

**ECONOMICS OF PRODUCTION AND MARKETING
OF SWEET ORANGE IN NAGPUR DISTRICT**

THESIS

**Submitted to
Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola
in partial fulfilment of the requirements
for the Degree of**

**MASTER OF SCIENCE
IN
AGRICULTURE
(AGRICULTURAL ECONOMICS)**

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By

KALAMKAR PRANALI BHAGAVATARAO

**SECTION OF AGRICULTURAL ECONOMICS AND
STATISTICS
COLLEGE OF AGRICULTURE, NAGPUR**

**DR. PANJABRAO DESHMUKH KRISHI VIDYAPEETH,
KRISHINAGAR PO, AKOLA (MS) 444104**

DECLARATION OF STUDENT

I hereby declare that, the experimental work and its interpretation of the Thesis entitled, "**ECONOMICS OF PRODUCTION AND MARKETING OF SWEET ORANGE IN NAGPUR DISTRICT**" or part thereof has neither been submitted for any other degree or diploma of any University, nor the data have been derived from any thesis / publication of any University or scientific organization. The source of materials used and all assistance received during the course of investigation have been duly acknowledged.

Place : Nagpur

Date : 15/06/2012.



(Kalamkar Pranali Bhagavatarao)

Enrolment No. DD-264

CERTIFICATE

This is to certify that thesis entitled "**ECONOMICS OF PRODUCTION AND MARKETING OF SWEET ORANGE IN NAGPUR DISTRICT**" submitted in partial fulfillment of the requirement for the degree of "**Master of Science in Agriculture (Agricultural Economics)**" of Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola. is a record of bonafide research work carried out by Kalamkar Pranali Bhagavatarao under my supervision and guidance.

The subject of the thesis has been approved by the Student's Advisory Committee.

Place : Nagpur

Date : 15/06/2012

(Shri. N. T. Bagde)

Chairman,
Advisory Committee

Countersigned



Associate Dean,
College of Agriculture, Nagpur

THESIS APPROVED BY THE STUDENT'S ADVISORY COMMITTEE
INCLUDING EXTERNAL EXAMINER (AFTER VIVA-VOCE)

1) Chairman Shri. N. T. Bagde

2) Member Shri. V.S.Mundafale

3) Member Dr. V. S. Tekale

4) Member Shri. V. J. Golliwar

5) Member Shri. S. G. Thote

6) External
Member

Dr. U.T. Dangore



Handwritten signatures of the Student's Advisory Committee members and external examiner, including dates like 21.9.12.

ACKNOWLEDGEMENT

"Aim at the sun and you may not reach it, but your arrow will fly for higher than if aimed at an object on a level with yourself."

Acknowledgement for a few might be just a trifle thing written on a piece of paper. But in its true essence, it gives us an opportunity to remember and express our feeling for those who we love and revere. Here I get a chance to express my token of thanks to people who have touched me in one-way or other by their small things. Words are not enough to express my feelings for them. Yet these lines are not exaggeration but feeling, which comes straight from heart.

First and foremost, I would like to thank and praise almighty "God" the most beneficent and merciful, for all his love and blessings conferred upon mankind.

From the core of my heart, which I owe to my Hon'ble Guide and Chairman of my Advisory Committee Shri. N.T. Bagde, Assistant Professor, Section of Agricultural Economics and Statistics, College of Agriculture, Nagpur. I express my cordial thanks to him for meticulous guidance, indelible inspiration, persistent encouragement, ingenious suggestions, mellifluous nature, indefatigable attitude, and painstaking efforts are shaped the research program and care throughout the present study period. His scholarly suggestions and constructive criticism of at every stage of this study and affectionate nature have been a source of great inspiration to me. His helpful and affectionate nature is better recorded in brain than in books.

With utmost benevolence, I express my deep sense gratitude and sincere thanks to my Advisory Committee member Shri. V. S. Mundafale, Assistant Professor, Section of Agricultural Economics and Statistics, College of Agriculture, Nagpur. Dr. V. S. Tekale Associate Professor of Extension Education, College of Agriculture, Nagpur. Shri. V. J. Gollivar, Associate Professor of Horticulture, College of Agriculture Nagpur. for their valuable advice, influencing interest and

tireless help boosted me during the course of this investigations and illuminating guidance and help as when needed.

I extend my immensely grateful thanks to Shri. S.G,Thote, Head of Section, Agricultural Economics and Statistics Section, College of Agriculture, Nagpur for their valuable suggestion and encouragement in completing this research programme.

I wish to record my sincere thanks to Dr. V. M. Mayande, Honourable vice-chancellor, Dr. P. D. K. V, Akola and Dr. P. G. Ingole Associate Dean, College of Agriculture, Nagpur, for their help both in administrative and technical which facilitated my research work.

No ecology can be long enough to recount the filial affection, whole hearted support, commendable encouragement, arduous guidance and never ending cooperation during the course of investigation and preparation of this relevant manuscript by Dr. N. V. Shende, Associate Professor of Agricultural Economics, College of Agriculture, Nagpur, Dr. U. T. Dangore, Assistant Professor of Agricultural Economics, College of Agriculture, Nagpur. Shri. P. D. Deshmukh Assistant Professor of Statistics, College of Agriculture Nagpur. Mrs. C. A. Vyawahare, S.R.A, Agricultural Economics and Statistics section College of Agriculture, Nagpur.

I am deeply privileged to express any heartfelt thanks to my friends, Kunda, Snehal, Nilam, Savita, Ashwini, Mayur, Amol, Satish, Vikram. They always provided me an inner strength and guided me during my entire academic carrier so as to steer up my ambitions in a proper way.

Last but not least, there aren't enough words to express my gratitude to my beloved father Shri. Bhagavatarao L.Kalamkar; my mother Smt. Rekha B. Kalamkar and all my family members for their encouragement, sincere prayers, expectations and blessing which have always been the most vital source of inspiration and motivation in my life.

I would like to convey my cordial thanks to all those unmentioned persons who helped me to fulfill my dreams come true.

I am thankful to researchers of past and present whose literature has been cited and which helped me to study in detail and insight of the dissertation work.

I am also thankful to all the Sweet Orange cultivators of villages in Katol and Narkhed tahsils who help me directly and indirectly during my investigation.

Lastly, I bow my head before the almighty God for blessing showered upon to complete this work successfully.



Place : Nagpur

Date : 15/06/2012

(Kalamkar Pranali Bhagavatrao)

Enrolment No. DD-264

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(C)**ABBREVIATIONS**

/	Per
et al.	Et alia (and associate)
etc.	Et cetera
Fig.	Figure
FYM	Farm Yard Manure
ha	Hectare
i.e.	That is
K	Potassium
Kg.	Kilogram
N	Nitrogen
No.	Number
P	Phosphorus
qt.	Quintal
Qty.	Quantity
Rs.	Rupees

(D)

THESIS ABSTRACT

- a) Title of the thesis : ECONOMICS OF PRODUCTION AND MARKETING OF SWEET ORANGE IN NAGPUR DISTRICT
- b) Full name of student : Kalamkar Pranali Bhagavatrao
- c) Name and Address of Chairman : **Shri. N. T. Bagde**
Assistant Professor, Agricultural Economics and Statistics Section, College of Agriculture, Nagpur.
- d) Degree to be awarded : M. Sc. (Agriculture)
- e) Year of award of Degree : 2012
- f) Major Subject : Agriculture Economics
- g) Total No. of Pages in Thesis : 77
- h) Number of words in Thesis Abstract : 277
- i) Signature of student : 
- j) Signature, Name and Address of forwarding authority :


Professor Agricultural Economics
and Statistics Section, College of
Agriculture, Nagpur.
NAGPUR.

ABSTRACT

The present study entitled "Economics of production and marketing of Sweet Orange in Nagpur district" was undertaken to study the cost and returns of cultivation of Sweet Orange, producers' share in consumer's rupee and problem in production and marketing of Sweet Orange. The study has been undertaken in Katol and Narkhed tahsil in Nagpur district. Data pertained for the year 2010-11.

The study revealed that, the higher per cent of illiteracy was noted in Narkhed tahsil. The highest area was sown under Sweet Orange fruit crop i.e.in Katol (1.23 hecter). The establishment cost of sweet orange by considering the shelf life of orchard was estimated Rs2294.80 and Rs 2934.13 for Katol and Narkhed tahsil respectively. The per hectare cost of production at overall level at cost 'A', cost 'B' and cost 'C' were Rs. 144580.65, Rs.115334.67 and Rs.110743.76 respectively. The net return over cost c of Rs 92365.25 and Rs 120667.17 was often in Katol and Narkhed tahsils respectively. At overall level the input output ratio at cost 'C' was 1:2.39.

Following important channels of distribution have been observed while marketing the sweet orange under study area.

Channel I: Producer →Pre-harvest contractor → Wholesaler →
Retailer →Consumer.

Channel II : Producer →Wholesaler → Retailer →Consumer

Among the different items of marketing cost, transportation charges was found to be the highest in both channels in the marketing of Sweet Orange. In regards of channel (I) and channel (II),the producer's share in consumer's rupee was highest in channel (I) i.e. 40.44 per cent. While in channel (II) was 21.52 per cent.

The unavailability of labour during peak period and high commission charges was acute problem faced by the grower.

CHAPTER-I

INTRODUCTION

Sweet Orange (*Citrus sinensis* L.) locally called as "Mosambi" belong to family "Rutaceae" is indigenous to China. It is believed to have been introduced into South India from where it was taken to the western world by Vasco da Gama in 1498. However it does not spread to India. The present cultivated varieties are recent introduction from abroad. Indian names of some of its varieties like Mosambi (mozambique), Malta and Batavian (found in south India) suggest their introduction from foreign countries. These have been introduced mostly from the west in the present century but one type, Soh-niangring, grows semi wild in Assam and must have entered India from the east at a very early time. The commercially grown varieties of sweet oranges in India are: 'Jaffa', 'Valencia', 'Hamlin', and 'Malta' in Punjab, Himachal Pradesh, and Rajasthan; 'Sathgudi' orange in Andhra Pradesh; and 'Mosambi' in region of Maharashtra. Among the sweet oranges the most important variety is 'Nucelar' from Maharashtra. Nucelar is mostly cultivated in Vidharbha region of Maharashtra specifically cultivated in Nagpur and Amravati region of Vidarbha this variety which is a distinctive furrowed fruit with a smooth circular areole, and juice with very low (0.3 %) acidity. It is similar in taste to 'Saucuari' orange of Egypt. Another variety is Sathgudi or Chini of Andhra Pradesh. It has a good flavour but does not develop a proper skin colour or flavour under the humid conditions of South India. A cultivar grown in the coastal areas of Andhra Pradesh is Batavian. It is similar to Sathgudi but less sweet. 'Pineapple' is also a recent introduction which is successfully grown in Punjab. Its fruit has a smooth deep bright orange skin, the pulp is highly flavoured and sweet, and good yield, but it has bold seeds, another successful variety is Malta Common. 'Joppa' and 'Vanille' are also good. 'Humlin' is

popular due to its earliness, but it shows a high percentage of dry granulated fruits on the rough lemon rootstock. 'Valencia' bears well but ripens too late in the seasons. Another important variety is Blood Red grown in the dry tracts of Punjab and Rajasthan. Washington Navel develops a large fruit which lacks both juice and quality.

India has been predominantly agrarian economy since the time immemorial. Agriculture occupies the central place in rural life. However, agriculture continues to be mainstay of our economy even today. The contribution of agriculture towards national income was about 22.1 per cent in 2003-04 and about 70 per cent of population depends on it. Therefore, it is rightly said that agriculture is the backbone of Indian economy.

Horticulture is an important industry among the land based agricultural systems. Horticultural industry is fast emerging as the most remunerative sector for changing the age old subsistence farming specially in the rainfed, dry lands, hills, arid and coastal agro ecosystems, horticultural crops are characterized by high productivity, higher returns, higher potential for employment generation and exports, comparatively lower requirement of water and easy adaptability to adverse soil and waste land situations. The input-output ratio in most horticultural crops is much higher than that in the field crops. Their role in improving environment is an added advantage. Horticulture crops cover large varieties of fruits and vegetables, flowers, plantation/spice crops. Medicinal and aromatic plants, roots and tuber crops. Fruits are man's oldest food. Fruit cultivation is as old as human civilization itself. Cultivation of fruit is a very important factor contributing to the property of Nation. Fruits and vegetables are the prime source of vitamins and minerals without which human body cannot maintain proper health to resist the diseases. Indian Council of Medical Research (ICMR) had recommended the consumption of at least 92 grams

of fruits per day and as much variety as the season permits (Anonymous, 2001). On the contrary, per capita consumption of fruits in India is only 46 grams per day. This indicates the wide gap between use and requirement of fruits in general. The major fruit crops grown are mango, banana, citrus, grapes, guava, papaya, sapota, pomogranate, jackfruit, ber, anola etc. Fruit crops in Indian economy India is endowed with different agro-climatic condition which offer immense scope for cultivation of various kinds of fruit crops. This provides an excellent platform for the country to emerge as a leading producer of fruit crops. The fruit crops have established their credibility by improving the economic condition of farmers and entrepreneurs, enhancing exports and above all, providing nutritional security to people. This has assumed special significance in the context of liberalized global economy and establishment of WTO. In India common citrus fruits are Mandarin orange (*Citrus reticulata*), Sweet Orange (*Citrus sinensis*) and Acid lime (*Citrus aurantifolia*). Mandarin (*C. reticulata*) is the most important commercial crop. It occupies about 39% of the area under citrus cultivation. The Chief Center's of production are Nagpur, Assam and Coorg. The sweet orange comes next to mandarin, occupying about 12 % of the area, Maharashtra, Andhra Pradesh, Punjab and Rajasthan are being its principal centers.

The sweet orange leads other citrus species in both production area and value. Sweet oranges can be classified into round oranges like 'Valencia', navel oranges, blood or pigmented oranges, and acid less orange. Brazil is the largest producer of oranges in the world with 18.3 billion metric tons representing 29.5 percent share of global production. Following, the U.S accounts for 17.3 percent share which represents 10.7 billion metric tons per year. In the third place is Mexico with total production around 3.9 million metric tons. India and Spain account for more than 4 percent of global share. Many varieties

of sweet orange have been introduced into India but only a few are prolific ones having good quality. Currently, exotic varieties like Jaffa, Hamlin and Pineapple are performing well in Punjab, Haryana and Rajasthan. Jaffa is a famous, mid-season sweet orange, while Hamlin is an early-season variety. Pineapple is another mid-season variety. Another late-season variety, Valencia has also shown good adaptability.

Sweet orange is generally used for juice purpose. Sweet orange is one of the rich source of nutrients particularly calories, occupying top place in the world fruit map. Sweet Orange fruits are most refreshing, delicious, wholesome and health promoting, juicy fruits. Its juice is immensely rich in vitamin C and is a good source of Vitamin A and B. Besides, the Vitamins the juice also contains fruit sugar, fruit acids and mineral like calcium, phosphorus and iron. Sweet Orange area under Maharashtra in 2000-2001 was 73,303 ha, production was 482115MT. Whereas productivity 15MT/ha was recorded and it was increased to area 91634 ha (1.25 %). Production 6,11,584 M.T (1.27 %), whereas productivity was recorded 15.2MT /ha in the year 2005-2006 (Source- National Horticulture Mission).

Heavy returns from Orange attracted several cultivators of Nagpur and Amravati resulting in general expansion. This high tendency of expansion without carry for large investment by the cultivators, increased burden on ground-water-table to a great extent, hampering the production of bearing orchards and drying at increasing rate too. The fear of complete abandonment of orange cultivation in these area, which is popularly known as "California of Vidarbha", in recent future cannot be ruled out. This scenario is resulted into cultivator has been switch over form cultivation of Orange to Sweet Orange as the soil and climatic conditions are very favor.

1.1 Sweet Orange Production Scenario:

	Global Scenario	National Scenario
Sweet orange	71 %	25 %
Mandarin	13 %	43 %
Lime & Lemon	10 %	25 %
Grapefruit & others	6 %	7 %

The distribution of major citrus fruits is as under:

The global scenario of sweet orange is 71% and national scenario is 25%. In India, the total area under fruit crop was 1.12 million hectares, in 1951-52 and increased to 3.79 million ha in 2001. India ranks second in the world with respect to fruit production having a global share of 10.1 per cent after China (57.73 million tonnes) with its projected value touching 98 Mt by the year 2020-2021 (Banerjee, 2009). India has the unique distinction of being able to grow almost all the varieties of fruits and vegetables. Annual growth of fruit production is 37.4 per cent from 28.63 million tonnes in 1991-92 to 63.50 million tonnes in 2007-08. Sweet oranges are cultivated in several States of India covering 1,26,400 ha with a total production of 12,10,400 tonnes. Highest from 85,100 ha cultivation of Mosambi (sweet orange) takes place in a sizable area in Maharashtra (35,500 ha) with a production of 5,18,100 tonnes. Highest productivity is in Maharashtra and Madhya Pradesh, the lowest being Rajasthan. Citrus fruits are grown in an area of 7.12 lakh ha in India with a production of 59.77 lakh tonnes and productivity of 8.3 t/ha. Among the citrus fruits in India, sweet orange is the second most important fruit, occupying an area of 1.26 lakh ha with a production of 21.1 lakh tonnes and productivity of 16.7 t/ha. The commercially grown varieties of sweet oranges in India are:

'Jaffa', 'Valencia', 'Hamlin', and 'Malta' in Punjab, Himachal Pradesh, and Rajasthan; 'Sathgudi' orange in Andhra Pradesh; and 'Mosambi' in the Marathwada region of Maharashtra. The production of fruits has also increased from 11.7 million tonnes in 1950 to 45.50 million tonnes in 2001.

