ECONOMIC ANALYSIS OF LARGE FARM IN YAVATMAL DISTRICT OF VIDARBHA REGION

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CANDIDATE'S DECLARATION

I hereby declare that the thesis
or part thereof has not been
Previously submitted by me
for a degree of any
University or
Institute

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CERTIFICATE – I

This is to certify that the thesis entitled "**ECONOMIC ANALYSIS OF LARGE FARM IN YAVATMAL DISTRICT OF VIDARBHA REGION"** submitted by **Miss. KALE PRACHI SANJAY** to the Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani in partial fulfilment of the requirements for the degree of **MASTER OF SCIENCE** in the subject of **AGRICULTURAL ECONOMICS** is record of original and bonafide research work carried out by her under my guidance and supervision. It is of sufficiently high standard to warrant its presentation for the award of the said degree.

I also certify that the thesis or part thereof has not been previously submitted by her for a degree of any university.

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CERTIFICATE – II

This is to certify that the thesis entitle "**ECONOMIC ANALYSIS OF LARGE FARM IN YAVATMAL DISTRICT OF VIDARBHA REGION"** submitted by **Miss. KALE PRACHI SANJAY** to the Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE** in the subject of **AGRICULTURAL ECONOMICS** has been approved by the student's advisory committee after viva-voce examination in collaboration with external examiner.

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"There always are in the world a few inspired men whose acquaintance is beyond price"

- Plato

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Place: Parbhani

Date: ***(Kale Prachi Sanjay)***

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INTRODUCTION

Economic analysis is a systematic approach to determining the optimum use of scare resources, involving comparison of two or more alternatives in achieving a specific objective under the given assumptions and constraints. The overall profitability of farm depends upon the income achieved from overall farm activities.

Agriculture has got a prime role in Indian economy and is the prime source of National income. Agriculture development is the basic and essential for economic development and human welfare. Share of agriculture in Gross Domestic Product is 17.4 % in 2016-17. About 65 per cent of the total population is directly and indirectly engaged in farming. The agriculture sector provides employment to 58.4 per cent of country's work force. Agriculture is the single largest private sector occupation in the country. Various important industries in India find their raw materials from agriculture sector, for example Cotton, Jute, textile and Sugar industries are directly depend on agriculture. India's foreign trade is deeply associated with agriculture sector. Agriculture accounts for about 38 per cent of the total exports of the country. According to agricultural ministry, The food grains production in India 272 million tonnes in 2016-17, 8% higher than the 251.6 million tonnes last year and surpassing the previous record of 265 millions tonnes in 2013-14.

India has geographical area of 328.73 million hectares which is 2.7 per cent surface of the world. The net sown area is 141.10 million hectares. According to Agricultural census (2000-2001), the area operated by large holding is 14.18 per cent, the number of large farmers to total farmers is 1.21 per cent. The geographical area of Maharashtra is 30.37 million hectares, out of which net sown area is 22.25 million hectares. The area operated by large holding is 12.32 per cent and the number of large farmers to total farmers is 1.79 per cent. Geographical area of Eastern Vidarbha zone includes entire Bhandara and Gadchiroli district and parts of Chandrapur and Nagpur district

is32.7 Lakhs/ha and with almost 50% under forest, Gross crop area 10.8 lakhs/ha. Main cash crops cultivated in Vidarbha region such as cotton, oranges and soybean.

Yavatmal is the largest cotton growing district. Also Jowar is the main produce of the district. Others items exported include lime, wooden furniture and oranges. Cotton and teakwood are the chief exports of the district. In 2006, the ministry of Panchayat Raj named Yavatmal one of the country's 250 most backward districts (out of total of 640). It is one of the twelve districts in Maharashtra currently receiving funds from the Backward Region Grant Fund programme (BRGF).

Farm means a piece of land where crop and livestock are taken up under a common management and has specified boundaries. A farm is a socio-economic unit which provide income and profit to the farmer. It is a decision making unit where the farmer has many alternative uses of his resources in the business point of view. Therefore, various concepts of farm business income representing returns to land, family labour and fixed capital singly or in combination have been studied. The net profit per holding at a time depends upon several factors.

Land is the major productive assets for agricultural development. The land holding pattern is of a relatively large number of small units. The structure and distribution of land holding pattern normally determine the level of productivity. Farm size is also crucial developmental issue. Agricultural policies are affecting sizes of farm as well as important economic resource use and progress in improving resource productivity. Generally, operational holding have been grouped into five classes Viz., marginal ($\leq$1ha) small (>1to $\leq$ 2ha), semi-medium (> 2 to $\leq$ 4 ha), medium (>4to<6 ha) and above large (< 6 and above).

The farm business analysis is the process of retrieving, organizing, processing and analysing information used in farm business decision making. It is a critical ingredient management of farm. The analysis process should begin with consideration of the business as a whole. Farm

business analysis may involve either the whole farm or a single enterprise. Whole farm analysis considers business features that affect the entire business. It includes balance sheet which shows changes in total assets, liabilities and resulting net worth. The income statement analysis which shows changes in business receipt expense. Farm management deals with the organisation and operation of a farm with the objective of maximizing the profits from the farm business on a continuing basis.

It deals with the analysis of the farming resources, alternative choice and opportunity within the framework of resources. It is a decision making science. It helps to decide about the basic course of action of the farming business.

Resource productivity in agriculture is influenced by number of factors such as cropping pattern, intensity of input use, timely availability and application of various input in adequate quantities, type of soil, general efficiency farm entrepreneurs and workers. Agricultural prices and marketing policy of the government for an effective manner for continuous development of agriculture in the country. The knowledge of costs and returns in farming from the farm as a whole, on which farm family investment decision are based rather than on the returns from a single crop. An attempt has been made in the present study to work out costs and returns from the farm as a whole and examines extent of income accruing to different size farm.

The overall profitability of farm depends upon the income achieved from overall farm activities. The farm business income gives an idea about the net income received from the various crop enterprises *vis -a-vis*the expenses incurred on the different crop enterprises taken together. The present study attempt to focus overall income per hectare received from various crop entities on the farm and the profitability over the total cost. A study of farm business income gives an idea about the profitability of the farm as a whole. Keeping in view the above aspects, the present study has been undertaken with following objectives.

Objectives

1. To study the socio-economic characteristics of large farmer
2. To examine the cropping pattern of the large farm
3. To estimate the costs and returns of major crops and live stock enterprises on large farm
4. To know the existing and optimum farm plans on large farm

Scope of study

This study would help the farmer for arranging their land in such way that it includes all crops with high profitability i.e. low cost and more production and gives the direction for different and optimum utilization of all resources available with them. Study would also help to Bank agency gives crop loan to farmer for deciding the maximum limit of loan crop. Study would also helpful to the policy makers in agricultural development.

Limitation of the study

1. The result of study is based on data collected for one year i.e.2016-17.It is well known that agriculture production is a function of so many variables and fluctuate from year to year.
2. Data were collected by cost accounting method. Farmers of the village do not maintain farm record so that responses of farmers regarding areas sown under different crops, quantity of seed used manures and fertilizers used, output produced, price received and information on other related aspects of study were mainly based on memory.
3. Due to limited resources and single person investigation the study is Undertaken for only limited villages of the Yavatmal district and sample size of 60 large farms. Hence the conclusion of the study may be considered as indicative and cannot be generalized.

Review of Literature

CHAPTER-II

REVIEW OF LITERATURE

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 the research area of interest. This requires that, the research findings of previous studies closely related to a particular field of his research work from various sources. The knowledge obtained through such review of literature efforts enables him or her to gain insight in respect of a manner in which a given research problem has been tackled; the nature of results obtained and the conclusion drown. Many a times, it may be true and 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 acts relating to designing of research problem, adopting suitable methodology and interpreting research results. In recognition of the importance of review of literature in research work, this chapter is devoted to present and discuss the reviews collected from various sources. For convenience, the reviews have been grouped in major headings as follows.

2.1 Socio economic characteristics of large farmers

2.2 To examine the cropping pattern on the large farm

2.3 To estimate the costs and returns of major crops and livestock enterprises

2.4 To know the existing and optimum farm plans on large farm

2.1 Socio-economic characteristics of large farmers

Shrivastav *et. al.* (1996) studied income, saving and investment behaviour of farmers. The Lalbarra Block of Balaghat district of Madhya Pradesh was purposely selected for the study. A cluster of three villages was selected on the basis of simple random sample method. For the study 25

farmers from small, 15 from medium and 10 from large size group were selected. The sample farmers held, on an average, 4.14 hectares of land holding with an average family size of 8 members. The average from all the activities for the small, medium and large farms comes to Rs.22617, Rs. 50214 and Rs.87694, respectively. Agriculture and allied activities like dairy, poultry, goat keeping were the major sources of income and contributed 85, 80 and 70 per cent of the income for the small, medium and large farm groups, respectively. The study also revealed that in Balaghat district the large farmer saved money (44.59 per cent) than the medium (29.68) and small farmers (14.70 per cent). Due to limited family income, the small farmer of Balaghat district spent 85 per cent of the earning on the necessities of life, i.e., food and clothing as compared to large farmer (14.70 per cent) . There was a significant relationship between the size of holding and family income of the farmer.

Narayanmoorthy (2000) studied farmer's education and productivity of crops. He analysed the role of the farmer's education in productivity of crops using two season data of 200 farm households in Tamilnadu. The study analysed the role of farmers education in the productivity of crops by estimating five alternative specifications of production fuctions. The bivariate analysis indicates that the use of increasing inputs is significantly higher among the higher educated group of farmers when compared to less educated group of farmers. The coefficient of education implies that one per cent increase in the education level of farmers will have an effect of 0.038 per cent in productivity of Paddy. The estimates of production function relating to samba paddy indicates that the coefficient of education was positive but not significant in influencing the productivity of Paddy.

Sundar and Sharma (2000) education examined the role of farmer's education and knowledge for raising the agricultural productivity. Education plays a key role in the economy. Farmer's education in rural area was considered to be central ingredients in a strategy to improve agricultural productivity. Farmer productivity was increased on an average by seven per cent as a result of farmers competing four additional year of schooling.

Reddy and Sen (2004) conducted study on technical inefficiency in rice production and its relationship with farm specific socio economic characteristics. The study was undertaken in the one canal command area of Bihar. There were 270 farm, from that 207 marginal farms were selected through stratified random sampling method. Technical inefficiency in rice production decreased with increase in farm size. The average technical inefficiency was highest in marginal farm (27.28 per cent). To study the effect of age, the farmers belonging to age group 40-50 years showed lowest technical inefficiency in production of rice followed by the farmers belonging to below 40 years age. It would be clear that technical inefficiency in level of farmers below 50 years of age was comparatively lower than that of farmers above 50 years. Technical inefficiency reduced significantly with the increase in level of education, lowest technical inefficiency reduced significantly with the increase in level of education. It was indicated that well educated farmers can understand production technology better.

Dhakane (2005) observed that 44.46 per cent of Grape growers in Barshi tehsil of Solapur district belonged with younger age groups, while 35.34 per cent and 20.00 per cent of Grape growers belonged to middle and old age respectively.

Khaire (2005) observed that about 34.00 per cent of Fig growers from Pune district were educated in between 8 to 10 standard only. About 18.00 per cent of the respondents were educated up to 4^{th} standard and 17.00 per cent were illiterate. While 9.00 per cent were educated up to 5^{th} to 7^{th} standard.

Mate (2006) conducted a study on economics of production and marketing of papaya in Solapur district and observed that most of papaya growers were in middle age groups (44.46%). He also noticed that about (44.44%) with lower education up to 10^{th} standard and having family size of 1 to 5 members (42.22%). Majority of papaya grower (37.77) had papaya garden with size of 10 hectares, about 64.40 per cent of papaya growers main occupation is agriculture.

Toor *et. al*.(2006) studied income and employment pattern in Punjab. The distribution of land holding was very important as farm incomes along with the level of technological adoption depends on size of farm. It was revealed that 122760 holding falling in size group up to 1 hectare out of total holding comprising 12.31 per cent. The size of analysis indicated the contribution of crops below 1 hectares area 33.97 per cent, dairying 36.09 per cent. Non-farm income 22.36 per cent and miscellaneous income 7.58 percent. This showed that contribution of income from dairying and nonfarm was found to decline with increase in farm size except crops indicating an inverse relation. The pattern and magnitude of total human labour employment in crop production, family labour 51.22 mandays and hired human labour 24.67 man-days and in dairying only family labour was 193.75 mandays. This indicated that substantial share of family labour in the state. The income of farm families showed that crop followed by dairying in the state contributed the major share.

Jain and Chetan (2007) studied marketing of major horticultural crops in Dharsiwa block of Raipur district of Chattishgarh. They have selected five vegetables i.e. brinjal, tomato, green chillies, cauliflower and okra and two fruit crop i.e. watermelon and muskmelon. They selected 62 respondent and 29 intermediaries for study. Study revealed that total cropped area was increasing with the increase in size of land holding. The cropping intensity on various farm size was estimated to be 178.92 per cent, 169.40 percent and 152.03 per cent on small, medium and large farm respectively.

Sridhar (2008) studied contract farming in maize and revealed that the age of contract farmer was 43 years with a family size of six. The education levels concerned, hardly 21.66 per cent of the farmers had illiterate and remaining 78.33 per cent had literate in which 15.83 per cent, 42.50 per cent and 20.00 per cent studied upto primary, high school and college level, respectively. In case of non-contract farming, the average age of the farmers was 47 years with an average family size of six. The annual income was Rs 66.950 per family and educational level concerned, 23.34 per cent had illiterate and 76.66 per cent literate. Among the literate about 36.66 per cent, 31.66 per

cent and 8.34 per cent of the farmers were studied up to primary, high school and college level, respectively.

Asmatoddin *et. al*.(2009) studied the resource productivity of tomato in different seasons in Western Maharashtra. Sangamner tehsil from Ahmednagar district was selected purposively and ten villages were selected randomly .From each village three tomato grower were selected. The result revealed that an on average family size of. *Kharif, rabi* and summer tomato grower .farmer was 5.97, 5.47 and 5.59 respectively. Education status of family members at overall level in kharif, rabi and summer season i.e. illiterate , primary, secondary , graduate farmers were 7.78, 24.44, 45.56 and 22.22 percentage, respectively. Livestock rearing at overall level by tomato growers in the three seasons was observed in which crossbreed occupied the highest place follower by sheep goat, bullock and buffaloes i.e. 37.00, 34.67, 17.34 and 10.97 percent respectively. Cropping intensity was highest in case of *Rabi* tomato growers followed by summer and kharif i.e. 170.68, 169.33 and 152.85 percent, respectively.

Borse *et. al.* (2017) Studied Socioeconomic characteristics and varietal preferences of groundnut growers in Kolhapur district of Maharashtra. The efforts were made to study the selected personal and socioeconomic characteristics of the groundnut growers and their preferences for different varieties in Kolhapur district of Maharashtra. Karveer Hatkanangale and Gadhinglaj tehsils were selected for the study on the basis of maximum area under groundnut. Proportionate random sampling procedure was adopted and thus 120 respondents were selected from 12 villages. The study noticed that majority of the respondents were from middle age group of 32 to 59 years (60.00%) and secondary level of education (28.34%); 65.00 per cent respondents had medium size of family (4 to 7 members), medium usage of sources of information (60.84%), small size of landholding (44.16%), medium farming experience (55.83%) and medium annual income (67.50%). Majority of the respondents had medium cropping intensity (65.00%), always used Gramsevak as formal personal source of information (89.16%) and used TV

among the mass media sources of information (72.50%). It was also found that majority of the farmers followed groundnut – wheat – groundnut and groundnut – sorghum – groundnut cropping patterns in their fields. Phule Pragati variety of groundnut was noticed as highly preferred for oilcake by the growers.

Reddy and Kumar (2017) studied describe the socio-economic characteristics of the groundnut farmers in the Nalgonda District of Telangana The Socioeconomic characteristics of groundnut farmers in the study area revealed mean age of 40.56 years. Most of the farmers are married with (82.03%) only 17.97% are single. About 53.33% of the sampled ground nut farmers were males and 46.66% were females. It was observed that a higher percentage of cashew farmers (43.33%) are primary education. About 23.33 % of ground nut farmers illiterates and SSC, inter and collage had completed 20.00, and 16.66 and 13.33 respectively. most of the farmer primary occupation agriculture (91.66) observed in the study.

Babiker *et. al.* (2017) technical Efficiency and Socioeconomic Characteristics Affect that Technical Efficiency of Crop production in the Gezira scheme, Sudan The primary aims of this study were estimation of technical efficiency for farmers in producing crops and determine the socioeconomic characteristics of farmers' that influence the level of technical efficiency for crop production in the Gezira scheme. Both primary and secondary data were used for the study purposes. Stochastic frontier production function was estimated using a sample of 150 farmers was collected during season 2011/2012 in the Gezira Scheme. The results showed that the mean technical efficiency of cotton, sorghum, groundnut, and wheat productions are 63%, 75%, 65%, and 90% respectively, this implying that scope to increase its crops yield through the better use of the farmers available resources are exist. Also the results revealed that socioeconomic characteristics of farmers' for effect on technical efficiency in general trend for production.

