ECONOMICS OF PRODUCTION AND MARKETING OF FLOWERS IN PUNE DISTRICT OF MAHARASHTRA

BY

RAUT KISHOR BALASAHEB

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DISSERTATION

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PARBHANI 431 402 (Maharashtra) INDIA

2003

Dedicated

To My

Beloved Parents

Shri Balasaheb H. Raut

&

Sow. Kamal B. Raut

CANDIDATE'S DECLARATION

I, hereby declare that this dissertation

or part thereof, has not been

previously submitted by

me for a degree of

any University.

Place : PARBHANI
Date : 23 / 06 /2003

(**RAUT K. B.**)
Reg. No. 58M/01A

Dr. D.N. Hedgire
Assistant Statistician
Sorghum Research Station
Marathwada Agricultural University,
Parbhani - 431 402 (M.S.) India.

CERTIFICATE-I

This is to certify that ***Shri RAUT KISHOR BALASAHEB*** has satisfactorily prosecuted his course and research for a period of not less than four semesters and that the dissertation entitled **"ECONOMICS OF PRODUCTION AND MARKETING OF FLOWERS IN PUNE DISTRICT OF MAHARASHTRA"** submitted by him is the result of original research work and is .of sufficiently high standard to warrant it's presentation to the examination.

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

Place : PARBHANI
Date : / /2003

(**Dr. D.N. Hedgire**)
Research Guide

CERTIFICATE-II

This is to certify that the dissertation entitled **"ECONOMICS OF PRODUCTION AND MARKETING OF FLOWERS IN PUNE DISTRICT OF MAHARASHTRA"** submitted by ***Shri RAUT KISHOR BALASAHEB*** to the Marathwada Agricultural University, Parbhani in partial fulfilment of the requirement for the degree of ***MASTER OF SCIENCE (Agriculture)*** in the subject of ***AGRICULTURAL ECONOMICS*** has been approved by the student's advisory committee after oral examination in collaboration with the external examiner.

External Examiner

(Dr. D.N. Hedgire)
Research Guide

Members of Advisory Committee:

(Dr. N.D. Pawar)

(Dr. K.D. Phuke)

(Prof. P.R. Waghmare)

(Prof. S.D. Jature)

Associate Dean (P.G.),
College of Agriculture,
M.A.U., Parbhani.

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(RAUT K. B.)

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Introduction

Chapter-I

INTRODUCTION

Flowers have been associated with our social life since ancient time and used for divine purpose. Just a few flowers in the living room will turn a dully day into one filled with warmth and sunshine. Flowers are symbolic of purity, beauty, love, passion and tranquillity. In our country, flowers are sanctified and are commonly used for beauty, aesthetic, religious and in worship in the homes and temples. We are intimately associated with flowers and in all festival occasions, in marriages, religious ceremonies and social functions. Thus, growing of flowers has become part of our daily life not only for joy but now-a-days flowers have become one of the good source of farm income if grown commercially. Farmers are also aware of this fact and started growing flowers like marigold, annual chrysanthemum,. Gladiolus, Tuberose, Gaillardia etc. on large scale.

Flowers play an important role in recreation and keeping the mind in good spirit. The sight of beautiful flowers normally thrills every body. Great many men and women have a basic desire to create something beautiful and one of the growing flowers. Growing flowers is a fascinating hobby where financial aspect plays minor role. Flowers gives pleasure while just watching their colour and shapes. Nature is lovish and artistic in bestowing flowers with numerous shades of colour and hues.

In olden days, flowers were not much of economic importance except religious purpose but with passage of time there has

been great changes in life style of people leading to commercialization of flower growing, rapid development in hotel industry. Flourism industrial establishment has resulted in the demand of floricultural products.

There is good demand for flowers from Europe and Gulf countries. The prices of flowers being remunerative, the returns from flowers are high. Flowers have good export trend and they are good source of earning foreign exchange. As our country is a member of World Trade Organization (WTO) the scope for selling flowers in foreign market is ample. India has earned 26,971,000 US $ during 2000 by export of floricultural products. The demand for flower is rising continuously due to liberalization, increase in standard of living, increase in income level, increase in educational status etc. Metropolitan cities like Mumbai, Calcutta, Chennai and Delhi are the major market places for cut flowers.

The cultivation of flower has become lucrative industry in countries like Netherlands, Columbia, Israel, Italy etc. as result of science based techniques. The Netherlands is the world's largest producer as well as exporter of flowers (62.90 per cent) followed by Colombia (12.40 per cent), Israel (4.10 per cent), Italy (3.20 per cent), Thailand (2.00 per cent) and other countries (15.40 per cent) in the world trade. The major flower importer counties are Germany, USA and UK. Holland (Amster dam) happens to be the world's biggest flower market handling 60 per cent of the world trade.

The per cent share of top five types of flower in the Holland auction market has been as share of rose (30.70 per cent) followed by share of chrysanthemum (20.69 per cent), carnation (10.22 per cent) Tulip (9.80

per cent), Lily (8.30 per cent) and other flowers (20.29 per cent) in total turn over. Flower consumption in development countries is also growing at the rate of 15 per cent every year. The current value of world floriculture product is estimated at about US $ 50 billion (Prasad and Srivastava , 1997)

In India, abundant sunshine, plenty of land, availability of cheap and skilled manpower are our strength for cultivation of flower in different region of the country. In our country, the total area under floriculture was 88,607 hectare in 2000 (Indian Horticulture, Jan.-March, 2002). Among the states, Karnataka has the highest area under flower cultivation (20,801 hectares) followed by Tamil Nadu (18120 hectares), Andhra Pradesh (18,087 hectares), West Begnal (13,227 hectares). In India, commonly Jasmine, rose, tuberose, gladiolus, aster, carnation chrysanthemum, marigold etc. are cultivated on large scale. The flowers are grown mainly for traditional and industrial purpose in recent years. However, commercial floriculture products are being taken up by private companies to produce cut flower for export purpose.

In India, domestic markets for flower are namely, Delhi for rose Jasmine and marigold, Banglore for rose and Jasmine, Srinagar for gladiolus, Pune for rose and jasmine and Chandigarh for rose. Commercial floriculture industry in the country is export oriented. In addition to natural advantages, our location is close to the Gulf countries and relatively close to Russian market. In the south East Asian countries like Japan Singapore, Hong-Kong and South Korea, the floriculture market is expected to develop fast in the years to come. It is worth mentioning here that export of flower neither easy nor economical particularly in highly competitive international

market. Exports have to take care of packing, transportation costs, auction cost and cost of agent. The grower also has to pay commission to the auction proceeds to the auction agent.

Agriculture and Processed Food Products Development Authority (APEDA) assists the entrepreneur, by providing financial assistance for post harvest facilities, transport and export promotion.

The important domestic markets for flower in the state are Pune, Mumbai, Nasik. The important domestic market for flower in the sate has 25 export oriented projects of flower in greenhouse with investment of Rs. 400 crore, the state is exporting, however, to America, Netherlands, Japan, Germany, South Korea mainly. Maharashtra is the major producer as well as exporter of cut flowers in the country.

Floriculture has become an important agri-business contributing to national economy and development in sub-urban and rural area. In India, during the recent years there has been an appreciable rise in the growth of floriculture. During last five years, there has been a thrust on export of cut flowers , especially roses, surplus of which has also entered in domestic market. As a result of these developments several florist shops have come up in big cities in hotel and commercial/shopping centres besides numerous street vendors selling flower and plants.

Status of flower

Table 1.1. State wise area and production of flowers in India during 1998-99 to 1999-2000.

States	Area (ha)		Production			
	1998-99	1999-2000	1998-99		1999-2000	
			Loose flowers (tonnes)	Cut flowers (lakh no.)	Loose flowers (tonnes)	Cut flowers (lakh no.)
Andhra Praeesh	8357.00 (11.29)	18087.0 (20.41)	32000 (7.64)	---	126609.00 (24.86)	---
Delhi	3450.00 (4.66)	3450.00 (3.90)	21007 (5.12)	---	21007.00 (4.13)	---
Haryana	2250 (3.04)	2250.00 (2.54)	40500 (9.67)	760.00 (11.82)	40500.00 (7.95)	760.00 (11.17)
J & K	75.00 (0.10)	42.00 (0.047)	46 (0.014)	5.80 (0.090)	7.00 (0.0014)	17.40 (0.26)
Karnataka	20780.00 (28.10)	20801.00 (23.47)	124290 (29.67)	---	124440.00 (24.43)	---
Madhya Pradesh	1956.00 (2.64)	1387.00 (1.57)	1170 (0.28)	---	832.00 (0.16)	---

Mahar-ashtra	4979.00 (6.73)	6600.00 (7.45)	38582 (9.21)	---	28336.00 (5.56)	---
Rajasthan	2353.00 (3.20)	2353.00 (2.66)	2389 (0.57)	---	2389.00 (0.47)	---
Tamil Nadu	17750.00 (24.00)	18120.00 (20.44)	133125 (31.78)	---	142250.00 (27.94)	---
West Bengal	10500.00 (14.20)	13227.00 (14.63)	17685 (4.22)	5312.00 (82.65)	14644.00 (2.88)	5678.00 (83.43)
Others	1522.00 (2.05)	4390.00 (2.95)	7564 (1.80)	350.20 (5.45)	8179.00 (1.61)	350.00 (5.14)
Total	73972.00 (100)	88607.00 (100)	418848 (100)	6428.20 (100)	509193.60 (100)	6806.00 (100)

1.1 Area and production of flowers in India

In total area under floriculture, Karnataka is having maximum area 20801 ha (23.47) per cent) followed by Tamil Nadu 18120 ha (20.44 per cent), Andhra Pradesh 18087 ha (20.41 per cent), while Jammu and Kashmir is having lowest area 42 ha (0.047 per cent).

While in production, Tamil Nadu having 142250 tonnes flower production (27.94 per cent) followed by 126609 tonnes (24.86 per cent), 124440 (24.43 per cent). In Maharashtra, area under floriculture was 6600 ha (7.45 per cent) of total area in India having production 28336

tonnes (5.56 per cent). India was having 88607 ha area under floriculture with production of 509193.60 tonnes in 1999-2000.

Table 1.2. Area, production and productivity of different flowers in Maharashtra

Crop name	Area (ha)	Production (tonnes)	Average yield (t/ha)
Rose	1019	2586	2.54
Jasmine	503	1585	3.15
Gaillardia	569	982	1.73
Aster	148	506	3.42
Marigold	1892	7288	3.85
Tuberose	198	581	2.93
Chrysanthamum	675	2907	4.31
Gladiolus	177	740	4.18
Carnations	8	6	0.75
Kagda	231	617	2.67
Jai	4	3	0.75
Zinia	210	625	2.98
Other	375	1605	4.28
Total	6009	20031	

Total area under floriculture in Maharashtra was 6009 ha. Total production was 20031 tonnes. In Maharashtra maximum area under marigold i.e. 1892 ha followed by Rose (1019 ha) and Chrysanthemum (675 ha) while production of merigold, rose and Chrysanthemum were 7288 tonnes, 2586 tonnes and 2907 tonnes, respectively.

