ECONOMICS OF GINGER (*Zingiber officinale*) PRODUCTION IN BEED DISTRICT (MAHARASHTRA)

By
MR. KAMBLE SWAPNIL RAVAJI

MASTER OF SCIENCE

(Agriculture)

IN

AGRICULTURAL ECONOMICS

DEPARTMENT OF AGRICULTURAL ECONOMICS AND STATISTICS

COLLEGE OF AGRICULTURE, LATUR

MARATHWADA AGRICULTURAL UNIVERSITY, PARBHANI

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B.Sc. (Agri.)

DISSERTATION

Submitted to

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2008

Affectionally

Dedicated to

My Beloved

Parents

And

Honorable

Dr. B. R. Ambedkar

CANDIDATE'S DECLARATION

I hereby declare that the dissertation

or part thereof, has not been

previously submitted by

me for a degree of

any University.

Place: Latur

Date: 20/12/2008

(MR. KAMBLE SWAPNIL RAVAJI)

(Registration No. 2006/ A / 27 / ML)

Dr. A.M. Degaonkar
Associate Professor **(Agricultural Economics)**
Department of Agricultural
Economics and Statistics,
College of Agriculture,
Latur-413 512 (M.S.)

CERTIFICATE – I

This is to certify that the dissertation entitled **"ECONOMICS OF GINGER (*Zingiber officinale*) PRODUCTION IN BEED DISTRICT (MAHARASHTRA)"** submitted by **MR. KAMBLE SWAPNIL RAVAJI** to the Marathwada Agricultural University, Parbhani in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE (Agriculture)** in the subject of **AGRICULTURAL ECONOMICS** is record of original and bonafide research work carried out by him under my guidance and supervision. It is of sufficiently high standard to warrant its presentation for the award of the said degree.

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

Place: Latur
Date: 20/12/2008

(Degaonkar A.M.)
Research Guide & Chairman
Advisory committee

CERTIFICATE – II

This is to certify that the dissertation entitled **"ECONOMICS OF GINGER (*Zingiber officinale*) PRODUCTION IN BEED DISTRICT (MAHARASHTRA)"** submitted by **MR. KAMBLE SWAPNIL RAVAJI** to the Marathwada Agricultural University, Parbhani in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE (Agriculture)** in the subject of **AGRICULTURAL ECONOMICS** has been approved by the student's advisory committee after viva-voce examination in collaboration with the external examiner.

External Examiner
(Dr. V. G. Dhondarkar)

(**Degaonkar A.M.**)
Research Guide & Chairman
Advisory committee

Advisory Committee

Prof. R. D. Shelke

Prof. S. S. Yadlod

Prof. J. V. Mande

Associate Dean (P.G.)
MAU, Parbhani

Associate Dean & Principal
College of Agriculture, Latur

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Place : Latur

Date : 20/12/2008

(Mr. Kamble S.R.)

CONTENTS

LIST OF TABLES

APPENDIX

LIST OF FIGURES

CHAPTER - I

INTRODUCTION

Page No. 1-7

CHAPTER I

INTRODUCTION

Ginger is the rhizome or rootstock of herbaceous perennial *Gingiber Officinale*. The aroma of ginger is pleasant and spicy, its flavour and taste penetrating, pungent and slightly bitter. Native of South Eastern Asia, ginger is cultivated in India, Japan, Thailand, Indonesia, China, Bangladesh, Fiji, Syria, Jamaica, South Korea, Nigeria, etc. India and Jamaica produce the best quality ginger followed by West Africa.

Ginger is used since time immemorial. It is a major crop cultivated in India and marketed as fresh and dried spice. It is a small grassy plant grown in all seasons throughout the year. Indian ginger is famous for its flavour, texture and taste. More than a spice ginger is considered as a tastemaker, a drug, an appetizer and a flavourant. Apart from being a good digestive, ginger contains gingerols and saogaols that relieve painful swelling and stiffness associated with arthritis. The gingerols in ginger also prevent some cancers. Ginger oil is used in medicated ointments in ayurvedic medicines. Osteoarthritis is a very common form of joint disease caused by wear and tear of the joints and ginger is found very effective in this case. In the ayurvedic medical system, ginger is used as a carminative and stimulant. It is recommended in dyspepsia and flatulent colic.

In India number of different varieties of ginger are grown in different parts of the country. Some of these are Burdwan, China, Erned, Joharat, Nadia, Thiladiam and Thingpui which are grown in Asam, Burdwan in West Bengal and Wayanad in Kerala. All these varieties

differ in shape, size, rhizomes, yields, moisture content, flavour and other characteristics like their suitability for drying and fresh consumption.

Superior quality of ginger is produced from Kerala though it is grown throughout the country. The congenial climate and the fertile soil help to produce quality ginger. In the world market, Indian ginger is popularly known as 'cochin ginger' (NUGC) and 'calicut ginger' (NUGK). Ginger is available in a variety of forms like oils, oleoresins, and fresh ginger in brine, pickles, candies and syrups. Garbled / ungarbled, bleached/unbleached and powder forms of ginger is also marketed. India has a predominant position in ginger production and export.

Fig. 1:

At present, India is the largest producer of ginger in the world

Among all spices, ginger (*zingiber officinale*) is the main cash crop supporting the livelihood and improving the economic level of many ginger growers of northeastern region. Ginger is grown in almost all the states of the region. India ranks first with respect to ginger production contributing about 32.75 percent of total world's ginger production followed by China (21.41%), Nigeria (12.54%) and Bangladesh (10.80%). World's average ginger productivity is 2419 kg/ha. USA has

the highest productivity per hectare of about 5636 kg and India's is only 3367 kg. Indian ginger has high esteem in the global market because of its characteristic lemon like flavor. The crop exhibited an annual growth rate of 4.6 per cent in area, 7.4 per cent in production and 2.7 per cent in productivity. Though grown all over India, the finest quality ginger comes from Kerala endowed as it is with a congenial climate and a rich earthy soil. Indian dry ginger is known in the world market as 'Cochin Ginger' (NUGC) & 'Calicut Ginger' (NUGK).

Ginger is used as taste maker, flavorant, appetizer and in drug in fresh and dried or powdered form. It is used in pickles, chutneys and curry pastes and the ground dried root is a constituent of many curry powders. Tender young ginger can be sliced and eaten as a salad. Sometimes the roots will produce green sprouts which can be finely chopped and added to a green salad. In the West, dried ginger is mainly used in cakes and biscuits, especially ginger snaps and gingerbread. Ginger is also used in puddings, jams, preserves and in some drinks like ginger beer, ginger wine and tea. Pickled ginger is a delicious accompaniment to satays and a colorful garnish to many Chinese dishes. Preserved ginger is eaten as a confection, chopped up for cakes and puddings, and is sometimes used as an ice cream ingredient.

Ginger is most commonly known for its effectiveness as a digestive aid. By increasing the production of digestive fluids and saliva, ginger helps in relieve indigestion, gas pains, diarrhea and stomach cramping. The primary known constituents of Ginger Root include gingerols, zingibain, bisabolenel, oleoresins, starch, essential oil (zingiberene, zingiberole, camphene, cineol, borneol), mucilage, and protein. Ginger root is also used to treat nausea related to both motion sickness and morning sickness. Ginger has been found to be even more

effective than Dramamine in curbing motion sickness, without causing drowsiness. Ginger's anti-inflammatory properties help relieve pain and reduce inflammation associated with arthritis, rheumatism and muscle spasms. Ginger's therapeutic properties effectively stimulate circulation of the blood, removing toxins from the body, cleansing the bowels and kidneys, and nourishing the skin. Other uses for Ginger Root include the treatment of asthma, bronchitis and other respiratory problems by loosening and expelling phlegm from the lungs. Ginger Root may also be used to help break fevers by warming the body.

Chemical analysis of ginger shows 2-3 % protein, 0.9 % fat, 1.2% minerals, 2.4% fiber, 12.3% carbohydrates and good amount of calcium, phosphorous, iron and vitamin, volatile oil, proteolytic enzymes etc. The pungency of ginger is due to gingenol while aroma is due to volatile oil i.e lisobolene, zingiberence and zingiberol.

