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MY BELOVED  
PARENTS  
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**“ECONOMIC ANALYSIS OF PRODUCTION, MARKETING  
AND VALUE ADDITION OF WHEAT IN SOUTH GUJARAT”**

**A  
THESIS  
SUBMITTED TO THE  
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*DOCTOR OF PHILOSOPHY*  
(AGRICULTURE)  
IN  
AGRICULTURAL ECONOMICS**

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# **ECONOMIC ANALYSIS OF PRODUCTION, MARKETING AND VALUE ADDITION OF WHEAT IN SOUTH GUJARAT**

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## **ABSTRACT**

With the globalisation the agricultural sector is opened up with the new avenues especially for food grains enterprises. The cereal crops are of vital importance not only in providing nutritional support but also earning additional income. Among the cereal, wheat is considered as “staple food’s grain” in the country. The normal National productivity is about 2703 kg/ha in 2011-12. India, the world's second biggest wheat producer, has shipped 1.3 million tonnes of the grain since the government lifted the export ban on the commodity in September, 2011. The present investigation was carried out to study the growth rates, cost structure, returns, resource use efficiency, marketable and marketed surplus marketing channel and marketing system, nature and degree of competition of market in Gujarat, value addition and constraints in production, marketing and value addition of wheat. The study was conducted in Bharuch, Narmada, Surat, and Tapi districts selected on the basis of highest area under wheat crop. From each district two taluka and from each taluka 2 villages were selected.

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A sample of 240 wheat growers was selected with probability proportional to number of farmers in each size group. Bharuch, Narmada, Surat and Tapi markets were selected on the basis of highest arrival under wheat crop in south Gujarat.

Even five markets from Gujarat were selected to measure nature and degree of competition in markets namely, Sanand, Jamnagar, Talod, Dahod and Bharuch on the basis of highest arrival of wheat.

The CGR of area, production and productivity of wheat were positive and significant in South Gujarat. Among the periods, production of wheat crop increased significantly by 4.72 per cent per annum in period-II (2002-03 to 2011-12) while, in the period-I, it was declined by 1.85 per cent per annum. Similar trend was observed in South Gujarat region. Production of wheat in South Gujarat was increased by 5.93 per cent per annum during the overall period (1992-93 to 2011-12). The production growth was increased significantly in period second compared to period-I. Acreage under wheat crop increased in period-II (4.46 per cent per annum) while period first it was declined. Productivity of wheat crop was increased by 0.94 per cent per annum in the state as a whole. While, in South Gujarat, it was increased 0.75 per cent per annum during the overall period. The coefficient of variation method was used to estimate the extent of instability in production, area and productivity of wheat crop. The coefficient of variation for wheat productivity of the state revealed that this has been 14.20 per cent during the study period. The extent of variability in productivity has been higher for the south Gujarat region compared to the state during the study period. The magnitude of variability has been higher in the production compared to area and productivity. The area instability was also higher side in south Gujarat region and state as a whole.

In south Gujarat, mostly paddy, sorghum, pigeon pea, cotton, groundnut, maize, sesamum, castor, sunflower and wheat were grown as field crop while in vegetables okra, brinjal, cluster

bean were grown by the farmers, and in fruits crops sapota, mango and banana were the major crops of selected districts.

The pattern of input use in cultivation of wheat in south Gujarat required hired labours 35, 44, 43 man days per hectare in case of small, medium and large respectively, it was found that medium and large farms used the mechanization for cultivation. Overall hired labours were 42 man days. The bullock labour utilization in case of small medium and large size groups was 9.31, 6.26, 4.85 pair days, respectively. The bullock labour utilization was more in small size group and at overall level, it was 4.79 days.

Cost of cultivation per hectare and cost of production per quintal of wheat was ₹ 46348.59 and ₹ 1232.68, respectively. The overall paid out cost (cost- A) per quintal was ₹ 764.70, 62.04 per cent of the total cost. The average Cost-B and Cost-C<sub>1</sub> accounted for about 86.73 and 90.00 per cent of the total cost C<sub>2</sub>. Districtwise cost of cultivation per hectare was highest in Surat followed by Tapi, Bharuch and Narmada. The overall net income per hectare was ₹ 22309.64. The return per rupee of investment was 1.48. Log linear production function analysis for wheat indicated that hired human labour, seed rate, F.Y.M, irrigation, Nitrogen fertilizer, Phosphorus fertilizer, significantly affected the yield. This indicates the scope to increase the use of these inputs. The R<sup>2</sup> was 53%. The bulk line cost of selected districts came to ₹ 1422.20.

The total production of wheat on sampled farms was 37.60 quintals. On farm utilization of wheat was 13.14 per cent and marketed surplus was 86.86 per cent of total production. There were four marketing channels for wheat. Total 4 channels were found during study (*i.e.*, Channel I : Producer – Wholesaler - cum - Processor - Retailer – Consumer, Channel II : Producer – Wholesaler - cum – Commission Agent - Retailer – Consumer, Channel III: Producer – Wholesaler - Retailer – Consumer, Channel IV: Producer - Retailers – Consumers). The producer's share in south Gujarat markets were 75.00, 76.97, 79.52 and 80.84 per cent in marketing channel I, II, III and IV, respectively. Average marketing cost incurred by market functionaries was 197.14, 137.32, 130.05, and 110.38, respectively. Channel IV was more

efficient than other Channels. The MME method result revealed that the channel IV (4.23) was most efficient compared to other channels. While, district-wise it was highest in Surat district *i.e.* 4.75.

The extent and nature of competition existing in the markets as well as the concentration of market power in the selected wheat markets of Gujarat. Wheat markets of Gujarat are vertically integrated to a good extent. The firms of Talod, Sanand, Dahod and Bharuch markets were integrated vertically to a higher extent as 88, 87, 86 and 80 per cent wheat dealing firms performed two and more functions. Wheat markets of the state were better integrated vertically than horizontally meaning thereby that the firms in the markets were more actively related to each other. These firms acquired greater power over the selling and buying process in marketing of wheat. The selected markets had shown the existence of concentration of market power to varying degrees. In Dahod and Talod markets the first five firms purchased 19.02 and 42.0 per cent of the wheat sold in these mandies during the study period. The first five firms of Jamnagar Sanand and Bharuch markets controlled 65 per cent of the total wheat purchases while the first five firms of Dahod and Talod markets purchased only 23 per cent of total wheat marketed in them. As such competition in marketing was more fair in the Dahod and Talod markets compared to Jamnagar and Sanand markets of the state. The markets situated at lesser distance from each other displayed higher price difference compared to the markets located at greater distance. It was due to movement of produce from their markets to consumer's markets or village markets. The wheat prices in these markets moved independently to the corresponding market so these markets are closely integrated. Returns to transportation cost was maximum in Sanand - Dahod market pair (₹ 350.00 per quintal), followed by Sanand - Talod market pair (₹ 339.50 per quintal), Sanand - Bharuch market pair (₹ 337.50 per quintal) and Sanand - Jamnagar market pair (₹ 305.00 per quintal). Price difference in all these selected market pairs was positive and substantially high to cover the transportation cost. The price difference per quintal of wheat

among the selected primary and corresponding secondary wholesale market has exceeded ₹ 350 in all of them. Even this price difference as much higher even after meeting the transportation cost involved for moving one quintal of wheat. The movement of wheat from secondary wholesale markets to primary wholesale markets has not been there. The wheat crops moves in general to consumer markets from the secondary wholesale market after performance of the operations like cleaning, grading and processing.

The directions of value addition in bakery unit, among the various item of expenditure maida rank get first position *i.e.* ₹ 6.50 and ₹ 14.46 lakh rupees, in small, medium firm, next ingredients items of costs are sugar, oil/ghee, egg, cake gel and baking powder were utilized at overall level that are ₹ 9.50, ₹ 4.12, ₹ 0.55, ₹ 0.62 and ₹ 0.08 quintals respectively and small quantity of colour and essence etc. utilized. The cost per quintal of Bakery products and the net profit worked out on variable cost *i.e.* ₹ 2.01 and ₹ 9.71 lakh in small and medium firm respectively. The input output ratio was found in the small and medium of firm was 1:1.22 and 1:1.43, respectively. Break even point was estimated on small, medium, firm *i.e.* 29.16 qtls. and 73.52 qtls, respectively. In case of flour mill unit, cost per quintal of flour mill products and the net profit worked out on variable cost *i.e.* ₹ 5.41 and ₹ 0.89 lakh in A and B unit respectively. The cost per quintal of Bakery products were estimated and recorded on the basis of before grinding and after grinding was ₹ 1702.70 and ₹ 525.00 respectively. The input output ratio was found for both A and B operation is 1:1.47. Break even point was estimated of flour mills for A and B operation was 34.20 qtls. and 150.56 qtls, respectively.

The problem of non availability of agricultural labour in time of wheat, non availability of power supply and connection in time, non availability of fertilizer in time, high price of input, Lack of irrigation facility, Lack of technical knowledge, Non Availability of hired farm machinery or implements, Non availability of sufficient bank/ co-operatives, were major constraints faced by farmers in production of wheat. The major constraints related to marketing were Price fluctuation in wheat, high cost of transportation, lack of

transport facility at local level, not getting price according to quality and No availability of power/power connection on time. The main constraints of APMC in study area were found that APMC were not provided technical literature or material to the wheat growers. The main constrains faced by the market functionaries was that price difference of wheat, the second constrains was trading is the risky business, followed by dominance of the big firm. Problem faced by bakery owner were non availability of semi-skilled labour on time and non availability of electric supply on time during production, and in during marketing spoilage during transportation, credit problem by retailer. Same problems also found in production and marketing of wheat flour unit.

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This is to certify that the thesis entitled “**ECONOMIC ANALYSIS OF PRODUCTION, MARKETING AND VALUE ADDITION OF WHEAT IN SOUTH GUJARAT**” submitted by **Mr. ASODIYA PINAKIN SURESHKUMAR** in partial fulfilment of the requirements for the award of the degree of **DOCTOR OF PHILOSOPHY (Agriculture)** in subject of **AGRICULTURAL ECONOMICS** to the Navsari Agricultural University, is a record of bonafide research work carried out by him under my guidance and supervision and the thesis has not previously formed the basis for the award of any degree, diploma or other similar title.

**Place: Navsari**  
**Date: 7<sup>th</sup> May, 2015**

**(K. S. Patel)**  
**Major Advisor**

# **DECLARATION**

This is to declare that the whole of the research work reported in this thesis for the partial fulfilment of the requirements for the degree of **DOCTOR OF PHYLLOSOPHY (AGRICULTURE)** in subject of **AGRICULTURAL ECONOMICS** is the result of investigation done by the undersigned under the direct guidance and supervision of **Dr. K. S. Patel**, Professor & Head, Department of Agril. Economics, Navsari Agricultural University, Navsari and that no part of the work has been submitted for any other degree so far.

**Place: Navsari**

**Date: 7<sup>th</sup> May, 2015**

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*Navsari:*

*Date: 7<sup>th</sup> May 2015*

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*INTRODUCTION*

# I. INTRODUCTION

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## **Background Information**

Agriculture plays a pivotal role in the economy of India. The agricultural sector provides livelihood for the population and raw material for agro-based (food processing) industries. The most important role of agriculture in the national economy is to generate surpluses for export to earn the much-needed foreign exchange. Agriculture accounts for 14% of the Gross Domestic Product (GDP) and employs about 56% of the total work force. Almost two third of the country's population is living in rural areas and directly or indirectly linked with agriculture for the livelihood (Government of India, 2014).

## **Global scenario of wheat:**

Cereals are the most important food crop of the world and provide the world with a majority of its food calories and about half its protein. They are staple foods in the diets of most population. In the year 2007, 2029 million metric tonnes of cereals were produced globally from 658.5 million hectare of land with an average productivity of 30.83 quintals per hectares (Balasubramanian, 2007).

According to FAO (2007) the wheat is cultivated in about 120 countries of the world. The major wheat producing countries are China, India, USA, Russian Federation, Canada, Australia, etc. The China has emerged as the largest producer of wheat and accounted for 15.7 per cent share followed by India, which shared 12.06 per cent in world production of wheat during the years 2001-2003. India is the second largest producer of wheat in the world after china. (FAO, 2004)

Meanwhile the world price of cereal took a dramatic down turn in the late-1990s, especially from 1998, but at the domestic level, the minimum support price (MSP) offered by the government kept rising. As a result, exports became uncompetitive while sales to the government became lucrative and, given the open-ended public procurement policy, this led to significant increase in public procurement. Faced with mounting fiscal deficit due to rising food subsidies, the government increased the ration prices resulting in a fall in demand from FPS.



**Fig-1.1: Export- Import Trend of India from 2000-2013. (FAO, 2012)**

This combination of increasing procurement and declining public distribution resulted in an unprecedented accumulation of public food grains stock that reached as high as 63 million metric tonnes by July 2002. In the subsequent years, the government had to subsidize export at a price that

was 50 percent lower than the government's procurement costs. As a result, stocks have plummeted to just 16 million tonnes by April 2007. The case of wheat is particularly sharp, from about 41 million tonnes in July 2002 to just 2 million tonnes in April 2007. The inadequacy of the existing food policy regime is reflected in the wild swings in the food grains stock, showing that a stable buffer is not being maintained. Maintaining the existing policy regime involves huge amount of expenditure on food subsidies by the Central Government. Food subsidies as a percentage of gross domestic products have more than doubled over the last decade and half. The growth in food subsidy is all the more sharp considering that during this period the Indian economy has witnessed a fairly high growth rate. The policies and instruments that served well during the 1960s, 1970s and 1980s, are proving to be ineffective in responding to the challenges and opportunities that this country faces. Comprehensive reforms of the food policy regime and the way food grain marketing has been managed are urgently required to ensure sustainability and vibrancy of the food grains sector. (Gulati and Mulen, 2003)

Wheat produces a good yield per unit area, grows well in a temperate climate even with a moderately short growing season. The center of origin for wheat was in the Mid-east, near the cross point of national boundaries for USSR, Turkey, Iraq, and Iran.

Wheat is a one of the most important staple food grains of human race. India produces about 70 million tonnes of wheat per year or about 12 per cent of world production. It is now the second largest producer of wheat in the world. Being the second largest in population, it is also the second

largest in wheat consumption after China, with a huge and growing wheat demand.

Export of wheat was liberalized in 1995; and the initial success was remarkable. However, as exports picked up, domestic prices of wheat rose and the government, fearing unrest, put a ban on wheat export and eliminated import duty.

The sudden and sharp decline in world trade from US \$ 16 trillion in 2008 to US\$ 12.4 trillion in 2009 was followed by an impressive recovery in 2010. World trade reached US\$ 7.03 trillion in the first half of 2012, with a value growth of 24 percent. World trade volumes which fell by an unprecedented 10.7 per cent in 2009 have quickly recovered with a growth of 12 per cent in 2010 as per the International Monetary Fund (IMF), World Economic Outlook (WEO), January 2011. Growth in trade volumes of emerging and developing economies in 2010 was more robust than that of advanced economies, It was fall in 2009 had been less severe. Growth in world trade volume is expected to be moderate in 2011 and 2012 to 7.1 per cent and 6.8per cent respectively, as per IMF projections. However, the trade growth in emerging and developing economies is expected to be more robust than that in the advanced economies in 2011 and 2012.

### **Background of wheat in India:**

Agriculture marketing plays a crucial role not only in stimulating production and consumption but in accelerating the pace of economic development. It has been described as the most important multiplier of agricultural development. Marketing includes all the business activities involved in moving products from producers to the consumers through

time, space (transport), farm processing and transferring ownership at the various stages in the marketing channels. The main aim of the marketing is that the production should realize a suitable net return of producer's produce. Producers always desire to get good price for their produce which can be possible only when effective and efficient marketing system exists.

These regulated markets are called as Agriculture Produce Marketing Committee's (APMCs). To help the farmer in disposing of their produce in the market smoothly by reducing the exploitation level and to promote fair trade, market regulation act came into existence.

Wheat cultivation in India started 5000 years ago. Wheat has made the largest contribution to the growth of foodgrain production in India. Wheat production has grown at a much faster pace compared to other food grains. During 1950/51-2000/01, when total foodgrain production grew at an annual rate of 2.68 per cent, wheat production grew at 5.36 per cent. Even in the last decade, wheat production is showing fastest growth.

The growth in wheat production has come from increase in yield as well as expansion of area. The increase in area sown has come at the expense of area under coarse cereals and pulses, and from an increase in cropping intensity through multiple cropping.

Wheat is grown in India over an area of about 266.92 lakh hectares with a production of 721.40 lakh tonnes. The average national productivity is about 2703 kg/ha in 2011-12. India, the world's second biggest wheat producer, has shipped 1.3 million tonnes of the grain since the

government lifted the export ban on the commodity in September, 2011. In view of bumper crop, the government decided to lift the ban on wheat exports in September, 2008. According to a Food Ministry official, "the country's total wheat exports through private trade have touched 1.3 million tonnes so far.

India occupied largest area estimated at 12.08 per cent of total area under wheat in the world followed by China which occupied 11.08 per cent, but the productivity of wheat in China, was appreciably higher at 3830 kgs. compared to 2696 kg. per hectare in India (IMF, 2010).

India harvested a record wheat of about 9.49 crore tonnes in 2011-12 from an area of 29.9 million hac. while today, But this year, the production of wheat may remain 3 per cent lower to about 92.3 million tonnes with 4.31 lakh ha. due to decline in area and slightly lower yield due to less availability of irrigation, as compared to last year (IFPRI, 2012).

In Gujarat, total cereals produced in year 2011-12 were 4.08 lakhs tonnes while, in case of wheat, production was 40721 lakh tonnes and productivity is 3015 kg/ha while the area under wheat was 1.35 million ha. (DOA, 2012).

The major wheat producing states are Uttar Pradesh, Punjab, Haryana, Madhya Pradesh, Rajasthan, Bihar, Maharashtra, Gujarat, Karnataka, West Bengal, Uttaranchal, Himachal Pradesh, and Jammu & Kashmir. These states contribute about 99.5 per cent of total wheat production in the country. Remaining states, namely, Jharkhand, Assam, Chattisgarh, Delhi and other North Eastern states contribute

only about 0.5 per cent of the total wheat production in the country.

Wheat, being the most important staple food of the country after rice, deserves due attention above. About 60 per cent of wheat output is contributed by N-W India comprising the states of Punjab, Haryana, Rajasthan (except Udaipur and Kota divisions) and western UP.

To meet the fundamental principle of comparative advantage, wheat crop has the advantage as far as Benefit - Cost ratio is concerned (Gulati, 1998). Therefore, it becomes all the more important to analyse cost structure and its components so as to explore possibilities of lowering cost of cultivation to meet the objective of protecting consumers' interests, increasing producers' margin and to earn foreign exchange.

Wheat is nutritious, and high quality flour is widely used in baking. Most of breads are prepared from wheat flour. Raw wheat can be used for making pasta, noodles, juices, crackers, pancakes, dough nuts, cakes, cupcakes, rolls, dalia, macaronis, piecrusts, ice cream cone, pudding, spaghetti etc. wheat gluten is useful for preparing coating, polymers etc. Wheat starch is used in cosmetic, paper and pharmaceutical industry. Wheat straw can be used as fodder for livestock and as construction material for thatch roofing. The popularity of foods made from wheat flour creates a large demand for the grain even in economies with significant food surpluses.

Improved information and marketing facility enables farmers to plan their production more in line with market demand, to schedule their harvest at the most profitable time, to decide which market to sell their produce to

and negotiate on a more even footing with traders and it also enables traders to move their produce profitably from a surplus to deficit market and to make decisions about the economics of storage, where ever technically possible. Thus, the market information is critical to the law of one price and to the price discovery process (Khol and Uhl, 2002).

However, revolution was not possible without provision of improved and high yielding varieties, chemical fertilizer, pesticides and insecticides which helps the farmers in increasing production; Therefore, Khol and Uhl, (2002) suggested that without modern marketing system, including communications, transportation, storage facilities and financial arrangement and the efforts of increasing agricultural production and productivity have to be accompanied by a well-performing marketing system which satisfies consumer demands with the minimum margin between producers and consumer prices. Higher prices for producers can encourage farmers to adopt new technologies and increase production, (Woldy, 1994).

The importance of agriculture sector for initiating and sustaining economic growth in developing countries is a recognized fact. In developing countries with limited cultivable land, growing population pressure and diminishing returns in agriculture, exploring the possibilities for achieving significant land-augmenting technical progress offered by the “Green Revolution” technology is of utmost importance. It, no doubt requires an increasing inflow of resources, investment on irrigable land and infrastructure, etc. Whatever, the final outcome, a net inflow to or outflow from agriculture depends

on the efficiency of resource use and genuine technological progress in the sector (Karshenas, 1993).

Processing of agricultural products has great importance. The processing creates 'Form Utility' in the agriculture products which help in fetching higher price. Processing and value addition of farm products have boosted agro-processing industry in the rural areas, generating employment opportunities. In rural areas, where the agro - industries come up in large numbers, may have set in motion the forces that change the socio-economic structure of the area. Therefore, development of agro processing industries implies development of agriculture as well as development of industries at rural level that cater to the needs of the masses in a decentralized fashion.

The fig- 1.2 shows that selected commodities globally was unable to explain the excess co-movement based on standard macroeconomic factors alone, such as exchange rates, business cycles, inflation and monetary policies that led to summaries that something else was responsible for such herd behavior, such as commodity futures markets. Another finding, looking specifically at domestic wheat markets in Pakistan, and as pick up in food inflation there, examined through high-frequency monthly data, the role of monetary factors, versus domestic supply-side structural market conditions in driving the volatility of wheat.

Price has to play an important role in economic planning. It determines not only what shall be produced? but also how much to be produced?. For stabilization of prices, commodity future market plays an important role in price discovery. The information regarding future prices helps the

producers to plan their activities on production, processing, storage and marketing of commodities. Marketing system for farm products and also inputs for agricultural production plays an important role in national economy of the country.

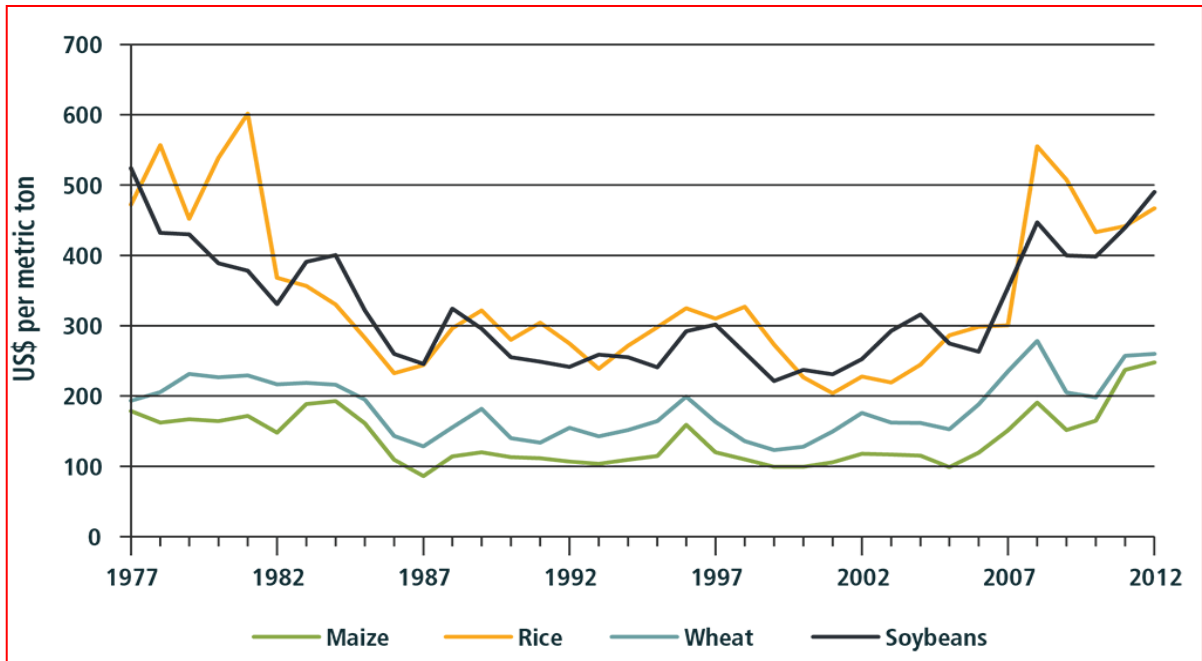


Fig -1.2: International prices of all commodities rise together and so does wheat (Government of India, 2013)

Fluctuation in market price of agriculture commodities are greatest obstacle in the way of agricultural development. Thus it is necessary and important to protect the farmers from sudden fall in prices and consumers from sharp rise in price. Due to fluctuations in agriculture prices, there is instability in income of the farmers, which result in instability in agricultural investment. Thus, to stabilize the agricultural industry there is need to stabilize the agricultural prices. Therefore, it helps farmers to make decision about when to sell their produce so as to earn more profit.

Apart from these microeconomic considerations there are macroeconomic effects of changes in agricultural

prices. While positive price incentives to farmers help the government to achieve self-sufficiency, fluctuations in agricultural prices spill over to other sectors of the economy, leading to increase in the overall rate of inflation. Sometimes, a steep increase in the prices of agricultural commodities creates serious problems as happened in the case of wheat during 1996 and onions and other vegetables during 1998. Large variations in prices have serious consequences. Firstly, they provide enough room for speculators to take advantage of the situation especially in cases where there are restrictions on the movement of commodities and external trade is not permitted. Secondly, they lead to the formulation of flawed policy measures, which can be very costly.

Indian food policy has evolved through various tests of time, including one of the worst famines in known history, repeated bouts of droughts, and constant challenge of feeding a vast and growing population. The country's journey from being a chronically food deficit country to becoming a food grains exporter is marked by waves of policy thinking, ranging from increasing public interventions in the early decades of independence to partial liberalization in the 1990s and a host of other experiments in between. At the centre of it all has been the agricultural price policies, implemented through the Food Corporation of India (FCI), the country's food logistic parastatal agency, with the panoply of control over both domestic and international trade.

The government follows a dual pricing policy in the agricultural sector, setting two prices – a procurement price at which it would purchase grains from farmers, and a ration price (lower than the retail price) at which it would sell limited

quantities of grains as entitlement to households through Fair Price Shops (FPS). Such a system was thought to be the best way to balance the conflicting interests of farmers (who would want higher prices) and consumers (who would want cheap food). The government took upon itself the task of procurement, storage and distribution, by dominating the entire marketing chain, with several self-serving controls on the private sector over both domestic and international trade.

The policy makers were convinced and, given the importance of food in the country's political stability, government pursued this policy with strong commitment that was fuelled by every sign of success in the early years of Green Revolution. The FCI grew quickly under a variety of regulatory supports and greater control over food grains markets. And the country became a "poster child" for the proponents of dual pricing and price stabilization policies.

An average Indian household spent 36% of its total expenditure today on food grains, which down from about 50% in 1983. The poor spent an even higher percentage, and derive much of their nutrition (more than three-quarters) from food grains. On production side, food grains occupy about 66% of the gross cropped area in the country, although they contribute only 28% of the gross value of crop output (TE 2011-12). How the grain economy is managed, therefore, is critical not only for poor consumers but also for large number of producers.

M.S. Swaminathan, Chairman of the National Commission on Farmers, says "The farming sector is fast heading for a total collapse if no rapid remedial measures are taken." [India Today 2009]. The fifth and final report of the

National Commission on Farmers recommended a massive approach to revitalize agricultural progress by making agrarian prosperity and food security and sovereignty the bottom line for government policies and priorities in agriculture [MOA, 2006]. The report of the Steering Committee on Agriculture and Allied Sciences for Formulation of the Eleventh Five Year Plan (2007-2012), chaired by C. H. Hanumantha Rao, noted that public and private investment in infrastructure, including irrigation, technological change, diversification and fertilizer, the four major sources of agricultural growth in India, had slowed down since the 1990s and recommended stepping up public investments in agriculture to four percent of Agricultural GDP, implying that public investments, at 1999-2000 prices, would be raised annually by 12 percent during the 11<sup>th</sup> Plan [Planning Commission 2007]. The Prime Minister stated in his inaugural speech to the National Development Council on May 29, 2009: “The rates of growth in agriculture in the last decade have been poor and are a major cause of rural distress. Farming is largely becoming an unviable activity.” A National Food Security Mission was launched and a mega Rs. 50,000 crores assistance program to reinvigorate agricultural productivity to four percent annually was announced.

The existing system of food grains management – with its origins in the unprecedented consecutive severe droughts in 1965-66 and 1966-67 necessitating massive emergency food aid imports and the subsequent need to disseminate high-yielding varieties – is characterized by the dominant presence of the government in all the basic aspects of marketing, viz., procurement, storage and distribution, with

all these operations being bundled and carried out by the Food Corporation of India (FCI), the nodal parastatal agency. The FCI procures food grains in the form of wheat or paddy directly from farmers and in the form of rice from rice millers. The procurement/levy price is recommended by the Commission for Agricultural Costs and Prices (CACP) based on considerations of cost of production and includes a “fair” return to land and family labour of the farmers. It is essentially a system of open-ended procurement under which the FCI is obligated to buy all the grains that farmers offer to sell at the prescribed procurement price as long as the grains meet a certain quality standard. Where it operates, this open-ended procurement system effectively renders the procurement price to be a support price below which the prices do not fall. With regard to rice, the millers are obligated to sell a certain fraction of their produce to the FCI at the levy price, which makes it essentially a “tax” on millers (Kumar, G.A., A. Gulati, and R. Cummings, 2010). After plunging in the early stages of the economic crisis, prices for primary products stabilized and staged a significant recovery in the second half of 2009. Between July 2008 and February 2009, energy prices fell by 64 per cent and metals prices dropped by 50 per cent, but between February 2009 and January 2011 prices for energy and metals rose 60 per cent and 65 per cent, respectively. Average commodity prices for 2009 were down for energy (-37 per cent), metals (-29 per cent), agricultural raw materials (-17 per cent) and food (-15 per cent).

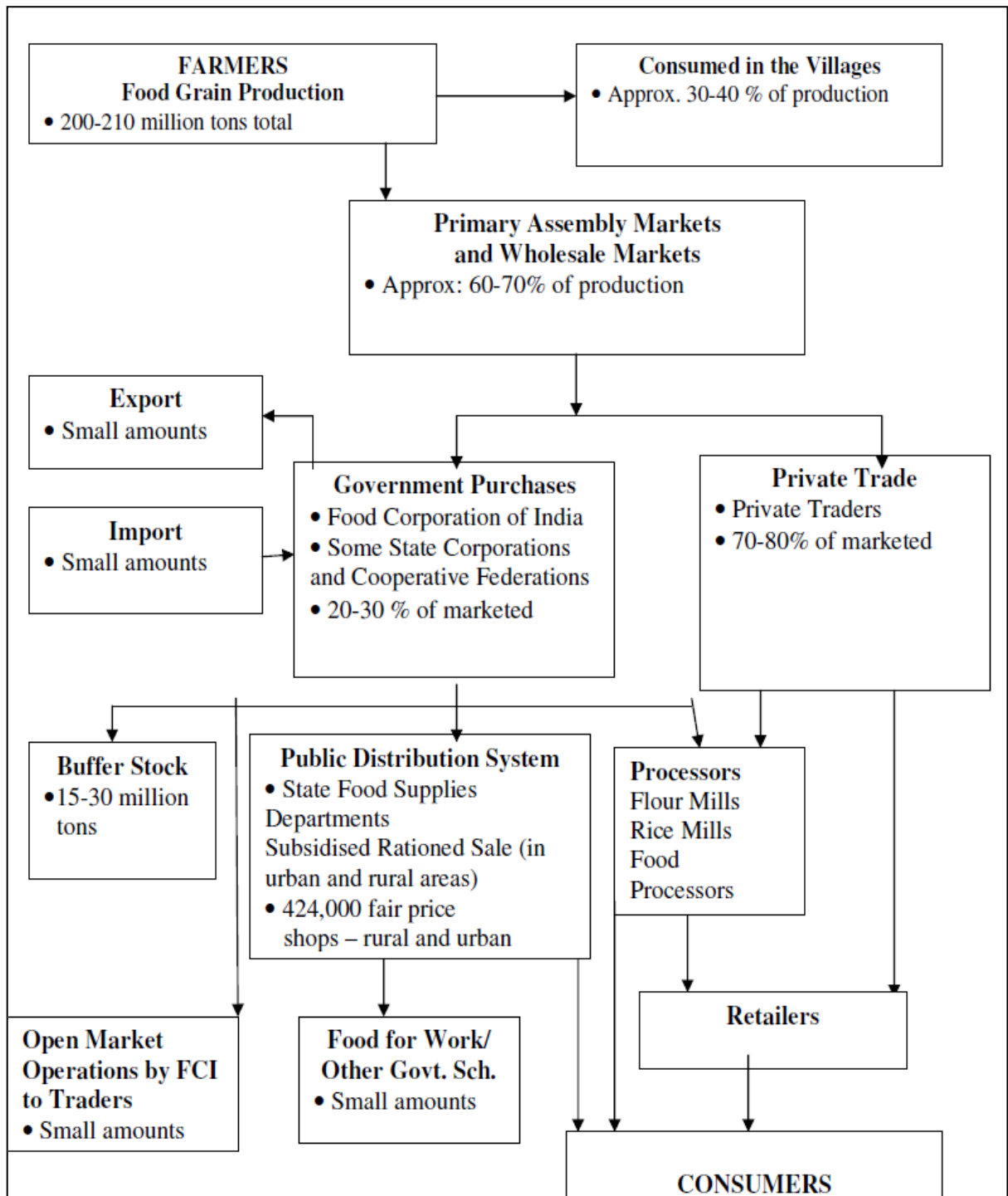
India’s trade growth (in US dollar) has been robust at 20 per cent plus since 2002-03. While India’s trade growth has a strong correlation with world trade growth, it has been

significantly higher than world trade growth particularly in two time periods, first just following the 1990 reforms and second after 2003.

Unlike many other countries, the global recession only slightly jolted the continued upward growth in India's export sector with exports rising at a reasonable rate of 13.6 per cent in 2008-09. The compound annual growth rate (CAGR) for India's merchandise exports for the five-year period 2004-05 to 2008-09 increased to 22 per cent from the 14 per cent of the preceding five-year period.

However, in 2009-10 export growth was negative at (-) 3.5 percent, partly reflecting the effect of global recession and partly the higher base effect due to lagged export data of 2008-09. Despite this negative growth, India's ranking in the leading exporters in merchandise trade which slipped marginally from 26<sup>th</sup> in 2007 to 27<sup>th</sup> in 2008 improved to 21<sup>st</sup> in 2009. However, the export growth in dollar terms decelerated in 2008-09 while in rupee terms it exhibited an opposite movement reflecting the direct effect of the high depreciation of the rupee by 12.5 per cent. In 2009-10, while export growth in dollar terms was negative, in rupee terms it showed a very marginal increase due to the marginal depreciation of India's share in world merchandise exports has started rising since 2007 albeit by a very slow 0.1 percentage point so as to reach 1.3 per cent in 2009 and 1.4 per cent in 2011 (January-June). This was mainly due to the relatively slow rise or greater fall in world export growth than India's. After looking at the India's trade performance, it would be more interesting to see the state-wise exports contributions in

that. As reflected in the data on state of origin of exports of goods showed clear domination of Maharashtra and Gujarat.



**Fig-1.3: Outline of India's Grain Marketing System**

Tamil Nadu, Karnataka, and Andhra Pradesh fall in the second rank of exporting States. In 2010-11, the growth of exports from all the states was negative, except in Haryana, Kerala, Goa, and Rajasthan. High negative export growth was registered by Delhi, followed by Uttar Pradesh, West Bengal, and Karnataka. But, the first half of 2011-12 export growth to all destinations was positive except for Kerala state (Chayulu and Prahadeeswaran, 2012).

In such a way food grains become an important component of the Indian economy and also it is said to be the biggest business of the world. Most of the small grains like wheat, barley, oat, rye were first domesticated in this vicinity.

The production and productivity of wheat was quite low, when India became independent in 1947. The production of wheat was only 6 million tonnes and productivity was merely 663 kg per hectare during 1950-51, which was not sufficient to feed the Indian population. The country used to import wheat in large quantities for fulfilling the needs of our people from many countries like USA under PL-480. The success of “Green Revolution” has made India a food grain surplus country.

The green revolution, so successfully achieved and lauded till some decade or so earlier, is being now argued that it was not the green revolution but only the “grain revolution”. The remarkable success of growth in grain production is bearing the burden of high, rather excessive, increase in the cost of production in terms of financial, social, economic and natural resources exploitation. Wheat was the crop that brought in the green revolution in India and paved the way for the country’s food security.

Global wheat consumption was up for the fifth year in a row and it exceeded wheat production. Consequently, wheat stocks tended to deplete, particularly among the importers. Developing world's share of all wheat imports amounted to 60% and had been increasing for 25 years and was expected to continue unabated (Anonymous, 2009).

Wheat crop is important to India's food economy and security. A large demand, India's wheat economy is now the second largest in the world. The marketed surplus from the production has also been rising and it is estimated that about 60-70 percent of the production now comes to the market (India, Directorate of Economic and Statistics 2002). As a result, the marketing system and its efficiency are of serious concern and interest in India. Poor efficiency in marketing has serious consequences for both producers and consumers as well as for the government budgets and the economy. Serious questions have been raised about the working of the market mechanisms and market related policies for wheat and rice. The study examines the marketing of wheat in India, focusing on the marketing efficiency and quality issues. Various studies have examined India's food grain and wheat economy: these Gandhi *et. al* (2004). In the 70's and 80's, some studies had examined the wheat marketing and its efficiency in India. However, no recent studies are available which take a comprehensive look at wheat marketing and its efficiency through field based research.

### **Status of food processing Industry in India**

Agriculture processing and value addition are the important aspect of wheat. In India, there is only cost addition

but no value addition in agricultural commodities. In developed countries more than 80 per cent of the produce is processed. The returns from processing and value addition of wheat are considerably higher as compared to raw material (grain). It not only increases the quality of the produce but also creates employment opportunities and enhancement of income. It requires minimum investment at household level. Due to the value addition of wheat price fluctuation could be minimized; excess production could be properly utilized. Processing / value addition serves as an adjunct to other marketing functions such as transportation, storage, merchandising, etc. it also provides the processed/value added product to the consumer at a reasonable rates which would have not been possible in other ways.

Agricultural processing may be defined as an activity, which is performed to maintain or improve the quality or to change the form or characteristics of the agricultural product. Processing operations are undertaken to add value to agricultural materials after their production. The main purpose of agricultural processing is to minimize the qualitative and quantitative deterioration of the material after harvest.

**Primary processing:**

Purification of raw materials by removing foreign matter, immature grain and then making the raw material eligible for processing by grading in different lots or conversion of raw material into the form suitable for secondary processing.

**Secondary processing:**

The processing of primary processed raw material into product which is suitable for food uses or consumption after cooking, roasting, frying etc.

**Tertiary processing:****Conversion of secondary processed material into ready to eat form.**

Food items are marketed in different forms as raw, primary processed, secondary processed and tertiary processed. The farmers in general prefer to sell their agricultural produce immediately after harvest leaving a part for own consumption and seed purposes. It has estimated that the farmers retain 44 per cent of the total wheat and 48 per cent of the paddy. Mandies and grain traders procure the balance for processing and / or for marketing.

The food processing sector in India has gained importance due to consumer's preferences for ready to cook (RTC) and ready to eat (RTE) foods, besides increased demand for snack foods and beverages. As much as 42 per cent of the food industry is in the organized sector and 33 per cent in the small scale, tiny and cottage sectors.

Burr mills (chakkis) are very common for milling of wheat in rural and urban areas. Uttar Pradesh, Maharashtra, Karnataka, Tamil Nadu, Andhra Pradesh, Bihar, West Bengal, Punjab, Haryana, Madhya Pradesh, Assam, Gujarat, Kerala have the largest number of roller flour mills. At present flours made by the roller mills are sold to institutional buyers like defence, hotels etc., and the household purchase is limited to only 1.0 per cent due to absence of open policy for sale of wheat flour through public distribution system. Sale of soy

blended and branded wheat flour is likely to increase due to better quality flour and thus scope of organized wheat milling will increase in future.

In India, about 90 per cent of wheat is consumed in the form of chappatis and 10 per cent as bread, biscuits, buns, toast and other bakery products. Irrespective of the form into flour or other forms of broken (like dalia). Wheat grain consists of 85 per cent endosperm, 12 per cent bran and 3 per cent germ. Wheat milling involves grinding the kernel into whole wheat flour and separating the bran from the white flour (endosperm). The first roller flour mill in India was set up in 1880. The number has increased to 40 in 1940 and 111 in 1958. By 1970, the number of roller flour mills went to 206. The number has increased to 454 in 1985 and further to 812 in 1996. In India there are about 900 roller flour mills milling about 12.5 million tonnes of wheat utilizing less than 50 per cent of their installed capacity. As per the union ministry of food processing industries estimate there are about 4,00,000 chakkis milling milled 42.5 million tonnes of wheat. The chakki milled wheat into wheat flour normally goes for direct household consumption and atta (wheat flour) and maida produced in organized roller flour mills normally are supplied to the industry. At present, around 10.5 million tonnes of wheat are converted to various wheat products by these roller flour mills.

The state-wise distribution of roller flour mills shows wide variation. The leading flour-producing states, as reflected from the number of roller flour mills, are Uttar Pradesh, Punjab, Haryana, Bihar, Maharashtra, Karnataka, West Bengal, Andhra Pradesh and Tamil Nadu.

Wheat is the most important staple food of about two billion people (36% of the world population). Worldwide, wheat provides nearly 55% of the carbohydrates and 20% of the food calories consumed globally (Breiman and Graur, 1995).

The motto of any investigation is to draw the useful conclusion in the light of objectives of the study in order to arrive the meaningful conclusions, it is essential to the investigator to adopt appropriate method and procedure, keeping this in view. The present investigating was undertaken to study the “Economic analysis of production, marketing and value addition of wheat in South Gujarat”. It deals with the procedure used for the selection of method of data collection, sources of data and analytical procedure used to draw the inferences.

The study entitled the “Economic analysis of production, marketing and value addition of wheat in South Gujarat region” will be undertaken with the following objectives.

- 1) To study the performance of wheat crop in Gujarat
- 2) To workout the economics (cost and returns) and resource use efficiency of wheat
- 3) To examine the marketing system of wheat (marketable and marketed surplus)
- 4) To evaluate the marketing channels, marketing cost, margin, price spread, and marketing efficiency in marketing of wheat
- 5) To analyse the nature and degree of competition in marketing of wheat.
- 6) To estimate economics of value added products of

wheat processing unit

- 7) To identify the problems faced by farmers in production, and in marketing, and in value addition (processing unit) of wheat

Obtaining information on the per-unit production costs for the individual activities, measured by so-called input-output coefficients, is particularly important, both from a business-management and agricultural-policy perspective. Specifically, farmers may need this kind of information for evaluating the performances of their individual enterprises. Moreover, information on enterprise-level costs of production may be helpful in preparing activity budgets, planning yearly operations, applying for operational loans, and analyzing alternative marketing strategies. Likewise, policy-makers may want to have such kind of information, as it would considerably improve their capability of properly assessing the consequences of agricultural policy and technology scenarios on the economic performances of different types of farms. If aggregated to higher levels, costs shares derived from farm accounting data may also provide a source of up-to date information for aggregated economic agricultural sector models.

Direct collection of enterprise-level information via farm surveys is time-consuming and costly, and existing studies are therefore often limited to small samples. Alternative tools based on econometric techniques may offer an attractive alternative for obtaining reliable estimates of unit cost of production in agriculture at a significantly lower cost.