Table 1.3. Year wise export of Indian floriculture

Year	Value (Rs in crores)
1991-92	14.80
1992-93	14.91
1993-94	18.84
1994-95	30.84
1995-96	60.14
1996-97	63.40
1997-98	86.74
1998-99	105.96
1999-2000	189.09
2000-2001	190.63
2001-2002	179.97

(Source : APEDA Handbook of Export)

In the year 2000-2001, India exported flowers of Rs. 190.63 crores followed by 1999-2000 (Rs. 189.09 crores) and in the year 2001-2002 it was Rs. 179.97 crores, while in the year 1991-92 it was Rs. 14.80 crores.

Favourable climatic condition, availability of transport and good demand for flower provides an ideal situation for flower cultivation in Maharashtra. The state has about 6600 hectares are under flower crops. The hectarage is mostly concentrate around town and cities like Ahmednagar, Akola, Amravati, Aurangabad, Jalgaon, Kolhapur, Mumbai, Nagpur, Nanded, Nasik, Pune, Sangli in these districts. In Pune district, floriculture area is concentrated under Rajgurunagar, Talegaon, Manchar, Haveli, Baramati, Maval. The important flowers grown are roses, tuberose, merigold, chrysanthemum, gladiolus, carnation orchids etc. majority of farmers are very familiar to grow rose, tuberose, gladiolus, due to their demand on one side and other side is favourable climatic conditions to grow them. Rose it's popular species (*Rosa domance*) belongs to family namely rosaceae and tuberose (*Polianthes tuberosa*) belongs to family amaryllidaceae. Gladiolus (*Gladiolus sp.*) belongs to family Tridaceae

In Pune city, Shivaji market Gultekdi is the main market for flowers. Throughout year different flowers are purchased and sold in this market. Commission agent sell flowers in wholesale or retail. In production of flower investment, cost and returns as well as resource productivities are important aspects with regards to flower growers. Marketing cost and margin of flower are related to commission agent and retailer. Consumer's preference help for planning of production and marketing of flowers. Therefore the efforts has been made to study the economics of production and marketing of flowers with following objectives :

1. To study the socio-economic status of flower cultivating families.
2. To work out the cost of cultivation of selected flowers.
3. To determine resource productivity and resource efficiency of flowers.
4. To find out the marketing margin and producer's share in consumer's rupee through various marketing channels.
5. To study the export of flowers.
6. To study the constraints and suggestions of flower growers.

Utility :

The present study will be useful to the cultivators, students research workers. Policy makers etc. It will be also help to the industry owners.

Review of Literature

Chapter-II

REVIEW OF LITERATURE

With the view to prosecuting the present research study with complete understanding it was necessary to study economics of flower production. Since it has attracted the attention of research workers in recent years, one of the problem reasons for this is the high profitability of this enterprise as compared to many other crop enterprise. Research studies on economics of flower production carried out in different parts of the country were reviewed in order to get an insight of the problems under study. Some of these studies have bearing on the present investigation have been reviewed. The review of work done as a guideline to research worker and institutions and same were discussed.

The selected references are collected and are grouped under the following sub-headings.

2.1 Studies on cost of cultivation

2.2 Studies on resource productivity in flower garden

2.3 Studies on marketing cost and marketing channels

2.4 Studies on marketing margin and price spread

2.5 Studies on constraints and suggestion of flower growers

2.1 Studies on cost of cultivation :

Jha (1967) analysed the data collected in Ahmednagar and Nashik districts with variables as output in rupees, cropped land in acres, human labour in man days, bullock labour, in days and value of working capital in rupees. He observed that the elasticities in respect of human

labour, working capital were higher in bigger sized farmers chain than those in smaller.

Phadnis, Kunte and Bhujbal (1970) examined commercial cultivation of chrysanthemum at the college of agriculture, Pune. The estimated expenditure and receipts from one acre of planted chrysanthemum were Rs.1815 and Rs.1185 per acre in addition to the above receipts. Those growers who took mixed crop realised an additional income of about Rs.500 per acre. The August planted crop gave 25 percent more income to the grower.

Thore *et al.* (1970) studied cultivation of tuberose at the Agricultural College, Pune. The study revealed that the net returns from tuberose ranged between Rs.2000 to Rs.2025 per years per acre when tubers were removed from field after three years the output would be 25 percent. The growers of tuberose would get additional returns Rs.375 per acre out of the sale of tuberose.

Patil (1973) studied the cultivation of roses around Pune city. He observed that 6 to 7 thousand plants planted in an acre were yielded 30 to 35 thousand flowers per year. According to the price of Bombay and Pune market the returns would be Rs. 6 to 7 thousand of growers. Besides sale of flower he could get an additional income from rose cultivation.

Sindhu and Bose (1973) studied in Punjab and have given general statement regarding tuberose for its economic use besides, preparing the most artistic garlands. The study revealed that the tuberose flowers is a good of essential that can be used for preparation of various

perfumes and cosmetics, moreover, tuberose has got a very good export potential because now a days it is more popular than ever in Europe. Since, it does not flowers in winter in temperate constraints.

Anonymous (1974-76) studied the economics of production and marketing of roses growers from Pune and Nashik districts. The per hectare total cost of production of roses came to Rs.24185.66. The most expensive item of cost was labour charges which was Rs. 11916.51 per hectare. The main produce was 20278.71 dozens valued at Rs.52015.94 and profit was Rs.27830 per hectare. The marketing cost was Rs. 13106.36 including packaging transport, hamali, commission and the profit per hectare as Rs.14723. Inspite of high cost of cultivation high marketing cost and high degree of risk and uncertainties, the production of rose has thus proved to be a profitable commercial activity.

Chattarjee and Bose (1975) studied the economics of rose cultivation of roses for export and the amount of net profit a grower is expected to earn therefrom. The export of roses has been handicapped mainly because organised efforts for cultivation of export quality plants and flower have yet been made and the cost of production and quantum of profit have not been worked out. Location is an important factor influencing growth of flowering of plants and also for easy and quick transport of perishable plant the gross income during 5½ years and net income per year was Rs. 57,426 and Rs.10441 per acre, respectively.

Rural (1976) studied the economics of production and marketing of the selected flowers. He revealed that the total marketing cost and the probable estimated losses were 15.91 and 44.44 percent per kg of tuberose and merigold flowers respectively, eventhough care is taken to transport the produce quickly. He also observed the channel of track viz.

i) Producer- Hundekaries- agent cum wholesaler- consumer for marketing of tuberose.

ii) Producer- small merchant- hundekari commission agent cum whole saler- retailer- consumer in marketing of worker zinnia and merigold flowers.

In case of merigold producer's share in consumer's rupee was extremely low i.e. 14.96 percent while profit of wholesaler and retailer was very high is 23.69and 27.68 percent respectively.

Suryawanshi and Kahage (1979) studied the production and marketing of roses in western track of Maharashtra. The share of different intermediaries in the consumer's rupee worked out 19.01, 16.12 and 8.47 percent for wholesaler, retailer and commission agents respectively. This shows the chain of intermediaries received exorbitant profit in the

marketing of roses while the growers received smaller share in consumer's rupee.

Mahandule (1983) studied production and marketing of chrysanthemum in Ahmednagar district revealed that, the overall per hectare yield of chrysanthemum was 8570.25 kg required 120.96 male labour days 648.15 female labour days for cultivation of chrysanthemum per hectare. Returns from chrysanthemum was Rs. 17813.25, net profit per kg was Rs.0.75. He found that channel of marketing was producer-hundekari-commission agent cum wholesaler- retailer- consumer. His study revealed that the significant items of cost was packaging charges contributing to the extent of 34.89 percent of total marketing cost.

Subrahmanyam (1989) studied the economics of production and marketing of roses in Karnataka. He collected data on economics of production and marketing of rose from the talukas around Banglore city for 1987-88 . Rose as a perennial crop with an economic life span of 10 years required initial investment of Rs.57,000 per hectare and from second year onwards around Rs.53,000 to 56,000 per hectare Rose crop gave good return of nearly Rs.36,000 to 57,000 per hectare over maintainance cost. It gave a benefit cost ratio of 1.8 with 2-3 years pay back period.

Lin and Chi (1990) studied analysis of production cost and returns for newly developed cut flowers grown under protection in Taiwan. It is revealed from the study that, production costs and income were in Taiwan. Production costs were the highest for four cut flowers grown under protected cultivation in Taiwan. Production costs was the highest for lilies. There also gave the highest income. Gross revenue was the lowest

for *Gypsofhila paniculata* but due to low production costs, net revenue was higher with this species than for carnations or lilies grown in spring. The production cost of *G. paniculata* were similar, but the income varied. The major production costs were labour followed by seed materials and facility investment was 1-2 years for most of crops. Suggesting that protected cultivation was profitable.

Hagdu *et al.* (1992) studied the on emerging cut flower industry in Bolivia. Cut flower (primarily rose) production in Bolivia is a growing economic activity with sales increasing greater than ten-fold in the past 6 years. Inspite of this growth, Bolivian producers faced considerable difficulties. Small and medium growers (production area < 6000 m^2) experienced lower costs than large producer (production >6000 m^2) but the price theory received was twice higher than cost they had incurred.

Jalunska (1995) highlighted some aspect of changes in polish floriculture in 1980-92. In 1992 he observed that there was decrease in area of 16 percent in the private and 54 percent in the state sector, mainly because of rising cost of production relative of flower prices. Most purchasers bought flowers for other people while some 40 percent were bought for cemeteries. Despite an increased number of people not buying because of rising living cost demand remained elastic and has risen overall since 1983. Factor limiting expansion of the sector included the absence of an organised wholesale market, expenditure of considerable amount of time on relatively low commodity turnover and competition for imports, mainly from Netherlands. Polish producers need to reduce cost and raise quality and output per unit area, while improving standards and quality control

packaging market information providing and objective pricing system all require development.

Balasubramaniam (1996) studied the techno-economic aspect of raising carnation cut flower. He opinioned that the economic liberalization process set in motion has opened immense potential for production of different cut flowers both for export and domestic markets. There were more than 100 units with an outlay of Rs.100 crore in India have started producing cut flower for export market. Carnation is one of the important cut flower in the world. Prevailing market price at Banglore was about Rs.4 to 5 per flower, while the cost of flower was taken @ Rs. 3 per flower. The entrepreneur can approach the financial institution for obtaining loan to take up this venture. The loan can be repaid within six years with a grace period of one year.

Pushpalata *et al.* (1997) examined the economics of rose production in Banglore district of Karnataka. They selected sixteen and twenty four rose growers randomly. From urban and rural district. Data pertained to year 1994-95 and tabular method was used to analyse the data. They stated that life of rose garden was 10 years. They observed that investment on rose garden was Rs.17,593 and 16668 per acre for the establishment of garden in the urban and rural area, respectively. In the urban and rural areas, total cost of cultivation were worked out to Rs.24947 and 23504, respectively. They observed that grafted plants started yielding after 1.5 years of planting. The net income realised after meeting of all cost was Rs.10998 and 8723 in urban and rural areas, respectively. The high

rate of return, which was more than one for both category indicated the high profitability of rose production.