India is one of the prime producers of ginger. From pots in gardens to large-scale, mechanized operations, it is cultivated on a local and commercial scale. In 2003, India grew over a quarter of a million tones of rhizomes - almost three quarters more than thirty years ago. It is grown on a smaller extent in Bangladesh and Pakistan. In India there are at least 400 different cultivars, each with varying properties such as the level of potent ginger oil. Ginger is native to India and China. It takes its name from the Sanskrit word *stringa-vera,* which means "with a body like a horn", as in antlers. Ginger has long been ascribed aphrodisiac powers, taken either internally or externally.

However, in Maharashrta ginger is grown as minor crop. For the years 2000-01, 2001-02 and 2002-03, the respective area under ginger crop was 1259, 1243 and 1304 (in ha) with production 1187, 1182 and 1249 (tonnes). The crop is mostly grown in Marathwada region. The

production of ginger is higher in Beed district. Hence the Beed district is selected for the study.

LOCATION

The Beed district is situated at the center place of the Maharashtra state, southward to Aurangabad District. It lies between the parallels of 18.28^0- 19.28^0 N latitudes and meridians of 74.54^0 – 76.57^0 E longitudes. The district has borders of Aurangabad and Jalna district at north side; Parbhani and Latur district at east side; Osmanabad and Ahmednagar district at south side and Ahmednagar district at west side.

HILLS and RIVERS

Mountains of Balaghat is the main mountain stream in the Beed district which spreads from west border (Ahemadnagar dist.) to east border (Parbhni & Latur dist.) of the district. This mountain stream has divided the district in two parts viz. northern low lands of Gangathadi and up lands of Balaghat. In Balaghat mountain there are number of hills of height 2500 ft and more. Balaghat and Gangathadi regions are about 2000-2200 ft and 1200-1500 ft above the sea level respectively. Northern high regions are sloping downward towards south and south-east borders. Ashti tahsil of the district is sloping down towards the South. Northern and southern regions of the district lie in Godawari and Manjara valleys respectively.

Godawari is the important river in the district which runs along north border of the district past Georai and Majalgaon tahsils. Manjra, Sindphana, Bendsura and Wan are other important rivers in the district. Manjra and Sindphana have their source in the hills of Patoda tahsil. Manjra runs along the south border and Sindphana runs in north side of the district and meets to Godawari in Majalgaon tahsil. Bendsura

and Wan have their source in the hills of Beed tahsil and hills of Balaghat respectively. Talwar, Kambali, Ruti and Mehkari are some other rivers in the district.

SOIL

An average soils of the district are shallow and rocky in structure. The fertile black cotton soils are present in Georai and Majalgaon tahsils. The black soil belts are found along riverside and nalla side. There are fare soils in southern region of Ashti tahsil and undulating shallow soils in north and east region. Patoda tahsil of the district is hilly region. On southern side of district, good condition soils are found along Sindphana river. Black soil belts are present in Beed, Kej and Ambejogai tahsils of the district.

CLIMATE

The climate of Beed district is subtropical. The year may be divided into three distinct seasons viz.,

1. Moderately warm season from June to September.
2. Cool dry season from October to February.
3. Hot dry season from March to May.

The rainy season which starts from mid of June to September is warm and pleasant . The average rainfall of Beed district was 666 mm recorded in 2001. The intensity of rainfall is low in Kej, Patoda and Asthi tahsils. As recorded in 2001, the intensity of rainfall is high in Majalgaon tahsil (811 mm) and the intensity of rainfall is low in Kej tahsil (534 mm). During rainy season the temperature ranges between 21.00 ^{0}C to 35.8 ^{0}C. The winter season is comparatively dry and starts from November and ends in February. During November to January sometimes the climate becomes cool. The hot dry season starts from March and lasts

in May. During summer, the days are hot and nights are fairy cool. The maximum temperature of the year recorded was 39.6 ^{0}C and minimum temperature recorded was 12.00 ^{0}C.

Therefore, in the present study a detailed investigation pertaining to input use, cost of cultivation and marketing practices was proposed with the specific objective outlined below.

OBJECTIVES

1. To study the cost and returns of ginger production.
2. To study the input efficiency in ginger production.
3. To identify the marketing channels.

CHAPTER - II

REVIEW OF LITERATURE

Page No. 8-20

CHAPTER II
REVIEW OF LITERATURE

In any systematic research, the review of literature on relevant aspects under the study forms an integral part of the research work. The exercise helps in highlighting the methodology and results obtained in similar fields and serves as a guideline for the research to be carried out. As such it helps in proper understanding of the concepts and methodological and analytical issues relating to problem under study. In view of this, the present chapter had been devoted to present in abstract form the reviews of the relevant studies conducted in recent past.

2.1 STUDIES ON COST OF CULTIVATON :

Singh and Pandey (1971) studied the cropping pattern and resource use efficiency in dry farming Band districts (U.P.). The results indicated that farmers were rational in the use of bullock labour only since its per hour marginal value product was close to per hour acquisition cost. They suggested one-fourth reduction in the use of human labour.

Singh *et al.* (1974) studied the relative economics and production function for commercial crop (cotton, sugarcane and oilseed) in Haryana. The production function indicated that fertilizer and irrigation for sugarcane and irrigation and human labour for cotton, showed negative contribution to production, while plant protection chemicals showed positive contribution to cotton production.

Singh (1975) used Cobb-Douglas production function to study the productivity of resource use. The results revealed that the productivity

per unit of land, seeds, fertilizers, plant protection chemicals and manure on the progressive farms were significantly higher than its acquisition cost. On the less progressive farms, only the productivity of bullock labour was significantly higher than its acquisition cost.

Singh *et al.* (1975) studied the resource use efficiency of land, labour, plant protection chemicals and capital inputs using the Cobb-Douglas production function. They reported the high output elasticity for plant protection chemicals and capital inputs as compared to land and labour input.

Verma and Pareek (1975) studied resource use efficiency in Jaipur district and found higher marginal value productivity of land on small as compared to large farms. The explanation given for this was that in effort to get more income from the limited area of land available with them, small farmers cultivated their lands more intensively.

Nadda *et al.* (1976) estimated economics of cultivation, returns and marketing of ginger in Sirmur district of Himachal Pradesh and revealed that an average net income from ginger crop was more than Rs. 63120.35 per hectare with average cost of production Rs. 121.17 per quintal. From the study, it had be seen that, the average expenditure on inputs varied between Rs.11,863 to Rs. 13,311 per hectare. The study also revealed that the expenditure on seed alone accounted for 60.57 per cent of total operating cost and 37.90 per cent of commercial cost while expenditure on fertilizer and manure was only 3.45 per cent of the total cost and 5.51 per cent of operational cost. The cultivation of ginger required human and bullock labour worth Rs. 2482.52 per hectare. The input-output ratio was found to be 1: 1.49 on an average. The average cost of production of ginger was estimated to Rs. 121.17 per quintal.

Subbaramaraju *et al.* (1987) in their study on the resource productivity and returns to scale in groundnut production of Mehaboobnagar district (A.P.) indicated that organic manures and irrigation formed the most influencing factors under irrigated conditions while land, bullock labour and fertilizer were significantly contributing under unirrigated farm situations. The returns to scale under irrigated conditions were found to be significantly different from unity (1.3426) at 5 per cent level of probability indicating increasing returns, while in the unirrigated farms constant returns to scale was noticed.

Radha (1989) evaluated the resource use efficiency in rice-rice and rice-pulse farming systems of Krishna districts in Andhra Pradesh. The results indicated that manures, fertilizers plant protection chemicals and irrigation were quite productivity used in both the farming systems. The sum of the elasticities indicated that operations of constant returns to the scale in both the farming systems.