2.2 To examine the cropping pattern on large farm

Singh *et. al.* (1978) studied economics of cropping pattern in the Uttar pradesh. Three stage stratified random sampling technique was used to select the block, village and the cultivators. The 100 cultivators were selected randomly under four size group's viz., small, medium and large. From ten villages of Sikrara block, district Jaunpur. The result revealed that on an average maize occupied that largest fraction (27.09 percent) followed by wheat (26.25 per cent), paddy (23.89 per cent), barley (7.23 per cent) and sugarcane (6.81 per cent) of the total cropped area. The percentage area under maize, barley and pea showed a decreasing trend with the increase in the size of farm. The percentage area under maize in case of large farm was 22.88 per cent, for barley 6.12 per cent and for pea 3.12 per cent. The area under cash crops i.e. sugarcane, tends to rise sharply with the increasing in the size of holding. It was 3.12 per cent on small farm and 8.1 6 per cent on large farm. Result showed that in cereal the intensity of cropping increased as the size of farm increased. The cropping intensity on small farm was 157.20 percent while on large farm it was 161.57 percent. This increased cropping intensity on large farm was associated with the better resource situation with them.

Tewari (1982) studied cropping intensity, irrigation and farm size in plains of Uttar Pradesh. Data on cropping intensity, gross cropped area irrigated area and percentage under small, medium and large size farms were derived from "Agricultural census in Uttar Pradesh, 1970-71". Cropping intensity was the lowest in Hamirpur (103.6 per cent) and highest in Nainital plains (156.0 per cent). The average cropping intensity in Uttar Pradesh plains was 132.5 per cent. Gross cropped irrigated varied from 8.6 per cent (in Bahraich district) to 83 per cent (in Meerut district) with an average of 37.8 per cent for Uttar Pradesh plains. Area under small size farms ranged between 15.3 per cent (in Nainital district) to 62.6 per cent (in Jounpur district), under medium size farms between 19.6 per cent (Hamirpur district) to 30.6 per cent (in Moradabad district) and under large size farms between 16.7 per cent (in Jaunpur district) to 64 per cent (in Hamirpur district) with an average of 41.1

per cent, 25.1 per cent and 33.8 per cent, respectively for Uttar Pradesh plains. Percentage gross cropped area irrigated and percentage area under small farms together explain 35 per cent variation in cropping intensity. It gross cropped area irrigated reaches 100 per cent in Uttar Pradesh plains this would help in attaining an average cropping intensity of about 162 per cent only. Irrigation has a positive and significant impact upon cropping intensity in Uttar Pradesh plains. Small size farms contributed positively in attaining the higher level of cropping intensity in Uttar Pradesh State.

Kundu and Santra (1984) examined the inter farm difference in the intensity of utilization of land and to bring out some of the important factor that contribute to those difference that was value of output, irrigation availability and human labour. Study was conducted in Nadia district of West Bengal. In all 75 farm households were selected and classified in small, medium and large groups according to land holding. Results revealed the inverse relation between the intensity of cropping and the size of the farm measured by the operation area. Value of correlation coefficient was 0.41. Result also indicated that cropping intensity is dependent on the value of output per farm; here value of correlation coefficient between them is significantly low i.e. 0.005. There was also a positive relationship between the cropping intensity and level of use of human labour. Value of correlation coefficient was 0.87.

Sangvikar (1986) studied farm business analysis in Banda district of Uttar Pradesh. Information regarding cropping pattern followed by farmer were collected by using simple random sampling method from Banda district of Uttar Pradesh. Results found that main of district were paddy and Jowar in kharif and wheat and gram in *Rabi* season. About 62.3 per cent area was under cereals. 36.15 per cent under cash crop. The intensity of cropping of a district as a whole was 119.07 per cent.

Pawar *et. al.* (2002) studied farm investment and income pattern of farm size groups in Maharashtra. The study was based on primary data collected from 300 farm families under comprehensive scheme for studying the

cost of cultivation of principle crops in Maharashtra. The farm size holdings were groups in small, semi-medium, medium and large. Simple statistical tools like percentages and averages were employed to analyse the data. The cropping intensity worked out to be 128.99 per cent on marginal farm and 110.91 per cent on large farm. The results revealed that the cropping pattern of all the size group of farms was dominated by cereals. Thus, Jowar, Bajra and Wheat were the major cereals in all the size group of farm. The contribution of proportionate of cereals was 46.16 per cent followed by cotton 22.11 percent, pulses 18.86 percent, oilseed 8.32 per cent, sugarcane 0.91 percent, vegetables 1.94 percent and fruits 1.95 percent on large farm. The proportionate of net cropped area was 0.69 per cent on marginal farm and 7.23 percent on large farm. The gross cropped area was 0.89 percent on marginal farm and 7.69 per cent on large farm. The proportion of area sown more than once was noticed to be relatively more in marginal size group of farm (9.41 per cent).

Goswami and Chall (2004) studied Indian land use scenario. The data were collected from directorate of Economics and Statistics, Ministry of agriculture, New Delhi for measuring variation in land use and cropping pattern, percentage analysis was done. The coverage of reporting area statistics went up from 282.32 million hectares in 1997-1998. The total available land for cultivation (net area sown plus current and other follows) in 1950-1951 constituted 51.70 percent and proportion was 54.50 percent of total reporting area in 1997-1998. The availability of arable land (net sown plus follow land) per capita declined by 51.60 percent between 1950-1951 and 1997-1998 from 0.407 to 0.197 hectare. The fallow and other than current fallow declined 44 percent 1950-1951 to 1997-1998. The stratified analysis of land statistics on current fallow showed an increased by 25.60 percent during period 1950-1951 to 1997-1998.

Shendge *et. al.* (2005) studied farm and nonfarm employment and income of farm families in Maharashtra. The study was undertaken in 3 regions of Maharashtra state viz. Western Maharashtra, Marathwada, Vidarbha. There were 600 families considered from that 160 farm families from Marathwada.

The data were collected from comprehensive scheme for studying the cost of cultivation of principal crops in a state year 2002-2003. The cropping pattern of Marathwada and also state dominated by the food grain crop which occupied 63.80 per cent of the total cropped area. The proportionate share of net cropped area to the total land holding was 90.96 per cent at a state level while lowest in Marathwada region i.e. 46.56 per cent. The crops grown in Marathwada region were sugarcane and other perennial crops. The lowest cropping intensity (119.6 per cent) noticed in Marathwada.

Gore *et. al.* (2015) examine the growth rates of area, production, productivity of major crops and changes in cropping pattern in Akola district of Vidarbha. The study was based on secondary data collected from different government publications. The covered a period of 15 years i.e. 1995-96 to 2009-10. In all six crops were considered for study. These crops covered more than 80% of the total cropped area of the study area. The analysis showed that the area under *kharif* Jowar has found to be decreased in of Akola district. Area under soybean crop was increased in Akola district and cotton still remains as major crop of the district.

2.3 Costs and returns of major crops and livestock enterprises

Mishra and Shukla (1970) analysed cost and income under different sizes of farming. The list of agriculture households was prepared with the help of Lekhpal record on the basis of operational holding and classified into three categories like small, medium and large. Result revealed that average gross farm income on small size farm was Rs 319 and Rs 418 on large size farm. Average farm cost per acre was Rs. 239.07 on small farm and Rs. 149.83 on large farm. Average gross farm income per acre was high on small farm and low on large size farm.

Gadre (1995) examined the costs and returns from milch animals and contribution of dairy and crop enterprise to the total farm income of different farm size of group of farms in Vidarbha region of Maharashtra. In all 113 sample of different farm size holdings selected from eight districts of Vidarbha region. Result showed that number of milch cattle per holding was

observed to be 2.67, 2.41, 2.55 and 2.75 in small, semi medium, medium and large size groups, resp. and corresponding number of dry cattle was 0.64, 0.99, 1.46 and 1.12 indicating that the ratio of dry to milch cattle increased with increases in size of holdings.

Murugan and Namasivayam (2005) analysed and compare the cost and return from agriculture under different size of land holding *viz*., marginal small, medium and large farmers in the irrigated, unirrigated and pooled farms in Cuddalore and Thanjavur districts of Tamilnadu. Cost-A it includes the cost on human labour, bullock labour, fertilizer, pesticides, irrigation, mechanical power and seeds. Cost-C includes, Cost-A, interest on working capital, rent on land and land revenue less taxes depreciation on farm machinery. Total operating cost accounts for Rs. 51.93 per cent; cost on working capital was 5.19 per cent. Total cost of production (C) was Rs. 20384.22 and gross return was Rs. 31709. Net return over cost (C) was Rs. 11324.98. Input output ratio over operational cost was 4.43 and cost benefit ratio for large farm was 1.55 which is less than the medium farm.

Kamble (2001) studied returns from milch animals at overall level in a lactation period of 293.46 days. Milk production from single crossbreed cow was 2008.91 litters, with gross value of Rs 19474.67 including value of dung. The milk production of local buffalo and local cow was 483.57 litres and 421.14 litres, respectively. Including value of dung the per animal gross returns worked out to Rs 9125.70 and Rs 4700.93, respectively in case of buffalo and local cow. On an average per litre cost of milk production was the highest (Rs 22.08) in case of local buffalo followed by local cow (Rs 15.32) and crossbred cow (Rs 7.46). Per litre cost of local milch animals was high because of low milk yield and more dry days.

Kshirsagar (2006) studied impact of organic farming on economics of sugarcane cultivation in Maharashtra. For study 142 sample farmers were selected. The major component of variable input was hired labour (214.79 number/hectare) followed by nitrogen (355.86 kg/ hectare), phosphorus (127.54 kg/ hectare), potassium (80.87 kg / hectare), seed (3.31

tonnes/ hectare) and manure (6.68 tonnes /hectare). Yield was 103.56 tonnes/ hectare.

Macdonald *et. al*. (2007) studied the profit, cost and changing structure of dairy farming confidential farm level records from successive census of agriculture (1992, 1997, 2002) were used to depict changes in the location and size distribution of dairy farms. More aggregated public information on the size distribution of dairy farm is drucon from annual dairy survey carried out by USDAS National Agricultural Statistics Services US diary production is consolidating in to fewer but larger farm. This report uses data from several USDA surveys to detail that consolidation and to analyse the financial drives of consolidation costs. Although, small dairy farms realise higher revenue per hundred weight of milk sold, the cost advantages of larger size allow large farm to be profitable on average, even while most small farms were unable to earn enough to replace their capital. Further surveys evidence as well as the financial data suggests the consolidation was likely to continue.

Kanhore (2008) studied economic analysis of large farm in Marathwada region of Maharashtra. The area operated large farmer land holding was 7.14 hectares. On large farm, the proportionate of unirrigated, irrigated and pasture area was 74.09, 18.48 and 7.43 per cent, respectively. The results revealed that per hectare net profit of sugarcane was Rs 29456.54 followed by *Rabi* Jowar (Rs 5060.43) and Soybean (Rs 3237.93). Net profit of cow enterprise and buffalo enterprise was Rs 4251.43, Rs 2639.92, respectively. It implied that a cow enterprise was more efficient than that of buffalo enterprise.

Gandhi and Namboodiri (2009) studied returns and economics of Bt cotton *vis-a-vis* traditional cotton varieties in state of Maharashtra in India. The district sampled for this study, Buldana and Jalgaon belong to two different agro-climatic region of Maharashtra and are important cotton growing district in state. There was marked difference in the cost of production per hectare has been comparatively high for large size farmers for both Bt and non Bt cotton. This can be mainly attributed to higher dose of fertilizer use, greater

cost of irrigation and high level of human labour use, particularly for cotton harvesting. The share of human labour and fertilizer in total cost of cultivation were higher under medium and larger size farms compared to small farms. Total cost of production was relatively higher for the eager size farmers for both Bt and non Bt cotton.

Thennarasu and Banumathy (2011) studied economics of sugarcane production using eco-friendly technology in Cuddalore district of Tamil Nadu. It was revealed that the total cost of cultivation per hectare was Rs 42794.88 in bio-input adopter farm which was 2.35 per cent higher than the total cost in bio-input non-adopter farm. Among the components of total cost, human labour (45.46 per cent) occupied the highest percentage followed by setts (21.37 per cent) and value of bio-inputs (18.03 per cent) whereas in bio-input non-adopter farms, the highest percentage of total cost was incurred for human labourers (49.50 per cent) followed by setts (21.60 per cent) and fertilizer (14.71 per cent).

Asodiya *et. al*. (2014) studied input use, costs structure, return and resource use efficiency of wheat crop in south Gujarat, India. In present investigation the sample of 240 wheat farmers were selected from study area which input-output data collected based on rabi cropping pattern. The results of study revealed that the average total cost of cultivation of wheat was Rs. Rs. 45784.31. It was highest on large farm followed by Rs. 45720.79 on medium farm, higher cost on large farm are associated with intensive use of human labour, bullock labour, manure and fertilizer, irrigation changes. The average net profit per hectare over (cost-C_2) was Rs. 20017.55 and it increased with increase in size of farm. The overall input-output ratio was 1:1.44 on the basis of total cost of cultivation. It was higher (1:1.48) on large farm.

Shivanaikar *et. al.* (2014) studied economics of sugarcane cultivation under organic and inorganic farming in Bagalkot district of Karnataka. The results showed that the per acre cost of sugarcane cultivation on organic farm was Rs 45974.50 while that on inorganic farm was Rs 54331.82. The return structure in sugarcane clearly revealed that the per acre

gross returns was higher (Rs 82328) on organic farm compared to that of inorganic farm (Rs 81360) with a positive net return on both the categories of the farms. The net return on organic farm was (Rs 36353.90) and was (Rs 27028.18) on inorganic farm. The benefit cost ratio was also higher on organic farm (1.79) compared to inorganic farm (1.50). Hence, organic cultivation of sugarcane was more profitable.

Ohen and Ajah (2015) studied costs, and return analysis in small scale rice production in cross river state, Nigeria. Agriculture has been and still the bedrock on which every successful, stable economy the world over is built. The Nigeria agricultural policy places the small scale farmers in the central focus. This is because the nation's agriculture has always been dominated by the small scale farmers, who have less than 3 hectares, but represent a substantial proportion of total population and produces about 90-95% of the total output in the country. These small scale farmers are the major actors in rice production.

Murthy *et. al.* (2015) studied cost and return structure of maize production in North Karnataka. A multistage random sampling procedure was used for selection of the district and sample respondents. The total sample size was 240. Study based on the primary data. Among the different category of farms the total variable cost incurred per acre by medium farmers was highest followed by small farmers and marginal farmers. The results show that, the average per acre cost of cultivation was Rs. 12532.78 in Dharwad district and Rs. 12529.38 Haveri district and the average net returns were Rs. 7582.86 in Dharwad district and Rs. 7831.96 in Haveri district. Maize production in the study area found to be profitable as also co-operated by B:C Ratio of 1.42 to 1.50 among different categories of farmers.

Medat *et. al*. (2016) study was designed to measure input use, cost structure production and returns in soybean production of south Gujarat division of Gujarat.oil seed crops have a vital role to play in the Indian agriculture industry and export trends. The important oilseeds grown in Gujarat area groundnut, mustard, rapeseed, soybean, caster, sesame, sunflower and

safflower. Gujarat occupies a prominent place in the oilseed map of the country with a production of 30.94 million tonnes with an area of 26.46 million ha. Soybean share is 4.3 percent of the total production oilseed crops.

Nathan *et. al*. (2015) studied profitability analysis of cowpea production in Gombi local government area of adamawa state of Nigeria. Result from the finding reveals that majority 52.5% of the respondents who engage in cowpea production were female and they were female and they were within their most active age of 20-49 years of age.

Sharma (2016) studied Costs, returns, and profitability of soybean cultivation in India trends and prospects. Soybean has emerged as a leading oilseed crop in India which accounts for 55.6 per cent area of under *kharif* oilseeds and 38 per cent of area under total oilseed during TE 2012-13, 42.5 per cent of total oilseed production, and contributing to 28.6 percent of the total vegetable oils production in the country. Input use, cost, returns and profitability of soybean cultivation for major soybean growing states was analysed by using CACP data. The results revealed that farmers use higher than recommended seed rate and lower than advised fertilizers and manures, impacting the yield realization by the farmers.

Audu *et. al*. (2017) studied the productivity and profitability of groundnut production in Lafia local government area, Nasarawa State, Nigeria. Structured questionnaire was used to generate primary data for the study. Descriptive statistics, gross margin analysis, and double –log production function were employed in the analysis. Results revealed that majority of the respondents (57.5%) were relatively young and fell within active age (25-45). Male respondents marginally dominated groundnut production at 51.7% and majority (78.3%) were married. Results further revealed that significant (78.3%) number of the respondents had below 10 inhabitants in their households. The total world groundnut output in 2008 was estimated at 34.8% million metric tonnes out of which Nigeria accounted for about 3.8 million metric tonnes. The crop is grown on 26.4 million hectares worldwide with a total output of 37.1 metric tonnes and an average yield of 1.4 metric tonnes/ha

reported that developing countries constitutes 97% of the global area and 94% of the global production of groundnut. Nigeria considered the third largest producer of groundnut in the world after China and India with an output of 16,114,231, 6,933,00 and 2,962,760 million metric tonnes respectively in 2011

2.5 Existing and optimum farm plans

Singh and Ramanna (1982) studied potential of employment on small and large farm. The data used in the study was collected from eastern region of Hyderabad. Multistage sampling design was used to select the sample. Four villages were selected randomly from the block. For each average farm situation four optimum plans were developed using linear programming technique. Plan-A: optimum plan at current production technology with currently available capital. Plan-B: optimum plan at current technology with capital constraints relaxed. Plan-C: optimum plan with improved technology and with farmers own funds. Plan-D:optimum plan with improved technology with adequate capital. An analysis of hired labour potential of larger farms together was 33,238 and 118mandays in plan A, B and C indicating hired labour potential on large farm. However, plan D generates substantial hired labour potential on large farm that apart from providing full employment to the unemployed family labour of small and marginal farms could also provide employment to landless agricultural labour.