Within India West Bengal is the largest producer of horticultural crops accounting for 12.20 per cent of India's total horticultural crop production followed by Uttar Pradesh (11.10 per cent) and Bihar (9.53 per cent) in 2004-05. Major fruits cultivated in India are mango (38.28 per cent), banana (16.27 per cent), Citrus (13.39 per cent), apple (5.98 per cent) and guava (5.26 per cent). Citrus is the third most important tropical fruit crop of India after mango and banana with an area of 712.4 thousand hectares and 5996.9 thousand metric tonnes of production. The most important Citrus growing states in India are Andhra Pradesh, Maharashtra, Orissa, Gujarat and Uttarakhand.

Total area under fruit crops in the Maharashtra 13.66 lakh ha. The soil and climatic conditions of Maharashtra are very congenial for cultivation of different fruit crops. Therefore an ambitious program namely "Employment Guarantee Scheme linked Horticulture Development Program" has been launched in 1990-91. Coverage under major fruit crops is as Mango- 37.83%, Citrus-19.13%, Cashew-13%, Pomogranate-6.92%, Sapota-5.06%, Custard Apple- 2.77%, Guava-2.41% and other is 13.26%. Due to massive plantation of fruit crops in the last decade production of horticultural produce in the state has increased substantially.

In Nagpur district, the sweet orange cultivation is mainly concentrated in Hingna, Katol, Narkhed, Kalmeshwar, Ramtek, Umred and Bhiwapurtahsils. For the year 2009-10, the productive area under Sweet Orange in Nagpur district was 3,542 ha and the total production was recorded 23,400MT, whereas the

productivity /ha was 6.61MT /ha (Source- Joint Director Office; Nagpur.

1.2 Need and Importance of the study:

Sweet orange, not only important place in market, but has its place in daily life too. It has assumed a discernible significance with wider precept and better potential. Hence, effort must be made for boosting for production of sweet oranges in the country which has high potential for export .In view of growing demand for sweet oranges for domestic consumption.The sweet orange crop requires large investment in the initial stages and offers relatively larger profit has helped in encouraging the entrepreneurship in the growers. The sweet orange growers have become more responsive to new and sophisticated inputs that are become recently being recommended. The adoption of new production outlook for food crop to fruit crop. The new capital resources were being increasingly acquired with the liberal financial assistant rendered by the co-operative banks. The bank expanded the credit supply of medium and long term loans.

Due to resent changes in outlook of sweet orange growers coupled with liberal credit supply made by co-operatives and commercial banks, there has been appreciable increase in the area under in sweet orange crop. The availability of long terms and medium term loans has an appreciable impact on capital formation in the tract lending to sustain rise in growers income. This coupled with technological change that has set in motion in horticulture production during the past decade and consequent upon increasing rise in the demand for sweet orange from selective tahsils that is Katol, Narkhad, Saoner, Warud, etc. had attracted not only remaining cultivar but also, the cultivar from other tahsils. Which are adjoined to the Nagpur and Amravati district to switch over to orchardist from cultivator indicating changing nature of Agriculture.The last decade had also

witnessed spectacular expansions of sweet orange plantation in Katol, Nerked, and Saoner district of Nagpur district.

The present study has been conducted in Katol and Narkhed tahsils of Nagpur district. In Katol tahsil, Sweet orange is grown on large scale. The study will be helpful to understand the present status of inputs available with Sweet orange growers and how they manage their inputs. In addition to this, also study relationship of selected variable with input management in terms of input requirement, procurement sources and use. Further, efforts have been also made to ascertain major contributing factors, by the Sweet orange growers.

The finding has been helpful to identify the constraints while managing the inputs. It would be also helpful to formulate strategies for extension worker, which ultimately would result in increasing its production level and also acreage under orange cultivation.

Keeping in view of the commercialization of Sweet Orange in this area the study will be undertaken with following objectives.

1.3 Scope of Study:

Sweet orange is one of the best citrus fruit after orange in world. Production of sweet orange in central and western part of India is increasing every year. Mrug crop (monsoon blossom) which matures in February-March has great potential for export since arrivals of sweet orange fruit in international market are very less during this period. Selection of desired quality fruit as per specific market demand and careful post-harvest handling to retain most of natural qualities and freshness play a key role in expanding export of sweet orange. Citrus industry in India is the third largest fruit industry of the country after mango and banana. India ranks ninth among top orange producing countries contributing 3% to the world's total orange production. Only

1.72% of the country production is exported. Producers sell fruits to post harvest contractor and fetch unremunerative price. Sweet orange growers receive better price in local market in comparison to sale of fruits at orchards. Transportation cost of fruit and payment to commission agent has major share in market cost. Wide variations in prices were found in different local markets. Producer's organization and co-operative societies should be formed for marketing of sweet orange fruits. Fruits should be harvested at proper maturity level. Precautions should be taken to avoid injuries at the time of harvesting and transportation of fruits to the markets. There is need to develop alternative marketing channel involving co-operatives societies to help the sweet orange growers. Steps should be taken to link production, marketing and processing of sweet orange to avoid the seasonal gluts in the markets. Careful harvest and handling of harvested fruits to maintain their "Sales appeal" and delicate flavor is of critical importance for sweet orange considering its fragileness.

1.4 Objectives:

- 1) To study the economics of Sweet Orange.
- 2) To work out the Marketing of Sweet Orange.
- 3) To identify constraints in production and marketing of Sweet Orange.

1.5 Hypothesis:

- 1) The Sweet orange cultivation profitable venture.
- 2) The sweet orange is marketed by various marketing channels.
- 3) Sweet orange have production as well as marketing constraints.

1.6 Limitations of the Study:

Growers was not recall the cost of establishment which they are invest on sweet orange during five years thus only 25 growers was studied for establishment cost and that cost is used for cost of cultivation.

Farmers, pre-harvest contractors, commission agent, wholesaler, retailers are the various functionaries involved in marketing of sweet oranges. These agencies perform different activities in the marketing of sweet oranges by which the sweet orange fruit reach the ultimate consumer. These functionaries face different problems which affect the marketing system of sweet oranges and put the producer on one hand and the consumer on the other at greater loss.

CHAPTER II

REVIEW OF LITERATURE

2.1 Production of Sweet orange:

Bhende (1965) estimated the total variable and fixed costs per acre varies from 80.20 per cent to 86.13 per cent and 19.79 per cent an average being 83.42 per cent and 16.58 per cent respectively in case of oranges. Per acre, per holding average variable and fixed cost amount to Rs. 638.79 and Rs. 127.05, the average total cost of cultivation per acre holding is Rs. 765.84. Average net gain from orange per acre for all the holding amounts to Rs. 208.44 and Rs. 453.15 during the year 1964-65 and 1963-64 and it varies from Rs.394.99 to Rs.46.89 and from Rs. 290.08 To Rs. 719.97 during the respective years. The average return from orange during 1964-65 and 1963-64 is 2.14 per cent and 18.35 per cent on capital investment, respectively.

Gupta et al. (1974) they studied that, the Coorge Mandarin orange in Karnataka for the first seven years, the trees gives no return and the return start from the eight year and continue beyond 40 years, unlike Nagpur Santras which start giving returns from the fifth year and go up to 30 years. The total cost of establishment was found to be about Rs. 970 and amortized over 40 years at the rate of 11 per cent, the establishment cost per year worked out to be Rs.108. The average cost of maintenance from the eight year onward was found to be varying from Rs. 65 to Rs. 590 per acre with an average of Rs. 370. This maintenance cost was low as compared to the cost incurred on Nagpur orange for which operating cost was Rs. 542 at 1973.74 prices. The return was found to be high with as low as Rs. 219 to as high as Rs. 3,000 per acre and it was found that there was no significant correlation between the age of orchard and income received. The average gross return was found to be Rs. 992 as against Rs. 1900 in case of Nagpur Santra. The return to maintenance cost ratio was worked out to be about 2.67 for Coorge Mandarin as compared to 3.61 of Nagpur Santra.

Kumar Rajeshet al.(1981) they concluded that, the cost incurred on net return received from mango orchard. The cost incurred on mango orchard was highest being Rs. 90536 per hectare establishment cost in 1st year followed by 2nd year to 21 and above year varying from Rs. 7306 to Rs.18456 per hectare per annum at different age of planting period. Mango orchard gives net return varying from Rs. 7306 to Rs. 305487.20 per hectare per annum at a different age of plantation period. The average input output ratio varied from 1: 2.64 to 1: 17.98 during different periods. The peak period of fruiting and thereby income from mango orchard was observed in 16-20 years age, where yield came to 399 quintals and net income of Rs 305487.20 per hectare per annum.

Khoja (1986) studied that, the net gain to the orange grower in the pre harvest sale at flowering stage method, whole contract method and count method were worked out to Rs.175.00, Rs. 211.00 and Rs. 219.00 respectively per thousand fruits. In post- harvest sale by loose consignment, box consignment and auction sale .The net gain of the orange growers were worked on to Rs. 510.00, Rs. 551.55 and Rs. 252.00 respectively per thousand fruits It is observed that the producer's share in consumer's rupee was 26.81 per cent, 30.57 per cent and 30.67 per cent only in the pre harvest sale of oranges. At flowering stage, there were whole contract sale and count method sale. While pre-harvest contractor involved in this method of sale incurred 28.58 per cent, 27.24 per cent and 25.44 per cent expenditure. Out of consumer's rupee as market cost and their profit margin in these three methods were worked out to 22.17 per cent, 20.14 per cent and 22.59 per cent in consumer's price respectively. While retailer profit margin in these three methods were estimated between 19 to 23 per cent in consumer's rupee.

Nighot et al. (1986) studied the economics of production of orange in selected villages of Nagpur district and observed that total cost of production including cost of establishment was Rs.11, 166.86 per hectare. Human labour, manure, fertilizer and pesticides were the

important item of expenditure in orange production. Per hectare gross returns were Rs.28599.14. Per tree cost of production and gross and net return were Rs.33.63, Rs.86.14 and Rs.52.51 respectively.

Anonymous (1989) studied that, the Kagzi lime cultivation was labour intensive and per hectare utilization of male labour days was 205.84 and per hectare use of N, P, K, was 43.76, 28.83 and 11.9 kgs, respectively. The average yield of Kagzi lime was 131.79 quintals per hectare. The total cost of production was Rs.10118.07 per hectare giving net return of 8332.97 at cost "C".

Patil (1989) studied on economics of production and marketing of oranges in selected area of Nagpur district. He calculated cost of cultivation of oranges for the sample, as a whole was Rs.18, 100.71. Cost "A" which approximate direct production expenses accounted for about 60 per cent of total cost (Cost "C"). Per hectare cost of cultivation in general decrease with the increase in age of garden except in age group of 11 to 15 year average per hectare gross income for the sample as whole was Rs.39202.80. Highest per hectare gross income was observed to be in age group of 11 to 15 years per hectare average net income was Rs.21102.18. Highest net income was obtained from age group of 20 years and above. Input output ratio of total cost was 2.17 for the sample as the whole. He estimated the market cost of oranges per thousand fruit was Rs.21.03. He concluded that two important channels in market of oranges were a) Produce sold through pre-harvest contractor (channel I). b) Produce sold directly in market by cultivator (channel II). Producer's share in consumer's rupee was observed to be higher (39 per cent) in channel (II). In channel (I) producer's share in consumer's rupee was 35 per cent.

Anonymous (1991) studied that, while establishment of orange orchard, if proper combination of intercrop is chosen the gross cost of establishment can be reduced to greater extent. Average per hectare, total cost of establishment was Rs.14,422.55 and average per hectare net cost of establishment deducting net return from intercrop was found to be Rs.13,302.55 whereas per hectare total cost incurred and gross

return and net return obtained from various intercrop were Rs.8,146.69, Rs. 9,267.24 and Rs.1,120 respectively.

Butox (1991) studied the cost of production of orange and sweet orange fruit in march 1990 in two leading citrus states of Florida and California as part of the US Department of Agriculture farm cost and return survey results indicated that, for 1988-89 season cash receipts per acre minus both variable and fixed cash expenses and capital replacement were positive for both orange and sweet orange fruits in both states. Return above full economic costs were negative for oranges in both state.

Sapate A.V. (1993) studied the sample of six tahsils of Nagpur districts, for raising orange nurseries indicated that 35 per cent of total expenditure was covered by hired human labour wages for raising nursery. Nursery growers on an average raised 36077.51 grafts seedling per hectare of which only 33 per cent could be marketed which hampered total profitability to a greater extent. Considering 20 per cent mortality and discarding, rest 45 per cent was treated as missing benefits. Average gross income of Rs2.52 lakhs per hectare was realized which retained Rs.84376.50, Rs.63200.98 and Rs.59592.01 as net income /receipt at cost A,B and C respectively Input-output ratios were positive (at all cost concepts) only for large sized nursery. Missing benefits were higher than actual benefits. Together these two factors indicated orange nursery business as a highly profitable venture.

Khade (1999) studied the establishment cost of orange orchard in selected area of Nagpur district. He estimated the net establishment cost of orange orchard was Rs. 65, 298.85 per ha. and it was accounted for first, second; third, fourth and fifth year was Rs.11, 416.94, Rs. 9559.71, Rs. 11,063.24, Rs.15, 251.84 and Rs. 18,007.02 per ha. respectively. Per cent recovery of gross establishment due to income generated by intercrops was 31.68 per cent for first year and 4.86 per cent for fifth year of garden establishment.

Navadkaret.al.(2004) studied the production processing and trade of fruits and vegetables in Himachal Pradesh vis-à-vis other states. At the end of 2000-2001, the world outputs of fruits and vegetable have crossed 4663 and 6981 lakh MT. The major area under fruit crops is located in the state of Maharashtra, A.P and Karnataka which together contribute nearly 35per cent of the national area. The productivity of fruit crops has also been raised from 10.00 MT/ha to 11.7 MT/ha. The area under fruits and vegetables in Himachal Pradesh increased by 3.1 and 1.5per cent, whereas the production rose by 2.6 and 4.4per cent annual.

Gangawaret al. (2005) studied on an economic evaluation of Kinnow mandarin Cultivation in Punjab. They estimated the return and economic feasibility of investment in orchards, cost and return from Kinnow Mandarins. This study has evaluated the economics of production and constraints in Kinnow-cultivation in Punjab. The internal rate of return (IRR) varies from 22.41 to 25.65 per cent, depending upon the size of orchards. The total establishment cost of orchard was Rs.1, 19,107.The average gross returns per ha amounted to Rs 73,672 per year.

Vijaendra et al.(2007) study reveals that,the comparative economics of mango fruit plant nurseries has been studied by them in the existing mango scion blocks as well as nursery outlets in Bangalore (urban) and Dharwad districts of Karnataka. The cost of production of 100 mango plants has been found as Rs 1884 under the Bangalore region (stone grafted plants) and Rs 2994 under the Dharwad region (approach-grafted plants). The expenditure incurred by traders in trading of mango plants has amounted to Rs. 4075 per 100 plants. All the three groups under study have been found economically better with a net return of Rs. 1805 in the Dharwad nurserymen group, followed by Rs. 1780 in the Bangalore nurserymen group and Rs. 1668 under traders group. The nurserymen groups of Bangalore and Dharwad have respectively recorded Rs 1.93 and Rs 1.59 as return per rupee of expenditure compared to that of traders group (Rs. 1.39).