Sharma *et al.* (1989) examined the cost and returns of ginger production on small and large farms in Nagrota and Kangra blocks of Kangra district, Himachal Pradesh in 1986-87. The study revealed that net returns were higher on small farms (Rs. 5166/ha) than on large farms (Rs. 3370/ha) due to better management and grater per hectare input use. The elasticity coefficients with respect to human labour (0.619) were found to be positive and significant in all categories of farms. The elasticity coefficients associated with bullock labour (0.118) were found to be positive and significant only on large farms. The study further indicate that coefficient of multiple determination (R^2) for all the categories of farms was significant i.e 0.813. This suggested that the explanatory variables (human labour, bullock labour, working capital)

included in the model were sufficient enough to explain the variation in ginger production.

Sharma *et al.* (1989) studied the economics of ginger production in Himachal Pradesh. The study revealed that the per hectare cost of production of dry ginger varied between Rs. 32,937.96 (marginal farms) to Rs. 58,331.98 (medium farms). On per quintal basis, the cost of production was found to be highest (Rs. 3,241.92) on marginal farms and lowest (Rs. 2,029.64) on medium farms. The per hectare and per quintal cost of production on an average farm was worked out to be Rs. 51,164.55 and Rs. 2,187.45, respectively. Marginal farmers were observed using critical inputs far below the recommended doses. This was main reason for low productivity in this size group. The production efficiency was highest on medium farms (122.87 per cent) followed by small farms (95.76 per cent) and marginal farms (43.43 per cent). From production efficiency point of view, marginal farms were observed to be most inefficient. The inefficiency of marginal farms was due to less use of inputs and consequently low output. The lack of interest, poor management ability, lack of adequate finance further contributed to the inefficiency of these farms.

Chandra reddy *et al.* (1990) fitted Cobb – Douglas production function to study the resource use efficiency in beetle vine cultivation in Cuddapah district (A.P.). The functions revealed that there is potential for further use of labour, manures and fertilizers up to its optimal levels. But further investment in seed and plant protection chemicals is not desirable as revealed from their insignificant coefficients.

Subramanian *et al.* (1991) analyzed the input use efficiency in command area of lower Bhavani Project in Tamil Nadu. The multiple regression analysis carried out in the three regions indicated positive and significant influence for fertilizer on the productivity of paddy in all the

three regions. The MVP on fertilizer was Rs. 20, Rs. 19.80 and Rs. 38 respectively in the three regions. They concluded that there is scope for increasing the level of fertilizer use to increase the productivity of paddy.

Gadre *et al.* (1992) studied the resource use efficiency in hybrid cotton production. The data were collected by cost accounting method from 140 hybrid cotton growers of Vidharba. In order to measure relative shares of various factors in cotton production they fitted the Cobb-Douglas production function. The results of the production function indicated higher efficiency in the use of human labour, bullock labour, fertilizer and plant protection chemicals on small farms than on medium and large farms.

Mahita and Hemachandrudu (1995) studied resource use efficiency in paddy cultivation in Andhra Pradesh. They concluded that, in general, there is high degree of resource use inefficiency on paddy farm in Andhra Pradesh. This warrants the need for reorganization of farm resources. There is good scope to reorganize the farm resources since MVP and MFC ratio for human labour, fertilizer and plant protection chemicals deviated from unity.

Vishweshwar (1997) studied the efficiency of various inputs used in the production of cotton under Integrated Pest Management and Conventional Pest Management practices adopted farmers in Malaprabha command area in Karnataka. The study indicated that the ratio of MVP to MFC for land was greater that one, while it was less than one for labour. It was negative for seed, fertilizers and pesticides in conventional farmers. In the case of IPM adopted farmers the MVP to MFC ratio for land, labour seeds and plant protection chemicals were greater than one and were negative for fertilizers.

Gaikwad *et al.* (1998) evaluated the economics of ginger production in Anjangaon Surji Tahsil of Amravati district (Maharashtra, India) during 1995-96. Cost of cultivation and gross returns were positively related with size of holdings. The overall cost of cultivation was Rs. 1,32,415.63 per hectare and Rs. 1012.04 per quintal. The overall net return at Cost C (which includes all costs) was Rs. 50,399.23 per hectare. However, net returns decreased with size of holdings. The overall input-output ratio at Cost C was 1: 1.38.

Chandel *et al.* (1998) evaluated impact of crop management research on ginger cultivation in Himachal Pradesh and revealed that the cost of cultivation was calculated on the basis of technology recommended for rhizome rot and CMP-1 where conventional flat surface sowing was done with 30 cm spacing from row to row and FYM mulch of 15 tones was applied. The highest expenditure for ginger cultivation was incurred on seed, accounting for 32 per cent (Rs. 13,600 per hectare) of total cost (Rs. 42,493 per hectare) followed by human labour charges (Rs. 9,410), showing thereby that the reduction of seed cost and expenditure on labour are the two major points of concern to the farmer in ginger cultivation. The net profit of Rs. 39,128 per hectare was estimated. The per quintal cost of cultivation of ginger was worked out to be Rs. 312.38 giving net profit of Rs. 287.62 over farm prices.

Dodke *et al.* (2002) studied the economics of turmeric production in Chandrapur district of Maharashtra state. The study revealed that total per hectare cost of cultivation at cost A, B, C, was worked out to Rs. 36,637.20, Rs. 50,470.15, Rs. 54,249.00 respectively. It is observed that the per hectare yield of cured turmeric was 19.14 quintals. The average price per quintal received by the selected cultivators was Rs. 3,405.31. The per hectare gross and net return was Rs. 65,177.21 and Rs. 928.71 respectively. The input-output ratio at cost 'C' was 1: 1.20 where as it

was 1:1.77 and 1: 1.29 at cost 'A' and 'B' respectively. Since the ratio is grater than unity at all cost concepts, the turmeric production in Bhadravati tahsil of Chandrapur district will be profitable venture.

Killedar *et al.* (2002) estimated the per hectare cost of cultivation was Rs. 2,31,224 where as per quintal cost of cultivation was Rs. 1830.90 for ginger crop at Satara District of Western Maharashtra. The yield of ginger was 126.29 quintal per hectare giving the per hectare returns of Rs. 4,80,912. The average per quintal price received by the cultivator was Rs.3808. The cost benefit ratio worked out to 1: 2.08. The study further revealed that the cultivators in Satara District can earn net profit of Rs. 2,49,678 per hectare by cultivating ginger crop. This indicate that, in this region there is scope for increasing the area under ginger crop.

Anonymous, (2003) undertaken the study on integrated programme for development of spices, which revealed that the yield per hectare of ginger in sample area was 17,543 kg. of green ginger in the year 1991-92. In the year 1996-97 the yield per hectare of ginger had been increased to 19,067 kg. The gross income per hectare of ginger was Rs. 87,598 during the year 1991-92. It increased to Rs. 1,90,401 in the year 1996-97. The gross income increased substantially in the year 1997-98, due to abnormal increase in the price of ginger. Net income per hectare of ginger was Rs. 54,229 in the year 1991-92. In the year 1996-97, the net income per hectare had increased to Rs. 1,13,733.

Bambawale *et al.* (2004) found on cotton crop found to be most effective. Net returns through IPM on cotton were Rs.16231 / ha as against non-IPM Rs.10501/- on farmers field in Nanded district.

Gupta *et al.* (2004) studied constrains in ginger cultivation in Himachal Pradesh. The study revealed that ginger seed was the main cost component of the ginger cultivation as it account for about 60 per cent of

total cost. Whereas, labour was another major cost component and it account for about 15 per cent of total cost. Share of fixed and variable cost was 85 and 15 per cent respectively. Per ton cost of production was estimated to be Rs. 9089. Input-output ratio under normal condition (no disease and favorable climatic factors) was found to be highest in ginger seed production (1: 2.73) followed by sonth-dry ginger (1: 1.8) and vegetable purpose ginger (1: 1.38). Non-availability of quality and disease free seed was major hurdle in ginger cultivation in the study area. Inferior inputs, particularly pesticides, was the another problem associated with ginger cultivation. In the study it was found that most of the ginger produced in the state was sold in row form without any value addition through processing. It has emerged from the study that rhizome rot has played havoc with ginger crop in the state and it was suggested that easy availability of disease free seed would be most effective step to revive ginger crop in the state.