Dubey and Sen (1988) studied resource use planning in agriculture in Eastern Uttar Pradesh. A sample of 37 households was drawn consisting of 14 marginal farmers, 12 small farmers and 11 large farmers. The optimal resource use plans were developed by using linear programming technique. The result revealed that size of marginal farm was 0.48 ha. While the size of small and large farm was 1.48 ha. and 3.75 ha., respectively. Area under the crops which are relatively more profitable has increased and this increment in area under these crops is adjusted by decreasing the area under the crops which are important only for family consumption. The increase in income was observed to be maximum (108.24 per cent) on small farm as compared to large farm (102.07 per cent) and marginal farm (28.64 per cent).

The human labour employment has increased considerably in optimum plan on all farms.

Sharma and Sharma (2004) studied income and employment increasing possibilities of various levels of technology in agro-climatic zone-2-A of Rajasthan. Linear programming technique was used for different farm sizes and different levels of technology. Four types of activities were included viz., existing crop activities, improved crop activities, human hiring activity and capital borrowing activities. The results indicated that irrigated Bajra (0.60 ha.) was 3 level of technology, area under irrigated Guar and irrigated Cowpea was found same as 0.31 hectares. It was observed that Barley was replaced by improved Wheat and Mustard was replaced by improved Gram at 3 level of technology. The cropping intensity was higher (258.44 per cent) at 3 level of technology because total irrigated area occupied in summer season due to relaxed capital.

Methodology

CHAPTER-III

METHODOLOGY

3.1 Salient features of Yavatmal district

Silent features which consists with location, soil, climate, population, land use pattern and cropping pattern of Yavatmal district has been presented as follows.

3.1.1. Location

Yavatmal district is situated in the South-Western part of wardha Penganga-Wainganga kho. The geographical location of the district falls in 19.26 and 20.42 north latitudes and 77.18` V and 79.9 in the eastern line. Amravati and Wardha district, from east to Chandrapur district, Andhra Pradesh and Nanded district are from the North whereas Parbhani and Akola districts are surrounded by west.

3.1.2 Soils

Generally, three types of soil observed in Yavatmal district i. e. shallow coarse, medium black and deep black.

3.1.3 Climate

Generally, the district climate is hot and dry and the winter is very cold. The whole year can be divided into four season. Starts in the summer season and stay up to the first week of June. Thereafter, south west monsoon rains take place and it till the end of September. The northern monsoon forms in October and November and finally the winter season arrives which ends at the ends of February. The annual rainfall of Yavatmal district is 999.8 mms.

The summer season is between March and May, the day and night temperature are constantly increasing. May is usually the hottest month of the years, the average daily temperature reaches 42 degrees Celsius. December is the coldest month of the year, with the average daily minimum temperature being 13 degrees Celsius. Sometimes the temperature of the district falls below 5 degrees Celsius due to the humidity of the northern cooling air.

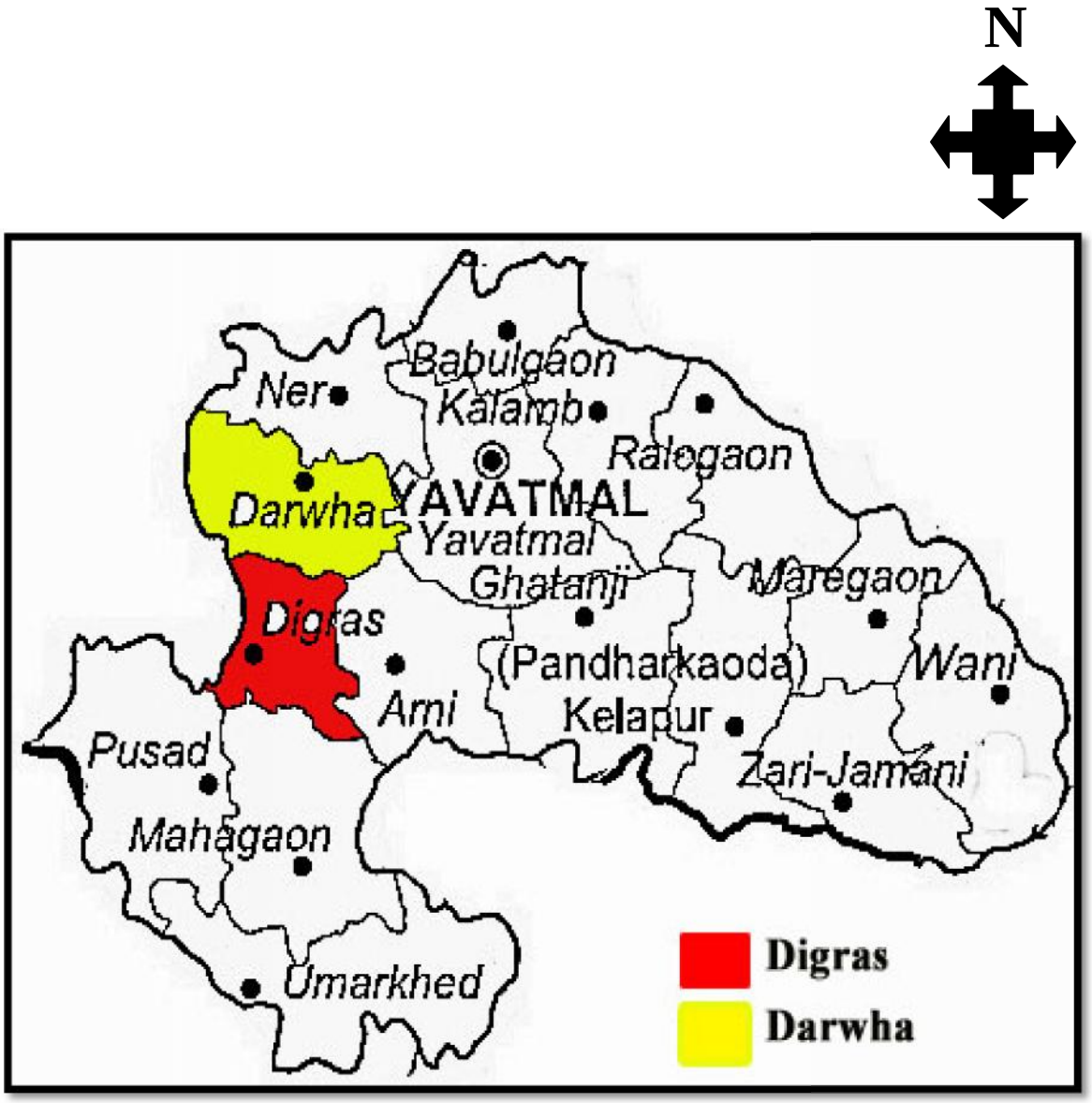


Fig. 3.1 Map of Yavatmal district showing study area.

3.1.4 Population

In 2011, Yavatmal had population of 2,772,34of which male and female were 1,419,965 and 1,352,383 respectively. In 2001, Yavatmal had a population of 2,458,271, of which males were 1,265,681b and remaining 1,192,590 were females. Yavatmal district population constituted 2.47 per cent of total Maharashtra population. In 2001 census, this figure for Yavatmal district was at 2.54 per cent of Maharashtra population.

3.1.5 Land use pattern

Geographical area of Yavatmal district is about 1352000 ha. out of which net sown area 884000 ha. In Yavatmal district, area under forest 243000 ha, permanent pasture area is 35000 ha., cultivable waste land area is 22000 ha., land under miscellaneous tree crops and growers area is 29000 ha., barren and uncultivable area is 39.4000 ha., current follows about 33000ha and other fallows 25000 ha.

3.1.6 Cropping pattern

The net sown area of Yavatmal district is about 884000 ha. which is about 1352000ha. of geographical area. The important food grains are taken as Wheat (160 sq. km.), Jowar (1092 sq. km.), Soybean (1664 sq. km.). The area under pulses is about 1791.59 sq. km.Tur is an important pulse crop taken in Yavatmal district. Cotton is an important fibre crop cultivated on an area about 3867 sq. km. Sugarcane is grown as a cash crop. Some horticultural crops are also taken in the district; fruits like mango, sweet orange, and kagzi lime are taken. Whenever assured irrigation facility is available, whereas summer groundnut is being cultivated.

3.2 Sampling design

Multistage sampling design was used for selection of zone, tehsils, villages and farms in Yavatmal district of Vidarbha region.

3.2.1 Selection of region

In first stage, the Yavatmal district was selected because this district is having large farming area.

3.2.2 Selection of tehsils

In second stage, 2 tehsils were selected from district on the basis of maximum area under large farm.

3.2.3 Selection of villages

In third stage, from selected tehsils five villages were selected from each of tehsil on the basis of large farm area.

3.2.4 Selection of cultivators

In fourth stage, from each cluster villages, six farmer were selected. Thus total sample size were 60.

3.3 Analytical techniques

In analytical techniques first objective was to know the socio economic characters, was achieved by tabular analysis. Second objective was achieved by using concepts like average, mean and percentages third objective that is to determine per hectare profitability of various enterprises was achieved by tabular analysis by using cost concept of cost A, cost B and cost C. fourth objective was achieved on the basis of existing farm plans on large farm.

3.4 Terms and concept used

Cost A: It is actual paid out cost of cultivation. This cost approximates the expenditure incurred by the farmers in cash and kind in cultivation of crop and it includes the items namely hired human labour, bullock labour, machine labour, seed, fertilizer, manure, plant protection, land revenue, incidental expenditure, interest on working capital and depreciation on assets and farm building.

Cost B: It comprises of cost A plus rental value of land and interest on fixed capital.

Cost C: It includes the cost B and imputed value of family labour.

3.5 Measurement and evolution of cost items

i) Hired human labour

Hired human labour was measured in man days. One man days consists with work of 8 hours. Labour cost evaluated at the rate Rs. 250 for per day male and Rs. 150 for per days female. The female labour was converted into man days to multiplying to number of female with 0. 06.

ii) Bullock labor

Hired bullock labour charges were considered for 8 hours a day, actually paid in the locality. Family bullock labour charges accounted equal to the charges paid to the hired bullock labour. For the present study, a hired bullock charge was Rs. 500 per day for a bullock pair.

iii) Machine labour

Machine labour in case of owned machine was evaluated as per the hired charges prevailed and in case of hired machine as per the actual amount paid machine charges was charged as the rate of Rs. 400 per hours.

iv) Seed

The actual cost paid and expenditure incurred on procurement were taken into account for the purchased seeds and cost of own farm produced seeds considered as the prevailing of prices in the locality at the time of sowing of the crop.

v) Fertilizers

Fertilizers in the farm of urea, diamonium phosphate (DAP), 18:18:10 were used and quality of nitrogen, phosphorus and potash was calculated in order to determine the actual expenditure on nitrogen, phosphorus and potash. The rate prevailing in the market for nitrogen, phosphorus and potash was Rs.13.04/kg, Rs. 49.24/kg and Rs. 28.33/kg, respectively.

vi) Manure

Manure produced on the own farm was evaluated at the rate prevailed in village. The cost of purchased manure was accounted according to the price paid by cultivators. One cartload of manure was considered as four quintals and its prevailing price was Rs.200/q.

vii) Plant protection

This includes the actual cost incurred on purchase of insecticides, pesticides, fungicides and procurement.

viii) Land revenue

The land revenue was considered with proportionate area of specific crop.

ix) Incidental expenditure

It includes minor repairs, refreshing charge and other expenditure for cultivation of the crop.

x) Interest on working capital

It was calculated by charging interest at the rate of 13 per cent on item of expenditure as hired human labour bullock labour, machine labour, seed, fertilizers, manure, plant protection, land revenue and incidental charges for crop cultivation.

xi) Depreciation of asset

Depreciation is the decrease in the value of asset through wear and tear. Straight line method was used for calculating depreciation. The uniform rate of 10 per cent on the present value at the beginning of the year of farm implements and machinery was taken and only the proportionate charges were taken for the crop on hectare basis.

xii) Rental value of land

Rental value of owned land was estimated as $1/6^{th}$ of the value of gross produce i.e. value of main produce plus value of by produce minus land revenue.

xiii) Interest on fixed capital

It was calculated by charging interest at the rate of 11 per cent of investment on commonly used assets like wooden implements, equipment and which distributed on cropped area.

xiv) Commonly used asset

It includes plough, harrow, seed drill, hoe, bullock cart, hand sprayer, machine sprayer and power sprayer.

xv) Irrigation structure

It includes capital investment on well, electric motor, pipeline and electric motor shed. Annual expenditure on irrigation structure mean, electric charge, repairing charge depreciation on electric motor (@ 10 per cent), depreciation on well (@ 2 per cent), depreciation on pipeline (@ 10 per cent) and interest on fixed capital (@ 10 per cent).

xvi) Asset

An asset is a physical property or intangible right owned by a business or an individual that have a value.

xvii) Current asset

They are very liquid or short term asset. They can be converted into cash, within a short time, usually one year e.g. cash on hand, agricultural produce ready for disposal.

Results and Discussion

CHAPTER-IV

RESULTS AND DISCUSSION

The study deals with the economic analysis and efficiency of farm having different levels of resource base. In order to meet the objectives of the study, Data were collected and processed for the year 2017-18. The major findings of this study are presented in this chapter under the following heads;

4.1 Land utilization and socio-economic characteristics

4.2 Cropping pattern and livestock pattern

4.3 Costs and returns of major crops and livestock enterprises

4.4 Existing and optimum farm plans

4.1 Land utilization and socio-economic characteristics

Land is a scarce resource and it must be used intensively in farming business, socio-economic characteristics are also influencing the farming business. Thus, these aspects are described as follows.

4.1.1 Land use pattern

Land holding, uncultivated land and cultivated lands were calculated and presented in Table 4.1. It was observed that land holding of large farmers was found to 8.51 hectare. Land holding was split into two parts as uncultivated land and net cultivated land. Proportion of net cultivated land and uncultivated land to total land holding was 98.17 per cent and 1.8 per cent, respectively.

Table 4.1 Land use pattern of large farm

SN	Particular	Area (ha)	Percentage (%)
1.	Total land holding	8.51	100.00
2.	Uncultivated land	0.15	1.8
3.	Net cultivated land	8.36	98.17
I)	Irrigated land	5.16	60.59
II)	Rain fed land	3.2	37.58

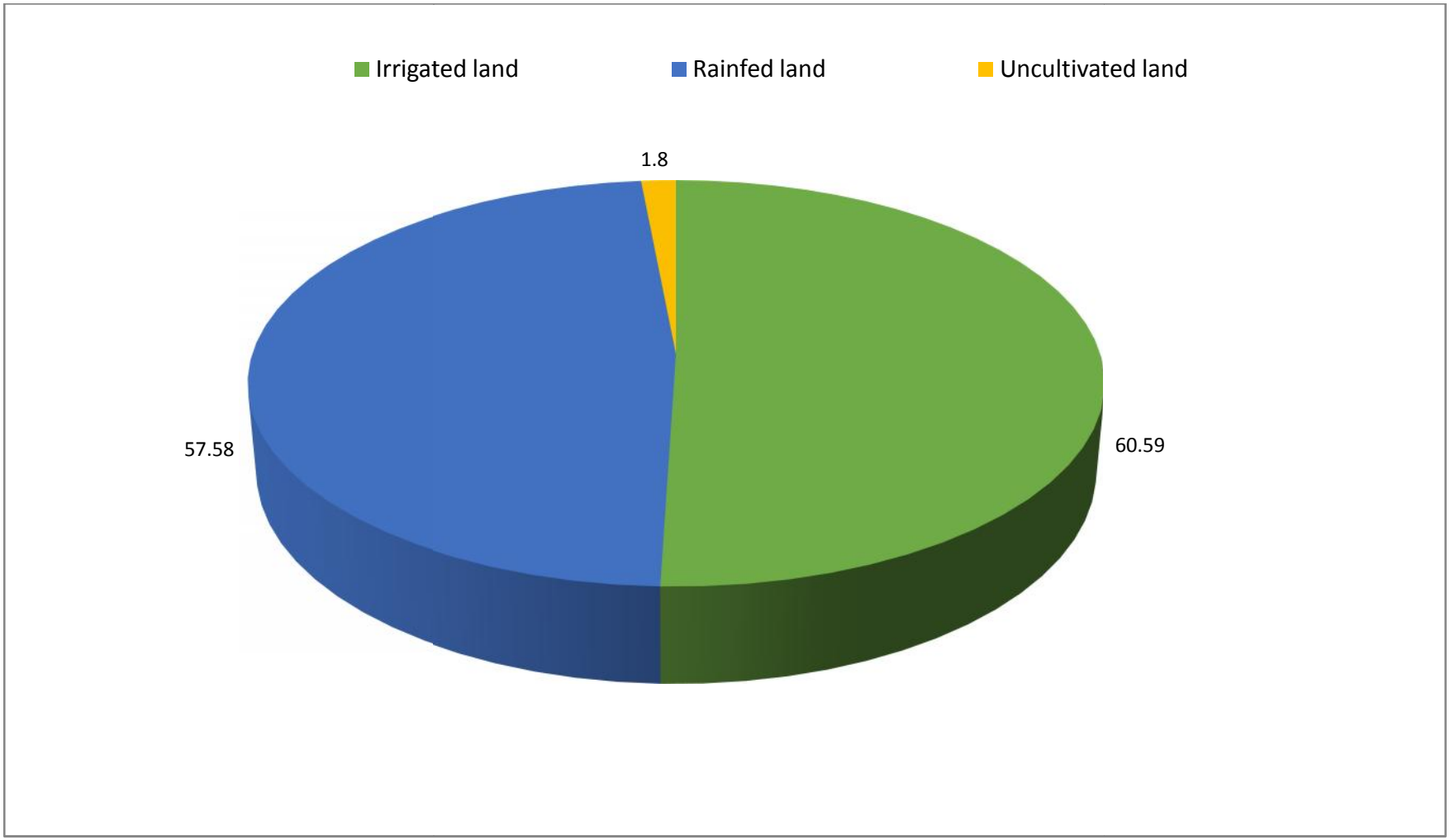


Fig. 4.1 Share of irrigated, rainfed and uncultivated land.