Koranne and Naik (1997) studied the floriculture as economically viable enterprise. The study was an attempt to work out cost and returns in cultivation of rose and tuberose on commercial basis. The data for study were collected from a sample of 15 cultivators of tuberose from Akola and Buldhana district of Maharashtra. Usual cost concept analysis was used for interpreting the results. Both rose and tuberose were found to be capital and labour intensive crops .The per hectare human labour utilization was 1246 days in rose and 1058 days in tuberose. Net return per thousand flowers amounted to Rs.1370 and Rs.426 in the case of rose and tuberose respectively. Output input ratio on cost 'C' basis were worked out to be 1.59 and 1.74 in rose and tuberose respectively.

Singh *et al.* (1997) studied the economics of flower production in Farukhabad district, Uttar Pradesh. The findings of the study revealed that on an average the area under floriculture formed about 24 percent of the total cropped area. The cost and returns analysis showed that rose cultivation yielded a net income of Rs.1.3 lakh per hectare. Per hectare investment was of 11,000 and the input came to Rs.1.04 lakh per hectare. While investment was of Rs. 97430 per hectare and the input output ratio come 1:1.76.

Alagumani and Anjugan (1998) probed into the economics of flower crops in Madurai district, Tamil Nadu. Nitakottai block in the district was selected and 30 farmers were contacted at random to collect primary data percentage and ratio analyses were used to draw meaningful

conclusion from the data. Return to investment on flower crop was studied through discount techniques such as net present worth, benefit cost ratio and internal rate of return. It could be seen that for all flower crops, the net present worth (NPW) was positive and (BCR) Benefit Cost Ratio was higher for Crossandra (6), followed by Kataratan (5.5) rose (5), jasmine (3.2). The (IRR) Internal Return Rate was more than 50 percent which indicated the high profitable nature of flower crops.

Goyal (1999) studied the economics of rose cultivation and its marketing in Sonpet district of Haryana State. It is important to note that rose is perennial crop with economic life span of 10 years. Net return from rose was Rs.65,834 per hectare. It is highly capital intensive crop, which required about Rs.27,000 for establishing one hectare of rose field and Rs.23,660 to Rs.28342 per hectare as operational cost for each year, Rose cultivation was profitable enterprise with benefit cost ratio as 8.48.

Tilekar and Salunkhe (2001) in their study found that after critical examination of cost of cultivation of roses, one will find that, of the total cost of cultivation, cost 'A' accounts for 62 percent, cost 'B' account for 28 percent and cost 'C' for 9 percent. In the total cost of cultivation, the item 'rental value' has maximum cost i.e. 23 percent followed by hired human labour which is around 20 percent. The next important item of expenditure is that of plant protection chemicals (14 percent) . However, if one combines hired human labour with family labour then the total wage cost comes to 29 percent on this account. The main reason for high cost of rental value is on the ground that it is estimated based on set methodology for estimation of cost of production of crops.

In case of tuberose as a "loose flower" it is very common in cultivation since long. However as a "cut flower" the producer have started cultivating it in recent years. It is annual crop. The per hectare cost of cultivation of tuberose as a cut flower has been worked out and it is Rs.4.38 lakh/ha. The share of rental value is maximum (25 percent) in the average total cost of cultivation of tuberose followed by FYM application (19 percent). Per hectare cost of marketing of this cut flower is substantially high which is Rs.1.01 lakh/ha as such the total cost of production of tuberose is Rs.5.40 lakh/ha.

2.2 Studies on resource productivity in flower garden:

Shedage and Borude (1972) studied the economic analysis of flower production in Thane district of Maharashtra. The size of sample flower grower was 45,37 and 23. In regard to Kagda, Mogra and Lily respectively. The data pertained to agricultural year 1987-88.It was observed that per hectare establishment cost of kagada, mogra and lily came to Rs.45547, Rs.36846 and Rs.35632 respectively. The average size of kagda garden was 0.23 hectare. There was great scope for area was positively significant. The sum of elasticities for kagda, mogra and lily was greater than unity, which indicated increasing return to scale.

Algumani *et al.* (1997) studied the economic performance of flower crops vis-à-vis field crops in Madurai district of Tamil Nadu. The data were collected by personal interview method, percentage analysis and multiple regression technique were employed to derive meaningful conclusion. The flower crop grown in the sample farms were rose, crossandra, jasmine mullai, chrysanthemum, pitchi, kakaratan while the

field crops were paddy, sugarcane, cotton and groundnut. The income obtained from the flower was higher than the field crops .Resource use efficiency analysis from jasmine crop showed that an increase in area under jasmine by per hectare would lead to increase 507.76 kg of jasmine and increase in the labour by one man day would result in the expenditure on manures and fertilizer would increase the output by 0.3 kg. Similarly, one rupee increase in the cost of irrigation would increase the yield by 1.32 kg.

Tilekar and Salunkhe (2001) conducted a study on price analysis of cut flowers in western part of Maharashtra. They fitted linear and Cobb-Douglas production function to find out the productivity of resources and found that in rose production the variable farm yard manure and machinery + bullock labours turned out to be significant. The R^2 coefficient of multiple determinant was 0.75 explaining thereby 75 percent variation in the output by selected variable.

2.3 Studies on Marketing cost and Marketing channels:

Acharya and Patil (1970) studied the economics of chrysanthemum cultivation in Ahmednagar and Parner tahsils of Ahmednagar district. They found that total cost of production worked out to Rs.4072.75 per acre. The major item of expenditure was marketing (Rs.2038.70) which included weighing, hamali, transport, cost of baskets, postage and commission. While analysing the marketing cost, they found that expenses on account of commission agent alone ranged between 25 to 50 percent of total marketing cost.

Anonymous (1976) studied the economics of production and marketing of roses. The study revealed that the per hectare total cost of

marketing of rose was Rs. 13106.36 out of total cost of marketing cost, the important item of expenditure was the share of commission agent which comprised of 64.10 per cent of total marketing cost while packing, transport and coolie charges were 23.46 , 5.98 and 5.14 percent of the total marketing cost respectively.

Narsimhan and Selvaraj (1976) studied flower cultivation and marketing in the environment of Madurai city. Daily 2000-2400 kg flowers were bought in season and during peak season it went upto 6 to 7 thousand kgs per day. His study concluded that seasonal variation in prices go with very elastic demand and relatively inelastic supply and creates risk of loss through price fluctuation of the traders who have little production against it in the present market system.

Papal (1976) studied economics production and marketing of selected flowers. The study revealed that commission charges (57.95 percent) and transport that commission charges (22.73 per cent) were the major items of the total cost of marketing of tuberose. The commission charges of aster and zinia were 52.11 percent and 51.93 percent whereas transport charges were 30.99 and 31.37 percent of their total marketing cost respectively.

Varadrajan and Ravidran (1979) studied flower marketing in Coimbatore city. The channel of marketing begin with producer and goes through wholesale merchant commission agent to the retailer and finally it reaches to the consumer. In this link, wholesaler trader were the most powerful who financed the business and took the risk. Producers and retailers were weal in market power and need to be recognized. This need

was felt by retail traders but not by the farmers. Retail traders needed protection against trade losses and financial assistance to minimise dependence on the wholesale traders. The study proved that the commercial floriculture is profitable but must be supported by an efficient marketing system.

Mahandule (1983) studied the production and marketing of chrysanthemum in Ahmednagar district. The study concluded that working cost accounted for nearly half of the total cost of production. The major items of marketing cost were packing (Rs.0.81 per kg), transport (Rs.0.46 per kg) and commission charges (Rs. 0.66 per kg) the share of intermediaries in the consumer's rupee was as high as 56.06 percent.

Subramanyam (1983) studied the economics of production and marketing of merigold and chrysanthemum. He found that the marketing cost accounted for 49 and 43 percent in respect of chrysanthemum and merigold, respectively. The return from the cultivation of these crops showed high profitability.

Subramanyam (1986) studied the production and marketing of chrysanthemum flower in Karnataka. Information on economic aspect of production and marketing were collected from Kolar district during 1985. It was observed the cost of cultivation which increase marketing cost was around Rs.21,500 per hectare. The labour cost accounted for the major portion of the input cost which was showing the labour intensive nature of crop. The high proportion of marketing cost (44 per cent) in the total cost of cultivation and the great difference in return released between channel-I (sale through commission agent) and channel II (sale to pre harvest

contractor) showed the need for encouraging self marketing by the grower instead of selling of pre harvest contractor.

Mitra *et al.* (1989) worked out the marketing cost incurred on various items, in tuberose marketing in Nadia district of West Bengal. They observed that the major component of cost of marketing of tuberose stick was wages and salaries (23.60 per cent)other important cost item were transport (7.4 percent)and taxes (5.07 percent) further more, they identified following four important type of marketing channel for cut flower trade.

I. Cultivator-packer-wholesaler- retailer-consumer

II. Cultivator-packer-retailer-consumer

III. Cultivator- wholesaler-retailer-consumer

IV. Cultivator- consumer

Out of these four channels, the first two were more common. Third was preferred by big cultivators only while the fourth one was negligible.

Selvamurugan and Mahanasudram (1990) studied the economics of production and marketing of roses and crossandra in Coimbatore district, Tamil Nadu. Flower are grown on a commercial basis throughout India. The trade offers better income and employment prospects for the rural poor, provided that they receive a fair share of the market price. The price spread taken as measure of competitiveness was too large in flower marketing leading to exploitation of growers by retailers. Evidence was provided from the Coimbatore district of Tamil Nadu, using two varieties of flower rose and Crossandra. Analysis of the cost of and returns of flower cultivation and consequent market revealed that commission agent received upto 10 percent of the price charged at

retail stage. It is recommended that flower marketing through cooperatives should be formed to conduct auctions of the product, as that would reduce the commission by about 8 per cent.

Subrahmanyam (1990) studied the economics of investment in Jasmine flower crop in Kolar district of Karnataka state. He studied the per quintal marketing cost incurred by jasmine cultivators and he found that was 35 per cent of the total cost of production of jasmine flower crop among different items of marketing cost commission charges accounted to major proportion (68 per cent) followed by the packaging market cost (24 percent).

Borude and Talathi (1991) studied the seasonal variation in demand and supply of flower in Bombay Market. They stated that, the flowers has continuously demand due to their social and religious value. However, during August to November, the demand for flowers increase tremendously and supply of flower also equally because of important festivals such as Ganeshotsav, Navratra and Diwali came in that season. Besides there was also more demand for flowers during December due to Christmas and March to June due to Marriage ceremonies.

Gawade (1991) studied the grading and packing of flowers while studying the marketing of flowers in Pune and Bombay market. He stated that cultivator graded the flowers according to availability of market. The point to be considered according to him are length of stalk, number of flower on stalk , their appearance, disease free and weight of flowers.

Grover (1991) reported that marketing of produce which was organised along the chain of middlemen eats into the producer's share in

the final price. There was pre harvest and post harvest contractors, commission agent, wholesaler, retailer, the cooperative and organised sector were playing limited role.

Patil (1991) studied the infrastructure availability for flowers trade while studying scope and limitation for export of flowers to the foreign countries. He stated that, India in endowed with land having varying climatic conditions for production of wide range of flowers but for exporting of flowers, infrastructure required for controlled production such as glasshouse, polyhouse and cold storage were not well developed in our country . He also added that, the technology required for harvesting, grading packing and processing of flowers with chemicals which inhibit and initiate opening are also not well developed in our country.