**Rationale of the study:**

Despite the many marketing studies conducted on irrigated wheat farming, few of them have focused on revising agricultural market's efficiency, performance, and market development. Consequently, there is limited information on marketing costs and margins, and price spread of agricultural commodities in South Gujarat. Therefore, the study comes to fill in these information gaps and form basis on agricultural markets and also links with knowledge on marketing margins, pricing efficiency and market development to other spheres that contribute, at large, to agricultural development and economic growth.

This study shall add to the growing literature on marketing efficiency analysis and addresses specific issues in relation to the agricultural markets in South Gujarat. In this regard, the study shall verify the reasons that usually make retail-farm margins of interest to agribusiness entrepreneurs and policy makers. In this direction, their observations, which need to be verified, tend to include the following arguments:

- a) Wider margins mean that growers obtain a smaller share of the retail price, and hence mean lower farmers revenue.
- b) The extent to which margin's growth is not due to higher marketing costs can suggest inefficiencies somewhere in the marketing chain/channel as due to market powers, on either the buying or the selling side, downstream from the farm.
- c) Situation of value added products in different wheat processing unit and the problem which faced by unit.

Considering the aforementioned reasons/ arguments for margin's analysis, the rationale to this study would be to seek new options to promote alternative strategies for those disadvantaged farmers, which face high costs because of tangible physical obstacles and / other reasons.

The challenge ahead for these study next steps is how to make use of available data to better explore price formation of the commodities sold in these markets and eventually evaluate the technical and policy options for improving their marketing efficiency.

**Presentation of the study:**

From the analytical conveniency the thesis was organized into five chapters which encompass the introduction, the scope and the objective of the study. Chapter two presents a review of the relevant to the topic understudy. Chapter three covers the sources of data and methodology used in the study. Chapter four presents the result of the study, while chapter five is concerned summary and policy implication of the study.

**Hypothesis:**

Following hypothesis were framed in respect of the stated objectives.

- 1) It is hypothesized that production of wheat crop in the state has remained stagnant during the study period.
- 2) It is hypothesized that costs and margins in marketing of wheat crop are not excessively high.
- 3) The wheat markets are closely integrated in terms of movement of prices.



*REVIEW  
OF  
LITERATURE*

## II. REVIEW OF LITERATURE

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The review of literature is one of the important aspects in the research process which helps researcher to get acquainted with the subject matter under study and future channelize efforts in desirable directions. It provides necessary guidelines and helps the researchers to delineate his research problem.

The main purpose of the research is to recognize the performance of wheat and to study the economics of production of wheat while understanding the market structure, research is also focused on to determined the changes in cost and prices, prices spread and value addition for wheat. It also identifies the problems in production, marketing and processing.

This chapter has been organized into following subsection.

- 2.1. Performance of wheat crop in Gujarat
- 2.2. Economics of wheat crop production and resource use efficiency
- 2.3. Marketable, marketed surplus, and marketing system of wheat crop
- 2.4. Marketing channels, marketing cost, marketing margin, marketing price spread, producer's share in consumer's rupee, and marketing efficiency, of marketing system of wheat crop
- 2.5. Nature and Degree of Competition of market
- 2.6. Value addition in wheat

2.7. Problem faced by farmers in production, and in marketing, and in Value addition unit of wheat

### **2.1 Performance of wheat crop in Gujarat.**

Desai and Patel (1983) estimated growth rates of area, production and productivity of major food grain in the four states *viz*; Gujarat, Madhya Pradesh, Maharashtra, and Rajasthan of the western region of India. The growth rate of wheat for the period of 1965-66 to 1981-82 was higher than rice in all the four states in the western zone. The highest growth rate was reported in Rajasthan (4.06 per cent) followed by Maharashtra (3.98 per cent) and Gujarat (3.31 per cent). However, Madhya Pradesh lagged much behind compared to other states.

Sharma and Kumar (2001) stated that there had been a decline in the rate of output growth during the 1990s as compared to the 1980s for all the selected crops. In case of wheat, lower growth in yield during 1990s was main reason for reduction in the rate of output growth because there has been an increase in the growth in area under wheat during the 1990s. However, there had been a decline in area during the 1990s. As a result, there was a decline in the output growth despite improvement in the productivity of these crops during the 1990s. The analysis also reflected that wheat was the only crop that had possessed higher intra-year fluctuations during the 1990s in comparison to the 1980s.

Gandhi *et al.* (2004) analyzed the India's wheat economy including production, consumption, marketing aspects and also prospects for future crop growth and concluded that the current growth in wheat is mainly because

of increase in yield and expansion of cropped area. Further, the increased usage of irrigation and high yielding varieties (85-90%) had contributed significantly. Thus, the scope for a substantial increase in production through these major drivers seems limited. The future growth in wheat production, is therefore, likely to be constrained. On the other hand, the demand for wheat grows at about 4 per cent per annum. But, the current production was only growing at 2 to 3 per cent. This supply and demand gap was likely to present a significant challenge to India's agriculture and food security.

Gajja *et al.* (2008) studied the growth and instability in area, production and productivity of wheat and acreage response to wheat crop in arid zone of Rajasthan. The study was confined to nine districts of arid zone having more than 10,000 ha. area under wheat cultivation during last decade. The data were collected for the period to 1966-67 to 2006-07 and analyzed by using exponential function, instability index and Nerovian adjustment model. The result revealed that area and production had increased in the arid zone of Rajasthan but with high instability.

Hassan *et al.* (2009) noted that area and production of wheat was increased to meet the demand of country. In the case of maize, significant increment in yield was observed during the study period. The area and production of maize also increased to fulfill the increasing demand of the maize. The growth of area, production and yield of wheat slightly improved in period II (1981-82 to 2006-07) whereas the growth rate of area, production and yield of maize had improved rapidly. The inter-district disparities were resulted due to variation in the extent of adoption of technological change in

agriculture. The growth rate area, of wheat crop were approximately increasing 3 per cent as well as production and productivity increases near about 6 per cent respectively.

Kundu and Banerjee (2010) studied growth and inter-district variation in the yield of rice in West Bengal and found that some far reaching changes in agricultural policies (like decontrol of prices of fertilizers, privatization of irrigation and free export and import of agricultural products) had been introduced by the Government of India from the decade of 1990s. Also examined the trend of growth in the yield of rice in the more recent years up to the year 2005-06 and compare it to that in the preceding '1983-84 to 1991-92' period. The present work also examined the trend in inter-district variation in the yield of rice in West Bengal during the period 1970-71 to 2005-06.

Kalmakar (2011) studied patterns and determinants of agricultural growth in Maharashtra and found that Maharashtra is economically among the most developed states in the country, but it was not counted among the advanced states in India in terms of food grain and agriculture production, though most of the state's workforce still depended on agriculture. During the last four decades, the agricultural sector of Maharashtra had undergone lot of changes. Though agricultural performance improved during the last forty years, its progress was not sustained and showed wide fluctuations. The important characteristics of Maharashtra agriculture was the instability in crop production and significant regional variations in the performance of agriculture in the state. The recent farmer suicides in

Vidarbha and Marathawada have once again highlighted regional disparity in Maharashtra.

Kanan and Sundaram (2011) studied the analysis of trends in India's agricultural growth and found that the major changes included provision of better irrigation facilities, government procurement system, guaranteed support price and input subsidies in wheat crop. As evident, wheat production registered compound annual growth of 5.03 per cent during the early green revolution period (1967-68 to 1979-80). Both yield and area contributed to higher growth in production. In the case of rice, growth in yield contributed to production growth of 1.84 per cent per annum. For food grains as a whole, the growth in area and yield were 1.75 per cent and 0.43 per cent, respectively and resulted in production growth of 2.19 per cent.

Acharya *et al.* (2012)<sup>a</sup> revealed that India produced 96 million tonnes of rice in 2010-11 and the production is expected to go up to 103 million tonnes in 2011-12. In the case of wheat, the production is likely to go up from 87 million tonnes in 2010-11 to 88 million tonnes in 2011-12. Performance of area, yield and production of rice and wheat in India during the last three decades shows deceleration in the growth rate of yield for both rice and wheat. With the rice area growth not compensating for the deceleration in yield growth, the growth rate of rice production has come down to 1.51 percent per year during 2000-01 to 2010-11, from 3.62 percent per year during the 1980s. In the case of wheat, the area growth could partially compensate for the decline in the yield growth. The growth rate of wheat production during the

recent decade at 2.16 percent per year was lower than that during the 1980s and 1990s.

Ahmad and Haseen (2012) revealed the performance of India's food grains production and found that there was significant decline in growth of production and productivity of total food grain in post reform period. However the growth of coarse cereal and pulses in post reform period had increased. But most heated items of food grain are rice and wheat whose growth of production and productivity adversely affected in post reform period. This was great challenge to Government of India to improve in production and productivity of rice and wheat under new economic regime.

Ramphul (2012) studied the performance and suitability of growing Crops in Haryana and found that the cropping pattern and performance of different districts in growing different crops in Haryana were assessed using three standards measures, namely) (i) location quotient, (ii) crop versatility index, and (iii) district versatility index over the period 1991-92 to 2008-09. The specialization of wheat in Panipat, Hisar and Faridabad, rice in Kurukshetra, Karnal and Gurgaon, jowar in Rohtak and Faridabad was highest during the period of study. The highest specialization of bajra was observed in Mahendragarh, Rewari and Gurgaon. The increased value of versatility indices for majority of districts during 2000-01 to 2008-09 as compared to 1991-92 to 1999-2000 implied the move towards specialization.

Doke (2013) studied an analysis of trend and pattern in Indian agriculture and found that the Indian economy had undergone structural changes over time with the anticipated decline in the share of agriculture in GDP. Despite

a fall in its share from 55.1 per cent in 1950-51 to 17.0 per cent in 2008-09, the importance of agriculture has not diminished for two major reasons. There was a marked shift from the cultivation of food grains to commercial crops. Among food grains, the area under coarse cereals declined by 13.3 per cent between 1970-71 and 2007-08. However, technological and institutional support for a few crops like rice and wheat brought significant changes in crop area and output composition in some regions. The results of crop output growth model indicated enhanced capital formation, better irrigation facilities, normal rainfall and improved fertilizer consumption helped to improve crop output in the country. The above discussion showed the trends and patterns in agricultural growth at the national and sub-national levels in India. Data on important variables like area, production, input use and value of output were compiled for the period 1967-68 to 2007-08 from various published sources. The analysis of data reveals that the cropping pattern in India has undergone significant changes over time.

Kumar and Jain (2013) studied growth and instability in agriculture productivity and examined the trends in growth and instability in Indian agriculture at the district level and identified distinctive features and drivers of productivity growth across districts. The productivity of crop sector had shown tremendous variations across districts both for the country as a whole and within a state. The varying performance of crop sector emphasized the need for evolving regionally differentiated strategies for ensuring sustainable and inclusive agricultural growth in a state and consequently in the country. The instability in productivity continued to

persist and there were wide variations in instability across different districts. To mitigate the consequences of persisting instability, large-scale promotion of stabilization measures like insurance should be pursued vigorously. The analysis of district level data revealed the important role of modern inputs in enhancing the productivity of crop sector. The use of fertilizers has turned out to be the most important input. Along with fertilizer-use, rainfall, irrigation, source of irrigation, better human resources and road connectivity have emerged as the other critical determinants of agricultural productivity. These results signified the importance of use of modern inputs and prudent management of rainfall water, particularly in the low productivity districts.

Reddy (2013) studied agricultural productivity growth in Orissa, Crop diversification to pulses, oilseeds and other high value crops and found that the extent of India's regional disparities has been an issue since many decades, and this concern had been partly motivated by a desire to alleviate poverty. Agriculture remained an important feature of the economic, cultural and political landscape in India. Orissa is one of the poorest States in India. Over the last four decades, there had been stagnation in agriculture in Orissa. During the period 1991 to 2008 the growth rate of agriculture was lower than all India. Significant income gains were possible through crop diversification from paddy to pulses, oilseeds and HVCs in upland rain fed areas in kharif (rainy) season, if proper drainage, institutional and policy support is provided in Eastern Ghats and Northern Plateau of Orissa.

## **2.2 Economics of wheat crop production and resource use efficiency**

Singh and Grover (1992) in their study worked out the economics of wheat crop which followed rice, maize, potato and cotton by collecting data from farmers selected from Punjab State. Variable cost of wheat per acre worked out to ₹ 2503, ₹ 1887, ₹ 2002 and ₹ 2027 when the crop was followed by potato, maize, cotton and rice, respectively. The returns over variable cost was highest (₹ 2023/acre) for wheat crop.

Hasan *et al.* (2005) explained that wheat yield per acre on small, medium and large farms were 33.49, 33.50 and 37.47 mounds respectively, showing a direct positive relationship between wheat yield and farm size. Number of ploughing and planking with bullocks were 1.18, 1.11 and 0.6 on small, medium and large farms respectively. This indicates inverse relation between bullock labour and farm size. The cost borne by the all farm groups for these operations were ₹ 272.52, ₹ 254.38 and ₹ 139.06 respectively. It's per hectare yield was very low as compared to other countries. To estimate the impact of various factors of production on yield of wheat, the Cobb-Douglas production function in logarithmic form was used. The results of the production function indicate that wheat yield can be increased by increasing the use of irrigation, fertilizer and ploughing. The country as a whole is facing a severe shortage of canal water that's why the coefficient of irrigation variable was highest and statistically significant. The cost of production analysis indicated cost of production and gross income of wheat per acre increases with an increase in farm size. The primary reason for this might be increased mechanization and farm inputs like fertilizer,

irrigation and weedicide with increase in farm size. The increase in yield was more than the increase in cost. So, the net income per acre, cost per 40 kg and income per 40 kg reduced with farm size.

Kumar *et al.* (2003) estimated economics of wheat cultivation at village Badayal Brahaman of R.S.Pura block in Jammu district of Jammu and Kashmir state. The input-output ration was the highest (1:1:72) on medium farm size group, while it was just same on the large and small farm size group. While it was just same on the large and small farm size groups. The average cost of production per quintal of wheat was ₹ 30. The average yield of wheat (main product) came to 34.72 quintal and by products (straw) was 36.86 quintal per hectare. The average net income was ₹ 10273.66 per hectare, farm labour income was ₹ 12720.68 per hectare and farm labour income came to ₹ 19009.14 per hectare.

Singh (2006) studied that the variable cost constitutes nearly 46% of total cost involved in wheat production in Northwest India. The study revealed that the cost of wheat production was only ₹ 18538/ha which was hardly sufficient to sustain a family for six months in cotton - wheat region of Punjab state. The figure of rice- wheat region was ₹ 18853/ha making no significant difference from cotton-wheat system. The cost of production was less in cotton - wheat system but rice - wheat system was more productive.

Aurngazeb *et al.* (2007) studied the resource use efficiency in wheat and the results of the production function narrated that over 48 per cent of the variations had been explained by the exogenous variables. The F-value gave

significance of the model. The powers (coefficients) were the elasticities of the respective variables. The sum of the elasticities stood at 0.45 (i.e. less than one) which means that traditional farms were operating in decreasing return to scale. The results of the MPPs show that labour was increasing with a decreasing return to scale. This may be due to excessive use of labour by traditional farms. It could be seen that in the case of mechanized farms the labour was giving increasing return to scale, which means that machinery was complimenting the labour. The MPP of tractor was giving increasing return to scale but it was much lower than that of the mechanized farms. The reason was that the traditional farms apply machinery only for threshing purposes.

Kachroo *et al.* (2010) revealed that operational cost, fixed cost and total cost were all lower under dryland farming than irrigated farming. It was also observed that though the cost involved in dryland wheat cultivation was 41 per cent of the total cost in these two farming systems, its yield was much less (20.3 qtl/ha) than of the irrigated system (34.7 qtl/ha). Their BCR worked out to be 1.10 for dryland and 1.44 for irrigated wheat. The value of  $R^2$  was 0.90 under dryland and 0.87 under irrigated conditions, which indicated 90 per cent and 87 per cent variations in wheat crop. The estimates of the stochastic frontier showed that coefficients of the area and (manures + fertilizers) were positive and statistically significant at one per cent level of significance in dryland wheat. It indicated 1.358 per cent and 0.087 per cent increase in wheat production with one per cent increase in area and (manures + fertilizers), respectively and were thus productive and underutilized inputs under dryland conditions. The

regression coefficients for area, seed and hired labour were positively significant at one per cent (area and seed) and five per cent (hired labour) levels of significance in irrigated wheat. The values revealed the possibility of 0.627 per cent, 0.359 per cent and 0.044 per cent increase in wheat crop production under irrigated conditions with one per cent increase in area, seed and hired labour, respectively.

Patel *et al.* (2011)<sup>a</sup> explained the economic analysis of production and marketing of wheat (durum) in Bhal region of Ahmedabad district (Gujarat). The result of the study indicated that over average cost of cultivation (cost  $c_2$ ) per hectare was ₹ 11,968.38, while per hectare average yield was 9.29 quintals. The average net profit per hectare over cost  $C_2$  was ₹ 4228.33 per hectare. Cob-Douglas production function analysis showed that 96 per cent variation in the income from the wheat production was explained by the independent variable and the sum of regression coefficient showed increase returns to scale. The researchers have analyzed the growth of production of wheat assess the contribution of major inputs *viz*; irrigation, fertilizer consumption, labours, seed by fitting Cobb-Douglas production function. Fertilizer application was the major factor responsible for increasing the production of wheat and the sum of regression coefficient showed increase return to scale. Thus it is cleared that the difference in cost of production directly influenced input use efficiency.

Singh and Grover (2011) found that the net return over variable cost of organic wheat was higher (₹ 21895/acre) than of inorganic wheat (₹ 16700/acre) for organic growers. The net return over variable cost was ₹ 16370/acre for inorganic wheat for inorganic growers. The returns over

variable cost of organic wheat were ₹ 5195/acre more in comparison to inorganic wheat, and were significant at 1 per cent probability level.

Singh *et al.* (2011) estimated the extent and pattern of marketed surplus and home utilization of wheat on farm households in Punjab. The analysis of monthly records in this respect of cross section data collected under comprehensive scheme to study the cost of cultivation of principal crops revealed that 7.69, 3.17, 2.41, and 2.28 per cent of the total wheat output was utilized at home as food, animal feed, seed and kind payments, respectively. The output elasticity of marketed surplus which was found out to be positive and more than unity indicated that in state the marketed surplus of wheat grew faster than the increase in production. In contrast to the official records indicated only 62 percent of total wheat produced in state as market arrivals, the study indicated that marketed surplus constituted about 82 percent of the wheat produced on sample farm households, thus clearly indicating that a significant proportion of marketed surplus was disposed of without entering the state records, resulting in loss to the state exchequer through evasion of market fee, rural development fund and other taxes.

Ahmad *et al.* (2012) found that the under agro-climatic conditions of Faisalabad mixed-wheat cropping system is being followed where sesbania, rice, cotton, maize, potato, mixed fodder, radish and spinach were grown in kharif while wheat as main crop in rabi season. The study was conducted to determine the efficient cropping systems and their effect on soil nutrition status under Faisalabad conditions. Each crop was grown on its optimum sowing time

with recommended production technology. Data on yield, cost of production and effect on soil health were recorded. Economic analysis was made to test the economic efficiency of different cropping systems. The results showed that bajra-potato-maize (grain) was the most economical cropping system with maximum net return of ₹ 379693 followed by sesbania-potato-maize (grain) (₹ 378490). Maximum benefit cost ratio of 2.19 was also recorded in sesbania-potato-maize (grain).

Patil and khobarkar (2013) studied production and resource use efficiency in wheat of Amravati division of Vidharbha region of Maharashtra state and used the double log type Cobb-Douglas production function. The result explained that seed rate, human labour, machine labour, bullock labour and nitrogen fertilizers, had the elasticity of 0.46, 0.03, 0.14, 0.12, and 0.07 respectively, which was positive and statistically significant which indicated that increase in these inputs will significantly affect wheat yield. The value of MVP in respect of Seed rate (6.88) , machine labour (2.15), bullock labour (1.87), nitrogen (1.19) were more than unity level, indicating if expenses made on these resources, then it will be gives profitable returns. The average allocative efficiency was 86 per cent.

Reddy (2014) examined the structure of cropping systems in semi-arid tropics of India and narrated that the net returns per hectare is the highest among commercial crop based cropping systems (like sugarcane, fruits and vegetables etc.,) with ₹ 60628/ha, followed by cotton based systems (₹ 40661/ha), oilseeds based cropping systems (₹ 32762/ha), rice or wheat based systems (₹ 25870/ha), cereal based mixed cropping systems (₹ 24870/ha), pulses-cereal mixed cropping

system (₹ 24783/ha), pulses based cropping system (₹ 17504/ha), coarse cereals (₹ 13429/ha). There was higher net return from cultivation of high-value crops like fruits and vegetables, cotton, rice or wheat in the SAT villages, but to increase an area under these crops required technological solutions in terms of micro-irrigation, evolving short duration and drought tolerant varieties and irrigation facilities.

### **2.3 Marketable, marketed surplus and marketing system of wheat crop.**

Goyal and Berg (2004) analyzed the marketed surplus response of cereals in Haryana State. The data confirmed the theoretical framework. The derived price elasticities of input demand, output supply, and marketed surplus had been simulated to examine alternative price policies for securing different levels of marketed surplus. Study revealed that at the observed price structure marketed surplus of wheat will increase almost equal to population growth, but in case of paddy it will grow at a very low rate. The study further revealed that besides price adjustment, technological improvement and non-price factors were also of critical importance for increasing output supply and, hence, marketed surplus.

Singh (2006) examined the existing system of marketing of agricultural commodities in India; the extent of state intervention; and the factors impacting marketing efficiency. It also drew policy implications to improve marketing efficiency and reduce the need for a large-scale state intervention in different states. The crops covered in this study were: rice and wheat in Haryana, Punjab and Uttar

Pradesh; rice and groundnut in Andhra Pradesh; rice and jute in Assam; and cotton, sugarcane and onions in Maharashtra. The study also examined the level of marketed surplus and the prices received by farmers by farm size; the share of public and private agencies in the marketed surplus; the price spread of individual commodities; and the spread of the marketing season. The study pertained to the agricultural year 2001-02 in all the states except in Punjab (2000-01). Among all the states, the procurement of wheat and rice had been also going on for quite some time in Uttar Pradesh. The prevailing system of marketing and the extent of state intervention varied considerably in the case of the three study crops in Maharashtra. The monopoly procurement scheme for cotton in Maharashtra had accumulated a huge amount of losses. The marketing cost incurred by different functionaries was studied and it was found that the wholesaler spend more, followed by retailer, producer, respectively. Due to the presence of large number of intermediaries in the market channel, the producer got a lower share in the consumer's rupee.

Suresh and Ready (2008) studied resource-use efficiency of paddy cultivation in Peechi command area of Thrissur district of Kerala and examined the resource productivity of paddy production. The cost of cultivation of paddy in the command area had been found as ₹ 21603/ha, resulting in a BC ratio of 1.34. The elasticity coefficients for chemical fertilizers, farm yard manure and human labour have been observed significant and positive.

Patel *et al.* (2011)<sup>b</sup> explained the economic analysis of production and marketing of wheat (durum) in Bhal region

of Ahmedabad district (Gujarat) and found that on an average 88.81 per cent of wheat production was marketed.

Singh *et al.* (2011) estimated the extent and pattern of marketed surplus and home utilization of wheat on farm households in Punjab. The study indicated that marketed surplus constituted about 82 percent of the wheat produced on sample farm households, thus clearly indicating that a significant proportion of marketed surplus was disposed of without entering the state records, resulting in loss to the state exchequer through evasion of market fee, rural development fund and other taxes.

Sudhakar *et al.* (2011) conducted micro level study of marketed and marketable surplus of rice in Bihar. They concluded that both, marketed and marketable surplus increased with increase in the size of land holdings and with quantum of rice production.

Acharya *et al.* (2012)<sup>b</sup> found that the marketed surplus (MS)-output ratio varies from 53 per cent to 85 per cent for wheat and 29 per cent to 99 per cent for paddy/rice. The implication was that 23.4 million tonnes of wheat, which were retained by the producer families for self consumption or on-farm uses like payment of wages in kind and as seed in the next season. Even otherwise, in India it had been estimated that 10 to 12 per cent of total production of cereals was used/retained for on-farm use and not available for human consumption and marketing.

Narendra (2012)<sup>a</sup> studied the critical analysis of regulated markets and this analysis of the data regarding marketing surplus of food grains *i.e.*, wheat and paddy showed that marketable surplus of wheat ranged between 62.76 to

66.39 per cent in Shamli, Sardhana, Muradnagar and Gulaothi mandi areas, respectively. The higher marketable surplus, particularly, in Sardhana and Gulaothi. The higher marketable surplus of paddy in Sardhana mandi area may be due to change in food habits consuming less of rice as compared to wheat against other selected districts *i.e.*, Muzaffarnagar, Ghaziabad and Bulandshahre, where rice was consumed in greater quantities.

Grover *et al.* (2013) found that the production, market arrivals and marketed surplus ratio (market arrivals to production) of wheat and paddy in Punjab state. Market arrivals of paddy increased from 6.37 lakh tonnes during 1970-71 to 131.36 lakh tonnes during 2010-11. The market arrivals for wheat in the corresponding period increased from 23.75 lakh tonnes to 102.78 lakh tonnes. Marketed surplus ratio taken as proportion of market arrivals to total production of paddy and wheat in state during 1970-71 was 0.62 and 0.49, respectively. Overtime during last four decades, these marketed surplus ratios of both paddy and wheat in state increased and was observed to be 0.81 and 0.62 during the year 2010-11.

Tuteja (2013) found that as Punjab and Haryana being non-rice eating states, retention of rice was less and hence 95 to 99 percent production of rice was marketed surplus. UP being leading wheat producing state, even though it generated marketed surplus between 30 to 67 percent. This was so because UP being wheat eating state and hence retention of wheat was higher and marketed surplus lower. Similar situation found in Rajasthan in case of bajra, maize and wheat crop.

Shah and Makwana (2013) studied the purpose-wise retention of wheat production per wheat growing household and found that overall, total retention was 18.41 quintals of which 14.88 quintals (80.85%) and 1.74 quintals (9.46%) retained for self consumption and feed purpose respectively. About 1.08 quintals (5.86%) retained for seed purpose. In all farm size categories, major proportion was retained for self consumption varying from 87.94 percent for marginal farmers to 76.63 percent for medium farmers. Wheat quantity retained by marginal, small, semi-medium, medium and large farmers was 5.84, 9.42, 19.46, 24.17 and 45.92 quintals respectively. This showed positive correlation between farm size and retention of wheat quantity.

#### **2.4 Marketing channels, marketing cost, marketing margin, marketing price spread, producer's share in consumer's rupee, and marketing efficiency, of marketing system of wheat crop**

Legesse and Basavaraja (2004) studied the economics of production and marketing of wheat in Dharwad district of Karnataka State. The analysis revealed that the major item of cost incurred by the farmers was the expenditure on labours (22.7 per cent). The gross and net returns per hectare of wheat cultivation had increased with an increase in the farm size. Two main channels were identified in wheat marketing. Channel-I consisting of producer-trader-wholesaler-retailer-consumer. Channel-II consisting producer-commission agent-wholesaler-consumer. The producer share in consumer's rupee was 76.32 per cent in Channel-I and 84.52 per cent in Channel-II.

Gandhi and Koshy (2006) studied the wheat marketing and its efficiency in India. The estimated average total marketing cost of wheat found in the order of ₹ 266 per quintal and in this transport has the largest share of 40 percent, commission and taxes make up 25 per cent, and wastage another 15 percent. When compared to the consumer-farmer price spread, the marketing costs account for 74 percent of the spread, leaving 26 percent for margins – this was fairly efficient but there was significant scope for improvement. On an average, the farmers received 66 percent of what the consumer pays. The government channel marketing cost was reported at ₹ 309 per quintal, but this did not cover the whole chain and was not strictly comparable.

Acharya and Agrawal, (2011), had evaluated the performance of the existing marketing system, institutions and policy in accelerating agricultural development in the country. The article and book contained an incisive analysis with special emphasis on marketing functions, institutions, efficiency, costs and margins, government efforts in the development of agricultural marketing and market research.

Patel *et al.* (2011)<sup>c</sup> explained the economic analysis of production and marketing of wheat (durum) in Bhal(Gujarat). Four agencies *i.e.* village merchant, wholesaler cum commission agents at regulated market, millers and consumers were preferred by the farmers for marketing their produce. About 10.25 per cent and 11.12 per cent of consumer's price was shared by marketing cost and market margin, respectively while the producer's share in consumer's price was 78.63 per cent and the marketing efficiency indicated an efficient channel for farmer to sell their produce.

The agriculture was still an unorganized sector consisting mainly for small farmers and agriculture labours. Cost of product of wheat on the larger group farms were found more while it was found low on the smaller size groups. This was due to the better economic status of the big farms. The overall average input-output ratio was 1:1.70. Possibilities of increasing income and employment through optimum allocation of resources.

Narendra (2012)<sup>b</sup> examined the critical analysis of regulated markets of U.P, and analysis of wheat and paddy found that the price spread for different commodities under study showed that the producer's share in consumers' price was different on different channels. The producer's share in channel I(Producer/seller- village beopari - commission agent - wholesaler -miller( in paddy) - retailer- consumer) for wheat and paddy/rice was worked out at 77.94 and 65.72 per cent, respectively, while in channel II(Producer/seller-wholesaler - cum-commission agent - miller (in paddy) - retailer - consumer ) the figures for the respective commodities came to 84.43 and 70.91 per cent. The lower producer's share in channel I was due to the presence of trader in this channel, who used to purchase food grains at presence of trader in this channel, who used to purchase food grains at village/ village market and obtained higher profit margins. As regards wholesaler's margin, miller's margin, retailer's margin and costs of marketing. In spite of the higher benefits of producer's share and higher price per unit of the produce obtained in regulated mandies, the sale of produce in regulated mandies was noted to be much lower being about 48 per cent in case of wheat. It was due to higher transportation

cost, small marketable surplus with the bulk of the farmers, forced sale, location of mandies at a long distance, unawareness about the marketing procedures and several other botherations.

Tuteja and Chandra (2012) calculated gap between prices received by the producers and prices paid by the consumers. Results show that producers received around 49% share of consumer's rupee in case of tomato and around 44% in case of muskmelon under TMC. These shares were around 40 per cent and 42 per cent respectively for farmers selling produce through EMC. The remaining share was incurred as the marketing cost and margins of the intermediaries in case of TMC. It is essential to mention that the Reliance Fresh received around 60 per cent and 58 per cent as marketing cost and margins. The calculation of marketing efficiency ratio showed that it was found better under the EMC for both the selected crops.

Kaur *et al.* (2013) conducted experiment in Hanumangarh district of Rajasthan which has highest production under paddy cultivation. On an overall basis, cost of cultivation of paddy (PR 106) was ₹ 31815.16. It had a tendency to increase with increase in the size of holding. The gross return, on an average, was ₹ 75210 and the net income was ₹ 43396.50 per ha. The marketable surplus had a tendency to increase with increase in farm size. Due to immediate cash needs, there was no difference in marketed and marketable surplus. The market analysis of paddy (PR 106) revealed that channel I was more remunerative because farmer's share in consumer rupee was highest (59.48 per cent). The net share of commission agent was 1.13 percent.

The net share of wholesaler was 4.02 per cent share in consumer rupee. The net share of miller was 13.14 percent and the net share of retailer was 2.73 percent. Price spread was maximum in channel II (44.59 per cent) followed by channel I (40.49 per cent). Modified Marketing efficiency measure of channel I was 1.56 followed by channel II (1.24). Therefore, channel I was more efficient than channel II.

## **2.5 Nature and Degree of Competition of market**

Freebairn (1991) examined that because of the high level of concentration of market power on the selling side of the market such a phase of price warfare was unlikely to continue for an extended period. The model indicated that competitive behavior in the international wheat market was to a large extent subject to constrain imposed by domestic agricultural policies. Because of the inward-looking nature of these policies the market was inherently unstable. The continuance of relative price stability and the present approximate balance of supplies and import requirements depend on governments' taking a responsible attitude in their domestic agricultural policies if extended periods of price welfare were to be avoided.

Ghosh (2000) studied that the maximum likelihood method of co-integration, examined the impact of agricultural policy reforms on spatial integration of food grain markets in India. The extent of spatial integration of food grain markets had improved during the post-reform period, as the regional markets, which were either segmented or poorly integrated during the pre-reform period, were found to be strongly integrated, and in most cases to such an extent that satisfies

the relative version of the law of one price. The agricultural policy reforms undertaken by the Indian government seem had contributed towards improving the extent of spatial integration of food grain markets.

Zahid *et al.* (2007) analyzed long run market integration for wheat between central market (Lahore) and five feeder markets (Faisalabad, Sargodha, Gujranwala, Gujrat and Sialkot). The Engle and Granger test of co-integration was applied to analyze long-run market integration between the central market and five feeder markets. The results from the analysis showed that market couples of Lahore-Gujranwala and Lahore-Faisalabad were perfectly integrated with each other in long-run. The rationale behind those integrated markets was better and direct road and rail link, common socio-economic cultures, better flow of information between those markets. The pairs of Lahore- Gujrat, Lahore-Sargodha, and Lahore-Sialkot markets were partially integrated. The reasons behind those partially integrated markets were having some what a long distance, different socioeconomic cultures and minor information flow. Those market pairs did not have any direct road and rail link for transportation of commodities. The study revealed that Government should develop infrastructure among major markets, especially roads and rails and should improve flow of information.

Shenoy (2008) determined whether the price of wheat in India converges to the world level. Using monthly prices from the United States of America, Canada, Australia, Argentina, and India over a period of thirteen years, looked for evidence of co-integration among the series. Co-integrated series follow a common stochastic process, and thus could be

said to move together. Also found that the world wheat trading centers were integrated, with Australia being the most dominant. The study also revealed that the Indian market adjusts more slowly to a new equilibrium, but the total magnitude of adjustment was greater. Possible explanations include poor infrastructure, regional segmentation within India, and high levels of government intervention.

Abrham (2009) stated an informed policy decision in regards of improving the performance of the agriculture marketing system needs an updated information on the – existing structure, conduct, and performance – of the market. Some attempts were made by some scholars on the subject reflecting the conditions prevailing after the introduction of country’s economic reform and market liberalization. They provided useful information on the organization and functioning of the grain market system. However, the impacts of the growing role of cooperatives and improving infrastructure were not grasped in these studies, and they did not represent the situation in all regions. These new developments might have introduced a new organizational structure in the marketing system.

Anonymous (2010) described several key supply chains and factors that influence market power in the supply chain. The Researcher considered that competition and efficiency concerns were only likely if horizontal competition was weak at any of the vertical stages, resulting in sellers having market power at that stage. The fact received that little firm evidence of such a situation prevailing at any level below the retail level, but had not been able to investigate all market participants involved with the supply chains for the thousands

of standard grocery products. Competition concerns may also arise if buyers had power on the demand side of the market. Thus, assessment of the supply chain involved an examination of the vertical relationships that exist between buyers and sellers, particularly between growers/suppliers and retailers/wholesalers.

Singh and Suhag (2010), conducted a study for Haryana by using secondary data from 1965-2006. Result showed that the market arrivals of wheat, market arrivals were about 48.6 per cent of production in 1995-96 which significantly increased to 52.03 per cent during 2005-06.

Ghosh (2010) revealed that in India the degree of market integration depended not only on agricultural policy reforms but also on the level of transaction costs determined primarily by transport and communication infrastructures, storage facilities, and contract enforcement mechanisms. The government could promote agricultural growth and ensure stability in food grain prices by limiting its direct intervention in the agricultural markets, but increasing its attended to improve physical and institutional infrastructures. Reliance on direct intervention of the government in the markets could be reduced significantly, if the government promotes efficient trading of agricultural commodities by liberalising the markets, improved the transport and communication networks, and provided storage facilities and short- and long-term finances to private traders

Villafuerte (2011) stated that the price transmission between markets was mostly interpreted as providing insights into the market's infrastructure efficiency and transaction costs. The present study pointed out the

distance between markets as one of the possible factors. However, the distance was closely related with other elements, such as road quality and the proximity to an export point, affected transportation costs, opportunity costs and thus the integration. Therefore, what the most important factor was when determining the relationship among markets remained unclear. The cointegration framework, OLS and principal component regressions were applied in order to investigate the influence of geographical distance on the cointegration relationship between Brazil's rice markets. In response to changes of the agricultural policies during the period of investigation, the presence of multiple structural breaks in the long run equation was allowed. The results highlighted a weak, negative and significant relation between distance and the elasticity of cointegration. Moreover, the region in which the market was located and a better access to export points were the main variables which defined the strength of the price transmission.

Acharya *et al.* (2012)<sup>b</sup> studied the market integration and price transmission in India. In the case of wheat and explained that the wholesale, retail and primary market prices at first difference were integrated when linear trend was excluded from the unit root test. There was, in general, a long-term equilibrium relationship in domestic wheat markets. Delhi wholesale market was integrated with Mumbai, Hyderabad and Bangalore wholesale markets, and the direction of price signal is from Delhi to others. Further, Bangalore and Hyderabad were integrated with Chennai, with price signals flowing from Bangalore and Hyderabad to Chennai. Nearly 11 to 15 per cent of divergence in prices was

corrected within each month. The speed of adjustment was faster from Hyderabad to Chennai and from Delhi to Mumbai. In the short-run, price shocks were contemporaneously transmitted in these markets, but not fully. The price transmission in wheat wholesale markets was asymmetric. The integration of wheat retail markets was the same as that of wholesale markets. All the four primary wholesale wheat markets were, in general, integrated and behave in the same way as observed for wholesale markets. There was a long-run equilibrium relationship between prices in the wholesale markets and those at the farm gates. The price change in Delhi wholesale market caused almost an equal change in prices in the primary wheat markets. The speed of adjustment in primary market prices, in response to changes in wholesale market prices, was quite high and up to 57 per cent of divergence was corrected each month. The nature of price transmission from Delhi wholesale to Karnal and Moga primary markets was symmetric and to Amritsar was asymmetric.

Ghoshray (2012) applied the momentum threshold autoregressive (M-TAR) model; this study examined the relationship between the various prices of wheat quoted at different market centers in four Indian states. Also found evidence of M-TAR asymmetric adjustments of wheat prices, indicating that price signals within states were transmitted over time in an asymmetric manner. This type of price adjusting behavior was consistent as to how price differentials may respond to poor dissemination of knowledge regarding market conditions and high transactions costs. The results offered important policy implications.

## **2.6 Value Addition in wheat**

Gurusharan (1995) studied the export marketing of Indian wheat. Wheat consumed in the form of roti, puri, paratha or suji halawa prepared from atta, maida or suji. In the North, 76% per cent of the households ate more than 40 kg wheat products per month, whereas in the south 75 per cent of the households ate less than 5 kg per month. Per capita consumption of wheat was 5.5 kg per month for India. There was tremendous scope for pasta products in the domestic as well as global markets. There was an estimated 15 million tones of milling capacity in India. The utilization capacity of these flour mills was hardly 50 per cent. The main bakery products were biscuits, bread and cake/pastry. Total requirement of wheat by the bakery industry is around 1.5 million tones and was expected to increase to 2.86 million tonne by 2001 AD. The total exports of bakery products during 1990-91 were 560 tones which increased to 1544 tones in 1991-1992 valued at 40.8 million. The exports could be improved further if the manufacturer were supplied wheat at the international market price.

Bhatnagar (2000) showed that procession of raw material for value addition is still at a very level less than 2 per cent as compared to 25-60 per cent in developed countries. To boost the growth, the government and the industry have to work in close union. The growth potential of India's food industry is enormous, which food habits changing rapidly towards value added foods, the India's food processing industry was on the brink of revolution that will modernized the entire food chain.

Anonymous (2002) revealed that marketing of products was more remunerative than raw commodities, farmer processor linkages are needed to add value as per demands of the consumers. There was a great scope of developing some of our traditional food items from cereals, fruits, milk and fish. Appropriate and cost-effective packaging technology for these items was needed to ensure safety and prolonged shelf life. Agriculture was fast becoming demand driven from the earlier supply driven situation. For the foodgrains like wheat and rice, government support in the form of assured purchase as done in past will not be the same in years to come. Farmers will have to grow specific varieties needed for processing or add value to their produce. Policy and legislation must be reformed to allow processors to purchase their produce requirement directly from the farmers.

Bagade *et al.* (2002) carried out study in the Chandrapur district of Vidarbha region. Five paddy processing units were selected for the study. The study revealed that for the poha processing unit operated for 0.60 days in a year having per day plant capacity of 6.4 quintals. The actual poha obtained from annual capacity 4028 quintals of paddy processed it was 2030.21 quintals. For one quintal of poha obtained, the maintenance of electricity consumption charge was incurred of ₹ 7.85 and ₹ 74.75, respectively. The labour employed for 330.60 days for getting 2030.21 quintal poha. The per quintal processing of paddy the charge ₹ 8.00. The indirect cost was constituted to ₹ 6.38 per quintal. Per quintal actual cost of procession of paddy procurement was 93.59 per cent in the cost of procession of ₹ 983.16 per quintal net returns to cost were obtained to 1:1:62 and this was a

profitable business. The study clearly indicated the economic benefit of value addition by the procession of rice. An addition income of ₹ 308.42 per quintal paddy could earn even if the price of poha is very low. They suggested that the establishment of paddy grower co-operative societies for assembling paddy and procession should be developed in Chandrapur district.

Martin *et al.* (2002) compared the relative value adding done to non-durum wheat in Western Canada vs. the northern tier states in the US. It contained average wheat production (all non-durum wheat) in Western Canada and in the northern US for 1997 to 2001. It also contained an estimate of the proportion of the wheat processed in each region relative to the region's wheat production. This estimate was in turn based on estimates of the amount of milling capacity in each region as reported by the CWB (for Canada) and Grain and Milling Annual 2002 (for the US). Milling capacity for the US was reported on a daily basis, and the assumption is made that mills run at full capacity 5 days a week, 52 weeks a year. It would appear that the proportion milled in the US states was twice to three times as high as in the Prairies. Per capita flour consumption in 2000 was approximately 71.4 kg in Canada and 64 kg in the United States (Statistics Canada, US Department of Commerce). Another interesting comparison was the proportion of durum that was processed in the northern tier US states and the Prairie Provinces. It was calculated in the same way as above. Again, the proportion was higher for the US states.

Sekhon *et al.* (2003) studied the rice processing industries in Punjab and concluded that there was

tremendous growth in the number of rice mills both at the national and state levels. It was observed that various techniques were used for paddy milling in the state. The net returns were worked out to be ₹ 29.58, ₹ 20.82, and ₹ 8.56 per quintal by rubber roll mills, huller and mini rice mills. The major problems faced by rice mills were poor quality of raw materials due to higher moisture of paddy through harvest combines, delay in announcing levy prices by the Central Government, demand for gratification while accepting rice by procurement agencies etc. public agency on the other hand faced difficulties in getting their paddy milled at proper time.

Spencer (2004) reported that flour products were a major consumer product group derived from grain products, where there was reasonably recognizable identity of product between farmgate and retail. Flour was the key product line for the Australian wheat industry in terms of domestic processing. However, the packet flour market is only a small component of overall flour usage. Packet flour accounted for only 5 per cent of flour manufacturing. As such, the packet flour market has a relatively small influence on overall miller profitability and trends through the chain. About 95 per cent of packet flour sales were through the supermarket channel. Private label represents about 30 per cent by value but almost 50 per cent by volume. Specialty grains were estimated to be 5 per cent of the volume of wheat used. The average net selling price achieved by the domestic miller/marketer and the farmgate return based on average prime white grade wheat delivered port prices adjusted to farmgate. In branded product there was little relativity between retail prices and the wheat or flour price.