Lokesh *et al.* (2004) were undertaken study on economics of turmeric production in Karnataka and results revealed that the average yield of fresh rhizomes was 120 quintals and 96 quintals per acre of improved and local varieties of turmeric. In case of local variety, total labour employed was 150, 140 and 146 man days with a cost of Rs. 6,600, Rs. 6,150 and Rs. 6,420 for small, large and pooled farmers respectively. Where as in improved variety growing farms, 190, 195 and 196 man days of labour employed with a cost of Rs. 8400, Rs 8700 and Rs. 8760 in small, large and pooled farmers. The cost of human labour forms 29 per cent (Rs. 8760) and 24 per cent (Rs. 6420) of the total cost of the improved variety and local variety turmeric cultivation. The cost of pesticides forms Rs. 2000 (6.6 per cent) and Rs.1700 (6 per cent) in improved and local variety farms respectively. Expenditure on rental value of land was Rs. 5000 per acre, which is prevailing land lease rate.

The cost of seed material was Rs.3600 and Rs. 4200 for local and improved varieties. The cost of farm yard manure was Rs. 3150 and Rs.2450 in local variety and Rs.3850 and Rs. 3150 in improved variety farms of small and large farmers respectively. Where as farmer incurred Rs. 1700 and Rs.2131 for chemical fertilizers in local and improved varieties of turmeric cultivation. Total cost 'A' of local variety of turmeric cultivation was Rs. 21,690, Rs.21,791 and Rs. 21,763 for small, large and pooled farmers respectively. Where as in case of improved variety, total cost 'A' was Rs. 30,328, Rs. 32,279 and Rs. 31,959 for small, large and pooled farmers respectively.

It appears from the reviews that most of studies relating to the production of any commodity have been evaluated using Cobb-Dauglas production function. The researches have attempted to evaluate the impact of different inputs on output.

2.2 STUDIES ON MARKETING OF GINGER :

Nadda *et al.* (1976) studied economics of ginger cultivation, returns and marketing of ginger in Sirmur district of Himachal Pradesh. The study revealed that there were mainly two marketing channels for fresh ginger i.e. producer – village merchant / commission agent – primary wholesaler – retailer – consumer and producer – primary wholesaler – secondary wholesaler – retailer – consumer. The study indicate that producer incurred an expenditure of about Rs. 20 per quintal in second channel. The study also revealed that producer received net income of Rs. 134 per quintal when he marketed his produce through channel first where as he received Rs. 140 per quintal by selling his produce through second channel. Also the producers share in consumers rupee was found to be 36.55 per cent during the study.

Sharma *et al.* (1989) were undertaken srtudy on marketing of dry ginger in Himachal Pradesh . He identified the seven marketing channels through which ginger is passed to consumer. The producers share is found to be highest (81.41 per cent) when the produce is passed to Delhi market through the channel :- Producer – Secondary wholesaler – Retailer – Consumer. But the producer's marketing costs were highest (Rs. 136.50 per quintal) in this channel. The retailers margins were found to be highest in all the channels (i.e. 8.48 per cent) followed by village traders (4.87 per cent). The margins of primary and secondary wholesalers were 4.03 and 4.72 per cent respectively.

Talukdar and Sharma (1991) studied the pattern and efficiency of ginger marketing in a hill district of Assam. The study constitute five marketing channels. The producers share in consumers' rupee was found to be highest (67.50 per cent) in channel:- producer – retailer – consumer, with lowest total cost and margin. But the total volume of transaction was lowest in this channel. In this channel, the ratio of cost and margin was found to be 1: 17.57 which was the highest for local retailer. Also the pricing and marketing efficiency of the channel were highest with lowest total effectiveness. It was found that, in this channel producer incurred the highest marketing cost of 54.84 percent followed by the retailer (45.16 per cent). For channel second i.e. producer – local trader – retailer – consumer, the producers share in consumers' rupee was found to be 52.50 per cent with total margin of Rs. 409.00 and total cost Rs. 83.00 per quintal. The total price spread was Rs. 492.00 per quintal with total volume of transaction of 11.40 per cent.

Shrivastava *et al.* (1994) studied marketing channels, marketing margins, marketing cost and price spread and export potential for ginger. Data was collected from Samastipur market in Bihar, India. A sample of ten local traders, eight wholesalers and twenty retailers was selected for the study. The data related to 1990/91. Three important marketing channels were identified, but most of the produce passed through the channel involving: producer – local trader – wholesaler – retailer – consumer. The comparatively higher margin obtained by the retailer as compared with the other market functionaries was mainly due to the slower disposal of produce at the retail level. India's economic policy liberalization should have some beneficial effect on ginger export.

Naidu *et al.* (1998) were studied price spread of turmeric in regulated marketing at Guntur district of Andhra Pradesh and indicated that the net price received by the turmeric grower in the consumers rupee was 56.36 per cent. It clearly implies that the turmeric marketing system was paying remunerative price to the turmeric grower. In the study it was found that in the marketing of the turmeric, due to elimination of middle men to the possible extent, the marketing system could apportion a sizeable portion of the consumers rupee to the producer. It was also observed that the index of marketing efficiency was higher in turmeric marketing.

Dodke *et al.* (2002) were undertaken the study on economics of turmeric marketing in Chandrapur district of Maharashtra. It was observed from the study that producers share in consumers rupee was 88.45 per cent. The per quintal total cost of marketing was worked out to be Rs. 434.15. The percentage share of marketing cost incurred by the producer, wholesaler and retailer worked out to 4.06, 2.49 and 1.08 per

cent of consumer price respectively. Also the profit earned by wholesalers and retailers worked out to 1.99 and 1.93 per cent respectively. The cured turmeric being a non perishable crop, the total cost of marketing was observed to be only 11.55 per cent of price paid by the consumer.

Killedar *et al.* (2002) had undertaken the study on cost of marketing of ginger in Satara district of Western Maharashtra. The study revealed that the per quintal cost of marketing of ginger was Rs. 402.62. Under the study, it was noticed that the highest share in total marketing cost was of commission charges (i.e. 75.67 per cent) which is followed by transport (12.41 per cent) and packaging charges (6.10 per cent). This large share of marketing charges in marketing cost can be minimized by following proper marketing channels. It is also found that about 80 per cent of ginger growers of the district sold there produce in Pune and Mumbai markets.

Lokesh *et al.* (2004) studied the economics of marketing of turmeric in Karnataka state. It was estimated that 80 per cent of turmeric rhizomes were sold to the commission agents from Erode market (in Tamilnadu). The price received by the farmers was Rs. 2360 per quintal. About 15 per cent of the farmers realize higher price of Rs. 2900 per quintal. The farmers selling the produce to the local traders received the price around Rs. 2200 per quintal. Thus, the farmers who sold the turmeric to the commission agent from Tamilnadu lost to the tune of 13 percent. The farmers who sold turmeric to local traders lost to the tune of 14 percent.

Thripathi *et al.* (2006) were undertaken study on marketing of ginger in Ri-Bhoi District of Meghalaya. The study was undertaken during 2003-04 crop session and data was collected from three important markets Umroi, Umsning and Nongpoh of Ri-Bhoi district of Meghalaya. A sample of 120 ginger grower from 6 villages had been randomly selected for study. The four important marketing channels were identified, but most of the produce was passed through channel:- producer – village trader/commission agent at village level – retailer – consumer. The total marketing cost is highest in this channel (Rs. 1867 per quintal) than others. The producers share in consumers rupee was found low due to exorbitant margin taken by village traders. The producers share can be increased by establishing regulated markets and processing units, providing storage and transport facilities etc.

The researches have attempted to findout marketing chanels for the the commodity.