Naphade S.A. and A. S.Tingre (2008) studied economics of production and marketing of Guava in Buldhana district of Maharashtra. The study was based on primary data of sixty farmers collected from five tehsil of Buldhana district. The selected guava growers were classified into three groups on the basis of age of guava orchard. Simple level of socio economic status le tabular analysis and standard cost concepts were used to work out the cost of cultivation of guava. On overall basis the co level of socio economic status cost of establishment and cost of cultivation of guava per hectare was Rs34333 and Rs.225222, respectively .The study revealed that the profit was increasing with the age of orchard. Guava is highly profitable crop and input output ratio at cost C was 4.9 and 4.3 for group second and third respectively. The results of study showed that the marketing cost per quintal of guava for group II was worked out to Rs.92 and for group III was Rs.110.94.In marketing of guava there were three channels by mostly marketing was done by producer –Wholesaler-retailer-consumer channel. The major problems faced by guava growers were lack of market information, lack of appropriate grader, and high market commission

Mahakalkar Y. N.(2010) Studied the cost of cultivation of oranges for the sample as a whole was Rs. 101619.89/-per hectare. The cost 'A' was Rs. 60577.19 (59.611per cent) per hectare. Per hectare average net return for the sample as a whole was Rs 120705.91. Highest net income was obtained for orchard age group 11-15 year (Rs. 156593.34).Output-input ratio at the total cost was 2.19 for the sample as whole highest output-input ratio was obtained from the orchard age group of 11-15 year i.e. 2.44.Producers share in consumer's rupee was observed in Katol market and Narkhed market was in channel II – (producer – wholesaler – retailer in local market - consumer in local market) it was 92.06per cent and 91.87per cent.

2.3 Marketing of sweet orange:

Sidhu and Kahlon (1967) identified three marketing channels for apple in Kullu valley, namely, a) contract system b) sales in market

through agents c) directly to consumers and their shares in the market were 62.2 percent contract basis. 34.14 percent to commission agents in the market and only 3.65 percent through direct sales to consumers. The main reason for leasing the orchard on contract were small and scattered holdings, lack of transportation facilities and absence of local market in Kullu proper.

Singh and Kahlon (1968) studied the marketing of grapes in Punjab observed that, commission agents and retailers were important channels for selling grapes. About 41 and 40 percent of produce was marketed through commission agents and retailers respectively. Further analysis showed that grading and packing formed 72.6 percent of total marketing costs in the primary markets transportation cost accounted for 10.96 percent and 34 percent in these markets respectively.

George and Singla (1969) studied marketing of sweet oranges in Punjab and found that, 77.39 percent of farmers disposed their produce to the pre-harvest contractors, 20.38 percent to the distant terminal markets and rest to the local whole salers and retailers and directly to consumer.

Kochhar and Thakur (1971) reported that, most common mode of marketing apples in Himachal Pradesh was through commission agents which accounted for about 85.63 of the marketable surplus. The next important method of sale was through pre-harvest contractors which accounted for only 14.67 percent of total marketable surplus.

Dharet *al.* (1976) stated that, the pre-harvest contract system was most common method of sale of apples, among small and medium orchardists and sales through commission agent was more popular among large orchards. The marketing costs when sold through commission agent at the markets of Jammu, Amritsar and Delhi came to Rs.11.88, Rs.14.58 and Rs.17.37 respectively. The major items of marketing costs were packing, transportation and commission charges. Further analysis showed that commission agents accounted for more

than 41 percent of total marketing margins followed by transportation and handling charges.

Krishnamurthy *et al.* (1978) studied the economics of production and marketing of coorg mandarin oranges in Karnataka and found that the pre-harvest contractors made a netprofit of R. 25.06 per thousand fruits and incurred expenses of Rs.24.24commission charges which were Rs.10.71 per thousand fruits formed 44.18 percent of the total marketing cost. Harvesting and transportation costs were the other important items of marketing cost. The grower received Rs.57.89 per thousand fruits.

Patilet *al.* (1983) studied the marketing margins and price spread in the marketing ofAlphanso mangoes in Ratnagiri district. Out of the four identified channels the direct sale to consumer was the most profitable, while selling through pre-harvest contractors was the least profitable.

Patilet. al.(1985) they studied the different marketing channel in marketing of fruits, which were follows:

Channel I: Producer- Consumer

Channel II: Producer–Cooperative –Consumer

ChannellIII : Producer–Commission agent–Wholesaler–Retailer–
Consumer

Channel IV: Producer–Pre-harvest contractor-Commission agent-
Wholesaler –Retailer –Consumer

They estimated that, the cost of grading and packing in different channels varied between Rs.6.37 and Rs. 6.53 per crate. The cost of grading and packing is higher than in channel II as compaired to that of channel I. The cost of transportation incurred was (Rs.4.87/crate) and channel II(Rs.4.04/crate). Marketing charges were the highest in the channel III and channel IV(Rs.1.15/crate). Whereas they were the lowest lowest in channel II(Rs.0.25/crate).The share of producer in consumer's rupee in case of Alphanso mango formed 82.8,72.8,38.2

and 17.8 per cent in channel I and channel II respectively. They analyzed that the share of producer in consumer's rupees comparatively lower channel III and IV. The producers share in channel IV was the lowest because producers has in marketed their supplies through pre harvest contractor and intermediaries took away the lion's share from consumer rupee. However, producers share in channel III was higher compared to channel IV because of elimination of pre harvest contractor whose share was shared by producers themselves. The producers share was highest (82.8 per cent) in channel I, in which they had disposal off their marketed supply directly to the consumer

Patil (1989) studied the marketing of Alphanso mangoes in Maharashtra identified four channels viz. producer- consumer (direct sale) producer-cooperative–consumer (Cooperative sale), producer - commission agents-wholesalers-Retailers- consumer (middle men sales) and producer –pre harvest contractor-commission Agents wholesalers–Retailers- consumer (pre-harvest contract sale). The study revealed that when the contract was made at the time of flowering stage, the price received by the growers was the lowest (Rs. 28.50/crate) though the crate size was big. The average price of Alphanso mangoes received by the growers was only Rs.29.40 per crate. Finally he concluded that the direct sale to consumer was the most profitable and the one through preharvest contractor was the least profitable.

Bhole et.al.(1992) conducted study on price spread in marketing of oranges in Amravati and Nagpur district. A sample of 60 orange growers and 10 pre harvester contractors from each district were selected for study. They found that producers get 32 per cent higher price in APMC marketing as against selling their produce to preharvest contractor. They also found producer's share was 48 per cent in APMC market. From this inferred that selling the produce in APMC market is more economical.

Hiremath (1993) paper reveals that, the economics of production and marketing of lime in Bijapur district, Karnataka revealed that the per

ha cost of establishment for the four year gestation period was Rs. 56,424.58 in small, Rs. 49,179.62 in medium and Rs.47,143.09 in large orchards. The intercrops reduced the establishment cost by 58.82,53.90 and 46.68 per cent in three size group of orchards, respectively. The per hectare cost of cultivation (8th to 30th year) was high in medium (Rs. 12,454.34) followed by large (Rs. 1,203.76) and (Rs.11,399.60) small orchards. The average yield of lime was 340.59, 366.98 bags in small, medium and large orchards, respectively.

Batraet *al.* (1994) observed that, the banana yield ranged between 358 q per ha and 464 q per ha and those of expenditure between Rs. 4995/ ha and Rs.5518 per ha according to the prevailing labour rates and material inputs in Gujarat state, India. Input cost was Rs. 18.76 per ha for basheri variety and Rs. 25.75 per q for Shinduri variety as compared to Basher variety. Sinthilnathan and Srinivasan (1994) estimated the costs and returns of poovan cultivar banana production in study area over a period of three years. With the per hectare total cost of cultivation of Rs.1,24,668.11, the gross income obtained was Rs. 2,86,913.80 and there by the net income worked to be Rs1,62,235.69. The study clearly showed the high profitability of variety poovan banana with a high returns cost ratio 2.3:1 in the study area. Deepak Shah (1996) studied the production and marketing pattern of grapes in Maharashtra. The study showed sharp increase in per acre annual gross maintains cost as well as returns of grapes orchards. In general about 67% of gross maintenance cost of grape production was spent on various production related operation and the remaining 33 percent owed it to investment on various marketing functions. The profitability in grape cultivation was found to be considerably high in state of Maharashtra.

Changole (1995) studied the marketing of fruits in APMC Amravati. He selected the APMC Amravati because it was one of the important market in Viderbha. The fruits like apple, mango, orange and sweet orange fruits for the study as they have anoticeable arrivals and spread price in Amravati market.He observed the marketing channels

for orange as, Producer-wholesaler-retailer-consumer.Producer-wholesaler of APMC-wholesaler of distant market-retailer-consumer.

The producer share in consumer's rupees in case of first channel was 48 per cent while in case of second channel the same was 31per cent. His study further reveals that, in the middle of Ambia bahar and Mrug bahar season arrivals were lower while the prices were highest toward the end of season.

He concluded that, because of more no of intermediaries producers get less share in channel second but the price by the farmers in both channel, was same from this he has inferred that the orange in APMC Amravati fetches good prices.

Bagde et.al.(1996) studied the dynamics of marketing of fruits crops in Nagpur district and revealed that, the producers share in consumer's rupee was 39.34 per cent, 44.70 per cent and 20.83 per cent in case of apple, grapes and mango respectively

Dangore (1996) studied that the marketing channel of orange marketing in katol and identified four marketing channels which were prevailing in study area that is,

1. Producer–pre-harvest contractor–wholesaler–retailer in local market-consumer in local market.
2. Producer–wholesaler–retailer in local market-consumer in local market.
3. Producer–wholesaler–selling agent at destination-retailer at destination –consumer at destination.
4. Producer–selling agent at destination-retailer at destination–consumer at destination.

It was estimated that, the net price per 1000 fruits received farmers was higher by rs. 92.05 in respect of post-harvest as compared to pre harvest sale. In pre harvest sale, net price received by farmers in whole contract method was higher by Rs.5.27 than net price received by farmer in count basis method. In post-harvest method of sale by, the farmer highest net price of Rs 515.91 was received through box

consignment at distant consuming market and then Rs. 273.68 by selling in A.P.M.C. out of total sale the proportion of quantity of fruits sold through channel I worked out to 72.82 per cent whereas, through II and III channel 18.67 per cent and through IV channel 8.51 per cent. At farmer level in local market and long distant market through box and loose consignment the total market cost worked out to Rs. 64.25, Rs. 438.63 and Rs. 304.28 per cent thousand fruits respectively.

The net price received by orange growers was more i.e. Rs. 274 per thousand fruits in channel II as compared to Rs.195 in channel (I).The market margin of Rs. 152.24 per thousand fruits out of which Rs. 57.76 was market cost and remaining Rs.94.48 as profit margin.

Adaskar (1998) studied the economics analysis of marketing of Kagzi lime in Akola district. He estimated net establishment cost of orchard was Rs. 5233 per hectare and cost of production of kagzilime isRs. 28148.43 per hectare. For the cost(A) constitute 57.09 per cent of the total cost. The production was 124.48 quintal with gross return to the extent of Rs. 65352.05. net return cost (C) was Rs.37203.62.the yield and gross return per tree was33.41 kgs and Rs.175.37 respectively. Net return per tree at cost (C)was estimated at Rs.52.13 it indicate that the cost (A) that is direct expense's incurred by the cultivar on overall basis worked out to Rs.50.49 per tree and this can be taken as guideline. For financing to the cultivation based on number of trees. The total marketing cost Rs. Per 1000 fruits incurred by producers wholesalers and retailer were worked to Rs.69.90, Rs 43.20 and Rs.85.25 respectively. Producer's share in consumer's rupee was worked out to 52.77 per cent.net margin of retailers was 24.09 per cent in consumer's share.

Bhat (1998) examined the marketing channels in marketing of apple and estimated the marketing channels, marketing cost, marketing margins, the variation of producer's share in consumer's rupee, and the operational efficiency of various marketing channels. He identified the channels, which were as follows:

Channel I: growers—pre harvest contractor—commission agent—wholesaler- retailer —consumer

Channel II: growers—forwarding agent —commission agent —wholesaler — retailer—consumer

Channel III: growers—commission agent— wholesaler — retailer — consumer

Channel IV: growers—co-operative marketing society— wholesaler — retailer —consumer.

Channel V: growers —J and K.H.P.M.C.— wholesaler — retailer—consumer

Channel VI :growers — consumer.

Through the first marketing channel the producer share was Rs. 9.50(16.28 per cent of consumer's price), marketing cost accounted for Rs.22.12 (37.90 per cent) and the margins of the intermediaries for Rs. 26.74(45.82 per cent) per standard box of apple. Under the marketing channels II, III, IV, And V the producer's share of the consumer's rupee wasRs. 15.21(26.06 per cent); Rs.17.25 (29.56 per cent); Rs.17.35 (29.73 per cent); and Rs.17.79(30.48 per cent) per box of apple respectively. The marketing cost and marketing margins together accounted for Rs. 43.15(73.94 per cent) under channel II Rs.41.11 (70.41 percent) under III; Rs. 41.01(70.27 per cent) under channel IV and Rs. 40.57(69.52 per cent) under channel V. By selling the produce directly to the consumer, the producer received Rs. 24.52(65.39 per cent) and the marketing costs accounted for Rs. 12.96(34.41 per cent) per box of apple.

More (1999) studied the economics of production and marketing of banana in Marathwada region of Maharashtra state. He found that the crop of small,large and pooled farmers. The independent variables included in the function were land, labour, machine labour, farm yard manure, nitrogen, phosphorus, potash, capital, irrigation and bullock labour. The dependent variable was yield of banana. The coefficient of multiple determination were 73.67 and 85 percents, respectively for the three categories of farmers. Land and capital had

significant influence on yield in all three categories of farmers and others were non – significant.

Gagwar and Singh (1999) studied the price behavior arrivals and market margins of Nagpur mandarin. Their study was based on primary and secondary data collected from five consumer markets Nagpur, Delhi, Calcutta, Mumbai, Bangalore, sample of 20 orange growers 12 commission agents, 12 retailers, 12 truck transporters were also selected for the collection of necessary information. The results indicated that the producer's share in consumer's rupee varied from 30 to 53 per cent. In the present system, high cost of transportation, packing materials, commission agents, charges have reduced the net returns to the mandarin orange growers. The wide fluctuations were observed in the prices of oranges. In beginning of the season prices were lower as that goes higher with proceeding of season.

From the study he has inferred that Govt. should take steps for rationalization of middleman's, profit to increase the producers share in consumers rupee, cheap and adequate supply of packing material should be ensured. The Government should provide cargo and rail wagons for transport of mandarins at lower rate. The Government should announce the procurement price for the producer's price and wide fluctuations in prices and arrivals.

Mali *et al.* (2001) studied the economics of production and marketing of banana in Jalgaon district of western Maharashtra found that the per hectare cost of cultivation of banana worked out to Rs. 133477.36 the gross returns per hectare of banana come to Rs. 214867.24 and net returns of Rs. 66761.87 were obtained.

Ladaniya and Wanjari (2003) Studied marketing pattern of "Mosambi" sweet orange in selected district of Maharashtra. They concluded that the farmer share can be increased by minimizing intermediaries and by marketing of fruit by farmer themselves in up country markets. Wholesaler of Nagpur city market at the time of auction and bring 4-5 tonnes fruit at a time in trucks at their shop or

warehouse. In price spread the market efficiency was maximum (0.97) when farmer sold the produce directly through commission agent, cost of marketing is also increased due to traders margin in the channels

Rana R.K. et.al.(2004) study is based on Kinnow crop study of Kangra district. Pre-harvest contractors (PHCs) purchased most of the produce, which was graded in grades and packed in crates, baskets, wooden boxes and palli (jute fabric of one square meter). Trucks (72.7per cent) were the major mode of transportation while jeeps (12.1 per cent), bullock-carts (12.3 per cent), and tractors (2.9 per cent) were also used. Due to heterogeneous geography and underdeveloped markets in the region, multiplicity of marketing channels was used, however, top three channels disposed of 77.6 per cent of the produce. It was found that in same market, orchardist, PHCs and retailers were paying commission to sell and buy the produce separately. The marketing cost increased significantly with every additional middleman in the marketing channel. Overall, 16.2 per cent and 18.2 per cent PHLs were estimated on weight and number basis, respectively. Similarly, 15.8 per cent and 10.5 per cent gross and net economic losses , respectively were found.

Umesh *et al.* (2005) observed that, the establishment cost was Rs.15,631 per ha in all the varieties studied during the first three years. The maintenance cost per ha from fourth year on wards varied from Rs 5881 to Rs.8254 in Chintamani-1, Rs.5640 to Rs.8254 in Ullal-4, Rs. 5812 to Rs.7882. In Ullal- 3 and Rs.5821 to 7229 in ullal at the net returns of cashew orchard per ha being fairly high were in the order of Rs.61314, Rs 62425, Rs.49672 and Rs.34231 in Chintamani -1, Ullal-4, Ullal-3 and Ullal-1.

Pandey(2011)an attempt has been made to study the marketing of sweet orange in Almora district of Kumaon region (Uttarakhand). Primary data was collected from various stakeholders constituting forty growers and five intermediaries operating at each level of marketing channels. Six distribution channels were identified. More than 57 per cent of the produce was sold directly to the village trader. Marketing

cost varied from ₹278 per quintal to 894.16 per quintal in channel I. A major component of the marketing cost of the producer was cost incurred on mules (₹150 per quintal). The producers were earning 100 per cent margin in channel I and channel II. The producer's share in consumer's rupee was 9.38 per cent and 8.60 per cent in channel II and I respectively. Channel IV was the most efficient channel with efficiency of 1.27. Channel VI was least efficient (1.00). The producers are getting only 9 per cent of the consumer's price. The spatial price difference between the local market and distant market is very wide i.e. more than ₹2000 per quintal. The main component of cost of producers is the labor cost and transportation cost borne by producers. The farmers of the hilly areas must be properly linked to the market through proper roads and other infrastructure and through co-operative federation. There is a need to form the active marketing self- help groups which can take the advantage of the distant and competitive markets, benefiting the members by remunerative price. To reduce the spatial differences in the price of produce, better transport and storage facilities are also required.