Brahamprakash (2006) had described that India produced more than 200 million tones of different food grains every year. All major grains – rice, wheat, maize, barley and millets like jowar (great millet), bajra (pearl millet) & ragi (finger millet) were produced in the country. About 15 per cent of the annual production of wheat is converted into wheat products. There were 10,000 pulse mills in the country with a milling capacity of 14 million tones, milling about 75 per cent of annual pulse production. The country was self sufficient in grain production and is the second largest rice producer in the world with a 20 per cent global share. Primary milling of rice, wheat and pulses was the most important activity in food grains processing. Total investment in the grain milling sector up to December 2002 was around US\$ 1.5 billion, of which US\$ 253.5 million was foreign investment. Branded rice was becoming popular in both the domestic as well as the export market. Indian Basmati rice commands a premium in the international market. This segment thus offers opportunities in marketing of branded grains, as well as grains processing.

Asmatoddin *et al.* (2008) explained the bakery industry occupied an important position among Indian food processing industries. The per capital consumption of bakery product was about 2.5 kg per year as compared to 15 kg in other developed countries indicating greater potential for industry as compared to present situation. The survey was conducted in Parbhani city during 2004-05 to study economics of bakery and confectionary industries in Parbhani city. Data were collected from 45 bakery firms viz. Small medium and large. The results revealed that overall total cost of bakery firm was ₹ 12.23 lakh. Gross return per bakery firms was ₹

7.70 lakh. The overall operational income was ₹ 8.27 lakhs. The net income of bakery firm was ₹ 5.47 lakh at overall level. The output input ratio was increasing with an increase in size of bakery firm. At over all level, it was 1.44 i.e. on investment of one rupee the profit was ₹ 1.44 rupees.

Singh *et al.* (2008)<sup>a</sup> examined the economic analysis of production constraints in wheat crop: A case of north-western India. They revealed that the yield gap was 785 and 895 kg/ha in rice-wheat and cotton-wheat system the yield of which could increase up to 17.86 and 19.12 per cent, respectively. In rice-wheat system, the economic loss due to constraints was ₹ 4788.5 crores. The figure for cotton-wheat system was ₹ 8189 crores. The most important constraints in term of loss in yield were Phalaris minar and late sowing of wheat.

Anonymous (2009) studied the India's trade in various segments in the Food Processing Sector had seen a good growth driven by the Mango Pulp, Dried and Preserved vegetables, Pickles and Chutney in F&V, Buffalo Meat in the Meat and Poultry, Basmati Rice in Grains and Shrimp in the Fisheries segments. India's exports, as is the case globally, are to the proximate geographies led by South Asia at 34 per cent and USA & Canada a poor 1 per cent of total exports. And also found that a dynamic Food Processing sector will help India ensure higher value addition to agricultural produce, generate employment, improve farmer income and create markets for domestic consumption and export of agro foods. Food processing industry in India is supported by a great agri-climatic diversity suitable for round the year cultivation of crops. In terms of production, India is among the world's

major food producers – India accounts for 17 per cent animal, 12 per cent plants and 10 per cent fish genetic resources of the globe; and 16 per cent of cattle, 57 per cent of buffalo, 17 per cent of goats and 5 per cent of sheep population of the world.

Khan (2012) studied in India about 90 per cent of wheat was consumed in the form of chapattis and 10 per cent as bread, biscuits, buns and other bakery products. The bread and biscuits manufacturing in India was reserved for small scale sector. The production of bread in both organized and unorganized sectors was estimated to be 14 lack tones and 10 lacks tones, respectively. Out of total biscuits manufactured in India, nearly, one third was in organized sector and remaining two thirds in the small and unorganized sector. The study was undertaken in the year 2009-10 & 2010-11. Multistage sampling design was adopted for selection of city, areas and the quality products i.e. yeast leavened and flour confectionery the appropriate statistical technique was used to draw the valid inferences like Tabular analysis, frequency, standard error, standard deviation, coefficient of variation and percentage method were used to analyse the data Result revealed that the cost of raw material utilized in production at different size of bakery firm industry viz. small, medium and large, were ₹ 5.95, ₹ 14.30, ₹ 30.30 lakh where as expenditure incurred on fixed cost was ₹ 0.59, ₹ 2.43 and ₹ 3.46 lakh respectively and variable cost contribute to small, medium and large firm were ₹ 6.72, ₹ 8.41 and ₹ 36.82 lakh. In case of flour confectionary product result revealed that the cost of raw material used in production at different size of bakery

industry viz. small, medium and large were ₹ 9.83, ₹ 26.46 and ₹ 62.80 lakh respectively.

Anonymous (2013) explained the wheat production in the country has increased to more than 73.53 million tonnes. Burr mills (chakkis) were very common for milling of wheat in rural and urban areas. Uttar Pradesh, Maharashtra, Karnataka, Tamil Nadu, Andhra Pradesh, Bihar, West Bengal, Punjab, Haryana, Madhya Pradesh, Assam, Gujarat, Kerala have the largest number of roller flour mills. At present flours made by the roller mills were sold to institutional buyers like defense, hotels etc., and the household purchase was limited to only 1.0 per cent due to absence of open policy for sale of wheat flour through public distribution system. Sale of soy blended and branded wheat flour is likely to increase due to better quality flour and thus scope of organized wheat milling will increase in future.

Kumar and Nain (2013) studied the agriculture scenario and explained that value addition was the sunrise sector. The average growth had doubled from 7 per cent in 2004 to 14 per cent in 2010. Food processing sector has a huge potential. Provision of efficient supply chains and processing infrastructure could do miracles in terms of employment generation and creation of productive assets in rural areas. Mega foods park (MFP's) scheme, a flagship scheme of the ministry of food processing facilitates establishment of a strong infrastructure backed by efficient supply chains. MFP's had the potential to revive the agriculture in surrounding areas by increasing returns for farmers, besides creating large employment opportunities in rural areas.

## **2.7 Problem faced by farmers in production, and in marketing, and in Value addition unit of wheat.**

Gill (2000) revealed that 7-10 per cent post-harvest losses from farm to market level and another 4 -5 per cent from market to distribution level resulted into loss of 12 to 16 million tonnes of food grains as a whole. Storage function was another major culprit for food grain losses in the form of theft and damages besides the leakages.

Singh (2000) observed that the post-harvest quantitative and qualitative losses occurred to the stored food grains due to physical factors (temperature and moisture), biological factors (insects, micro-organisms, rodents, birds and mites), chemical breakdown along with mechanical factors and pesticide use. It was estimated that about 10 per cent of the food grains were being lost due to conventional means of storage at the farm level. Thus problems relating to post harvest handling and storage of food grains need to be addressed on priority.

Mathur *et al.* (2001) examined the status of technology adoption, yield gaps and production constraints in rice and wheat in the plains of North-Western Uttar Pradesh. The constraints, which stood as a barrier to raise the productivity of rice and wheat, were examined through farmer's response survey. The result of the study indicated that the farmers faced constrains like non-availability of vital inputs such as HYV seeds of rice and wheat, fertilizers and plant protection chemicals, etc. the farmers of the region lacked familiarities about knowledge of soil testing, optimum dose of fertilizer application. Therefore, suggested that the

existing extension agencies be strengthened and input supply infrastructure be stem lined so that the farmers may not face constraints either with respect to technical know-how or input availability and augment the productivity of rice and wheat in the study area.

Basavaraja *et al.* (2007) estimated the post-harvest losses at different stages in two major food grains, viz. rice and wheat in India. The post-harvest losses at the farm level had been estimated to be 3.82 kg/ q for rice and 3.28 kg/q for wheat. The losses had been highest during storage in both the crops.

Kumar *et al.* (2007) studied the Indian wheat economy and trade prospects in India with about 70 million tones of wheat production per year from 26 million hectares areas. Consistent increasing domestic consumption of wheat in the past indicates that the wheat demand may grow fairly rapidly with population and income growth. Past observations indicated that with the current rate and nature of economic and population growth, the demand for wheat will grow at about 4 per cent annually. Considering the present level of production growth (2-3 per cent), the demand exceeds the production in intermittent years India's wheat export is plagued with lack of advanced facilities for procurement, processing, storage and transport of the grain. Due to lack of long term concrete policy on wheat exports, nation could not become a player in international market even with huge surplus stocks.

Narayanamoorthy (2007) argues that fall in wheat and rice production is not due to technology fatigue rather due to extensive mono crop cultivation and high use of

fertilizers and faulty agricultural pricing. Lack of allocation of funds to irrigation development after liberalisation during this period net area irrigated remained constant. This poor growth in surface irrigation had compelled farmers to rely heavily on groundwater irrigation. The increased dependence on groundwater irrigation increases the cost of cultivation and depletion of ground water resources and in addition to this credit unavailability for investment on inputs put farmer.

Singh *et al.* (2008)<sup>b</sup> explained that it was difficult to ignore aphids and rust also. The problem of late sowing calls for some technological refinement in sowing techniques of the crop. Zero tillage technology for wheat sowing seems to be a wise option which has already carved a niche for itself and result are quite encouraging. The loss due to social-economic constrains was 146.7 kg/ha in cotton-wheat and 172.12 kg/ha in rice-wheat system, respectively. Among socio-economic constrains, top rank goes to quality of weedicides based on rank based quotient. Then, it was cost of fertilizers followed by seed sector where quality seeds were very costly which farmers were unable to afford. The size of land holding and labour availability were other aspects which need attention.

Hashim (2009) stated that efficiency of market, possibility of its discovery and its expansion depends on hardcore physical infrastructure. The most crucial of which were roads (transport links) and electricity. Electricity supply to rural areas, excepting some regions, was inadequate. Cold storage did not work. Transport links in rural India were weak and therefore, cost of transporting perishables is prohibitive. Fortunately, communication system has improved. Infrastructure, efficient information system and availability of

credit can go a long way in developing markets for agricultural produce without which the next phase of agricultural development will remain stunted.

Amare (2011) found that weather effects are problem of production. Farmers reported that the late starting of rain fall and early ceasing of rain fall had affected their production. Input supply (14%) and diseases (11%) were other production problems. 66 % Information on market price, demand and supply was also mentioned as a problem by 37 % of sample households. The information that farmers got in particular did not assist them in deciding what crops to plant and how much to produce. 36 per cent of sample respondents stated that market distance was also a major problem. Since the existing markets in the wereda are in the towns, farmers have to walk long distances to sell their grains. For farmers transportation system is their pack animals, they couldn't take large amount of grains at a time. Lack of standard measures (16%), price setting (22%), access to transportation vehicle (25%) and lack of market (15%) were other marketing problems of farmers.

Jha and Tripathi (2011) found that there is significant correlation of wheat yield with temperature and more recently with the winter rainfall. The yield of wheat in Haryana and Bihar was regressed on the positive deviation in maximum temperature, square of positive deviation in temperature and also on time trend. Though farmers were adopting certain agricultural practices, replacement of late had sown wheat with other crops by the bulk of Haryana farmers in an example. The scientists for instance need to develop suitable varieties should be available in the market.

The risk management options that address some of the climate change related concerns also needs to be devised in the country. There were many problems faced by farmers in production and marketing as well as in processing of crops such as high cost of inputs, wage rate, transportation, storage, market charges, lack of information etc. traders take advantage of the weakness and ignorance of the farmers because they have full knowledge of the price prevailing in the other market. Therefore famers did not get proper profits as share various constraints, which stood as a barrier to raise the productivity.

Mavia *et al.* (2012) studied the problem of marketing in kinnow and found that Lack of sufficient market information affects operational and market efficiency of the agricultural markets. About 54 per cent of sample farmers and about 57 per cent of pre-harvest contractors reported that the market intelligence system in providing information on market prices of kinnow in important markets of the Punjab was not sound. Of the total sample farmers, 38 per cent reported that perishability of kinnow alone contributed to heavy losses and made kinnow cultivation risk-prone. The post-harvest management accounted for 20-40 per cent of the losses at different stages of grading, packing, storage, transportation and marketing of kinnow. The weak processing infrastructure as it exists today in Punjab has been one of the contributing factors for ineffective utilization of the kinnow fruit. It was reported by about 65 per cent of sample farmers.

Narendra (2012)<sup>c</sup> researched the critical analysis of regulated markets the main problems associated with the farmers in marketing of their produce through regulated

mandies, these included long distance of mandies from their villages, lack of publicity about the advantages and function of regulated mandies, lack of supervision and vigilance in market, lesser attention paid to farmers having small marketed surplus, failure of auction sale, lack of grading and standardization, lack of storage facilities, lack of input centers, higher marketing cost, forced sale, problem of shifting transaction in new mandi yards etc.

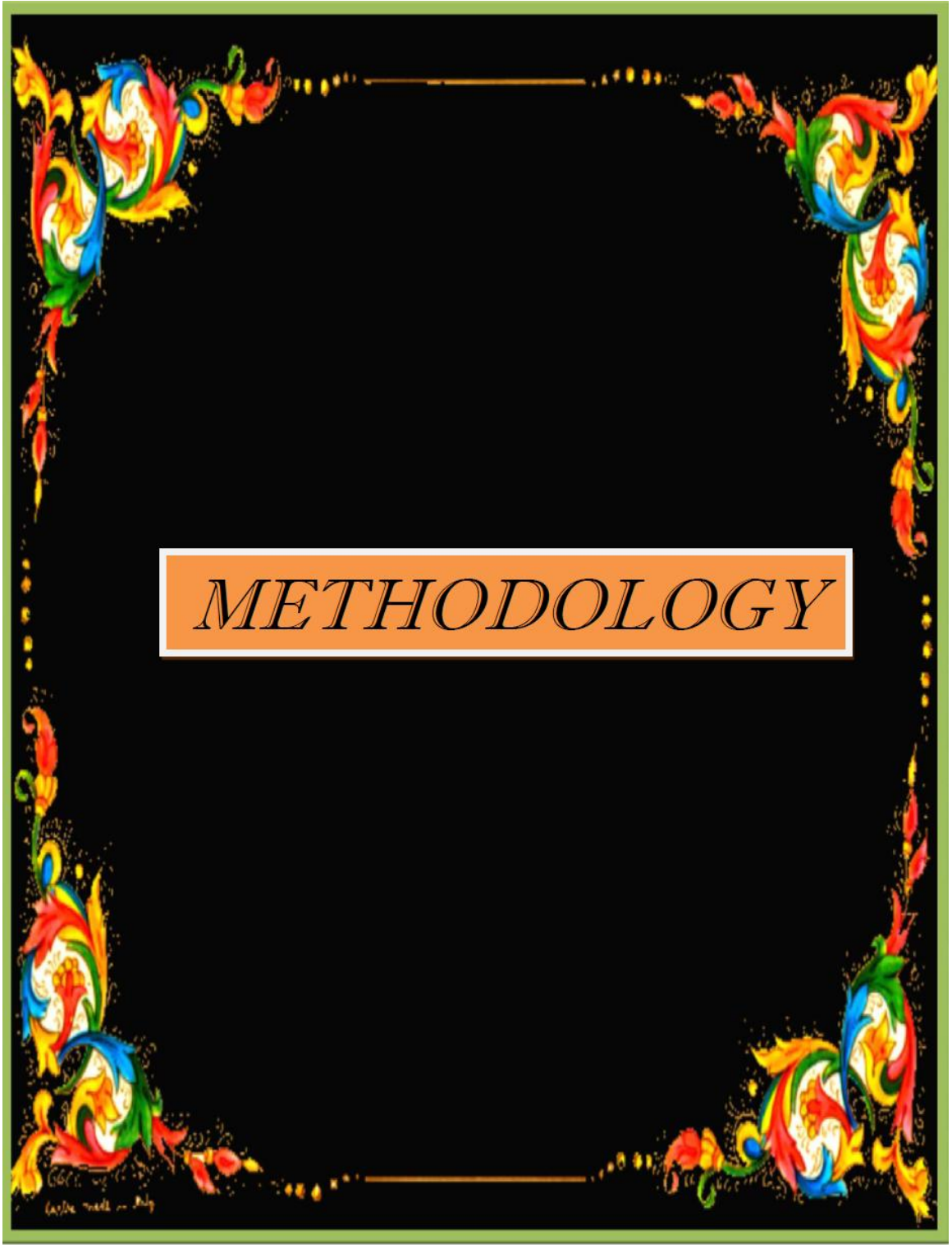
Anonymous (2013) studied the problem in fortification of wheat and rice and found that clear and specific standards for fortification should be developed based on existing global or Codex standards or, where these are not available, using the EAR cut-point method. For wheat and maize flour fortification, recommendations for fortification standards have already been developed based on the best available global evidence, and should guide Member States. For rice fortification, WHO recommendations were under development. Wheat and maize fortification programmes needed to be adequately monitored and quality assured. Millers needed to implement proper internal quality assurance systems in their mills and national governments needed to establish and maintain regular external quality assurance visits to mills to support quality fortification. National governments should also ensure the quality of fortification premix.

Mehta (2013) studied the agro industries' problems and found that inadequacy in the supply of raw material from different sources and poorly developed marketing facilities, lacking financial facilities for running the units, irregular supply of power, access to only poor quality of raw materials,

shortage of skilled labour were the important factor limiting the scope of development of this sector. For the healthy growth of this sector, a remarkable number of 86 percent entrepreneurs of units comprising 90 percent registered and 82 percent un-registered units recommended for reducing the problems of electricity supply though making regularity in its supply in industrial areas. A second majority of 66 percent entrepreneurs of units recommended for minimizing the cost of various machines though providing incentives in its purchases though different sources. Such entrepreneurs were over 82 percent registered and 49 percent un-registered units. Providing financial support in capital investment, procurement of raw material and transportation of goods at selling, initiating protection policy to reduce extent of competition in selling goods, reduction in the rate of various taxes especially VAT imposed on marketing of goods and development of efficient marketing channels and proper marketing arrangements for selling industrial produces were the remaining recommendations of the entrepreneurs of sample units.

Rais *et al.* (2013) studied the detailed analysis of food processing industry in India, its S&T capability, skills and employment opportunities. Food processing industry was slowly and steadily becoming one of the major industries of our economy. Its share in GDP was on continuous rise, with a CAGR of 8.40%, from 2005-06 to 2009-10. There had been a continuous increase in the total plan outlay amount from ₹ 650 crore in 10<sup>th</sup> plan; to ₹ 15077 crore in proposed outlay for 12<sup>th</sup> plan. The sector was growing, but it was yet to compete in the world market. India's share in world export was emerged

with 1.17%. There was a wide gap between productivity and processing of items. The factors which had been used to study food processing industry were S&T capability of sector, its employment generation capacity and skills needed in the sector. The S & T capability segment venture into the changing trend of technology, difference between conventional and modern technology, the areas in which India was lagging behind. The employment generation capacity highlights growth and size of the industry and skills about the kind of human resources involved in the industry, the level of technology used in the sector. The employment generation capacity of the sector is huge, but the industry was not working at its potential. The labor force was highly unskilled, with 80% of them having educational level below 10<sup>th</sup> standard. The impact of a variety of policies and programmes undertaken by government to develop food processing sector has not been very encouraging. The state needs to strengthen its efforts in S&T capability, infrastructure support and skill set in order to develop food processing industry.



*METHODOLOGY*

### III. METHODOLOGY

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The motto of any investigation is to draw the useful conclusion in the light of objectives of the study in order to arrive the meaningful conclusion, it is essential to the investigator to adopt appropriate method an procedure, keeping in this view, this chapter has devoted to explain the methodology adopted to fulfil the objectives of the study. The present investigating was undertaken to study the “Economics of Production, Marketing system and Value addition of Wheat in South Gujarat Region”.

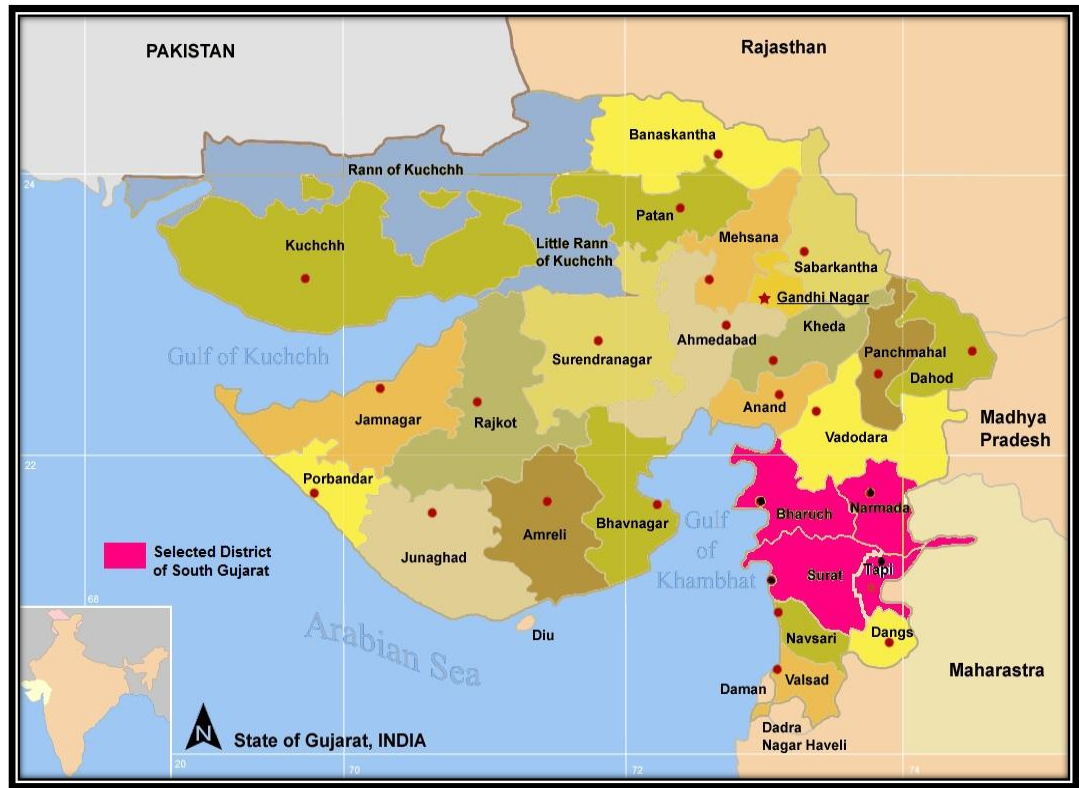
(processing unit)of wheat.

With the brief description of the selection of area and wheat growers selection of sampling technique for the selection of respondents, where and source of data, method of data selection and statistical methods adopted for analysis of data. The various phases of methodology used to carry out study entitled “Economics of Production, Marketing system and Value addition of Wheat in South Gujarat Region" are discussed under the following heads:

- Sampling framework,
- Collection of data, and
- Analysis of data

#### **Sampling frame work**

The state of Gujarat is bounded by Pakistan and the state of Rajasthan in the North and Maharashtra in South and Madhya Pradesh in East and Arabian Sea in the West. The state is situated on latitude  $20.01^{\circ}$  to  $24.07^{\circ}$  North and longitude  $68.04^{\circ}$  to  $74.04^{\circ}$  East lies in the western part of the



**Fig. 3.1: Selected district map of South Gujarat.**

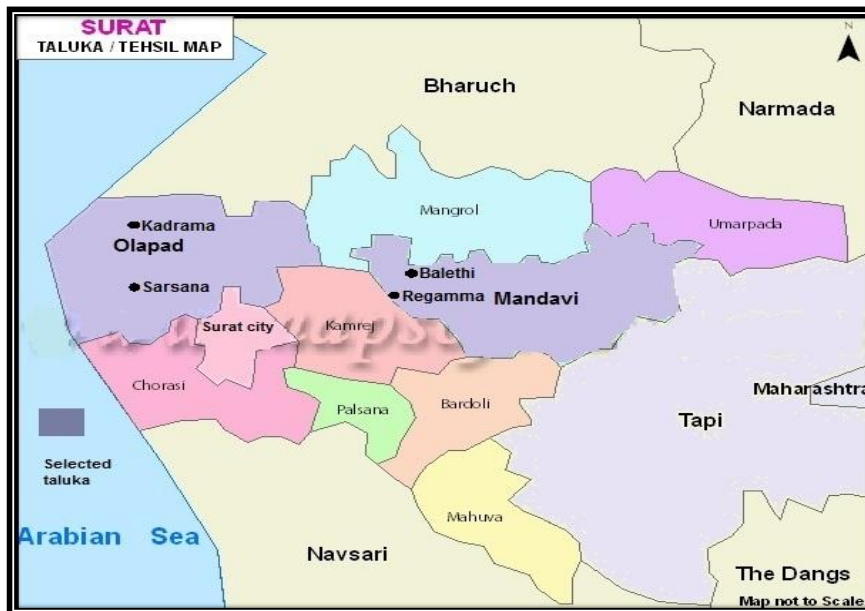
country. It covers an area of 195984 sq. km and accounts for six percent of the total geographical area of the country.

The state of Gujarat comprises of 33 districts. Among these, Bharuch, Narmada, Surat, Tapi, are covered under South Gujarat. It is known for production of wheat in the south Gujarat part. South Gujarat was selected purposively for the present study.

### **PROPOSED PLAN OF WORK**

The sampling frame work and design of study is presented as under:

- I. **Selection of Crops :** The area under Wheat crop was studied in South Gujarat.
- II. **Selection of District:** Four districts namely Surat, Bharuch, Narmada and Tapi were selected purposively on the basis of highest area under crop for the study and shown in table 3.1.
- III. **Selection of Taluka:** To fulfill the objectives of the study, two talukas from each district were selected on the base of highest area under wheat crop. Out of the Surat district, two talukas viz. Olpad, and Mandi, from the Bharuch district, two talukas viz. Vagara, and Jambusar, from the Narmada district, two talukas viz. Tilakwada, and Sagbara , from the Tapi district, two talukas viz. Nizar, and Songadh were selected on the basis of highest area under wheat cultivation. The taluka - wise data of area under wheat crop is given in Table 3.2.
- IV. **Selection of villages:** Two villages from each taluka were selected randomly, thereby, selecting 16 villages which are presented in Table 3.3.



**Fig. 3.2: Selected villages map of Surat district.**

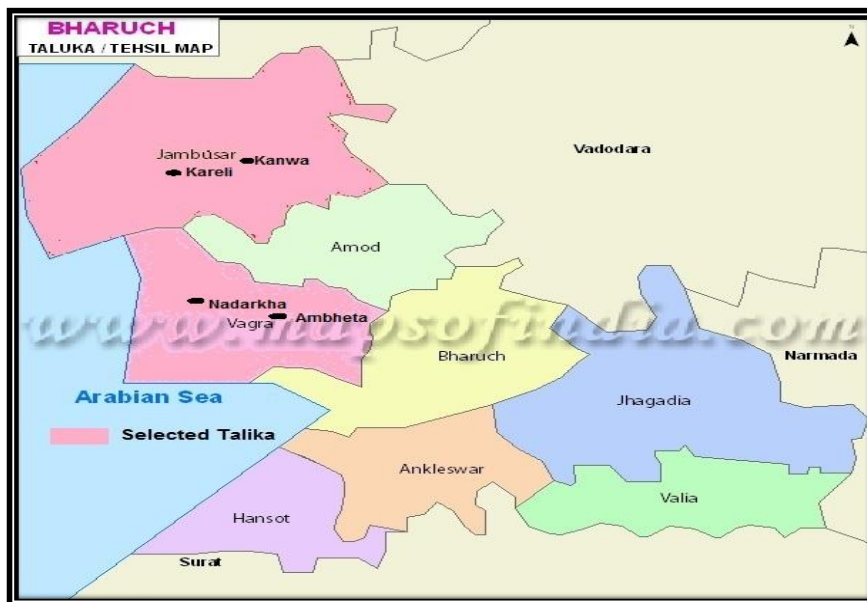
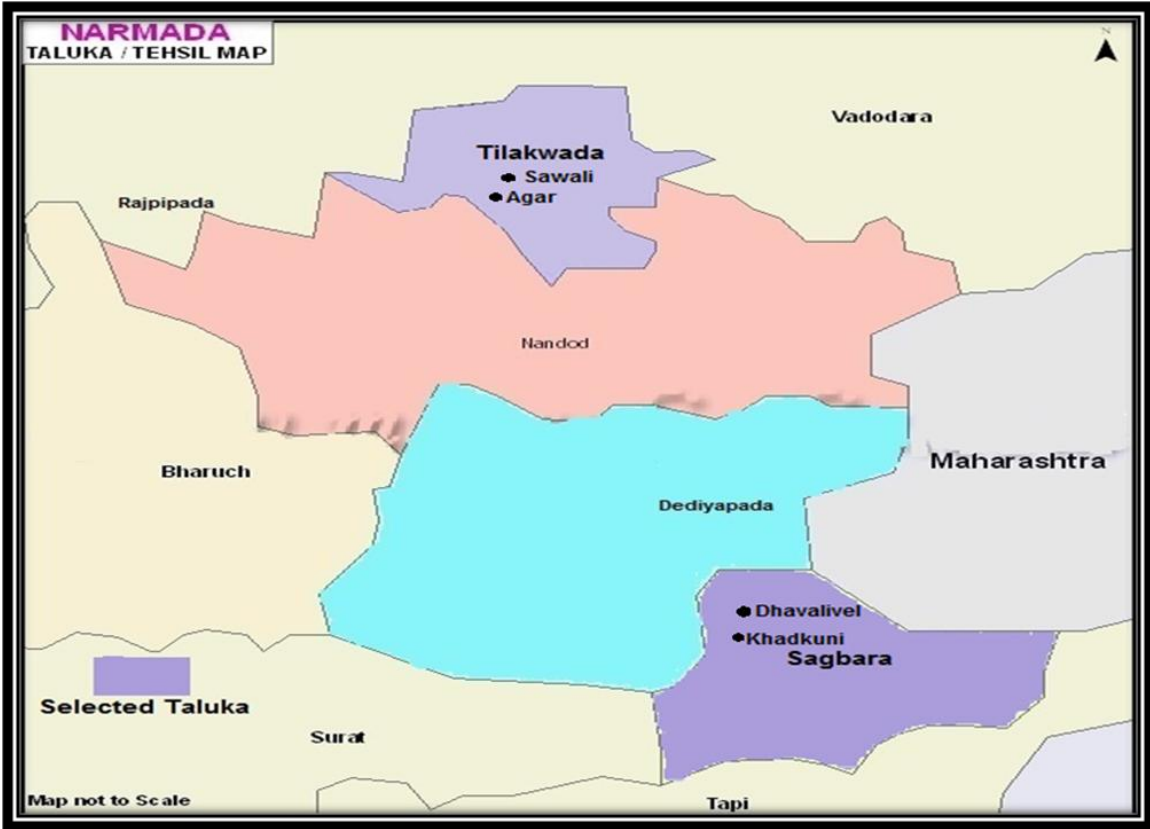
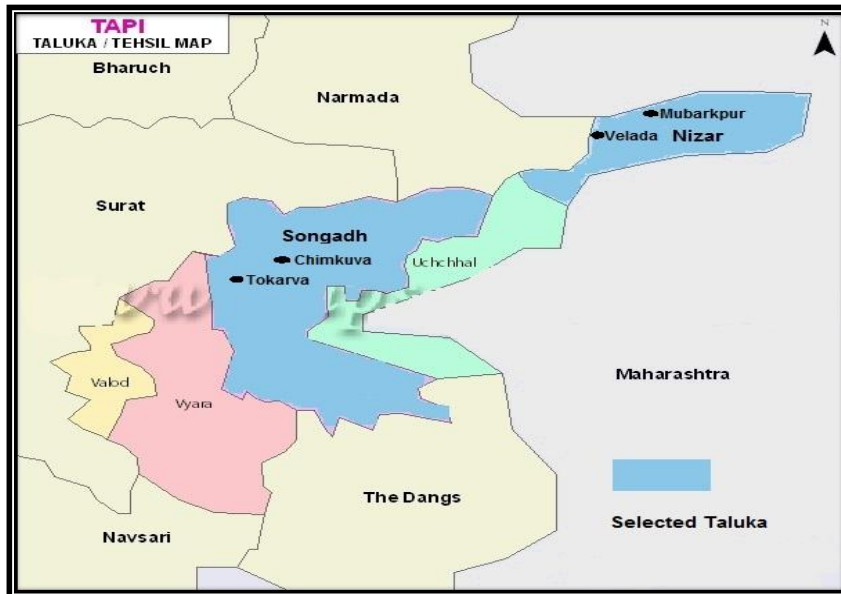


Fig. 3.3: Selected villages map of Bharuch district.

**Fig. 3.4: Selected villages map of Narmada district.**





**Fig. 3.5: Selected villages map of Tapi district.**

V. **Selection of Farmers:** From each village, 15 farmers were selected by PPS method on basis of number of farmers in each size group. Thus a sample of 240 farmers were selected having 96 small, 74 medium and 70 large farmers

The relative share of total of each stratum to the total wheat cultivators of all the 16 selected villages was worked out. Considering size of population and resources, 240 cultivators were selected randomly with proportional allocation from the selected villages. For studying the price spread in marketing of wheat, 5 functionaries (Wholesaler, Retailer, commission agent, wholesaler cum processor etc..) of each type were selected. The primary data required for the study was collected through personal interview with the help of pre-tested comprehensive schedule.

The selected farmers were stratified into their groups on the basis of size of holding viz.

Small size farmers group - 1.01 ha to 2.00 ha.  
Medium size farmers group - 2.01 ha to 4.00 ha.  
Large size farmers group - above (>) 4.00 ha.

#### **Selection of Intermediaries**

Five intermediaries from each market viz. commission agent, wholesaler and retailers were selected, thus making a sample of 60 intermediaries (15 from each selected market).

#### **Characteristics of Selected Districts:**

South Gujarat comprise of Bhruch, Narmada, Surat, Tapi, Navsari, Valsad and Dang districts, dominantly the soils

are very deep, well drained and fine and medium textured they are slightly alkaline, slight to strong saline,. The soil characteristics like soil, depth, soil texture, soil drainage, soil salinity and sodicity district wise is mapped characteristics.

Soil depth in South Gujarat is well distributed in two parts. The solids in western side are dominantly very deep followed by moderately deep and in eastern parts soils are dominantly shallow followed by moderately shallow.

The soils in Bharuch, Narmada, Surat, districts dominantly distributed to very deep soils depth class followed by shallow depth moderately deep soils are also observed, where as in Tapi district the soils depth are dominantly shallow followed by very deep. Soil of south Gujarat varies from fine to medium texture, well drainage, and belongs to sever to slight salinity class.(DOA, Gandhinagar).

**Table3.1: District-wise triennium average area under wheat in Gujarat. (Area in Ha.)**

Sr. No.	District of south Gujarat	Year			triennium Average
		2006-07	2007-08	2008-09	
1	Bharuch	2284.00	1930.00	2726.00	2097.00
2	Dang	0.00	3179.00	2503.00	2876.00
3	Narmada	1908.00	3179.00	2503.00	2843.33
4	Navsari	2796.00	3179.00	2503.00	2747.00
5	Surat	2482.00	1947.00	2264.00	2632.67
6	Tapi	0.00	0.00	2503.00	2851.67
7	Valsad	2265.00	3179.00	2503.00	1612.00

(Source: Dept. of Agriculture, Gandhinagar, 2012)

**Table: 3.2- Taluka-wise last three year Average of wheat area of Selected district. (Area in Ha.)**

Name of District/ Taluka	Area			Average	Rank
	2010-11	2011-12	2012-13		
<b>Surat District</b>					
Olpad	2500	2480	2966	2648.67	<b>1</b>
Choryasi	1700	570	486	918.67	
Bardoli	45	220	394	219.67	
Kamrej	355	200	154	236.33	
Mandavi	500	1021	1316	945.67	<b>2</b>
Mangrol	775	780	894	816.33	
Umarpada	230	340	461	343.67	
Mahuva	25	170	230	141.67	
Palsana	23	80	150	84.33	
<b>Bharuch District</b>					
Ankleshwr	1560	2500	2400	2153.33	
Hansot	1600	2010	2150	1920	
Bharuch	1850	1600	1650	1700	
Vagara	3750	2960	5140	3950	<b>2</b>
Amod	1525	2240	2850	2205	
Jambusar	3100	5900	5370	4790	<b>1</b>
Jagadiya	2000	2150	1940	2030	
Valiya	1400	1825	1950	1725	
<b>Tapi District</b>					
Valod	150	110	163	141	
Vyara	326	430	620	458.67	
Songadh	715	802	830	782.33	<b>2</b>
Uchhal	255	498	654	469	
Nizar	3900	3200	2709	3269.67	<b>1</b>
<b>Narmada District</b>					
Nandod	440	410	551	467	
Tilakwada	175	876	1038	696.33	<b>2</b>
Sagbaara	259	1117	1045	807	<b>1</b>
Dediyapada	470	730	885	695	

(Source: JDA office, Baroda and Surat, DOA, Gujarat)

**Table: 3.3 -Distribution of farmers according to size groups of selected districts of South Gujarat. (N=240)**

Sr. No	District of south Gujarat	Taluka	Villages	Size of Groups			
				Small	Medium	Large	Total
1	Surat	Olpad	Sarsana	1.00	7.00	7.00	15.00
			Kadrama	2.00	6.00	7.00	15.00
		Mandavi	Reggama	4.00	9.00	2.00	15.00
			Baethi	8.00	5.00	2.00	15.00
2	Bharuch	Vaghara	Nadarkha	9.00	3.00	3.00	15.00
			Ambheta	7.00	3.00	5.00	15.00
		Jambusar	Kareli	10.00	4.00	1.00	15.00
			Kanwa	6.00	5.00	4.00	15.00
3	Tapi	Songadh	Chimkuva	3.00	5.00	7.00	15.00
			Tokarva	3.00	4.00	8.00	15.00
		Nizar	Velda	6.00	5.00	4.00	15.00
			Mubarkpur	6.00	4.00	5.00	15.00
4	Narmada	Sagbara	Dhavalivel	9.00	3.00	3.00	15.00
			Khadkuni	6.00	5.00	4.00	15.00
		Tilakwada	Sawali	9.00	4.00	2.00	15.00
			Agar	7.00	2.00	6.00	15.00
	Total	-	-	96.00	74.00	70.00	240

(Source: Field Survey)

## **Nature and Sources of Data**

Primary as well as secondary data were collected for the proposed study. The primary data were collected by survey method adopting personal interview of the selected wheat growers with the help of well developed questionnaire. At the time of survey the aim and objective of the study were explained to respondents with a view to obtaining correct information. The fact is that wheat growers furnished the data mostly from their memories recall. But care has been taken through cross check for the accuracy. Information regarding cost of cultivation, returns and inputs used in production of wheat was collected from farmers on the structured and pretested questionnaire by personnel interview. The information about marketing of wheat, price received and cost incurred in marketing was collected from farmers, commission agent, wholesalers and retailers. Their channels of marketing were identified. The secondary data were collected regarding area, production and productivity of wheat crop of selected districts and the state from Agricultural Co-operation Department, Government of Gujarat. An attempt has been made to analyse the compound growth rate of area, production and productivity from 1992-93 to 2011-12.

### **Analysis of data:**

For the purpose of assessing the objectives of the study, following analytical tools and statistical techniques were used.

- 3.1. Simple tabular analysis.
- 3.2. Compound growth rate.
- 3.3. Cost concepts.

- 3.4. Resource use efficiency.
- 3.5. Marketed and Marketable surplus.
- 3.6. Marketing channel, cost, margin, price spread, and producer's share in consumer's rupee.
- 3.7. Marketing efficiency of South Gujarat markets of wheat.
- 3.8. Degree of Concentration of main wheat market of Gujarat.
- 3.9. Cost concept and B.E.P of Value addition unit of wheat.
- 3.10. Problem faced by farmers in production, and in marketing, and in value addition unit of wheat.

### **3.1 Simple tabular analysis:**

The data collected were presented in tabular form to facilitate easy comparison. The techniques of tabular presentation were employed for finding the economics of selected farmers. Absolute and percentage forms were used for tabulation of the collected data.

### **3.2 Estimation of Compound growth rate**

One of the objective was to study the performance of wheat in South Gujarat Region. The performance of wheat was examined by studying.

- 1) Growth rate of area, production and productivity.
- 2) Degree of instability in area, production and productivity.

The compound growth rates of area, production and productivity of wheat crop, data were collected for the last 20 years were worked out by exponential function of the farm (Kuthe, 2012).

$$Y = a \cdot b^t u_t$$

by taking logarithm of both sides, the equation taken the linear form

$$\log Y = \log A + x \log B + \log u_t$$

on writing  $\log A = a$  and  $\log B = b$  and  $\log Y = y$ , the equation becomes

$$Y = a + bx + u_t$$

Where,

Y = Area/production/productivity of wheat

a = Intercept

b = Regression coefficient

t = Time variable

$u_t$  = Disturbance term

The compound growth rate

$$(r) = (B-1)*100$$

The standard error of the CGR were calculated using the formula.

$$S.E (r) = \frac{\log B}{\log 10^e} \frac{\sqrt{[\sum \log Y^2] - (\log Y)^2 / N} - [\sum x^2 (\sum x^2) / N] (\log B)^2}{(N - 2)[\sum x^2 (\sum x^2) / N]}$$

Where,

$\log 10^e = 0.4343$

N = Number of observation

Student t test were used for testing the significance of the compound growth rate

$$t = \frac{r}{S.E (r)}$$

Where,

r = compound growth rate

S.E (r) = standard error of compound growth rate

**Degree of instability:**

The degree of instability in area, production and productivity of wheat for different period was measured by using coefficient of variation.

$$cv = \frac{\sigma}{\bar{x}} \times 100$$

Where,

$$\sigma = \text{standard deviation} = \sqrt{\frac{\sum(x-\bar{x})^2}{n}}$$

$\bar{x}$  = Arithmetic means

X = The observed values of the sample

n = Number of sample

**Economics of wheat production:****3.3: Cost concepts**

The cost concepts of wheat were worked out by using various cost concepts as defined below, these cost concepts defined by CACP scheme, Government of India.

**Estimation of cost**

**(A) Cost A:** It includes

1. Value of hired human labour
2. Value of hired and owned bullock labour
3. Value of hired and owned machine labour
4. Value of seed (both own seed and purchased)
5. Value of manures (owned and purchased).
6. Cost of fertilizers
7. Value of plant protection (insecticide/ pesticide)
8. Value of weeding (including weedicide charges)
9. Irrigation charges
10. Land revenue
11. Interest on working capital

12. Miscellaneous expenses
13. Depreciation

**(B) Cost B:** Cost A + interest on fixed capital + rental value of owned land

**(C) Cost C<sub>1</sub>:** Cost B + imputed value of family labour.

(Note: Family labours were charged at the rate of hired labour charges prevailing in the region. Owned bullock labour, depreciation, machine labours, seeds, FYM costs were taken on the basis of hire rate prevailing in the village.)

**(D) Cost C<sub>2</sub>:** Cost C<sub>1</sub> + 10 per cent of cost C<sub>1</sub> as management cost.

**Cost of production:**

$$\text{Cost of production ₹/ qtl} = \frac{\text{Cost of cultivation}}{\text{Quantity of main product}}$$

**Income measures:** Following income measures were used:

**(i) Gross income:** it is the total value of main product and by-product.

$$\text{GI} = (\text{Q}_m \times \text{P}_m) + (\text{Q}_b \times \text{P}_b)$$

Where,

GI = Gross income

Q<sub>m</sub> = Quantity of main product

P<sub>m</sub> = Price of main product

Q<sub>b</sub> = Quantity of by product

P<sub>b</sub> = Price of by product

**(ii) Returns over variable cost (RVC):**

$$\text{RVC} = \text{Gross income} - \text{Cost } A_1$$

**(iii) Farm business income (FBI):**

$$\text{FBI} = \text{Gross income} - \text{Cost } A_2$$

**(iv) Family labour income (FLI) or return to family labour and management:**

$$\text{FLI} = \text{Gross income} - \text{Cost } B_2$$

**(v) Net income (NI):**

$$\text{NI} = \text{Gross income} - \text{Cost } C_2$$

**(vi) Returns to Mgt:**

$$\text{GI} - \text{Cost } C_3$$

**(vii) Returns per rupee (RPR):**

$$\text{RPR} = \frac{\text{Gross income}}{\text{Cost } C_2}$$

**Procedure for calculation and allocation of costs**

- a) Casually hired labour was valued at prevailing market rate.
- b) Hired labour was valued at actual amount paid both in cash and kind.
- c) Family labour was valued at the rate of permanently hired labour.
- d) Hired machine labour was valued at prevailing market rates paid by farmers. The owned machine labour was valued by quantity of diesel consumed plus depreciation apportioned in the wheat crop on the basis of area under the crop.
- e) Depreciation on implements and machine was worked out by straight-line method at the rate of 4 per cent per annum.