It is also important to note that net cultivated land (8.36 ha) was also divided into irrigated and rain fed areas with proportion of 60.59 per cent and 37.58 per cent, respectively. It implied that the higher proportionate area was under irrigated condition.

4.1.2 Socio-economic characteristics of large farmer

Absolute mean with respect to socio-economic characteristics of large farmer were studied and presented in Table 4.2.

Table 4.2 Socio-economic characteristics of large farmer

SN	Particular		Frequency	Percentage
1.	Family size			
	i)	Small(1 to 4)	15.00	25.00
	ii)	Medium(5 to 7)	30.00	50.00
	iii)	Large(8 and above)	15.00	25.00
		Total		**100**
2.	Age			
	i)	Young (up to 25-35 yrs.)	18.00	30.00
	ii)	Middle (35 to 45 yrs.)	30.00	50.00
	iii)	Old (Above 45 yrs.)	12.00	20.00
3.	Education level			
	i)	Primary	35.00	58.34
	ii)	High school	15.00	25.00
	iii)	College	10.00	16.66
4.	Type of soil			
	i)	Shallow	15	25.00
	ii)	Medium	35	58.34
	iii)	Heavy	10	16.66
5.	Occupational level			
	i)	Agriculture	38	63.34
	ii)	Business	10	16.66
	iii)	Service + farmer	12	20.00

In socio-economic characteristics of large farmer, age, family size, type of soil and occupation level was also calculated in the form of frequency and percentage is presented in Table 4.2. Regarding to family size 50 per cent large farmer having medium family size followed by 25 per cent as large and 25 per cent as small. Regarding to age of farmer, it was observed that majority of farmers (50 per cent) were found in middle followed by young (30 per cent) and old age (20 per cent). In regard to education, 58.34 per cent of

farmers were found in education standard up to primary school, secondary school was 25 per cent and only 16.66 per cent farmers were up to college level. Regarding soil type, 58.34 per cent of farmers had medium type of soil followed by shallow (25 per cent) and heavy (16.66 per cent). In relation to occupation level 63.34 per cent farmers had agriculture as a main occupation followed by 20 per cent as service plus farmer and 16.66 per cent as business. It could be inferred that owner of the family was middle age group with primary school education and medium size of family. Land under agriculture was with medium type of soil with main occupation as agriculture.

4.2 Cropping pattern and livestock pattern

Farm business consisted with all crops and livestock on the farm. In business analysis, both crops as well as livestock enterprises are to be evaluated for determining the profitability of farm business as a whole. In cropping pattern individual crops were grouped into *Kharif, rabi*, summer and annual crops with their areas along with animals on farm and are presented in Table 4.3. The results revealed that gross cropped area was 9.21 hectares, in which the highest proportionate area was 40.39 per cent under *kharif* crops followed by *Rabi* (25.95 per cent), summer (19.00 per cent) and annual crop (14.11 per cent).

It is revealed from the table that, summer Groundnut contributed 19.00 per cent as the highest share of area in cropping pattern. In next order, Turmeric contributed 14.54 per cent and Orange showed 14.11 per cent, while Gram and Soybean contributed same area i.e. 0.82 ha. while Cotton and Tur contributed same area, i.e. 0.78 ha. wheat contributed 8.36 per cent and Safflower 8.68 per cent in all crops. Cropping intensity was found to be 133.5 per cent. It inferred that in farming business farmer were giving more importance to crops like Cotton, Turmeric, Soybean and summer Groundnut, Wheat are taken as staple food crop.

Cow and buffalo herds were also estimated and are presented in Table 4.3. It was observed that herd size of cow enterprise was found to be 1.78 on large farm followed by herd

Table 4.3 Cropping patternof large farmer

SN	Particular	Area (ha)	Percentage
1.	***Kharif***		
a.	Soybean	0.82	8.90
b.	Cotton	0.78	8.46
c.	Tur	0.78	8.46
d.	Turmeric	1.34	14.54
	Sub Total	**3.72**	**40.39**
2.	***Rabi***		
a.	Wheat	0.77	8.36
b.	Gram	0.82	8.90
c.	Safflower	0.8	8.68
	Sub Total	**2.39**	**25.95**
3.	**Summer**		
a.	Groundnut	1.75	19.00
	Sub Total	**1.75**	
4.	**Annual**		
a.	Orange	1.30	14.11
	Sub Total	**1.30**	
5.	Gross cropped area	9.21	100.00
6.	Double crop area	1.55	
7.	Net sown area	8.36	
8.	Cropping intensity	-	133.5
	Livestock		
	Cows	1.78	60.75
	Buffalo	1.15	39.25
	Total	**2.93**	**100**

Size of buffalo enterprise was 1.15 in which the share of cow was 60.75 per cent followed by buffalo 39.25 per cent. The large farmer was given more importance to cow enterprise as compared to buffalo enterprise in farming business.

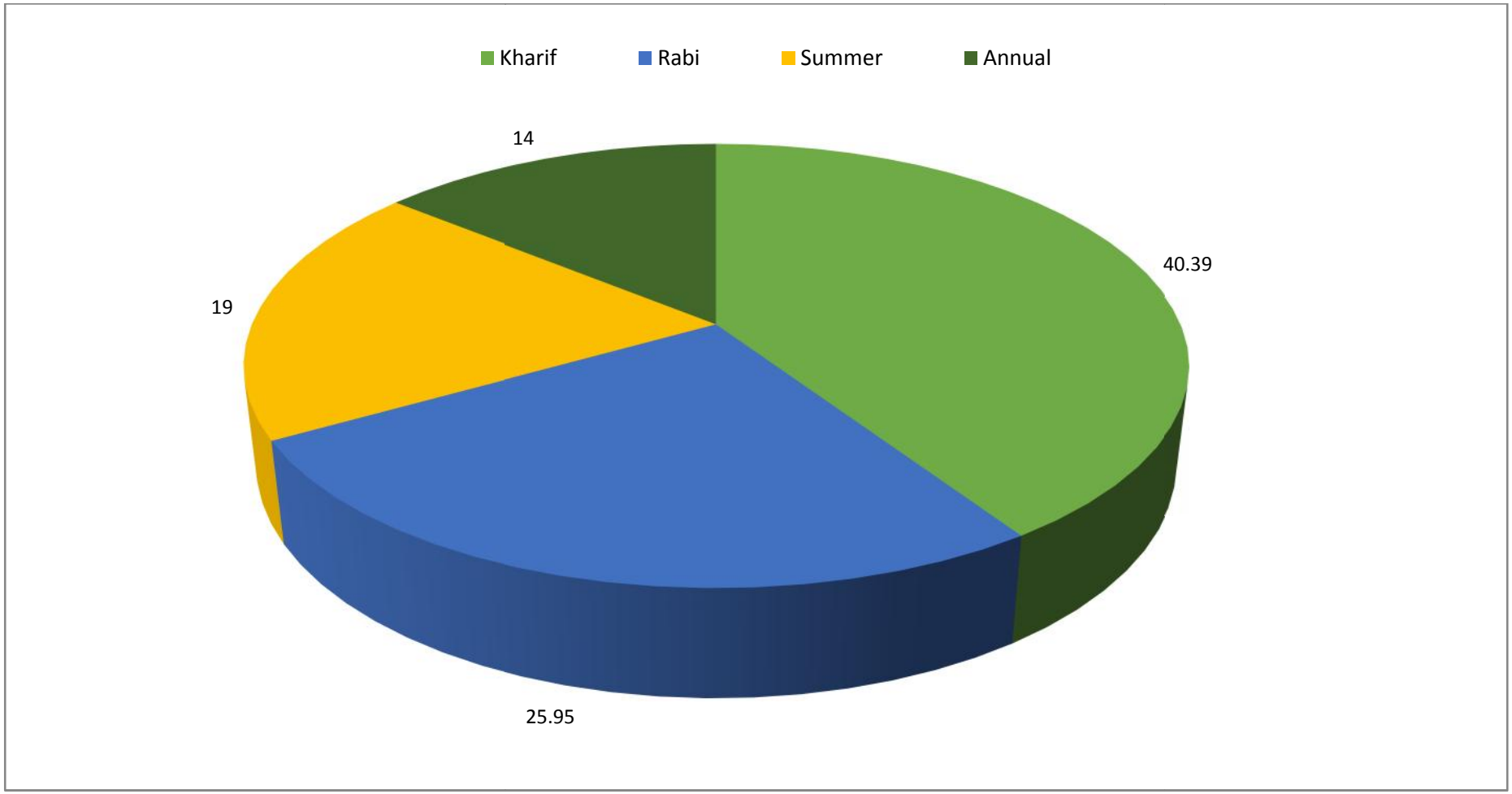


Fig. 4.2 Share of cropping pattern on large farm

4.3 Per hectare and per animal costs and returns on large farm

Physical inputs can be transformed in production of crops. The inputs can be converted into monetary term to determine the cost of cultivation per hectare. Similarly main produce and by produce can be converted into monetary term to know gross returns with the help of costs and returns profits with respect to crop production could be determine as follows.

4.3.1 Per hectare cost and returns of Soybean crop

Per hectare cost and returns of soybean crop with respect to use of physical inputs and main produce, as well as by produce were estimated and are presented in Table 4.4. In regard to use of physical inputs in soybean it was observed that the use of hired human labour and family human labour was 22.26 and 10.38 man days, respectively. Use of machine labour was 1.19 hours while the use of bullock labour was 1.66 pair days. In case of use of fertilizers, total quantity of NPK was used 65.5 kg. In general, use of manure was 2.21 quintals. It implied that use of pesticides also entered in soybean. The use of plant protection was 3.77 per cent also the results revealed that cost-C was Rs. 31966.43 in which cost-A was Rs. 23491.24 having the share of 73.49 per cent in cost-C. Among individual items of costs, rental value of land was dominant with 12.62 per cent. In next order hired human labour showed the highest share of 25.22 per cent followed by seed (13.58 per cent), manure (1.19 per cent) and irrigation charges (6.06 per cent). It was found that hired human labour, manure, rental value of land and seed were the major items of expenditure.

Per hectare main produce, by produce and gross returns were also calculated and presented in Table 4.4. It was clear from the table that main produce of soybean was 23.57 quintals while by produce was 6.37 quintals. It was clear from the table that gross return was found to be Rs.79828.83 in which the share of main produce was 98.62 per cent while the share of by produce was 1.38 per cent. It was obvious that net profit from soybean crop was found to be Rs. 47862.4. The output-input ratio was 2.50.

Table 4.4 Per hectare costs and returns of Soybean crop

	Particular	Unit	Physical quantity	Amount (Rs.)	Percentage
	Input				
1.	Hired human labour	Man days	22.26	8065	25.22
2.	Bullock labour	pair days	1.66	830.00	2.59
3.	Machine labour	Hours	1.19	476.00	1.48
4.	Seed	Kg	73.71	4342.15	13.58
5.	Fertilizer (N:P:K)	Kg	65.5	3702.65	11.58
6.	Irrigation	m^3	230.50	1938.14	6.06
7.	Manure	Qt.	2.21	381.51	1.19
8.	Plant protection	Litre	3.90	1205.93	3.77
9.	Land revenue	-	-	140	0.43
10.	Incidental expenditure	-	-	662.86	2.07
11.	Interest on working capital	-	-	2412.78	7.55
12.	Depreciation on capital assets	-	-	540.15	1.69
13.	Cost-A (Item 1 to 12)	-	-	23491.24	73.49
14.	Rental value of land	-	-	4109.17	12.62
15.	Interest on fixed capital	-	-	1403.02	4.39
16.	Cost-B (Item 12 + 13 + 14)	-	-	28931.43	90.50
17.	Family human labour	Man days	10.38	3035.00	9.5
18.	Cost-C (Item 16 + 17)	-	-	31966.43	100
	Output				
19.	Main produce	Qt.	23.57	78734.43	98.62
20.	By produce	Qt.	6.37	1094.39	1.38
21.	Gross returns	-	-	79828.83	100
22.	Net profit(21-18)	-	-	47862.4	-
23.	Output-input ratio			2.50	

Table 4.5 Per hectare costs and returns of Cotton crop

	Particular	Unit	Physical quantity	Amount (Rs.)	Percentage
1.	Hired human labour	Man days	32.57	8142.5	25.95
2.	Bullock labour	Pair days	2.95	1475.00	4.70
3.	Machine labour	Hours	6.83	2732.00	11.89
4.	Seed	Kg	1.96	1701.00	5.42
5.	Fertilizer (N:P:K)	Kg	162.38	5383.76	17.16
6.	Manure	Qt.	7.04	116.5	0.37
7.	Irrigation	m^3	413.05	500.00	1.59
8.	Plant protection	Litre	4.25	876.17	2.79
9.	Land revenue	-	-	17.01	0.05
10.	Incidental expenditure	-	-	381.88	1.19
11.	Interest on working capital	-	-	872.00	1.22
12.	Depreciation on capital assets	-	-	563.97	1.80
13.	Cost-A (Item 1 to 12)	-	-	22761.79	73.55
14	Rental value of land	-	-	6066.90	19.33
15.	Interest on fixed capital	-	-	631.37	2.01
16.	Cost-B (Item 13 + 14 + 15)	-	-	29460.06	93.90
17.	Family human labour	Man days	9.56	1912.66	6.10
18.	Cost-C (Item 16 + 17)	-	-	31372.72	100
	Output				
19.	Main produce	Qt.	17.89	80505.00	98.86
20.	By produce	Qt.	6.61	921.38	1.14
21.	Gross returns	-	-	81426.38	100
22.	Net profit (Item 21-18)	-	-	50053.66	-
23	Output-input ratio	-	-	2.59	-

4.3.2 Per hectare cost and returns from Cotton

Per hectare cost and returns of Cotton with respect to use of physical inputs and output were estimated and are presented in Table 4.5.The results revealed that use of hired human labour and family human labour was 32.57 and 9.56 man days, respectively. Use of machine labour was 6.83 hours while the use of bullock labour was 2.95 pair days. In case of use of fertilizers, total quantity of NPK was 162.38 kg. The use of plant protection was 4.25 litres. The results revealed that cost-C was Rs. 31372.72 in which cost-A was Rs.22761.79 having the share of 73.55 per cent in cost-C. Among individual items of cost, rental value of land was dominant with 19.33 per cent. In next order hired human labour showed the highest share of 25.95 per cent followed by seed (5.42 per cent) and plant protection charges (2.79 per cent).

It was clear from the table that main produce of Cotton was 17.89 quintals while by-produce was 6.61 quintals. It was clear from the table that gross returns were found to be Rs. 81426.38 in which the share of main produce was 98.86 per cent while the share of by produce was 1.14 per cent. Thus, net profit from cotton was found to be Rs. 50053.66. The output-input ratio was 2.59.

4.3.3 Per hectare costs and returns summer Groundnut

Per hectare costs and returns of summer Groundnut with respect to use of physical inputs and outputs were estimated and are presented in Table 4.6. In regard to use of physical inputs in summer groundnut, use of hired human labour and family human labour was 48.10 and 15.25 man days, respectively. Use of machine labour was 5.52 hours while the use of bullock labour was 3.76 pair days. In case of use of fertilizers, total quantity of NPK was used 163.55 kg, while the use of irrigation was 1652.25 m^3. The results revealed that cost-C was Rs. 40116.7 in which cost-A was Rs.34282.18 having the share of 85.45 per cent. In regard to the proportionate expenditure, rental value of land was 24.90 per cent, followed by hired human labour (29.97 per cent), seed (12.41 per cent) and irrigation was (11.07 per cent). Thus, it was found that rental value of land, hired human labour, seed, and irrigation were

the major items of expenditure. The proportionate expenditure which was less than 5 per cent was considered as minor expenditure in summer groundnut.