Bhat et al.(2011) an economic analysis of kinnow has been presented through studying their costs and returns. The average first year establishment costs per acre for kinnow has been worked out to be ₹5298, while its total establishment costs has been found as ₹12707. The overall per acre per year returns from kinnow orchards have been worked out to be ₹6632. The overall economic viability of the kinnow fruit, mainly net present value, internal rate of return, benefit-cost ratio and payback period have been computed as ₹7929, 15.42 per cent, 1.52 and 7.6 years, respectively. The average per quintal marketing cost at producers' level has been found to vary to the extent of ₹450, ₹375, ₹303 and ₹223 for channels I, II, III and IV, respectively. The average per quintal marketing cost borne by the wholesaler in channel II was ₹61, while as it was ₹30, ₹32 and ₹19 in channels I, II and III, respectively at the retailer's level and in channel-IV, whole of the marketing cost was borne by the producer as there

was direct marketing of produce. A comparison of price spread through different marketing channels has revealed that producers' share in consumers' rupee was the highest (about 81%) in channel-IV, due to self sale in the local market. The marketing efficiency has been found to be highest in channel-IV. The producer got maximum benefits in channel-IV, therefore this channel should be followed to make producer highest beneficiary; although this channel has its own limitations.

CHAPTER III METHODOLOGY

The object of any scientific investigation is to draw the useful conclusions in the light of objective of the study. It is essential to the investigator to adopt appropriate method and procedure, keeping this in view, this chapter has denoted to explain the methodology adopted to fulfill the objective of the study. The present investigation is undertaken to study the "Economics of Production and Marketing of Sweet Orange". This chapter deals with the procedure used for the selection of method of data collection, source of data and analytical procedure used to draw inference.

3.1 Sampling Technique

The sampling design adopted for the study was multistage sampling. In first stage, Nagpur district was purposively selected taking into consideration the higher area under cultivation of sweet orange orchards. In second stage, two tehsils viz Katol. and Narkhed were selected purposively because concentration of sweet orange cultivation and availability of data. In third stage, three villages from each tahsil were selected purposively. Considering sizable area under sweet orange orchard, the villages selected was Masli, Mauza Babulkheda, Mauzalsasni from Katol tahsil and Jalalkheda, Bharsingi, Narkhed from Narkhed tahsil.

Sr. No.	Tahsil	Village	Size of sample	
			For cost of establishment	For cost of cultivation
1.	Katol	Masli	4	6
		Mauza Babulkheda	4	6
		Mauzalsasni	3	7
2..	Narkhed	Jalalkheda	5	5
		Bharsingi	6	4
		Narkhed	3	7
		Total	25	35

The Sweet orange growers from each village were selected as shown in table. All the selected sweet orange growers were undertaken for the study making the total of 60 respondent out of that 25 cultivator were selected for cost of establishment and 35 cultivator were selected for cost of cultivation.

3.1.1. Selection of period:

The primary data were pertained to year 2010-2011

3.1.2. Method of investigation:

A schedule was designed for data collection keeping in view the objectives of study. The survey method, which is most identical, was selected for collection of data for the present study. The questionnaires were prepared, as were identical to collect the relevant information.

The questionnaires were got filled in through frequent visits to the farmer at their destinations.

3.1.3 Selection of market

Katol and Narkhed market were selected purposively for the study because the author is well acquainted with the area and various functionaries in Katol and Narkhed orange market facilitated the collection of reliable data about the market.

3.1.4 Selection of market intermediaries

All the major agencies involved in marketing of sweet orange i.e. ten pre-harvest contractor, ten wholesalers, and ten retailers were selected for the present study. The information regarding marketing cost, market margin price received by producer etc. agencies involved in marketing of sweet orange was collected.

3.2 Analytical tools:

Simple tabular analysis was done to accomplish the objectives. In respect of objectives of present study the standard cost concept were used.

Cost concept: -

3.2.1 Cost "A"

It is the actual paid out cost by the cultivators in the form of cash and kind. It approximate the actual expenditure incurred by the farmer.

This cost includes the expenditure on following items.

- 1) Hired human labour (Permanent/casual)
- 2) Bullock labour (Owned/Hired)
- 3) Value of manure (Owned/Hired)
- 4) Value of fertilizer ,
- 5) Value of seedling
- 6) Plant protection
- 7) Irrigation charges
- 8) Land revenue
- 9) Depreciation
- 10) Interest on working capital
- 11) Miscellaneous expenses

3.2.2 Cost "B"

It was calculated by adding the interest on fixed capital and rental value of owned land to cost "A".

3.2.3 Cost "C"

It is the total of direct as well as imputed cost including the imputed value of family labour. It is obtained by adding the imputed value of family labour to cost "B".

3.3 Measurement and evaluation of different cost component

3.3.1 Human labour

It includes both the family and hired human labour used on the farm. The value of family human labour was evaluated at the hiring wage rates prevailing in the locality from time to time.

3.3.2 Bullock labour

Hired bullock labour was evaluated at the rate of actual charges paid for the operation and owned bullock labour was charged at the hiring rate for bullock pair prevalent in the area of study.

3.3.3 Machine labour.

Machine labour in case of owned machine was evaluated as per the hired charge prevailed in the village and in case of hired machine was accounted as per the price paid by cultivator.

3.3.4 Manures

In case of purchased farm yard manure, it was charged at the actual price paid by the cultivators and manure prepared on own farm was evaluated at the prevailing market rate in the locality.

3.3.5 Fertilizers

The cost of fertilizers was worked out on the basis of actual expenses paid by the farmer for purchasing it including the transportation charges

3.3.6 Seeds

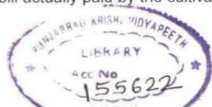
For Sweet orange seedling actual expenses incurred for purchasing was considered

3.3.7 Plant protection

This includes the actual cost paid for the insecticides / pesticides

3.3.8 Irrigation

In case of electric motors, electric bill actually paid by the cultivators was considered.



3.3.9 Land revenue

It includes the actual land revenue with other cesses paid by the farmer for the total land holdings. The land revenue and other cesses by the gross cropped area of the respective crop.

3.3.10. Depreciation

$$\text{Amount of annual depreciation} = \frac{\text{Purchase price} - \text{Junk value}}{\text{No. of useful year (expected life)}}$$

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

3.3.11 Interest on working capital

The interest on working capital was worked at the rate of 6 per cent per annum and on fixed capital it was estimated at the rate of 10 per cent per annum for the entire growing period of crop.

3.3.12 Rental value of land

It is estimated at the rate of 1/6 of the total value of produce. It is calculated by the following formula:-

$$\text{Rental value of land} = 1/6 \text{ of gross income-land revenue.}$$

3.3.13 Interest on fixed capital.

It was calculated by charging interest at the rate of 10 per cent on investment on commonly used assets.

3.3.14 Imputed value of family labour.

Wage for the work done by the family labour was imputed on the basis of average wage rate of per man day labour.

3.3.15 Value of produce

The value of produce was calculated at the price at which farmers actually sold their produce.

Value of produce in case of producers, sellers was recorded after deducting all marketing expenses from gross sale of total produce sold in assembling market.

Gross return :

Gross return is the total of the value of both the main and by-product.

Gross income = Value of main produce + Value of by-produce.

Net return :

Gross return – Cost 'C

Input-Output ratio:

It is a ratio between the value of gross output and the cost of cultivation at different cost concepts.

3.3.16 Cost of establishment of an orchard

Once the seedling are planted in field, they are required to be nurtured and cared for about five year of age till the plant comes to bearing stage. The investment incurred for these five year is the cost of establishment of an orchard.

3.4 Concept and terms related to marketing of sweet oranges

3.4.1 Marketing channels:

The chain of intermediaries through which the various farm commodities passes between producers to consumers is called as marketing channel. There are three marketing channels in the study area:-

Channel (I): – Producer– pre harvest contractor- wholesaler –retailer in local market – Consumer.

Channel (II): – Producer-wholesaler – retailer in local market – Consumer.

3.4.2 Marketing cost:

The total cost incurred on marketing either in cash or in any kind of the producer seller and by the various intermediaries

involved in the sale and purchase of the commodity till the commodity reaches the ultimate consumers.

3.4.3 Marketing margins:

Marketing margin represent the difference between price paid and received by a given market intermediary in the marketing of a commodity.

3.4.4 Price spread:

The price spread indicates the difference between net price received by producer of sweet orange in market and price paid by ultimate consumer for equivalent quantity of produce in retail market. The study of price spread involves ascertainment of the actual price at various stages of the marketing and the costs incurred in the process of the movement of paddy from the farm to the consumer and the margin of various intermediaries.

The price spread for sweet orange in the present study consist of following items.

ross Price received by the selected cultivators, various marketing cost incurred by the cultivators, net price received by the cultivators, margins of the intermediaries and finally price paid by the ultimate consumer.

3.5 Material Required

The computational devices i.e. electronic calculators and computers was made available in the Section of Agricultural Economics and Statistics, College of Agriculture, Nagpur. and Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola.

3.6 Place, time and duration of research work:

The information of present study was obtained from cultivators and Agricultural Produce Market Committee of Nagpur district. Data pertained for the year 2010-11. Data was analyzed & interpreted at Agricultural Economics & Statistic Section, College Of Agriculture, Nagpur.

CHAPTER IV

SOCIO ECONOMIC STATUS OF NAGPUR DISTRICT

Nagpur the most beautiful, historical city also called as the "Heart of Maharashtra". Situated on the bank of river Nagnadi. Maharashtra state has seven revenue divisions viz., Mumbai, Pune, Nasik, Aurangabad, Amravati, Nagpur and Nanded. Vidarbha region includes Amravati and Nagpur revenue divisions comprising eleven districts viz., Buldhana, Akola, Washim, Amravati, Yavatmal, Wardha, Nagpur, Bhandara, Gondia, Chandrapur and Gadchiroli. Washim and Gondia are newly formed districts by furcating Akola and Bhandara districts respectively. Nagpur division includes Nagpur Bhandara, Gondia, Chandrapur Gadchiroli and Wardha which are the eastern districts of Vidarbha. The western districts are Buldhana, Akola, Washim, Amravati and Yavatmal. The western districts are known for cotton crop and the eastern region is for good quality of rice. Vidarbha as a whole contributes cotton rice jowar millets oilseeds soybean citrus forest timber etc.

The present study is confined to Nagpur district. The agro climatic conditions differ from place to place and even in close vicinity also.

Geography:

Nagpur is located at 27°12'N 73°44'E / 27.2°N 73.73°E / 27.2; 73.73.[3]It has an average elevation of 302 meters (990 feet). Sonegaon Lake is a man-made lake. Nagpur lies on the Deccan plateau of the Indian Peninsula and has a mean altitude of 310 meters above sea level. The underlying rock stratum is covered with alluvial deposits resulting from the flood plain of the Kanhan River. In some places these give rise to granular sandy soil. In low lying areas which are poorly drained, the soil is alluvial clay with poor permeability characteristics. In the eastern part of city crystalline metamorphic rocks

NAGPUR DISTRICT



Fig. 1: Map of Nagpur district showing tahasis selected for study.

such as gneiss, schist and granites are found, while in the northern part yellowish sand stones and clays of the lower Gondwana formations are found

Nagpur city is dotted with natural and man-made lakes with Ambazari Lake being the largest. Other natural lakes include Gorewada Lake and Telangkhedī Lake. Sonegaon Lake along with Gandhisagar Lake is man-made lakes created by cities historical rulers. Nag river, Pilli nadi along with nallas form the natural drainage pattern for the city. Nagpur is known for its greenery and was judged as the cleanest and second greenest in India after Chandigarh

Location of Nagpur district:

Nagpur district include in Vidarbha region of Maharashtra. It comprises of fourteen tahsilsIt lies between 20.350 and 21.440 North latitudes and 78.150 and 79.400 East latitudes. It covers area of 9892 sq. km. accounting for 3.22% of total area of Maharashtra.Nagpur district surrounded by Chindwada and Seoni district of Chattisgarh state. In North, Bhandara and Gondia in East, Chandrapur in South and Wardha in West. Along with small strips on North West by Amravati district of Maharashtra.

Soil:

Climate, geology, vegetation, topography and time are five factors, which influence the formation of soils. However topography appears to have the predominant effect in the development of the soils of Nagpur district. The geology of the district is transitional with predominant trap rock in the western portion and sandstones and shales in the eastern portion. Due to the undulating topography of the district, soil erosion has also played an important part in the formation of soils. The soils with varying depths in the same catchments are, therefore, to be found in all the tahsils of the district.

Sr. No.	Type of Soil	Hectares	Acres
1.	Kali	21,083.490	(52,058)
2.	Morand	3,97,309.455	(9,81,011)
3.	Khardi and Bardi	2,23,006.365	(5,50,633)

The soils in the district may broadly be divided into following six classes: (1) Kali, (2) Morand, (3) Khardi, (4) Bardi, (5) Kachhar and (6) Wardi.

Black Soil

Black cotton soil containing a small per centage of lime in a very powdered state is known as kali. In different places kali soil bears different names such as chikni meaning sticky soil, gaohari, wheat soil, etc. Black soil is also known as medium and deep soil. It is the richest soil in the district which is fine-grained and retentive of moisture. This is not much in use for kharif crops except in drier parts of the district like Katoltahsil and in the years of scanty rainfall. The soil hardens into large clods and when wet can be broken by hand into laminae. Black soil contains less lime nodules than morad soil. It is deep black in colour with its depth varying between 0.915 and 6.100 meters (three feet and twenty feet) or even more. It is clayey in texture, the clay content being about 60 per cent. It contains sand to the extent of about 10 per cent. Its PH value, i.e., the degree of acidity or alkalinity in solution is around eight per cent. This soil is found Crops chiefly taken in these soils include among others, cotton, groundnut, jowar (kharif) and wheat.

Morand Soil

When there is a higher per centage of lime than in the kali soil, present in the form of nodules about as large as peas, the black cotton soil is known as morad. It is the most predominant and the most

common soil in as much as it occupies about 66 per cent of the cultivated area in the district. It is black and grey or dark to light brown in colour, its depth varying between 0.915 and 1.220 meters (3-4 feet) and 2.440 to 3.050 meters (8.10 feet). It is clayey in texture, the clay content being about 56 per cent. Its sand content (about 16 per cent) is much more than that of black soil. Its PH value is around eight per cent. This soil is easily culturable and is eminently suited to cotton and jowar. It makes excellent rice land when embanked requiring but little irrigation if the rainfall is normal. A second crop can also be taken in this soil. Hence, both kharif and rabi crops are taken in this soil. Chief crops grown comprise cotton, jowar, groundnut, wheat, linseed, and most of the pulses. The bagayat land in the district largely falls under morad land.

Khardi Soil

This is the soil of hills. The term is applied to shallow soil mixed with sand and having grey colour. It is also applied to the sandy soil formed from crystalline rock, which constitutes the regular rice land. Its PH value is about seven per cent. It is clay loam in texture, the clay content being about 36 per cent. This soil contains sand to the extent of nearly 23 per cent. It is dark brown in colour and blocky in structure. Due to shallow depth, the soils are only suitable for light kharif crops

Bardi Soil

This refers to the red gravel covered with boulders found on the summits and slopes of the trap hills. Bardi soil covers about five and a half per cent of the total cultivated area of the district, occurring principally in Katoltahsil. Though bardi field is often in surface a mass of stones, no portion of it is left fallow and good crops can be taken if manuring and cultivation of the crops are done carefully. Jowar (kharif), sesame and pulses (kharif) like udid, mug, tur, etc., are profusely grown in these soils. Where-ever the soil is levelled, cotton is also cultivated.

Kachhar Soil

This category includes alluvial lands fertilized by the deposit of silt found in the riverbeds. This land is chiefly found in Nagpur district on the banks of Kanhan River. Its depth varies between 0.915 and 1.220 meters (three and four feet) and 2.440 to 3.050 meters (eight to ten feet). It contains silt to the extent of about 48 per cent, organic matter a little over three per cent, sand 25 per cent and clay 21.5 per cent. It is loamy in texture and has PH value of about eight per cent. On account of its alluvial silt all crops including cotton and garden crops can be grown abundantly in it. In a year of flood the land receives a fresh layer of silt which makes for bumper crops for the next few years.

Wardi Soil

This is a red soil, containing a little over 60 per cent of sand. It is shallow in depth and sandy clay loam in texture. Its PH value is nearly seven per cent and clay content about 23 per cent. This soil is found in paddy growing tracts in Ramtek and Umrertsahsils.