- f) Rental value of owned land was evaluated on the basis of rent paid for similar land in the village.
- g) Interest on working capital was worked out at the rate of 4 per cent for four months.
- h) Interest on fixed capital was calculated at the rate of 10 per cent and apportioned in wheat crop on the basis of area under crop.
- i) Other inputs like seed, fertilizer and manure were valued at prevailing market prices.

### **Functional analysis**

#### **3.4 Resource use efficiency**

##### **Cobb Douglas production function,**

The use of different inputs in production of wheat crop on sample farm was studied. To analyse the resource use efficiency in wheat crop, the different variable used in the production function and log linear production function was good to fit which as under (Khatri, 2004).

The log linear function is used for present study, as under

$$Y = a X_1^{b1} X_2^{b2} X_3^{b3} X_4^{b4} X_5^{b5} X_6^{b6} X_7^{b7} X_8^{b8} X_9^{b9} X_{10}^{b10} u_i$$

Where,

Y = Output in quintals per ha.

a = Intercept

b = parameter regression coefficient

X<sub>1</sub> = Quantity of seed (Kg) per ha.

X<sub>2</sub> = Quantity of FYM cartload (in quintal) ha.

X<sub>3</sub> = Quantity of Nitrogen (in Kg) per ha.

X<sub>4</sub> = Quantity of Phosphorus (in Kg) per ha.

$X_5$  = Hired labour (man days) used per ha.

$X_6$  = Number of sprays per ha.

$X_7$  = Number of weeding per ha.

$X_8$  = Number of irrigation per ha.

$X_9$  = Machine hours (hrs / operation)

$X_{10}$  = Bullock labour (in days) used per ha.

Where  $X_i$  is the variable resources measure,  $Y$  is the output,  $a$  is constant and  $b_i$  estimates give extent of relationship between  $X$  and  $Y$  and when  $X$  is at different magnitudes. The  $b$  coefficient also represents the elasticity of production. The log linear function of Cobb-Douglass was used for present study, because it gave good  $R^2$  and adjusted  $R^2$  than other function like Non-linear function and Quadratic function.

### **3.3.5 Marketable and Marketed surplus**

#### **Marketable Surplus**

This refers to the quantity of produce which can be made available to the nonfarm population, that is, the residual left with the producer/farmer after meeting his requirements for family consumption, seeds, feed for cattle, payment to labour in kind, payment to artisans (carpenter, blacksmith, potter, mechanic), social and religious payments in kind etc deducting from the total quantity available.

This is expressed as,

$$MS = P - C$$

Where,

MS = Marketable Surplus,

P = Total Production,

C = Total requirements.

### **Marketed Surplus**

This is the quantity of produce which the producer/farmer actually sold by the producer (farmer), irrespective of his other requirements.

#### **3.3.6 Marketing cost, Margin, Price spread,**

#### **and Producer's share in consumer's**

#### **rupee**

Market cost and market margin were worked out from the actual data which were collected from market intermediaries. Marketing cost incurred by producers was estimated from the data collected from selected cultivators.

#### **Marketing cost:**

Total marketing cost were estimated by including the cost incurred by producer and by various intermediaries involved in the sale and purchase of commodity till the commodity reaches to the ultimate consumer.

Marketing costs were computed by using following formula.

$$MC_i = CG_i + CP_i + CT_i + CC_i + CM_i$$

Where,

$MC_i$  = Average marketing cost of  $i^{\text{th}}$  wheat

$CG_i$  = Average cost of grading of  $i^{\text{th}}$  wheat

$CP_i$  = Average cost of packing  $i^{\text{th}}$  wheat

$CT_i$  = Average cost of transportation  $i^{\text{th}}$  wheat

$CC_i$  = Average amount of commission paid per  $i^{\text{th}}$  wheat

$CM_i$  = Average miscellaneous cost of  $i^{\text{th}}$  wheat

(all parameter have same unit ₹/qtls)

### **Absolute and per cent margin**

$$\text{Absolute margin} = \text{PRi} - (\text{PPi} - \text{CMi})$$

$$\text{Per cent margin} = \frac{\text{PRi} - (\text{PPi} + \text{CMi})}{\text{PRi}} \times 100$$

Where,

PRi = Total value of receipt (sale price)

PPi = Total purchase value of goods (purchase price) and

CMi = Cost incurred in marketing

### **Marketing margin:**

It refers to difference between the prices prevailing as successive stages of marketing at given period of time. Profits of the various market functionaries involved in moving the produce from the initial point of production till it reaches to the ultimate consumer. The absolute value of the marketing margin varies from channel to channel, market to market and time to time.

### **Price Spread:**

Price spread indicates shares of various agencies involved in the marketing along with the cost incurred by them. The price spread of the produce shows the difference between net price received by the producers in the assembling market and price paid by the ultimate consumers in the retail market. It includes all the market charges incurred by producers, wholesalers and retailers as well as profit margins of wholesalers and retailers.

$$Ps = \frac{Pf}{Pc} \times 100$$

Where,

Ps = Producer's share in consumer's rupee

Pf = Price of the produce received by the farmer

Pc = Price of the produce paid by the Consumer

### **Producer's share in consumer's rupees:**

This indicator is very helpful in deciding the appropriate strategies for reducing the market costs. It is the price received by the farmers expressed as per cents of the retail price (*i.e.* the price paid by the consumer). If it is the retail price the producers share in the consumer's rupee (Ps) expressed as follows

Producer's share in consumer's rupee (Ps)

$$Ps = \frac{\text{Net price received by the producer}}{\text{Price paid by consumer}} \times 100$$

### **3.3.7 Marketing efficiency of South Gujarat markets of wheat.**

#### **Marketing Efficiency**

The modified marketing efficiency suggested by Acharya and Agarwal (2011) were work out as under

$$MME = \left( \frac{RP}{MC + MM} \right) - 1$$

Where,

MME = modified measures of marketing efficiency

MC = marketing cost

MM = marketing margin

RP = Price paid by consumer (Retail Price)

### **3.3.8 Nature and Degree of competition of main wheat market.**

#### **Selection of Market:**

The selection of markets was done on basis of highest arrival of wheat in markets of Gujarat, and from their APMCs, 121 middle men were selected purposively who were trading wheat during the season. Last 5 year's arrival data had been collected from middlemen. Five markets had been selected *i.e.* Sanand, Talod, Jamnagar, Dahod and Bharuch.

#### **Market integration**

For assessment of market integration, following procedure was adopted;

#### **Horizontal Integration**

The extent and nature of competition in marketing of wheat seed were assessed by working out vertical and horizontal integration in the market. The horizontal integration was worked out by counting the number of firms dealing in wheat in the market under the single management *i.e.* number of offices/shops under single ownership.

Concentration of market power in the selected wheat markets were evaluated by arranging the wheat dealing firms in descending order according to the volume of wheat purchases and by working the cumulative per cent.

### **Vertical Integration**

Vertical integration is analyzed by counting the firms performing the number of functions performed by wheat dealing firms in the selected wheat markets *viz.*, as function of wholesaler, commission agent, retailer and processor, etc.

### **Price correlation coefficients**

Price correlation coefficients were worked out among the monthly wholesale prices of wheat for the period of last five year for all the four selected market. The correlation coefficients were tested for their significance from zero by using 't' test and against one by using Fisher's 'z' transformation (S.N.D.) test. The standard normal deviate (S.N.D.) values were worked out using the formula;

$$r = \frac{1}{2} \log_e (1+r / 1-r) \text{ or } 1.1513 \log_{10} (1+r / 1-r)$$

The correlation matrix were worked out for pair of markets.

### **3.3.9 Cost and B.E.P of Value addition**

#### **unit of wheat.**

The value addition due to processing were estimated by deducting the costs of raw material per quintal and cost of value addition unit per quintal from the per quintal gross returns. The simple tabular analysis was used to accomplish the objectives of study.

### **Selection of sample**

South Gujarat region were purposively selected as majority of wheat value addition units are concentrated in the area which are:

- (1) Flour mill,
- (2) Bakery unit

**Table: 3.4 Selection of sample for value addition of wheat.**

Sr. NO	Particular	Surat	Bharuch	Tapi	Narmada	Total
1	Flour mill	5.00	5.00	5.00	5.00	20.00
2	Bakery	10.00	10.00	10.00	10.00	40.00
	Total	15.00	15.00	15.00	15.00	60.00

**Source of data**

The primary data related to value addition of wheat were collected from value addition units in the specially designed schedule by personal interview with the owners of processing units and their staff in selected districts of south Gujarat.

**Allocation of cost**

**Fixed cost**

The fixed cost includes cost of machinery, building, furniture, and wages of permanent employed persons, license fee and taxes. Data on above items were collected separately from each unit. Per quintal fixed cost were calculated for respective category.

**Variable Cost**

Variable cost consists of the expenditure on wages of casual labour, repair, maintenance, interest on working capital, energy charges which includes electricity charges,

telephone bill and storage charges and miscellaneous charges etc. Data on these aspects were collected through interview with the unit owners and bakery owners. The variable cost were divided by the quantity processed per year to obtain the per quintal variable cost.

### **Total cost**

The total cost per quintal comprised of variable cost per quintal and fixed cost per quintal and was calculated by adding these costs together.

### **Marketing cost**

The marketing cost includes marketing charges on raw material and marketing expenses on disposal of final produce which in turn includes loading and unloading charges, weighing charges, transportation charges, brokerage and packing material charges per quintal etc.

### **Estimation of cost and return**

#### **Depreciation**

Depreciation on machinery were calculated by straight line method taking into consideration the purchase value of machinery.

#### **Interest on fixed capital**

Interest on fixed capital were calculated @ 12 per cent on the total capital invested and were charged for one year.

#### **Interest on working capital**

For calculating Interest on working capital, the expenditure on items included in variable cost taken into

consideration. Interest on working capital were calculated @ 12 per cent per annum.

### **Cost of value addition units**

The per quintal gross and net returns were worked out by per quintal raw material while the net returns per quintal were estimated by deducting the total cost incurred by selected unit of flour mills and per unit cost of cultivation for bakery units.

### **Break even analysis**

This concept is important in any business as it indicates minimum level of production necessary for operating the enterprise in short run without loss. The break even point for the production of wheat flour/ bakery unit or biscuit or toast were calculated.

The point at which the two curves *i.e.* Total cost curve and Total revenue curve intersect is called the Break Even Point (BEP) which indicates the level of production at which the producer neither loses money nor makes a profit. The calculation of B.E.P was carried out under following formula. (Khan, 2012.)

$$\text{B.E.P} = \frac{\text{FC}}{\text{PS} - \text{VC}}$$

Where,

BEP = Volume of business or break-even point (tonnes)

FC = Total annual fixed cost (Rs. In lacs)

PS = Selling price / tonnes or receipt realized ( ₹/ qtls )

VC = Variable cost ( ₹/ qtls )

### **3.3.11 Problem faced by farmers in production, and in marketing, and in Value addition unit of wheat.**

Various constraints were faced by the farmers and intermediaries in production and marketing of wheat crop. Problems faced by the value addition unit (processing unit) and marketing of value addition product of wheat were also studied.

#### **Limitation of the study:**

- 1) The area, production and marketing of wheat have not been documented by institution/ Government. Thus, the data on production and estimated requirement suffer from lack of authentic statistical information. APMCs should also increase the storage capacity.
- 2) Since the data were collected by survey method, the inherent lacunae associated with its type of enquiry have crept in to the study, even though the estimates were provided by the memory recall memory due to the non-maintenance of the farm records. Sincere efforts have been made to elicit accurate and reliable information as far as possible. The discrepancy, if any, would be negligible as the estimates presented are in averages.
- 3) It may be however, be emphasized that the findings of the study need not be generalized beyond the boundaries of the area under investigation and applicable to other areas having similar agro-climatic and socio, economic conditions.



*RESULT*  
&  
*DISCUSSION*

## IV. RESULTS & DISCUSSION

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The findings of present investigation was on “Economic analysis of production, marketing and value addition of wheat in south Gujarat” presented in this chapter, after necessary tabulation and analysis of data in keeping the objective in view. The findings of the study are discussed in following heads.

- 4.1. Performance of wheat crop in Gujarat
- 4.2. Economics of wheat crop production and resource use efficiency
- 4.3. Marketable, marketed surplus and marketing system of wheat crop
- 4.4. Marketing channel, marketing cost, margin, price spread, and producer’s share in consumer’s rupee, marketing channel and marketing efficiency in marketing system of wheat crop
- 4.5. Nature and Degree of Competition of market
- 4.6. Cost and BEP of value addition in wheat
- 4.7. Problem faced by farmers in production, and in marketing, and in value addition unit of wheat

### **4.1 Performance of wheat crop in Gujarat**

The knowledge about performance of growth trend in area, production and productivity is an important ingredient of perspective planning and policy decisions. Production of a crop is a resultant function of area and

productivity of the crop. The knowledge about the contribution of area and productivity in the production of a crop is of immense value in taking of policy decisions pertaining to future productions.

#### **4.1 Growth rate of area, production and productivity of Wheat in Gujarat.**

The analysis of growth and performance of wheat in the selected districts of south Gujarat region was pertinent to take a resume of the selected districts during the study *Period 1992-93 to 2011-12* in respect of certain specific parameter would strengthen the analysis of determinants of good growth or slow or poor growth of wheat crop under study.

Gujarat and south Gujarat region has classified into different period *i.e.*

- (1) Period-1: 1992-93 to 2001-2002.
- (2) *Period-II*: 2002-03 to 2011-12.
- (3) Overall period: 1992-93 to 2011-12

Growth rates of area, production and productivity of wheat crop in the Gujarat and South Gujarat has been presented in Table 4.1. The estimates of growth rates revealed that wheat production increased significantly in the state at a compound rate of 2.40 per cent per annum. Among the periods, production of wheat crop increased significantly by 4.72 per cent per annum in period-II while, in the period-I, it declined by 1.85 per cent per annum. Similar trend was observed in South Gujarat region. Production of wheat in South Gujarat increased by 5.93 per cent per annum during the year 1992-93 to 2011-12. The production growth increased significantly in *Period-II* as compared to period-I.

Some agricultural economist revealed that the main problem was the growth performance of the Indian agriculture had decelerated significantly after the opening up of the economy. Since agriculture continues to be the largest sector of the economy in terms of employment, the deceleration of growth of this sector has serious implications for the living standard of agricultural workers both farmers and agricultural laborers.

The growth rate of agriculture production was generally judged by the performance of food grains and non-food grains production. From these two items of agriculture production of food grain particular wheat was significant due to two reasons. Firstly, it provides the base for subsistence by supplying as staple food items and secondly, it was the only group of agricultural produce, where Green Revolution was introduced firstly and more successfully. Its importance has also increased due to the inception of World Trade Organization (WTO) in 1995 and therefore, in the present study we concentrate on self over the production. At the time of independence agriculture occupied the most dominant place in the Indian economy by providing livelihood to about 70 percent of population and contributing about 48.6 percent of GDP (Sharma, P.N., 2005).

**Table 4.1: Compound growth rate and stability of wheat crop during year 1992-93 to 2011-12**

Particular	Area	Production	Productivity
<b>(A) CGR (% per annum)</b>			
<b>South Gujarat</b>			
<i>Period I</i>	-2.04	-1.85	0.19
<i>Period II</i>	4.46*	5.93*	1.41
Overall	1.98	2.74**	0.75
<b>Gujarat</b>			
<i>Period I</i>	-4.29	-1.85	0.43
<i>Period II</i>	2.52*	4.72**	1.46
Overall	0.71	2.40**	0.94
<b>(B) Stability(%)</b>			
<b>South Gujarat</b>			
<i>Period I</i>	30.77	18.59	13.47
<i>Period II</i>	19.22	34.02	13.61
Overall	27.02	45.65	17.22
<b>Gujarat</b>			
<i>Period I</i>	21.66	27.33	7.88
<i>Period II</i>	33.31	43.92	13.24
Overall	41.21	56.11	14.20

Note : Period I-(1992-93 to 2001-02),  
 Period II -(2002-03 to 2011-12),  
 Over all -(1992-93 to 2011-12)

Source: Directorate of Agriculture, Gandhinagar, Gujarat.

\* Significant at 5 % level of significance

\*\* Significant at 1 % level of significance

It is evident from the Table that acreage under wheat crop in the state increased at a compound rate of 0.71 per cent per annum during the study period. It increased significantly in period second by 2.52 per cent per annum. In *Period-I* it was negative and non significant. Growth rates in area had been positive in south Gujarat region (1.98 per cent per annum). The increased was more pronounced in *Period-II* (4.46 per cent per annum) while in *Period-I*, it declined.

Productivity of wheat crop increased by 0.94 per cent per annum in the state as a whole. In *Period-I*, it increased by only 0.43 per cent per annum in the state, while it increased significantly by 1.46 per cent per annum in *Period-II*. In South Gujarat region, productivity of wheat crop increased by 0.75 per cent per annum during the year 1992-92 to 2011-12. Among periods, it increased in *Period-II* (1.41 per cent per annum) compared to *Period-I*.

It is also inferred from the analysis presented in this section that there has been increase in production of wheat in the state as well as in the South Gujarat region. This increase in production was contributed by the increase in productivity and area under the crop. Productivity of the crop has shown positive growth in the state as whole. This clearly brings that, even the existing technology has been able to sustain the existing level of production of the crop.

The scene of agriculture in Gujarat had been completely changed and transformed from food shortage to self reliance. This had become possible because of transfer of technology from lab to farm along with the Government initiatives in form of various programme/ policy. The new method of agricultural practice brought a drastic change in the productivity and production. More and more agricultural land are brought under cultivation with the help of improved irrigation facilities (with the help of assured means of irrigation), highly subsidized chemical fertilizers on time and supply of high yielding varieties of seeds in the market. Farm mechanization has also shortened the period of ploughing, sowing and harvesting process of agriculture.

Further climate change had emerged as an important determinant, particularly in the recent past. In Gujarat, before *Period-I* (1992-93) reforms, government was providing a lot of subsidies over the inputs that made the purchase of inputs affordable for the farmer which helps in fighting against the climate change. But after the economic reforms there was high rise in the prices of agricultural inputs has made it difficult for the farmers to purchase the inputs in right amount and vulnerability of agriculture to climate change has increased and it is expected that agriculture sector in Gujarat would be negatively affected. (Narain *et al.*, 2009).

Table 4.1 also revealed the instability in production observed wide variation in arrival of the crop produce in the markets caused wide fluctuations in prices of the crop product. Apart from increasing the overall total production, stability in production of the crop over the years is equally important in planning for agricultural development of any area. A pre-requisite for stabilizing of wheat production is the necessity of examining and measurement of the extent of instability and also identification of the factors or sources causing the instability. As such an attempt has been made to examine the extent of the instability in wheat crop.

The coefficient of variation method was used to estimate the extent of instability in production, area and productivity of wheat crop. The coefficient of variation for production of wheat in the state of Gujarat was 56.11 per cent during the *Period I* 1992-93 to 2011-12. The instability in production was higher in *Period-II* as compared to *Period-I*. For the south Gujarat region, similar trend was observed. The coefficient of variation for wheat acreage in Gujarat was 41.21

per cent. The instability was high in period-II (2002-03 to 2011-2012) compared to period-I (1992-93 to 1999-2000). The coefficient of variation for the acreage under wheat crop in south Gujarat region was 27.02 per cent during the study period (1992-93 to 2011-12). The area instability for wheat crop was found to be higher for the period first compared to the second period.

The coefficient of variation for wheat productivity of the state revealed that this has been 14.20 per cent during the study period. The extent of variability in productivity had been higher for the south Gujarat region compared to the state during the study period. The foregoing discussion led to conclude that magnitude of variability has been reported higher in the production as compared to area and productivity. The area instability was also higher side in south Gujarat region and state as a whole. The result was also corroborated with study has been done by Chand *et al.* (2011). So in this case, it was hypothesized that production of wheat crop in the state has remained stagnant during the study period is rejected.

#### **4.2 INPUT USE, COSTS STRUCTURE AND RETURN ANALYSIS**

The decision and choice of crops to be grown on a farm and the area to be allocated under a crop depends to a large extent on the prices of output, productivity level, technology available and the level and prices of inputs used in their production. The knowledge of input use, cost structure and returns from the cultivation of crops helps in formulating the policies at micro levels. Such knowledge is more useful for

crops taken mainly for the market *viz.* the cash crops, spices crops, fruits, vegetables and other high value crops. The input use, cost structure and profitability of wheat crop had been discussed in the following manners.

Realizing this importance, an attempt had been made to examine characteristics and cropping pattern of selected wheat growers in south Gujarat.

The objective has been divided into following sections;

4.2.1 General characteristics of sample farmers

4.2.2 Cropping pattern

4.2.3 Cost concept

#### **4.2.1 General Characteristics of Sample Farmers**

The information on general characteristics of the sample wheat cultivator has been presented in the Table 4.2.1.1.

From the Table, it could be seen that average age of the wheat growers was about 47.77 years, while highest youngsters were engaged in agriculture in small group followed by medium and large while in case of medium age group larger farmers were highest in cultivation of land followed by medium and small while in older group small farms were higher followed by medium and large.

**Table 4.2.1.1: Age of sample farmers****(n=240)**

Sr. No.	Particulars	Youngsters (< 30 Year)	Meddle Age (30-58 Year)	Old Age (> 58 Year)	Av. Year	Total
1	Small	20.00 (20.83)	48.00 (50.00)	28.00 (29.17)	42.03	96.00 (100.00)
2	Medium	12.00 (16.22)	46.00 (62.16)	16.00 (21.62)	48.03	74.00 (100.00)
3	Large	13.00 (18.57)	50.00 (71.43)	7.00 (10.00)	53.04	70.00 (100.00)
	<b>Average</b>	-	-	-	47.77	240.00

(Source: Field survey.)

From Table 4.2.1.2 it can be inferred that overall the main occupation of the sample growers was agriculture *i.e.* 87.50 per cent. In small group highest respondents were engaged with agriculture occupation followed by small (35.42 per cent) and medium (29.17 per cent).

**Table 4.2.1.2: Occupation pattern of sample farmers****(n=240)**

Size of group	Main Occupation	Sub Occupation			Others	Total
	Agril.	Agril.	Dairy	Service		
Small	85.00 (35.42)	0.00 (0.00)	3.00 (1.25)	5.00 (2.08)	3.00 (1.25)	96.00 (40.00)
Medium	70.00 (29.17)	0.00 (0.00)	1.00 (0.42)	2.00 (0.83)	1.00 (0.42)	74.00 (30.83)
Large	55.00 (22.92)	2.00 (0.83)	0.00 (0.00)	6.00 (2.50)	7.00 (2.92)	70.00 (29.17)
<b>Overall</b>	210.00 (87.50)	2.00 (0.83)	4.00 (1.67)	13.00 (5.42)	11.00 (4.58)	240.00 (100.00)

(Source: Field survey)

From the Table 4.2.1.3 it can be revealed that majority of the sample wheat growers were literate (74.00 per cent) *i.e.* 7.67, 41.00 and 25.33 percent of the sample wheat growers studied up to primary, high school and college level education respectively.

The Table also revealed that the average size of family of sample wheat growers was 4.81.

**Table 4.2.1.3: Literacy rate amongst sample farmers  
(n=240)**

Sl. No.	Particulars	Small	Medium	Large	Average
<b>1</b>	<b>Education</b>				
<b>A</b>	<b>Illiterate</b>	8.00	6.00	4.00	6.00
<b>B</b>	<b>Literate</b>	88.00	68.00	66.00	74.00
<b>i.</b>	<b>Primary</b>	11.00	7.00	5.00	7.67
<b>ii.</b>	<b>High school</b>	47.00	28.00	48.00	41.00
<b>iii.</b>	<b>College</b>	30.00	33.00	13.00	25.33
<b>2</b>	<b>Family size</b>	5.31	4.55	4.57	4.81

#### **4.2.1.4: Land utilization pattern**

Size of land holding largely determines the income of farmers. Possession of land is also looked upon as a status symbol in the rural areas. The larger the size of land holding, the more is the requirement of credit for farm investment. Operational land and percent cultivated area under wheat is presented in Table 4.2.1.4. In all, 240 farms were selected for the study, among which 96 were small farm, 74 medium and 70 large farms. The area under wheat cultivation was totally irrigated. On an average, 2.30 ha of wheat were cultivated by the farmers on 68.71 per cent of their total cultivated area. Small, medium and large farmers cultivated wheat on an average 1.20, 2.44 and 3.67 hectare, respectively.

**Table 4.2.1.4: Land use pattern of wheat growers on selected farm size groups**

Particular	Farm group			
	Small	Medium	Large	Average
<b>No. of selected farms</b>	96	74	70	240
<b>Total cultivated area (ha)</b>	153.49	246.39	360.16	760.04
<b>Total cultivated area under wheat (ha)</b>	115.04	180.56	256.63	522.23
<b>Area under wheat as per cent of total cultivated area (ha)</b>	74.95	73.28	71.25	68.71
<b>Average area under wheat (ha)</b>	1.20	2.44	3.67	2.30

#### **4.2.2 Cropping pattern**

Cropping pattern of selected districts is presented in Table 4.2.2. It could explained that mostly paddy, sorghum, pigeon pea, cotton, groundnut, maize, seasamum, castor, sunflower and wheat were grown as field crop while in vegeTables okra, brinjal, cluster bean were grown by the farmers, and in fruits crops sapota, mango and banana were the major crops of selected districts.

In case of small farmers during the kharif season highest area covered by the cotton (60.00 ha) followed by paddy (45.00 ha.). While, in summer season small farmer were grown paddy mostly followed by G'nut and Green gram (Mung).

In case of medium and large farmers same pattern was found, but these groups also cultivated vegeTables, castor, horticultural and pulses with these pattern.

**Table 4.2.2: Cropping pattern of selected sample of south Gujarat (Area in ha) (n=240)**

Category	Season	Area sown (ha.)	Cropping pattern							
			Food Grains		Pulses		Cash crop		Oil crop	
			Crop	Area	Crop	Area	Crop	Area	Crop	Area
Small	Kharif	153.48	Sorghum	13.48	Mung	9.00	Cotton	60.00	G'nut	22.00
			Paddy	45.00	-	-	-	-	Sesamum	2.00
	Rabi	153.48	Wheat	115.04	Gram	2.44	S'cane	21.00	-	-
			Sorghum	7.00	-	-	-	-	-	-
			Maize	8.00	-	-	-	-	-	-
	Summer	150.00	Paddy	98.00	Mung	23.00	-	-	G'nut	27.00
Bajara			12.00	-	-	-	-	-	-	
Medium	Kharif	246.00	Sorghum	25.00	Mung	25.00	Cotton	75.00	G'nut	21.00
			Paddy	66.00	-	-	-	-	Sesamum	9.00
	Rabi	246.39	Wheat	180.56	Gram	5.00	S'cane	36.00	Castor	5.00
			Sorghum	8.00	Pea	2.00	-	-	mustard	0.33
			Maize	3.00	Mung	5.5	-	-	-	-
	Summer	198.50	Paddy	98.50	Mung	67.00	-	-	G'nut	10.50
Lagre	Kharif	360.00	Sorghum	9.50	Mung	30.00	Cotton	82.00	G'nut	30.00
			Paddy	200.00	-	-	-	-	Sesamum	5.00
	Rabi	360.16	Wheat	256.63	Gram	8.00	S'cane	39.00	Mustard	5.00
			Sorghum	15.00	Pea	4.00	-	-	Sunflower	4.00
			Maize	5.00	Mung	7.00	-	-	Sesamum	2.00
	Summer	330.00	Paddy	187.00	-	-	-	-	G'nut	40.00
Bajara			35.00	-	-	-	-	-	-	

(Source: Field Survey.)

### **4.2.3 ECONOMICS OF WHEAT CROP**

Wheat is one of the major cereal grain crops occupying a prominent place in the economy of cultivators. Therefore, cost of wheat cultivation has paramount importance in determining the net income from it.

In this section, an attempt has been made to present the details of cost of cultivation of wheat on the sample farms in Surat, Bharuch, Narmada and Tapi districts. Production is normally considered as the function of area and yield. The decision regarding the choice of crop enterprise to be taken on the farm and the allocation of area and resources under it depends to a great extent, on level of yield, price of output and the cost of inputs used in the production of that crop. The cost of cultivation and the returns to different factors of production help in decision making about the selection of crop and hence, these measures were worked out for the wheat.

The details of per hectare cost and use of physical input for wheat cultivation on different size of farms were explained and the results are presented in Tables 4.2.3.1 to Table 4.2.3.5.

Table 4.2.3.1 narrated that per hectare average cost of selected districts was found highest (₹ 48930.86) on large farms and lowest (₹ 41735.23) on small farms with an overall total cost of ₹ 46348.59.

In Surat district, as per Table 4.2.3.2, per hectare average cost of cultivation was found highest among all category *i.e.* ₹ 48662.84, while in case of small, medium and large farm, it came to ₹ 42492.52, ₹ 48374.25 and ₹ 50931.91, respectively.

The per hectare cost of wheat cultivation in Bharuch district was found highest (₹ 49838.39) on large farms and lowest (₹ 41436.81) on small farms with an average total cost of ₹ 45853.54. It is because of high rate of labour and more fertilizer utilization.

In case, of Narmada district per hectare average cost of cultivation was ₹ 44515.77, while in case of small, medium and large farm it was ₹ 41455.82, ₹ 45131.15, and ₹ 46645.53 respectively.

While, Table 4.2.3.5 explained the per hectare cost of cultivation of Tapi district, average cost of cultivation per hectare worked out to be ₹ 46477.96, while in case of small, medium and large category the costs were ₹ 41467.47, ₹ 45526.51, ₹ 48533.06.

In case of Surat district per hectare cost of wheat cultivation was high because of shortage of labour and cost of hired labour as compared to other districts.

Further, the table also revealed that total physical units used in cost of cultivation of wheat crop, bifurcates all inputs hired labour, family labour and fertilizer contributed around 50% of cost of cultivation.

**Table 4.2.3.1 : Per hectare cost and use of total physical unit of inputs in wheat crop of south Gujarat (Value in ₹) (n=240)**

Sr · No	Particular (Charges/cost)	Small	Cost per ha.	Medium	Cost per ha.	Large	Cost per ha.	Average	
		Physical Unit		Physical Unit		Physical Unit		Total P.U	Cost per ha.
1	Hired labour	3996.00	4261.52	7915.00	5127.13	11031.00	5431.91	22942.00	5088.44
2	Bullock labour	1071.00	3417.25	1130.00	2207.91	1208.00	1648.48	3409.00	2199.86
3	Seed (Kg.)	13795.15	2463.8	22564.77	2737.48	31358.31	3076.31	67718.23	2837.93
4	Manures/FYM	184.06	582.36	308.62	886.13	323.70	1055.9	816.38	901.75
5	Urea (Bag)	451.00	1250.6	762.00	1346.25	1038.50	1290.89	2251.50	1300.6
6	DAP (Bag)	243.50	2473.91	419.90	2744.14	678.90	3121.62	1342.30	2863.27
7	A.Sulphate (Bag)	60.00	275.38	105.00	307.04	200.00	411.49	365.00	348.99
8	Potash (Bag)	17.00	206.54	39.00	190.08	57.00	195.46	113.00	196.01
9	Micronutrient	50.00	140.82	799.00	796.52	1221.00	856.41	2070.00	687.76
10	Irrigation	-	5710.34	-	6014.51	-	6411.51	-	6135.64
11	Machine	-	1372.72	-	2870.17	-	3654.07	-	2922.51
12	Pl. protection	-	64.73	-	150.7	-	233.74	-	171.38
13	Weedicide	-	322.92	-	681.57	-	820.68	-	671.5
14	Miscellaneous	-	242.52	-	424.24	-	536.22	-	438.42
15	Depreciation	-	717.55	-	949.74	-	982.02	-	916.37
16	IOWC	-	911.42	-	1059.35	-	1153.33	-	1072.21
17	ROVL	-	9330.99	-	10934.42	-	12012.83	-	10985.32
18	IOFC	-	358.77	-	474.87	-	491.01	-	458.19
19	Family labour	4718.00	3836.98	2524.00	2000.5	2352.00	1098.72	9594.00	1938.93
20	Managerial cost	-	3794.11	-	4190.28	-	4448.26	-	4213.51
21	Total cost	-	<b>41735.23</b>	-	<b>46093.03</b>	-	<b>48930.86</b>	-	<b>46348.59</b>

(Source: Field survey.)

**Table 4.2.3.2 Per hectare cost and use of total physical inputs for wheat production in Surat District (Value in ₹)**

Surat District (n=60)									
Sr. No	Particular (Charges/cost)	Small		Medium		Large		Average	
		Physical Unit	Cost per ha.	Physical Unit	Cost per ha.	Physical Unit	Cost per ha.	Total P.U	Cost per ha.
1	Hired labour	642.00	4968.65	2188.00	5436.25	74.51	5726.31	2904.51	5506.53
2	Bullock labour	185.00	3474.75	351.00	2165.88	224.00	1371.01	760.00	1977.03
3	Seed (Kg.)	2079.20	2482.58	6337.53	2622.51	7051.55	2875.81	15468.28	2720.27
4	Manures/FYM	27.21	892.048	118.76	1084.23	74.51	1027.3	220.48	1031.94
5	Urea (Bag)	76.50	1416.33	223.50	1389.79	247.00	1345.28	547.00	1372.88
6	DAP (Bag)	36.80	2519.06	118.30	2721.13	153.40	3090.52	308.50	2863.96
7	A.Sulphate (Bag)	7.00	214.5	39.00	401.4	47.00	423.7	93.00	386.34
8	Potash (Bag)	2.00	153.22	11.00	188.69	5.00	75.12	18.00	131.55
9	Micronutrient	10.90	104.46	277.00	971.92	321.00	986.51	608.00	861.05
10	Irrigation	-	6927.12	-	6261.01	-	6592.79	-	6504.2
11	Machine charge	-	439.35	-	3088.26	-	4896	-	3562.21
12	Pl. prote <sup>n</sup> cost	-	153.8	-	162.76	-	222.71	-	189.17
13	Weedicide	-	553.85	-	772.7	-	930.07	-	815.56
14	Miscellaneous	-	235.63	-	441.91	-	598.43	-	486.07
15	Depreciation	-	432.37	-	1089.98	-	1101.21	-	1006.01
16	IOWC	-	981.41	-	1108.34	-	1206.46	-	1136.35
17	ROVL	-	9000.99	-	10758.57	-	12186.29	-	11093.93
18	IOFC	-	216.18	-	544.99	-	550.61	-	503.01
19	Family labour	677.00	3463.26	809.00	2766.27	520.00	1095.61	2006.00	2090.89
20	Managerial cost	-	3862.96	-	4397.66	-	4630.17	-	4423.89
21	Total cost	-	<b>42492.52</b>	-	<b>48374.25</b>	-	<b>50931.91</b>	-	<b>48662.84</b>

(Source: Field survey.)

**Table 4.2.3.3 Per hectare cost and use of total physical inputs for wheat cultivation in Bharuch District (Value in ₹)**

Bharuch District (n=60)									
Sr. No	Particular (Charges/cost)	Small		Medium		Large		Average	
		Physical Unit	Cost per ha.	Physical Unit	Cost per ha.	Physical Unit	Cost per ha.	Total P.U	Cost per ha.
1	Hired labour	301.00	4876.58	1886.00	5843.99	2317.00	6075.91	4504.00	5689.3
2	Bullock labour	1167.00	3514.17	221.00	1834.59	247.00	1753.51	1635.00	2237.69
3	Seed (Kg.)	4024.59	2221.67	5020.59	2728.47	6562.03	3113.68	15607.21	2757.76
4	Manures/FYM	62.54	474.65	61.88	778.6	59.42	1049.43	183.84	812.82
5	Urea (Bag)	125.50	1206.59	165.00	1284.09	209.50	1252.68	500.00	1250.78
6	DAP (Bag)	74.00	2631.78	100.00	2878.75	126.00	2786.88	300.00	2776.06
7	A.Sulphate (Bag)	14.00	222.78	12.00	154.57	35.00	346.39	61.00	252.57
8	Potash (Bag)	7.00	185.65	10.00	214.69	11.00	148.45	28.00	179.42
9	Micronutrient	10.00	54.25	120.00	526.96	387.00	1309.09	517.00	731.18
10	Irrigation	-	5749.01	-	5992.07	-	6142.83	-	5991.9
11	Machine charge	-	1584.84	-	2490.85	-	3399.23	-	2635.15
12	Pl. prote <sup>n</sup> cost	-	24.11	-	111.98	-	201.97	-	126.76
13	Weedicide	-	444.25	-	618.32	-	895.48	-	688.98
14	Miscellaneous	-	266.73	-	329.59	-	412.16	-	347.78
15	Depreciation	-	749.74	-	842.33	-	1024.73	-	894.55
16	IOWC	-	938.28	-	1031.5	-	1155.51	-	1059.13
17	ROVL	-	9124.50	-	10816.91	-	12422.36	-	10870.54
18	IOFC	-	374.87	-	421.16	-	512.37	-	447.27
19	Family labour	1358.00	3025.38	1873.63	1873.63	571.00	1304.97	3802.63	1935.4
20	Managerial cost	-	3766.98	-	4077.31	-	4530.76	-	4168.50
21	Total cost	-	<b>41136.81</b>	-	<b>44850.36</b>	-	<b>49838.39</b>	-	<b>45853.54</b>

(Source: Field survey.)

**Table 4.2.3.4: Per hectare cost and use of total physical inputs for wheat cultivation in Narmada District (Value in ₹)**

Narmada District (n=60)									
Sr. No	Particular (Charges/cost)	Small		Medium		Large		Average	
		Physical Unit	Cost per ha.	Physical Unit	Cost per ha.	Physical Unit	Cost per ha.	Total P.U	Cost per ha.
1	Hired labour	1478.00	3748.79	1644.00	4505.19	2489	4862.56	5611.00	4427.59
2	Bullock labour	416.00	4087.38	265.00	3331.06	291	1647.91	972.00	2843.6
3	Seed (Kg.)	4884.95	2480.95	4764.32	2807.93	7030.96	3238.5	16680.23	2892.05
4	Manures/FYM	58.64	437.82	57.72	815.23	80.76	1014.09	197.12	785.27
5	Urea (Bag)	157.00	1215.61	148.50	1425.82	256	1413.61	561.50	1356.72
6	DAP (Bag)	81.70	2274.1	90.10	2906.45	174.5	3564.31	346.30	2994.62
7	A.Sulphate (Bag)	27.00	346.02	25.00	360.85	44	402.15	96.00	373.94
8	Potash (Bag)	6.00	128.16	6.00	144.34	14	213.26	26.00	168.79
9	Micronutrient	10.00	218.45	306.00	359.21	311	243.03	627.00	266.91
10	Irrigation	-	5340.88	-	6082.2	-	5813.43	-	5742.33
11	Machine charge	-	1039.64	-	2219.52	-	2902.2	-	2151.85
12	Pl. prote <sup>n</sup> cost	-	25.49	-	103.61	-	244.5	-	139.91
13	Weedicide charge	-	100.97	-	652.06	-	724.72	-	515.52
14	Miscellaneous	-	170.75	-	469.66	-	545.79	-	411.25
15	Depreciation	-	668.98	-	754.15	-	1266.41	-	946.59
16	IOWC	-	864.6	-	1047.32	-	1073.2	-	1002.81
17	ROVL	-	9701.238	-	10911.72	-	11530.49	-	10676.91
18	IOFC	-	334.49	-	377.08	-	633.21	-	473.29
19	Family labour	1674.00	4502.79	454.00	1754.92	444	1071.66	2572.00	2298.93
20	Managerial cost	-	3768.71	-	4102.83	-	4240.5	-	4046.89
21	Total cost	-	<b>41455.82</b>	-	<b>45131.15</b>	-	<b>46645.53</b>	-	<b>44515.77</b>

(Source: Field survey.)

**Table 4.2.3.5: Per hectare cost and use of total physical input for wheat production in Tapi District (Value in ₹)**

Tapi District (n=60)									
Sr. No	Particular (Charges/cost)	Small		Medium		Large		Average	
		Physical Unit	Cost per ha.	Physical Unit	Cost per ha.	Physical Unit	Cost per ha.	Total P.U	Cost per ha.
1	Hired labour	709.00	3176.70	2197.00	4692.01	3834.00	5216.7	6740.00	4754.41
2	Bullock labour	171.00	2654.72	271.00	1750.82	446.00	1771.34	888.00	1892.51
3	Seed (Kg.)	2806.41	2762.70	6442.33	2808.86	10713.76	3080.69	19962.50	2948.01
4	Manures/FYM	35.67	761.33	70.26	824.98	109.01	1106.92	214.94	967.03
5	Urea (Bag)	92.00	1252.58	210.00	1296	326.00	1196.16	628.00	1236.16
6	DAP (Bag)	51.00	2568.50	111.50	2545.37	225.00	3053.83	387.50	2821.49
7	A.Sulphate (Bag)	12.00	270.42	29.00	296.23	74.00	449.41	115.00	374.68
8	Potash (Bag)	4.00	413.15	12.00	204.29	29.00	293.54	45.00	282.36
9	Micronutrient	20.00	153.65	329.00	1145.68	434.00	898.55	783.00	869.68
10	Irrigation charge	-	5410.43	-	5739.75	-	6851.68	-	6288.65
11	Machine charge	-	2344.43	-	3414.97	-	3473.38	-	3291.53
12	Pl. prote <sup>n</sup> cost	-	125.78	-	202.75	-	253.51	-	218.85
13	Weedicide charge	-	371.58	-	662.14	-	764.85	-	675.23
14	Miscellaneous	-	339.52	-	449.6	-	564.09	-	495.11
15	Depreciation	-	967.07	-	1034.16	-	686.54	-	837.97
16	IOWC	-	904.22	-	1041.34	-	1158.99	-	1084.63
17	ROVL	-	9237.90	-	11246.81	-	11965.27	-	11273.97
18	IOFC	-	483.53	-	517.08	-	343.27	-	418.99
19	Family labour	1009.00	3499.49	675.00	1514.9	817.00	992.24	2501.00	1521.43
20	Managerial cost	-	3769.77	-	4138.77	-	4412.1	0.00	4225.27
21	Total cost	-	<b>41467.47</b>	-	<b>45526.51</b>	-	<b>48533.06</b>	-	<b>46477.96</b>

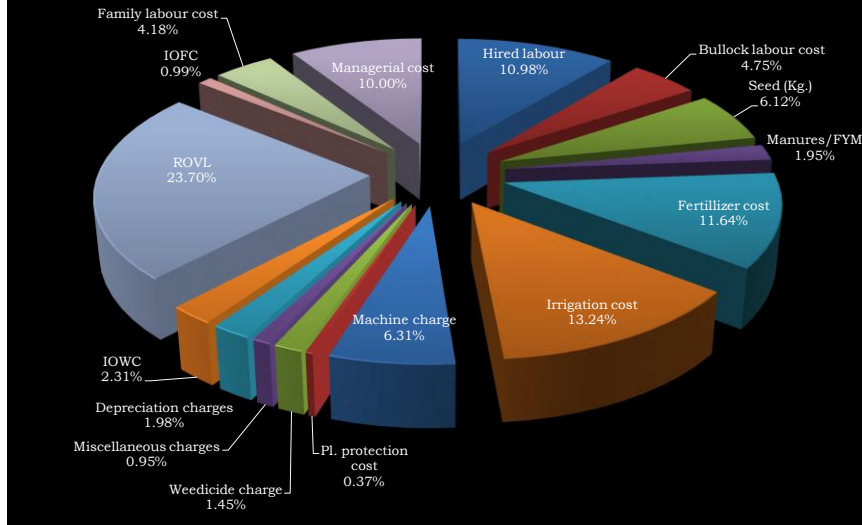
(Source: Field survey.)