Table 4.6 Per hectare costs and returns of summer Groundnut

	Particular	Unit	Physical quantity	Amount (Rs.)	Percentage
	Input				
1.	Hired human labour	Man days	48.10	12025.00	29.97
2.	Bullock labour	Pair days	3.76	1880.00	4.68
3.	Machine labour	Hours	5.52	2208.00	5.50
4.	Seed	Kg	98.02	4980.35	12.41
5.	Fertilizer (N:P:K)	Kg	163.55	3825.99	9.53
7.	Irrigation	m^3	1652.25	4444.55	11.07
8.	Plant protection	Litre	4.01	984.37	2.45
9.	Land revenue	-	-	123.35	0.30
10.	Incidental expenditure	-	-	355.90	0.88
11.	Interest on working capital	-	-	3013.94	7.51
12.	Depreciation on capital assets	-	-	440.73	1.09
13.	Cost-A (Item 1 to 12)	-	-	34282.18	85.45
14	Rental value of land	-	-	9991.22	24.90
15.	Interest on fixed capital	-	-	484.80	1.20
16.	Cost-B (Item 13 + 14 + 15)	-	-	36304.2	90.49
17.	Family human labour	Man days	15.25	3812.5	9.50
18.	Cost-C (Item 16 + 17)	-	-	40116.7	100
	Output				
19.	Main produce	Qt	19.01	69579.45	98.29
20.	By produce	Qt	4.64	1208.02	1.71
21.	Gross returns	-	-	70787.47	100
22.	Net profit	-	-	19393.20	-
23	Output-input ratio	-	-	1.76	-

Per hectare profitability of summer Groundnut was calculated and also presented in Table 4.6. It was clear from the table that main produce of summer Groundnut was 19.01 quintal, while the by produce was 4.64 quintals. It was clear from the table that gross return was found to be Rs. 70787.47 in which the share of main produce was 98.29 per cent, while the share of by produce was 1.71 per cent. Thus, net profit from summer Groundnut crop was found to be Rs. 19393.20. It was inferred that summer Groundnut crop was profitable. The input- output ratio was 1.76.

4.3.4 Per hectare costs and returns from Tur

Per hectare costs and returns of Tur with respect to use of physical inputs and output were estimated and are presented in Table 4.7. The results revealed that use of hired human labour and family human labour was 25.90 and 10.38man days, respectively. Use of machine labour was 2.68 hours while the use of bullock labour was 2.85 pair days. In case of use of fertilizers, total quantity of NPK was 45.66 kg while the use of manure was 4.14 quintals. S The results revealed that cost-C was Rs.29080.42 in which cost-A was Rs.16249.35 having the share of 55.89 per cent in cost-C. Among individual items of cost, seed was dominant with 7.74per cent. In next order rental value of land showed the highest share of 35.31 per cent followed by hired human labour 22.26 per cent, and manure charges (2.85 per cent). It was clear from the table that main produce of Tur was 16.67 quintals while by produce was 7.84 quintals. It was clear from the table that gross returns were found to be Rs. 84295.00 in which the share of main produce was 98.87 per cent while the share of by produce was 1.13 per cent. Thus net profit from Tur was found to be Rs. 55214.58 and output-input ratio was 2.85.

Table 4.7 Per hectare costs and returns of Tur crop

	Particular	Unit	Physical quantity	Amount (Rs.)	Percentage
	Input				
1.	Hired human labour	Man days	25.90	6475.00	22.26
2.	Bullock labour	Pair days	2.85	1425.00	4.90
3.	Machine labour	Hours	2.68	1072.00	3.69
4.	Seed	Kg	10.03	2251.1	7.74
5.	Fertilizer (N:P:K)	Kg	45.66	821.34	2.82
6.	Manure	Qt.	4.14	828.00	2.85
7.	Irrigation		200.00	325.00	1.11
8.	Land revenue	-	-	85.00	0.29
9.	Incidental expenditure	-	-	419.40	1.44
10.	Interest on working capital	-	-	2431.78	8.36
11.	Depreciation on capital assets	-	-	440.73	1.51
12.	Cost-A (Item 1 to 12)	-	-	16249.35	55.89
13.	Rental value of land	-	-	10270.00	35.31
14.	Interest on fixed capital	-	-	484.80	1.66
15.	Cost-B (Item 12 + 13 + 14)	-	-	27004.15	92.85
16.	Family human labour	Man days	10.38	2076.27	7.15
17.	Cost-C (Item 15 + 16)	-	-	29080.42	100
	Output				
18.	Main produce	Qt.	16.67	83350.00	98.87
19.	By produce	Qt.	7.84	945.00	1.13
20.	Gross returns	-	-	84295.00	100
21.	Net profit (21-17)	-	-	55214.58	
22.	Output-input ratio			2.85	

4.3.5 Per hectare costs and returns Wheat

Per hectare costs and returns of Wheat with respect to use of physical inputs and main product as well as by product were estimated and presented in Table 4.8. The results revealed that in regard to use of physical inputs in wheat, use of hired human labour 26.73 and family human labour was and 8.21 Man days, respectively. Use of machine labour was 5.88 hours while the use of bullock labour was 3.75 pair days. Use of seed was 91.81 kg. In case of use of fertilizers, total quantity of NPK was used 101.41 kg. The use of irrigation was 800.00 m^3.

The results revealed that cost-C was Rs. 38928.45 in which the cost-A wasRs.26847.53having the share of 68.96 per cent in cost-C. In regard to the proportionate expenditure, rental value of land 23.61 per cent followed by hired human labour (17.16 per cent), fertilizer (11.32 per cent)and irrigation charges (5.00 per cent), seed (10.12 per cent) and family human labour (6.18 per cent). Among individual items of cost, hired human labour was dominant with 17.16 per cent. The proportionate expenditure was less than 5 per cent considered as minor items expenditure.

Table 4.8 Per hectare costs and returns of Wheat

	Particular	Unit	Physical quantity	Amount (Rs.)	Percentage
	Input				
1.	Hired human labour	Man days	26.73	6682.5	17.16
2.	Bullock labour	Pair days	3.75	1875.00	4.85
3.	Machine labour	Hours	5.88	2940.00	7.55
4.	Seed	Kg	91.81	3942.30	10.12
5.	Fertilizer (N:P:K)	Kg	101.41	4410.43	11.32
6.	Manure	Qt.	5.22	305.94	0.78
7.	Irrigation	m^3	800.00	1950.25	5.00
8.	Plant protection	Litre	2.86	1004.8	2.58
9.	Land revenue	-	-	90.54	0.23
10.	Incidental expenditure	-	-	297.60	0.76
11.	Interest on working capital	-	-	2907.44	7.46
12.	Depreciation on capital assets	-	-	440.73	1.13
13.	Cost-A (Item 1 to 12)	-	-	26847.53	68.96
14	Rental value of land	-	-	9192.28	23.61
15.	Interest on fixed capital	-	-	484.80	1.24
16.	Cost-B (Item 13 + 14 + 15)	-	-	36524.61	93.82
17.	Family human labour	Man days	8.21	2403.84	6.18
18.	Cost-C (Item 16 + 17)	-	-	38928.45	100
	Returns				
19.	Main produce	Qt.	32.56	54769.23	98.33
20.	By produce	Qt.	2.96	927.69	1.67
21.	Gross returns	-	-	55696.92	100
22.	Net profit (21-18)	-	-	16768.47	-
23	Output-input ratio	-	-	1.43	-

Per hectare main produce, by produce and gross returns were also calculated and presented in Table 4.8. It was clear from the table that main produce of Wheat grain was 32.56 quintals, while the by produce was 2.96 quintals. It was clear from the table that gross returns were found to be Rs. 55696.92 in which the share of main produce was 98.33 per cent, while the share of by produce was 1.67 cent. The net profit from wheat crop was found to be Rs. 16768.47. It inferred that a Wheat crop was profitable whereas, output-input ratio was 1.43.

4.3.6 Per hectare costs and returns of Gram

Per hectare costs and returns of Gram with respect to use of physical inputs and main produce as well as by produce were estimated and are presented in Table 4.9. In regard to use of physical inputs in gram, it was observed that use of hired human labour and family human labour was 25.61 and 10.00 man days, respectively. Use of bullock labour was 4.55 pair days while the use of machine labour was 4.05 hours. In case of use of fertilizers, total quantity of NPK was used 57.93 kg. while the use of pesticides was 0.84 litres. It implied that use of pesticides also entered in gram cultivation. The results revealed that cost-C was Rs. 26764.52 in which cost-A was Rs.18060.34 having the share of 67.47 per cent in cost-C. In regard to the proportionate expenditure, rental value of land was 23.51 per cent, followed by hired human labour (23.93 per cent), seed (8.32 per cent) and irrigation charges (1.74 per cent). It was found that rental value of land; hired human labour and machine labour were the major items of expenditure.

Per hectare profitability of Gram was calculated and also presented in Table 4.9. It was clear from the table that main produce of gram was 19.43 quintal, while the by- produce was 4.23 quintals. It was clear from the table that gross returns were found to be Rs.40532.6 in which share of main produce was 95.51, while the share of by produce was 4.49 per cent. Thus, net profit from Gram was found to be Rs.13768.08. The output-input ratio was 1.51.

Table 4.9 Per hectare costs and returns of Gram

	Particular	Unit	Physical quantity	Amount (Rs.)	Percentage
	Input				
1.	Hired human labour	Mandays	25.61	6402.5	23.93
2.	Bullock labour	Pairdays	4.55	2275.00	8.50
3.	Machine labour	Hours	4.05	1620.00	6.05
4.	Seed	Kg	68.80	2226.87	8.32
5.	Fertilizer (N:P:K)	Kg	57.93	2044.07	7.74
6.	Irrigation	m^3	300.00	467.18	1.74
7.	Plant protection	Litre	0.84	274.60	1.02
8.	Land revenue	-	-	95.74	0.35
9.	Incidental expenditure	-	-	235.50	0.87
10.	Interest on working capital	-	-	1978.15	7.39
11.	Depreciation on capital assets	-	-	440.73	1.64
12.	Cost-A (Item 1 to 12)	-	-	18060.34	67.47
13	Rental value of land	-	-	6293.02	23.51
14.	Interest on fixed capital	-	-	484.80	1.82
15.	Cost-B (Item 13 + 14 + 15)	-	-	24838.16	92.80
16.	Family human labour	Mandays	10.00	1926.36	7.2
17.	Cost-C (Item 16 + 17)	-	-	26764.52	100
	Output				
18.	Main produce	Qt.	19.43	39116.43	95.51
19.	By produce	Qt.	4.23	1416.17	4.49
20.	Gross returns	-	-	40532.6	100
21.	Net profit (20-17)	-	-	13768.08	-
22	Output-input ratio	-	-	1.51	-

Table 4.10 Per hectare costs and returns of Safflower

	Particular	Unit	Physical quantity	Amount (Rs.)	Percentage
	Input				
1.	Hired human labour	Mandays	15.02	3755.00	12.52
2.	Bullock labour	Pairdays	7.11	3555.00	11.86
3.	Machine labour	Hours	5.67	2268.00	7.56
4.	Seed	Kg	6.41	557.05	1.85
5.	Fertilizer (N:P:K)	Kg	38.04	263.14	0.87
6.	Manure	Qt..	7.91	1582.00	5.27
7.	Plant protection	Litre	1.19	229.40	0.76
8.	Land revenue	-	-	127.66	0.42
9.	Incidental expenditure	-	-	201.91	0.67
10.	Interest on working capital	-	-	1000.18	3.33
11.	Depreciation on capital assets	-	-	4458.38	14.88
12.	Cost-A (Item 1 to 11)	-	-	17997.72	60.05
13.	Rental value of land	-	-	6226.03	20.78
14.	Interest on fixed capital	-	-	3628.15	12.10
15.	Cost-B (Item 12 + 13 + 14)	-	-	27851.9	93.93
16.	Family human labour	Mandays	9.40	2118.00	6.07
17.	Cost-C (Item 16 + 17)	-	-	29969.9	100
	Output				
18.	Main produce	Qt	13.37	47596.64	98.23
19.	By produce	Qt.	2.08	857.51	1.77
20.	Gross returns	-	-	48454.15	100
21.	Net profit (20-17)	-	-	18084.25	-
22	Output-input ratio	-	-	1.60	-

4.3.7 Per hectare costs and returns of Safflower

Per hectare costs and returns of Safflower with respect to use of physical inputs and main produce as well as by produce were estimated and are presented in Table 4.10.

In regard to use of physical inputs in gram, it was observed that use of hired human labour and family human labour was 15.02 and 9.40 man days, respectively. Use of bullock labour was 7.11 pair days, while the use of machine labour was 5.67 hours. In case of use of fertilizers, total quantity of NPK was used 38.04 kg. In general the use of pesticides was 1.19 litres. It implied that use of pesticides also entered in Safflower cultivation. The results revealed that cost-C was Rs.29969.9 in which cost-A was Rs. 17997.72 having the share of 60.05 per cent in cost-C. In regard to the proportionate expenditure, bullock labour charges was 11.86 per cent, followed by rental value of land (20.78 per cent) hired human labour (12.52 per cent), seed (1.85 per cent). It was found that rental value of land; hired human labour and machine labour were the major items of expenditure.

Per hectare profitability of Safflower was calculated and also presented in Table 4.10. It was clear from the table that main produce of Safflower was 13.37 quintal, while the by produce was 2.08 quintals. It was clear from the table that gross returns were found to be Rs.48454.15 in which share of main produce was 98.23, while the share of by produce was 1.77 per cent. Thus, net profit from safflower was found to be Rs. 18084.25. The input - output ratio was 1.60.

4.3.8 Per hectare costs and returns from Turmeric

Per hectare costs and returns of Turmeric with respect to use of physical inputs and output were estimated and are presented in Table 4.11.

Table 4.11 Per hectare costs and returns of Turmeric crop

	Particular	Unit	Physical quantity	Amount (Rs.)	Percentage
	Input				
1.	Hired human labour	Mandays	119.15	29787.5	10.69
2.	Bullock labour	Pairdays	15.28	7640.00	2.20
3.	Machine labour	Hours	10.10	4040.00	1.64
4.	Seed	Kg	2307.69	32884.62	22.93
5.	Fertilizer (N:P:K)	Kg	328.06	9359.06	3.36
6.	Irrigation	m^3	188.00	7509.61	2.69
7.	Manure	Qt.	35.28	3528.20	1.26
9.	Land revenue	-	-	123.07	0.04
10.	Incidental expenditure	-	-	280.84	1.20
11.	Interest on working capital	-	-	1674.51	0.10
12.	Depreciation on capital assets	-	-	418.33	0.15
13.	Cost-A (Item 1 to 12)	-	-	100115.09	46.72
14.	Rental value of land	-	-	129120.6	46.35
15.	Interest on fixed capital	-	-	460.17	0.16
16.	Cost-B (Item 12 + 13 + 14)	-	-	229695.86	93.25
17.	Family human labour	Mandays	75.18	18795	6.75
18.	Cost-C (Item 15 + 16)	-	-	248490.86	100
	Output				
19.	Main produce	Qt.	35.54	487352.2	-
20.	By produce	Qt.	-		-
21.	Gross returns	-	-	487352.2	100
22.	Net profit (21-18)	-	-	23886.34	-
23.	Output-input ratio			1.96	-

The results revealed that use of hired human labour and family human labour was 119.15 and 75.18 man days, respectively. Use of machine labour was 10.10 hours while the use of bullock labour was 15.28 pair days. In case of use of fertilizers, total quantity of NPK was used 328.06 kg while the use of manure was 35.28 quintals. The results revealed that cost-C was Rs. 248490.86 in which cost-A was Rs. 100115.09 having the share of 46.72 per cent in cost-C. Among individual items of costs, rental value of land was dominant with 46.35 per cent. In next order hired human labour showed the highest share of 10.69 per cent followed by seed (22.93 per cent), and irrigation charges (2.69 per cent).

Per hectare main produce, by produce and gross returns were also calculated and presented in Table 4.11. It was clear from the table that main produce of Turmeric was 35.54 quintals. It was clear from the table that a gross return was found to be Rs. 487352.2. Thus net profit from turmeric was found to be Rs. 23886.34. The output-input ratio was 1.96.

4.3.9 Per hectare costs and returns of Orange

Per hectare costs and returns of Orange with respect to use of physical inputs and outputs were estimated and are presented in Table 4.12. In regard to use of physical inputs in Orange, use of hired human labour and family human labour was 57.25 and 47.68 man days, respectively. Use of bullock labour was 4.77 hours. In case of use of fertilizers, use of NPK was 327.3kg while the use of irrigation was 1752.25^{m3}while use of manure was 10.15 quintals. The results revealed that cost-C was Rs.210342.51in which cost-A was Rs. 144618.72 having the share of 69.67 per cent. In regard to the proportionate expenditure, seed was 39.93 per cent followed by rental value of land was 24.29 per cent, hired human labour was (6.80 per cent) and irrigation was (12.04 per cent). Thus, it was found that seed, rental value of land, hired human labour, irrigation were the major items of expenditure. The proportionate expenditure which was less than 5 per cent was considered as minor expenditure in Orange.