Rahudkar (1991) stated that costly flower were transported by the air freight. The jasmine flowers were transported with air from Madurai and Coimbatore to Bombay and gladioli from Calcutta to Delhi.For one kg flower was Rs.3.85 during year 1987. Charges from Madurai to Bangalore wasRs.1.10 only. Besides this there was approximately 30 percent concession in air charges for costly flowers transport, on some special airways.

Schoeider (1991) studied the comparison between Italian and Dutch Floriculture technical and economical aspects. The production structure and marketing system of floriculture industry in Netherlands and Italy. The Netherlands were in it's strategic position and developed of capital intensive production, has become the worlds main exporter of flowers was sold via auctions. In Italy, as a result of wide range of

intermediaries, the prices of products double or even triple between grower and consumer wholesaler and exporter negotiate directly with producer at the sale room. The private treaty method of selling as opposed to the institutional method used in Netherlands may have adverse effect on the economy as there is in control for future growth to rationalize marketing in which the profitable segment of the channels are maintained and the unnecessary steps eliminated.

Dordi (1994) studied the packaging of horticultural produce. He stated that, the corrugated fiber board boxes (CFB) are internationally used for packing of horticultural produce. They are hygienic, light in weight and recyclable. A suitable adhesive or coating with wax or plastic film can make the CFB boxes water resistant. They can also be made stronger by reinforcing the board. Other forms of packaging are also used depending upon the distance to which the produce is to be carried since metabolic activity in the produce continuous even after harvest.

Kasar *et al.* (1994) studied the marketing cost of roses and gladioli in Nasik district. The per crate marketing cost of roses upto 18 inches stalk, 12 inches stalk and upto 6 inches stalk worked out to Rs.19.50, Rs.24.50, Rs.29.50 in Nasik market respectively as against Rs.73.28, Rs.89.56, and Rs. 74.68 in Bombay market. The cost of grading packing and transport were the important items of marketing cost accounting together for 81.97 per cent of the total marketing cost.

Jagtap (1995) studied marketing of selected flowers in Pune district. The study has been undertaken to examine the marketing practices, marketing costs, marketing margins and price supply relationship of

important confronted by producers in marketing of selected flowers in Pune district.

Bhujbal (1996) studied marketing of commercial flowers in Maharashtra. It is revealed from sample farms was 562150 bundles of 12 flowers each. Per farm quality produced of tuberose flowers was 83.33 per cent was marketed to wholesalers. The quantity sold to retailer was 5355 bundles of value of Rs.31130. The production of gaillardia was 40000 bundles of 12 flowers each.

The average price received for a bundles of dozens of flower under study was Rs.3.50 for rose Rs. 9.02 for gladiolus, Rs.5.16 for tuberose and Rs.4.80 for chrysanthemum. In case of gladiolus and chrysanthemum three channels were found viz.

1. Producer- consumer
2. Producer- retailer-consumer
3. Producer- wholesaler cum commission agent- retailer- consumer.

Guledeagudda *et al.* (1997) studied the economic analysis of jasmine marketing in Dharwad district, Karnataka. Jasmine is an important flower crop and is cultivated over an area of nearly 9000 hectares in the state the study attempts to identify the major channels and price spread in the marketing jasmine. About 120 growers were surveyed in 1995-96. Two channels of marketing were identified in the study area, producer-village trader consumer (channel-I) and producer commission agent cum wholesaler- retailer -consumer (channel-II). On an average jasmine grower received 62 percent of the consumer's price and maximum profit margin

was enjoyed by the village traders Government intervention in marketing of jasmine is felt long overdue.

Tilekar and Salunkhe (2001) studied the price analysis of cut flower in Western part of Maharashtra. In their study they found that the average cost of marketing of rose and tuberose as cut flower produced as open cultivation was Rs.1.41 lakh and Rs.1.01 lakh per hectare. Amongst the several items of costs, commission of trader has got maximum share which was 48 and 64 percent respectively. The another item in the marketing cost of roses and tuberoses was the cost of transportation having share of 39 and 23 percent respectively.

2.4 Studies on market margin and price spread:

The review of research work on market margin indicate the percentage share of different market intermediaries.

Papal (1976) worked out market margin for various inter mediaries in the marketing of selected flowers in Pune district. In tuberose the producer's share in consumer's rupee worked out to 22.88per cent , while the margin of wholesaler and retailer were 10.74 percent and 28.68 percent, respectively. Moreover, the producer's share in consumer's rupee was 25.93 percent and 27.26 percent in the aster and zinia respectively. In case of merigold, the producer's share in consumer's rupee was extremely low i.e. 14.96 percent, while profit of wholesaler and retailer was very high i.e. 23.69 and 27.68 percent respectively.

Suryawanshi and Kahage (1979) observed the per hectare cost of marketing of producer's level as Rs.13106.36 . The share of intermediaries in the consumer's rupee worked out to 19.01, 16.12 and 8.47

percent for wholesaler, retailer and commission agent, respectively. Producer received only 47.33 percent share in the consumer's rupee.

Gaikwad (1981) identified marketing problem of chrysanthemum. The investigation made in this regard showed that producer catches only 40 paise from consumer's rupee. Due to fixed season and perishable nature of chrysanthemum flower, there was wide fluctuation in the price of flowers.

Varadrajan (1982) studied the market margin of various intermediaries in jasmine flower in Coimbatore city. His study revealed that the producer's share in consumer's rupee was not more than 40 percent in lean as well as in peak season.

Mahandule (1983) studied per kg price spread in the marketing of chrysanthemum in Bombay market. The study revealed that the total marketing cost incurred by all the intermediaries and producer's accounted for 53.47 percent of consumer's rupee. Out of the net profit of Rs.3.36 per kg in consumer's price, the proportionate share of the net profit received by the producers, commission agent and retailers middlemen jointly shared 77.68 percent of the net profit.

Singh and Vasisth (1985) conducted the study on changes in producer's share in consumer's rupee of agricultural commodity in India. They revealed that consumers were paying increasingly higher prices for agricultural commodities but grower did not receive adequate share of higher prices paid by consumers. This was because of large magnitude of gross market margin which consists of margin of various intermediaries engaged in moving the produce from grower to ultimate consumer and

marketing cost involved on various aspects. They conducted that the market margins were inversely related to market arrivals of agricultural products.

Mitra *et al.* (1989) studied market margin for various intermediaries such as wholesaler, packer and retailers in tuberose trade in Nadia district of west Bengal. It was revealed that the cultivator received Rs. 6.66 per kg for cut flower while consumer paid Rs.12.10 indicating the producer's share in consumer's rupee was 55 percent.

2.5 **Studies on constraints and suggestions of flower grower:**

Negi (1970) studied the constraints regarding exporting cut flower. From at production, transport and marketing stages. He found that poor production in terms of quality, lack of planting material and export varieties, high air charges, lack of incentives and financial assistance for export and absence of an organised marketing monitoring system were the constraints for exporting of cut flowers from India.

Laskar (1977) found that one of the major marketing problem faced by small formers was that, they received considerably lower prices for their produce as compared to that of by medium and bigger ones. They had distress sale to the village traders and moneylenders due to necessity of urgently cash.

Shirazi (1979) revealed from his study that there were considerable difficulties in marketing agricultural productions. There were complex channels and variety of market margin which ultimately reduces the share of produce.

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Agarwal (1981) identified the marketing problems of chrysanthemum investigation made in this regard revealed that from the consumer's rupee producer catches only 40 paise by value due to fixed season and perishable nature, it chrysanthemum flowers there were wide spread fluctuations in the price of flowers.

Sundarsan and Ravindran (1986) studied the Ramonathpuram district of horticultural development revealed that, horticultural development was limited by the price of market and low prices to the producers. They also noticed that lack of credit facilities at cheaper rate and lack of necessary technical guidance were also the causes for limited growth. Therefore, improvement in marketing facilities should receive priority. Extending regulated market facilities and strengthening infrastructural facilities at market yard to help quick disposal of products and communication of market information would be of help.

Ohdaira (1990) studied the problems of production of cut flower in cold districts and revealed that production of cut flower under the more difficult conditions in cold areas is discussed with special reference to carnations and chrysanthemum . The most important species grown in colder areas of Japan are listed a range of timetables for the propagation and raising of plants can be used give harvests over a long period even in unfavourable conditions. Production costs may be higher in unfavourable conditions especially those cost involved in protected cultivation required for preparation or to extend the harvesting period. The labour needs for cut flower production are also considered.

Shih *et al.* (1990) probed into the development of horticulture industry in Taiwan. Recent development of the floriculture industry in Taiwan led on area of 4308 hectares and a value of NT $2500 million in 1987. The main crop like chrysanthemum and gladiolus cover 2471 hectares and comprise 57 percent of the total flower crop while ornamental seedling and trees occupied 15.84 hectares. Most product were marketed locally, while the export being valued at NT $ 330 million. Limiting factors in the development of flower industry include lack of capital and lack of facilities which led to high production costs, unstable production and quality, lack of open auction system.

Parkale and Khorse (1992) identification the constraints in marketing of flowers in Pune district of Maharashtra. It was concluded from the study that distance of production centre from market affect the farmer's income. There was no stability in the demand of flower producer had no scientific knowledge about standardization and grading of flower. Commission charges were found to be considerably high.

Rasane and Gore (1992) identified the constraints in marketing of flower in Nasik district of Maharashtra. It was concluded that per day disposal of selected flower was small due to lack of efficient transportation. It was mainly sold in local market resulted in lowering the income of flower grower. The flower like rose which was supplied to Mumbai market has to be sold only through commission agent. Hence depending on middleman, increased lack of bank finance, no proper storage facilities, non availability of another market source processing industries resulted in forced sell and hence, lowering the income of farmers.

Asokan and Chokshi (1997) studied on export of floricultural product potential for exporting Indian floricultural constraints faced by Indian exporters, observed the reasons for Indian inability to capture the international market . The poor qualities of products, lack of infrastructure for post harvest care. Production small farms poorly developed domestic flower market and restrictive trade policies were some of them . In order to increase the share of this export in the booming floriculture trade, India should chalk out well planned strategies.

Sharma *et al.* (1997) conducted a study on the export oriented floriculture in India, status, constraints and strategies. The study was based on secondary data obtained from various published sources. The status of export from India revealed that it has increased from Rs.5.13 lakh in 1971-72 to Rs. 57.8 crore in 1995-96 with an annual compound growth in export of floricultural product had been rising at an increasing rate, India dismal performance in the world trade share is attributable to infrastructural production, policy, logistic constraints. In order to strengthen the export oriented floriculture in India, there is need for a coherent of hi-tech in infrastructure, germplasm material, production technology, human resources, skill and intensive location.

Tiwari (1998) studied economics of production and marketing of selected flowers in Marathwada region. Cost 'C' of Mogra garden was Rs. 68434.03 profit at cost 'C' was Rs. 63742.98, profit at cost 'C' was 44989.93, input-output ratio was 1.70 per quintal marketing cost of mogra was Rs. 149.13, while for Kagda it was Rs. 170.16. In marketing major

item of cost was transportation. Net returns per quintal were higher in Mogra than Kagda.

Singh (2000) studied statewise area and production of flowers during 1998-99 to 1999-2000. Maximum area recorded in Karnataka state (20801 ha) having production of 142250 tonnes flowers while area under floriculture of Maharashtra 6600 ha producing 28336 tonnes of flowers. He gave major exporter, major importers of floricultural products during 1999-2000.