CHAPTER III

METHODOLOGY

Page No. 21-29

CHAPTER III
METHODOLOGY

Adoption of sound methodology is of vital importance in the economic study. Any type of investigation conducted with specific objectives requires the adoption of scientific methods, procedure of collection of data and analytical tools used in study. An attempt is made in this chapter to describe the methodology adopted for collection and analysis of data to arrive at meaningful conclusions.

3.1 LOCATION OF THE STUDY:

The Beed district is selected purposively for this study as the district rank first in the state for area under the ginger crop.

3.2 SAMPLING PLAN:

The three stage random sampling technique is used in the study for the selection of cultivators taking tahsils as primary unit, villages as secondary unit and cultivators as final unit.

3.3 SELECTION OF TAHSILS AND VILLAGES:

Among the 11 tahsils of the district , 3 tahsils viz. Ambejogai, Kej and Parli, are selected for the study on the basis of maximum area under the ginger crop. Two villages from each tahsil are selected randomly for collection of sample and from each village ten cultivators were selected for the study. Thus, the total sample size is of 60 farmers.

3.4 SELECTION OF SAMPLE CULTIVATORS:

All 60 sample farms spreads over three talukas are selected for the study by simple random sampling method.

3.5 COLLECTION OF DATA:

The data on related aspects of the study for the year of 2007-08 was obtained from sample cultivators by survey method. A pre-tested questionnaire was used for the collection of data. A copy of schedule is given in Appendix I.

The data on relevant aspects such as area, input used, cultivation and marketing of ginger were collected from sample survey method. The ginger farmers were personally interviewed mostly at their farm and homes and some cases at common places in village. The information was collected in specially designed pretested schedule for the study under purpose. The data regarding marketing were collected from selected respondents and local market. The data for the reference year 2007-08 was collected.

3.5.1 Analysis of Data

Tabular analysis, frequency distribution and percentage method were adopted for studying the cost and returns. Cobb-Douglas production function was used for knowing the resource use efficiency.

Tabular analysis comprised of arithmetic means, percentage and ratio was used to determine the cost and returns of ginger cultivation.

3.5.2 Cost concepts and evaluation of items of cost.

The cost of cultivation of ginger was studied by using the three cost concepts viz., cost A, cost B and cost C.

Cost of establishment and cultivation.

i) Cost A

Includes the cost on account of hired human labour, total bullock labour charges, total machinery labour charges, cost of rhizomes, cost of manure and fertilizers, insecticides and pesticides, irrigation charges, depreciation of implements and farm building, land revenues, cesses and other taxes as well as interest on working capital. Cost A is sum of value of all above items

ii) Cost B

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

iii) Cost C

Comprises of cost B plus imputed value of family labour.

A) Human labour

It includes both hired and family labour. Most of the labour force engaged in ginger production was hired one. However, the cultivators have to engage his own family members from time to time for different operations. Human labour cost comprises of wages actually paid to hired labour, imputed value of labour put in by the family members. Human labour is measured in man days. One man days consists with 8 hrs. The female working days were converted in man days by multiplying it with 0.75 to have man equivalent days

B) Irrigation charges

Irrigation was through well and lift. The amount spent on the maintenance of electric motor for irrigating the crop, the depreciation and the hours of used were considered for estimating the irrigation charges in case of well irrigation. In case of lift irrigation the actual irrigation charges paid by cultivators were taken into account. In case of establishment cost irrigation charges were more due to it comprises of cost of drip irrigation system implemented.

C) Land revenues, cesses and taxes

This cost includes land revenue and other relevant taxes and cesses, which were actually paid by cultivators.

D) Depreciation on implements, machinery and farm buildings

Farm assets like implements and farm building were evaluated at the prevailing market prices taking into consideration the condition of assets for the current year was calculated using straight line method. For which the present value and the remaining useful life of assets was considered.

E) Interest on working capital

Interest on working capital was charged at the rate of 10 per cent per annum working capital includes cash or kind expenses incurred during the period of cultivation.

F) Bullock labour

Bullock labour cost was calculated by considering the actual hired charges paid by the farmers.

G) Machine labour

In case of owned machines, cost was evaluated on the basis of hired charges prevailed in the village and in case of hired machines as per the actual amount paid.

H) Seed

In case of seed purchased from the market or from the other cultivators, the actual price paid was ascertained and charged.

I) Manure

The cost of farmyard manure or compost produced on the farm was evaluated at the rates prevailed in the village. The cost on account of manures purchased was accounted as the actual price paid by cultivator.

J) Fertilizers

The fertilizers were evaluated at the actual price paid by farmer.

K) Insecticides and pesticides

The insecticides and pesticides expenses were considered as the actual price paid by cultivators.

L) Interest on fixed Capital

Interest on present value of fixed assets (excluding land) such as farm building, implements and machinery, irrigation structure and equipment and livestock (only draught animals) was charged the rate of 6 percent.

M) Rental value of land

This cost includes the estimated rental value of own land. It was evaluated at the rate of 1/6 of the value of gross output minus the land revenue.

3.6 ANALYSIS OF DATA:

The study includes various aspects viz. input use, cost of returns for crop production, productivity of the crop in relation to farm size. The data collected was analyzed in accordance with the different size group of holdings by adopting both tabular and statistical methods of analysis.

The cost and returns of ginger production for sample farms were estimated on per farm and per hectare basis for different size groups of holdings. Simple statistical and arithmetic tools like arithmetic mean, percentage, ratios and frequency distribution of production were used in farm management studies.

3.6.1 Management factors influencing the productivity of ginger

An attempt was made to study contribution of management factors in the productivity of ginger. The same was studied with the help of Cobb-Douglas production function. The following type of production function was fitted to estimate the contribution of various parameters of ginger production technology in productivity of ginger.

The data obtained was analyzed group wise and fitted in suitable tabular formats. Regression analysis was used for the data and Cobb-Douglass type production function was fitted to input-output data to study the input efficiency for the ginger crop.

The Cobb-Douglas production function is used for the present investigation as it studies the resource productivity to give the specific diminishing, increasing and constant returns.

The Cobb-Douglas production function is given as follows,

$$Y = a X_1^{b1} X_2^{b2} X_3^{b3} X_4^{b4} X_5^{b5} X_6^{b6} \text{ - - - - - - -} e_i$$

In this function Y is dependent variable while $x1^{b}$'s are independent variables. The 'a' is constant representing intercept of production function and b_i's are regression coefficients of respective resource variables. The regression coefficients obtained from this equation are also elasticity's of production which remain constant through out the relevant ranges of input. The sum of regression coefficient indicate the nature of return to scale.

This function can be transformed into linear function when expressed in logarithmic form as,

$$\text{Log } Y = \text{Log } a + b_1 \text{ Log } X_1 + b_2 \text{ Log } X_2 + b_3 \text{ Log } X_3 + b_4 \text{ Log } X_4 + b_5 \text{ Log } X_5 + b_6 \text{ Log } X_6 + \text{- - - - - - - - - - + Log } e_i$$

The Cobb-Douglas production function for following independent resource variables was estimated,

$$Y = a X_1^{b1} X_2^{b2} X_3^{b3} X_4^{b4} X_5^{b5} X_6^{b6} \text{ - - - - - - -} e_i$$

Y = Gross income in rupees

X_1 = Seed (qt)

X_2 = Labour in days

X_3 = Bullock pairs day

X_4 = Fertilizers

X_5 = Plant protection

X_6 = Irrigation

e_i = Error term

a = Constant

b_1, b_2, b_3, b_4, b_5 b_6 = Coefficients of Regression

The significance of the coefficient of each variable of above function were tested by using 't' test of chosen level of significance.

The goodness of fit was judged on the basis of coefficient of multiple determination (R^2) and relevant 'F' test was carried out.

3.6.2 Estimation of Marginal Product and Marginal Value Products:

In order to determine whether a particular resource is used optimally, the marginal value produce and opportunity cost of one unit of the resource were compared. The marginal value produce was obtained by multiplying the marginal product by the price of the product. Wherever the ratio of marginal value product to opportunity cost was more than unity, the resource is considered to be employed.