Per hectare profitability of Orange was calculated and also presented in Table 4.12. It was clear from the table that main produce of Orange was 18.64 quintal. It was clear from the table that gross return was found to be Rs. 307661.42.

Table 4.12 Per hectare costs and returns of Orange

	Particular	Unit	Physical quantity	Amount (Rs.)	Percentage
	Input				
1.	Hired human labour	Mandays	57.25	14312.5	6.80
2.	Bullock labour	Pairdays	4.77	2385.00	1.13
4.	Seed	Kg	-	83984.4	39.93
5.	Fertilizer (N:P:K)	Kg	327.3	3564.81	1.69
6.	Manure	Q	10.15	5512	2.61
7.	Irrigation	m^3	1752.25	25365.66	12.04
8.	Plant protection	Litre	1.70	1190.23	0.56
9.	Land revenue	-	-	180.00	0.08
10.	Incidental expenditure	-	-	302.81	0.14
11.	Interest on working capital	-	-	7612.96	3.61
12.	Depreciation on capital assets	-	-	685.35	0.32
13.	Cost-A (Item 1 to 12)	-	-	144618.72	69.67
14	Rental value of land	-	-	51157.37	24.29
15.	Interest on fixed capital	-	-	2646.42	1.25
16.	Cost-B (Item 13 + 14 + 15)	-	-	198422.51	95.21
17.	Family human labour	Mandays	47.68	11920	4.79
18.	Cost-C (Item 16 + 17)	-	-	210342.51	100
	Output				
19.	Main produce	Q	18.64	307661.42	-
20.	By produce	Q		-	-
21.	Gross returns	-	-	307661.42	100
22.	Net profit (21-18)	-	-	97318.91	-
23	Output-input ratio	-	-	1.46	-

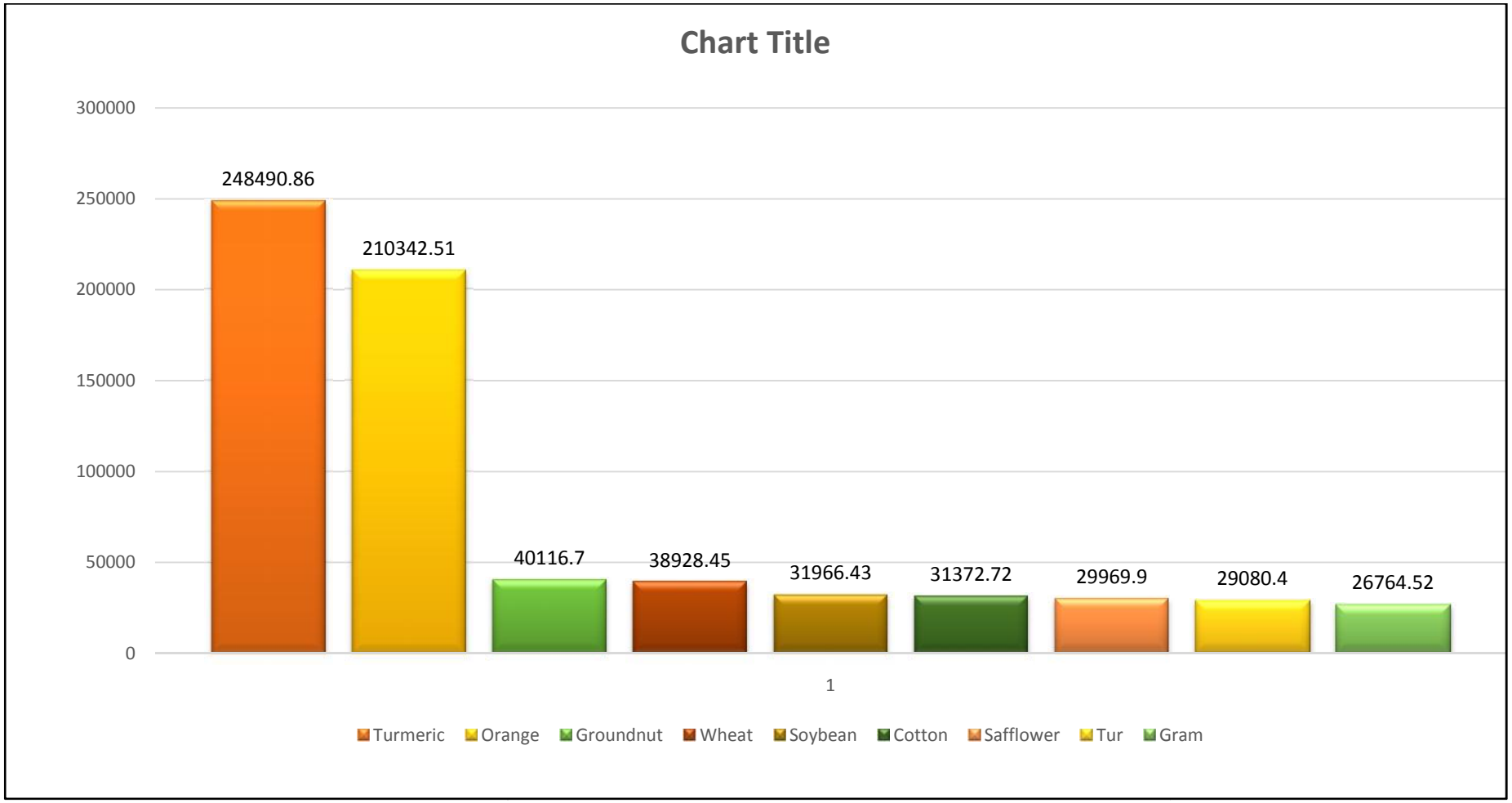


Fig. 4.3 Net profit of crops on per hectare basis on large farm (Rs/ha)

Table 4.13 Per animal costs and returns of Cow enterprise

	Particular	Unit	Physical quantity	Amount (Rs.)	Percentage
	Input				
1.	Dry fodder	Q	21.93	4824.60	22.30
2.	Green fodder	Q	14.75	2212.50	10.22
3.	Concentrate	Q	0.80	1920.00	8.87
4.	Medicine	-	-	112.18	0.52
5.	Human labour	Man days	32.93	4574.50	21.15
6.	Electricity charges	-	-	45.57	0.21
7.	Miscellaneous charges	-	-	154.43	0.71
8.	Interest on working capital @ 13.5%	-	-	1799.00	8.31
9.	Total variable cost (sum of 1 to 8)	-	-	15644.18	72.33
10.	Depreciation on livestock @ 12.5%	-	-	2632.15	12.17
11.	Depreciation on shed and equipment @ 10%	-	-	493.11	2.27
12.	Interest on fixed capital @ 11%	-	-	2858.73	13.21
13.	Fixed cost (sum of 10 to 12)	-	-	5984.99	27.66
14.	Total cost (sum of 8 and 13)	-	-	21628.17	100
	Output				
15.	Milk	Litre	926.81	23633.65	89.55
16.	Manure	Q.	20.65	2165.80	8.22
17.	Calf upto one year	No.	0.78	590.62	2.23
18.	Gross income	-	-	26390.07	100
19.	Net profit (17-13)	-	-	4761.90	-
20.	Output-input ratio	-	-	1.22	-

Thus, net profit from Orange crop was found to be Rs.97318.91. It was inferred that Orange crop was profitable. The output- input ratio was 1.46.

4.3.10 Per animal costs and returns Cow enterprise

Per animal costs and returns of cow enterprise with physical inputs and milk, manure as well as calf in number were estimated and presented in Table 4.13.

The results revealed that in regard to physical inputs, use of green fodder, dry fodder and concentrate were 14.75, 21.93 and 0.80 quintals, respectively. Total labour use in cow enterprise was 32.93 mandays. The total cost was Rs. 21628.17 in which the share of variable cost was 72.33 per cent and fixed cost was 27.66 per cent. Among the individual items of cost dry fodder was predominant item with 22.30 per cent followed by human labour (21.15 per cent), green fodder (10.22 per cent) and concentrate (8.87 per cent). It implied that the dry fodder, labour and green fodder were the major items of expenditure in cow enterprise.

Per animal gross income was calculated and are presented in Table 4.13. It showed that milk production of cow was 926.81 litres while the manure was 20.65 quintal and calf was 0.78 in number. It was clear from the table that gross income from cow was Rs.26390.07. The gross income the share of milk was 89.55 per cent followed by manure (8.22 per cent) and calf upto one year (2.33 per cent). It was obvious that the net profit from cow enterprise was found to be Rs.4761.9. It was observed that cow enterprise was profitable.

4.3.11 Per animal cost and returns of Buffalo enterprise

Per animal cost and returns of buffalo enterprise with physical inputs and milk, manure as well as calf in number were estimated and presented in Table 4.14. The results showed that the use of dry fodder was 24.56 quintal followed by green fodder (14.18 quintal) and concentrate (0.90 quintal). The total labour use for buffalo enterprise was 35.83 mandays. The total cost was Rs. 24679.77 in which the share of variable cost was 75.74 per cent and fixed cost was 24.25 per cent. Among the individual items of cost, dry fodder was dominant with 23.07 per cent followed by human labour (21.77 per

cent), depreciation on livestock (10.66 per cent), green fodder (11.32 per cent), concentrate (8.83 per cent), depreciation on shed and equipment (1.99 per cent). It implied that the dry fodder, labour, depreciation on livestock were the major items of expenditure in buffalo enterprise.

Table 4.14 Per animal costs and returns of Buffalo

	Particular	Unit	Physical quantity	Amount (Rs.)	Percentage
	Input				
1.	Dry fodder	Q	24.56	5916.75	23.07
2.	Green fodder	Q	14.18	2795.00	11.32
3.	Concentrate	Q	0.90	2180.00	8.83
4.	Medicine	-	-	177.81	0.72
5.	Human labour	Mandays	35.83	5374.50	21.77
6.	Electricity charges	-	-	35.60	0.14
7.	Miscellaneous charges	-	-	64.40	0.26
8.	Interest on working capital @ 13.5%	-	-	2150.72	8.71
9.	Total variable cost (sum of 1 to 8)	-	-	18694.78	75.74
10.	Depreciation on livestock @ 12.5%	-	-	2632.15	10.66
11.	Depreciation on shed and equipment @ 10%	-	-	493.12	1.99
12.	Interest on fixed capital @ 11%	-	-	2858.73	11.58
13.	Fixed cost (sum of 10 to 12)	-	-	5984.99	24.25
14.	Total cost (sum of 8 and 13)	-	-	24679.77	100
	Output				
15.	Milk	Litre	858.43	26952.90	90.93
16.	Manure	Q	19.53	1963.50	6.62
17.	Calf upto one year	No.	0.40	621.87	2.45
18.	Gross income	-	-	29638.27	100
19.	Net profit (17-13)	-	-	4958.50	-
20.	Output-input ratio	-	-	1.20	-

Fig. 4.4 Profitability of Livestock in a year (Rs/animal)

Per animal gross income was calculated and are presented in Table 4.14. The result showed that milk product of buffalo was 858.43 litres while the manure was 19.53 quintal and calf upto one year was 0.40 in numbers.

It was clear from the table that gross income from buffalo enterprise was Rs. 29638.27, in which the share of milk was 90.93 per cent, manure 6.62 per cent and calf upto one year 2.45 per cent. It inferred that net profit from buffalo enterprise was Rs. 4958.5. The output-input ratio was 1.20. The buffalo enterprise was profitable.

4.4 EXISTING AND OPTIMUM FARM PLANS

Existing farm plans has been considered after analysis of facts with respect to costs, returns and profits on farm as a whole. But future expenditure and income could be estimated on the basis of existing plans is known as optimum or alternative plan as described as fallows.

4.4.1 Per farm physical inputs on large farm for crops and livestock

In farm business, utilization of important inputs in crop production was calculated and is presented in Table 4.15. It was clear that the land utilization under summer Groundnut was 1.75 hectares. This was highest among all crops on large farms. In next order, Turmeric was grown on 1.34 hectares followed by Orange (1.30 ha.), Gram (0.82 ha.), Soybean (0.82 ha.), Cotton (0.78 ha.), Tur (0.78 ha.), Wheat (0.77 ha.) and Safflower (0.8 ha.). Thus, total cropped area was 8.36 hectares on large farms. It was observed that utilization of hired human labour was the highest of 119.15 man days in Turmeric followed by Orange (57.25 ha.), summer Groundnut (48.10 ha.), Cotton (32.57 ha.), Wheat (26.73 ha.), Tur (25.90 ha.), Gram (25.61 ha.), Soybean (22.26 ha.) and Safflower (15.02 ha.). Total hired human labour employment was 372.59 man days on large farm during the year. In case of utilization of bullock labour Turmeric, summer Groundnut, Orange, Cotton, Soybean, Wheat and Gram were found important crops. Thus total use of bullock labour was 46.68 pair days. Similarly, use of machine labour was highest in Orange, Turmeric, Cotton, Groundnut, Soybean, Wheat Gram crops.

Thus, total machine labour utilization of 41.92 hours on large farm. It inferred that mechanization was observed mostly in cultivation of crops on large farm. Use of total seed of different crop was 2643.43 kg. In case of fertilizers, the use of NPK was 1291.83 kg. At farm level, use of manure, pesticide and irrigation was 71.95 quintals, 22.4 litres and 5336.05 m^3, respectively. In case of use of family labour at farm level total family labour employment was 196.04 man days.

Main produce and by-produce with respect to various crops were also calculated and presented in Table 4.15. It was observed that total main produce from all crops was 199.86quintals and by produce was 34.73 quintals. In the case of livestock family labour was 68.76, main produce and by produce was 985.24 litre and 40.18 quintal, respectively.

Table 4.15 Per hectare physical inputs on large farm for crops and livestock

SN	Name of Crops	Area of crops	Hired human labour (Man days)	Bullock labour (Pair days)	Machine labour (hours)	Seed (Kg)	NPK (kg)	Manure (qt)	Pesti cide (lit.)	Irrigation (m3)	Family Labour (Mandays)	Main Produce (qt)	By Produce (qt)
1.	Soybean	0.82	22.26	1.66	1.19	73.71	65.5	2.21	4.90	230.50	10.38	23.57	6.37
2.	Cotton	0.78	32.57	2.95	6.83	1.96	162.38	7.04	3.25	413.05	9.56	17.89	6.61
3.	Tur	0.78	25.90	2.85	2.68	10.03	45.66	3.65	3.65	200.00	10.38	16.67	7.84
4.	Turmeric	1.34	119.15	15.28	10.10	2307.69	328.06	2.86	2.64	188.00	75.18	35.54	-
5.	Wheat	0.77	26.73	3.75	5.88	91.81	101.41	9.38	2.86	400.00	8.21	28.56	2.96
6.	Gram	0.82	25.61	4.55	4.05	68.80	57.93	4.52	0.84	300.00	10.00	14.43	4.23
7.	Safflower	0.8	15.02	7.11	5.67	6.41	38.04	7.91	1.19	00.00	9.40	13.37	2.08
8.	Groundnut	1.75	48.10	3.76	5.52	83.02	165.55	12.19	4.01	1652.25	15.25	12.37	4.64
9.	Orange	1.30	57.25	4.77	-	-	327.3	3564.81	1.70	1752.25	47.68	18.64	0.00
10	**Livestock**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**68.76**	**985.24**	**40.18**
	Total	**8.36**	**372.59**	**46.68**	**41.92**	**2643.43**	**1291.83**	**3689.02**	**22.4**	**5336.05**	**264.8**	**1184.92**	**74.31**

Table 4.16 Existing farm plans and alternative farm plan on large farm

	Existing plan					Alternative plan			
SN	**Crops**	**Area**	**Cost**	**Returns**	**Profit**	**Area**	**Cost**	**Returns**	**Profit**
1.	Soybean	0.82	31966.43	79828.83	47862.4	1.62	80302.11	98324.18	45293.13
2.	Cotton	0.78	31372.72	90571.38	59198.66	1.56	50783.29	93322.24	18992.18
3.	Tur	0.78	29080.42	84295.00	55214.58	1.48	70345.30	80392.18	35282.11
4.	Turmeric	1.34	248490.86	487352.2	23886.34	2.54	426902.43	739323.24	183423.22
5.	Wheat	0.77	38928.45	55696.92	16768.47	1.47	45390.94	81392.33	20392.33
6.	Gram	0.82	26764.52	40532.6	13768.08	1.57	50392.88	75323.18	18832.13
7.	Safflower	0.8	29969.9	48054.15	18084.25	0.16	45823.18	50331.90	12325.15
8.	S. Groundnut	1.75	40116.7	70787.47	19393.20	2.96	75912.38	80392.14	20634.56
9.	Orange	1.30	210342.51	307661.42	97318.91	2.7	80837.78	6039228.13	98478.73
	Total crops	**8.36**	**686972.51**	**1264779.97**	**350894.89**	**16.06**	**926690.29**	**1902729.52**	**453653.54**
	Livestock								
10.	Cow	1.78	21628.17	26390.07	4761.90	2.28	40839.12	50304.13	80834.21
11.	Buffalo	1.15	24679.77	29638.27	4958.50	2.15	44392.38	55293.30	83269.59
	Total livestock	**2.93**	**46361.94**	**56028.34**	**9720.41**	**4.43**	**85231.5**	**105597.43**	**164103.8**
	Total farm as a whole	**-**	**733334.45**	**1320808.31**	**360615.3**	**-**	**1009221.97**	**2008326.93**	**617757.34**

4.4.2 Existing farm plan and alternative farm plan for large farm

Per farm costs, returns and profitability in existing condition on large farm with respect to all crops and livestock enterprises were calculated and are presented in Table 4.16. Results revealed that in all 9 crops were grown are on 8.36 hectares. Total expenditure on all crops in the form of cost-C was Rs.686972.51. Gross return from all crops found to be Rs.1264779.97, Net profit on cost-C was Rs.350894.89. Profitability on cow and buffalo enterprises with their costs and returns were also calculated. It was observed that in existing condition size of cow enterprise was 1.78 while the size of buffalo enterprise was 1.15. Total expenditure on cow enterprise was Rs. 21628.17 followed by buffalo enterprise was Rs. 24679.77. Gross return from cow enterprise was Rs. 26390.07. While the net profit from cow enterprise was Rs. 4761.90 followed by buffalo enterprise was Rs. 4958.50. Total size of livestock enterprise was 2.93 units. Total expenditure on livestock was Rs. 46307.94 and gross return was obtained from livestock enterprise was Rs. 56028.34 and net profit obtained from livestock was Rs. 9720.41. It inferred that buffalo enterprise was most profitable than cow enterprise. In regard to farm as a whole consisted with all crops and livestock enterprises were calculated. The result revealed that expenditure on farm as a whole was found to be Rs. 733334.45 While gross returns was observed to be Rs. 1320808.31. Net profit on farm as a whole was Rs. 360615.3.