Anonymous (2001) studied countrywise export of floriculture from India including roses, cut flowers for bouquets/fresh other cut flowers for bouquets, foliages / branch / buds not fresh other foliages / buds for bouquets fresh.

India exported floriculture product of 7336.160 metric tonnes (29.27 per cent) having value 2525.91 Rs. Lakhs (20.51 per cent) to America during 2000-2001 followed by Netherlands 6775.774 metric tonnes (27.03 per cent) having value 2921.00 (Rs. Lakhs (23.72 per cent).

While India exported 97180 kg of roses to Netherlands out of 261619 kg contributing 37.14 per cent as foreign exchange from Netherlands.

India exported 729315 kgs (18.06 per cent) of cut flowers for bouquets / fresh having value Rs. 89766106 (2.95 per cent) to Japan in 2000-2001.

USA was major importer of other cut flowers for bouquets. From India contributing 29.27 per cent of total export of India having 22.92 per cent share in value in 2001-2002.

Zagade (2002) studied "Economics of production and marketing of cut flowers in Ahmednagar district of Maharashtra". And calculated cost of cultivation of rose and tuberose, resource productivity resource efficiency, producer's share in consumer's rupee , market margin of different intermediaries.

The previous studies were majorly concentrated in cost of cultivation i.e. economic s of production. The research workers also gave emphasis on marketing cost and marketing channels.

While the studies on resource productivity and resource use efficiency, marketing margin and price spread were less.

Studies on constraints and suggestions of flower cultivators were also limited.

The important aspect of study i.e. export of flowers have given negligible importance by research workers. Emphasis is to be given to export studies for earning foreign exchange and competing at global level. New aspects like prospectus for export of cut flowers, cut flower production in polyhouse, export oriented crops should be studied.

Methodology

Chapter-III

METHODOLOGY

The present study entitled, Economics of production and marketing of flowers is undertaken in Pune district. The importance and utility of any study depends upon the reliability of the data collected and the soundness of the material and methods used in the study. This chapter deals with salient features of the Pune district and structural frame work of the study regarding data collection, methodology adopted, analytical tools used and methods of interpreting results etc.

3.1 Salient features of Pune district

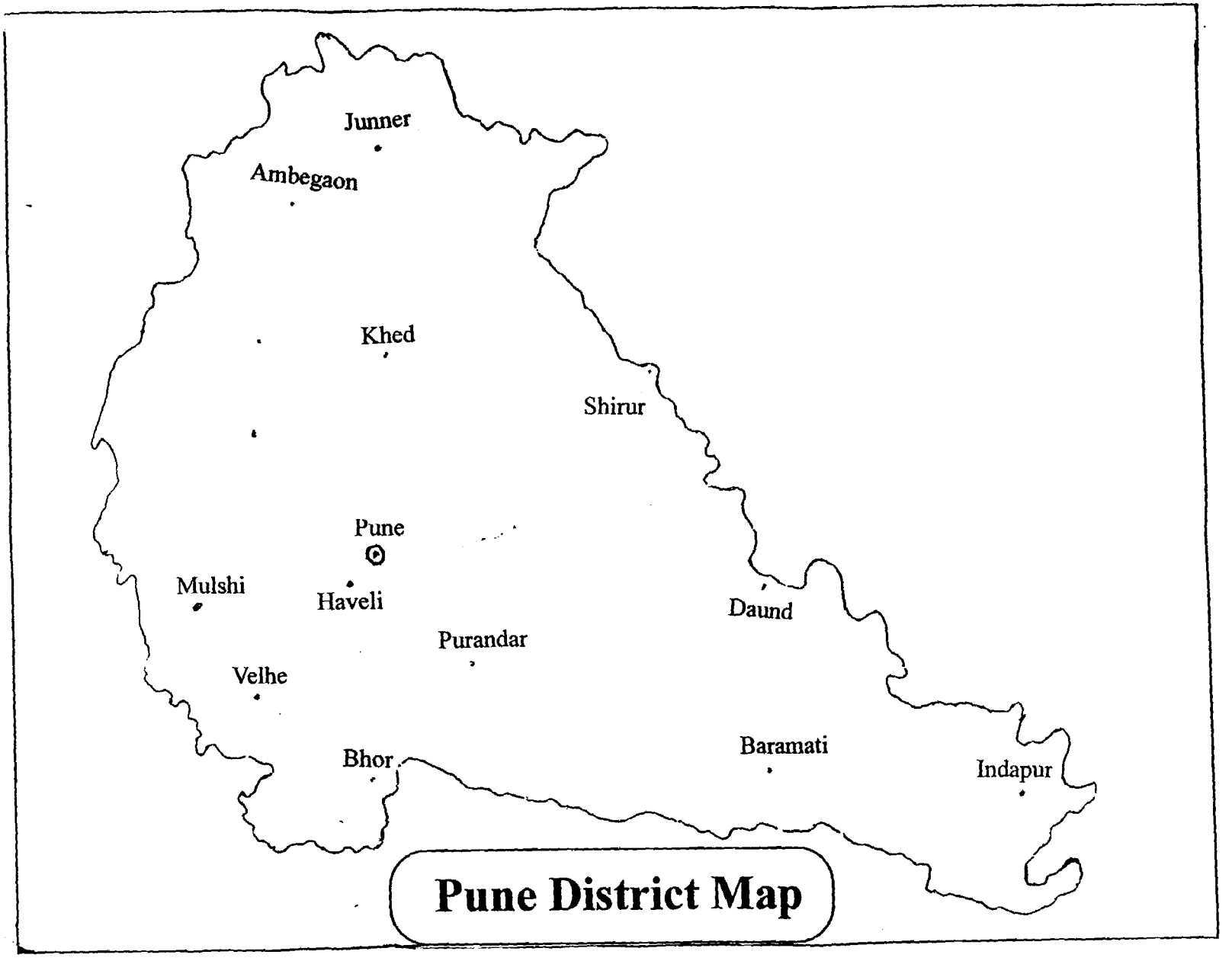
Salient features which consisted with location, soils climate population and cropping pattern of the district.

3.1.1 Location

Pune is one of the district of western Maharashtra. Its total geographical area is 15640 sqkm. The district has 14 tahsils namely Haveli Indapur, Baramati, Dound, Bhor, Purandar, Vele (Velhe) khed, Shirur, Junnar, Ambegaon, Maval, Mulshi and Pune city. The district lies between 17°54' and 19°24' north latitude and 73°19' and 75°10' east longitude. It is surrounded by Satara district in north- west, Ahmednagar district in north - east, and Solapur district in south- east.

3.1.2 Soils

There are three kinds of soils in Pune district like red, laterite and black. In some places there are mixture of two soils. In western part of hilly areas i.e. Junnar, Ambegaon, Khed, Purandar there is red soils, east


Junner
Ambegaon
Khed
Shirur
Pune
Mulshi
Haveli
Daund
Purandar
Velhe
Bhor
Baramati
Indapur
Pune District Map

region of Khed, Haveli tahsils and west part of Shirrur, Dound Purandar tahsils there is laterite type of soil. While east region of Khed, Shirur, Dound, Purandar, Indapur and Baramati tahsils there is black type of soil. In bank of river there is fertile soil.

3.1.3 Climate

As western Maharashtra Pune is also having monsoon climate. In month of May temperature goes upto 41°C while in month of January temperature goes down to 5.6°C. The rainy season is comparatively cooler. The winter is quite fear and slightly severe during the month of December and January. The average rainfall of region is 920.7 mm annually.

3.1.4 Population

The total population of Pune district is 7,224,224 in 2001. This is 7.46 per cent of total population of the state. Sex ratio (Females per 1000 males) is 912.

3.1.5 Land utilization statistics

In Pune district reported area for land utilization statistic is 1562000 ha. Area under forest is 163900 ha. Barren and uncultivable land is 146100 ha. Land under non-agriculture use 105400 ha. Cultivable waste area is 36900 ha. Permanent pasture and other grazing land is 71700 ha. Current fallow area is 19500 ha. Net sown area is 977200 ha. Area sown more than once is 194500 ha.

The district deals in kharif with crops like rice, groundnut, jowar, bajra, oilseeds, vegetable crops while in rabi wheat, jowar, gram and in summer, groundnut and oilseed crops are taken

3.2 Requirement of data

The present study is based on primary data collected from farmers. These data were collected for working out cost of cultivation, cost and returns input output ratio. This mainly included the material cost and actual expenses incurred by the cultivators on different items. The data regarding utilization of bullock labour, hired and family labour, inventory of livestock, farm building, farm machinery and implement etc. were also collected from the cultivator.

3.3 Preparation of schedule

The schedule was specially prepared for the collection of data. The schedule was pre-tested and then finalised for the collection of data. The following information were collected in the schedule by survey method.

I. General information of selected cultivators

II. Details about land holding

III. Cropping pattern

IV. Cultivation record

a) Quantity and expenses on material used, viz. planting material, manure and fertilizers, plant protection etc.

b) Labour utilization and wages

c) Farm inventing

d) Information regarding production and marketing of flowers

3.4 Selection of sample

Haveli, Shirur and Khed tahsils of Pune district was purposively selected for the present study as flower cultivation is

concentrated in these tahsils. Following three type of flowers were selected for the present study.

1) Rose (Rosa domance)
2) Tuberose (Polianthes tuberosa)
3) Gladiolus (Gladiolus sp.)

These were commonly grown flowers in these tahsils. A sample of 30 flower growers was drawn purposively for each type of flower. Thus, the study is based on a total sample of 90 flower growers. Details of sample selected is in Table 3.1

A sample of 10 wholesalers and retailers was drawn randomly for each type of flower, for the study.

Table 3.1 : Details of sample selected.

Name of tahsils	No. of flower growers selected		
	Rose	Tuberose	Gladiolus
Talegaon	10	10	10
Shirur	10	10	10
Khed	10	10	10
Total	30	30	30

Out of the total villages in Pune district three villages were purposively selected for the study purpose in the vicinity of Pune city. Three villages namely Talegaon, Shirur and Khed were selected from Haveli, Shirur and Khed tahsils. There were 25, 31 and 42 flower growers, respectively.

3.5 Collection of data

The personal interview method for data collection was adopted to obtain the necessary information from the cultivators. The information regarding cropping pattern, input utilization, cost incurred for different operations and return were collected from farmers. The information about production was collected from the producers and information about market was collected from the producers and market

intermediaries like commission agent or wholesaler, retailer etc. for the period of 2001-2002.

3.5 Analysis of data

Simple tabular analysis was carried out to workout level of input utilization and cost of cultivation per hectare of flower. The collected data were compiled, tabulated and analysed to accomplish the objective of present study. While studying the marketing of flowers, the marketing of flowers, the marketing cost, marketing margin and producer's share in consumer's rupee were worked out.

The collected data was analysed by using different cost concepts. These concepts are recently revised by the committee appointed by government of India. The details of cost concepts used are given below :

Cost concepts

The cost concepts used and the methods followed for evaluation of various items of cost are described in the following section.

Cost A:

It is the actual paid out cost for owner cultivators. This cost approximates the expenditure incurred in cash and kind and include the expenditure on the following items.