Climate and rainfall:

Nagpur generally has dry tropical weather. Being away from sea, the district has extreme climate. The weather during winter is cool, while in summer it is too hot. The climate of Nagpur follows a typical seasonal monsoon weather pattern. The peak temperatures are usually reached in May/June and can be as high as 48°C. The onset of monsoon is usually from July and the season extends up to September, with monsoon peaking during July and August. After monsoons, the average temperature varies between 27°C and approx 6 to 7°C right through December and January. Maximum, Average & Minimum Rain fall are 1093 mm, 1205 mm and 606 mm respectively. The forest cover is 16.94 per cent i. e. 5213 sq. kmrs. The maximum humidity is about 70 % and that of minimum is 20% Area under major crops in Nagpur district is 70 (00' hectare).

Area under food grains in Nagpur district is 1364.00 ha where as total kharif cereals contribute 58100 hectare and area under total kharif crops is 485100 hectare.

Population and Area

The district comprises 1570 Revenue Estates (Villages), out of which Merta, Didwana, Makarana, Parbatsar, Ladnu and Kuchaman are the major towns of the district. The total area of the district is 17,718 km², out of which 17,448.5 km². is rural and 269.5 km² is urban. The density of population in Nagpur district is 405 per sq.km. As per the 2001 census, the population of the district is 40,67,637 out of which 21,05,314 male 19,62,323 female (26,13,751 urban and 22, 97,721 rural population) which is 4.20% of the total population of the State. As per

2001 census the out of total population the 84.03% are literate. In which the 75.58% from rural area and 88.65% are from urban area are literate. In total population the 77.42% female and 90.18% male are literate

Civic Administration:

Nagpur is administered by Nagpur Municipal Corporation (NMC) which is democratically elected civic governing body. Nagpur Improvement Trust (NIT) works with NMC and carries out works like development of the civic infrastructure and new urban areas on behalf of NMC. The city is divided in 10 zones which are in turn divided into 136 wards. Each ward is represented by a corporator, majority of who are elected in local elections.

Nagpur is headquarters of national level scientific and governmental establishments like the National Environmental Engineering Research Institute NEERI, the Central Institute of Cotton Research (CICR), the National Research Centre for Citrus, the National Bureau of Soil Survey and Land Use Planning, the Jawaharlal Nehru National Aluminum Research and Development Centre, and the Petroleum And Explosives Safety Organization (PESO) (formerly known as Department of Explosives).

Education:

Nagpur is a major education centre in Central India. Founded in 1923, Nagpur University is one of the oldest in the country. The city has both municipal schools (run by the NMC) as well as private schools (run by trusts or individuals), which in some cases receive financial aid from the government. The city's school system follows a 10+2+3/4 plan, students have the option to enroll in Junior college after 10 years of schooling and later degree courses for three or four years depending on the field. The school system has a geographical jurisdiction over the five districts of Nagpur division in addition to giving affiliation to hundreds of colleges. Nagpur has one veterinary college Veterinary

College, and three Medical colleges namely Government Medical College and Hospital (GMCH), Indira Gandhi Medical College (IGMC) and Lata Mangeshkar Medical College (LMC) and 1 Dental college. In addition,

Nagpur has several engineering colleges which provide education in various specialty courses. Visvesvaraya National Institute of Technology (VNIT) is one of the reputed technical institutes in the country. Nagpur is also home to India's only National Fire Service College that provides a graduation course in Fire Engineering. Nagpur has an I.G.N.O.U regional centre located at Amravati Road where a large pool of students from all over the Vidarbha region pursues education from certificate courses to Masters Degree programs.

Forest, flora and fauna:

The district of Nagpur is poor in forest resources. The total area under including hills is reported to be 2399 km². This is 24.25 per cent of total geographical area of the district scanty rainfall & other geographical constraints account for this. The western part of the district is divided of natural vegetation cover except for low herbs & grass which grows on low sand dunes. However, the South-Eastern part of the district & part of the northern tehsil of Ladnun & Didwana have much greater greenery as compared to North-West part of the district. Khejri trees are commonly found in the district. Its leaves are used as fodder. It also gives gum. Apart from commercial value, this tree is considered holy. The tree also plays an important role in checking soil erosion. The other common species found in the district are Babool, Neem, Shisham, Peepal, Rohira, Kalsi, Dhangood, Akara etc. A Rohira & Shisham tree provide timber & is used for making furniture. Dhan good is generally used for making cots. Dried Akara skin is called *Sunn* and is used in making ropes for huts, and woven chairs, locally called as *Muddhas*. *Kheep* is another shrub which is used for making ropes for thorny fences. A common shrub-phog

provides building material from its roots and twigs. Common grass found in the district include bargers, bhambar etc.

Live stock resources:

According to the 2003 census, the livestock population of the district was 983940 1997 census which figure out 10,98,323 total livestock population. According to 2003 livestock population out of total livestock 55.71% were estimated to be Cattle and bullock, 8.58% buffaloes, 28.65% sheep and goat and others livestock were 7.06%. the density of livestock population is 99. The livestock population of district according to 2003 census are 2867 thousands and its break up under different groups as per 1987 census to 1997 census is given in the Table III-I.

Table- 3.1 Live stock resources

Sr. No.	Category	Population 2003 census in thousands
1.	Cows & Bullocks	602
2.	Buffaloes (Both Sex)	66
3.	Sheep & goat	297
4.	Other livestock	18
5.	Poultry	346
6.	Total livestock	1329

(Source: Socio-economic review and district statistical abstract of Nagpur district.)

Language spoken:

Marathi, Marwari, Hindi, English, Urdu and Punjabi.

Sources Of Water Supply And Net Area Irrigated:

(Area in hectare)

Sr. No.	Area	Area irrigated other than wells	Area irrigated through well	Total net irrigated area	Irrigated area sown more than ones	Total irrigated area
1.	Nagpur	517	715	1232	240	1472
2.	Vidharbha	3954 (39.08)	3446 (15.08)	7400 (27.45)	1144 (19.84)	8542 (22.06)
3.	Maharashtra	10117	22845	32962	5766	38726

(Source: Socio-economic review and district statistical abstract of Nagpur district.)

In Nagpur district the area are irrigated through well is larger than area irrigated through any other source as wells are major source of irrigation in this region because no of rivers are very less and because of that area sown more than one is very less as compared to total net irrigated area in Nagpur district.

Agriculture

Agriculture is the most important economic activity in the Nagpur district. Kharif and rabi are two seasons followed in the district. The kharif season commences with advent of the rains in the month of June and is followed by rabi season (winter month).

Cropping pattern

The total area as well as relative area under different crops in Nagpur district for 2009-2010 is presented in Table 4.1.

Table 4.1 Cropping pattern of Nagpur District (2009-10)

Name of crop	Area "00" ha
Kh. Rice	431
Summer Rice	2
Kh. Jowar	405
Rb. Jowar	48
Mung	24
Urid	20
Tur	525
Kh. Maize	4
Other kh.pulses	27
Soybean	2348
Cotton	753
Wheat	318
Gram	403
Other Rb.pulses	16
Kh. G.nut	67
Summer G.nut	2
Rb. Sunflower	2
Summer Sunflower	1
Linseed	17
Rapeseed & mustard	4
Sweet orange	3,542 ha
Sugarcane	4

(Source: Socio-economic review and district statistical abstract of Nagpur district.)

Land use pattern

Land use pattern shows that geographical area of Nagpur district is 9892 hectares and net cultivated area is 5391 hectares of the total geographical area. The pattern of land utilization in the district reflects the cultivation potential of the district and also the extent to which it can fully explained.

Table 4.2 Land use pattern of Nagpur district (2009-10).

Particulars	Total area ("00"ha)	Per cent to total geographical area
Total geographical area	9892	100
Area under forest	1329	13.44
Non agricultural land	778	7.86
Barren and uncultivated land	378	3.82
Cultivable waste	401	4.05
Permanent pasture and grazing	564	5.70
Land under miscellaneous trees	168	1.70
Current fallow	256	2.59
Other fallow	627	6.34
Net sown area	5391	54.50
Area sown more than once	773	7.80
Gross cropped area	6164	62.30

Source: Socio-economic review and district statistical abstract of Nagpur district.)

It is more or less a mixed tract. Western tract of the district is Cotton tract and grows oranges, Eastern tract of the district is Rice tract and thus it forms a mixed tract. As such the Nagpur district can neither be classified of Cotton tract nor a Rice tract.

Cotton and Jowar are main cash and food crops of the district. Jowar has the fixed position followed by Cotton crops in the cropping pattern of the district. After taking hybrid Jowar, Wheat is taken in the region amongst the majority cultivators. Wherever there is a assured irrigation gram is also grown as a rabi crop after Jowar or Soybean cultivation in kharif season. The practices of Chilli and Soybean cultivation found particularly in Bhiwapur, Umrer and Kuhitahsils. Under pulses, Tur is the major crop in this region.

Crop rotation

The district has two agricultural seasons viz; Kharif and Rabi. The main crops grown in kharif season are Cotton, Jowar, Tur, Groundnut, Soybean and Chillies while Wheat, Gram, rabi Jowar are the main rabi crops. The perennial crops like Oranges, Banana, Guava,

Mango and Lemon are also grown. Now farmers of the region are shifted towards growing forest trees.

Transport and communication

Nagpur district is well connected with railways, airways, bus and truck transport. All the tahsils places are well connected to district headquarters. The agricultural and industrial products are quickly transported to the district and States by trucks and railways. The fruits like oranges are transported by airways.

Input supply:

Agriculture inputs like seed, manure, fertilizer, insecticides, pesticides, etc. require by farmers are made available to them through no. of agriculture. Service centers established at district level and block levels.

Maharashtra state seed corporation; and other private seed companies supply quality seeds to the farmers. The farm inputs are made available to farmers by cooperative societies also.

Markets:

For the marketing of agriculture produce, agriculture market committees are functioning in the district. All fourteen tahsils having facilities of regulated markets are also functioning in the district. These sub markets are connected with roads and having facilities of banking electricity etc.

Transport:

Rail

Due to its central location in India, the Nagpur Railway Station is an important railway junction and a transit terminal for trains that connect the country lengthwise and breadthwise, especially trains connecting India's major metropolises, Mumbai to Howrah-Kolkata, Delhi and Jammu to Chennai, Hyderabad, Bangalore and Kanyakumari in the South, as well as western cities such as Pune and Ahmedabad. The city is the Divisional Head Quarters for the Central Railway and

South East Central Railway Zone of Indian Railways. In 2010 Jan aadhar opened its outlet in Nagpur Railway station. Jan aadhar has only a few of its outlets in India. Jan aadhar offers light and healthy food at very affordable prices.

Road

Nagpur is a major junction for roadways as India's two major national highways, Kanyakumari-Varanasi (NH 7) and Hajira-Kolkata (NH-6), passing through the city.[59] One more highway number 69 connects Nagpur to Obaidullaganj near Bhopal. Nagpur is at the junction of two Asian Highways namely AH43Agra to Matara, Sri Lanka and AH46 connecting Kharagpur, India to Dhule, India. Auto rickshaws operate in most parts of Nagpur and are the main form of hired transport within the city.

The new national highway is being built between Nagpur and Mumbai, an alternative to the existing NH 6, and will be a boost to the under developed regions of Vidarbha and Marathwada in Maharashtra state.

Air transport

Nagpur's Dr. Babasaheb Ambedkar International Airport has the busiest Air traffic control room in India. Nagpur's Air Traffic Control (ATC) is the busiest in India, with more than 300 international flights flying over the city every day in 2004. In October 2005, Nagpur's Sonegaon Airport was declared an international airport and was renamed Dr. Babasaheb Ambedkar International Airport. Nagpur is currently witnessing an economic boom as the "Multi-modal International Cargo Hub and Airport at Nagpur (MIHAN)" is under development. MIHAN will be used for handling heavy cargo coming from south East Asia and the Middle East. The project will include ₹ 10,000 crore (US\$2.17 billion) Special Economic Zone (SEZ) for Information Technology (IT) companies.

CHAPTER V

RESULTS AND DISCUSSION

The data was collected from the sample of Sweet Orange growers, and Sweet Orange market were analyzed as per the objectives and methodology given in Chapter III and the results of the study are presented and discussed in this chapter under the following subheadings 1) Sweet Orange production, and 2) Sweet Orange marketing.

5.1 Socio-economic characteristic of selected Sweet Orange growers in Nagpur district.

The socio-economic parameters of the Sweet Orange growers influence the production income and marketing activities of the agro produce of farm. The family size, educational status, land use pattern, cropping pattern were the major socio-economic factors need to be studied for studying economics. These factors are explained below.

5.1.1 Tahsil wise average family size of selected Sweet Orange growers.

The average family size of selected Sweet Orange growers in Nagpur district was given in Table 5.1.

Table:5.1 Tahsil wise average family size of selected Sweet Orange growers in Nagpur district:

Sr. No.	Particulars	Katol	Narkhed	Overall
1	Male	2 (40)	1 (25)	3 (40)
2	Female	1 (20)	1 (25)	2 (20)
3	Children	2 (40)	2 (50)	4 (40)
4	Total	5 (100)	4 (100)	9 (100)

(Figure in parenthesis indicate the percentage to total)

The table 5.1.revealed that the average family size of selected farmers inKatoltahsil, there was 40 per cent male, 20 per cent female and 40 per cent children out of total family members. In Narkhedtahsil, 25 per cent male, 25 per cent females and 50 per cent children out of total family members. On an overall basis, there was 40 per cent male, 20 per cent females and 40 per cent children out of total family members.

5.1.2 Tahsil wise Educational Status of selected Sweet Orange growers.

The educational status of selected Sweet Orange growers in Nagpur district is presented in Table 5.2.

Table:5.2 Tahsil wise educational status of selected Sweet Orange growers:

Sr. No.	Particulars	Tahsil		
		Katol	Narkhed	Overall
1	Illiterate	3 (10.00)	4 (13.33)	7 (11.67)
2	Primary school	4 (13.33)	3 (10.00)	7 (11.67)
3	Middle school	6 (20.00)	8 (26.67)	14 (23.33)
4	High school	9 (30.00)	6 (20.00)	15 (25.00)
5	Higher secondary	5 (16.67)	7 * (23.33)	12 (20.00)
6	Graduate & above	3 (10.00)	2 (6.67)	5 (8.33)
7	Total	30 (100.00)	30 (100.00)	60 (100.00)

(Figure in parenthesis indicate the percentage to total)

It is observed that, no. of farmers having education up to High school was highest (25.00 per cent) followed by Middle school (23.33 per cent) at overall level. The overall illiteracy per cent was 11.67 per cent. In two tahsils, illiteracy per cent was 10.00 and 13.33 per cent for Katol and Narkhed tahsil respectively. The no. of farmers having primary level education were highest in Katol tahsil (13.33 per cent). It was followed by Narkhed tahsil i.e. (10.00 per cent). The no of farmers having college level education was highest in Katol tahsil (10.00 per cent). The higher literacy level of farmers was observed in Katol tahsil.

Table:5.3 Tahsil wise land use pattern of selected Sweet Orange growers in Nagpur district:

Sr. No.	Particulars	Size group (Area in Ha)		
		Katol	Narkhed	Overall
1	Total land holding	3.59 (100.00)	2.70 (100.00)	3.24 (100.00)
2	Current fallow	0.15 (4.180)	0.14 (5.19)	0.15 (4.63)
3	Net cultivated area	3.44 (95.82)	2.56 (94.81)	3.09 (95.37)
4	Area sown more than once	1.97 (54.87)	1.74 (64.44)	1.92 (59.26)
5	Gross crop area	5.41	4.30	5.01
6	Cropping intensity (%)	157.27	167.96	162.13

(Figures in parenthesis indicated percentage to the total land)

Land utilization indicates the area of land actually utilized. Tahsil wise land use pattern of selected Sweet Orange grower in Nagpur districts given in Table 5.3.

The total land holding of the Sweet Orange grower was observed highest in Katol tahsil i.e. 3.59 Hectares per farm. Whereas, in Narkhed tahsil the total land holding was 2.70 Hectare per farm. The net cultivated area observed in katol tahsil was 95.82 per cent and in Narkhed tahsil it is 94.81 per cent. The Gross crop area in katol tahsil is 54.87 per cent and in Narkhed tahsil 64.44 per cent. The cropping intensity in Katol, Narkhed was 157.27 per cent, 167.96 per cent respectively. On overall basis the cropping intensity was 162.13 per cent per farm.