In regard to alternative farm plan per hectare profitability with respect to all crops, livestock and farm as a whole were calculated and are presented in Table 4.16. It was observed that all crops were arranged in descending order on the basis of profitability of crops (Appendix No. XII). The result revealed that total expenditure on all crops in the form of cost-C was Rs. 926690.29. Gross returns from all crops were Rs.1902729.52 net profit on cost-C was Rs. 453653.54. It was observed that in optimum farm plan size of cow enterprise was 2.28 while the size of buffalo enterprise was 2.15. Total expenditure on cow enterprise was Rs. 40839.12 followed by buffalo enterprise was Rs. 44392.38. Gross return from cow enterprise was Rs. 50304.13 while

buffalo enterprise was Rs. 55293.30. In case of net profit, it was Rs. 80834.21 in cow enterprises followed by buffalo enterprise was Rs. 83269.59. Total expenditure on livestock was Rs. 85321.5, while the gross return was Rs. 105597.43. In case of net profit it was Rs. 164103.8. It is obvious that buffalo enterprises was most profitable than cow enterprises with respect to farm as a whole total expenditure on farm as a whole was Rs. 1009221.79. While the gross return was Rs. 2008326.93. The net profit on farm as a whole was Rs. 617757.34.

In farm as a whole the net profit obtained in existing farm plan was Rs. 360615.3 and in alternative farm plan it was Rs.617757.34. It means increased share sin alternative farm plan was 7.34 per cent. It inferred that the profitability on large farm can be increased by giving optimum farm plan.

Summary and Conclusion

CHAPTER-V

SUMMARY AND CONCLUSIONS

Agriculture has got a prime role in Indian economy and is the prime source of National income. Agriculture development is the basic and essential for economic development and human welfare. Share of agriculture in Gross Domestic Product is 17.4 % in 2016-17. About 65 per cent of the total population is directly and indirectly engaged in farming. The agriculture sector provides employment to 58.4 per cent of country's work force. Agriculture is the single largest private sector occupation in the country. According to Agricultural ministry, the foodgrains production in India was 272 million tonnes in 2016-17.

The knowledge of costs and returns in farming from the farm as a whole, on which farm family investment decision are based rather than on the returns from a single crop. An attempt has been made in the present study to work out costs and returns from the farm as a whole and examines extent of income accruing to different size farm. The overall profitability of farm depends upon the income achieved from overall farm activities. The present study attempt to focus overall income per hectare received from various crop entities on the farm and the profitability over the total cost. A study of farm business income gives an idea about the profitability of the farm as a whole. Keeping in view the above aspects, the present study has been undertaken with following objectives.

1. To study the socio-economic characteristics of large farmer
2. To examine the cropping pattern of the large farm
3. To estimate the costs and returns of major crops and livestock enterprises on large farm
4. To know the existing and optimum farm plans on large farm

Multistage sampling design was adopted in selection of district, tehsil and villages. The Yavatmal district was selected because this district is

having large farming area. Two tehsils were selected from district on the basis of maximum area under large farm, from selected tehsils five villages were selected from each of tehsil on the basis of large farm area. From each cluster villages, six farmers were selected. Thus total sample size was 60. Data were collected for the year 2017-18. Keeping in view the specific objective of investigation, the data was collected and processed through the tools of statistical analysis.

It was observed that land holding of large farmers was found to 8.51 hectare. Land holding was split into two parts as uncultivated land and net cultivated land. Proportion of net cultivated land and uncultivated land to total land holding was 98.17 per cent and 1.8 per cent, respectively. It is also important to note that net cultivated land (8.36 ha) was also divided into irrigated and rain fed areas with proportion of 60.59 per cent and 37.58 per cent, respectively.

Regarding the age of farmer, it was observed that majority of farmers (50 per cent) found in middle age group followed by young (30 per cent) and old age (20 per cent). In regard to education, 58.34 per cent of farmers were found in education standard up to primary school, secondary school was 35 per cent and only 16.66 per cent farmer's were up to college level. In relation to occupation level 63.34 per cent farmers had agriculture as a main occupation. The results revealed that gross cropped area was 9.21 hectares, in which the highest proportionate area was 40.39 per cent under *kharif* crops followed by *Rabi* (25.95 per cent), summer (19.00 per cent) and annual crop (14.11 per cent). Cropping intensity was found to be 133.5.The herd size of cow enterprise was found to be 1.78 on large farm followed by herd size of buffalo enterprise was 1.15 in which the share of cow was 60.75 per cent followed by buffalo 39.25 per cent. The large farmer was given more importance to cow enterprise as compared to buffalo enterprise in farming business.

Main produce and by-produce can be converted into monetary term to know gross returns with the help of costs and returns profits with respect to crop production could be determine as follows.

Soybean

It was observed that the use of hired human labour and family human labour was 22.26 and 10.38 man days, respectively. The results revealed that cost-C was Rs. 31966.43 in which cost-A was Rs.23491.24having the share of 73.49 per cent in cost-C. Among individual items of costs, hired human labour was dominant with 25.22 per cent, followed by seed (13.58 per cent), manure (1.19 per cent) and irrigation charges (6.06 per cent).The main produce and by-produce of soybean was 23.57, 6.37 quintals, respectively. The gross return was found to be Rs.79828.83 in which the share of main produce was 98.62 per cent while the share of by produce was 1.38 per cent. It was obvious that net profit from soybean crop was found to be Rs. 47862.4. The input-output ratio was 2.50.

Cotton

The use of hired human labour and family human labour was 32.57 and 9.56 man days, respectively. Use of machine labour was 6.83 hours while the use of bullock labour was 2.95 pair days. In case of use of fertilizers, total quantity of NPK was 162.38 kg. The use of plant protection was 4.25 litres. The results revealed that cost-C was Rs. 31372.72 in which cost-A was Rs.22761.79 having the share of 73.55 per cent in cost-C. The main produce of cotton was 17.89 quintals while by-produce was 6.61 quintals. The gross returns were found to be Rs. 81426.38in which the share of main produce was 98.86 per cent while the share of by produce was 1.14 per cent. Thus, net profit from cotton was found to be Rs. 50053.66. The input-output ratio was 2.59.

Groundnut

The results revealed that cost-C was Rs. 40116.7 in which cost-A was Rs.34282.18 having the share of 85.45 per cent. The main produce of summer groundnut was 19.01 quintal, while the by produce was 4.64 quintals. It was clear from the table that gross return was found to be Rs. 70787.47 in

which the share of main produce was 98.29 per cent, while the share of by produce was 1.71 per cent. Thus, net profit from summer groundnut crop was found to be Rs. 19393.20. It was inferred that summer groundnut crop was profitable.

Tur

The cost-C was Rs.29080.42 in which cost-A was Rs.16249.35 having the share of 55.89 per cent in cost-C. Rental value of land showed the highest share of 35.31 per cent followed by hired human labour 22.26 per cent, and manure charges 2.85 per cent. The main produce of Tur was 16.67 quintals while by-produce was 7.84 quintals. The gross return was found to be Rs. 84295.00 in which the share of main produce was 98.87 per cent. Thus net profit from tur was found to be Rs. 55214.58 and input-output ratio was 2.85.

Wheat

The results revealed that cost-C was Rs. 38928.45 in which the cost-A was Rs.26847.53having the share of 68.96 per cent in cost-C. In regard to the proportionate expenditure, rental value of land 23.61 per cent followed by hired human labour (17.16 per cent), fertilizer (11.32 per cent),seed (10.12 per cent) and family human labour (6.18 per cent).Per hectare main produce and by-produce of wheat grain was 32.56 and 2.96 quintals, respectively. The gross return was found to be Rs. 55696.92 in which the share of main produce was 98.33 per cent. The net profit from wheat crop was found to be Rs. 16768.47.

Gram

Per hectare costs and returns of Gram with respect to use of physical inputs and main produce as well as by produce was estimated. The cost-C was Rs. 26764.52 in which cost-A was Rs.18060.34 having the share of 67.47 per cent in cost-C. It was clear from the table that main produce of gram was 19.43 quintal, while the by- produce was 4.23 quintals. It was clear from the table that gross returns were found to be Rs.40532.6 in which share of main produce was 95.51, while the share of by produce was 4.49 per cent. Thus, net profit from gram was found to be Rs.13768.08.

Safflower

In regard to use of physical inputs in gram, it was observed that use of hired human labour and family human labour was 15.02 and 9.40 man days, respectively. Use of bullock labour was 7.11 pair days, while the use of machine labour was 5.67 hours. The results revealed that cost-C was Rs.29969.9 in which cost-A was Rs. 17997.72 having the share of 60.05 per cent in cost-C. The main produce of Safflower was 13.37 quintal, while the by-produce was 2.08 quintals. It was clear that gross returns were found to be Rs.48454.15 in which share of main produce was 98.23. Thus, net profit from safflower was found to be Rs. 18084.25.

Turmeric

The results revealed that use of hired human labour and family human labour was 119.15 and 75.18 man days, respectively. Use of machine labour was 10.10 hours while the use of bullock labour was 15.28 pair days. In case of use of fertilizers, total quantity of NPK was used 328.06 kg while the use of manure was 35.28 quintals. The results revealed that cost-C was Rs. 248490.86 in which cost-A was Rs. 100115.09 having the share of 46.72 per cent in cost-C. Per hectare main produce, by produce and gross returns were also calculated and presented in Table 4.7. It was clear from the table that main produce of Turmeric was 35.54 quintals. It was clear from the table that a gross return was found to be Rs. 487352.2. Thus net profit from turmeric was found to be Rs. 23886.34.

Orange

Per hectare costs and returns of Orange with respect to use of physical inputs and outputs were estimated. The cost-C was Rs.210342.51in which cost-A was Rs. 144618.72having the share of 69.67 per cent. In regard to the proportionate expenditure, seed was 39.93 per cent followed by rental value of land was 24.29 per cent, hired human labour was (6.80 per cent) and irrigation was (12.04 per cent). It was clear that main produce of Orange was 18.64 quintal. The gross return was found to be Rs. 307661.42. Thus, net profit

from Orange crop was found to be Rs.97318.91. It was inferred that Orange crop was profitable.

Cow enterprise

The results revealed that in regard to physical inputs, use of green fodder, dry fodder and concentrate were 14.75, 21.93 and 0.80 quintals, respectively. Total labour use in cow enterprise was 32.93 man days. The total cost was Rs. 21628.17 in which the share of variable cost was 72.33 per cent and fixed cost was 27.66 per cent. Among the individual items of cost dry fodder was predominant item with 22.30 per cent followed by human labour green fodder and concentrate. The milk production of cow was 926.81 litres while the manure was 20.65 quintal and calf was 0.78 in number. The gross income from cow was Rs.26390.07. It was obvious that the net profit from cow enterprise was found to be Rs.4761.9. It was observed that cow enterprise was profitable.

Buffalo enterprise

The results showed that the use of dry fodder was 24.56 quintal followed by green fodder (14.18 quintal) and concentrate (0.90 quintal). The total labour use for buffalo enterprise was 35.83 man days. The total cost was Rs. 24679.77 in which the share of variable cost was 75.74 per cent and fixed cost was 24.25 per cent. Among the individual items of cost, dry fodder was dominant with 23.07 per cent followed by human labour (21.77 per cent), depreciation on livestock (10.66 per cent), green fodder (11.32 per cent), concentrate (8.83 per cent), depreciation on shed and equipment (1.99 per cent). The result showed that milk product of buffalo was 858.43 litres while the manure was 19.53 quintal and calf upto one year was 0.40 in numbers. It was clear that gross income from buffalo enterprise was Rs. 29638.27, in which the share of milk was 90.93 per cent, manure 6.62 per cent and calf upto one year 2.45 per cent. It inferred that net profit from buffalo enterprise was Rs. 4958.5.

Existing and optimum farm plans

The land utilization under Groundnut was 1.75 hectares. This was highest among all crops on large farms. Turmeric was grown on 1.34 hectares followed by Orange (1.30 ha.), Gram (0.82 ha.), Soybean (0.82 ha.), Cotton (0.78 ha.), Tur (0.78 ha.), Wheat (0.77 ha.) and Safflower (0.8 ha.). Thus, total cropped area was 8.36 hectares on large farms. It was observed that utilization of hired human labour was the highest of 119.15 man days. It was observed that total main produce from all crops was 199.86quintals and by-produce was 34.73 quintals. In the case of livestock family labour was 68.76, main produce and by-produce was 985.24 litre and 40.18 quintal, respectively.

Existing farm plan and alternative farm plan for large farm

In existing farm plan, results revealed that in all 9 crops were grown are on 8.36 hectares. Total expenditure on all crops in the form of cost-C was Rs.686972.51. Gross return from all crops found to be Rs.1264779.97, Net profit on cost-C was Rs.350894.89. It was observed that in existing condition size of cow enterprise was 1.78 while the size of buffalo enterprise was 1.15. Total expenditure on cow enterprise was Rs. 21628.17 followed by buffalo enterprise was Rs. 24679.77. Gross return from cow enterprise was Rs. 26390.07. While the net profit from cow enterprise was Rs. 4761.90 followed by buffalo enterprise was Rs. 4958.50.

In alternative farm plan, result revealed that total expenditure on all crops in the form of cost-C was Rs. 926690.29. Gross returns from all crops were Rs.1902729.52 net profit on cost-C was Rs. 453653.54. It was observed that in optimum farm plan size of cow enterprise was 2.28 while the size of buffalo enterprise was 2.15. Total expenditure on cow enterprise was Rs. 40839.12 followed by buffalo enterprise was Rs. 44392.38. Gross return from cow enterprise was Rs. 50304.13 while buffalo enterprise was Rs. 55293.30. In case of net profit, it was Rs. 80834.21 in cow enterprises followed by buffalo enterprise was Rs. 83269.59.In farm as a whole the net profit obtained in existing farm plan was Rs. 360615.3 and in alternative farm plan it was Rs.617757.34.

Conclusions:

1. Land holding of large farmers was found to 8.51 hectare.
2. Agriculture as a main occupation of 63.34 per cent farmers.
3. Gross cropped area was 9.21 hectares, in which the highest proportionate area was 40.39 per cent under *kharif* crops followed by *Rabi* (25.95 per cent).
4. Herd size of cow enterprise was found to be 1.78 on large farm followed by herd size of buffalo enterprise was 1.15.
5. The large farmer was given more importance to cow enterprise as compared to buffalo enterprise in farming business.
6. The net profit from cow enterprise was found to be Rs.4761.9.
7. Gross income from buffalo enterprise was Rs. 29638.27, in which the share of milk was 90.93 per cent, manure 6.62 per cent and calf upto one year 2.45 per cent.
8. Existing farm plan can show the present condition of farming business.

Policy implications:

1. Emphasis must be given to increase area under horticulture crops and oilseeds in government schemes.
2. Farmer has to give more importance to profitability of crop in the cropping pattern.
3. On commercial point of view importance is to be given to buffalo enterprise on farm.
4. Alternative farm plan help to increase the profit of farm business in future; farmer has to take the advice of expert for preparing optimum farm plan.