1. Hired human labour
2. Bullock labour
3. Planting material
4. Fertilizers
5. Plant protection
6. Farm yard manure

7. Depreciation
8. Land revenue and other charges
9. Irrigation charges
10. Interest on working capital

Cost B :

This cost was calculated as below :

Cost B = Cost A + interest on fixed capital + rental value of land

Cost C :

This is the total cost of cultivation. It includes direct as well as imputed cost. This cost was estimated as below

Cost C = Cost B + imputed value of family labour

3.6 Evaluation of inputs

Inputs used in the cultivation of flower were evaluated to estimate the total cost of cultivation of flower. Method used in evaluation of various inputs are presented in following section.

Human labour includes both the family and hired human labour (i.e. male and female labour) used on the farm. The value of family labour was evaluated at the prevailing wage rates in the locality from time to time.

Bullock labour

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

Planting material

The different types of planting materials are used both flowers cuttings and seedlings for rose and tubers for tuberose and

gladiolus. The cost of planting material was estimated on the basis of actual price paid by the farmer.

Plant protection

This included the actual cost paid for the insecticides and fungicides with hiring charges of appliances.

Irrigation

In case of electric motor, electric bill actually paid by the cultivators were taken into consideration. Irrigation rates calculated on hourly basis in the area of study.

Land revenue and other cesses

It was estimated according to actual land revenue with other cesses paid by the farmers for the total land holdings. The land revenue per hectare was calculated by dividing land revenue and other cesses by the gross cropped area on the farm.

Depreciation

Depreciation on the farm implements, machinery and building was calculated by straight line method and the proportionate charges were considered on the basis of area under individual crop.

Marketing charges

Marketing cost constituted the packing, transportation charges hamali, commission, market fees etc. These charges were estimated according to actual payment made by the farmers during marketing of produce.

Interest on working capital

Interest on working capital was calculated at the rate of 13 per cent per annum for the life period of the crop.

Interest of fixed capital

In case of fixed capital, interest was calculated at rate of 10 per cent per annum and it was approximately among various crop on the basis of the area.

Rental value of land

Rental value of land estimated by following formula.

$$\text{Rental value of land} = \frac{\text{Gross income (Rs)}}{6} - \text{land revenue}$$

Measure of income

Flower production business analysis has been carried out by different measures of income as under

a) **Gross income**

The value of produce was calculated at prevailing price in the area.

b) **Farm business income**

The difference between the gross income and cost A represented the farm business income of the producer from particular flower crop.

c) **Family labour income**

The profit at cost B i.e. difference between the gross income and cost B represents the income of cultivator of the amount of his own and family labour used in particular flower crops. It is the profit on cost B.

d) Net income

The profit on cost C is the net profit from particular flower crop.

e) Input -output ratio

It is the ratio of output (gross income) to input cost C. The input use separately for establishment and maintenance of flower garden was studied. However, for calculating the cost of cultivation the total input use (Establishment + maintenance) was considered.

f) Amortization cost

The per hectare amortization cost was calculated on the establishment cost and average bearing life of garden (years).

$$\text{Amortization cost} = \frac{\text{Establishment cost (Rs)}}{\text{Average bearing life of garden (years)}}$$

3.7 Analytical technique

Tabular analysis, linear, multiple regression analysis, frequency and percentage methods were used to analyse the data in present study.

Tabular analysis

Tabular analysis of arithmetic mean percentage and ratio. This method was used to determine the costs and returns of flower production, cost of marketing of flower and market margin of intermediaries.

Measures of productivity and resource use efficiency

Cobb-Douglas production function allows either constant increasing or decreasing marginal productivity. In Cobb-Douglas the regression coefficients duetly represent the elasticity of production.

Marginal value of productivity of resources indicates the addition of gross value of farm production for a unit increase in the resources with all other resource fixes at their geometric mean levels. The MVP of different input factors is worked out by the following formula.

$$MVP = \frac{by}{X} \times Py$$

Where,

b = Regression coefficient of particular independent variable

X = Geometric mean of particular independent variable

Y = Geometric mean of dependent variable

Py = Price of dependent variable

II) Elasticity of production (EP)

Cobb-Douglas production function analysis

On the basis of goodness of fit (R^2) Cobb-Douglas production function was used to determine the resource productivity and resource use efficiency in flower production. The data were, therefore, subjected to functional analysis by using the following form of equation.

$$Y = ax_1^{b1} x_2^{b2} \ldots\ldots\ldots x_n^{bn} e.i.$$

In this functional form Y is the dependent variable X_1 are independent resource variable, a is the constant representing intercept of production function and b_i are the regression coefficients of the respective resource variables.

The regression coefficient obtain from this function directly represents the elasticities of production which remain constant throughout the relevant ranges of inputs. The sum of coefficient i.e. b_i indicates the nature of return to scale. This function can easily be transformed, into a linear form by making logarithmic transformation after logarithmic transformation this function is

$$\text{Log } Y = \log a + b_1 \log x_1 + b_2 \log x_2 + \ldots\ldots\ldots + b_n \log x_n + \log e$$

For fitting production function for two species of flower, six variables were considered as important factor by considering problem of multicollinearity is estimating production function.

The equation fitted was on following type

$$Y = aX_1^{b1}.X_2^{b2}.X_3^{b3}.X_4^{b4}.X_5^{b5}.X_6^{b6}$$

Where,

Y= yield of flower in number per hectare

a = Intercept of production function

b_i = regression coefficient of the respective resource variable

(i = 1,2,3,.....6)

x_1= Area of flower garden in (R)

x_2 = Hired male labour in man days per garden

x_3 = Farm yard manure in tonns per garden

x_4 = Nitrogen fertilizer in kgs per garden

x_5 = Phosphorus fertilizers in kgs per garden

x_6 = potassium fertilizer in kgs per garden

'F' value was tested at 'k' and n-k-1 degree of freedom i.e. explanatory or independent variable (k) and number of observation or explanatory or

number of flower grower (n) 'R' is coefficient of multiple determination. Intercept (a) is the mean of flower productivity obtained in the absence of selected variables and regression coefficient (b_i) are coefficient of independent variables. Regression coefficient tested for significance by applying 't' test at n-k-1 degree of freedom as under

$$tn\text{-}k\text{-}1 = \frac{b}{SE}$$

Where,

b = regression coefficient of particular

SE = Standard error of that variable

3.8 Marketing cost and marketing margin

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

3.8.1 I) Price spread

The price spread of the produce show the difference between net price received by the producer in the assembling market and price paid by the ultimate consumer of produce in the retail market. It include all the market charges incurred by producer, commission agent-cum-wholesaler and retailer as well as profit margin of wholesaler and retailer.

II) Producer's share in consumer's rupee

This indicators is very helpful in deciding the appropriate strategies for reducing the market costs in the present study the producer's share in consumer's rupee calculated by the actual price received by producer.

It is the price received by the farmer expressed as a percentage of the retails prices, i.e. the price paid by the consumers. If price is the retail price the producers share in consumers rupee (Ps) be expressed as follows

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

3.9 Cultivation practices of Rose, Tuberose and Gladiolus

3.9.1 Rose

Rose is contributing major part of worlds flower market and having first place therefore it is called as 'king of flower' rose having characteristical arrangement different colours, fragrance and medicinal utility

Climate

Cultivation of rose requires cold and dry climate. For better growth and flower production it require temperature from 15 to 30°C while clean air and sufficient sunlight is also necessary atmospheric humidity range should be 60 to 65 per cent.

Soil

Rose requires well drained and rich in organic manure having pH range from 6 to 7.5. Soil deep upto one meter is suitable.

Preparatory tillage

The filed should be ploughed in winter and summer. The field should be weed free for planting of rose. For planting of rose pits of 45 cm long, 45 cm broad and 45 cm deep are taken. Nearly 50 tonnes of FYM should be incorporated in soil.

Plantation

Planting of roses should be done in month of June-July for planting of roses nearly 15000 cuttings per hectare are necessary. Row spacing should be 75-100 cm.

Fertilizers

Rose requires 490-515 kg of nitrogen 350-400 kg of phosphorus and 150-200 kg of potassium per hectare.

Production

Every plant of rose gives 30 to 45 flowers in second years and 50 to 65 flowers in third year annually. In Konkans climate rose gives good production upto 8 years.

3.9.2 Tuberose

Tuberose is an ornamental bulbous plant which has great economic potential in the cut flower trade as well as essential oil industry. The flower remain fresh for days together with sweet pleasant fragrance. Tuberose has got very good export potentiality because it is now more popular in Europe and it does not flower during winter months in temperate countries. Tuberose can be grown successfully in pots, bordes, subrubberies and rockeries.

Climate

Tuberose requires average temperature ranging from 20 to 30°C for its luxuriant growth, it requires high humidity and moderate temperature (around 30°C) and gradually ceases to grow as these two vital factors. It thrives in an open sunny situation and tends to grow more vegetatively in place devoid of sun.

Soil

Tuberose can commercially be grown in wide range of soils, loam and sandy loam soils having a pH range from 6.5 to 7.5 with good aeration and drainage are considered suitable for its cultivation.

Fertilizers

Tuberose responds well to application of FYM @ 40-50 tonnes/hectare and 180-200 kg of nitrogen 160-180 kg of phosphorus and 100-125 kg of potassium.

Cultivation

Propagation is by means of bulbs and seeds. Nearly 1 lakh to 1 lakh 20 thousand bulbs are necessary for one hectare. Bulb spacing is 20-30 cm and row spacing is 20-30 cm and 5 to 7 cm deep planted.

Production

On an average, about 2.5 lakhs flowering spikes giving a yield of 50 to 55 quintals of fresh flowers are obtained by planting one lakh mature tuberose bulbs per hectare.

In addition to the above, a yield of 200 quintals of tuberose bulbs per hectare fetches on extra income.

3.9.3 Gladiolus

Gladiolus is an excellent plant for floriculture industry in India because of its striking colours and majestically impressive blooms. It has been appropriately called as the "Queen of the bulbous plants". This beautiful flower comes in immense variety of colour, attractive shape and varying sizes. It is available throughout and varying sizes. It is available throughout the years and it has excellent keeping quality.

Planting

Although in plains the planting may be done with the cessation of rains, the ideal period is first week of October onwards upto the 15th November, before planting, the beds are thoroughly worked upto a depth of 50 cm.

In beds, the planting is done at distance of 20 to 30 cm depending on the corm size the corms are placed at a depth of 5 to 7 cm depending on their size. Sowing of corms from first week of September to middle of the December at regular intervals produces on array of blooms for 5 months.