5.1.4 Tahsil wise cropping pattern of selected Sweet Orangegrowers in Nagpur district:

Cropping pattern refers to allocation of area under different crops on the basis of farmers past experience, irrigation facilities available the pattern of distribution of rainfall and type of soil available with farmer decide the cropping pattern (Table5.4)

Table:5.4 Tahsil wise cropping pattern of selectedSweet Orange growers in Nagpur district:

Sr. No.	Particulars	Katol	Narkhed	Overall
A	Kharif Crops			
1	Cotton	2.33 (43.07)	1.55 (36.05)	2.01 (40.12)
2	Tur	0.41 (7.58)	0.37 (8.60)	0.40 (7.98)
3	Soybean	0.70 (12.94)	0.64 (14.88)	0.68 (13.57)
	Total Kharif Crop	3.44 (63.59)	2.56 (59.53)	3.09 (61.67)
B	Rabi Crops			
3	Wheat	0.34 (6.28)	0.44 (10.23)	0.41 (8.18)
4	Gram	0.1 (1.85)	0.09 (2.10)	0.10 (2.00)
	Total Rabi Crop	0.44 (8.13)	0.53 (12.33)	0.51 (10.18)
C	Summer Crops			
5	Summer groundnut	0.30 (5.54)	0.29 (6.74)	0.30 (5.99)
	Total summer crop	0.30 (5.55)	0.29 (6.74)	0.30 (5.99)
	Perennial Crop			
6	Sweet Orange	1.23 (22.74)	0.92 (21.40)	1.11 (22.16)
	Total	1.23	0.92	1.11
	Gross crop area	5.41 (100.00)	4.30 (100.00)	5.01 (100.00)

(Figures in parenthesis indicated percentage to the grossed crop area)

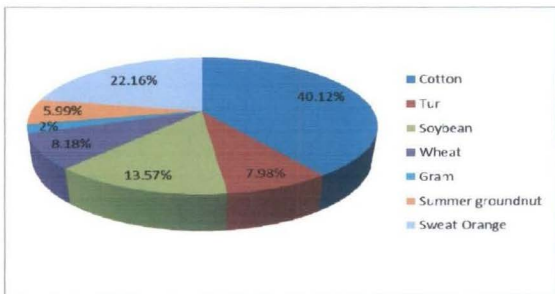


Fig 2:Tahsil wise cropping pattern of selected Sweet Orange growers in Nagpur district:

The Table 5.4 was presented for kharif, rabi and summer season cropping pattern among the selected tahsils, The area under kharif crop was highest in Katol tahsil (63.59 per cent) and it was followed by Narkhed tahsil(59.53 per cent) whereas the area under rabi season was highest in Narkhed tahsil. The percent share of Wheat was highest in Narkhed tahsili.e. 10.23 per cent and it was followed by Katol tahsil (6.28 per cent). In summer the highest area under cultivation was in Narkhed tahsil i.e. 6.74 per cent followed by Katol tahsil (5.54 per cent) In perennials Sweet Orange occupies highest area in Katol tahsil (22.74 per cent).

5.1.5 Per ha input utilization for Sweet Orange orchard

The degree of management of the resources can be judged for the utilization of resources, the choice and the decision making. Beside this, it also indicates the level of technology adopted by the farmers. The farmers required to spend on various inputs like seed, manure, fertilizer, human labour and bullock labour. Therefore, it is necessary to know the pattern of expenditure on various inputs on per hectare basis.

Table:5.5 Per hectare input utilization pattern of selected Sweet Orange growers For cost of establishment.

Particulars			KATOL	NARKHED	OVERALL
		Unit	Unit used	Unit used	Unit used
Seedling		No.	316.03	323.50	319.01
Manure		Qtl.	55.48	71.01	61.67
Fertilizer	N	Kg.	61.30	89.93	72.71
	P	Kg.	37.55	49.42	42.28
	K	Kg	19.78	24.90	21.82
Human labour		DAYS	200.06	269.22	227.63
Bullock labour		DAYS	12.06	14.58	13.06
Machinery		Hr.	0.29	0.95	0.55
Irrigation		No.	16.00	18.00	15.00

The Per hectore input used in Sweet Orange garden was estimated and presented in Table 5.5 Use of human labour was highest in Narkhed tahsil (269.22 days.) whereas in Katol tahsil it was 200.06 days. The fertilizer use was also highest in Narkhed tahsil. 89.93, 49.42, 24.9 Kg. N,P,K respectively. While in Katol tahsil fertilizer i.e. N,P,K was used 61.30, 37.55, 19.78 Kg respectively. along with these input i.e. bullock labour (14.58 Days), machine labour (0.95 Days), manures (71.01 Qtls), irrigation (18 No), seedling (323.50 No) was highest in Narkhed tahsil. While in Katol tahsil bullock labour (12.06 Days), machine labour (0.29 Days), manures (55.48 Qtls), irrigation (16 No), seedling (316.03 No) was use.

5.2 (A) Cost of establishment of Sweet Orange orchard:

Every long duration horticultural crop has two phases i.e. establishment phase or development phase and production phase. The Sweet Orange orchard starts bearing after five years from the year of plantation. The grower has to invest considerable amount for establishing orchard till it starts bearings. This period is called as gestation period and the Sweet Orange growers do not get any returns from the sole orchards. Therefore, the cost of establishment of Sweet Orange orchards can be regarded as an investment capital.

In order to study, capital investment made by the farmers in the study area, a separate sample of 25 Sweet Orange growers was selected who were having the orchards of one year to five years of age i.e. first five years. During which they have to invest in preparation of land, purchase and planting of seedlings, irrigation, fencing, application of manures, fertilizers and plant protection chemicals and gap filling if necessary. The data on the cost of establishment of Sweet Orange orchard of Nagpur district during five years is presented in the following Table 5.6 (a),(b),(c).

Table 5.6 (a) depicted that the details of cost of establishment of Sweet Orange orchard in Katol tahsil shows that, among the different items of expenditure, human labour accounted highest share i.e. 42.10

per cent out of these male labour shares was 32.10 per cent and female labour was 9.99 per cent, followed by bullock labour, which was 4.73 per cent. The proportion of other items expenditure were highest in manure (6.96 per cent) followed by seedling(5.94 per cent) and irrigation (5.90 per cent) The net returns from Cotton, Wheat, Summer ground nut as an intercrop were 17903.36 and per year establishment cost for bearing life of the orchard was Rs.2294.80.(On the basis of 20 years shelf life of orchard).

Table 5.6 (b) depicted that the details of cost of establishment of Sweet Orange orchard in Narkhed tahsil and it is shows that,Among the different items of expenditure, human labour accounted highest share i.e. 41.32 per cent out of these male labour shares was 28.71 per cent and female labour was 12.61 per cent, followed by bullock labour, which was 4.50 per cent. The proportion of other items of expenditure were highest in manure (7.01per cent), followed by irrigation (6.56 per cent).The net returns from Cotton, Wheat, Summer Ground nut as an intercrop were 22422.02 per year establishment cost for bearing life of the orchard was Rs. 2934.13 (On the basis of 20 years shelf life of orchard).

Table 5.6(c)depicted that the details of cost of establishmentof Sweet Orange orchard in Overall and it is shows that, Among the different items of expenditure, human labour accounted highest share i.e. 41.86 per cent out of these male labour shares was 30.64per cent and female labour was 11.22 per cent, followed by bullock labour, which was 4.64 per cent. The proportion of other items of expenditure were manure (7.00 per cent) followed by irrigation charges (6.22 per cent) and plant protection (4.50 per cent).The net returns from Cotton, Wheat, Summer Ground nut as an intercrop were 19703.94 per year and establishment cost for bearing life of the orchard was Rs. 2539.31(On the basis of 20 years shelf life of orchard).

Table: 5.6 (a) Per Hectare establishment cost of selected Sweet Orange growers during five year (Katol)

Sr. No.	Item		Unit	Per Ha	Per unit cost	Cost in Rs.	Percent to total
1	Hired Human Labour	Male	Days	102.4	200.01	20481.01	32.10
		Female	Days	63.75	100.01	6375.52	9.99
		Total	Days	166.15	161.64	26856.53	42.10
2	Bullock Labour	Hired	Days	9.36	250.19	2341.77	3.67
		Owned	Days	2.70	250.04	675.10	1.06
		Total	Days	12.06	250.16	3016.87	4.73
3	Machine	Hired	Hrs.	0.29	387.00	112.23	0.18
		Owned	Hrs.	0	0.00	0	0.00
		Total	Hrs.	0.29	387.00	112.23	0.18
4	Seedling		No.	316.03	12.00	3792.40	5.94
5	Manure		Qtls.	55.48	80.01	4438.81	6.96
6	Fertilizer	N	Kgs.	61.30	13.18	808.01	1.27
		P	Kgs.	37.55	21.00	788.60	1.24
		K	Kgs.	19.78	31.01	613.45	0.96
		Total	Rs.			2210.06	3.46
7	Micronutrient		Rs.			1352.13	2.12
8	Irrigation		No.	16.00		3763.71	5.90
9	Plant protection		Rs.			2784.81	4.36
10	Fencing		Rs.			1890.29	2.96
11	Repairs		Rs.			455.69	0.71
12	Incidental		Rs.			81.43	0.13
13	Depreciation		Rs.			239.24	0.37
14	Land Revenue		Rs.			111.39	0.17
15	Int. on Working Capital @7% p. a.		Rs.			3420.54	5.36
16	Cost "A"		Rs.			54526.13	85.46
17	Rental Value of Land		Rs.			2872.50	4.50
18	Int. on Fixed Capital@ 10p.a.		Rs.			687.76	1.08
19	Cost "B"		Rs.			58086.39	91.05
20	Family Labour Charges	Male	Days	23.20	200.06	4641.35	7.27
		Female	Days	10.71	100.07	1071.73	1.68
		Total	Days	33.91	168.48	5713.08	8.95
21	Cost "C"		Rs.			63799.47	100.00
22	Net Return From Intercrop					17903.36	
23	Net Establishment Cost					45896.11	
24	Per Year Establishment Cost For Bearing Life of Orchard (20 Yr) Rs.					2294.80	

Table: 5.6 (b) Per Hectare establishment cost of selected Sweet Orange growers during five year (Narkhed)

Sr.	Item		Unit	Per Ha	Per unit cost	Cost in Rs.	Percent to total
1	Hired Human Labour	Male	Days	116.43	200.01	23286.62	28.71
		Female	Days	102.29	100.00	10229.3	12.61
		Total	Days	218.72	153.24	33515.92	41.32
2	Bullock Labour	Hired	Days	12.80	250.05	3200.63	3.95
		Owned	Days	1.78	250.48	445.85	0.55
		Total	Days	14.58	250.10	3646.48	4.50
3	Machine	Hired	Hrs.	0.95	382.16	363.05	0.45
		Owned	Hrs.	0	0.00	0	0.00
		Total	Hrs.	0.95	382.16	363.05	0.45
4	Seedling		No.	323.5	12.00	3882.03	4.79
5	Manure		Qtls.	71.01	80.01	5681.52	7.01
6	Fertilizer	N	Kgs.	89.93	13.33	1198.98	1.48
		P	Kgs.	49.42	21.00	1037.96	1.28
		K	Kgs.	24.90	31.01	772.03	0.95
		Total	Rs.			3008.97	3.71
7	Micronutrient		Rs.			1347.13	1.66
8	Irrigation		Rs.	18.00		5318.47	6.56
9	Plant protection		Rs.			3757.96	4.63
10	Fencing		Rs.			3146.49	3.88
11	Repairs		Rs.			634.39	0.78
12	Incidental		Rs.			133.75	0.16
13	Depreciation		Rs.			433.37	0.53
14	Land Revenue		Rs.			100.76	0.12
15	Int. on Working Capital @ 7% p.a.		Rs.			4289.26	5.29
16	Cost "A"		Rs.			69259.55	85.40
17	Rental Value of Land		Rs.			3579.04	4.41
18	Int. on Fixed Capital @ 10%p.a.		Rs.			667.38	0.82
19	Cost "B"		Rs.			73505.97	90.63
20	Family Labour Charges	Male	Days	25.47	200.06	5095.54	6.28
		Female	Days	25.03	100.01	2503.18	3.09
		Total	Days	50.50	150.47	7598.72	9.37
21	Cost "C"		Rs.			81104.69	100.00
22	Net Return From Intercrop					22422.02	
23	Net Establishment Cost					58682.67	
24	Per Year Establishment Cost For Bearing Life of Orchard (20 Yr)					2934.13	

Table: 5.6(c) Per Hectare establishment cost of selected Sweet Orange growers during five year (Overall)

Sr.no.	Item		Unit	Per hect	Per unit cost	Cost in Rs.	Percent to total
1	Hired Human Labour	Male	Days	107.99	200.01	21598.98	30.64
		Female	Days	79.11	100.00	7911.16	11.22
		Total	Days	187.10	157.72	29510.14	41.86
2	Bullock Labour	Hired	Days	10.73	250.14	2684.01	3.81
		Owned	Days	2.33	250.54	583.75	0.83
		Total	Days	13.06	250.21	3267.76	4.64
3	Machine	Hired	Hrs.	0.55	385.78	212.18	0.30
		Owned	Hrs.	0	0.00	0	0.00
		Total	Hrs.	0.55	385.78	212.18	0.30
4	Seedling		No.	319.01	12.00	3828.12	5.43
5	Manure		Qtls.	61.67	80.01	4934.01	7.00
6	Fertilizer	N	Kgs.	72.71	13.26	963.80	1.37
		P	Kgs.	42.28	21.00	887.96	1.26
		K	Kgs.	21.82	31.01	676.64	0.96
		Total	Rs.			2528.40	3.59
7	Micronutrient		Rs.			1350.25	1.92
8	Irrigation		Rs.		17.00	4383.24	6.22
9	Plant protection		Rs.			3172.58	4.50
10	Fencing		Rs.			2390.86	3.39
11	Repairs		Rs.			526.90	0.75
12	Incidental		Rs.			102.28	0.15
13	Depreciation		Rs.			316.59	0.45
14	Land Revenue		Rs.			107.15	0.15
15	Int. on Working Capital@7%p.a.		Rs.			3767.11	5.34
16	Cost "A"		Rs.			60397.57	85.68
17	Rental Value of Land		Rs.			3143.89	4.46
18	Int. on Fixed Capital @10%p.a.		Rs.			679.64	0.96
19	Cost "B"		Rs.			64025.77	90.83
20	Family Labour Charges	Male	Days	24.11	200.01	4822.33	6.84
		Female	Days	16.42	100.01	1642.13	2.33
		Total	Days	40.53	159.50	6464.46	9.17
21	Cost "C"		Rs.			70490.23	100.0
22	Net Return From Intercrop					19703.94	
23	Net Establishment Cost					50786.29	
24	Per Year Establishment Cost For Bearing Life of Orchard (20 Yr) Rs.					2539.31	

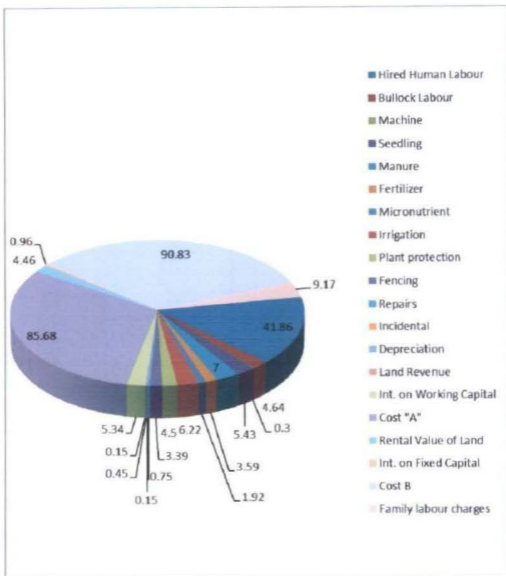


Fig3:Per Hectare of establishment cost of selected Sweet orange growers during five years (Overall)

Table:5.7 Per hectare input utilization pattern of selected Sweet Orange orchard.

Particulars			KATOL	NARKHED	OVERALL
		unit	Unit used	Unit used	Unit used
Manure		Qtl.	30.29	27.13	28.34
Fertilizer	N	Kg.	99.46	97.88	98.48
	P	Kg.	51.25	52.45	51.99
	K	Kg.	28.50	28.25	28.34
Human labour		DAYS	247.47	207.79	231.43
Bullock labour		DAYS	30.59	24.94	27.10
Machinery		Hr.	1.61	1.89	1.78
Irrigation		No.	18.00	15.00	17.00

Per hector inputs used in Sweet Orange orchard was estimated and presented in Table 5.7 Use of human labour was highest in Katoltahsil (247.47 days.) whereas in Narkhedtahsil it was 207.79 days. The fertilizer use was also highest in Katoltahsil. 99.46, 51.25, 28.5 kg N,P,K respectively. While in Narkhedtahsil N,P,K used 97.88, 52.45, 28.25 Kgs respectively. Along with these input bullock labour, machine labour, manures, irrigation was highest in Katoltahsil. On overall 231.43 Days use for per hector. 98.48 Qtl. manures were use.

5.2 (B) Cost of cultivation of Sweet Orange orchard

Generally, Sweet Orange trees starts bearing from fifth year onwards. The growers have to incurred expenditure for the maintenance of orchard every year to obtain production. The expenditure is mainly incurred on labour for various operations, and inputs. The per hectare operations wise labour required for Sweet Orange orchard, expenditure incurred on labour, other inputs used by the growers is discussed in the following part.