The marginal products were calculated at the geometric mean levels of the variables by using the following formula.

$$\text{Marginal Product of input} = MVI(Xi) = b_i = \frac{\bar{Y}}{\bar{X}_i}$$

Where,

$\bar{y}$ = Geometric mean of output

$\bar{X}_i$ = Geometric mean of the independent variables.

b_i = The regression coefficient of the independent variables.

The marginal value product of each resource was calculated by multiplying the marginal product of the resource by the price of the product.

The formula used for the purpose was as under :

$$MVP(Xi) = b_i \times \frac{Geometric\ Mean(Y)}{Geometric\ Mean(X_i)} \times P_y$$

Where,

b_i = Elasticity of production of i^{th} input.

P_y = Price of that product

CHAPTER IV

RESULT AND DISCUSSION

Page No. 30-38

CHAPTER IV

RESULTS AND DISCUSSIONS

The present investigation focuses majority on the analysis of production and marketing of ginger in Beed district of Marathwada region of Maharashtra State. The chapter presents the results in line with the objectives of the study under the following headings:

4.1 Pattern of input use in ginger cultivation

4.2 Cost of cultivation

4.3 Resource Use Efficiency in the Production of ginger

4.4 Path analysis

4.5 Ratio of marginal value product (MVP) to marginal factor cost (MFC)

4.6 Marketing Channels for ginger

4.1 Pattern of input use in ginger cultivation:

The input use pattern in ginger cultivation is presented in Table 4.1. The farmers engaged on an average 439.49 man days of human labour. There was more requirement of female labours than male labours for cultivation of ginger. Similarly, farmers engaged 34.10 pair days of bullock labour on the farm. Farmers used 13.09 quintals of seed for sowing of one hectare area which is much less than recommended seed rate of 19 quintal per hectare. The farmers applied on an average, 9.80 tractors of manures, which is more than the recommended dose of 6 tractors per hectare. The use of fertilizers was 398.91 kg per hectare (184.86 kg N/ha, 207.68 Kg P/ha and 6.37 kg K/ha) by farmers was found to be higher than recommended dose. In the case of output, farmers obtained relatively higher yield of 94.23 quintals per hectares.

Table 4.1: Pattern of input use and output of ginger cultivation (Per hectare)

Sr. No.	Items	Units	2007-08
1	Area under study	Hectares	18.36
2	Rhizome sets	Quintals	13.09
3	Bullock Labours	Pair days	34.10
4	Human Labours	Man days	439.49
	Male		188.74
	Female		250.65
5	Manure	Tractors	9.80
6	Fertilizers		
	N	Kg	184.86
	P	Kg	207.68
	K	Kg	6.37
7	Plant Protection		
	Endosulphan	Lit	2.5
	Sever	ml	242.37
	Bavistin	gm	149.78
8	Average Yield	Quintals	94.23

4.2 Per hectare cost of cultivation of ginger

The ginger cultivation being a commercial activity under taken by the cultivators. The use of different inputs was scrupulously followed by them. As a result, the expenditure on labour, seed, irrigation, fertilizer and manures is very high resulting into cost of production.

Item wise details of per hectare cost of production of ginger have been presented in Table 4.2.

Table 4.2.1: Per hectare cost of cultivation of ginger (Rs. / ha.)

Sr.No.	Items	Cost (Rs)	% with cost 'C'
1	Human Labours	18880.79	12.45
2	Bullock Labours	11211.58	7.40
3	Rhizome sets	38070.83	25.11
4	Manures	11178.57	7.37
5	Fertilizers	6081.12	4.01
6	Plant Protection	562.39	0.37
7	Land Revenue	49.00	0.03
8	Irrigation Charges	2514.88	1.66
9	Depriciation	1089.00	0.71
10	Interest on working capital @ 10 per cent	4427.46	2.92
11	**Cost A**	**94065.62**	**62.05**
12	Rental Value of Land	43450.50	28.66
13	Interest on fixed capital @ 6 per cent	5732.35	3.79
14	**Cost B**	**143248.50**	**94.49**
15	Family Labour	8344.70	5.50
16	**Cost C**	**151593.20**	**100.00**
17	**Ginger yield (qt / ha)**	**94.23**	-
18	**Total Value of ginger yield**	**260703**	-

The cost incurred on seed was higher amounting to Rs.38070.83/ha (25.11 % of Cost C) followed by labour Rs. 18880.79/ha (12.45 % of

Cost C), bullock labour (7.40 % of cost C) and Manures (7.37% of Cost C). The cost incurred on fertilizer, plant protection and irrigation were Rs.6080.12 (4.01% of Cost C), Rs.562.39 (0.37% of Cost C) and Rs.2514.88 (1.66% of Cost C) respectively. The total cost A was Rs.94065.62 (62.05 % of Cost C). The yield of ginger obtained was 94.23 q / ha.

Cost benifit ratio:

The cost benefit ratio for cost A, cost B and C were also presented in Table 4.2.2 and it was observed that cost benefit ratios at all the cost were higher. The net returns received for ginger cultivation were Rs.166637.38, Rs. 117454.50 and Rs.109109.80 for Cost A, Cost B and Cost C respectively. The cost benefit ratio with Cost A, Cost B and Cost C were 1:2.77, 1:1.81, and 1:1.71 respectively. Similar results were also obtained by Killedar *et al* and Gupta and Kumar (2004).

Table 4.2.2: Benefit cost ratio:

Sr. No.	Item	2007-08
1	Ginger yield (qt / ha)	94.23
2	Total Value of ginger yield	260703
3	Net Profit with cost A	166637.38
4	Net Profit with cost B	117454.50
5	Net Profit with cost C	109109.80
6	Cost Benefit ratio with cost A	1 : 2.77
7	Cost Benefit ratio with cost B	1 : 1.81
8	Cost Benefit ratio with cost C	1 : 1.71

4.3 Resource Use Efficiency in the Production of ginger:

The details of the production function estimates for ginger production are in Table 4.3 and co-efficient of determination (R^2) was 0.7223 which indicating that the variables included in the function have explained 72.23 per cents of variation in the ginger yield.

Table 4.3: Production function estimates in ginger cultivation

variable	Regression coefficient (b_i)	SE (b_i)	't' value
Intercept	5.8046**	1.8387	3.157
Labour	0.2966	0.1883	1.575
Bullock pair	0.1885*	0.0747	2.524
Seed	0.3094*	0.1272	2.433
FYM	0.0364*	0.0144	2.525
Fertilizer	0.0208	0.0343	0.607
Plant protection	0.0022	0.0328	0.067
Irrigation	-0.2521*	0.1150	2.193

* Significant at 5 % level of significance

** Significant at 1 % level of significance

It is observed that bullock pair, seed and FYM inputs had positive and significant influence on the ginger yield while irrigation had negative and significant influence on ginger yield. It is worth noting that the influence of labours and plant protection chemicals were non-significant.

The output elasticity (2.1024) was more than one, indicating an increasing return to scale. This meant that if all the inputs were increased by one per cent, the yield of ginger would increase by 2.1024 per cent.

On the contrary, the sum of regression coefficient found to be increasing returns to scale (0.6020).

4.4 Path Analysis:

Coefficient of correlation, direct and indirect effects of inputs on ginger yield were estimated and presented in Table 4.4 and Fig 2. From Table 4.4 it was observed that coefficient of correlation of seed and FYM with ginger yield were positive and significant. This indicates that these two inputs had very good impact in increasing yield levels on farmer fields. In partitioning these coefficients of correlations into direct and indirect effects using the method of path analysis revealed that bullock pair, seed and FYM had direct and positive effect on ginger yield while irrigation showed negative direct effect on ginger yield.