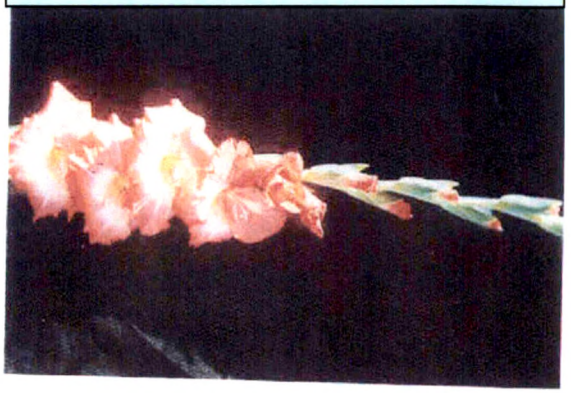
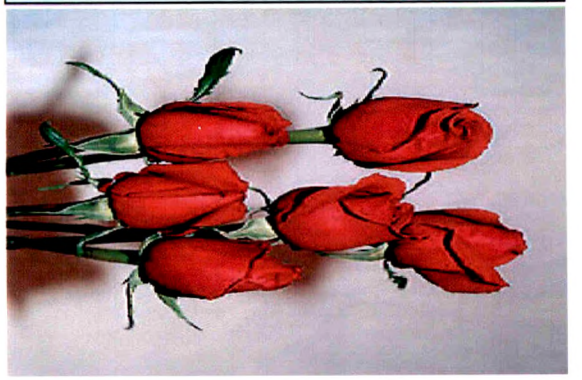
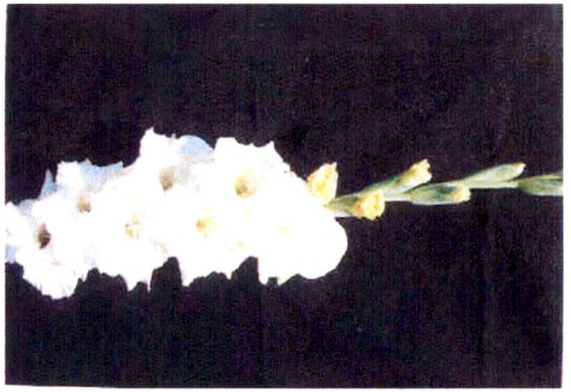
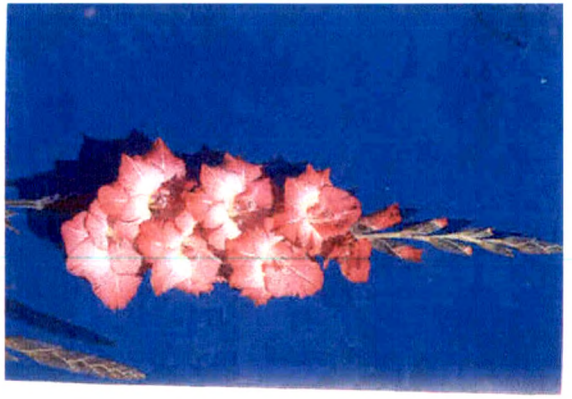
The corms planted in the first week of September start blooming within 45 days while in the late sowing the time taken may vary from 60 to 90 days.

Cultural practices

For commercial planting, it is advisable to apply 40 to 80 tonnes FYM. 80-180 kg of N, 70-160 kg of phosphorus and 40-110 kg of potassium.

Production

On an average, about 1 to 1.5 lakh flowering spikes are produced form one hectare.

Gladiolus	Tuberose	Rose
		
		
		

Results and Discussion

Chapter-IV

RESULT AND DISCUSSION

In this chapter, the results of the study are presented in the following section.

1. General information of flower growers
2. Costs and returns of flower garden
3. Impact of flower technology on flower production
4. Marketing of flowers
5. Export of flowers from India
6. Constraints and suggestions of flower growers

4.1 General information of flower growers

General information includes socio-economic characteristics, land use pattern and cropping pattern of selected flower growers.

4.1.1 Socio-economic characteristics of sample cultivators

Information regarding socio-economic characteristics like the size of family, education status and profession, holding size, asset position of sample household was obtained and same is presented in Table 4.1 and Table 4.2.

It is seen from the Table 4.1 that, the average size of family of rose flower growers was 7.02 in which the percentage of male was high i.e. 44.15 per cent. As regard the educational status, the percentage of secondary and higher secondary education of rose flower grower was high i.e. 53.34 per cent, followed by percentage of flower grower having university education which was 20.00 per cent. Percentage of illiterate

Table 4.1. Socio-economic characteristics of selected cultivators

(N=30)

Sr. No	Particulars	Rose		Tuberose		Gladiolus	
		Av.	%	Av.	%	Av.	%
A)	**Family size**						
1.	Male	3.10	44.15	2.88	46.08	2.35	43.13
2.	Female	2.25	32.05	1.99	31.84	1.60	29.35
3.	Children	1.67	28.70	1.38	22.08	1.50	27.52
	Total	7.02	100	6.25	100	5.45	100
B)	**Education status**						
1.	Illiterate	3	10	2	6.66	4	13.33
2.	Primary	5	16.66	6	20	8	26.66
3.	Secondary and higher secondary	16	53.33	17	56.66	10	33.33
4.	University	6	20	5	16.66	8	26.66
	Total	30	100	30	100	30	100
C)	**Occupation**						
1.	Farming	23	76.66	18	59.94	15	50
2.	Service	7	23.31	12	39.96	15	50
	Total	30	100	30	100	30	100
D)	**Holding size**						
1.	Irrigated	2.19	64.22	2.20	67.90	2.31	69.36
2.	Rainfed	1.11	32.55	0.89	27.46	0.79	23.72
3.	Permanent fallow	0.11	3.23	0.15	4.64	0.23	6.92
	Total	3.41	100	3.24	100	3.33	100

Table 4.2. Per farm average asset position of selected cultivators

(n=30)

Sr No	Particulars	Rose				Tuberose				Gladiolus			
		Av. No.	%	Av. Value	%	Av.No.	%	Av. Value	%	Av.No.	%	Av. Value	%
A.	**Equipment, machineries and long lived assets**												
1.	Tractor	0.10	1.66	25.000	32.23	0.10	1.70	25000	32.24	0.10	1.21	25833.33	40.34
2.	Bullock cart	0.30	4.99	1510	1.95	0.33	5.60	1500	1.93	0.26	3.15	1200	1.81
3.	Sprayer	0.73	12.14	907	1.17	0.66	11.22	1050	1.35	1.1	13.13	653.33	1.02
4.	Duster	0.03	0.49	152	0.20	0.33	5.60	166.66	0.22	0.53	6.42	383.33	0.59
5.	Weighing balance	0.56	9.31	142	0.20	0.56	9.52	150	0.19	1.03	10.48	110.00	0.17
6.	Harrow	0.43	7.14	97.5	0.12	0.30	5.10	75	0.09	1.00	12.12	346.66	0:54
7.	Hoe	0.83	13.81	108	0.14	0.70	11.90	91	0.11	1.10	12.60	289.16	0.45
8.	Plough	0.93	15.47	653	0.84	0.83	14.12	581	0.74	0.39	10.80	368.33	0.57
9.	Well	0.70	11.65	28000	37.0	0.71	12.07	28000	36.07	1.1	10.90	32000	37.97
10.	Tubewell	0.40	6.65	10000	12.0	0.36	6.13	10000	12.88	0.40	6.60	10000	12.00
11.	Electric motor	1.00	6.64	11000	14.13	1.00	17.04	11000	14.17	1.0	13.11	2850.00	4.45
	Total	6.01	100	77569.5	100	5.88	100	77613.66	100	8.25	100	74034.14	100
B.	**Livestock**												
1.	Bullock	1.08	31.76	8440	32.51	0.63	12.16	5183.33	21.96	1.00	17.92	7814.81	30.02
2.	Buffalo	0.36	10.58	4960	19.11	0.33	6.37	5166.66	21.89	0.36	6.45	4960	19.05
3.	Local cow	0.72	21.17	4000	15.41	0.60	11.58	3633.33	15.39	0-.60	10.75	3633.33	13.95
4.	Crossbreed cow	0.48	14.11	8020	30.89	0.53	10.23	8850	37.49	0.53	9.49	8850	34.00
5.	Goat	0.56	16.47	414	1.59	0.93	17.95	631.67	2.68	0.93	16.69	631.67	2.44
6.	Other	0.20	5.88	127	0.49	2.16	41.69	137.66	0.58	2.16	38.70	137.66	0.54
	Total	3.4	100	25961	100	5.18	100	23602.65	100	5.58	100	26027.47	100

farmers was 10.00 per cent. It was observed that education status was good. As regard the occupation of the sample households, the farming has been observed to be main occupation of majority of the flower growers. The other subsidiary occupation was service, which was 23.31 per cent. Average holding size was 3.41 hectares from the table 4.2 the asset position of the selected cultivator was observed. Among the equipment, machineries and long lived assets, the share of plough was high i.e. 15.47 per cent having average value of Rs. 653. While the share of duster was very less i.e. 0.49 per cent having average value Rs. 152.

In case of livestock possession, share of bullock was higher i.e. 31.76 per cent having average value Rs. 8440. Total average value of livestock was Rs. 25961.

In case of Tuberose, the family size of selected flower grower was 6.25 in which the male members are more. The level of education status of flower grower was 93.34 per cent, in which the farmer having the secondary and higher secondary education was more. Illiterate percentage was 6.66 per cent. It implies that educated farm households took up cultivation of flower.

As regard to occupation, farming was main occupation of the majority of the selected growers. While 39.96 per cent of grower having other occupation i.e. service, average holding size was 3.24 hectare.

It was seen from the Table 4.2 that the percentage of electric motor was higher i.e. 17.04 per cent each among the all equipment, machineries and long lived assets, having the average value Rs. 11000. Total average value of all the assets was Rs. 77613.66

The average value of all livestock was Rs. 23602 in which the percentage of bullock and buffalo in value term was higher which was 21.96 and 21.89 per cent respectively.

In case of Gladiolus, the family size of selected flower grower was 5.45 in which male members were more. The level of education state of flower grower was 86.67 per cent, in which the farmer having the secondary and higher secondary education was more. Illiterate percentage was 13.33 per cent. It implies that educated farm households took up cultivation of flower.

As regard to occupation, farming and service both were having same share in selected cultivators. Average holding size was 3.33 hectare.

It was seen from the Table 4.2 that the percentage of sprayer was higher i.e. 13.13 per cent each among the all equipments, machineries and long lived assets, having the average value Rs. 653.33. Total average value of all the assets was Rs. 74034.14.

The average value of all livestock was Rs. 26027.47 in which the percentage of crossbreed cow and Bullock in value term was higher i.e. was 34.00 and 30.02 per cent respectively.

4.1.2 Use of Land by Flower Grower :

Details regarding total holding, uncultivated area, net cultivated area which includes irrigated as well as rainfed areas were calculated and are presented in Table 4.3

Table 4.3. Per farm average land use pattern of selected cultivators

(N=30)

Name of flower	Total holding (ha)	Irrigated area (ha)	Rainfed area (ha)	Net cultivated area (ha)	Uncultivated area (ha)
Rose	3.41 (100.00)	2.19 (64.22)	1.11 (32.55)	3.30 (96.77)	0.11 (3.23)
Tuberose	3.24 (100.00)	2.20 (67.90)	0.89 (27.46)	3.09 (95.36)	0.15 (4.64)
Gladiolus	3.33 (100.00)	2.31 (69.36)	0.79 (23.72)	3.10 (93.08)	0.23 (6.92)

(Figures in parentheses indicate percentage to total holding)

The study of land use pattern of rose, tuberose and gladiolus growers separately revealed that on an average total land possessed by rose growers was slightly higher than gladiolus growers which was also slightly higher than tuberose growers. i.e. rose cultivator had average total land 3.41 hectare, gladiolus cultivator had average total land 3.33 hectares while tuberose cultivator had average total land 3.24 hectares.