**Table 4.2.3.6: Per hectare pattern of input use in cultivation of wheat crop (Value in ₹)**

South Gujarat (n=240)													
Sr. No	Particular (Charges/cost)	Small			Medium			Large			Overall		
		Physical Unit	Cost per ha.	% to total cost	Physical Unit	Cost per ha.	% to total cost	Physical Unit	Cost per ha.	% to total cost	Total Physical Unit	Cost per ha.	% to total cost
1	Hired labour	35.00	4261.52	10.21	44.00	5127.13	11.12	43.00	5431.91	11.10	42.00	5088.44	10.98
2	Bullock labour	9.31	3417.25	8.19	6.26	2207.91	4.79	4.71	1648.48	3.37	6.17	2199.86	4.75
3	Seed (Kg.)	120.00	2463.8	5.90	125	2737.48	5.94	122.19	3076.31	6.29	122.63	2837.93	6.12
4	Manures/FYM	1.59	582.36	1.40	1.71	886.13	1.92	1.26	1055.9	2.16	1.48	901.75	1.95
5	Urea(Bag)	3.92	1250.6	3.00	4.22	1346.25	2.92	4.05	1290.89	2.64	4.08	1300.6	2.81
6	DAP(Bag)	2.12	2473.91	5.93	2.33	2744.14	5.95	2.65	3121.62	6.38	2.43	2863.27	6.18
7	A.Sulphate(Bag)	0.52	275.38	0.66	0.58	307.04	0.67	0.78	411.49	0.84	0.66	348.99	0.75
8	Potash (Bag)	0.15	206.54	0.49	0.22	190.08	0.41	0.22	195.46	0.40	0.20	196.01	0.42
9	Micronutrient	0.43	140.82	0.34	4.43	796.52	1.73	4.76	856.41	1.75	3.75	687.76	1.48
10	Irrigation	-	5710.34	13.68	-	6014.51	13.05	-	6411.51	13.10	-	6135.64	13.24
11	Machine	-	1372.72	3.29	-	2870.17	6.23	-	3654.07	7.47	-	2922.51	6.31
12	Pl. protection	-	64.73	0.16	-	150.7	0.33	-	233.74	0.48	-	171.38	0.37
13	Weedicide	-	322.92	0.77	-	681.57	1.48	-	820.68	1.68	-	671.5	1.45
14	Miscellaneous	-	242.52	0.58	-	424.24	0.92	-	536.22	1.10	-	438.42	0.95
15	Depreciation	-	717.55	1.72	-	949.74	2.06	-	982.02	2.01	-	916.37	1.98
16	IOWC	-	911.42	2.18	-	1059.35	2.30	-	1153.33	2.36	-	1072.21	2.31
17	ROVL	-	9330.99	22.36	-	10934.42	23.72	-	12012.83	24.55	-	10985.32	23.70
18	IOFC	-	358.77	0.86	-	474.87	1.03	-	491.01	1.00	-	458.19	0.99
19	Family labour	42.00	3836.98	9.18	14.00	2000.5	4.33	9.00	1098.72	2.24	17.00	1938.93	4.19
20	Managerial cost	-	3794.11	10.00	-	4190.28	10.00	-	4448.26	10.00	-	4213.51	10.00
22	Total cost	-	<b>41735.23</b>	100.00	-	<b>46093.03</b>	100.00	-	<b>48930.86</b>	100.00	-	<b>46348.59</b>	100.00

(Source: Field survey.)

**Fig: 4.1: Item-wise break up of cost of cultivation/ha in wheat crop**



Resource use pattern depends on the availability of inputs with the farmer. This significantly determines the cost of production of any crop. The use of inputs and various cultural practices used in the cultivation of wheat crop on the sample farms in the study area have been presented in this section. Generally, wheat is grown in the rabi season and harvested in the month of March- April. in Surat, Bharuch, Navsari and Tapi districts, the input use pattern followed in cultivation of wheat crop across the land size categories of the study area are presented in the Table 4.2.3.6.

Table 4.2.3.6 explained the per hectare pattern of resource use in cultivation of wheat in south Gujarat. The requirement of hired labours were 35, 44,43 man days in case of small, medium and large respectively, it was found that medium and large farms were more mechanized for wheat cultivation. Overall average hired labours were 42 man days. The bullock labour utilization in case of small, medium and large size groups was 9.31, 6.26, 4.85 pair days, respectively. The bullock labour utilization was more in small size group and at overall level, it was 4.79 days.

The details of per hectare component wise costs for wheat cultivation on different size of farms were studied and the results furnished in Table 4.2.3.6.

It could be also inferred from the Table 4.2.3.6 that per hectare average cost was found highest (₹ 48930.86) on large farms and lowest (₹ 41735.23) on small farms with an overall total cost of ₹ 46348.59. Relatively more utilization of hired labours, fertilizer, manure and irrigation charges might have inflated the higher total cost on large farms as compared to other farm size groups. Among the different items of cash expenditure, the rental value of owned

land ranked first with 23.70 per cent of the total cost. Another the major cost of wheat cultivation was irrigation charges with 13.24 per cent of the total cost, followed by Hired labours with 10.98 per cent, because wheat cultivation required more number of labours for harvesting, threshing, weeding and application of irrigation.

The other per hectare expenditure were fertilizers cost (Jointly) (11.64 per cent), managerial costs (10 per cent), tractor/machine charges (6.31 per cent), seed cost (6.12 per cent), Bullock labour charges (4.75 per cent), family labour (4.18 per cent ), interest on working capital (2.31 per cent), depreciation (1.98 per cent), manures and cakes (1.95 per cent), weeding charges (1.45 per cent), interest on fixed capital (0.99 per cent), miscellaneous cost (0.95 per cent), and plant protection cost to control pest and disease infestation (0.37 per cent).

Same results was found by Patel *et.al* in their study “An Economic analysis of production and marketing of wheat in Bhal region of Ahmedabad

#### **4.2.4 COST STRUCTURE**

##### **4.2.4.1 Estimates of different costs**

Using different cost concepts, it is possible to find out different types of income measures. These include farm business income, which indicates returns over variable cost. The family labour income is the difference between gross income and Cost B and has a lot of relevance under Indian conditions. Table 4.2.4.1 shows estimates of different costs such as cost A, Cost B, Cost C<sub>1</sub> and Cost C<sub>2</sub> incurred by different size groups in wheat cultivation.

From the Table, it concluded that average cost-A of Surat districts was highest *i.e.* ₹ 30551.12 (62.78 per cent) followed by Tapi, Bharuch and Narmada districts. Same trend was observed in other costs, that was because of high wages of hired/family labours and irrigation charges and rental value of own land.

It could be further inferred from the above Table that in all selected districts average per hectare average Cost-A came to ₹ 28752.64. The highest per hectare Cost-A was ₹ 30880.04 on large farms and lowest was ₹ 24414.38 on small farms. The study also shows that Cost-B and Cost-C<sub>1</sub> accounted for about 86.73 and 90.00 per cent of the total cost C<sub>2</sub>. On an average, Cost-C<sub>2</sub> came to ₹ 46348.59 per hectare which was highest on large farms (₹ 48930.86 per hectare) and lowest on small farms (₹ 41735.23 per hectare). Higher costs on large farms are associated with intensive use of human labours, seed, manures and fertilizer charges, irrigation miscellaneous. No particular trend was observed in different cost concepts on various categories of wheat cultivators.

#### **4.2.4.2 Yield, price, gross income and net gains**

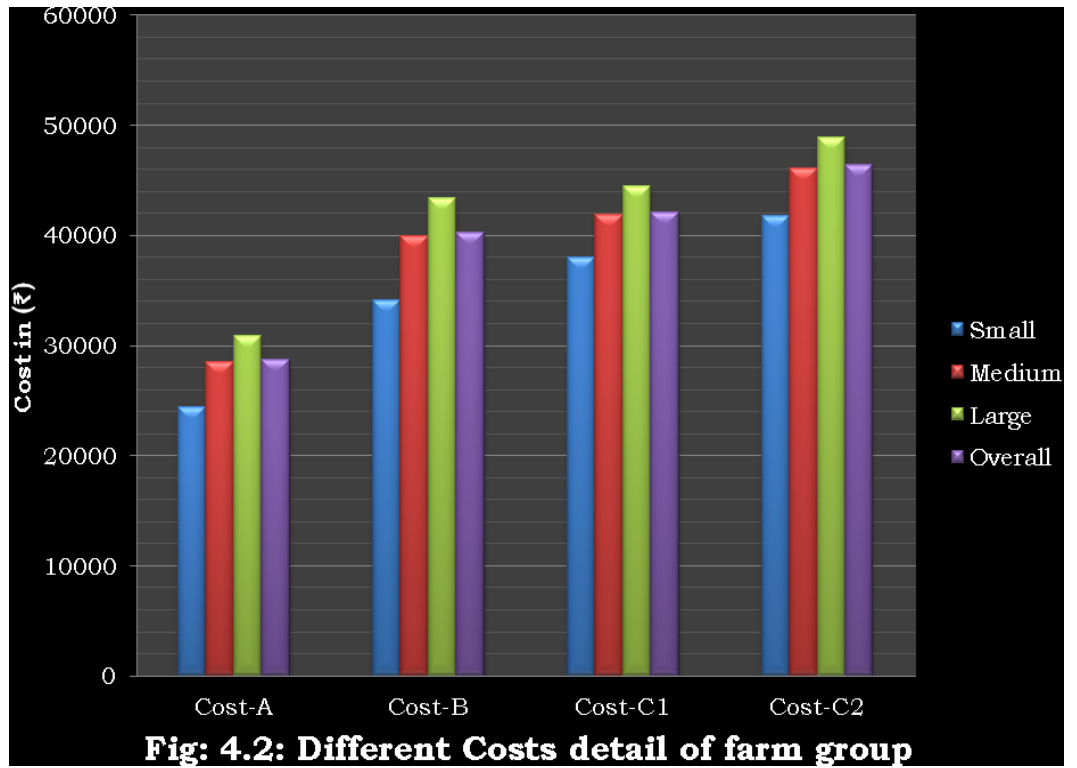
The productivity, gross returns and farm harvest price on sample farms for wheat cultivation is given in Table 4.2.4.2.

**Table 4.2.4.1: Estimation of different cost**

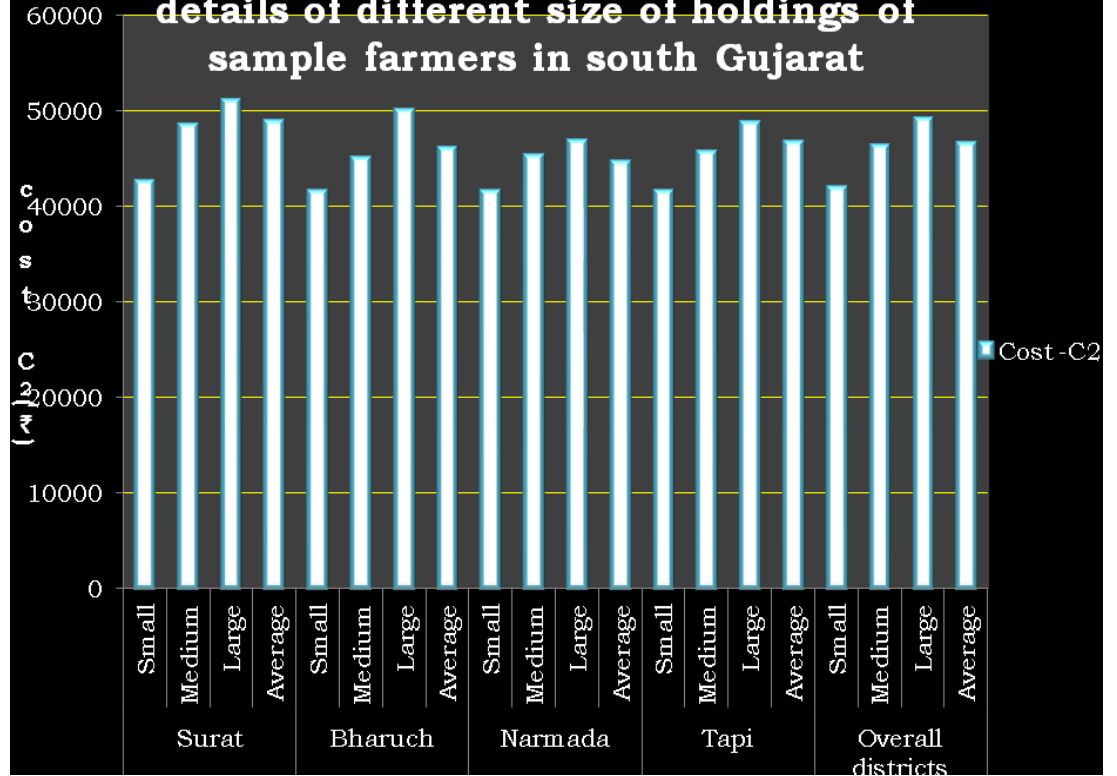
Districts	Farm Group	Different costs ( ₹ per hectare )			
		Cost-A	Cost-B	Cost-C <sub>1</sub>	Cost-C <sub>2</sub>
Surat	Small	25949.13 (61.07)	35166.30 (82.76)	38629.56 (90.00)	42492.52 (100.00)
	Medium	29906.76 (61.82)	41210.32 (85.19)	43976.59 (90.00)	48374.25 (100.00)
	Large	32469.23 (63.75)	45206.13 (88.76)	46301.74 (90.00)	50931.91 (100.00)
	<b>Average</b>	<b>30551.12</b> <b>(62.78)</b>	<b>42148.06</b> <b>(86.61)</b>	<b>44238.95</b> <b>(90.00)</b>	<b>48662.84</b> <b>(100.00)</b>
Bharuch	Small	25145.08 (60.68)	34644.45 (83.61)	37669.83 (90.00)	41436.81 (100.00)
	Medium	27661.35 (61.67)	38899.42 (86.73)	40773.05 (90.00)	44850.36 (100.00)
	Large	31067.93 (62.34)	44002.66 (88.29)	45307.63 (90.00)	49838.39 (100.00)
	<b>Average</b>	<b>28431.83</b> <b>(62.01)</b>	<b>39749.64</b> <b>(86.69)</b>	<b>41685.04</b> <b>(90.00)</b>	<b>45853.54</b> <b>(100.00)</b>
Narmada	Small	23148.59 (55.84)	33184.32 (80.05)	37687.11 (90.00)	41455.82 (100.00)
	Medium	27984.60 (62.01)	39273.40 (87.02)	41028.32 (90.00)	45131.15 (100.00)
	Large	29169.67 (62.53)	41333.37 (88.61)	42405.03 (90.00)	46645.53 (100.00)
	<b>Average</b>	<b>27019.75</b> <b>(60.70)</b>	<b>38169.95</b> <b>(85.74)</b>	<b>40468.88</b> <b>(90.00)</b>	<b>44515.77</b> <b>(100.00)</b>
Tapi	Small	24476.78 (59.03)	34198.21 (82.47)	37697.70 (90.00)	41467.47 (100.00)
	Medium	28108.95 (61.74)	39872.84 (87.58)	41387.74 (90.00)	45526.51 (100.00)
	Large	30820.18 (63.50)	43128.72 (88.86)	44120.96 (90.00)	48533.06 (100.00)
	<b>Average</b>	<b>29038.30</b> <b>(62.48)</b>	<b>40731.26</b> <b>(87.64)</b>	<b>42252.69</b> <b>(90.00)</b>	<b>46477.96</b> <b>(100.00)</b>
Overall districts	Small	24414.38 (58.50)	34104.14 (81.72)	37941.12 (90.00)	41735.23 (100.00)
	Medium	28492.96 (61.82)	39902.25 (86.57)	41902.75 (90.00)	46093.03 (100.00)
	Large	30880.04 (63.11)	43383.88 (88.66)	44482.60 (90.00)	48930.86 (100.00)
	<b>Average</b>	<b>28752.64</b> <b>(62.04)</b>	<b>40196.15</b> <b>(86.73)</b>	<b>42135.08</b> <b>(90.00)</b>	<b>46348.59</b> <b>(100.00)</b>

Figure in parenthesis indicate percentages to Cost-C<sub>2</sub>

Source: Field Survey.



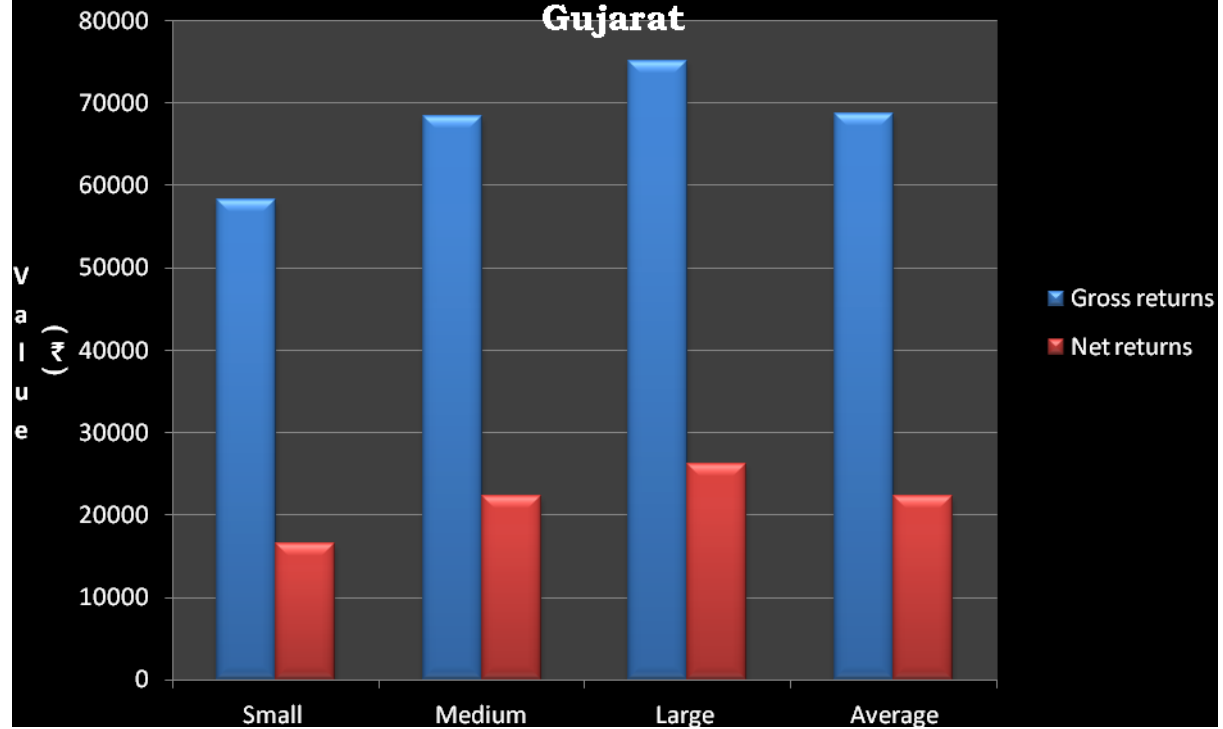
**Fig. 4.3: District-wise average Cost -C<sub>2</sub> details of different size of holdings of sample farmers in south Gujarat**



**Table 4.2.4.2: Yield level, FHP and Gross Income per hectare**

<b>District</b>	<b>Category of Farm</b>	<b>Yield (qtls.)</b>	<b>Harvest price (₹ / qtls.)</b>	<b>Value of By-product (₹)</b>	<b>Gross Income (₹)</b>
<b>Surat</b>	Small	34.82	1491.37	4326.69	56256.19
	Medium	36.16	1567.41	10563.5	67241.05
	Large	38.13	1594.33	15372.49	76164.29
	<b>Average</b>	<b>36.88</b>	<b>1556.48</b>	<b>11934.1</b>	<b>69337.08</b>
<b>Bharuch</b>	Small	35.14	1489.84	4675.14	57028.12
	Medium	38.30	1556.73	7982.94	67605.7
	Large	40.47	1598.46	12950.05	77639.73
	<b>Average</b>	<b>38.39</b>	<b>1530.1</b>	<b>9200.34</b>	<b>67940.88</b>
<b>Narmda</b>	Small	36.92	1497.04	5362.02	60632.74
	Medium	37.68	1595.93	8063.58	68198.22
	Large	37.77	1598.13	11704.18	72065.55
	<b>Average</b>	<b>37.49</b>	<b>1545.39</b>	<b>8794.03</b>	<b>66730.7</b>
<b>Tapi</b>	Small	34.03	1532.64	5581.14	57736.88
	Medium	37.84	1599.72	9759.14	70292.54
	Large	38.46	1598.75	13295.00	74782.93
	<b>Average</b>	<b>37.62</b>	<b>1579.21</b>	<b>11052.45</b>	<b>70462.33</b>
<b>Overall district</b>	Small	35.50	1500.43	5053.47	58318.74
	Medium	37.44	1578.5	9241.08	68340.12
	Large	38.65	1597.43	13339.52	75080.19
	<b>Average</b>	<b>37.60</b>	<b>1552.79</b>	<b>10273.33</b>	<b>68658.23</b>

**Fig 4.4: Per hectare gross and net returns of wheat of different categories of farmers in south Gujarat**



It is revealed that the average yield of wheat was 37.60 quintals per hectare. It ranged from 38.65 quintals on large farms to 35.50 quintals on small farms. Higher yield level on large farms may be due optimum level of inputs utilized by them along with timely weeding operations, proper selection of varieties of wheat, as compared to other farms. The variation in the yield might be due to the different time of sowing, types of land.

The results (Table 4.2.4.2) also indicated that per quintal average farm harvest price received by the wheat growers was ₹ 1552.79. The large size growers realized higher prices per quintal (₹ 1597.43) followed by medium (₹ 1578.50) and small sized farms (₹ 1500.43). Generally, large farm growers sell their produce at higher prices compared to medium farms, which was mainly due to time of sale and agencies to which the produce was sold.

It is evident from the Table that average gross returns per hectare on wheat farms amounted to ₹ 68658.23. It varied from ₹ 58318.74 on small farms and ₹ 75080.19 on large farms. The gross income was high on large farms followed by medium and small farms. This might be due to sale of wheat by large farmers through the channel IV *i.e.* directly sale to retailers and cost of production of per quintal of wheat was less than other categories because of optimal use of input resources. They sold their byproduct to Maharashtra industries for fuel purpose as quantity of byproduct is more than other groups, so they got good rate of it than other categories. Table also revealed the Bharuch districts had highest average yield (38.39 qtls.), followed by Tapi (37.62 qtls.), Narmada (37.49 qtls.), and Surat (36.88 qtls).

**Table 4.2.4.3: Net gains over different costs per hectare**

<b>District</b>	<b>Category of Farm</b>	<b>Net gains over different costs (₹)</b>			
		<b>Cost-A</b>	<b>Cost-B</b>	<b>Cost-C<sub>1</sub></b>	<b>Cost-C<sub>2</sub></b>
<b>Surat</b>	Small	30307.06	21089.89	17626.63	13763.67
	Medium	37334.29	26030.73	23264.46	18866.80
	Large	43695.06	30958.16	29862.55	25232.38
	<b>Average</b>	<b>38785.96</b>	<b>27189.02</b>	<b>25098.13</b>	<b>20674.24</b>
<b>Bharuch</b>	Small	31883.04	22383.67	19358.29	15591.31
	Medium	39944.35	28706.28	26832.65	22755.34
	Large	46571.80	33637.07	32332.10	26255.84
	<b>Average</b>	<b>39509.05</b>	<b>28191.24</b>	<b>26255.84</b>	<b>22087.34</b>
<b>Narmada</b>	Small	37484.15	27448.42	22945.63	19176.92
	Medium	40213.62	28924.82	27169.90	23067.07
	Large	42895.88	30732.18	29660.52	25420.02
	<b>Average</b>	<b>39710.95</b>	<b>28560.75</b>	<b>26261.82</b>	<b>22214.93</b>
<b>Tapi</b>	Small	33260.10	23538.67	20039.18	16269.41
	Medium	42183.59	30419.70	28904.80	24766.03
	Large	43962.75	31654.21	30661.97	26249.87
	<b>Average</b>	<b>42424.67</b>	<b>29731.07</b>	<b>28209.64</b>	<b>23984.37</b>
<b>Overall districts</b>	Small	33904.36	24214.60	20377.62	16583.51
	Medium	39847.16	28437.87	26437.37	22247.09
	Large	44200.15	31696.31	30597.59	26149.33
	<b>Average</b>	<b>39905.59</b>	<b>28462.08</b>	<b>26523.15</b>	<b>22309.64</b>

Source: Field Survey.

A perusal of above Table 4.2.4.3 shows that, among the all districts, the overall net gain on the basis of cost C<sub>2</sub> was highest in Tapi district followed by Narmada, Bharuch and Surat. While In case of overall districts per hectare average net returns over operational cost (Cost-A) was the highest (₹ 44200.15) on large farms and the lowest (₹ 33904.36)

on small farms with on an average of ₹ 39905.59 on sample farms. Net returns from wheat farms on the basis of Cost B, Cost C<sub>1</sub> and cost C<sub>2</sub> was ₹ 28462.08, ₹ 26523.15 and ₹ 22309.64 per hectare, respectively. It is apparent from the Table that per hectare average net returns on wheat farms over Cost C<sub>2</sub> ranged from ₹ 26149.3 on large farms to ₹ 16583.51 on small farms with an average of ₹ 22309.64. No particular trend was observed in different cost concepts on various categories of wheat cultivators. So in this case our hypothesis that to “Cultivation of wheat is quite remunerative has accepted.

A comparison of various income measures from wheat cultivation in South Gujarat are given in Table 4.2.4.2.

**Table 4.2.4.4: Farm Business Income, Family Labour Income, Farm Investment Income and Net Profit over Cost-C<sub>2</sub> in wheat cultivation (₹ /hectare)**

<b>Category of Farm</b>	<b>Small</b>	<b>Medium</b>	<b>Large</b>	<b>Weighted Av. cost</b>
<b>Farm business income</b>	33904.36	39847.16	44200.15	39905.59
<b>Family labour income</b>	24214.60	28437.87	31696.31	28462.08
<b>Farm investment income</b>	20377.62	26437.37	30597.59	26523.15
<b>Net profit</b>	<b>16583.51</b>	<b>22247.09</b>	<b>26149.33</b>	<b>22309.64</b>

Source: Field Survey.

Table 4.2.4.4 explained Farm business income which represents returns over variable cost. On an average,

the farm business income from wheat cultivation was worked out ₹ 39905.59. While, average family labour income per hectare of wheat cultivation was ₹ 28462.08. Net income implies profit per hectare after deducting cost C<sub>2</sub> from gross income. The overall net income/profit from wheat cultivation was for all farms. The overall farm investment income from wheat cultivation was ₹ 22309.64 per hectare. Among different size groups, it varied between ₹ 20377.62 to ₹ 30597.59 per hectare on different farm size holdings. It is evident from the overall net returns from the cost C<sub>2</sub> in wheat cultivation were ₹ 22309.64 per hectare. Among different size farm groups, it varied between ₹ 16583.51 to ₹ 22309 on different land size holdings.

Return per rupee investment is one of the effective methods to measure the economic feasibility of any crop. It is also called input-output ratio which reflects the criteria for economic viability of the crop based on return per rupee invested. The input-output ratios were worked out on the basis of different cost concepts and the same are presented in Table 4.2.4.5.

It is evident from the Table that the overall districts average B : C ratio was 1:1.48 on the basis of cost- C<sub>2</sub>. It indicated that an investment worth ₹ 1 on all the inputs used in the cultivation of wheat yielded an additional returns of ₹ 1.48. The input output ratio was the lowest (1:1.40) on small farms and the highest (1:1.53) on large farms.

**Table 4.2.4.5: Returns per rupee of investment or B : C ratio in wheat cultivation**

<b>District</b>	<b>Category of Farm</b>	<b>Cost-A</b>	<b>Cost-B</b>	<b>Cost-C<sub>1</sub></b>	<b>Cost-C<sub>2</sub></b>
<b>Surat</b>	Small	1: 2.17	1: 1.60	1: 1.46	1: 1.32
	Medium	1: 2.25	1: 1.63	1: 1.53	1: 1.39
	Large	1: 2.35	1: 1.68	1: 1.64	1: 1.50
	<b>Average</b>	<b>1: 2.27</b>	<b>1: 1.65</b>	<b>1: 1.57</b>	<b>1: 1.42</b>
<b>Bharuch</b>	Small	1: 2.27	1: 1.65	1: 1.51	1: 1.38
	Medium	1: 2.44	1: 1.74	1: 1.66	1: 1.51
	Large	1: 2.50	1: 1.76	1: 1.71	1: 1.56
	<b>Average</b>	<b>1: 2.39</b>	<b>1: 1.71</b>	<b>1: 1.63</b>	<b>1: 1.48</b>
<b>Narmada</b>	Small	1: 2.62	1: 1.83	1: 1.61	1: 1.46
	Medium	1: 2.44	1: 1.74	1: 1.66	1: 1.51
	Large	1: 2.47	1: 1.74	1: 1.70	1: 1.54
	<b>Average</b>	<b>1: 2.47</b>	<b>1: 1.75</b>	<b>1: 1.65</b>	<b>1: 1.50</b>
<b>Tapi</b>	Small	1: 2.36	1: 1.69	1: 1.53	1: 1.39
	Medium	1: 2.50	1: 1.76	1: 1.70	1: 1.54
	Large	1: 2.43	1: 1.73	1: 1.69	1: 1.54
	<b>Average</b>	<b>1: 2.43</b>	<b>1: 1.73</b>	<b>1: 1.67</b>	<b>1: 1.52</b>
<b>Overall district</b>	Small	1: 2.39	1: 1.71	1: 1.54	1: 1.40
	Medium	1: 2.40	1: 1.71	1: 1.63	1: 1.48
	Large	1: 2.43	1: 1.73	1: 1.69	1: 1.53
	<b>Average</b>	<b>1: 2.39</b>	<b>1: 1.71</b>	<b>1: 1.63</b>	<b>1: 1.48</b>

Source: Field Survey.

Further, it was observed that the B:C ratio on the basis of cost- A, *i.e.* paid out cost, was highest (1:2.43) on large farms followed by medium farms (1:2.40) and small farms (1:2.39). It was lowest (1:2.39) on small farms might be because of higher cost of input or time of selling and agency to whom produce sold.

#### **4.2.4.6 Costs per Quintal**

It is the cost-price relationship (the cost-price ratio) that generally decides the economic prosperity and the degree of commercialization on these farms. Given the price, offered by the market mechanism to a unit of output, the farmers' prosperity depends upon his capacity to produce his output at a lesser cost than the market price.

The estimated average cost of production per quintal of wheat is given in Table 4.2.4.6. The overall paid out cost (cost- A) per quintal was ₹ 764.70, which was 62.04 per cent of the total cost. The overall cost- B came to ₹ 1069.05 per quintal which was 86.73 per cent of total cost. The overall total cost of production (cost- C<sub>2</sub>) per quintal of wheat was about ₹ 1232.68. Cost of production per quintal highest on large farms (₹ 1266.00), followed by medium farms (₹ 1231.12) and small farms (₹ 1175.64).

Here, there was an increasing cost according to size. The market price of wheat for producer ranged from ₹ 1400 to ₹ 1600 per quintal. Therefore, it can be concluded that the wheat cultivation was quite profitable even if, the MSP per quintal of wheat is considered.

On the basis of Cost A and Cost C<sub>2</sub>, it was lowest in Narmada districts.

**Table 4.2.4.6: Cost of Production per Quintal on the basis of different cost concepts**

Districts	Category of Farm	Costs of production ( ₹ per quintal)			
		Cost A	Cost B	Cost C <sub>1</sub>	Cost C <sub>2</sub>
Surat	Small	745.24 (61.07)	1009.95 (82.76)	1109.41 (90.00)	1220.35 (100.00)
	Medium	827.07 (61.82)	1139.67 (85.19)	1216.17 (90.00)	1337.78 (100.00)
	Large	851.54 (63.75)	1185.58 (88.76)	1214.31 (90.00)	1335.74 (100.00)
	<b>Average</b>	<b>828.39</b> <b>(62.78)</b>	<b>1142.84</b> <b>(86.61)</b>	<b>1199.54</b> <b>(90.00)</b>	<b>1319.49</b> <b>(100.00)</b>
Bharuch	Small	715.57 (60.68)	985.90 (83.61)	1071.99 (90.00)	1179.19 (100.00)
	Medium	722.23 (61.67)	1015.65 (86.73)	1064.57 (90.00)	1171.03 (100.00)
	Large	767.68 (62.34)	1087.29 (88.29)	1119.54 (90.00)	1231.49 (100.00)
	<b>Average</b>	<b>740.61</b> <b>(62.01)</b>	<b>1035.42</b> <b>(86.69)</b>	<b>1085.83</b> <b>(90.00)</b>	<b>1194.41</b> <b>(100.00)</b>
Narmada	Small	626.99 (55.84)	898.82 (80.05)	1020.78 (90.00)	1122.86 (100.00)
	Medium	742.69 (62.01)	1042.29 (87.02)	1088.86 (90.00)	1197.75 (100.00)
	Large	772.30 (62.53)	1094.34 (88.61)	1122.72 (90.00)	1234.99 (100.00)
	<b>Average</b>	<b>720.72</b> <b>(60.70)</b>	<b>1018.14</b> <b>(85.74)</b>	<b>1079.46</b> <b>(90.00)</b>	<b>1187.40</b> <b>(100.00)</b>
Tapi	Small	719.27 (59.03)	1004.94 (82.47)	1107.78 (90.00)	1218.56 (100.00)
	Medium	742.84 (61.74)	1053.72 (87.58)	1093.76 (90.00)	1203.13 (100.00)
	Large	801.36 (63.50)	1121.39 (88.86)	1147.19 (90.00)	1261.91 (100.00)
	<b>Average</b>	<b>771.88</b> <b>(62.48)</b>	<b>1082.70</b> <b>(87.64)</b>	<b>1123.14</b> <b>(90.00)</b>	<b>1235.46</b> <b>(100.00)</b>
Overall Districts	Small	687.73 (58.50)	960.68 (81.72)	1068.76 (90.00)	1175.64 (100.00)
	Medium	761.03 (61.82)	1065.77 (86.57)	1119.20 (90.00)	1231.12 (100.00)
	Large	798.97 (63.11)	1122.48 (88.66)	1150.91 (90.00)	1266.00 (100.00)
	<b>Average</b>	<b>764.70</b> <b>(62.04)</b>	<b>1069.05</b> <b>(86.73)</b>	<b>1120.61</b> <b>(90.00)</b>	<b>1232.68</b> <b>(100.00)</b>

Note: Figures in parentheses indicate the percentages to Cost-C<sub>2</sub>.

#### **4.4.2.7 Bulk line cost concept:**

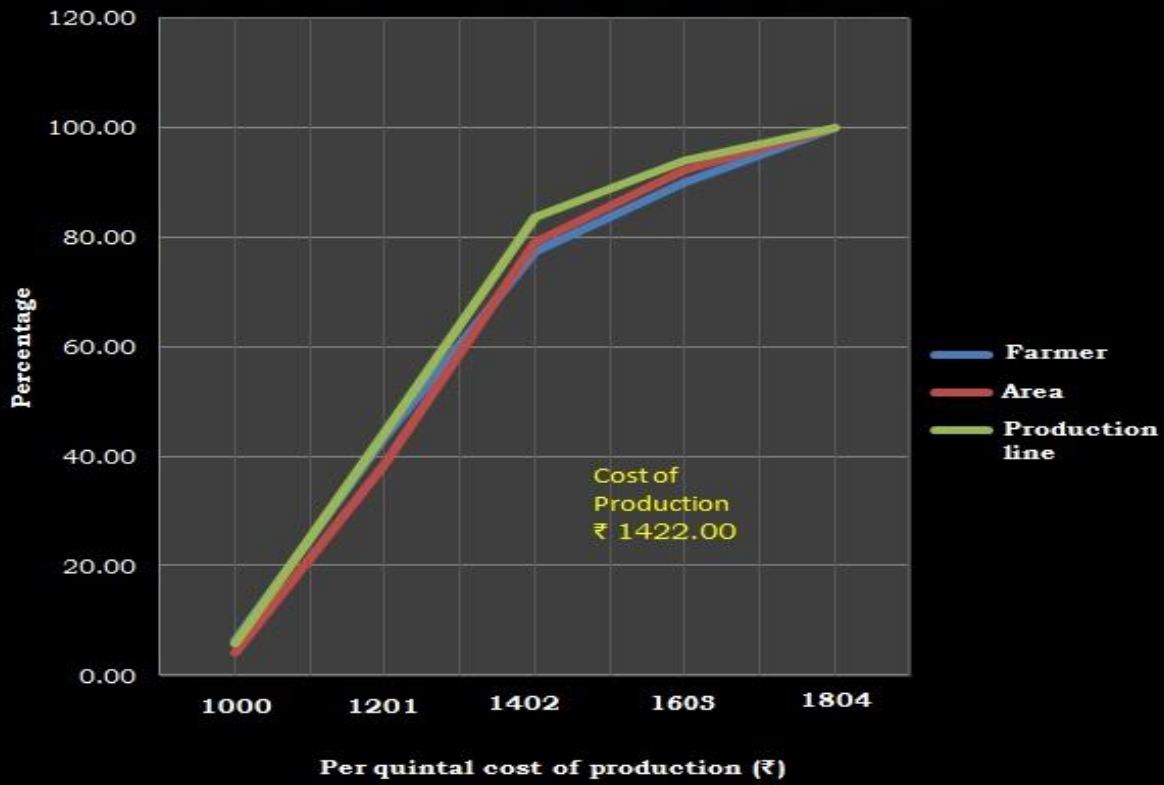
The bulk line cost concept is giving the information regarding the exact cost of production of particular crop. In this concept total respondent's cost of production per hectare was arranged in ascending or descending order and formulated the categories of cost of cultivation per hectare in which the respondent fall and same way the number of farmer and total area under wheat crop of this particular farmer of categories are added and converted it to percentage of total and then cumulative percentage was found out which is shown in Table 4.2.4.7.

This cumulative percentage was further drawn on graph paper. In graph paper, on Y axis the percentage and on X axis the cost of production marked. At the point of 85 per cent the horizontal and vertical line touched the production line or cost of cultivation per hectare is called the bulk line cost which shown in fig 4.5

**Table 4.2.4.7: Bulk-line cost of selected samples farmers of South Gujarat.**

Sr · N o	Cost C <sub>2</sub> range (₹/qtls.)	No. of farmer Covered	Area covere d	Productio n covered in quintal	Percent of farmer covered	% of area covered	% of Productio n covered	Cumulative percentage		
								Farme r	Area	Productio n
1	800-1000	15	22.11	1220	6.25	4.00	5.88	6.25	4.00	5.88
2	1001-1201	89	190.71	7975.43	37.08	34.53	38.41	43.33	38.54	44.29
3	1202-1402	82	224.46	8164.5	34.17	40.65	39.32	77.50	79.18	83.61
4	1403-1603	30	72.32	2180.34	12.50	13.10	10.50	90.00	92.28	94.12
5	1604-1804	24	42.63	1221.8	10.00	7.72	5.88	100.00	100.00	100.00
	Total	<b>240</b>	<b>552.23</b>	<b>20762.07</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>			

Fig. 4.4.A: Bulk line cost of sample farmer of South Gujarat



In case of selected wheat growers of south Gujarat, the bulk line cost concept covered total 84 per cent farmer, 83 per cent area and ₹ 1422.20 cost of cultivation at 85 per cent line of total 240 respondent of south Gujarat from selected district.

#### **4.2.5 RESOURCE USE EFFICIENCY OF WHEAT GROWER IN SOUTH GUJARAT**

Resource Use Efficiency means how efficiently the farmer can use his resources in production process. It is very important because our resources are very limited. For calculating resource use efficiency, we consider ten factors namely hired human labour, seed rate, FYM, insecticide and pesticide's spray , irrigation, No. of weeding, bullock labour, and machine hours. The data collected from the respondents were used to run log linear regression analysis so as to determine the relationship between inputs and the output of wheat crop. The results obtained are shown in the Table 4.2.5.1.

**Table 4.2.3.1: Resource use efficiency of wheat growers  
in south Gujarat (n=240)**

<b>Variables</b>	<b>Regression coefficient</b>	<b>Standard Error</b>	<b>'t' statistics</b>
Constant	-2.856	0.688	-4.148
Seed (X <sub>1</sub> )	0.429	0.137	3.119**
F.Y.M (X <sub>2</sub> )	0.166	0.029	5.653**
N (X <sub>3</sub> )	0.235	0.067	3.492**
P (X <sub>4</sub> )	0.154	0.053	2.885**
Human labour (X <sub>5</sub> )	0.513	0.066	7.711**
No. of spray (X <sub>6</sub> )	-0.007	0.012	-0.582
No.of weeding (X <sub>7</sub> )	-0.108	0.056	-1.926
Irrigation (X <sub>8</sub> )	0.169	0.071	2.366**
Machine hours (X <sub>9</sub> )	0.015	0.012	1.274
Bullock labour(X <sub>10</sub> )	-0.105	0.023	-4.543
R <sup>2</sup>	53.00 %		
Calculated F	26.16**		

\* Significant at 5 % level of significance.

\*\* Highly significant at 1 % level of significance

The results showed that all inputs (except No. of spray, No. of weeding and Bullock labour) were positively related to the output of wheat. The R<sup>2</sup> of 0.53 implied that 53 per cent of total variation in the output of wheat is explained by the inputs specified in the log linear Cobb-Douglas production function. The regression co-efficient of most of the variables are positive, indicating that a unit increase in any of the variable holding others constant will lead to a unit increase in the gross output. Furthermore, number of weeding and bullock labour, are negative but significance because more use of weedicide increases the cost. While no. of spray was negative and non significance

The regression co-efficient of seed rate (Kg.) were significant at 1 percent level which indicated that holding other factors constant one percent increase in seed (Kg.) would increase the gross return by 0.429, while for variable irrigation of wheat growers was 0.169 which was significant at 1 percent level of confidence. In the case of co-efficient of fertilizer phosphors (N) were significant at 1 percent level which indicated that holding other factors constant one percent increase in phosphors rate would increase the gross return by 0.154. While, in the case of human labour, N fertilizer, F.Y.M, *i.e.* 0.513, 0.235, and 0.166, respectively which is positive and statistically significant, indicated that increase in these inputs will significantly effect on wheat yield. If expenses made on these resources, then it will be gives profiTable returns.

The elasticity of production ( $E_p$ ) of all the variables summed up to 0.54 meaning decreasing returns to scale, implying that, if these resources are increased by 1 per cent, the output would increases by less than 1 per cent except in case of fuel variable. The F - value of the equation was 26.16 which were highly significant at 1 percent level implying that all the explanatory variables were important for explaining the variations in gross returns of the operators or wheat growers.

The regression equation is

$$Y = - 2.856 + 0.429 X_1 + 0.166 X_2 + 0.235 X_3 + 0.154 X_4 + 0.513 X_5 - 0.007 X_6 - 0.108 X_7 + 0.169 X_8 + 0.015 X_9 - 0.105 X_{10}$$

It must be noted that      Intercept =  $\ln A = - 2.856$

Therefore,  $A = e^{-2.856} = 0.058$

Thus, the estimated equation in its multiplicative form is:

$$Y = (0.058) (X_1^{0.429} X_2^{0.166} X_3^{0.235} X_4^{0.154} X_5^{0.513} X_6^{-0.007} X_7^{-0.108} X_8^{0.169} X_9^{0.015} X_{10}^{-0.105})$$

The results are matched with the study Resource use efficiency in wheat production of Amravati division conducted by Patil and Khobarkar in 2013.