Data on the cost of cultivation of Sweet Orange orchard in the Table 5.8(a),(b),(c)

Table 5.8(a) depicted that the details of per hectare cost of cultivation of Sweet Orange orchard in Katol tahsil found that, the total cost i.e. cost "C" was worked out to Rs.84859.74. The cost "A" was Rs49379.16 (58.19 per cent) The highest contribution was rental value

of land (34.68 per cent) followed by total hired human labour (22.19 per cent) out of these hired male labour was 11.53 per cent and female labour 10.66 per cent in cost "A". Bullock labour (9.01 per cent), manures (2.86 per cent), fertilizers i.e. (N-1.88, P-1.39, K-1.04 per cent), micronutrient (1.31 per cent) irrigation charges (5.21 per cent), Plant protection (4.57 per cent) were also contributed share in Cost A. The total production of Sweet Orange during the year was obtained 94.79 Qtls. and its total receipts were Rs.177224.60. The per Qtl. cost of production of Sweet Orange was worked out i.e. Rs.895.24.

Table 5.8 (b) depicted that the details of per hectare cost of cultivation of Sweet Orange orchard in Narkhed tahsil was found that the total cost i.e. cost "C" was worked out to Rs.76475.23. The cost "A" was Rs.43651.08 (57.08 per cent) The highest contribution was rental value of land (37.31 per cent) followed by total hired human labour (19.34 per cent) out of these hired male labour was 10.35 per cent and female labour 8.99 per cent in cost "A". Bullock labour (8.15 per cent), manures (2.84 per cent), fertilizers i.e. (N-2.05, P-1.658, K-1.15 per cent), micronutrient (1.93 per cent) irrigation charges (5.28 per cent), Plant protection (4.62 per cent) were also contributed share in Cost A. Per hectare cost of cultivation of Sweet Orange orchard i.e. cost "C" was Rs.76475.23. The total production of Sweet Orange during the year was obtained 108.32 Qtls. and its total receipts were Rs. 197142.4. The per Qtl. cost of production was worked out i.e. Rs.706.01

Table 5.8 (c) depicted that the details of per hectare cost of cultivation of Sweet Orange orchard in Overall found that the total cost i.e. cost "C" was worked out to Rs.79532.00. The cost "A" was Rs.45695.11 (57.46 per cent). The highest contribution was rental value of land (36.31 per cent) followed by total hired human labour (20.54 per cent) out of these hired male labour was 10.85 per cent and female labour 9.69 per cent in cost "A". Bullock labour (8.52 per cent), manures (2.85 per cent), fertilizers i.e. (N-1.98, P-1.50, K-1.10 per cent), micronutrient (1.68 per cent) irrigation charges (5.26 per cent), Plant protection (4.61 per cent) were also contributed share in Cost A. Per

hectare cost of cultivation of Sweet Orange orchard i.e. Cost "C" was Rs.79532.00. The total production of Sweet Orange during the year was obtained 103.14Qtls. and its total receipts were Rs.190275.76. The per Qtl. cost of production was worked out i.e. Rs.771.10

Table:5.8 (a) Per Hectare Cost of cultivation of selected Sweet Orangegrowers during the year 2010-11 (Katoltahsil)

Sr.no.	Item		Units	Unitsrequired	Price per unit	CostinRs.	Percent to total	
1	Hired Human Labour	Male	DAYS	97.84	100.00	9784.43	11.53	
		Female	DAYS	113.05	80.00	9044.31	10.66	
		Subtotal	DAYS	210.89	89.28	18828.74	22.19	
2	Bullock Labour	Hired	DAYS	17.48	250.07	4371.25	5.15	
		Owned	DAYS	13.113	250.01	3278.44	3.86	
		Subtotal	DAYS	30.593	250.05	7649.69	9.01	
3	Machine	Hired	Hr.	1.61	381.60	614.37	0.72	
		Owned	Hr.	0	0.00	0	0.00	
		Subtotal	Hr.	1.61	381.60	614.37	0.72	
4	Manure		QTLS.	30.29	80.02	2423.95	2.86	
5	Fertilizer	N	KGS.	99.46	16.00	1591.37	1.88	
		P	KGS.	51.25	23.00	1178.92	1.39	
		K	KGS.	28.50	31.00	883.59	1.04	
		Subtotal				3653.88	4.31	
6	Micronutrient		Rs.			1110.77	1.31	
7	Irrigation		No.	18.00		4425.20	5.21	
8	Plant protection		Rs.			3874.30	4.57	
9	Incidental		Rs.			429.34	0.51	
10	Land Revenue		Rs.			110.17	0.13	
11	Depreciation		Rs.			511.25	0.60	
12	Repairs		Rs.			413.17	0.49	
13	Int. On Working Capital@7%p.a.		Rs.			3039.63	3.58	
14	Establishment cost		Rs.			2294.80	2.70	
15	COST "A"		Rs.			49379.16	58.19	
16	Rental Value Of Land		Rs.			29427.25	34.68	
17	Int. On Fixed Capital @10%p.a.		Rs.			208.38	0.25	
18	COST "B"		Rs.			79014.79	93.11	
19	Family Human Labour	Male	DAYS	21.86	200.00	4372.10	5.15	
		Female	DAYS	14.72	100.06	1472.86	1.74	
		Subtotal	DAYS	36.58	159.79	5844.95	6.89	
20	COST"C"		Rs.			84859.74	100.00	
21	Yield	Main	QTLS.	94.79	1869.66	177224.60		
		Bye	QTLS.	0	0.00	0		
22	Value Of Total Produce		Rs.			177224.60		
23	Per Qtl. Cost Of Production(Rs.)						895.23	

Table:5.8 (b) Per Hectare Cost of cultivation of selected Sweet Orangegrowers during the year 2010-11 (Narkhedtahsil)

Sr. no.	Item		Units	Unitsrequired	PricePer Unit	Cost In	Percent To Total
1	Hired Human Labour	Male	DAYS	79.18	100.00	7918.22	10.35
		Female	DAYS	85.91	80.00	6872.86	8.99
		Subtotal	DAYS	165.09	89.59	14791.08	19.34
2	Bullock Labour	Hired	DAYS	14.68	250.07	3671.00	4.80
		Owned	DAYS	10.26	250.01	2565.06	3.35
		Subtotal	DAYS	24.94	250.04	6236.06	8.15
3	Machine	Hired	Hr.	1.89	381.19	720.44	0.94
		Owned	Hr.	0.00	0.00	0.00	0.00
		Subtotal	Hr.	1.89	381.19	720.44	0.94
4	Manure		QTLS.	27.13	80.02	2171.00	2.84
5	Fertilizer	N	KGS.	97.88	16.00	1566.10	2.05
		P	KGS.	52.45	23.00	1206.43	1.58
		K	KGS.	28.25	31.00	875.83	1.15
		Subtotal				3648.36	4.77
6	Micronutrient		Rs.			1475.84	1.93
7	Irrigation		NO.	15.00		4037.55	5.28
8	Plant protection		RS.			3531.60	4.62
9	Incidental		RS.			400.00	0.52
10	Land Revenue		RS.			110.78	0.14
11	Depreciation		RS.			520.92	0.68
12	Repairs		RS.			450.92	0.59
13	Int. On Working Capital@7%p.a.		RS.			2622.40	3.43
14	Establishment cost		RS.			2934.13	3.84
15	COST "A"		RS.			43651.08	57.08
16	Rental Value Of Land		RS.			28534.20	37.31
17	Int. On Fixed Capital@10%p.a.		RS.			469.88	0.61
18	COST "B"		RS.			72655.16	95.00
19	Family Human Labour	Male	DAYS	20.14	100.04	2014.87	2.63
		Female	DAYS	22.56	80.02	1805.20	2.36
		Subtotal	DAYS	42.70	89.46	3820.07	5.00
20	COST "C"		RS.			76475.23	100.00
21	Yield	Main	QTLS.	108.32	1820.00	197142.40	
		Bye	QTLS.	0.00	0.00	0.00	
22	Value Of Total Produce		RS.			171870.10	
23	Per Qtl. cost of production		Rs.			706.01	

Table:5.8(c) Per Hectare Cost of cultivation of selected Sweet Orangegrowers during the year 2010-11 (Overall)

Sr.no.	Item		Units	Units	Price per unit	Cost in Rs.	Percent to total
1	Hired Human Labour	Male	DAYS	86.33	100.00	8633.02	10.85
		Female	DAYS	96.30	80.01	7704.58	9.69
		Subtotal	DAYS	182.63	89.46	16337.60	20.54
2	Bullock Labour	Hired	DAYS	15.75	250.11	3939.22	4.95
		Owned	DAYS	11.35	250.07	2838.30	3.57
		Subtotal	DAYS	27.10	250.09	6777.52	8.52
3	Machine	Hired	Hr.	1.78	381.92	679.81	0.85
		Owned	Hr.	0	0.00	0	0.00
		Subtotal	Hr.	1.78	381.92	679.81	0.85
4	Manure		QTLS.	28.34	80.02	2267.88	2.85
5	Fertilizer	N	KGS.	98.48	16.00	1575.78	1.98
		P	KGS.	51.99	23.00	1195.89	1.50
		K	KGS.	28.34	31.01	878.80	1.10
	Subtotal					3650.47	4.59
6	Micronutrient		Rs.			1336.009	1.68
7	Irrigation		No.	17.00		4186	5.26
8	Plant protection		Rs.			3662.84	4.61
9	Incidental		Rs.			411.23	0.52
10	Land Revenue		Rs.			110.55	0.14
11	Depreciation		Rs.			517.22	0.65
12	Repairs		Rs.			436.46	0.55
13	Int. On Working Capital		Rs.			2782.21	3.50
			Rs.			2539.31	3.19
14	Establishment cost		Rs.			2539.31	3.19
15	COST "A"		Rs.			45695.12	57.46
16	Rental Value Of Land		Rs.			28876.26	36.31
17	Int. On Fixed Capital		Rs.			369.72	0.46
18	COST "B"		Rs.			74941.09	94.23
19	Family Human Labour	Male	DAYS	27.31	101.96	2784.49	3.50
		Female	DAYS	21.49	84.06	1806.42	2.27
		Subtotal	DAYS	48.8	94.08	4590.91	5.77
20	COST"C"		RS.			79532.00	100.00
21	Yield	Main	QTLS.	103.14	1844.83	190275.76	
		Bye	QTLS.	0	0.00	0	
22	Value Of Total Produce		RS.			190275.76	
23	Per Qtl. Cost Of Production		Rs.			771.10	

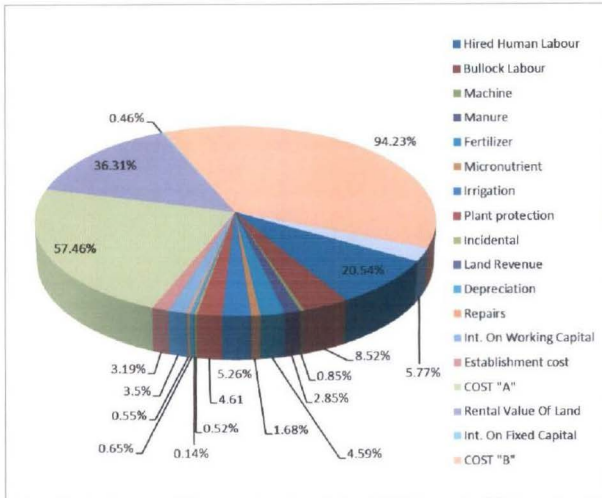


Fig4:Per Hectare Cost of cultivation of selected Sweet Orange growers during the year 2010-11 (Overall)

Table: 5.9 Cost of cultivation and net returns obtained from Sweet Orange cultivation:

Sr. No.	Particulars	Name Of Tahsil		
		KATOL	NARKHED	OVERALL
1	Value of Main Produce	177225.00	197142.40	190275.76
2	Value of By- Produce	0.00	0.00	0.00
3	Total Produce	177225.00	197142.40	190275.76
4	Total Cost			
	Cost "A"	49379.17	43651.08	45695.11
	Cost "B"	79014.80	72655.16	74941.09
	Cost "C"	84859.75	76475.23	79532.00
5	Net Return Over			
	Cost "A"	127845.83	153491.32	144580.65
	Cost "B"	98210.20	124487.24	115334.67
	Cost "C"	92365.25	120667.17	110743.76
6	Input- Output ratio at			
	Cost "A"	1:3.59	1:4.52	1:4.16
	Cost "B"	1:2.24	1:2.71	1:2.54
	Cost "C"	1:2.09	1:2.58	1:2.39

The per hectare profitability of Sweet Orange orchards was worked out by deducting different costs viz. Cost-A, Cost-B, Cost-C from the gross returns received from the output for both the groups and presented in Table 5.9

Table 5.9 represents per hectare cost and return from Sweet Orange the net return over cost "A" was highest in Narkhed tahsil. i.e. Rs.153491.32 followed by Rs.127845.83 in Katol tahsil. Net return over cost "B" was Rs.124487.24 and Rs.98210.20 in Narkhed and Katol tahsil respectively. The net returns over cost "C" was Rs.120667.17 in Narkhed tahsil and Rs.92365.25 in Katol tahsil. The input-output ratio at cost "A" was 1:4.52 and 1:3.59 for Narkhed and Katol tahsil and at cost "B" it was 1:2.71 in Narkhed tahsil and 1:2.24 in Katol tahsil. Input-output ratio at cost "C" was 1:2.58 in

Narkhed tahsil followed by 1:2.09 in Katol tahsil. The results show that Sweet Orange is more profitable crop in Narkhed tahsil than in Katol tahsil.

5.10 Marketing of Sweet Orange:

5.10.1 Marketing channels of Sweet Orange in selected tahsil:

Marketing channels are the route through which produce moves from producer to ultimate consumer. In respect of Sweet Orange, there were two marketing channels in the study area.

Marketing channels observed were:

Channel I : Producer → Pre-harvest contractor → Wholesaler →
Retailer → Consumer.

Channel II : Producer → Wholesaler → Retailer → Consumer

5.10.2 Marketing cost and marketing margin

For selling the produce in wholesale market, the seller has to pay for certain market services from sale proceeds. The marketing expenses incurred by the Sweet Orange cultivators are the expenses which are incurred after the harvest and prior to the sale of Sweet Orange. The expenses were incurred for several purposes like transport, unloading, weighing, commission and other purposes. The marketing expenses vary as the farmers sell their produce through different channels.

Table: 5.11 Channel wise Marketing cost of Sweet Orange

(Rs./Qtl)

Sr.no.	PERTICULARS	P-PHC-W-R-C		P-W-R-C	
		channel-I		channel- II	
		Rs./Qtl.	%	Rs./Qtl.	%
Marketing Cost Incurred by Producer					
1	Picking charge	0	0	300.00	33.69
2	Loading	0	0	54.60	6.13
3	Transportation	0	0	277.56	14.85
4	Unloading	0	0	54.60	6.13
5	Commission	0	0	130.87	14.70
6	Miscellaneous	0	0	28.04	3.15
7	Market fee	0	0	44.87	5.04
	Total Market Cost	0	0	890.54	
	Selling Price of Producer	1820		1869.66	
Marketing Cost Incurred by Pre-harvest Contractor					
1	Picking charge	300.00	32.73	0	0
2	Loading	87.00	9.49	0	0
3	Transportation	277.50	30.28	0	0
4	Unloading	87.00	9.49	0	0
5	Paddy straw	18.56	2.03	0	0
6	Commission	133.42	14.56	0	0
7	Weighing charge	13.05	1.42	0	0
	Total Market Cost	916.53		0	0
	Selling Price of Pre-harvest Contractor	2900.00		0	0
Marketing Cost Incurred by Wholesaler					
1	Cost of packing materials	24.00	3.61	20.00	3.28
2	Loading	87.00	13.10	96.18	15.76
3	Transportation	240.00	36.14	210.00	34.41
4	Unloading	62.56	9.42	59.27	9.71
5	Commission	203.00	30.57	184.23	30.19
6	Market cess	30.45	4.59	26.42	4.33
7	Weighing charge	17.10	2.57	14.12	2.31
	Total Marketing Cost	664.11		610.22	
	Selling Price of Wholesaler	3800.00		3787.00	
Marketing Cost Incurred by Retailer					
1	Shope rent	29.56	10.56	29.57	10.45
2	Loading	114.00	40.74	115.57	40.84
3	Transportation	40.00	14.30	40.49	14.31
4	Unloading	76.00	27.16	76.89	27.17
5	Weighing Charge	20.25	7.24	20.47	7.23
	Total Marketing Cost	279.81		282.99	
	Price Paid by Consumer	4500.00		4500.00	

The cost per quintal incurred by the producer was analysed in all the two channels and the results are presented in the Table 5.6.2.