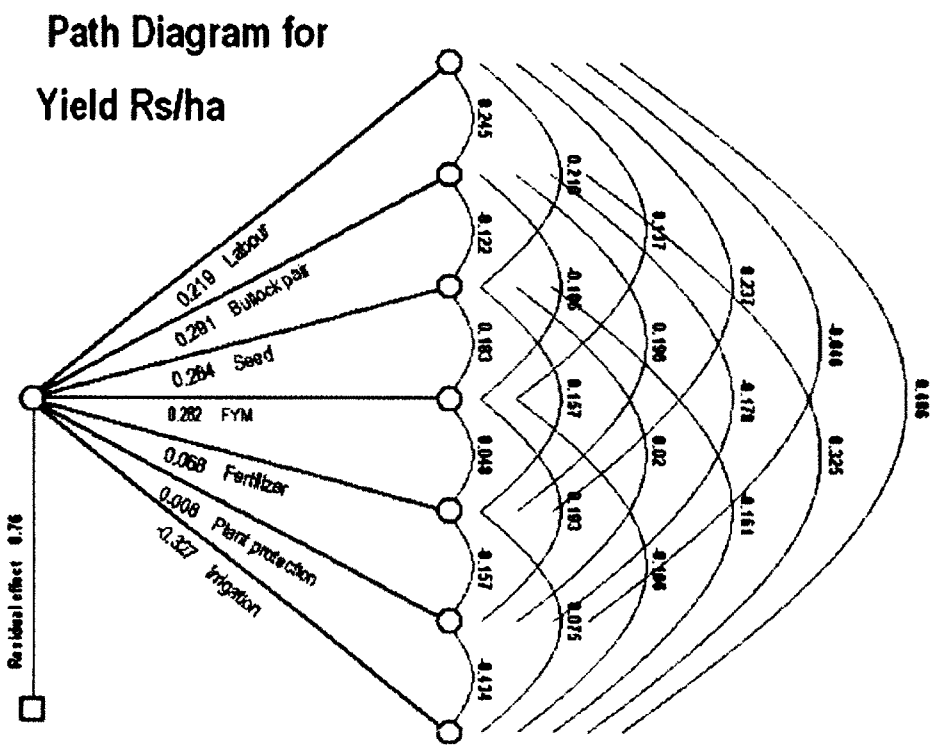

Fig. 2: Path diagram

Table 4.4: Direct and indirect effects of inputs on ginger yield estimated through Path analysis

Inputs	Labour	Bullock pair	Seed	FYM	Fertilizer	Plant protection	Irrigation
Labour	**0.2192**	0.0538	0.0474	0.0301	0.0520	-0.0101	0.1065
Bullock pair	0.0713	**0.2907**	-0.0356	-0.0308	0.0570	-0.0518	0.0945
Seed	0.0613	-0.0347	**0.2839**	0.0520	0.0445	0.0057	-0.0458
FYM	0.0387	-0.0299	0.0517	**0.2821**	0.0136	0.0545	-0.0468
Fertilizer	0.0162	0.0134	0.0107	0.0033	**0.0684**	-0.0107	0.0052
Plant protection	-0.0004	-0.0015	0.0002	0.0016	-0.0013	**0.0083**	-0.0036
Irrigation	-0.1591	-0.1064	0.0528	0.0543	-0.0247	0.1421	**-0.3275**
Coefficient of Correlation	0.247	0.185	0.411**	0.393**	0.209	0.138	-0.217
Partial R^2	0.0542	0.0539	0.1167	0.1107	0.0143	0.0012	0.0712

4.5 Ratios of marginal value product (MVP) to marginal factor cost (MFC):

The ratios of marginal value product (MVP) of various resources to their respective marginal factor cost (MFC) were computed for ginger farmers and are presented in Table 4.5.

The ratio of MVP to MFC was greater for bullock pair (4.83), followed by labour (2.61), seed (1.97), FYM (1.90), plant protection (1.37) and fertilizers (1.03). This clearly indicates that there is scope for increasing use of bullock labours and human labours to increase the

production. Also, the yield can be increased by increasing seed rate, manures and plant protection measures. The farmers had used the fertilizers at optimum level. The irrigation is only item which was used in excessive quantities and it had negative impact on production.

Table 4.5: Ratios of MVP to MFC in ginger cultivation

Sr. No.	Items	Ginger Farmers
1	Human Labours	1:2.61
2	Bullock Labours	1:4.83
3	Seeds	1:1.97
4	Manures	1:1.90
5	Fertilizers	1:1.03
6	Plant Protection	1:1.37
7	Irrigation	1: -27.05

4.6 Marketing channels for ginger:

To identify different marketing channels in Beed district, sampled ginger growers and traders were interviewed and following marketing channels were observed.

Table 4.6 Marketing channels observed for ginger

Marketing Channel	Marketing Channel
Channel - 1	Producer – Retailer - Consumer
Channel - 2	Producer – Wholesaler – Retailer – Consumer
Channel - 3	Producer – small traders – Retailer – Consumer

Channel – 1:

Under this channel bulk of the produce (55.00 per cent) are being disposed. Predominance of this channel in marketing of ginger in Beed district was observed. As majority of farmers disposed their produce through this channel near by taluks market like Ambajogai.

Channel – 2:

This is second important marketing channel (38.00), which is mainly governed by few commission agents. They use to pass the produce to wholesale market at Pune.

Channel – 3:

In this channel small quantity of produce (7.00) is being carried out to secondary market (Neknur, Parli etc) in anticipation to get higher prices.

CHAPTER V

SUMMERY AND CONCLUSION

CHAPTER V

SUMMARY AND CONCLUSION

Ginger is the rhizome or rootstock of herbaceous perennial *Gingiber Officinale*. The aroma of ginger is pleasant and spicy, its flavour and taste penetrating, pungent and slightly bitter.

Ginger is used as taste maker, flavorant, and appetizer and in drug in fresh and dried or powdered form. It is used in pickles, chutneys and curry pastes and the ground dried root is a constituent of many curry powders. Tender young ginger can be sliced and eaten as a salad. Sometimes the roots will produce green sprouts which can be finely chopped and added to a green salad. In the West, dried ginger is mainly used in cakes and biscuits, especially ginger snaps and gingerbread. Ginger is also used in puddings, jams, preserves and in some drinks like ginger beer, ginger wine and tea. Pickled ginger is a delicious accompaniment to satays and a colorful garnish to many Chinese dishes. Preserved ginger is eaten as a confection, chopped up for cakes and puddings, and is sometimes used as an ice cream ingredient.

Ginger is most commonly known for its effectiveness as a digestive aid. By increasing the production of digestive fluids and saliva, ginger helps in relieve indigestion, gas pains, diarrhea and stomach cramping. The primary known constituents of Ginger Root include gingerols, zingibain, bisabolenel, oleoresins, starch, essential oil (zingiberene, zingiberole, camphene, cineol, borneol), mucilage, and protein. Ginger root is also used to treat nausea related to both motion sickness and morning sickness. Ginger's anti-inflammatory properties

help relieve pain and reduce inflammation associated with arthritis, rheumatism and muscle spasms. Ginger's therapeutic properties effectively stimulate circulation of the blood, removing toxins from the body, cleansing the bowels and kidneys, and nourishing the skin. Other uses for Ginger Root include the treatment of asthma, bronchitis and other respiratory problems by loosening and expelling phlegm from the lungs. Ginger Root may also be used to help break fevers by warming the body.

Therefore, in the present study a detailed investigation pertaining to input use, cost of cultivation and marketing practices was proposed with the specific objective outlined below.

OBJECTIVES

1. To study the cost and returns of ginger production.

2. To study the input efficiency in ginger production.

3. To identify the marketing channels.

Findings of the study:

The most important findings of the study are summarized below:

1. The input use pattern in ginger cultivation revealed that the farmers engaged on an average 439.49 man days of human labour. There was more requirement of female labours than male labours for cultivation of ginger. Similarly, farmers engaged 34.10 pair days of bullock labour on the farm. Farmers used 13.09 quintals of seed for sowing of one hectare area which is much less than recommended seed rate of 19 quintal per hectare. The farmers applied on an average, 9.80 tractors of manures which can be increased to increase the ginger yield. The use of fertilizers was 398.91 kg per

hectare (184.86 kg N/ha, 207.68 Kg P/ha and 6.37 kg K/ha) by farmers which was found to be an optimum dose. In the case of output, farmers obtained relatively higher yield of 94.23 quintals per hectares. The cost benefit ratio with Cost A, Cost B and Cost C were 1:2.77, 1:1.81, and 1:1.71 respectively.