### **4.3 MARKETABLE, MARKETED SURPLUS AND MARKETING SYSTEM OF WHEAT**

Marketed surplus refers to total quantity of produce that is actually sold in the market. Therefore, when we talk about marketing of any agricultural commodity, it becomes important to measure the marketed surplus. Marketable surplus on the other hand, shows the quantity that is available for marketing after meeting the necessary consumption requirement of the family and farm. Considering the perishable nature, bulkiness and seasonal nature of wheat, the profitability depends upon how marketing of wheat is undertaken by the producers. Therefore, different aspects of marketing *viz.*, utilization pattern, Marketable surplus, and agency through whom sold and the results are discussed here.

#### **4.3.1 Utilization pattern**

For agrarian economics, it is not important to merely increase agricultural production, but simultaneously Marketable surplus must also increased. Total production, utilization pattern and Marketable surplus of wheat by the sample farmers of the study area are presented in Table 4.3.1.

**Table 4.3.1: Average per ha. pattern of utilization of Wheat on the sample farms  
(Qtls./ha.)**

District	Size of farm	Total production	Home consumption	Wage	Relative	Others	Marketable surplus	Marketed surplus
Surat	Small	34.82 (100.00)	1.30 (3.73)	0.30 (0.86)	0.23 (0.66)	0.37 (1.06)	2.20 (6.32)	32.62 (93.68)
	Medium	36.16 (100.00)	1.48 (4.09)	0.82 (2.27)	0.52 (1.44)	0.18 (0.50)	3.00 (8.30)	33.16 (91.70)
	Large	38.13 (100.00)	1.99 (5.22)	1.50 (3.93)	0.80 (2.10)	0.76 (1.99)	5.05 (13.24)	33.08 (86.76)
Bharuch	Small	35.14 (100.00)	1.75 (4.98)	0.50 (1.42)	0.34 (0.98)	0.21 (0.60)	2.80 (7.97)	32.34 (92.03)
	Medium	38.30 (100.00)	2.24 (5.85)	1.81 (4.73)	0.56 (1.46)	0.20 (0.52)	4.81 (12.56)	33.49 (87.44)
	Large	40.47 (100.00)	2.81 (6.94)	1.93 (4.77)	1.75 (4.32)	0.87 (2.15)	7.36 (18.18)	33.11 (81.81)
Narmada	Small	36.92 (100.00)	1.78 (4.82)	1.02 (2.76)	0.54 (1.46)	0.24 (0.65)	3.58 (9.70)	33.34 (90.30)
	Medium	37.68 (100.00)	2.98 (7.91)	1.56 (4.14)	1.10 (2.92)	0.63 (1.67)	6.27 (16.64)	31.41 (83.36)
	Large	37.77 (100.00)	3.56 (9.59)	2.45 (6.49)	2.03 (5.37)	1.78 (4.71)	9.82 (26.00)	27.95 (74.00)
Tapi	Small	34.03 (100.00)	0.9 (2.64)	0.50 (1.47)	0.30 (0.88)	0.42 (1.23)	2.12 (6.23)	31.91 (93.77)
	Medium	37.84 (100.00)	1.06 (2.80)	0.88 (2.33)	0.78 (2.06)	0.23 (0.61)	2.95 (7.80)	34.89 (92.20)
	Large	38.46 (100.00)	1.16 (3.06)	1.5 (3.90)	1.76 (4.58)	0.58 (1.51)	5.00 (13.00)	33.64 (87.00)
S.Guj	Overall	37.60 (100.00)	1.92 (5.11)	1.37 (3.64)	1.06 (2.82)	0.59 (1.57)	4.94 (13.14)	32.66 (86.86)

Source: Field survey, Note: Figure in parenthesis indicates per cent to total production.

It is evident from Table that the total production of wheat on sampled farms was 37.60 quintals. The on farm utilization of wheat was 13.14 per cent of total production. The quantity for home consumption was 5.11 per cent and wage purpose 3.64 per cent, for relatives 2.82 per cent and for others 1.57 per cent. The proportion of this utilization was less. Because of the bulkiness and season of wheat, there was 13.14 per cent difference between Marketable and marketed surplus of wheat in the present study. The marketable surplus of wheat was 86.86 per cent on over all farms. The marketed surplus was less in Surat and Tapi districts because Mandavi, Nizar and songadh talukas were different than others because the consumption pattern of people is different (rice or sorghum).

#### **4.4 Marketing channel, marketing cost, margin, price spread, and producer's share in consumer's rupee, marketing efficiency in marketing system of wheat crop**

##### **4.4.1 Marketing channel**

The difference between the price paid by the ultimate consumer and the price received by the farmer for an equivalent quantity of produce is known as price spread. It included cost of performing various marketing functions and margins of different agencies associated in the marketing process of the commodity. The extent of price spread helps policy makers in devising suitable policies for increasing marketing efficiency either by way of reducing the marketing costs or eliminating unwanted middlemen from the marketing process of by both. The marketing costs, margins and price spread in marketing of wheat through major channel have

been presented based on the data collected from farmers and market functionaries. The channels identified in the study area were:

**Channel I :** Producer – Wholesaler - cum - Processor -  
Retailer – Consumer

**Channel II :** Producer – Wholesaler - cum - Commission  
Agent - Retailer – Consumer

**Channel III:** Producer – Wholesaler - Retailer – Consumer

**Channel IV:** Producer - Retailers – Consumers

On an average about 79.86 per cent of total wheat moved in studied area through Channel I, II, and III. While, in case of retailer or channel IV it was 20.14 per cent. Thus, more than 80 per cent of wheat was marketed through producer to channel I, II and III. The costs incurred and margins earned by various market functionaries as well as price spread in marketing of wheat through Channel I, II and III. Even district wise price spread indicated in Table 4.4.5.1.

#### **4.4.2 Agency-wise sale of Wheat**

Like other crops, the profitability of wheat crops depends upon how marketing is undertaken by the producers. Agency through which it is sold and some of the important factors which influence the net price received by the farmers. The farmer's decisions with respect to agency for sale of wheat is influenced by number of factors such as mode and transportation facilities available, distance and location of markets, price of the produce, transportation cost, Marketable

quantity and economic conditions of the farmers. Disposal of wheat through various agencies is presented in Table 4.4.2.

**Table 4.4.2: Disposal Pattern of Wheat under Different Agencies (Qty. in Quintal)**

Marketing Agency	Particulars	Category of Farm			
		Small	Medium	Large	All Farms
<b>Retailer</b>	No. of Farmers	30.00 (23.29)	24.00 (39.38)	18.00 (25.71)	72.00 (30.00)
	Quantity Sold	977.08 (27.26)	1562.07 (27.31)	1150.46 (13.21)	3689.71 (20.48)
<b>W.S cum Processor/ W.S /W.S cum C.A</b>	No. of Farmers	66.00 (92.59)	50.00 (67.58)	52.00 (74.29)	168.00 (70.00)
	Quantity Sold	2607.20 (72.74)	4158.52 (72.69)	7558.18 (86.79)	14323.90 (79.52)
<b>Total Marketed Surplus</b>	No. of Farmers	96.00 (100.00)	74.00 (100.00)	70.00 (100.00)	240.00 (100.00)
	Quantity Sold	3584.28 (100.00)	5720.59 (100.00)	8708.64 (100.00)	18013.51 (100.00)

Source: Field survey. (W.S = wholesaler, C.A = Commission agent).

Note: Figure in parentheses indicate per cent to total marketed surplus.

The purchase of wheat was undertaken by the retailers and the wholesaler/ wholesaler cum commission agent/ wholesaler cum processor in the market. The data in the Table indicated the relative importance of the different agencies in overall marketing system.

The Table reveals that maximum number of farmers (about 70.00 per cent on an overall basis) preferred to sale their produce to the wholesaler/ wholesaler cum commission

agent/ wholesaler cum processor. About 20.48 per cent producers preferred to sell to the retailers. Further, it was observed from Table 4.4.2 that per cent sale of wheat to wholesaler cum processor increased as small, large, medium. Table 4.4.2 also depicts that marketed surplus of different farm size group out of 18013.51 quintals of total marketed surplus of wheat, 14323.90 quintals (79.52 per cent) was purchased by the wholesaler/ wholesaler cum commission agent/ wholesaler cum processor and 3689.71 quintals (20.48 per cent) was marketed through the retailers.

The above results pointed that the role played by the wholesaler/ wholesaler cum commission agent/ wholesaler cum processor were dominant in marketing of wheat; from both the point of view *i.e.* number of farmers used it and quantity of wheat sold through these agencies. This might be due to the immediate payment of produce and lower marketing cost.

#### **4.4.3 Marketing Cost Incurred by the Wheat Growers**

Cost of marketing affects the producer's net share in consumer's rupee. The details of component wise per quintal marketing cost were calculated for four channels separately. Also the different marketing costs incurred by wheat growers are presented in Table 4.4.3.

**Table 4.4.3: Marketing Cost Incurred by the Wheat Growers in south Gujarat (₹/Quintal)**

Particular	Category of Farm			
	Small	Medium	Large	All Farms
Cleaning, Grading and Packing Charges	2.50 (18.38)	1.84 (18.20)	1.12 (11.70)	1.82 (16.55)
Loading and Unloading Charges	3.00 (22.06)	2.98 (29.48)	3.00 (31.35)	2.96 (26.91)
Transportation Cost	5.20 (38.24)	3.95 (39.07)	3.31 (34.59)	4.14 (37.64)
Post-harvest loss	2.90 (21.32)	2.34 (23.15)	2.14 (22.36)	2.08 (18.91)
<b>Total Marketing Cost</b>	<b>13.60</b> <b>(100.00)</b>	<b>10.11</b> <b>(100.00)</b>	<b>9.57</b> <b>(100.00)</b>	<b>11.00</b> <b>(100.00)</b>

Source: Field survey.

(Note: Figure in parentheses indicates per cent to total marketing cost, Marketing cost added in miscellaneous cost in cost concept.)

It is evident from the Table 4.4.3 that on an average marketing cost was incurred by wheat growers amounted to ₹ 11.00 per quintal. Among the various components of marketing cost incurred by the growers, transport cost was highest (₹ 4.14/qtls.), accounting 37.64 per cent of total marketing cost, followed by cost of loading and unloading (26.91 per cent), post harvest loss cost (18.91 per cent), Cleaning, Grading and Packing Charges (16.55 per cent). Further, the results revealed that per quintal total cost was highest on small farms (₹ 13.60), followed by on medium farms (₹ 10.11) and on large farms (₹ 9.57).

Marketing cost incurred by the wheat growers was negligible because most of growers selling their produce

through wholesaler / wholesaler cum commission agent/ wholesaler cum processor, the clean wheat are demanded by consumers.

**4.4.4 Marketing Cost Incurred by wholesaler cum Processor, wholesaler cum commission agent, wholesaler, and retailer**

The detail about marketing cost incurred by wholesaler cum Processor, wholesaler cum commission agent, wholesaler in the marketing of wheat is presented in Table 4.4.4.

**Table 4.4.4: Marketing cost incurred by wholesaler cum processor, wholesaler, Wholesaler cum commission agent (₹/Qtls.)**

<b>Sr. No.</b>	<b>Particulars</b>	<b>Wholesaler</b>	<b>Wholesaler cum commission agent</b>	<b>Wholesaler Cum processor</b>
1	Cleaning, Grading and Packing Cost	45.00 (34.60)	45.00 (32.77)	40.00 (20.29)
2	Loading and unloading Charges	6.03 (4.64)	6.05 (4.41)	6.01 (3.05)
3	Transportation cost	50.80 (39.06)	60.50 (44.06)	110.14 (55.87)
4	Weighing Charges	2.49 (1.91)	2.45 (1.78)	2.10 (1.07)
5	Post-harvest loss	10.00 (7.69)	8.90 (6.48)	15.00 (7.61)
6	Market commission	6.80 (5.23)	6.49 (4.73)	13.20 (6.70)
7	Others	8.93 (6.87)	7.93 (5.77)	10.69 (5.42)
<b>Total marketing cost</b>		<b>130.05 (100.00)</b>	<b>137.32 (100.00)</b>	<b>197.14 (100.00)</b>

Source: Field survey.

It can be inferred from the Table that the total marketing cost borne by post wholesaler cum Processor for wheat was ₹ 197.14 per quintal. Among the various cost components, the major cost component was transportation cost which accounted as 55.87 per cent of total marketing cost, followed by cleaning, grading and packing cost (20.29 per cent), Post-harvest loss (7.61 per cent), market cess (6.70 per cent), loading-unloading charges (3.05 per cent) and weighing charges (1.07 per cent). While, marketing cost in case of wholesaler and wholesaler cum commission agent were ₹ 130.05 and ₹ 137.32 respectively. Same trends were found in components of marketing cost in both the market functionaries like wholesale cum processor. The higher marketing cost of wholesaler cum processor was due to high transportation cost incurred by wholesaler cum Processor as a buyer while buying and selling it to mostly in Bombay retail market from distant places.

#### **4.4.5 Marketing Cost Incurred by Retailer**

Generally, retailers operating in selected markets area purchased wheat from producers and sold to consumers through their retail shops. The result on costs incurred by retailers in the marketing of wheat was presented in Table 4.4.5.

In wheat, retailers incurred ₹ 110.38 as total marketing cost per quintal. Among different items of expenditure, the maximum share was noticed for cleaning, grading and packing cost (40.77 per cent to total marketing cost).

**Table 4.4.5: Cost incurred by the Retailer in marketing of Wheat (₹/qtls.)**

<b>Sr. No.</b>	<b>Particulars</b>	<b>Retailer</b>	<b>Percentage to total</b>
1	Cleaning, Grading and Packing Cost	45.00	40.77
2	Loading and unloading Charges	6.03	5.46
3	Transportation cost	31.00	28.08
4	Weighing Charges	2.49	2.26
5	Post harvest loss	10.00	9.06
6	Market fees	6.89	6.24
7	Others	8.97	8.13
<b>Total marketing cost</b>		110.38	100.00

The other important components were the cost of transport (28.08 per cent), post harvest loss (9.06 per cent), Others cost (8.13 per cent), market cess (6.24 per cent), the cost of loading and unloading (5.46 per cent) and weighing cost (2.26 per cent) to total marketing cost.

The district wise marketing cost presented in Table 4.4.5.1 and revealed that channel-I, II, III and IV the cost incurred by producer per quintal of wheat in Surat district was ₹ 13.22, ₹ 11.40, ₹ 10.80 and ₹ 9.57 respectively. In case of Bharuch district the per quintal cost of wheat it was ₹ 13.22, ₹ 11.40 ₹ 10.80 and ₹ 9.97, respectively. While in case of Narmada district per quintal of wheat was ₹ 12.22, ₹ 10.97, ₹ 10.43, and ₹ 9.70, respectively. In case of Tapi district it was ₹ 12.02, ₹ 11.02, ₹ 10.10, and ₹ 9.51, respectively.

**Table 4.4.5.1 : District wise cost, margin and price spread, producer's share in consumer rupees and marketing efficiency in marketing of Wheat in Selected districts (n=240) ( ₹ / qtls.)**

Particulars	Surat District				Bharuch District				Narmada District				Tapi District			
	C-I	C-II	C-III	C-IV	C-I	C-II	C-III	C-IV	C-I	C-II	C-III	C-IV	C-I	C-II	C-III	C-IV
Producer's net price(°) (PS in %)	1489.90 (74.58)	1517.60 (76.19)	1581.23 (79.58)	1599.90 (82.09)	1498.70 (74.98)	1507.00 (75.71)	1567.89 (78.82)	1598.04 (79.85)	1516.00 (75.66)	1567.41 (78.72)	1590.56 (80.06)	1599.93 (79.87)	1493.00 (74.75)	1534.99 (77.12)	1582.5 (79.55)	1599.9 (79.80)
<b>Cost incurred by (₹)</b>																
(a) PP	13.22	11.40	10.80	9.97	12.22	10.97	10.43	9.70	12.02	11.02	10.10	9.51	12.94	11.13	10.67	9.90
(b) WSCP	197.50	-	-	-	196.78				200.00				194.26			
(c) WSCC	-	138.90	-	-		137.12				134.23				138.90		
(d) WS	-	-	132.60	-			128.90				127.56				129.78	
(e) R		-	-	111.34				109.12				105.35				111.09
<b>TMC</b>	<b>210.72</b>	<b>150.30</b>	<b>143.40</b>	<b>121.31</b>	<b>209.00</b>	<b>148.09</b>	<b>139.33</b>	<b>118.80</b>	<b>211.00</b>	<b>145.25</b>	<b>137.66</b>	<b>114.86</b>	<b>208.30</b>	<b>150.03</b>	<b>140.45</b>	<b>120.99</b>
<b>Margins of (₹)</b>																
(a) WSCP	157.33 (7.88)	-	-	-	133.89 (6.70)	-	-	-	113.02 (5.64)	-	-	-	157.00 (7.86)	-	-	-
(b) WSCC	-	190.00 (9.54)	-	-	-	199.37 (10.02)	-	-	-	174.04 (8.74)	-	-	-	198.35 (9.96)	-	-
(c) WS	49.88 (2.50)	-	117.22 (5.90)		51.00 (2.55)	-	121.87 (6.13)		49.12 (2.45)		110.28 (5.55)		50.00 (2.50)	-	117.35 (5.90)	-
(d) R	90.00 (4.50)	133.85 (6.72)	145.06 (7.30)	217.70 (11.17)	106.30 (5.32)	135.95 (6.84)	159.88 (8.05)	274.81 (13.73)	114.70 (5.72)	102.20 (5.13)	145.48 (7.32)	274.61 (13.71)	89.00 (4.46)	110.00 (5.53)	149.58 (7.52)	274.08 (13.67)
RSP/ CPP	1997.80	1991.80	1986.90	1948.90	1998.90	1990.40	1989.00	2001.40	2003.80	1991.20	1986.76	2003.10	1997.30	1990.50	1989.20	2005.00
MME	2.93	3.20	3.90	4.75	3.00	3.12	3.72	4.08	3.11	3.70	4.02	4.08	2.96	3.37	3.89	4.07

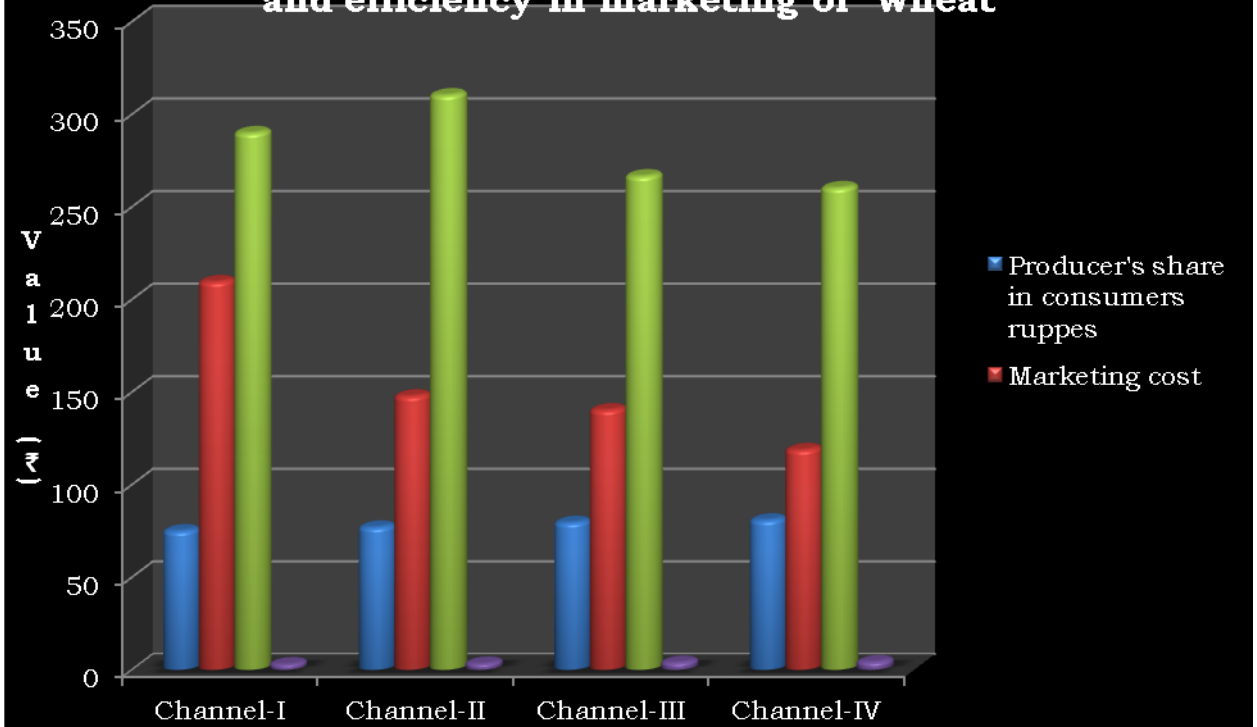
(Note: C-I = Channel I, C-II = Channel II, C-III = Channel III, C-IV = Channel IV, PP = producer's price, WSCP = wholesaler cum processor, WSCC = wholesaler cum commission agent, WS = wholesaler, R = Retailer, RSP = Retailer's selling price, CPP = consumer's purchase price, MME = modified marketing efficiency)

**Table 4.4.5.2: Cost, margin and price spread in marketing of Wheat in south Gujarat** (n=240)

Sr. No.	Particulars	Channel-I	Channel-II	Channel-III	Channel-IV
1	Producer's net price(₹)(Producer's share %)	1499.40 (75.00)	1531.75 (76.97)	1580.56 (79.52)	1599.45 (80.84)
2	<b>Cost incurred by (in ₹)</b>				
	(a) Producer	12.60	11.13	10.50	9.77
	(b) wholesaler cum processor	197.14	-	-	-
	(c) Wholesaler-cum-commission agent	-	137.32	-	-
	(d) Wholesaler	-	-	130.05	-
	(e) Retailer		-	-	110.38
	<b>Total marketing cost</b>	209.74	148.45	140.55	119.43
	<b>Margins of ( in ₹)</b>				
	(a) wholesaler cum processor	140.31 (7.02)	-	-	-
	(b) Wholesaler-cum-commission agent	-	190.44 (9.57)	-	-
	(c) Wholesaler	50.00 (2.50)	-	116.68 (5.87)	
	(d) Retailer	100.00 (5.00)	120.00 (6.03)	150.00 (7.55)	260.30 (13.16)
4	Retailer's sale price/ consumer's purchase price (₹)	1999.45	1990.64	1987.79	1989.60
5	Marketing efficiency	3.00	3.34	3.88	4.23

Source: Field survey. (Note: Grading/packing, Market cess are counting one time during margin calculation)

**Fig: 4.6: Producer' share, marketing cost, margin and efficiency in marketing of Wheat**



#### **4.4.6 Price spread**

The producer's share in the consumer's rupee is one of the important yardsticks for measuring the price offered by the buyer after deducting marketing cost. The share of producer varies from market to market and one category to another category of farmer.

Table 4.4.5.1 revealed the district wise marketing channels in which marketing costs, margins, and producer's shares in consumer's rupee of different intermediaries. Producer's share in the consumer's rupee was highest in Channel IV of Surat district *i.e.* was 82.09 per cent. While it is lowest in channel I of Surat district *i.e.* 74.58 per cent.

In Surat districts the margin earned by market functionaries Channel IV had highest margin because in this channel produce was less changing hands or transaction of product was less compared to other channels. The retailer margin was ₹ 217.70, which was 11.17 per cent of consumer rupee. The producer's share in consumer rupee in all channels was ranged from 74.58 per cent to 82.09 in Surat district.

In Bharuch districts same as Surat district the margin earned by market functionaries Channel IV had highest margin. The retailer margin was ₹ 274.81, which was 13.73 per cent of consumer rupee. The producer's share in consumer rupee in all the channels was ranged from 74.98 per cent to 79.85 per cent in Bharuch.

In case of Narmada districts the margin earned by market functionaries Channel IV had highest margin. The retailer margin was ₹ 274.61, which was 13.71 per cent of consumer rupee. The producer's share in consumer rupee in

all channels was ranged from 75.66 per cent to 80.06 per cent, in Narmada district.

In Tapi districts the margin earned by market functionaries Channel IV had highest margin also among the all districts. The retailer margin was ₹ 274.08, which was 13.76 per cent of consumer rupee. The producer's share in consumer rupee in all channels was ranged from 75.76 per cent to 79.80 per cent, in Narmada district.

From Table 4.4.5.2 observed that in channel I, producer got a net price of ₹ 1499.40 per quintal or 75.00 per cent of the price paid by the consumer. Marketing cost incurred by different middlemen including the producer was ₹ 209.74 or 10.49 per cent of consumer rupees. Wholesaler cum processor in sale of wheat earned a margin of ₹ 140.31 or 7.02 per cent of price paid by consumer rupee. While, wholesaler earned margin of ₹ 50 (2.50 per cent) and retailer earned profit of ₹ 100 (5.00 per cent).

In channel II, producer got a net price of ₹ 1531.75 per quintal or 76.97 per cent of the price paid by the consumer. Marketing cost incurred by different middlemen including the producer was ₹ 148.45 or 7.44 per cent of consumer rupees. Wholesaler cum commission agent in sale of wheat earned a margin of ₹ 190.44 or 9.57 per cent of price paid by consumer rupee. While, retailer earned profit of ₹ 120 (6.03 per cent).

In channel III, producer got a net price of ₹ 1580.56 per quintal or 79.52 per cent of the price paid by the consumer. Marketing cost incurred by different middlemen including the producer was ₹ 140.55 or 7.42 per cent of consumer rupees. Wholesaler in sale of wheat earned a margin

of ₹ 116.68 or 5.87 per cent of price paid by consumer rupee. In case of retailer share in consumer rupees was ₹150 (7.55 per cent).

In channel IV, producer got a net price of ₹ 1599.45 per quintal or 80.84 per cent of the price paid by the consumer. Marketing cost incurred by different middlemen including the producer was ₹ 119.43 or 6.00 per cent of consumer rupees. Retailer in sale of wheat earned a margin of ₹ 260.30 or 13.16 per cent of price paid by consumer rupee.

Among the various middlemen, retailer margin had been ₹ 260.30 or 13.16 per cent of consumer rupees, this was higher than the other market functionaries.

#### **4.4.7 Market efficiency**

Market efficiency essentially reflects the degree of market performance. An efficient marketing system is an effective agent of change and an important means of raising income level of consumers. The existence of competitive conditions and desire to maximize profit are the main forces which induce firms to operate efficiently. In this section, comparative marketing efficiency of alternate marketing channel in wheat trade was analyzed and presented (Table 4.4.5.1 and Table 4.4.5.2).

In the Surat districts, marketing efficiency of channel I, Channel II, Channel III and Channel IV was 2.93, 3.20, 3.90, and 4.75 respectively.

In case of Bharuch districts, marketing efficiency of channel I, Channel II, Channel III and Channel IV was 3.00, 3.12, 3.72, and 4.08 respectively.

While, in Narmada districts marketing efficiency of channel I, Channel II, Channel III and Channel IV was 3.11, 3.70, 4.02, and 4.08 respectively.

In Tapi districts, the marketing efficiency of channel I, Channel II, Channel III and Channel IV was 2.96, 3.37, 3.89, and 4.07 respectively.

In all the districts the channel IV was earned more profit as compared to other channels and also noted that producer's share in consumer's rupees was high in this channel.

#### **4.5 NATURE AND DEGREE OF COMPETITION OF MARKET**

One of the important indicators of efficient functioning of markets is the existence of the degree of integration in them. According to Uma Lele, market integration is the inter-relationship between price movements of the commodities in two markets. In an integrated market, price of a product is responsive to price change in another market and as such price differences for a particular variety of a product between the markets should not exceed the transportation and handling costs of produce. The analysis of movements in prices of a commodity in the corresponding and linked markets helps to judge the extent of efficiency in the marketing system of the region for the selected produce. In this objective, markets integration between the markets spatially located at different places for wheat has been analysed.

The objective has been divided in following three sections:

- i. Examining the extent and nature of competition and concentration of market power in the selected wheat markets of Gujarat,
- ii. Correlation between monthly wholesale prices of wheat in the selected markets of Gujarat; and
- iii. Spatial price difference and transportation costs for wheat between the selected market pairs.

#### **4.5 Competitiveness of markets and Concentration of market power**

##### **4.5.1 Competitiveness of markets**

The existence of integration in markets reveals the situation of competitive structure of marketing system as a whole. In an economic literature, the perfectly competitive market has been considered as a desirable condition for providing better returns from a unit of the product to the producers and goods to the consumers at reasonable prices. To know this, an attempt has been made to analyse the extent and nature of competition existing in the markets as well as the concentration of market power in the selected wheat markets of Gujarat. Both type of integration existing in the study area has been studied.

##### **4.5.1.1 Vertical Integration**

Vertical integration is linking together of two or more functions in the marketing process within a single firm or ownership (Kohls and Uhl, 1980). In vertical integration, particular firm performs two or more activities in the marketing process as the assumption of the function of commission agent and processor by the traders and so on.

In selected market of Gujarat found that the firms performed different operation like as wholesaler, wholesaler cum commission agent, processor, retailer, exporter.

**Table 4.5.1.1 : Vertical integration among the market functionaries of the selected markets of Gujarat**

Markets	Number of firms performing the functions				Total No. of firms
	One	Two	Three	More than three	
<b>Dahod</b>	4.00 (13.79)	8.00 (27.59)	13.00 (44.83)	4.00 (13.79)	29.00 (100.00)
<b>Jamnagar</b>	3.00 (33.33)	5.00 (55.56)	1.00 (11.11)	0.00 (0.00)	9.00 (100.00)
<b>Sanand</b>	3.00 (13.04)	18.00 (78.26)	2.00 (8.70)	0.00 (0.00)	23.00 (100.00)
<b>Talod</b>	5.00 (12.50)	13.00 (32.50)	10.00 (25.00)	12.00 (30.00)	40.00 (100.00)
<b>Bharuch</b>	4.00 (20.00)	15.00 (75.00)	1.00 (5.00)	0.00 (0.00)	20.00 (100.00)
<b>Total markets</b>	<b>19.00</b> <b>(15.70)</b>	<b>59.00</b> <b>(48.76)</b>	<b>27.00</b> <b>(22.31)</b>	<b>16.00</b> <b>(13.22)</b>	<b>121.00</b> <b>(100.00)</b>

(Figures in parentheses are the percentages of the total number of firms in the respective market)

Table 4.5.1.1 explained that extent of vertical integration among the market functionaries of the selected wheat markets of Gujarat. Out of 121 wheat dealing firms, 19 firms (15.70 per cent) acted only as wholesaler and remaining 101 firms (84.30 per cent) performed two and more functions *viz.* as wholesaler, as commission agent, as retailer and as processor of wheat. In the Talod wheat market, out of 40 wheat dealing firms 5 firms (12.50 per cent) acted only as wholesaler and remaining 35 firms (87.50 per cent) performed two and more functions *viz.* acted as wholesaler, as commission agent and as a processor. In Sanand market, out

of 23 wheat dealing firms 3 firms (13.04 per cent) acted only as wholesaler and 20 firms (86.96 per cent) acted as wholesaler, commission agent and as a processor *i.e.* performed more than two functions in the marketing sequence. In Dahod market, out of 29 wheat dealing firms 4 firms (13.79 per cent) acted only as a wholesaler and 25 firms (86.21 per cent) acted with multiple of function *viz.* as wholesaler, as commission agent, as retailer and as processor.

In Bharuch market, out of 20 wheat dealing firms, 4 firms (20.00 per cent) acted only as a wholesaler and 5 firms (80.00 per cent) performed the function of wholesaler cum commission agent, retailer and as processor in the market. In Jamnagar market, out of 9 wheat dealing firms, 3 firms (33.33 per cent) acted only as a wholesaler and 6 firms (66.67 per cent) performed the function of wholesaler cum commission agent, retailer in the market.

The above analysis revealed that the important wheat markets of Gujarat are vertically integrated to a good extent. The firms of Talod, Sanand, Dahod and Bharuch markets were integrated vertically to a higher extent as 88, 87, 86 and 80 per cent wheat dealing firms performed two and more functions. They acted as wholesaler, as commission agent, as retailer and also as processor of wheat. The degree of vertical integration was slightly lower in Jamnagar market as only 66.67 per cent firms performed two and more functions and 33.33 per cent firms acted only as a wholesaler (*i.e.* performed only one function in the process of trade).

#### **4.5.1.2 Horizontal Integration**

Horizontal integration exists when a firms gain control over other firms of the market performing similar

marketing functions in the marketing sequence. The existence of horizontal integration among the firms of the market reduces the extent of factual competition in the market. The mere presence of large number of functionaries in the markets cannot be considered as an indicator of existence of more competition unless the firms are free from such interrelations. The existence of horizontal integration among the market functionaries of the selected markets has been presented in Table 4.5.1.2.

**Table 4.5.1.2 : Horizontal integration among the market functionaries of the selected markets of Gujarat**

<b>Markets</b>	<b>Number of firms having ownership of similar nature firms</b>			<b>Total No. of firms</b>
	<b>One</b>	<b>Two</b>	<b>Three</b>	
<b>Dahod</b>	25.00 (86.20)	2.00 (6.90)	2.00 (6.90)	29.00 (100.00)
<b>Jamnagar</b>	7.00 (77.77)	2.00 (22.22)	0.00 (0.00)	9.00 (100.00)
<b>Sanand</b>	23.00 (100.00)	0.00 (0.00)	0.00 (0.00)	23.00 (100.00)
<b>Talod</b>	35.00 (87.5)	2.00 (5)	3.00 (7.5)	40.00 (100.00)
<b>Bharuch</b>	18.00 (90.00)	2.00 (10.00)	0.00 (0.00)	20.00 (100.00)
<b>Total markets</b>	<b>108.00 (89.26)</b>	<b>8.00 (6.61)</b>	<b>5.00 (4.13)</b>	<b>121.00 (100.00)</b>

(Figures in parentheses are the percentages of the total number of firms in the respective market)

The selected wheat markets of the state had very little horizontal integration as 89.26 per cent firms (108 firms of total 121 wheat dealing firms) owned only one establishment and only 10.74 per cent firms (13 firms) had two and more establishments in the markets. Among the selected markets, the firms of Jamnagar and Dahod markets

were integrated horizontally to a greater extent than the state as whole (6.61 and 4.13 per cent). The extent of horizontal integration was lesser in Sanand, Bharuch and Talod markets in marketing of wheat as 95 per cent firms in these markets had only one establishment and only 5 per cent firms had two and more establishments. The study reveals that the firms dealing in wheat were lesser horizontally integrated in the markets of the state. The study reveals that wheat markets of the state were better integrated vertically than horizontally meaning thereby that the firms in the markets were more actively related to each other. These firms acquired greater power over the selling and buying process in marketing of wheat.

#### **4.5.2 Concentration of market power**

Concentration of market power is an indicator of poor competition among the firms of a trade and consequently, market conduct and performance in sale of agricultural commodities is not conducive for betterment of farmer-sellers. Concentration of market power is assessed by the control of the quantity of the produce by an individual firm or a group of firms over buying and selling of large part of the produce. High degree of market concentration restricts the free and fair competitive movement of goods between buyers and sellers and in turn creates an oligopoly or oligopsony situation in the market. The extent of competition in a market and consequently prices of commodities in the market are largely influenced by the existence of concentration of market power.

While measuring the concentration of market power in the selected markets, the volume of wheat purchased by the

wheat traders were taken in account for six months period of the peak marketing season of the crop. All the firms of the selected markets were arranged according to the volume of wheat purchased in the descending order and the cumulative percentages were worked out (Table 4.5.2.1).

The selected markets had shown the existence of concentration of market power to varying degrees. In Dahod and Talod markets the first five firms purchased 25.89 and 19.02 per cent of the wheat sold in these mandies during the study period.

**Table 4.5.2.1: Concentration of wheat purchases in the selected markets of Gujarat states during 2012-2013**

(n= 121,Quantity in quintals)

Markets	Total arrivals of wheat	Purchase of Wheat by the firms						
		The largest firm	First 5 Firms	First 10 firms	First 15 Firms	First 20 Firms	First 25 Firms	First 50 Firms
<b>Dahod [29]</b>	66815 (100.00)	3840 (5.74)	17300 (25.89)	32140 (48.10)	43645 (65.32)	53785 (80.50)	63015 (94.31)	66815 (100.00)
<b>Jamnagar [09]</b>	11785.70 (100.00)	2330 (19.77)	8435 (71.57)	11785.70 (100.00)	-	-	-	-
<b>Sanand [23]</b>	81770 (100.00)	36780 (44.98)	57250 (70.01)	70580 (86.32)	78790 (96.36)	81770 (100.00)	-	-
<b>Talod [40]</b>	23060 (100.00)	549 (2.38)	4385 (19.02)	8590 (37.25)	11770 (51.04)	14230 (61.71)	16340 (70.86)	23060 (100.00)
<b>Bharuch [20]</b>	33130 (100.00)	4650 (14.03)	17490 (52.79)	27130 (81.89)	31250 (94.33)	33130 (100.00)	-	-

1. Figures in square brackets are the total number of firms dealing in wheat in the market.
2. Figures in parentheses are the cumulative percentages of total wheat transaction in each market.

Further, the first 10, 15, 20 and 25 firms purchased 48.10, 65.32, 80.50 and 94.31 per cent of wheat produce, respectively in the Dahod market. In Talod market,

the first 10, 15, 20 and 25 firms purchased 37.25, 51.04, 61.71 and 70.86 per cent wheat arrivals, respectively. The results revealed that in Dahod and Talod markets involvement of trader in auction and purchase of wheat was fairly large and evenly distributed indicating thereby that these markets did not have high degree of concentration of market power. In Sanand, Jamnagar and Bharuch, market concentration of market power was more as the first five firms purchased 70.01, 71.57 and 52.79 per cent of total wheat arrived in the mandi during the study period. Further, the first 10 and 15 firms of Sanand and Jamnagar market purchased 86.32 and 100 per cent of wheat marketed in the mandi. In Bharuch market, the first 15 firms purchased 81.89 and 94.33 per cent of total wheat arrived in the market.

The largest single firm of Sanand, Jamnagar, Bharuch, Dahod and Talod markets purchased 44.98, 19.77, 14.03, 5.74 and 2.38 per cent wheat seed sold in the mandies, respectively. In Sanand, Jamnagar and Bharuch markets where there existed high degree of concentration of market power, the largest single firm controlled the major business activity of wheat trade in these markets. The largest firm in these markets had strong bargaining power due to their better financial position as well as due to the ownership of processing unit for wheat in the market.

The first five firms of Jamnagar Sanand and Bharuch markets controlled 65 per cent of the total wheat purchases while the first five firms of Dahod and Talod markets purchased only 23 per cent of total wheat marketed in them. As such competition in marketing was more fair in the

Dahod and Talod markets compared to Jamnagar and Sanand markets of the state.

**4.5.3 Correlation coefficients in monthly wholesale price of wheat in different wheat markets of the state**

The extent of association between the prices of a commodity between the primary wholesale and the corresponding secondary wholesale market was studied by working out the correlation coefficients in them and the price differential between the prices over a period of time. The price differential between the selected primary and the corresponding secondary wholesale market pair was worked out by finding out the difference in the wholesale prices of wheat in these markets, month by month. The frequency distribution of months according to extent of price differential in monthly wholesale price between the selected market pairs has been presented in Table 4.5.3.1.

**Table 4.5.3.1: Frequency distribution of month according to absolute difference in monthly whole sale prices for wheat between the selected market pairs of Gujarat during, January, 2009 to December, 2013 (Number of months)**

Price difference (Rs/qtl)	Market pairs			
	Sanand -Dahod ( 224.7 Kms )	Sanand-Talod ( 90 Kms )	Sanand-Jamnagar ( 210 Kms )	Sanand-Bharuch ( 225.2 Kms )
<b>100- 150</b>	7.00 (11.67)	4.00 (6.67)	27.00 (45.00)	8.00 (13.33)
<b>151-200</b>	17.00 (28.33)	2.00 (3.30)	0.00 (0.00)	0.00 (0.00)
<b>201-350</b>	15.00 (25.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
<b>350-500</b>	13.00 (21.66)	7.00 (38.33)	23.00 (38.00)	9.00 (15.00)
<b>Total month</b>	60.00 (100.00)	60.00 (100.00)	60.00 (100.00)	60.00 (100.00)

Figures in parentheses are the percentages of total monthly observations in the market - pair.

It is evident from the table that the price differential of wheat exceeded ₹ 150 per quintal in 11.67, 6.67, 45.00 and 13.33 per cent months in Sanand - Dahod, Sanand - Talod, Sanand - Jamnagar and Sanand - Bharuch market pairs, respectively. Price difference exceeded more than ₹ 350 in 21.66, 38.33, 38.00 and 15.00 per cent months in Sanand - Dahod market (224.7 KM\*), Sanand - Talod (90 KM\*), Sanand - Jamnagar (210 KM\*) and Sanand - Bharuch market pairs (225.2 KM\*), respectively. The markets situated at lesser distance from each other displayed higher price difference compared to the markets located at greater distance. This was due to movement of produce from their markets to consumer's markets or village markets.

These results were further corroborated by working out the correlation coefficients in monthly prices. The correlation coefficients in monthly wholesale prices during the study period between the selected market pairs has been presented in Table 4.5.3.3.

**Table 4.5.3.2: Correlation coefficients in monthly wholesale arrival of wheat between the selected market pairs of Gujarat during, January, 2009 to December, 2013**

Markets	Dahod	Jamnagar	Sanand	Talod	Bharuch
<b>Dahod</b>	1	0.9613**	0.8556**	0.8218**	0.6754**
<b>Jamnagar</b>		1	0.8596**	0.8710**	0.6935**
<b>Sanand</b>			1	0.9265**	0.7824**
<b>Talod</b>				1	0.8675**
<b>Bharuch</b>					1

\*\* Significantly different from zero at 1 per cent level of significance

\* Significantly different from zero at 5 per cent level of significance

**Table 4.5.3.3 : Correlation coefficients in monthly wholesale price of wheat between the selected market pairs of Gujarat during, January, 2009 to December, 2013**

Markets	Dahod	Jamnagar	Sanand	Talod	Bharuch
<b>Dahod</b>	1	0.5634	0.5616	0.4933	0.4825
<b>Jamnagar</b>		1	0.9428**	0.9366**	0.6288**
<b>Sanand</b>			1	0.9672**	0.6357**
<b>Talod</b>				1	0.5701
<b>Bharuch</b>					1

\*\* Significantly different from zero at 1 per cent level of significance

\* Significantly different from zero at 5 per cent level of significance

The correlation coefficients in monthly wholesale prices for wheat between all the selected market pairs were positive and significantly different from zero. Among the market pairs studied correlation coefficients has been high in Sanand - Talod (0.96), Sanand - Jamnagar (0.94) and Jamnagar - Talod (0.93) market pairs. Correlation coefficients was low (0.48 to 0.63) in other market pairs *viz.* Sanand - Bharuch, Sanand - Dahod, Talod - Dahod, Talod - Bharuch, and Dahod - Jamnagar. The estimates of correlation coefficient were high in market pairs of Sanand - Talod, Sanand - Jamnagar and Jamnagar - Talod markets. The price association between these selected market pairs showing high correlation coefficient for wheat was tested against one by S.N.D. test to find out the existence of perfect association. The correlation coefficients analysis revealed that the values were positive and statistically different from zero in all the market pairs. The value of correlation coefficients were higher in Sanand - Talod, Sanand - Jamnagar and Jamnagar - Talod market pairs. This proves that these market pairs were well integrated and interdependent on each other for price movements. Lower value of correlation coefficients showed weak integration indicating the existence of imperfections in the markets. The wheat prices in these markets moved independently to the corresponding market. The hypothesis postulated earlier that wheat markets of the state are closely integrated in terms of movements of prices is not accepted. The results of this study are in conformity with the studies conducted by Singh and Gupta (1993) for rape seed and mustard in Punjab and Thakur (1994) for foodgrains in Gujarat.