It is inferred from Table 5.10 that, In case of Sweet Orange cultivator, there was no marketing cost incurred by Sweet Orange cultivar in channel (I), because producer sold their Sweet Orange orchards at maturity stage by whole contract or count method of sell.

On other hand, in channel(II) producer sold his produce to wholesaler incurred the marketing cost of Rs.890.54 in which higher share was from picking charges. It was followed by the transportation charges.

The total marketing cost for channel (I) is Rs.1860.45. and Rs.1783.75 in channel (II) respectively.

The data presented in table 5.10 indicate that the marketing cost incurred by pre-harvest contractor in channel (I) was Rs.916.53. Which contribute the higher share of picking charges, which was 32.73 per cent followed by the transportation charges i.e. 30.28 per cent of total cost.

Table 5.11 revealed that, marketing cost incurred by wholesaler in market in channel (I) and channel(II) was Rs.664.11 and Rs. 610.22 Which also contribute the higher share of transportation charges which was 36.14 per cent and 34.41 per cent for channel (I) and channel (II) followed by the commission charges i.e. 30.57 per cent and 30.19 per cent of total cost for channel (I) and channel (II)

Table 5.12 depicted that, in market the marketing cost incurred by retailer in channel (I) and channel (II) was Rs.279.81 and Rs.282.99 respectively. in which higher share of loading charges and it is followed by unloading charges. ie Rs. 27.16 per cent and 27.17 per cent .

Table 5.12 Price spread in Sweet Orange in market. (Cost(Rs.))

Sr. No.	Particulars	Channel I	Channel II
1	Net price received by producer	1820.00 (40.44)	979.12 (21.52)
2	Total marketing cost	1860.45 (41.34)	1783.75 (39.20)
3	Total marketing margin	819.54 (18.21)	1737.13 (38.18)
4	Purchas price of consumer	4500.00 (100.00)	4550.00 (100.00)

(Figure in parenthesis indicate the percentage to total)

Table 5.12 depicted that the, net price received by producer was higher in channel (I) i.e. (40.44 per cent). The total marketing cost in channel (I) and channel (II) was 41.34 per cent and 39.20 per cent respectively.

The total market margin received by the intermediaries in Sweet Orange marketing in channel (I) and channel (II) was 18.21 per cent and 38.18 per cent respectively.

In regards of channel(I) and channel(II),the producer's share in consumer's rupee was highest in channel (I) i.e. 40.44 per cent. While in channel (II) was 21.52 per cent.

5.13 Constraints faced by Sweet Orange growers

The agricultural marketing is defined as the operations involved in the movement of food and raw materials from the farmers to the final consumer and the effect of such operations on producers and middlemen. The farmers have various problems like poor quality of plant protection material, Unavailability of labours during peak period, Contract breaking due to deterioration of fruit quality, Heavy commission charges, Non- remunerative prices. The overall results are presented in the following Table 5.12

Table 5.12 Constraints faced by selected Sweet Orange growers

Sr. No.	Constraints faced	No. of respondents
Production(N=60)		
1	Poor quality of plant protection material	35
2	Unavailability of labours during peak period	56
3	Contract breaking due to deterioration of fruit quality.	12
Marketing		(N=35)
1	Heavy commission charges	24
2	Non- remunerative prices	18

Table 5.12 depicted the problems in Production and Marketing of Sweet Orange, growers. The result revealed that the unavailability of labour during peak period was savior problem which was expressed by 35 growers out of 60 growers. Poor quality of plant protection materials was faced by 50 growers. While the contract breaking is the problem faced by 12 growers. While considering the marketing aspect, 24 growers having a problem of high commission charges. whereas 18 farmers stated non-remunerative prices problems.

CHAPTER VI

SUMMARY AND CONCLUSION

Sweet orange is an important fruit crop of Vidarbha. Its cultivation is distributed widely in the Nagpur and Amravati. In present study an attempt was made to study Economics of Production and Marketing of this fruit of Nagpur. The specific objectives of the study were as under;-

1. To study the economics of Sweet orange.
2. To worked out the marketing of Sweet orange.
3. To identify the constraints in production and marketing of Sweet orange.

The present study was conducted in Nagpur district. Two tahsils from Nagpur district were selected purposively for the study, where the area under Sweet orange cultivation is concentrated. Three villages from each Tahsil and randomly ten Sweet orange growers from each village was selected for this study. Total Sixty growers from the sample area were selected for the study. Selection of samples depends on available acreage under Sweet orange orchards in the area.

The socio-economic characteristic of farmers i.e. size of family, educational status, land utilization pattern and cropping pattern were studied. The standard cost concept i.e. Cost 'A', Cost 'B' and Cost 'C' were used for working out per hectare cost and return.

There were Twenty Five Sweet orange grower interviewed personally holding sweet orange orchards upto 1 to 5 years plantation and Thirty Five Sweet orange growers was interviewed and collected respective information whose plantation were above 6 years of age.

In this study, the growers sold their produce Marketing aspects pertaining to sweet orange Viz. Channel of marketing, price spread

producer share in consumer rupee ,etc. The constrains in production and marketing was identified.

The results of the study are summarized as follows.

On an overall basis, there was 40.00 per cent male, 20.00 per cent female and 20.00 per cent children out of total family members. The higher per cent (13.33 per cent) of illiteracy was noted in Narkhed tahsil of selected Sweet orange growers.

The overall land holding was 3.24 hectare out of which 3.09 hectare was under net cultivable area, remaining 0.15 hectare as fallow land. The area sown more than once was 1.92 hectare. The cropping intensity worked out to be 162.13 per cent. Cotton and Soybean were important crops grown by the farmers under this study.

Overall highest area was sown under Sweet orange fruit crop i.e.in Katol, and on overall level was (22.16 per cent). The total area under kharif crop on an overall basis grown by selective farmers was 3.09 hectare (61.67 per cent). The highest area (40.12 per cent) was under Cotton crop followed by soybean.

The area under total Rabi crops for Katol and Narkhed tahsil was accounted to 8.13 per cent, 12.33 per cent, respectively. The highest area (0.41 per cent) was under wheat crop followed by gram. On an overall basis, the area under total summer crop was 5.99 per cent.

Information on inputs used in establishment of Sweet orange orchard and production of Sweet orange was collected and specially designed schedule pertaining to year 2009-10. Usual cost concept i.e. Cost "A", Cost "B", Cost "C" and simple analysis were use to accomplish the objectives of study.

Per hectare cost of establishment of Sweet orange on an overall basis was Rs. 70490.23/-. Among the different items of expenditure, human labour accounted highest share i.e.41.86 per cent, out of this male labour share was 30.64 per cent and female labour was 11.22 per cent, followed by bullock labour which was 4.64 per cent. The



proportion of other items of expenditure viz. seedling machinery labour, manures, fertilizer, irrigation and plant protection was also included. The per year establishment cost for bearing life of the orchard i.e. 20 year was 2539.31/-

Cost of cultivation of Sweet orange for the sample as a whole was Rs. 79532.00/- per hectare. The cost "A" was Rs. 45695.11 (57.46 per cent) per hectare which contributed highest. Rental value of land (36.31 per cent) followed by hired human labour (20.54 per cent) out of this hired male labour was 10.85 per cent and hired female labour was 9.69 per cent. The bullock labour (8.52 per cent), manures (2.85 per cent), fertilizers i.e. (N-1.98, P-1.50, K-1.10 per cent), micronutrient (1.68 per cent), irrigation charges (5.26per cent) and plant protection (4.61per cent) were also contributed the share in cost A. The total yield was obtained 103.14 Qtis and its cost was Rs.190275.76/-. It was observed from the study; per hectare cost of cultivation of Sweet orange crop was decreased with increase in age of garden. Per hectare average production of Sweet orange for the sample as a whole was 103.14 Qtls Average per hectare gross income for the sample as a whole was Rs. 190275.76/-.

Per hectare average net return for the sample as a whole was Rs. 96928.21/- Highest net income was obtained for orchard at Narkhed was Rs.124487.24/- followed by Katol of Rs.92365.25/-.

Output-input ratio at the total cost was 1:2.39 for the sample as whole. Highest output-input ratio was obtained from the orchard from Narkhed i.e.1: 2.58. Study revealed that the Sweet orange cultivation is profitable preposition and that profits are higher for orchards at Narkhed i.e.1:2.58

As regard marketing of Sweet orange there were Two channels of marketing,

Channel I : Producer → Pre-harvest contractor → Wholesaler →
Retailer → Consumer.

Channel II : Producer → Wholesaler → Retailer → Consumer

Producers' share in consumer's rupee was highest in channel (I) i.e. 40.44 per cent. While in channel (II) was 21.52 per cent.

CONCLUSION

1. On an overall basis, family size was 40.00 per cent male, 20.00 per cent female and 40.00 per cent children of the family members.
2. The higher per cent (11.67 per cent) of illiteracy was noted in selected Sweet orange growers on overall .
3. The average size of land holding in Katol, Narkhed was 3.59 hectare, 2.70 hectare, respectively.
4. The cropping intensity was 162.13 per cent at overall level.
5. Per hectare cost of establishment of Sweet orange orchard during five year for overall of orchard was Rs.70490.23 /-. Among the different items of expenditure share of human labour was higher followed by bullock labour.
6. Per hectare cost of cultivation (Cost "C") of Sweet orange orchard during the year 2010-11 for the sample as a whole was Rs.79532.00/-.
7. The net return obtained on an overall basis was Rs. 110743.76/-
8. The output-input ratio was higher in Narkhed tahsil .that's concluded that Sweet orange is more profitable in Narkhed tehsil than Katol tahsil.
9. Producers' share in consumer's rupee was observed from this study we concluded that channel (I) was more profitable than channel(II)
10. The result revealed that the unavailability of labour during peak period was savior problem in studied area.

CHAPTER VII

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VITA

- 1 **Name of Student** : Kalamkar Pranali Bhagavatrao
2 **Date of Birth** : 20/5/1987
3 **Name of College** : College of Agriculture, Nagpur.
4 **Resident Address** : Indira chowk, Nagpur Road, Warud
Ta- Warud Dist- Amravati
Pin code- 444906
5 **Mobile No.** : 9579080345
6 **Academic qualifications:**

Sr.No.	Name of Degrees awarded	Year in which obtained	Division/ class	Name of awarding university	Subjects
1	B.Sc.(Agri.)	2010	Second	Dr. PDKV, Akola	Agriculture
2	HSC	2004	Second	Amravati Board	General
3	SSC	2002	Second	Amravati Board	General

6. **Field of interest** : Reading, Marketing.



Place : Nagpur

Date : 15/06/2012

(Kalamkar Pranali Bhagavatrao)

APPENDIX I

Section of Agricultural Economics and Statistics, College of Agriculture, Nagpur

Title of research:- Economics of production and marketing of Sweet Orange in Nagpur district

Chairmen :- Shri N.T. Bagde

Name of student :- Miss. KalamkarPranaliBhagavatarao

1) Information of farmer:-

Name _____ Sex _____

Age _____ Education _____

Village _____ Tahsil _____

District - Nagpur

Occupation:- 1) Major:-

2)Subsidiary:-

a)Information of family member:-

Sr. No.	Name	Sex(M / F)	Age (yrs.)	Relation with Head	Education	Occupation		Income (Rs.)
						Main	Subsidiary	

Note: Education:- Fill I =Illiterate, P=Primary (1to 4th std),M= Middle school (5 to 7th) H=High school (8 to 10th),H.S.S.=Higher secondary school(11th to 12th),C=College (degree, diploma etc).

b) Information of Agricultural Land(ha):-

- 1) Total size of holding:-
- 2) Fallow land :-
- 3) Cultivated land :-
- 4) Irrigated land :-
- 5) Unirrigated land:

- 6) Area sown more than once :-
 7) Gross cropped area:-
 8) Land revenue & other:-

c) Land information (Ha):-

Sr.No.	Crop Variety	Area under crop (ha)	Total area (ha)
A.	Kharif		
1			
2			
3			
4			
Total			
B.	Rabi		
1			
2			
3			
4			
Total			
C.	Summer		
1			
2			
D.	Perennial		
1			
2			
Total			
Grand Total			

d) Detail of Sweet Orange orchard:-

Sr. no.	Item	Field No.		
		1	2	3
a)	Year of plantation			
b)	Area in acre			
c)	No. of plant			
d)	Yield			
	1)Mrug			
	2)Ambia			
	3)Hast			

e) Information of livestock :-

Sr.No	Particular	No.	Age (Yrs.)	Purchased Year	Purchase Price (Rs.)	Present Price (Rs.)

II) Inventory on implements and machinery for the year 2010-11:

Sr.No.	Name of Implements	Year of Purchase	Present Market Price (Rs.)	Purchase Price Unit	Present Total Value (Rs.)
A.	Implement				
1	Iron Plough				
2	Wooden Plough				
3	Harrow				
4	Hoe				
5	Bullock Cart				
6	Other				
B	Machinery				
1	Tractor				
2	Oil Engine				
3	Electric Pump				
4	Thresher				
5	Sprayer				
	a) Hand sprayer				
	b) Foot sprayer				
	c) Power sprayer				
6	Duster				
7	Scissor				

8	Tools				
9	Secatear				
10	Others				
C	Others				
1	Shed Net				
2	Drip Irrigation System				

a) Information about building and assets:-

Sr. No.	Particulars	Type of Building			Current Value (Rs.)
		Year	Brick	Kaccha	
1	Residential				
2	Farm building				
3	Animal shed				
4	Implement shed				
5	Machinery				
6	Implements				

b) Irrigation structure:-

Sr. No.	Assets	No./Qty.	Purchased year	Present Price(Rs.)
1	Well			
2	Electric Pump			
3	Shed for elec. pump			
4	Pipe line (length)			
5	Drip Irrigation System			
6	Electricity bill (Rs.)			
	Total			

c) Subsidiary Occupation of Family members(year 2010-11):-

Occupation	Annual Expenditure on Occupation(Rs)	Income from Occupation(Rs)	Problems in the occupation
Service			
Milch/Dairy animals			
Goat rearing			
Poultry birds			
Shop			
Tailoring			
Shoe making			
Other specify			

Annual Family Expenditure in year 2010-11(Rs):

Food grain & Grocery: _____ Clothing : _____

Education: _____

Marriage: _____ Health: _____

Other: _____

d) Loan Status:-

Source	Amount Taken	Rate of interest	In which year taken?	In which year to be repaid?	Amount Paid	Amount Not paid
Commercial Bank						
Cooperative Society						
Private Moneylenders						
Relatives						
Friends						
Other(specify)						

8.	repair of implement																			
9.	depreciation																			
10.	land revenue																			
11.	transportation to market																			
12.	Fencing																			
13.	Other operation a) b) c)																			
	Total																			

Total yield of mango:-

Produce	Production		Quantity sold	
	Quintals	Price/Qtl	Kg	Rs/kg
Main Produce				

IV) Marketing of mango:-

Method of sale adopted:-

i) On spot sale

Sr. no.	Item of cost	Amount paid
1	Picking	
2	Carting	
3	Heap making	
4	Grading	
5	Packing	
6	Predicted yield(farmer)	
7	Actual yield after harvesting	
8	Others	

ii) Through pre-harvest contractor

iii) Through Mandi

iv) Market destination at wider center

Sr No.	Marketing cost	Marketing channels				
		I	II	III	IV	V
1.	Marketing cost incurred by producer					
i	Packing charges					
ii	Loading charges					
iii	Transportation charges					
iv	Octrai					
v	Unloading charges					
Vi	Heap making					
Vii	Dalali					
viii	Cultivator expenditure					
ix	Weighing charges					
x	Total marketing cost					
xi	Selling price of producer					
2.	Marketing cost incurred by pre-harvest contractor					
I	Purchase price of pre-harvest contractor					
ii	Loading charges					
iii	Transportation charges					
iv	Unloading charges					
v	Octrai					
vi	Heap making					
vii	Dalali/commission					
viii	Packing/sorting/grading					
ix	Marketing committee charges(bazaar entry fee)					
x	Total marketing cost					
xi	Selling price of pre-harvest contractor					
3	Marketing cost incurred by wholesaler					
i	Purchase price of wholesaler					
ii	Charges of empty wooden box/plastic container					
iii	Paddy straw					
iv	Paper					
v	Nails					
vi	Roap					
vii	Packing of mango					
viii	Nail fitting					
ix	Marking/labeling					
x	Transportation					
xi	Octrai					

xii	Commission charges				
xiii	Total marketing cost				
xiv	Selling price of wholesaler				
4.	Marketing cost incurred by retailer				
i	purchasing price of retailer				
ii	shop rent/cart rent				
iii	transportation charges				
iv	weighing charges				
v	loading and unloading				
vi	sorting/grading				
vii	packing charges				
viii	Other				
ix	Total marketing cost				
x	selling price of retailer				
5	Grand Total				

V) Constraints faced by farmers in :-

Production
1
2
3
4
5
Marketing
1
2
3
4
5
Processing
1
2
3
4
5

