Pattern and Growth of Diffusion of High yielding varieties of paddy in Indian Agriculture. Agril. Situation in India. Vol. LXII No. 2. Page. 127-135.

- Thakare, G.G. 1995. Adoption of modern technology and its constraints in rice cultivation in Sindhudurg district, Maharashtra J. of Agril. Economics. 7(1): 56.
- Yadav, R.V. and A.C. Gangwar, 1986. Rice production and constraints in Bihar state. Agricultural situation in India. : 9-13.



**APPENDIX**



## 2. Details of farm assets

### A. Farm buildings

Sr. No.	Category	Construction type	Year of construction	Present value	Repairs during the year	Remaining life
1.	House					
	In village					
	On farm					
2.	Byre					
3.	Store house					
4.	Engine house					
5.	Well					
	Dug well					
	Tube well					
6.	Other					

### B. Implements and Machinery

Sr. No.	Particulars	Year of purchase	Value (Rs.)	Present value (Rs.)	Repairs during the year	Remaining life	Remark
	<b>Implements</b>						
1.	Wooden plough						
2.	Iron plough						
3.	Seed drill						
4.	Harrow						
5.	Hoe						
6.	Bullock cart						
7.	Other						
	<b>Machinery</b>						
1.	Oil engine						
2.	Electric motor						
3.	Tractor						
4.	Sprayer						
5.	Duster						
6.	Pipeline						
7.	Thresher						
	<b>Other</b>						
1.	Sickle						
2.	Weeding hoo						
3.	Kudal						
4.	Spade						
5.	Pick axe						
6.	Wooden basket						
7.	Iron basket						

**C. Livestock**

Sr. No.	Type	Number	Age	Purchased/Home-bred	Present value (Rs.)
1	Draft animals				
	Bull				
	Bullock				
	He-buffalo				
2	Milch animal				
A	Cow				
	Local				
	Crossbred				
B	Buffaloes				
C	Calves				
	Cow-calves				
	Buffalo calves				
D	Other animals				
	Goat				
	Sheep				
	Poultry birds				

**3. Cropping pattern**

Sr. No.	Season	Name of crop	Irrigated/ Dry	Area (ha)
A.	Kharif season			
B	Rabi season			
C	Summer season			
D	Perennial/Annual			

#### 4. Labour requirement

Sr. No	Operations	Labour required (family /hired)						Machine (hrs)
		Male	Female	Bullock	Male	Female	Bullock	
1.	Preparatory tillage							
	i. Ploughing							
	ii. Harrowing							
	iii. Collection of stubbles							
	iv. Transportation and manure application							
2	v. Preparation of ridges and furrows							
3	Planting							
	i. Interculturing							
	ii. Hoeing							
	iii. Weeding							
	iv. Irrigation							
	v. Earthing up							
	vi. Spraying of insecticides							
	vi. Application of fertilizer							
4	Harvesting							
5	Transportation							

### 5. Cost of cultivation

Sr. No.	Particulars	Material used		Value ( Rs.)
		Name	Qty	
1.	Family labour i. Male ii. Female			
2	Hired labour i. Male ii. Female			
3	Bullock labour			
4	Machine labour			
5	Seed			
6	Manure			
7	Fertilizer			
8	Irrigation charges			
9	Insecticide and pesticide			
10	Land revenue and other			

### 6. Disposal of paddy

Sr. No.	Particular	Quantity (qtls)
1	Quantity sold out	
2	Quantity used for home consumption	
3	Quantity given to relatives	
4	Quantity given to labours as wage	
5	Quantity used for the preparation of seed material	



Sr. No	Operations	No. of Turns	Labour required days				Bullock required pair days		Machinery		Material cost			Rema rks
			Owned		Hired		Owned	Hired	Owned	Name	Qty/ kg	Value Rs.		
			M	F	M	F								
<b>C)</b>	<b>Plant protection</b>													
i)	Insecticides													
ii)	Pesticides													
iii)	Weedicides													
iv)	Other													
<b>D)</b>	<b>Watching</b>													
<b>E)</b>	<b>Harvesting</b>													
i)	Cutting													
ii)	Tying													
iii)	Earhead cutting													
iv)	Other													
<b>F)</b>	<b>Threshing</b>													
<b>G)</b>	<b>Transportation</b>													
i)	Farm to store													
ii)	To market													
<b>H)</b>	<b>Other</b>													

Production : Main produce : Qty : Qtls. Rate Rs. : Total value Rs.  
 By produce Qty : Qtls. Rate Rs. : Total value Rs.

## Constraints faced by the farmers

### 1. Natural constraints

- a. Rainfall                                      Whether adequate / inadequate / excess
- b. Distribution                                      Normal / abnormal

### 2. Water constraints

- a. Do you get adequate quantity of water through canal?      Yes / No
- b. Do you get timely water through canal?                                      Yes / No
- c. Do you have problem of electricity supply?                                      Yes / No
- d. Do you have any drainage problem?                                      Yes / No
- e. Is there any shortage of water at the time of maturity?      Yes / No
- f. What is your opinion about water charges? High / low / optimum

### 3. Constraints in input supply

#### i. Improved seed

- a. Timely      Yes / No
- b. Adequate      Yes / No
- c. Seed cost      High / Appropriate

#### ii. Labour

- a. a. Timely      Yes / No
- b. Adequate              Yes / No
- c. Wage rate      High / Appropriate

#### iii. Chemical fertilizers

- a. Timely      Yes / No
- b. Adequate              Yes / No
- c. Cost of fertilizers              High / Appropriate

#### iv. Insecticides / pesticides

- a. Timely      Yes / No
- b. Adequate              Yes / No
- c. Cost of pesticides              High / Appropriate

#### v. Credit

## v. Credit

a. Timely Yes / No

b. Adequate Yes / No

c. Procedure for obtaining credit is complex / easy

## vi. Price to produce

Remunerative Yes / No

Low price Yes / No

**4.Details of marketing expenditure**

Sr. No.	Particulars	Qty.	Place of marketing	Distance	Remarks
1					
2					
3					
4					
5					
6					

## 1. Prominent variety of paddy

a

b

c

## 1. Prominent variety used in study area

a.

b.

c.

## 2. Reason for selection of particular variety by the farmers

a. High yielding

b. Delicious aroma

c. Demand in market

d. Price in market

e. Easily available seed

f. Resistent to disease and paste

g. Requirement of water

h. Whether it is useful for fish production

i. Maturity period



**VITA**

## 9. VITA

GOUTAM SHANKAR KAMBLE

A candidate for the degree

of

MASTER OF SCIENCE (AGRICULTURE)

in

AGRI.BUSINESS MANAGEMENT

**Title of Thesis** : "PRODUCTION AND MARKETING  
MANAGEMENT OF PADDY IN  
KOLHAPUR DISTRICT"

**Major field** : Agri.Business Management

**Biographical information:**

\* **Personal** : Born at Palewadi, Dist. Kolhapur in Maharashtra on 8<sup>th</sup> October, 1981. Son of Shri. Kamble Shankar Sakharam and Sau. Kamble Bebutai Shankar.

\* **Educational** :

- Passed SSC examination with First Class from Mahatma Phule Highschool, Kolwan in 1997.
- Passed HSC examination with First Class from DVN Mauninagar Bidri in 1999.
- Received the B.Sc.(Agri.) degree with first class in 2003 from College of Agriculture, Kolhapur.

\* **Others** :

- Participation in National Service Scheme (240 hrs) during under graduation.
- Participation in National Integration and Youth Festival held at Amravati 2002.



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# Per hectare gross income