Thesis Abstract

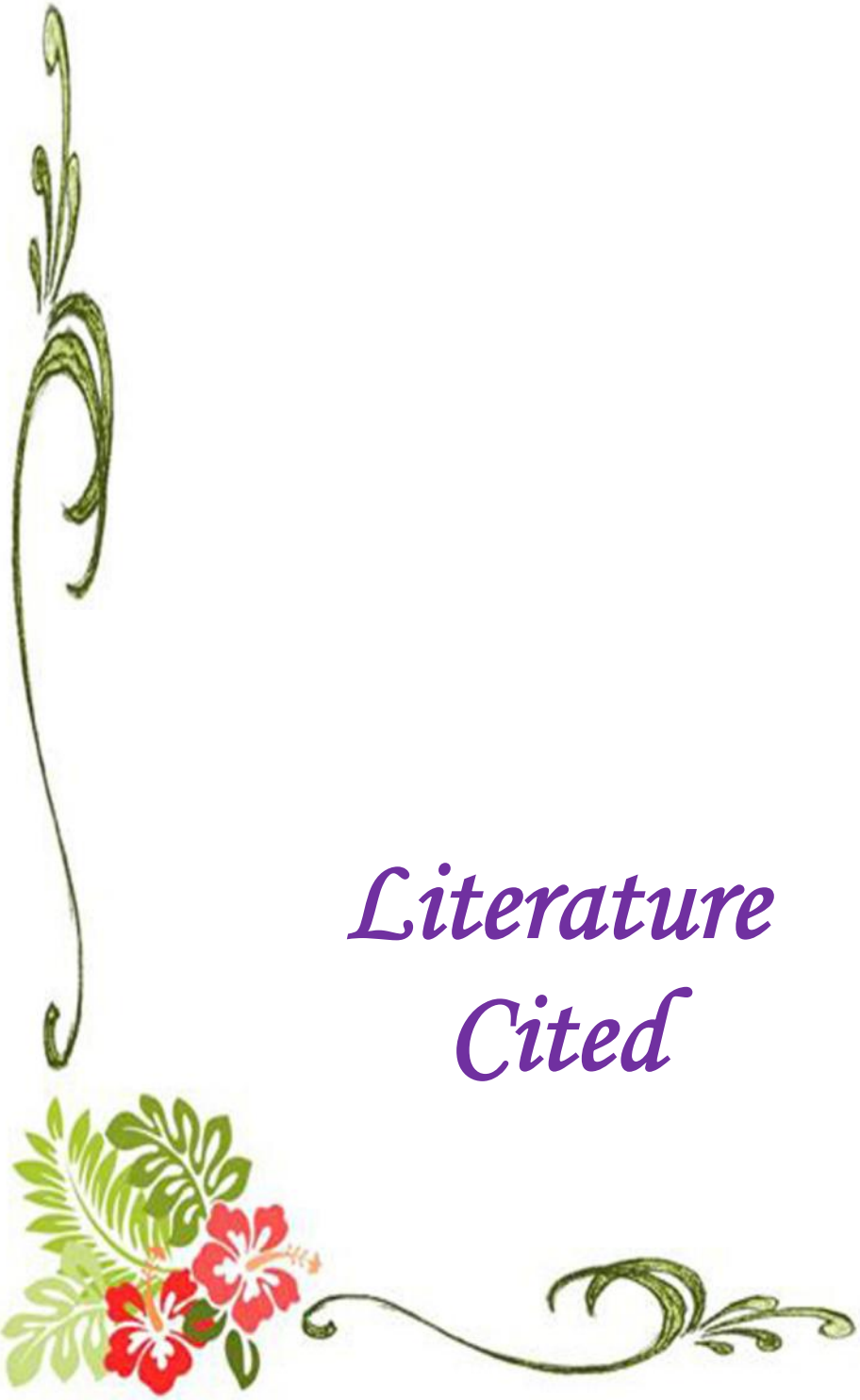
ABSTRACT

Name of the Student	:	Miss. KALE PRACHI SANJAY
Registration No.	:	2016A/48M
Degree	:	M.Sc.(Agri.)
Year of admission	:	2016-2017
Major advisor	:	Dr. D. S. Perke Professor, Dept. of Agricultural Economics, College of Agriculture, VNMKV, Parbhani
Discipline	:	Agricultural Economics
Major Field	:	Agricultural Economics
a) Minor Field	:	Extension Education, Computer Application
b) Supporting field	:	Statistics
Title of the thesis	:	**ECONOMIC ANALYSIS OF LARGE FARM IN YAVATMAL DISTRICT OF VIDARBHA REGION**

Agriculture has got a prime role in Indian economy and is the prime source of National income. Agriculture development is the basic and essential for economic development and human welfare. The agriculture sector provides employment to 58.4 per cent of country's work force. Agriculture is the single largest private sector occupation in the country. According to Agricultural ministry, the foodgrains production in India was 272 million tonnes in 2016-17. The knowledge of costs and returns in farming from the farm as a whole, on which farm family investment decision are based rather than on the returns from a single crop.

Multistage sampling design was adopted in selection of district, tehsil and villages. The Yavatmal district was selected because this district is having large farming area. Two tehsils were selected from district on the basis of maximum area under large farm, from selected tehsils five villages were selected from each of tehsil on the basis of large farm area. From each cluster villages, six farmers were selected. Keeping in view the specific objective of investigation, the data was collected and processed through the tools of statistical analysis.

The land holding of large farmers was found to 8.51 hectare. Land holding was split into two parts as uncultivated land and net cultivated land. The majority of farmers found in middle age group (50 per cent) followed by young (30 per cent) and old age (20 per cent). In relation to occupation level 63.34 per cent farmers had agriculture as a main occupation. The results revealed that gross cropped area was 9.21 hectares. Cropping intensity was found to be 133.5. The large farmer was given more importance to cow enterprise as compared to buffalo enterprise in farming business.The results revealed that major crops grown by the large farmers were soybean, cotton, groundnut, tur, wheat, gram, safflower, turmeric and orange. Theper hectare net profit obtained from tur was maximum i.e. Rs. 55214.58 followed by cotton (Rs.50053.66) and soybean (Rs.47862.40). The net profit of buffalo was (Rs. 4958.50) followed by cow enterprise (Rs.4761.90). There was scope to increase area, bullock labour, machine labour, nitrogen, potassium and irrigation on farm as a whole. Existing farm plan show the present situation of farm business. Alternative farm plan help to increase profitability of farm in future. The net profit obtained on alternative farm plan was Rs. 617757.34. It is indicated that profitability from all crops and livestock were more on alternate farm plan.



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Appendix

APPENDIX-I

Per hectare profitability of different crops and livestock on large farm (RS/ha.)

	Existing plan				
SN	**Crops**	**Area**	**Cost**	**Returns**	**Profit**
1.	Soybean	0.82	31966.43	79828.83	47862.4
2.	Cotton	0.78	31372.72	90571.38	59198.66
3.	Tur	0.78	29080.42	84295.00	55214.58
4.	Turmeric	1.34	248490.86	487352.2	23886.34
5.	Wheat	0.77	38928.45	55696.92	16768.47
6.	Gram	0.82	26764.52	40532.6	13768.08
7.	Safflower	0.8	29969.9	48054.15	18084.25
8.	S. Groundnut	1.75	40116.7	70787.47	19393.20
9.	Orange	1.30	210342.51	307661.42	97318.91
	Total crops	**8.36**	**686972.51**	**1264779.97**	**350894.89**
	Livestock				
10.	Cow	1.78	21628.17	26390.07	4761.90
11.	Buffalo	1.15	24679.77	29638.27	4958.50
	Total livestock	**2.93**	**46361.94**	**56028.34**	**9720.41**
	Total farm as a whole	**-**	**733334.45**	**1320808.31**	**360615.3**

APPENDIX-II

DEPARTMENT OF AGRICULTURAL ECONOMICS
VNMKV, PARBHANI

SCHEDULE

Name of the Student : Kale P. S. Research Guide : Dr. D.S. Perke

Title : Economic analysis of large farm in Yavatmal district of Vidarbha region.

Production on large farm :

(1) Socio-economic status of large farmer :

1. Name: _____ Mob. No._____
2. Village: _____ Taluka : _____ : District : Parbhani
3. Age: _____ Yrs.
4. Education: Primary / Secondary / College Level
5. Family Size: Male: _____ Female: _____
6. Occupation (level) :
   a) Service b) Business c) Farming
7. Social category: SC / ST / OBC / NT / OPEN / OTHER
8. Types of Soil : Light / Medium / Heavy
9. **Land holding:** Total land _____ ha.
   a) Cultivated : _____ ha.
   b) Irrigated : _____ ha.
   c) Rainfed : _____ ha.
10. **Land revenue :** _____ Rs.

(2) Cropping pattern

Kharif			Rabi			Summer		
Seasonal Crop	**I (ha)**	**R (ha)**	**Crop**	**I (ha)**	**R (ha)**	**Crop**	**I (ha)**	**R (ha)**
Annual crops	**I (ha)**	**R (ha)**	**Crop**	**I (ha)**	**R (ha)**	**Crop**	**I (ha)**	**R (ha)**
Perennial crops	**I (ha)**	**R (ha)**	**Crop**	**I (ha)**	**R (ha)**	**Crop**	**I (ha)**	**R (ha)**

(3) Livestock :

SN	Name of livestock	No.	Age	Present value (Rs.)
1.	Bullock pair			
2.	Cow			
3.	Buffalo			
4.	Goat			
5.	Poultry			
6.	Other			
	Total			

(a) Feeding of livestock :

SN	Type of fodder	Rate (`)	Quantity offered/day					
			Cow	Buffalo	Goat	Sheep	Poultry	Bullock pair
1.	Dry fodder							
2.	Green fodder							
3.	Mineral mixture							
4.	Oilseed cake							
5.	Any other							

(b) Amount spent on livestock :

SN	Type of fodder	Amount spent/day					
		Cow	Buffalo	Goat	Sheep	Poultry	Bullock pair
1.	Dry fodder						
2.	Green fodder						
3.	Mineral mixture						
4.	Oilseed cake						
5.	Any other						

(c) Income received through livestock :

SN	Items	Amount received (`)					
		Cow	Buffalo	Goat	Sheep	Poultry	Bullock pair
1.	Sale of calves/kid						
2.	Sale of dung						
3.	Sale of milk						
4.	Work by bullock pair						
5.	Sale of poultry bird						
6.	Sale of eggs						
7.	Any other						

(4) Irrigation structure :

SN	Assets	No./Qty.	Age	Present value (Rs.)
1.	Well			
2.	Electric Motor			
3.	Shed for Electric Motor			
4.	Pipeline (Length)			
5.	Tubewell			
	Total			

(5) Machinery :

SN	Assets	No./Qty.	Year of purchase	Purchase price	Present value (Rs.)
1.	Tractor				
2.	Thresher				
3.					
4.					
5.					
	Total				

(6) Commonly Used Assets :

SN	Assets	No./Qty.	Age	Present value (Rs.)
1.	Plough			
2.	Harrow			
3.	Seed drill			
4.	Hoe			
5.	Bullock cart			
6.	Sprayer			
a)	Hand sprayer			
b)	Foot sprayer			
c)	Power sprayer			

(7) Operation wise labour requirement for each enterprise on large farm :

Name of crop : _____

Operation	No.	Human labour				Bullock pair (day)	Machine power (Hours)
		Hired male (man day)	Hired female (man day)	Family male (man day)	Family female (man day)		
Ploughing							
Harrowing							
Cleaning							
Manuring							
Sowing							
Irrigation							
Application of fertilizer							
Weeding							
Hoeing							
Harvesting							
Threshing							
Other (If any)							
Total							

(8) Use of physical inputs in each enterprise on large farm :

Name of crop : _____

Particular	Unit	Qty.	Rate/unit	Value (Rs.)
A) Seed				
B) Type of fertilizer				
C) Manure				
1.				
2.				
D) Plant Protection				
1.				
2.				
E) Irrigation				

(9) Yield of crop :

Name of crop : _____

SN	Particular	Qty.	Rate/q	Value (Rs.)	Remarks
1.	Main production (grains)				
2.	By products (Fodder)				

Score and rate per unit used

SN	Particular	Score / rate
1.	**Education:**	
	Illiterate	
	Primary	1
	High school	2
	Higher secondary	3
	College level	4
2.	**Occupation level**	
	Agriculture	1
	Business	2
	Service	3
3.	**Fertilizer**	
	Urea	Rs./bag
	MOP	Rs./bag
	DAP	Rs./bag
	Nitrogen	Rs.13.04 /kg
	Phosphorus	Rs.49.24/kg
	Potash	Rs.28.33/kg
4.	**Labour**	
	Hired male labour	Rs 250.00/ manday
	Hired female labour	Rs 150.00/manday
	Hired bullock labour	Rs 500.00/ pairday
	Hired machine labour	Rs.400.00/hrs
5.	**Seed**	
6.	**Manure**	Rs. 200/q.
7.	**Price of commodities**	
	Main produce of crop	
	Byproduce of crop	

APPENDIX-III

LIST OF FARMERS

SN	Name of Farmer	Village			Contact No.
1.	Dattatray Bhutkar	Lakh	Digras	:	9223235627
2.	Pritish Tayde	Lakh	Digras	:	8600269957
3.	Satish Tayde	Lakh	Digras	:	9922209388
4.	Gajanan Umbarkar	Lakh	Digras	:	9923235627
5.	Ganesh Patil	Lakh	Digras	:	--
6.	Pandurang Gughane	Lakh	Digras	:	9422108455
7.	Rambhau Marshetwar	Dehani	Digras	:	9373267608
8.	Sachin Atal	Dehani	Digras	:	9420040911
9.	Sanjay Raut	Dehani	Digras	:	--
10.	Vasantrao Nirpase	Dehani	Digras	:	9673803657
11.	Vijay Marshetwar	Dehani	Digras	:	--
12.	Dhansingh Rathod	Dehani	Digras	:	--
13.	Mahammad Rafik Parekh	Kalgaon	Digras	:	9881584709
14.	Shaikh Husen Skaikh Chand	Kalgaon	Digras	:	9850911314
15.	Sayyad Nujai Ali	Kalgaon	Digras	:	9822774613
16.	Sahebrao Ratnavare	Kalgaon	Digras	:	9403455157
17.	Pundalik Ratnavare	Kalgaon	Digras	:	9403455157
18.	Rameshwar Raut	Kalgaon	Digras	:	9421845557
19.	Gunvantrao Deshmukh	Harsul	Digras	:	9552985336
20.	Shrikant Prabhakar Vaskar	Harsul	Digras	:	8552822459
21.	Pankaj Deshmukh	Harsul	Digras	:	9881009771
22.	Aabasaheb Shinde	Harsul	Digras	:	7020940929
23.	Pramod Chopade	Harsul	Digras	:	9623667128
24.	Rajesh Savane	Harsul	Digras	:	9623435995
25.	Mohammad Sameer Kadar	Savanga	Digras	:	8999393802
26.	Sameer Bahodin Malnas	Savanga	Digras	:	9145652636
27.	Mohammed Anif Isuf	Savanga	Digras	:	9923682264
28.	Imran Khan Jameer Khan	Savanga	Digras	:	7798968496
29.	Ameet Mohan Sontakke	Savanga	Digras	:	9767269892
30.	Gajanan Nanaji Mahindre	Savanga	Digras	:	9765631247

SN	Name of Farmer	Village			Contact No.
1.	Ramesh Wankhede	Mahatoli	Darwha	:	8605443018
2.	Nivrutti Chavan	Mahatoli	Darwha	:	9922247244
3.	Nandkumar Chavan	Mahatoli	Darwha	:	--
4.	Parshram Rathod	Mahatoli	Darwha	:	9657886405
5.	Vithoba Matarmare	Mahatoli	Darwha	:	9403016161
6.	Gopal Ingole	Mahatoli	Darwha	:	--
7.	Nanarao Patil	Naigaon	Darwha	:	9518959529
8.	Pankaj Patil	Naigaon	Darwha	:	8329911014
9.	Gajanan Patil	Naigaon	Darwha	:	8806701671
10.	Rahul Patil	Naigaon	Darwha	:	9763801792
11.	Santosh Bhajane	Naigaon	Darwha	:	9921361120
12.	Jotiram Jadhav	Naigaon	Darwha	:	8975866325
13.	Dilip Chaudhari	Deurwadi	Darwha	:	9850393139
14.	Suresh Chaudhari	Deurwadi	Darwha	:	9850764018
15.	Fanidar Chaudhari	Deurwadi	Darwha	:	9921418935
16.	Prakash Bhende	Deurwadi	Darwha	:	9689584344
17.	Madhukar Thokal	Deurwadi	Darwha	:	9922463875
18.	Madhukar Ramteke	Deurwadi	Darwha	:	--
19.	Vasaramji Chavan	Mahagaon	Darwha	:	9422649136
20.	Satish Bhende	Mahagaon	Darwha	:	9922347271
21.	Raju Lad	Mahagaon	Darwha	:	9922389959
22.	Ashok Dudhe	Mahagaon	Darwha	:	7030910265
23.	Bhaskar Tajme	Mahagaon	Darwha	:	9822462765
24.	Rajesh Dudhe	Mahagaon	Darwha	:	9405907292
25.	Ravindra Khode	Khopadi	Darwha	:	9921696191
26.	Renurao Khode	Khopadi	Darwha	:	9657433356
27.	Ajay Gayke	Khopadi	Darwha	:	9921847801
28.	Sanjay Rathod	Khopadi	Darwha	:	9850131447
29.	Vijay Khode	Khopadi	Darwha	:	9689067422
30.	Suresh Rathi	Khopadi	Darwha	:	7887755150