#### **4.5.4 SPATIAL DIFFERENTIAL IN PRICES OF WHEAT AND THEIR COMPARISON WITH TRANSPORTATION COSTS**

The market integration as measured by working of correlation coefficients between the market pairs is not a perfect indicator of the existence of market Integration as the market pairs may sometimes reveal high degree of price correlation on account of better information system. In reality they may not be actually integrated.

The market integration as studied by working of correlation coefficients ( $r$ ) in the prices between the market pairs has been further corroborated by examining the spatial price differentials and their comparison with the transportation costs.

The spatial price differential between the selected secondary wholesale market and the primary wholesale market pair were worked out assuming the movement of the commodity from primary wholesale market to the secondary wholesale market. The results revealed that the average price difference has been positive in all the market pairs during the study period. This supports the existing contention that prices in the secondary wholesale markets are higher compared to the primary wholesale markets (Table 4.5.4.1).

Transportation costs between the selected market pairs varied from ₹ 30.50 to ₹ 50.00 per quintal. The difference in transportation costs between the market pairs has been there due to varying distance between the market pairs and the variation in charges of labour and other charges.

Transportation costs so computed were compared with the price differentials and returns to transportation per quintal of wheat were worked out. Returns to transportation costs were positive and above ₹ 350 per quintal in all the selected market pairs.

Returns to transportation cost was maximum in Sanand - Dahod market pair (₹ 350.00 per quintal), followed by Sanand - Talod market pair (₹ 339.50 per quintal), Sanand - Bharuch market pair (₹ 337.50 per quintal) and Sanand - Jamnagar market pair (₹ 305.00 per quintal). Price difference in all these selected market pairs was positive and substantially high to cover the transportation cost.

**Table 4.5.4.1: Average spatial price difference, transportation costs and returns to transportation between primary and secondary wholesale markets for wheat between the selected market pairs of Gujarat during, January, 2009 to December, 2013**

<b>Market pairs (Primary- Secondary)</b>	<b>Distance between the market pairs (kms)</b>	<b>Spatial price difference for wheat (₹/qtl)</b>	<b>Transport costs for wheat (₹/qtl)</b>	<b>Returns to Transport in wheat (₹/qtl)</b>
<b>Sanand -Dahod</b>	224.70	400.00	50.00	350.00
<b>Sanand -Jamnagar</b>	210.00	350.00	45.00	305.00
<b>Sanand -Talod</b>	90.00	370.00	30.50	339.50
<b>Sanand-Bharuch</b>	225.20	386.00	48.50	337.50

(Source: Field survey.)

Return to transportation increased with the increase in distance between the market pairs, except for Sanand - Dahod market pair. From the foregoing discussion, it is inferred that prices of wheat in the secondary wholesale markets has been higher than their respective primary wholesale markets and as such movement of wheat from primary wholesale market to the secondary wholesale market had been profitable. This is true in cash crops as these crop produce moves from production centers to city markets and from there to export markets. As against this foodgrains sometimes moves from big markets to village markets to meet the need of village consumers. The number of months in which net prices of wheat were higher in the secondary wholesale markets compared to primary wholesale markets and vice-versa were worked out by taking in to account the transportation costs (Table 4.5.4.1).

In 97 per cent months, prices were found to be higher in the secondary wholesale market compared to their corresponding primary wholesale market. Among the selected market pairs, prices of wheat were higher in the secondary wholesale markets in 96 to 98 per cent months. Prices of wheat were higher in primary wholesale markets in only 2 to 4 per cent months over the secondary wholesale markets.

Price difference in all the market pairs had been ever greater than transportation cost involved for moving the wheat from primary to secondary wholesale markets. The movement of wheat from secondary wholesale to primary wholesale market was not profitable entity.

An over view of the results presented in this section highlights that the price difference per quintal of wheat among

the selected primary and corresponding secondary wholesale market has exceeded ₹ 350 in all of them. Even this price difference is much higher even after meeting the transportation cost involved for moving one quintal of wheat. The movement of wheat from secondary wholesale markets to primary wholesale markets has not been there. The wheat moves in general to consumer markets from the secondary wholesale market after performance of the operations like cleaning, grading and processing. So it was concluded that the selected wheat markets of Gujarat were closely integrated in terms of movement of prices and therefore we accepted the hypothesis.

The results of this study are in conformity with the studies conducted by Singh and Gupta (1993) for rape seed and mustard in Punjab and Thakur (1994) for foodgrains in Gujarat.

#### **4.6 VALUE ADDITION IN WHEAT**

##### **4.6.1 Cost structure of bakery of south Gujarat**

The cost of production of Bakery products were calculated on the basis of size of bakery industry are presented in Table 4.6.1.1.

Table revealed that the cost of raw material used in production at different size of bakery industry *viz.* small, and medium were ₹ 6.50 and ₹ 14.46 lacs respectively.

The highest fixed cost was observed in medium bakery firm ₹ 2.50 lacs followed by ₹ 0.97 lacs in small firm where as the variable cost contributes in the production of various products. The highest cost observed in medium firm ₹ 20.07 lacs followed by small *i.e.* ₹ 8.50 lacs.

Among the various item of expenditure maida rank get first position *i.e.* ₹ 6.50 and ₹ 14.46 lacs rupees, in small, medium firm, next ingredients items of costs are sugar, oil/ghee, egg, cake gel and baking powder were utilized at overall level that are ₹ 9.50, ₹ 4.12, ₹ 0.55, ₹ 0.62 and ₹ 0.08 quintals respectively and small quantity of colour and essence etc. utilized.

The profitability of Bakery product was analyzed and presented in Table 4.7.1, it was seen that bakery products total cost was small and medium firms *i.e.* ₹ 9.47 and ₹ 22.57 lacs respectively. Whereas the gross returns was ₹ 11.51 and ₹ 32.28 lacs rupees respectively.

The cost per quintal of Bakery products and the net profit worked out on variable cost *i.e.* ₹ 2.01 and ₹ 9.71 lacs in small and medium firm respectively. The cost per quintal of Bakery products were estimated and recorded on the basis of before baking and after baking was ₹ 4220.70, ₹ 3400.38 and ₹ 7474.03 and ₹ 7595.29 in small and medium firms, respectively. The input output ratio was found in the different size of firm was 1:1.22, 1:1.43, respectively.

Break even point was estimated on small, medium, firm *i.e.* 29.16 qtls. and 73.52 qtls., respectively.

Table 4.6.1.2 revealed that in the sense of time, overall selected bakeries are covered their BEP within year. If the production is less than the BEP the unit is running in loss and if more than BEP it is in profit.

**Table 4.6.1.1: Per annum cost of production of profitability**

**(flour Confectionery and Baked) products of  
Bakery of selected districts in South  
Gujarat (n = 40)**

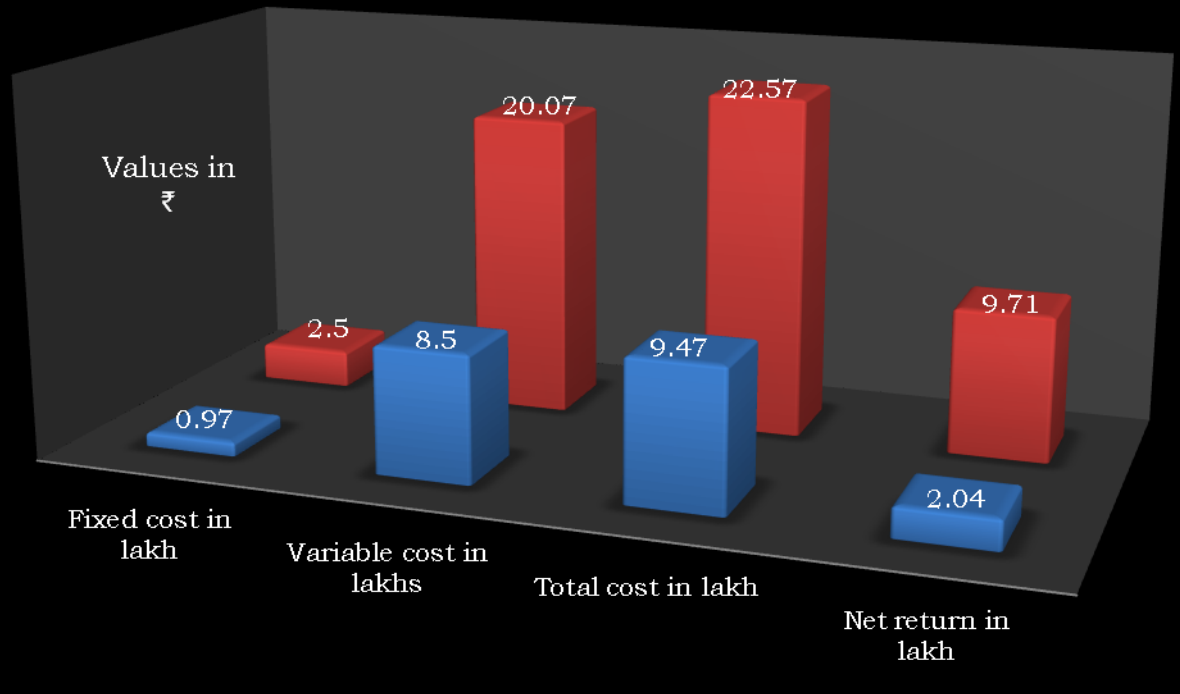
<b>Sr. No.</b>	<b>Particular</b>	<b>Small (₹ in lacs)</b>	<b>Medium (₹ in lacs)</b>
<b>1</b>	(A)Baked Products (Qtls.)	154.00	425.00
	(B)Confectionary Products(Qtls.)	50.92	238.75
<b>2</b>	Cost of raw material	6.50	14.46
<b>3</b>	Fixed cost	0.97	2.50
<b>4</b>	Variable cost	8.50	20.07
<b>5</b>	Total cost	9.47	22.57
<b>6</b>	Gross returns	11.51	32.28
<b>7</b>	Net profit on variable cost	2.01	9.71
<b>8</b>	Per quintal cost after baking (₹/Qtls.)	7474.03	7595.29
<b>9</b>	Per quintal cost before baking (₹/qtls.)	4621.31	3400.38
<b>10</b>	Output input ratio	1:1.22	1:1.43
<b>11</b>	<b>Break even point (Qtls)</b>	<b>29.16</b>	<b>73.52</b>

(Source: Field Survey.)

[Note: Variable cost sincludes sugar, oil/ghee, egg, cake gel and baking powder i.e ₹ 9.50, ₹ 4.12, ₹ 0.55, ₹ 0.62 and ₹ 0.08 quintals respectively]

**Fig. 4.7: Cost concept of Bakery**

■ Small scale bakery unit    ■ Medium scale bakery unit



**Table 4.6.1.2: Per annum output produced in Bakery of selected district of South Gujarat.**

Sr. No.	Particular	Group of Bakery firm		Overall (Qtls.)
		Small (Qtls.)	Medium (Qtls.)	
<b>I. Baked Products</b>				
1	Bread	30.00	150.00	90.00
2	Toast	15.00	106.00	60.50
3	Buns	10.00	28.00	19.00
4	Pav	15.00	26.00	20.50
5	Rolls	5.00	5.00	5.00
6	Khari	8.00	26.00	17.00
7	Samosa	18.00	12.00	15.00
8	Pizza	4.00	13.00	8.50
9	Burger	2.00	13.00	7.50
10	Puff (non veg.)	4.00	4.00	4.00
11	Puff (veg.)	8.00	27.00	17.50
12	Doughnuts	35.00	15.00	25.00
<b>Total baked products</b>		<b>154.00</b>	<b>425.00</b>	<b>289.50</b>
<b>II Flour confectionery</b>				
<b>A</b>	<b>Biscuits</b>			
13	Sweet biscuits	10.50	22.25	16.38
14	Salty biscuits	10.70	23.45	16.98
15	Cream biscuits	0.30	10.15	5.23
<b>B</b>	<b>Cake (plane)</b>			
16	Chocolate cake	0.45	19.50	9.98
17	Veg. cake	0.39	11.50	5.95
18	Non-veg cake	0.35	10.40	5.38
19	Cup cake	1.10	10.60	5.85
20	Pastry	1.50	22.90	12.20
21	Coconut cookies	11.78	24.50	18.14
22	Nan khatai	11.30	26.50	18.90
23	Vanilla biscuit	0.65	10.30	5.48
24	Plum cake sponge	0.40	11.40	5.90
25	Fruit cake	0.80	10.20	5.50
26	Peanut biscuits	0.25	10.60	5.43
	<b>Total confectionery products</b>	<b>50.92</b>	<b>238.75</b>	<b>144.78</b>

(Sources: Field survey)

#### 4.6.2 COST STRUCTURE OF FLOUR MILL OF SOUTH GUJARAT (SMALL SCALE)

The cost of production and returns of Flour mills were calculated on the basis of fixed and variable costs and are presented in Table 4.6.2.1.

**Table 4.6.2.1: Per annum cost of production and profitability of Flour mills of selected districts in South Gujarat (n = 20)**

Sr. No.	Particular	Flour selling cost (₹ in lacs) (A)	Flour Grinding cost (₹ in lacs) (B)	Overall cost (A+B)
1	Physical output (Qtls)	148.00	200.00	348
2	Cost of raw material	2.52	-	2.52
3	Fixed cost	0.56	0.67	1.23
4	Variable cost	1.25	0.38	1.63
5	Total cost	4.33	1.05	5.38
6	Gross returns	6.66	1.94	7.93
7	Net profit on variable cost	5.41	0.89	6.30
8	Per quintal cost after grinding (₹/Qtls)	4500.00	635	5135.00
9	Per quintal cost before grinding (₹/qtls)	1702.70	525	2227.70
10	Output input ratio	1:2.64	1:1.85	1:1.47
<b>11</b>	<b>Break even point (Qtls)</b>	<b>34.20</b>	<b>150.56</b>	<b>26.36</b>

Source : Field survey

(Note: A - indicates the flour directly sold to consumer by Owner of mill, B - indicates the flour grinding charges paid by consumer)

From various item of expenditure cost of wheat rank get first position *i.e.* ₹ 2.52 lacs followed by machinery cost, rent of shop, Electricity cost, labour cost and weighing cost, packing material cost etc..

The profitability of Flourmill was analyzed and presented in Table 4.6.2.1, it was seen that flour milling total

cost ₹ 4.33 lacs for direct sell of flour to consumer and ₹ 1.05 lacs for grinding charges from consumer. Whereas the overall gross returns was ₹ 7.93 lacs rupees.

The cost per quintal of flour mill products and the net profit worked out on variable cost *i.e.* ₹ 5.41 and ₹ 0.89 lacs in A and B unit respectively. The cost per quintal of flour products were estimated and recorded on the basis of before grinding and after grinding was ₹ 1702.70 and ₹ 4500.00. The input output ratio was found for both A and B operation is 1:1.47. Break even point was estimated of flour mills for A and B operation was 34.20 qtls. and 150.56 qtls, respectively. If the production is less than the BEP the unit is running in loss and if more than BEP it is in profit.

So, the hypothesis that the returns of value addition units are remunerative is true and it was accepted.

#### **4.7            CONSTRAINTS / PROBLEMS OF PRODUCTION, MARKETING OF WHEAT / APMC / MARKETING FUNCTIONARIES / VALUE ADDITION UNIT OF WHEAT IN SOUTH GUJARAT**

Due to perishable and bulky nature of wheat, there might be number of constraints opined by the sample wheat growers in adoption of wheat production technology and marketing.

The wheat growers were asked to state the production, marketing, economic and technical related constraints faced by them. Their responses were collected and intensity of particular constraint was computed by calculating

percentage according to their opinion on the basis of percentage.

**4.7.1 Production and marketing constraints of  
Wheat crops**

Production and marketing Constraints faced by Wheat Growers were presented in Table 4.7.1.1.

**Table 4.7.1.1 : Constraints faced by Wheat Growers during production (n = 240)**

<b>Sr. No</b>	<b>Production Constrains / problems of wheat growers</b>	<b>Yes</b>	<b>No</b>
1	Availability of improved seed on time.	240.00 (100.00)	0.00 (00.00)
2	Availability of sufficient fertilizer in time.	167.00 (69.58)	73.00 (30.41)
3	Lack of irrigation facilities.	30.00 (12.50)	210.00 (87.50)
4	Availability of labours in peak time.	50.00 (20.83)	190.00 (79.17)
5	Labour wages are higher.	230.00 (95.83)	10.00 (4.17)
6	Availability of pesticides /Fungicides /Agril. inputs in peak period.	240.00 (100.00)	0.00 (00.00)
7	Availability of sufficient Banks/co-operative loan for crop.	212.00 (88.33)	28.00 (11.67)
8	Lack of technical knowledge of wheat.	190.00 (83.33)	40.00 (16.67)
9	Availability of hired farm machinery or implements.	211.00 (87.92)	29.00 (12.08)
10	Are you suffering from high price of input of wheat?	60.00 (25.00)	180.00 (75.00)
11	Timely payment made by private purchaser/ Private trader/ co-operative?	240.00 (100.00)	0.00 (00.00)
12	Rate of interest is high on crop loan?	10.00 (4.17)	230.00 (95.83)
13	By whom you get to improve technical knowledge for cultivation of wheat?	U(31.00) D(60.00) P(9.00)	U(69.00) D(40.00) P(91.00)
14	Availability of power supply/connection on time.	90.00 (37.50)	150.00 (62.50)

Source: Field survey.

(Note: U- Navsari Agricultural University, D- Dept. of Agriculture, P- Private Company/firms)

(Figures in parentheses are the percentages of total observations.)

It is observed from Table 4.7.1.1 that the Non availability of agricultural labour in time of wheat (79.17 per cent), Non availability of power supply and connection in time (62.50 per cent), Non availability of fertilizer in time (30.41 per cent), were the major constraints encountered by the sampled farmers. The other constraints faced by the wheat grower of south Gujarat are high price of input (25.00 per cent), Lack of irrigation facility (16.67 per cent), Lack of technical knowledge (12.5 per cent), Non Availability of hired farm machinery or implements (12.08 per cent), Non availability of sufficient bank/ co-operatives (11.67 per cent). Wheat grower got information about technical knowledge from Navsari Agricultural University (31.00 per cent), Department of Agriculture (60.00 per cent), and private agricultural companies or firm (9.00 per cent).

#### **4.7.1.2 Marketing Constraints of Wheat crops**

Marketing Constraints faced by Wheat Growers were presented in Table 4.7.1.2

**Table 4.7.1.2: Marketing Constraints faced by Wheat****Growers****(n = 240)**

<b>Sr. No</b>	<b>Marketing Constrains / Problems of wheat growers</b>	<b>Yes</b>	<b>No</b>
<b>1</b>	Availability of regulated market nearby.	225.00 (93.75)	15.00 (6.25)
<b>2</b>	Lack of Transportation facilities.	145.00 (60.42)	95.00 (39.58)
<b>3</b>	Is cost of the transportation high?	150.00 (65.00)	90.00 (35.00)
<b>4</b>	Are you facing the problem of loss/ Spoilage during transportation and marketing?	50.00 (20.83)	190.00 (79.17)
<b>5</b>	Are you suffering from price fluctuation in wheat?	240.00 (100.00)	0.00 (00.00)
<b>6</b>	Are you getting payment in time?	240.00 (100.00)	0.00 (00.00)
<b>7</b>	Are you getting price according to quality?	170.00 (70.83)	70.00 (29.17)
<b>8</b>	Are you satisfied with market price of wheat?	90.00 (37.50)	150.00 (62.50)
<b>9</b>	Availability of grading and packaging facility.	240.00 (100.00)	0.00 (00.00)
<b>10</b>	Lack of sufficient packing materials.	0.00 (00.00)	240.00 (100.00)
<b>11</b>	Are you facing the problem of malpractices in weighing?	12.00 (5.00)	228.00 (95.00)
<b>12</b>	Availability of storage facilities.	230.00 (95.83)	10.00 (4.17)
<b>13</b>	Availability of power supply/connection on time.	180.00 (75.00)	60.00 (25.00)

Source: Field survey.

(Figures in parentheses are the percentages of total observations.)

So far marketing constraints were concerned about 100 per cent wheat cultivators felt the problem of Price fluctuation in wheat. Second major marketing constraints of wheat growers were high cost of transportation facility (65.00

per cent), Other major marketing problems faced by sample wheat growers on overall basis were market price (62.50 per cent), lack of transport facility at local level (60.42 per cent), Not getting price according to quality (28.17 per cent) and No availability of power/power connection on time (25.00 per cent).

The other small constraints faced by the wheat growers in markets are lack of Non availability of local regulated market nearby (6.25 per cent), and malpractices in weighing (5.00 per cent), non availability of storage facility (4.17 per cent).

#### **4.7.2 APMC's Constraints / Problems**

Problem faced by the Agriculture produce market committees are illustrated in Table 4.7.2.1.

**Table 4.7.2.1 : Constraints / problems of APMC of selected Districts (n=8)**

<b>S.No</b>	<b>APMC's Constrains</b>	<b>Yes</b>	<b>No</b>
<b>1</b>	Is there price difference between big and small market functionaries?	0.00 (00.00)	8.00 (100.00)
<b>2</b>	Is any firm dominant in APMC?	0.00 (0.00)	8.00 (100.00)
<b>3</b>	Availability of facilities for storage like warehouse or go-down at time of peak season.	8.00 (100.00)	0.00 (00.00)
<b>4</b>	Availability of facilities for farmers like guest house/ canteen/ wash room	8.00 (100.00)	0.00 (00.00)
<b>5</b>	Is daily selling/purchasing information provided by the market functionaries?	8.00 (100.00)	0.00 (100.00)
<b>6</b>	Is APMC provided the technical literature related to marketing for major crops?	5.00 (62.50)	3.00 (37.50)
<b>7</b>	Is APMC provided the IT facility to know the price of different market of different commodities?	8.00 (100.00)	0.00 (00.00)

Source: Field survey.

(Figures in parentheses are the percentages of total observations.)

The main constraints of APMC in study area were found that most of APMC had not provided technical literature or material to the wheat growers (62.50 per cent), even those APMC who provided literature, that was given by the other agencies like Navsari agriculture university, Private organization/ company/ ATMA / Department of Agriculture during seminar and training. According to chairmen of APMCs, there was no any particular fund for technical literature for farmers. While, others facilities were excellent in APMCs.

#### **4.7.3 Market Functionaries' constraints/ Problems**

Problems faced by market functionaries were illustrated in Table 4.7.3.1.

**Table 4.7.3.1: Constraints /problems of market functionaries of selected Districts (n = 50)**

<b>S. N</b>	<b>Middlemen's ( Market functionaries ) Constrains</b>	<b>Yes</b>	<b>No</b>
<b>1</b>	Are you getting available stock on time for sale as per demand?	40.00 (80.00)	10.00 (20.00)
<b>2</b>	Are you getting good quality stock?	43.00 (86.00)	7.00 (14.00)
<b>3</b>	Is there price difference among functionaries/middlemen in market?	50.00 (100.00)	0.00 (00.00)
<b>4</b>	Do you think that it's risky business because of price fluctuation?	44.00 (88.00)	6.00 (12.00)
<b>5</b>	Availability of storage during peak season in APMC.	48.00 (96.00)	2.00 (4.00)
<b>6</b>	Are you facing dominancy of firm in APMC?	36.00 (72.00)	14.00 (28.00)
<b>7</b>	Availability of grading and packing facility (processing Industries) during peak season.	41.00 (82.00)	9.00 (18.00)
<b>8</b>	Is license fee more in APMC?	0.00 (00.00)	50.00 (100.00)
<b>9</b>	Are you getting positive co-operation from APMC?	49.00 (98.00)	1.00 (2.00)

Source: Field survey.

(Figures in parentheses are the percentages of total observations.)

The main constrains faced by the market functionaries was that price difference of wheat (100.00 per cent), the second constrains was trading is the risky business

(88.00 per cent), followed by dominance of the big firm (72.00 per cent).

#### **4.7.4 Constraints/ Problems of Bakery unit**

Obstacles had been faced by the bakery unit is divided in two part *viz.* Production constraints and Marketing constraints.

##### **4.7.4.1 Production constraints:**

Problem faced by bakery owner is presented in Table 4.7.4.1. Main constraint was non availability of semi-skilled labour on time (75.00 per cent), the second one was non availability of electric supply on time (25.00 per cent), followed by non availability of electric connection on time (20.00 per cent), Non availability of raw material market nearby (17.50 per cent), and government interference (13.50 per cent).

**Table 4.7.4.1 : Constraints/problems of Bakery Production****Unit****(n = 40)**

<b>Sr. No</b>	<b>Bakery's Production Constrains</b>	<b>Yes</b>	<b>No</b>
<b>1</b>	Are you facing government interferences?	15.00 (13.50)	35.00 (87.50)
<b>2</b>	Availability of semi-skilled labour on time.	10.00 (25.00)	30.00 (75.00)
<b>3</b>	Availability of electric connection on time.	32.00 (80.00)	8.00 (20.00)
<b>4</b>	Availability of electric supply on time.	30.00 (75.00)	10.00 (25.00)
<b>5</b>	Availability of raw materials on time.	38.00 (95.00)	2.00 (5.00)
<b>6</b>	Do you have raw material market nearby?	33.00 (82.50)	7.00 (17.50)
<b>7</b>	Is credit facility is available to purchase raw material?	36.00 (90.00)	4.00 (10.00)
<b>8</b>	Are you facing problem of spoilage during production time?	8.00 (20.00)	32.00 (80.00)
<b>9</b>	Are you facing problems in packing or packing material?	10.00 (25.00)	30.00 (75.00)
<b>10</b>	Availability of credit facility.	38.00 (95.00)	2.00 (10.00)
<b>11</b>	Are you facing the machinery problem?	2.00 (5.00)	38.00 (95.00)

Source: Field survey.

(Figures in parentheses are the percentages of total observations.)

#### 4.7.4.2 Marketing constraints of Bakery

During the marketing problems of bakery owners presented in Table 4.7.4.2.

**Table 4.7.4.2: Constraints/problems of Bakery marketing unit (n = 40)**

<b>Sr. No</b>	<b>Bakery's Marketing Constrains</b>	<b>Yes</b>	<b>No</b>
<b>1</b>	Availability of transportation facility.	38.00 (40.00)	2.00 (5.00)
<b>2</b>	Availability of quality packing demanded by consumers.	35.00 (87.50)	5.00 (12.50)
<b>3</b>	Availability of semi-skilled labour for marketing function.	10.00 (25.00)	30.00 (75.00)
<b>4</b>	Are you facing Price fluctuation?	5.00 (12.50)	35.00 (87.50)
<b>5</b>	Are you facing perishability problem in products during marketing?	0.00 (00.00)	40.00 (100.00)
<b>6</b>	Do you have problems regarding advertisement?	0.00 (00.00)	40.00 (100.00)
<b>7</b>	Do you have problems regarding payment from middlemen/consumer?	19.00 (47.50)	21.00 (52.50)
<b>8</b>	Is there spoilage during transportation?	19.00 (72.50)	11.00 (27.50)
<b>9</b>	Is there spoilage during packing?	4.00 (10.00)	36.00 (90.00)
<b>10</b>	Are you facing problems in selling?	9.00 (22.50)	31.00 (77.50)

Source: Field survey.

(Figures in parentheses are the percentages of total observations.)

Table revealed that 75 per cent bakery owners faced problem mainly during marketing of bakery products was non availability of semi skilled labours, followed by spoilage during transportation (72.50 per cent), credit problem by retailer of bakery products in villages (47.50) and problem in selling (22.50 per cent).

#### **4.7.5 Constraints/ problems of Flour mill unit**

Same as bakery unit, flour mill owner also faced the problems during the production and marketing of flour mills which are illustrated below.

##### **4.7.5.1 Production constraints of Flour mill unit**

Constraints of flour mill owners were explained in Table 4.7.5.1.

From the Table 4.7.5.1, it can concluded that 65 per cent of owner faced the problem of non availability of semi skilled labours, followed by non availability of electric connection (25.00 per cent), non availability of electric supply (20.00 per cent), problems in packing and packing material (15.00 per cent), and problems of machinery maintenance (15.00).

**Table 4.7.5.1: Constraints/problems of flour mill production unit. (n = 20)**

<b>Sr. No</b>	<b>Flour mill's Production Constrains</b>	<b>Yes</b>	<b>No</b>
<b>1</b>	Are you facing government interferences?	4.00 (20.00)	16.00 (80.00)
<b>2</b>	Availability of semi-skilled labour on time.	7.00 (35.00)	13.00 (65.00)
<b>3</b>	Availability of electric connection on time.	15.00 (75.00)	5.00 (25.00)
<b>4</b>	Availability of electric supply on time.	16.00 (80.00)	4.00 (20.00)
<b>5</b>	Availability of raw materials on time.	20.00 (100.00)	0.00 (00.00)
<b>6</b>	Do you have raw material market nearby?	18.00 (90.00)	2.00 (10.00)
<b>7</b>	Is credit facility is available to purchase raw material?	8.00 (40.00)	12.00 (60.00)
<b>8</b>	Are you facing problem of spoilage during production time?	1.00 (5.00)	19.00 (95.00)
<b>9</b>	Are you facing problems in packing or packing material?	3.00 (15.00)	17.00 (85.00)
<b>10</b>	Availability of credit facility.	18.00 (90.00)	2.00 (10.00)
<b>11</b>	Are you facing the machinery problem?	17.00 (85.00)	3.00 (15.00)

Source: Field survey.

(Figures in parentheses are the percentages of total observations.)

#### **4.7.5.2 Marketing constraints of Flour mill unit**

Problems/constraints regarding marketing of flourmills are presented in Table 4.7.5.2.

So far as marketing constraints has concerned about 50 per cent flour mill owners faced the problem of non availability of semi skilled labour as it is small unit, per day wages are higher in industry and agriculture field work, so it is very tough to get skilled labour in local area.

**Table 4.7.5.2: Constraints/problems of flour mill marketing unit. (n= 20)**

<b>Sr. No</b>	<b>Flour mill's Marketing Constrains</b>	<b>Yes</b>	<b>No</b>
<b>1</b>	Availability of transportation facility.	18.00 (90.00)	2.00 (10.00)
<b>2</b>	Availability of quality packing demanded by consumers.	2.00 (10.00)	18.00 (90.00)
<b>3</b>	Availability of semi-skilled labour for marketing function.	10.00 (50.00)	10.00 (50.00)
<b>4</b>	Are you facing Price fluctuation?	1.00 (5.00)	19.00 (95.00)
<b>5</b>	Are you facing perishability problem in products during marketing?	0.00 (00.00)	20.00 (100.00)
<b>6</b>	Do you have problems regarding advertisement?	0.00 (0.00)	20.00 (100.00)
<b>7</b>	Do you have problems regarding payment from middlemen/consumer?	2.00 (10.00)	18.00 (90.00)
<b>8</b>	Is there spoilage during transportation?	1.00 (5.00)	19.00 (95.00)
<b>9</b>	Is there spoilage during packing?	4.00 (20.00)	16.00 (80.00)
<b>10</b>	Are you facing problems in selling?	9.00 (45.00)	11.00 (55.00)

Source: Field survey.

(Figures in parentheses are the percentages of total observations.)

Second obstacles for mill owner were spoilage during packing (20.00 per cent), followed by non availability of quality packing demanded by consumers (10.00 per cent), and payment problem of consumer / small vendor (10.00 per cent).



*SUMMARY*  
*&*  
*CONCLUSION*

## **V. Summary and Conclusion**

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India has been a predominantly agrarian economy and agriculture continues to be main stay of our economy even today. With the globalisation the agricultural sector is opened up with the new avenues especially for food grains enterprises. The cereal crops are of vital importance not only in providing nutritional support but also earning additional income. Among the cereal, wheat is considered as “staple food’s grain” in the country.

Wheat is grown in India over an area of about 266.92 lakh hectares with a production of 721.40 lakh tones. The normal National productivity is about 2703 kg/ha in 2011-12. India, the world's second biggest wheat producer, has shipped 1.3 million tones of the grain since the government lifted the export ban on the commodity in September, 2011.

India occupied largest area estimated at 12.08 per cent of total area under wheat in the world followed by China which occupied 11.08 per cent, the productivity of wheat in China, was appreciably higher at 3830 kgs. compared to 2696 kgs./hectare in India.

India harvested a record wheat of about 9.49 crore tonnes in 2011-12 from an area of 2.99 crore ha. But this year, the production of wheat may remain 3 per cent lower to about 9.23 crore tonnes with 4.31 lakh ha decline in area and slightly lower yield due to less availability of irrigation, comparing year 2010-11.

In Gujarat, total cereal produced in year 2011-12 was 4.08 lakhs tones while, in case of wheat

production was 40721 lakh tones and productivity is 3015 kg/ha while the area under wheat was 13,50,600 ha.

Wheat being the most important staple food of the country after rice deserves the due attention from the above angle. About 60 per cent of wheat output is contributed by N-W India comprising the states of Punjab, Haryana, Rajasthan (except Udaipur and Kota divisions) and western UP.

The present study investigates some of the vital and sensitive issues of the crop. The information on cost of cultivation/production as well as the efficiency of resources will be useful to the government for devising appropriate policies for wheat growers. It will be useful to credit institution in deciding the scale of finance for crop loans and schedule of repayment. The results of the study will also be helpful to the wheat growers in reallocation of their resources in order to improve the productivity. The study will be helpful to the farmers in minimizing the costs and raising the net returns and in planning of their production and marketing operations. Marketing costs and margins assume particular importance in predominating agricultural country like India where agricultural price policy aims at safeguarding interest of both farmers (producers) and consumers. In this regard, economic analysis of horticultural produces assumes great significance. The study also covers the economics of wheat production and marketing as well as economic and technical constraints faced by the wheat cultivators. It envisages suggesting possible corrective measures to bring about the desired improvement in production and marketing of wheat.

Thus, the present study entitled **“Economic Analysis of Production, Marketing and value addition of**

**Wheat in South Gujarat"** was planned with following objectives;

### **5.1 OBJECTIVES**

- 1) To study the performance of wheat crop in Gujarat
- 2) To work out the economics (cost and returns) and resource use efficiency of wheat
- 3) To examine marketable, marketed surplus in marketing system of wheat
- 4) To evaluate the marketing channel, marketing cost, margin, price spread, and marketing efficiency in marketing of wheat.
- 5) To analyse the nature and degree of competition in marketing of wheat.
- 6) To estimate the economics of value added products of wheat processing unit.
- 7) To identify the problems faced by farmers in production, and in marketing, and in value addition (processing unit) of wheat.

### **5.2 METHODOLOGY**

South Gujarat agro-climatic zone is known for production of varieties of cereal in the state. Therefore, this zone was selected purposively for this study. From South Gujarat region, four districts were selected purposively as this district rank in area under the crop as well as in production of wheat followed by the districts of Surat, Bharuch Tapi, Narmada.

Out of the Surat district, two talukas viz. Olpad, and Mandvi, from the Bharuch district, two talukas viz.

Vagara, and Jambusar, from the Narmada district, two talukas viz. Tilakwada, and Sagbara, from the Tapi district, two talukas viz. Nizar, and Songadh were selected on the basis of highest area under wheat cultivation.

In order to select the villages, taluka development officer/ Sarpanch/ talati cum mantra /ATMA was contacted and a list of the wheat growing villages was prepared. From the prepared list five villages were selected randomly from the each selected taluka. Thus, total 16 villages will be selected for the study.

Lists of the wheat growing farmers of the selected villages were obtained from the village Talati cum mantri. The wheat growing farmers in the sample villages were divided in three standard size groups on the basis of the size of their operational land holdings. These size groups are small (0-2 hectares), medium (2-4 hectares) and large (above 4 hectares).

The relative share of total of each stratum to the total wheat cultivators of all the 16 selected villages was worked out. Considering size of population and resources, 240 cultivators (96 small, 74 medium and 70 large) were selected randomly with proportional allocation from the selected villages. For studying the price spread in marketing of wheat, 5 functionaries of each type were selected. The primary data required for the study was collected through personal interview with the help of pre-tested comprehensive schedule.

While processing the collected data following objectives were used for the analysis.

5.2.1. Performance of wheat crop in Gujarat

5.2.2. Economics of wheat crop production and resource use efficiency

- 5.2.3. Marketable and marketed surplus, and marketing system of wheat crop
- 5.2.4. Marketing channel, marketing cost, margin, price spread, and producer's share in consumer's rupee, and marketing efficiency in marketing system of wheat crop
- 5.2.5. Nature and Degree of Competition of markets
- 5.2.6. Cost and BEP of Value addition in wheat
- 5.2.7. Problem faced by farmers in production, marketing, and in Value addition unit of wheat

### **5.3 MAJOR FINDING**

The salient research results obtained are being summarized and concluded in this chapter.

#### **5.3.1 Performance of wheat crop in Gujarat**

- 5.3.1. In case of wheat crop in estimates of growth rates revealed that wheat production increased significantly in the state at a compound rate of 2.39 per cent per annum. Among the periods, production of wheat crop increased significantly by 4.47 per cent per annum but in the period-I, it was declined by 1.85 per cent per annum .Similar trend was observed in South Gujarat region. Production of wheat in South Gujarat was increase by 2.73 per cent per annum during the year 1992-93 to 2011-12. The production growth was increased significantly in period-II (5.92 per cent per annum) compared to period first. Productivity of wheat crop was increased by 0.93 per cent per annum in the state as a whole. Acreage under wheat crop in the

state increased at a compound rate of 0.71 per cent per annum during the study period. It is only because of the development of technicality in agriculture knowledge of farmers through strengthening the different department of SAUs, KVKs and DOAs. Also the easy availability of agriculture input, agriculture produce market yard, irrigation facility, electricity supply and mechanization.

### **5.3.2 Economics of wheat crop production and resource use efficiency**

5.3.2.1 Average family size of wheat growers was 4.81. On an average land holding size was 3.20 hectare out of which about 2.30 hectare land put under wheat cultivation.

5.3.2.2 The gross cropped area was 768 hectares on sample farm of South Gujarat of which wheat crop contributed 552.23 hectare area in rabi during year 2012-13, respectively. While mainly in field crop area under cultivation of major crops were Paddy, wheat, S'Cane, Cotton, Maize, G'nut, Castor, Sunflower, Sesamum, were grown as field crop while in vegetables okra, brinjal, clusterbean were grown by the farmers, and in fruits crops sapota and mango, banana were the major crops of selected districts. In case of small farmers during the summer season highest area covered by the cotton (60.00 ha) followed by paddy (45.00 ha.). While, in summer season small farmer were grown paddy mostly followed by G'nut and Green gram (Mung). In

case of marginal and small farmers same pattern was found, but these groups also cultivated vegetables, castor, horticultural and pulses with these pattern.

5.3.2.3 The average total cost of cultivation of wheat was ₹ 46348.59. It was found highest (₹ 48930.86) on large farms and lowest (₹ 41735.20). In Surat districts, per hectare average cost of cultivation was found highest among all districts *i.e.* ₹ 48662.84, while in case of small, medium and large farm, it came to ₹ 42492.52, ₹ 48374.25 and ₹ 50931.91, respectively. The per hectare cost of wheat cultivation in Bharuch district was found highest (₹ 49838.39) on large farms and lowest (₹ 41436.81) on small farms with an average total cost of ₹ 45853.54. In case of Narmada district, per hectare average cost of cultivation was ₹ 44515.77, while in case small, medium and large farm *i.e.* ₹ 41455.82, ₹ 45131.15, and ₹ 46645.53 respectively. While, the per hectare cost of cultivation of Tapi district, average cost of cultivation per hectare came to ₹ 46477.96, while in case of small, medium and large category the costs were ₹ 41467.47, ₹ 45526.51, ₹ 48533.06. In case of Surat district, per hectare costs of wheat cultivation were high because of shortage of labour and cost of hired labour was high as compared to other districts. Relatively more utilization of hired laboureres, fertilizer, mannure and irrigation charges might have inflated the

higher total cost on large farms as compared to other farm size groups.

Among the different items of cash expenditure, the rental value of owned land ranked first with 23.70 per cent of the total cost. Another the major cost of wheat cultivation was irrigation charges with 13.24 per cent of the total cost, followed by Hired labour with 10.98 per cent, because of wheat requires more number of laboureres for harvesting, weeding and application of irrigation. The other per hectare expenditure were fertilizers cost (Jointly) (11.64 per cent), managerial costs (10 per cent), tractor/ machine charges (6.31 per cent), seed cost (6.12 per cent), Bullock labour charges (4.75 per cent), family labour (4.18 per cent ), interest on working capital (2.31 per cent), depreciation (1.98 per cent), manures and cakes (1.95 per cent), weeding charges (1.45 per cent), interest on fixed capital (0.99 per cent), miscellaneous cost (0.95 per cent), and plant protection cost to control pest and disease infestation (0.37 per cent).

5.3.2.4 Average cost-A of Surat districts was highest *i.e.* ₹ 30551.12 (62.78 per cent) followed by Tapi, Bharuch and Narmada districts. In all selected districts per hectare average, Cost-C<sub>2</sub> came to ₹ 46348.59 per hectare which was highest on large farms (₹ 48930.86 per hectare) and lowest on small farms (₹ 41735.23 per hectare). Higher costs on large farms are associated with intensive use of

human laboureres, seed, manures and fertilizer charges, irrigation miscellaneous.

5.3.2.5 The average overall yield of wheat was 37.60 quintals per hectare. It ranged from 38.65 quintals on large farms to 35.50 quintals on small farms. The average overall farm harvest price received by the wheat growers was ₹ 1552.79 per quintal. It varied from ₹ 1500.41 on small farms to ₹ 1598.31 on large farms.

The gross income per hectare was highest *i.e.* ₹ 75080.19 on large farms and lowest *i.e.* ₹ 58318.74 on small farms with an average of ₹ 68658.23 on sample farms.

5.3.2.6 On an average net return per hectare from wheat farms on the basis of Cost A, B, C<sub>1</sub> and Cost C<sub>2</sub> was ₹ 39905.59, ₹ 28462.08, ₹ 2652.15 and ₹ 22309.64, respectively.

5.3.2.7 The average per hectare farm business income, family labour income and farm investment income were ₹ 39905.59, ₹ 28462.08, and ₹ 26523.15, respectively on the sample farms. The average net profit per hectare over (Cost-C<sub>2</sub>) was ₹ 22309.64 and it increased with the increase in size of farms.

5.3.2.8 The overall input-output ratio was 1:1.48 on the basis of cost- C<sub>2</sub>. It was the highest (1: 1.53) on large farms, followed by medium farms (1:1.48), and small farms (1:1.40). Thus, it shows the increasing trend with an increase in the farm size.

5.3.2.9 The average cost of production per quintal of wheat was about ₹ 1232.68 which was lower than the

market price of wheat ranging from ₹ 1490 to ₹ 1600 per quintal. Therefore, it can be concluded that the wheat cultivation was quite remunerative even if the lowest market price is considered. Cost of production per quintal varied from ₹ 1175.64 on small farms to ₹ 1266.00 on large farms.

5.3.2.10 All inputs (except No. of spray, No. of weeding and Bullock labour) were positively related to the output of wheat except fuel. The  $R^2$  of 0.53 implied that 53 % of total variation in the output of wheat is explained by the inputs specified in the log linear Cobb-Douglas production function. The regression co-efficient of all the variables are positive, indicating that a unit increase in any of the variable holding others constant will lead to a unit increase in the gross output. Furthermore, number of weeding and bullock labour, are negative but significance because more use of weedicide increases the cost. While no. of spray was negative and non significance. The regression co-efficient of seed rate (Kg.) were significant at 1 percent level which indicated that holding other factors constant one percent increase in seed (Kg.) would increase the gross return by 0.429, while for variable irrigation of wheat growers was 0.168 which was significant at 1 percent level of confidence. In the case of Co-efficient of fertilizer phosphors (N) were significant at 1 percent level which indicated that holding other factors constant one percent increase in phosphors rate would increase the gross return

by 0.235. While, in the case of human labour, P fertilizer, F.Y.M, *i.e.* 0.513, 0.154, and 0.166, respectively which is positive and statistically significant, indicated that increase in these inputs will significantly effect on wheat yield. If expenses made on these resources, then it will be gives profitable returns. The elasticity of production ( $E_p$ ) of all the variables summed up to 0.54 meaning decreasing return to scale, implying that, if these resources are increase by 1%, the output would increases by less than 1% except in case of fuel variable. The F - values of the equation derived for farmer 26.16 which were highly significant at 1 percent level implying that all the explanatory variables were important for explaining the variations in gross returns of the operators or wheat growers.