2. Co-efficient of determination (R^2) was 0.7223 which indicating that the variables included in the function have explained 72.23 percent of variation in the ginger yield. The output elasticity (2.1024) was more than one, indicating an increasing return to scale. This meant that if all the inputs were increased by one per cent, the yield of ginger would decrease by 2.1024 per cent. On the contrary, the sum of regression coefficient found to be increasing returns to scale (0.6020).
3. In partitioning these coefficients of correlations into direct and indirect effects using the method of path analysis revealed that bullock pair, seed and FYM had direct and positive effect on ginger yield while irrigation showed negative direct effect on ginger yield.
4. The ratio of MVP to MFC was greater for bullock pair (4.83), followed by labour (2.61), seed (1.97), FYM (1.90), plant protection (1.37) and fertilizers (1.03). This clearly indicates that there is great scope to increase the use of inputs.
5. The marketing channels mostly used in Beed district were Producer – Retailer – Consumer, Producer – Wholesaler – Retailer – Consumer and Producer – small traders – Retailer – Consumer.

Policy Implications:

The implications that have emerged from this study are summarized below:

1) The yield increasing technology will enhance the marketed surplus of ginger. The technology for improving better keeping quality, better transportation facilities, biotechnology for seed economy and quick procurement facility may enhance marketed surplus.
2) The Farmers should be trained in value addition of ginger in the form of 'Sonth' to get high prices in the region.
3) Distant trade of ginger needs Government intervention with proper price policy.
4) The exploitative nature of ginger market needs regulation of marketing system in case of transportation, storage, etc for attaining marketing efficiency in terms of form, time, space and possession utility.

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Page No. I-V

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APPENDIX

Page No. A-E

Table 1 Questionnaire for the collection of data

Economics of Ginger Production in Beed District (MS)

Name of Student : Mr. Swapnil Kamble

Name of Research guide : Dr. A.M. Degaonkar
Associate Professor. College of Agriculture.
Latur.

Name of Tahsil :-

Name of Village :-

1. Demographic Characteristics
1.1 Name of the Farmer :
1.2 Age of the Farmer
1.3 Education Status : (Year of Schooling)
1.4 Occupation : (a) Main : (b) Subsidiary :
1.5 Family size :

Category	Number	Education				Occupation						Non Farm Income
		Illit.	Pri.	Sec.	Col.	A	B	C	D	E	L	
Male												
Female												
Children												
Total												

A- Agriculture; B- Business; C- Contract; D- Dependent; E- Employee; L- Labour

1.6 Particulars of Land (Acres)

Type of Land	Owned			Leased in		Leased out
	Area	Land Revenue	Rental Value	Area	Rental Value	Area
Dry						
Irrigated						
Garden						
Fallow						
Forest/Barren						
Total						

1.7 Source of Irrigation

Source	No.	Area Irrigated	Year of Construction	Present Value
Open Well				
Tube Well				
Other				

1.8 Live Stock

Type	Heard Size				Yield (lit./day)	Rate
	Present		Before 5 yr.	Before 10 yr.		
	No.	Value				
Cows						
Buffaloes						
Bullock						
Goat						
Other						

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		Illit.	Pri.	Sec.	Col.	A	B	C	D	E	L	
Male												
Female												
Children												
Total												

A- Agriculture: B- Business: C- Contract: D- Dependent: E- Employee: L- Labour

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Tube Well				
Other				

1.8 Live Stock

Type	Heard Size				Yield (lit./day)	Rate
	Present		Before 5 yr.	Before 10 yr.		
	No.	Value				
Cows						
Buffaloes						
Bullock						
Goat						
Other						

2.1 Cropping Pattern

Season	Crop	Area	Variety	DOS	Total Prod.(qt)	Sold (Rs./qt)	App. Cost/ac

2.2 Previous season yield of Ginger

Particulars	2004-05	2005-06	2006-07
Areas (Acres)			
Total Production			
Approximate Expenditure			
Price Received Rs./qtls.			

3.1 Land Preparation for Ginger

Operation	Bullock Pair		Human Labour			Tractor plough		Total cost
	No.	Rate	Family	Hired	Rate	Hrs.	Rate	
Deep Ploughing								
Ploughing								
Harrowing								
Ridges & Furrows								
Any other								

3.2 Seed & Sowing

Variety	Area	DOS	Source (Cash/Credit)	Spacing	Seed Rate	Price Rs./qt	Family Labour		Hired Labour	
Total Sowing cost (Only labour cost): Rs.										

3.3 Source of seed and reason for purchase : (Owned/Purchased)

3.4 Manure and Fertilizers

Type	Method of application	Qty	Value (Rs.)	DAS	Source (Cash/Credit)	Family Labour		Hired Labour		Total cost
						M	F	M	F	

3.5 Intercultural

Operation	Stage (DAS)	Bullock pair		Family Labour		Hired Labour	
		No.	Value	No.	Value	No.	Value
Interculture (Bullocks)							
a)							
b)							
c)							
d)							
Weeding (Manual)							
a)							
b)							
c)							
d)							
Mulching							

3.6 Plant protection

Name of Pest	Period of occurrence (DAS/Month)	Chemical used	Quantity	Price of chemical	Spray cost charges	
					Hired Lab. & Rate	Family Lab.

3.7 Irrigation

No.of Irrigations	
No. Labour	
Total labour charges	
Method of irrigation	
Total irrigation cost (Excluding labour charges) (Diesel / Petrol / Electricity)	
Any other	

4.1 Harvesting Charges

Hired labour					**Family Labour**				**Total Harv. cost**
Bullock	Val.	Male	Female	Val.	Bullock	Val.	Male	Female	

]

4.2 Harvesting and Marketing of Ginger

Operation	No. of time	Month	Contract (Rs.)	Total cost (Rs.)
Harvesting				

Transport				
Marketing				

5.1 Marketing. Transportation and processing constrains
Sale of Ginger during the year.

Particulars	Main Product	By Product	Constrain faced by Farmer
Total Qty. Produced			1) Low rate given by trader
Quantity Retained			2) High transport charges
Family Consumption			3) Low production
1) Seed			4) Storage problem
2) Cattle feed			
3) Kind payments			
4) Other			
Post harvest loss			
Quantity sold (qt.)			Any other (specify)
Period of sale			
Price (Rs./qt)			
Type of market/ sale to			
Reason for selling			
Price (not fair/sati./good)			
Distance (km)			
Transport mode			
Transport cost			
Storage of produce: - Godowns / Own house / any other			

5.2 Do you dispose of the produce (Ginger) immediately after the harvest ? yes/ no
Give reason :
Are you wait for the harvesting ? yes / no. Reason :

5.3 Marketing cost incurred by the farmer

Particulars	Total amount paid by producer	Any other
Quantity of produce sold (Qtls)		
Loading charges		
Transportation cost		
Octroi		
Unloading charges		
Weighing		
Commission		
Market fees		
Miscellaneous		
Total price received		
No. of installment		

Marketing Channel Identified: -

Processing: yes / no

Activities	Cost

6.1 How do you priorities among the activities

Sr. No.	Activity	Priority
1	Fertilizer	
2	Plant Protection	
3	Weeding	
4	Irrigation	
5	Other (Specify)	

7.1 Proposed cropping pattern for next year

Crop	Area	Variety

8.1 Expenditure (Approximately) per Month / Year

- Food :-
- Clothing :-
- Social functions :-
- Education :-
- Medical :-
- Farm maintenance :-
- Electric / Telephone bill :-
- Other

8.2 Details of farm assets owned

Type of asset	Number	Year of purchase	Life span	Present Value (Rs.)
Housing Puckka Kachaa				
Cattle shade				
Dug well / Tube well				
Electric motor / any other				
Tractor / Power tiller				
Bullock cart				
Other farm implements				
Other assets				