5.3.2.11 In case of selected wheat growers of south Gujarat, the bulk line cost concept covered total 84 per cent farmer, 83 per cent area and ₹ 1422.20 cost of cultivation at 85 per cent line of total 240 respondent of south Gujarat from selected district.

#### **5.3.4 Marketable and Marketed surplus in marketing system of wheat crop**

5.3.4.1 On an average, the marketable surplus of wheat 86.86 per cent on sample farms and the on farm utilization of wheat was 13.14 per cent of total production. The quantity for home consumption was 5.11 per cent and wage purpose 3.64 per cent,

for relatives 2.82 per cent and for others 1.57 per cent. The proportion of this utilization was less. Because of the bulkiness and season of wheat, there was 13.14 per cent difference between Marketable and marketed surplus of wheat in the present study. The marketable surplus of wheat was 86.86 per cent on over all farms. The marketed surplus was less in Surat and Tapi districts because Mandavi, Nizar and songadh talukas were different than others because the consumption pattern of people is different (rice or sorghum).

**5.3.5 Marketing channel, cost, margin, price spread, and producer's share in consumer's rupee, marketing efficiency marketing system of wheat crop**

- 5.3.5.1 Four major marketing channels were identified in marketing of wheat in study area *i.e.*
- i. Wheat Grower – wholesale cum processor – Retailer – Consumer
  - ii. Wheat Grower – wholesaler cum Commission agent – Retailer – Consumer
  - iii. Wheat Grower – Wholesaler -Retailer- Consumer
  - iv. Wheat Grower – Retailers – Consumers

Majority of farmers preferred to sale their produce through wholesale cum processor/ wholesaler/ wholesaler cum commission agent. The marketable surplus and marketed surplus were equal on all size groups of farms. Wholesaler cum processor played

major role in marketing of surplus produce of farmers of study area.

- 5.3.5.2 On an average the total marketing cost incurred by wholesaler cum processor amounted to was ₹ 197.14 per quintal. Among the various cost components, the major cost component was transportation cost which accounted as 55.87 per cent of total marketing cost, followed by cleaning, grading and packing cost (20.29 per cent), Post-harvest loss (7.61 per cent), market cess (6.70 per cent), loading-unloading charges (3.05 per cent) and weighing charges (1.07 per cent). Similar trend was also observed in channel – II channel – III.
- 5.3.5.3 The total marketing cost borne by wholesaler cum processor in channel I was ₹ 197.14 per quintal. In channel – II, wholesaler cum commission agent incurred ₹ 137.32 in marketing of wheat at market. In channel – III, wholesaler incurred ₹ 130.05 in marketing of wheat at market. In channel – IV, Retailer incurred ₹ 110.38 in marketing of wheat at market.
- 5.3.5.4 In Channel -IV, retailers incurred ₹ 110.38 as total marketing cost per quintal. Among different items of expenditure, the maximum share was noticed for Cleaning grading and packaging (40.77 per cent to total marketing cost). The other important components were the cost of transport (28.08 per cent).

- 5.3.5.5 The producer's share in consumer rupees in channel-I of south Gujarat was 75.00 per cent. While, in channel-II, III and IV *i.e.* 76.97, 79.52, 80.84 per cent. In district-wise Producer share was more in channel-IV of Narmada district (80.22 per cent) and lower in channel-I of Surat district (74.52 per cent).
- 5.3.5.6 In channel-I, farmers got a net price of ₹ 1499.40 per quintal of the price paid by the consumers. Channel - IV in sale of wheat earned a margin of ₹ 260.30 or 13.16 per cent of the price paid by the consumers. Among various middlemen of channels, retailer's got highest margin of ₹ 260.30 per quintal (13.16 per cent) compared to wholesaler ₹ 140.31 per quintal (7.02 per cent) and wholesaler cum commission agent got a margin of ₹ 190.14 per quintal (9.60 per cent) of consumer price. Further, the share of retailer in the total margin has been much higher (14.51 per cent) because numbers of middlemen were less in channel IV and retailer directly sold their product to consumer in market area so cost of marketing was also less.
- 5.3.5.7 While marketing efficiency, channel VI had highest marketing efficiency *i.e.* 4.23 followed by channel III (3.88), channel II (3.34 per cent), channel I (3.00 per cent). The MME method suggested by Acharya used for present study, and result revealed that the channel IV (4.23) was most efficient compared to other channels. While district wise channels,

marketing efficiency of Channel-IV of Surat district was highest *i.e.* 4.75 and channel-I was lower (2.92).

### **5.3.6 Nature and Degree of Competition of market**

The results of market integration and concentration of market power for wheat seed in the spatially situated markets as discussed above is summarized as under:

- 5.3.6.1 The selected wheat markets of Gujarat are vertically integrated to a good extent as 88, 87, 86 and 80 per cent firms of Talod, Sanand and Dahod and Bharuch market were vertically integrated. Contrary to this, only 15.70 per cent firms of Gujarat selected markets were vertically integrated.
- 5.3.6.2 The selected wheat markets of Gujarat had very little horizontal integration as 89.26 per cent firms owned only one and only 10.64 per cent firms had two and more establishment in the markets. Among the selected markets, Among the selected markets, the firms of Jamnagar and Dahod markets were integrated horizontally to a greater extent than the state as whole (6.61 and 4.13 per cent). As such the wheat markets of the state in general were integrated vertically and not horizontally.
- 5.3.6.3 The selected wheat markets of Gujarat were characterized by high concentration of market power. In Sanand and Jamnagar markets, concentration of market power was more as the first 5 firms purchased 44.98 and 19.77 per cent of

total wheat arrived in the mandi during the study period. Further, the first 10 and 15 firms of Sanand market purchased 86.32 and 96.36 per cent of wheat marketed in the market. The degree of concentration of market power in Sanad and Jamnagar markets were relatively low compared to Bharuch, Dahod and Talod markets indicating there by that the business in Dahod and Talod markets has not been concentrated in the hands of few firms as has been there in Sanand and Jamnagar markets. As such market concentration has been lower in big sized markets.

- 5.3.6.4 The value of correlation coefficient in monthly wholesale prices for all the selected market pairs has been positive and statistically significant. The value of correlation coefficients in most market pairs ranged 0.48 per cent to 0.96 per cent, proving thereby that the selected markets were integrated but not highly. None of the market pairs were found to be perfectly integrated in terms of price movements in them.
- 5.3.6.5 Price difference between the market pairs (primary to secondary) has been positive showing thereby that the movement of wheat from primary wholesale market to secondary wholesale market is profitable. Vice-verse is not true in all these market pairs.
- 5.3.6.6 The returns to transportation were sufficient to warrant the cost needed in movement of wheat from primary wholesale markets to secondary wholesale market of the state. Transportation cost is not the

barrier in movement of wheat seed from primary wholesale to secondary wholesale markets.

The new trend found in Sanand market, the stock of wheat were purchased by the commission agent for so many flour mills company and commission agent took the charge of interest for credit to processor as per duration of credit. Those stock which purchased by commission agent for whom they purchased that was unknown for APMCs. So, selected wheat markets of Gujarat were closely integrated in terms of movement of prices.

### **5.3.7 Costs and BEP of Value addition in wheat**

Present study conducted for value addition in wheat in two unit.

- (1) Bakery unit &
- (2) Flour mill unit.

#### **5.3.7.1 Bakery unit**

Result revealed that the Amongst the various item of expenditure cost of raw material maida rank get first position *i.e.* ₹ 6.50 and ₹ 14.46 lakh rupees, in small, medium firm, next ingredients items of costs are sugar, oil/ghee, egg, cake gel and baking powder were utilized at overall level that are ₹ 9.50, ₹ 4.12, ₹ 0.55, ₹ 0.62 and ₹ 0.08 quintals respectively, and small quantity of colour and essence etc. utilized. The input output ratio was found in the different size of firm was 1:1.22, 1.43, respectively. Break even point was estimated on small, medium, firm

*i.e.* 29.16 qtls. and 73.52 qtls., respectively. It is also found that selected bakeries covered their BEP within year. From the above summary we could concluded that Bakery business is quite remunerative.

#### **5.3.7.2 Flour mill unit**

The total cost of flour milling ₹ 4.33 lakh for direct sell of flour to consumer (A) and ₹ 1.05 lakh for grinding charges from consumer (B). Whereas the overall gross returns was ₹ 7.93 lakh rupees. Bakery products and the net profit worked out on variable cost *i.e.* ₹ 5.41 and ₹ 0.89 lakh in A and B unit respectively. The input output ratio was found for both A and B operation is 1:1.47. Break even point was estimated of flour mills for A and B operation was 34.20 qtls. and 150.56 qtls, respectively.

#### **5.3.8 Constraints / Problems of study**

##### **5.3.8.1 Production constraints of wheat growers**

Respondent medium wheat grower's rank first to high cost of input (seed, fertilizer and pesticide) and least rank was given by them to high cost of transportation.

Respondent medium and large wheat grower's ranked first to non availability of labour in time and the least rank given was lack of knowledge about production technology.

##### **5.3.8.2 Marketing constraints of Wheat growers**

Major marketing problems faced by respondent wheat growers were low price, fluctuation in market

price, high cost of transportation and market price was not appropriate etc.

Small respondent of wheat growers ranked first to low prices while medium wheat grower's ranked first to fluctuation in market price, lack of transportation facility at local level. Respondent of large wheat growers complaint for market fluctuation and high rate of transportation and high cost of input.

#### **5.3.8.3 APMC constraints in Wheat marketing**

The main constraints of APMC in study area were found that most of APMCs were not provided technical literature or material to the wheat growers (62.50 per cent), even those APMC who were provided, literature that was given by the other agencies like Navsari agriculture university, Private organization/ company/ ATMA / Department of Agriculture during seminar and training.

#### **5.3.8.4 Market functionary's constraints**

The main constrains mostly retailers and commission agents faced by the market functionaries was that price difference of wheat (100.00 per cent), the second constrains was trading is the risky business (88.00 per cent), followed by dominance of the big firm (72.00 per cent).

#### **5.3.8.5 Bakery production constraints**

Main constraint in study area was non availability of semi-skilled labour on time (75.00 per cent), the second one was non availability of electric supply on time (25.00 per cent). In south Gujarat mostly

laboureres got industrial work with good wages compared to local wages, so this problem is common for all the constraints while in village area one day off in electric supply regulated by electric company.

#### **5.3.8.6 Bakery marketing constraints**

Same constraints observed during marketing of bakery products was non availability of semi skilled laboureres, followed by spoilage during transportation (72.50 per cent), credit problem by retailer of bakery products in villages (47.50) and problem in selling (22.50 per cent). It was tough for retailer to sell good quality bakery products in village area, even breakage was more during transportation. Even bakers got problem of credit, local retailer gave product bill after three or four month. So bakers have to invest money more than direct saler.

#### **5.3.8.7 Flour mill unit production constraints**

65 per cent of flour mill owners faced the problem of non availability of semi skilled laboureres, followed by non availability of electric connection (25.00 per cent), non availability of electric supply (20.00 per cent), as discussed earlier same trend was found like bakery unit in flour mill unit. Further, at local level direct sell of wheat flour was less only landless labour or small laboureres took the wheat flour, most income came from grinding of wheat of consumer/villagers.

#### **5.3.8.8 Flour mill unit marketing constraints**

So far as, marketing constraints are concerned, about 50 per cent flour mill owners faced the problem of non availability of semi skilled labourers, as it is small unit, per day wages are higher in industry therefore, it is very tough to get skilled labour in local area. Second obstacles for mill owner were spoilage during packing (20.00 per cent), followed by payment problem of consumer / small vendor (10.00 per cent).

#### **5.4 SUGGESTIONS / CONCLUSION**

On the basis of the present study, the following suggestions were emerge.

- 5.4.1 The study facilitates in knowing the characteristics of the wheat growers of selected districts which will serve as guidance for the planner and extension workers for planning and implementing programme related to the peasantry modernization.
- 5.4.2 During the study medium level of education was found among the wheat growers. It is fact that the level of education contributes in extent of knowledge, adoption, socio-techno economic change and overall modernization. Hence, high priority should be given to improve the existing level of education and broaden their outward horizon.
- 5.4.3 There is an ample potentiality of raising wheat production on sample farms through adoption of

improved technologies along with optimum utilization of resources like manures and fertilizers, irrigation, providing High yielding variety seeds and better management.

- 5.4.4 It is evident that the rental value of owned land, human labour and irrigation cover 50 per cent of total production cost. Therefore, it is suggested to use or hire human labourers to a certain extent.
- 5.4.5 To prevent the post harvest losses there is need for developing such farm machinery or upgrade harvester machine in such a way that can reduce the grain loss and by product loss.
- 5.4.6 Wheat cultivators in South Gujarat's districts were operating in first zone of production function, as well as the utilization of inputs was not optimum on the production of wheat. Therefore, it is suggested that wheat growers should use the inputs rationally and as per recommendation.
- 5.4.7 Institutional crop/marketing loan should be made available to wheat growers at a lower cost at the time when they require it most, as it is staple food of India. As far as proprietorship of land was concerned, most of farmers complained against revenue department. As per their suggestions, the process of name registration according to heredity should be fast. Because of this reason, many farmers could not be able to take loan from bank subsidies of Government.

- 5.4.8 The cultivators of wheat had lack of scientific knowledge about cultivation practices, lack of technical knowledge about identification of pests and diseases and efficient use of productive resources. Therefore, it is important to impart technological knowhow at doorstep through extension workers, private companies, ATMA by organizing special programmes.
- 5.4.9 The extent of marketable surplus of the crop was found to be related with productivity and in short run productivity is a function of technological adoption, therefore, wider adoption of crop production technology is of prime importance in the study area. Looking at quantum of the marketed surplus coupled with bulkiness of wheat, every effort should be made by the policy makers to promote processing of wheat for value addition and should also exploit other export avenues from the state.
- 5.4.10 During study it was found that in south Gujarat most of the farmers used sugarcane byproduct as fodder, and it results better than wheat fodder, though most of the region has different consumption pattern. They were not eating chappati made of wheat, therefore, it is the reason for low area under wheat in this region. Even as per the AGRESCO report of Department of Agricultural economics, N.M.C.A the BCR were higher in Banana, S'cane and Paddy crop than the wheat crop.

- 5.4.11 Development of infrastructure, including roads and efficient transport facilities and strengthening of the cooperative marketing institutions for the cereals may help in improving the efficiency of wheat marketing in the state.
- 5.4.12 There is need to develop good transportation services with subsidy to regulated cereal markets in study area. Due to non availability of market and market at distant places forced wheat growers to dispose off their produce at low prices to the wholesaler cum processor. Inter-village and intra-village road infrastructure in the market area should be developed.
- 5.4.13 To improve the marketing efficiency, the growers should sell their produce directly to the retailer or have tie up with the processor or wholesaler wherever feasible. The exporters can give a better price to the producers as the profit margin realized by them was the highest (found during Sanand market study)
- 5.4.14 Farmers must have the knowledge on market information, for taking better sales decision. Even farmer don't have knowledge about the Prices SMS policy (RLM) of government. There is need in study area to educate farmer for marketing process improvement. There is an urgent need to set up an

efficient market information network by state Government, so that farmers can get timely and adequate market information which may help them to get better prices of wheat.

- 5.4.15 Provision of storage facilities to the farmers at the village level, adequate transport facilities for the cheap movement of wheat from the places of production to the various centers, dissemination of market information to the farmers are some of the means suggested for improving the efficiency of marketing of wheat in the state. This will help in reducing the wide gap prevailing between price paid by the consumer and price received by the wheat growers.
- 5.4.16 APMCs didn't have the registered only they have slips of total season. There should be one registered where they also mentioned the day-wise arrival in tone/quintal although APMCs maintained market cess register, but it is not enough for researcher.
- 5.4.17 APMC should be integrated with DOA, and seminar and value addition information should be given by APMC. There should be some grant for literature because in study found that APMC did not have such provision of grant for extension activities. There is need to develop marketing information system and provide news regarding various services

available in regulated markets and their usefulness to the farmers.

- 5.4.18 In south Gujarat, it is requirement to start the processing unit under the particular APMC which will helpful to farmers to sell their product direct to consumer. Best example is Dahod APMC which has processing unit for wheat and it is giving good result. In this way the wheat cultivation area will be increase because it will increase net profit of growers.
- 5.4.19 It is necessary to open more regulated markets and sub/feeder market yards, preferably a yard for every five village Panchayats. There is an urgent need to link the hinter land village with the regulated mandies. Though, all four district's mandies under study were having mostly own good constructed market yards with various infrastructural facilities. The entire market yard of these mandies is surrounded by walls with separate gates for entrance and exit.
- 5.4.20 The election of APMC should be conducted on democratic lines and there should not be any nominated members. A major share of seats should go to the farmer's representatives.
- 5.4.21 A drink link between producers and APMC should be developed to resolve various problems relating to marketing of agricultural commodities.

- 5.4.22 If possible the commission agent may be eliminated to remove commission charges in mandis, which help in shortening the price spread.
- 5.4.23 The grading and standardization facilities needed to be improved and strengthened.
- 5.4.24 The knowledge about storage facilities should be provided to the farmers in mandi area and proper security of their produce is needed.
- 5.4.25 Regulated mandies should function throughout the day, at least in the busy agricultural harvesting season, irrespective of holidays.
- 5.4.26 The market committee should provide quality services and adequate facilities to all farmers and equal response to small, marginal and large farms producers should be given.
- 5.4.27 APMC should open input centers in mandi yards and provide inputs at subsidized rates to the farmers, particularly to small and marginal farmers, who marketed their produce through regulated mandies. Provision should also be made for domestic necessities in the same.
- 5.4.28 An agency should be developed which should take charge of the farmer's produce, advance money for his immediate needs, processed the produce, particularly in case of paddy, arrange for further marketing at the next point and make final payment.

- 5.4.29 Proper coordination among the various central and state agencies operating in the regulated markets should be made. These agencies can provide a strong market intervention mechanism which would save the farmers from exploitation.
- 5.4.30 In nut shell, it can be concluded that regulated mandies have still struggling for their efficient working with regards to provision of necessary infrastructural facilities and benefits to the Producers/farmers, for the purpose they were introduced in the state.
- 5.4.31 In the case of Bakery and Flour mill unit, there was requirement of semi skilled laboureres because of industrialization there was shortage of laboureres, government should increase credit and subsidy for transportation and processing unit. It is remunerative business.

## **5.5 Policy Implications of study**

- The compound growth rates of area, production and productivity in South Gujarat have registered positional statistically significant in wheat. In Bharuch, Tapi, Surat, Narmada productivity, Area and Production has shown positive and significant growth in wheat.
- Cost of cultivation of wheat showed tendency to increase with increase in the size of holding. However per hectare yield was higher on large farms as compared to medium, and small. Therefore gross returns per hectare wheat cultivation were higher on large farms.

- The net income was higher on large farms as compared to small and medium farms in wheat cultivation.
- The cultivators of wheat had lack of scientific knowledge about cultivation practices and efficient use of productive resources. Therefore, it is important to impart technological knowhow at doorstep through extension workers and Wheat Research Stations organizing field days.
- In wheat, channel IV (Producer— wholesaler cum Commission agent — Retailer— Consumer) was more efficient as it ensured higher percent share of farmer in the consumer rupee. Government should watch on other channels and regulate the markets.
- Though, all the mandies under study have godowns in the market yards but the farmers could not avail benefit of storage due to unawareness about the terms and condition of storage.
- Similarly, the grading and standardization facilities were not present in the mandi yards. So its prime requirement in south Gujarat to increase number of processing unit so that producers can also sale the produce direct to consumer.

- The sale of produce in regulated mandies yielded higher share to the producer, because of higher price and lower marketing margins in comparison to unregulated mandies.
- About 80 percent farmers/producers gave their opinions in favour of regulated mandies. They were of the opinions that there was correct weighment of the produce, fixed and reasonable marketing charges and prompt payment of their produce. They were also reported that the facilities regarding dissemination of marketing information, provision of godown and storage, construction of more auction platforms need to be provided for making regulated mandies more beneficial to them.
- Though, the mandies provided necessary infrastructural facilities to the producers/ farmers but they were highly availed by the traders as compared to producers/farmers.
- In south Gujarat there was requirement of value addition units and processing units for wheat which will enhance the area and production in region. Even in Narmada, Bharuch and Tapi districts productivity is increasing which will helpful to government to face food security constraints.



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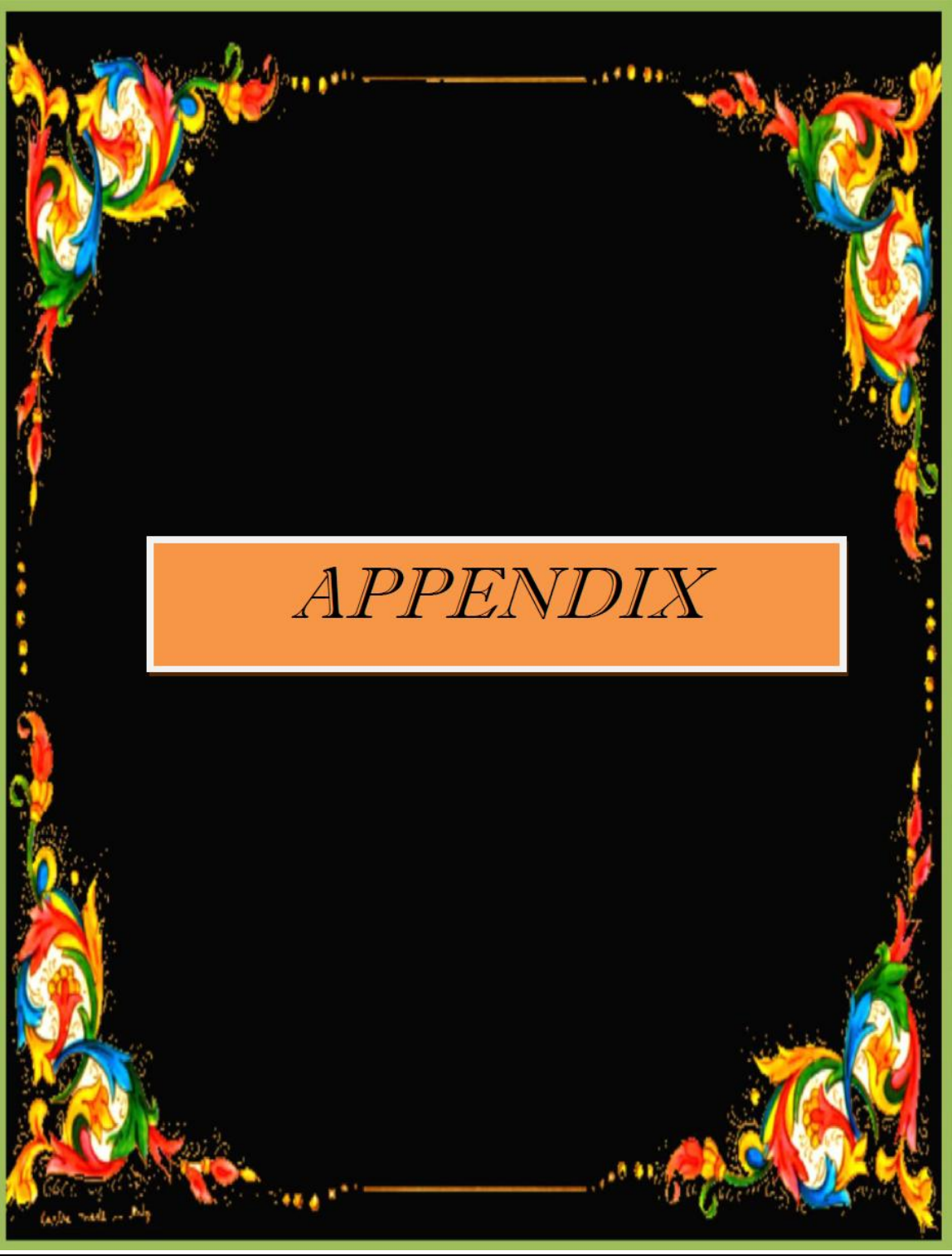
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*APPENDIX*

# APPENDIX - I

## SCHEDULE FOR FARMER

**Department of Agricultural Economics**  
N.M. College of Agriculture, Navsari  
NAVSARI AGRICULTURAL UNIVARCITY, NAVSARI

**Title: “Economic Analysis of Production, Marketing and Value addition of Wheat of South Gujarat”**

**Name of Investigator:** Asodiya Pinakin Sureshkumar

**Date of interview** \_\_\_\_\_

**A. General information**

a. Name of the respondent:.....

b. Age: ..... c. Education: .....

d. Village:..... e. Taluka: .....

f. District:..... g. Sex: .....

**B. Family information:**

SN.	Name	Sex	Age	Education	Occupation
1.					
2.					
3.					
4.					

**C. Occupation Details:**

(a) **Main occupation (Agril./Dairy/Service/ Business ):** .....

(b) **Subsidiary Occupation:**.....

**D. Details of Land holdings: (ha./per farm)**

Particular	Land under cultivation		Orchards	Grazing lands	Others	Total
	Irrigated	Unirrigated				
Operational						
Leased in						
Leased out						
Total						

- I) Land Rent/ Revenue (₹): .....
- i. Land Revenue paid on owned land cash (₹).....
- ii. Land Rent on leased out land cash (₹) .....
- ii. Rent paid on leased in land cash (₹) .....
- (II) Rental value of owned land ..... (₹) .....
- (III) Working capital ..... (₹) Interest .....

**E. Cropping pattern and production pattern(per farm/per ha)**

S r .	Season	Area (acres)	Area under													
			Food Grain		Pulses		Cash crop		Fruits crop		Grazing lands		Others			
			C	A	C	A	C	A	C	A	C	A	C	A		
1	<b>Kharif</b>															
2	<b>Rabi</b>															
3	<b>Summer</b>															

**C= Crop. A= Area under**

**F. Farm Building and Inventory:**

<b>Sr. No.</b>	<b>Items</b>	<b>Yr. of purchase</b>	<b>No.</b>	<b>Present Value (₹)</b>	<b>Sr. No.</b>	<b>Items</b>	<b>Yr. of purchase</b>	<b>No.</b>	<b>Present Value (₹)</b>
1	Farm building (K/P)				13	Seed drill			
2	Cattle shed				14	Hoe			
3	Store room				15	Harrow			
4	Bullock cart				16	Rake			
5	Tube Well/Well				17	Plank			
6	Electric motor				18	Spade			
7	Tractor				19	Ridger			
8	Sprayer				20	Sickle			
9	Duster				21	Others			
10	Desi plough				i				
11	Iron plough				ii				
12	Sprinkler set				iii				

**K - Kachcha, P - Pacca**

## G. Economics of Wheat crop

### I. Labour use pattern: (Per acre/ per ha./per farm)

Sr. No.	Operations	Labour (man days)								Labour Expenditure (₹)							
		Human labour				Bullock labour				Human labour				Bullock labour			
		Family		Hired		Family		Hired		Family		Hired		Family		Hired	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1	Land preparation. i. Ploughing ii. Harrowing iii. Leveling																
2	Manure application i.FYM ii iii																
3	Fertilizer application i ii ii																
4	Sowing																
5	Inter culturing																
6	Weeding																
7	Irrigation. i. ii. iii.																
8	Plant protection application																
9	Watching																
10	Harvesting																
11	Threshing																
12	Others if any																

M= male, F=Female

### II. Input cost of Wheat crop: (Per acre/ per ha./per farm):

Sr. No	Particulars / types of expenditure	Quantity	Price per unit (₹)	Total cost (₹)
1.	Seed			
2.	Seed Treatment			
3.	Manures i. F.Y.M ii. iii.			
4.	Fertilizers i. ii. iii. iv.			
5.	Irrigation(Electricity charge, canal charge etc, No. of irrigation) i. ii. iii			
6.	Weedicide i. ii.			
7.	PP Chemicals. i. ii.			
8.	Tractor or any machinery hired expenditure			
9.	Hired implements used			
10	Land revenue etc..			
	Others if any i. ii.			

#### H. Gross Returns:

Sr. No.	Product	Quantity	Price (₹)	Value (₹)
1.	Main Product (qtls.)			
2.	By-product (qtls.)			
	Total.			

**I. Production surplus:**

<b>Sr. No.</b>	<b>Particular</b>	<b>Quantity (Qtls.)</b>
<b>1</b>	<b>Last year's stock</b>	
<b>2</b>	<b>Total production during 2012-13</b>	
<b>3</b>	<b>Requirements</b>	
a.	Family consumption	
b.	Labour Wage (in kind)	
c.	Post harvest loss	
d.	Friend & Relatives	
e.	Others	
<b>4</b>	<b>Marketable surplus</b>	

**Marketing channels and marketing costs:**

**A. Marketing channels**

1. Producer — Consumer.  
Quantity:\_\_\_\_\_qtls.
2. Producer — Village Trader/Retailer — Consumer.  
Quantity:\_\_\_\_\_qtls.
3. Producer — Wholesaler - Retailer — Consumer.  
Quantity:\_\_\_\_\_qtls.
4. Producer — Wholesaler— Retailer —Consumer.  
Quantity:\_\_\_\_\_qtls.
5. Producer — Wholesaler Cum commission agent — Retailer  
—Consumer. Quantity:\_\_\_\_\_qtls.
6. if any Others
  - a.
  - b.
  - c.

**B. Distance from the market:**

<b>Sr. No.</b>	<b>Name of the market</b>	<b>Distance from farm</b>
1		
2		
3		
4		

**C. Marketing cost of the producer/respondents:**

<b>Sr. No</b>	<b>Channel /Cost (₹)</b>	<b>Producer</b>
1.	Quantity sale(qntl)	
2.	Packing	
3.	Loading/ unloading charge	
4.	Transport cost	
5.	Weighing cost	
6.	Commission paid	
7.	Storage cost	
8.	Other's if any	

**D. Disposal pattern of Wheat**

<b>Sr. No</b>	<b>Lot No.</b>	<b>Date of Agency adopted for sale of wheat</b>	<b>Qty. sold (qtls)</b>	<b>Rate of sale (₹/qtls.)</b>	<b>Total value Of wheat</b>
1	First				
2	Second				
3	Third				
4	Fourth				
	Total				

## **Constraints in Production and Marketing Of wheat**

### **Production constraints (Yes/no)**

- |    |  |                       |
|----|--|-----------------------|
| a. | Availability of improved seed on time.                                   | Yes/ No               |
| b. | Availability of sufficient fertilizer in time.                           | Yes/ No               |
| c. | Lack of irrigation facilities.   | Yes/ No               |
| d. | Availability of labours in peak time.                                    | Yes/ No               |
| e. | Labour wages are higher.   | Yes/ No               |
| f. | Availability of pesticides /Fungicides/Agril. inputs in peak period.     | Yes/ No               |
| g. | Availability of sufficient Banks/co-operative loan for crop.             | Yes/ No               |
| h. | Lack of technical knowledge of wheat.                                    | Yes/ No               |
| i. | Availability of hired farm machinery or implements.                      | Yes/ No               |
| j. | Are you suffering from high price of input of wheat?                     | Yes/ No               |
| k. | Timely payment made by private purchaser/ Private trader/ co-operative?  | Yes/ No               |
| l. | Rate of interest is high on crop loan?                                   | Yes/ No               |
| m. | By whom you get to improve technical knowledge for cultivation of wheat? | (VLW / N.A.U / D.O.A) |
| n. | Availability of power supply/connection on time.                         | Yes/ No               |
| o. | Any others problems/suggestion.  |                       |

### **Marketing constraints (Yes/no) (Rank)**

- |    |  |         |
|----|--|---------|
| a. | Availability of regulated market nearby.   | Yes/ No |
| b. | Lack of Transportation facilities.   | Yes/ No |
| c. | Is cost of the transportation high?  | Yes/ No |
| d. | Are you facing the problem of loss/Spoilage during transportation and marketing? | Yes/ No |
| e. | Are you suffering from price fluctuation in wheat?                               | Yes/ No |
| f. | Are you getting payment in time?   | Yes/ No |
| g. | Are you getting price according to quality?                                      | Yes/ No |
| h. | Are you satisfied with market price of wheat?                                    | Yes/ No |
| h. | Availability of grading and packaging facility.                                  | Yes/ No |

- i. Lack of sufficient packing materials. Yes/ No
- j. Are you facing the problem of malpractices in weighing?  
Yes/ No
- h. Availability of storage facilities. Yes/ No
- m. Any others problems/suggestion.

## **APPENDIX-II**

### **SCHEDULE FOR KRISHI UPAJ MANDI SAMITI,**

1. Date of establishment.....
2. Area commanded.....
3. Information about different wheat products handled by APMC,  
\_\_\_\_\_

<b>S.No.</b>	<b>Particulars</b>	<b>Arrivals of products in last year (qtls) 2012-13</b>
--------------	--------------------	---

- |    |   |  |
|----|---|--|
| 1. | Name of different agril.<br>Product handled by the APMC<br>(a)<br>(b) |  |
| 2. | Wheat grain handled   |  |

**4. Information about market functionaries**

S.No.	Category of functionaries	Total No. of licence functionaries	Total No. of wheat dealing functionaries during last yr.
1.			
2.			
3.			

**5. Prescribed market charges in sale of wheat**

<b>S.No.</b>	<b>Charges</b>	<b>Rate</b>	<b>Borne by</b>
1.	Market fee		
2.	Sales tax		
3.	Sieving and cleaning		
4.	Loading charge		
5.	Unloading charge		
6.	Commission		
7.	Weighing charge		
8.	Any other charges (specify)		

6. Information obtained from APMC Secretary (based on his experience) :

- (a) Common marketing channels in marketing of wheat
  - 1.
  - 2.
  
- (b) Area from where wheat comes for sale in APMC
  - 1. Within jurisdiction .....
  - 2. Out of jurisdiction .....
- (c) Area to which wheat is taken by the trader for
  - 1. Within the state.....
  - 2. Outside the state.....
- (e) Method of weighing followed in cum.....
- (f) Suggestions, if any (regarding improvement of wheat marketing)
  - a)
  - b)

**APMC constraints: (Yes/No)**

- 1. Is there price difference between big and small market functionaries? Yes/ No
- 2. Is any firm dominant in APMC? Yes/ No
- 3. Availability of facilities for storage like warehouse or godown at time of peak season. Yes/ No
- 4. Availability of facilities for farmers like guest house/ canteen/ wash room. Yes/ No
- 5. Is daily selling/purchasing information provided by the market functionaries? Yes/ No
- 6. Is APMC provided the technical literature related to marketing for major Crops? Yes/ No
- 7. Is APMC provided the IT facility to know the price of different market of different commodities? Yes/ No
- 8. Any other problems/suggestion.

**APPENDIX – III**

**SCHEDULE FOR MARKET MIDDLEMEN**

**1. Name:**

a. Wholesaler/Retailer/Processor/Contractor/Village trader.....S/o.....

**2. Purchase of wheat by Middlemen**

<b>Sr. No</b>	<b>Category of functionaries</b>	<b>Quantity purchased</b>	<b>Price paid (₹)</b>
1.	Wholesaler		
2.	Village trader		
3.	Processor		
4.	Retailer		
5.	Contractor		
6.	Other if any		

**3. Disposal of wheat by the middlemen**

<b>Market functionaries</b>	<b>Month and place of sale</b>	<b>Qty. sold (qtls)</b>	<b>Rate (₹/qtls)</b>	<b>Total (₹/qtls)</b>
Processor				
Wholesaler				
Wholesaler cum commission agent				
Village trader / Retailer				
Contractor				
Other if any				

#### 4. Marketing costs of market functionary.

<b>Sr. No</b>	<b>Channel /Cost (₹/qtls)</b>	<b>Contractor/Village trader/Wholesaler/Wholesaler cum commission agent/Retailer /Processor/Other if any</b>
1	Quantity Purchase (qtls)	
2	Purchase price	
3	Commission paid to agent	
4	Packing	
5	Loading charge	
6	Transport cost	
7	Weighing cost	
8	Unloading charge	
9	Market fee	
10	Commission	
11	Sale tax	
12	Storage charge	
13	License charge	
14	Any Other.	
15	Average Net price received by	

**Middlemen (Market functionaries) constraints: (Yes/No)**

1. Are you getting available stock on time for sale as per demand? Yes/ No
2. Are you getting good quality stock? Yes/ No
3. Is there price difference among functionaries/middlemen in market? Yes/No
4. Do you think that it's risky business because of price fluctuation? Yes/ No
5. Availability of storage during peak season in APMC. Yes/ No
6. Are you facing dominancy of firm in APMC? Yes/ No
7. Availability of grading and packing facility (processing Industries) during peak season. Yes/ No
8. Is license fee more in APMC? Yes/ No
9. Are you getting positive co-operation from APMC? Yes/ No
10. Any other problem/solution.



## APPENDIX- V

### **SCHEDULE FOR STUDY COST OF PRODUCTION OF BAKERY/WHEAT PROCESSING/WHEAT VALUE ADDITION UNIT**

#### **(A) Bakery Unit**

1. Name of the Backer or Unit :.....
2. (a) Village:.....(b) Taluka:..... (c).District : .....
3. Cost/ Rent of shop or land or factory:.....
4. Capacity of the unit(Qtls) : .....5. Turnover of the Unit(Qtls.):.....
6. Cost of machinery:.....
7. Cost of Furniture (₹): .....
8. Cost of wheat flour/year (₹) : .....
9. Cost of (RTU) backer flour/year (₹):.....
10. Labour / employee cost per month/year (₹): .....
11. Electricity Connection cost (₹) :.....
12. Electricity bill per month/ year Cost (₹): .....
13. Item wise cost of production and retail price and cost and sell per month/year:

Sr No	Item	Biscuits		Cack		Bread		Others	
		Qnty.	cost (₹)	Qnty.	cost (₹)	Qnty.	cost (₹)	Qnty.	cost (₹)
1	Menda								
2	Ghee/cheese								
3	Sugar								
4	Sodium bicarbonate								
5	Elachi								
6	Jayfal								
7	Milk								
8	Yeast								
9	Salt								
10	Milk powder								
11	Cumin								
12	Ajama								
13	Essence								
14	Coco powder								
15	Backing powder								
16	Egg								

17	Wheat flour								
18	Other if any								

14. Packing cost per month/year (₹) : .....
15. Transportation cost per month/year (₹): .....
16. Post- tele cost(₹): .....
17. Miscellaneous cost per month/year (₹) : .....
18. Cost of advertisement month/year (₹): .....
19. Total cost of production per month/year (₹): .....
20. Total return of unit per month/ year(₹): .....
21. Cost and returns of Bakery products per month/year:

Sr. No.	Item	Production cost		Wholesaler		Retailers		Other if any		Net return (₹)
		Total Qty.	Value (₹)	Total Qty.	Value (₹)	Total Qty.	Value (₹)	Total Qty.	Value (₹)	
1	Sweet Biscuits									
2	Salty Biscuits									
3	Cake									
4	Egg less cake									
5	Bread									
6	Wheat bread									
7	Others									

**Constraints of Bakery (value addition unit): (Yes/No)**

**A. Production problem:**

- (a) Are you facing government interferences? Yes/ No
- (b) Availability of semi-skilled labour on time. Yes/ No
- (c) Availability of electric connection on time. Yes/ No
- (d) Availability of electric supply on time. Yes/ No
- (e) Availability of raw materials on time. Yes/ No
- (f) Do you have raw material market nearby? Yes/ No

- |  |         |
|--|---------|
| (g) Is credit facility is available to purchase raw material?  | Yes/ No |
| (h) Are you facing problem of spoilage during production time? | Yes/ No |
| (i) Are you facing problems in packing or packing material?    | Yes/ No |
| (j) Availability of credit facility.                           | Yes/ No |
| (k) Are you facing the machinery problem?                      | Yes/ No |
| (m) Any other problems/suggestions:                            |         |
| i.   |         |
| ii.  |         |

**B. Marketing problem (Yes / No) (Rank)**

- |  |          |
|--|----------|
| (a) Availability of transportation facility.                           | Yes / No |
| (b) Availability of quality packing demanded by consumers.             | Yes / No |
| (c) Availability of semi-skilled labour for marketing function.        | Yes / No |
| (d) Are you facing Price fluctuation?                                  | Yes / No |
| (e) Are you facing perishability problem in products during marketing? | Yes / No |
| (f) Do you have problems regarding advertisement?                      | Yes / No |
| (g) Do you have problems regarding payment from middlemen/consumer?    | Yes / No |
| (h) Is there spoilage during transportation?                           | Yes / No |
| (i) Is there spoilage during packing?                                  | Yes / No |
| (i) Are you facing problems in selling?                                | Yes / No |
| (j) Any other suggestion or problem: i.                                |          |
| ii.  |          |

**APPENDIX- VI**

**(B) FLOUR MILL UNIT**

(a) Name of the firm/ owner:

(b) Village:.....

(c) Taluka:.....

(d) District : .....

(e) **Cost and return of flour mills per month/year:**

<b>Sr. No.</b>	<b>Particular</b>	<b>Quantity/No.</b>	<b>Cost / Return (₹)</b>
1	Cost / Rent of shop/premises		
2	Cost of Machinery/Grinder		
	Cost of Furniture		
3	Cost of labour		
4	Electricity connection cost		
5	Electricity connection cost		
6	Cost of packing		
7	Cost of weighing machine		
8	Post-tele/ communication cost		
9	Transport cost		
10	Loading unloading cost		
11	Storage cost		
12	License fee		
13	Tax paid		
14	Miscellaneous cost		
15	Total production cost/ month or year		
16	Retailer's cost		
17	Consumer's cost		
18	Net profit / month or year		

**Constraints of flour mill: (Yes/No)**

**A. Production problem:**

- |  |         |
|--|---------|
| (a) Are you facing government interferences?     | Yes/ No |
| (b) Availability of semi-skilled labour on time. | Yes/ No |
| (c) Availability of electric connection on time. | Yes/ No |
| (d) Availability of electric supply on time.     | Yes/ No |
| (e) Availability of raw materials on time.       | Yes/ No |

- (f) Do you have raw material market nearby? Yes/ No
- (g) Is credit facility is available to purchase raw material? Yes/ No
- (h) Are you facing problem of spoilage during production time? Yes/ No
- (i) Are you facing problems in packing or packing material? Yes/ No
- (j) Availability of credit facility. Yes/ No
- (k) Are you facing the machinery problem? Yes/ No
- (m) Any other problems/suggestions:
  - i.
  - ii.

**B. Marketing problem (Yes / No)**

- (a) Availability of transportation facility. Yes/ No
- (b) Availability of quality packing demanded by consumers. Yes/ No
- (c) Availability of semi-skilled labour for marketing function. Yes/ No
- (d) Are you facing Price fluctuation? Yes/ No
- (e) Are you facing perishability problem in products during marketing?
  - Yes/ No
- (f) Do you have problems regarding advertisement? Yes/ No
- (g) Do you have problems regarding payment from middlemen/consumer?
  - Yes/ No
- (h) Is there packing spoilage during transportation? Yes/ No
- (i) Are you facing problems in selling? Yes/ No
- (j) Any other suggestion or problem:
  - i.
  - ii.

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

This is to certify that I have no objection for supplying to any scientist only one copy any part of this thesis at a time through reprographic process, if necessary for rendering reference services in a library or documentation centre.

**Place: Navsari.**

**Date: 7<sup>th</sup> May , 2015**

**(Asodiya Pinakin S.)**