As regard to rose growers, it was observed that among total land holding the irrigated area was more i.e. 64.22 per cent while rainfed area and uncultivated area was 32.55 and 3.23 per cent respectively. Net cultivated area was 3.30 hectares.

In case of gladiolus growers, the net cultivated area was 3.10 hectares, in which irrigated area was more which was 2.31 hectares while rainfed area was 0.79 hectares, uncultivated area was 0.23 hectares.

While in tuberose growers, the net cultivated area was 3.09 hectares, in which irrigation area was more which was 2.20 hectares while rainfed area was 0.89 hectares,. Uncultivated area was 0.15 hectares.

4.1.3 Cropping pattern of selected flower growers :

Cropping pattern indicates the proportion of gross cropped area allocated by the farmer under different crops. Per farm average cropping pattern of selected flower growers was studied and is presented in Table 4.4

Cultivators decide their cropping pattern by considering the availability of soil, climate conditions, irrigation facilities, availability of labour, inputs, credit, price of output, government policies regarding the price of the farm of produce etc.

In case of rose cultivation, the gross cropped area was 6.30 hectares of which the proportion of *kharif, rabi* and *summer* crops was 24.60 per cent, 24.29 per cent and 16.50 per cent respectively. The area allocated to roses was 2.22 per cent. Among *khrif* crops the Rice, groundnut vegetables and flowers crops were dominating crops. While in *rabi* season wheat, gram, vegetables and flowers were the major crops. Summer groundnut covered an area of 5.23 per cent. Sugarcane and fruit crop were the major annual crops grown by cultivators.

It can be noted that the vegetable crops were grown in every season on a considerable area. The cropping intensity was 191.0 per cent.

In case of tuberose growers the gross cropped area was 5.64 hectares of which the break up of *kharif, rabi, summer* and annual was 24.82 percent 21.63 per cent, 17.55 per cent and 12.94 per cent

Table 4.4. Per farm average cropping pattern of selected cultivators

(n=30)

Sr No	Seasonwise crop	Rose (Av. Area in ha)				Tuberose (Av. Area in ha)				Gladiolus (Av. Area in ha)			
		Irriga-ted	%	Rainfed	%	Irriga-ted	%	Rainfed	%	Irriga-ted	%	Rainfed	%
A.	**Kharif**												
1.	Rice	0.40	6.34	--	--	0.37	6.56	--	--	0.35	7.05	--	--
2.	Groundnut	0.37	5.87	--	--	0.29	5.14	--	--	0.25	5.04	--	--
3.	Jowar	--	--	0.25	3.96	--	--	0.26	4.60	--	--	0.39	6.05
4.	Bajara	--	--	0.16	2.53	--	--	0.13	2.30	--	--	0.21	4.22
5.	Oilseed crops/pulses	0.13	2.06	--	--	0.15	2.66	--	--	0.15	3.02	--	--
6.	Vegetables	0.42	6.66	--	--	0.40	7.09	--	--	0.39	7.86	--	--
7.	Other crops	0.09	1.42	0.78	7.61	0.07	1.24	0.50	8.86	0.08	1.61	0.28	5.65
8.	Flower crops	0.14	2.22	--	--	0.12	2.12	--	--	0.20	4.03	--	--
	Sub-total	1.55	24.60	1.19	17.62	1.40	24.82	0.89	15.78	1.42	28.63	0.79	15.92
B.	**Rabi**												
1.	Wheat	0.43	6.83	--	--	0.33	5.85	--	--	0.38	7.66	--	--
2.	Jowar	--	--	0.43	6.28	--	--	0.41	7.26	--	--	0.12	2.41
3.	Gram	0.31	4.92	--	--	0.26	4.60	--	--	0.32	6.45	--	--
4.	Vegetables	0.45	7.14	--	--	0.31	5.49	--	--	0.47	9.47	--	--
5.	Other crops	0.00	0.00	--	--	0.02	0.35	--	--	--	--	--	--

6.	Flower crops	0.14	2.22	--	--	0.30	5.31	--	--	0.05	1.00	--	--
	Sub-total	1.53	24.29	--	--	1.22	21.63	0.41	7.26	1.34	27.01	0.12	2.41
C.	**Summer**												
1.	Groundnut	0.33	5.23	--	--	0.25	4.43	--	--	0.31	6.25	--	--
2.	Vegetables	0.46	7.30	--	--	0.30	6.38	--	--	0.36	7.25	--	--
3.	Other crops	0.11	1.74	--	--	0.11	1.95	--	--	0.09	1.81	--	--
4.	Flower crops	0.14	2.22	--	--	0.27	4.79	--	--	0.05	1.00	--	--
	Sub-total	1.04	16.50	--	--	0.99	17.55	--	--	0.81	16.33	--	--
D.	**Annual perennial crops**												
1.	Sugarcane	0.35	5.55	--	--	0.30	5.31	--	--	0.30	6.04	--	--
2.	Fruit crops	0.15	2.38	--	--	0.15	2.65	--	--	0.15	3.02	--	--
3.	Rose	0.14	2.22	--	--	0.10	1.77	--	--	0.08	1.61	--	--
4.	Tuberose	--	--	--	--	0.18	3.11	--	--	--	--	--	--
5.	Gladiolus	--	--	--	--	--	--	--	--	0.07	1.41	--	--
	Sub-total	0.64	10.15	--	--	0.73	12.94	--	--	0.60	12.1	--	--
	Gross cropped area	6.30				5.64				4.96			
	Cropping intensity	191.0				182.5				160.0			

Fig 1. Cropping pattern of selected rose and tuberose cultivators in irrigated area

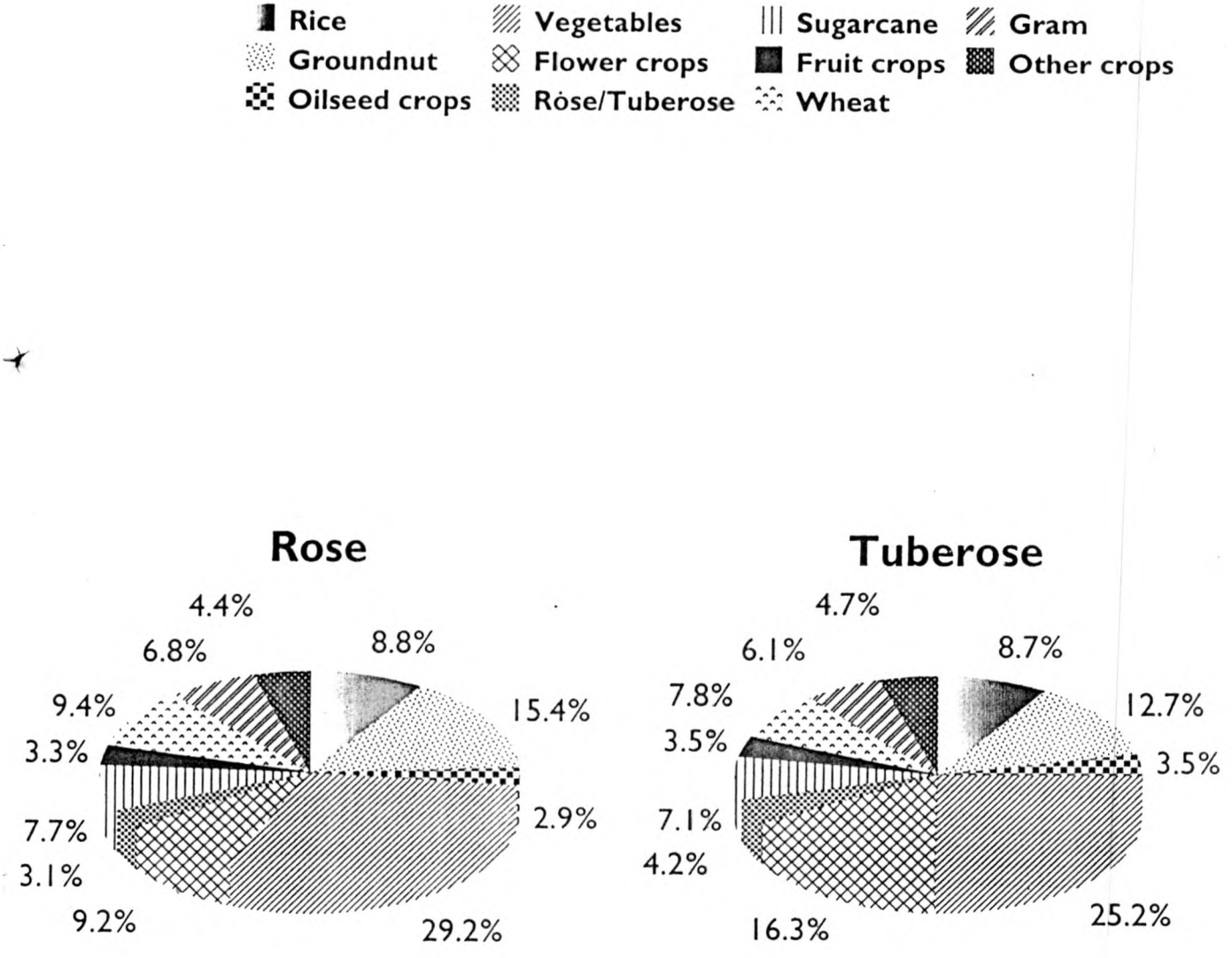
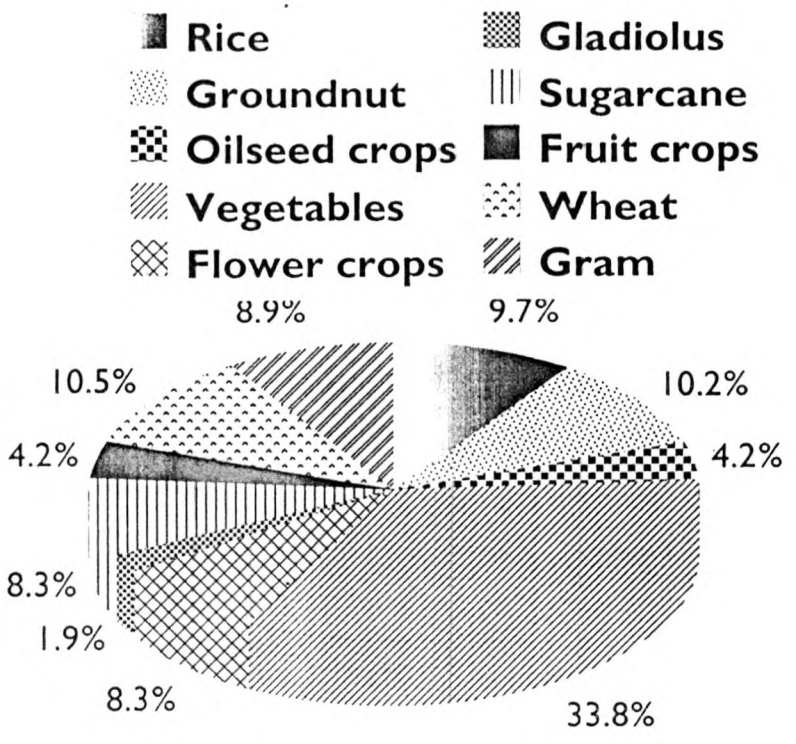


Fig 2. Cropping pattern of selected gladiolus cultivators in irigated area



respectively. In *kharif* season Rice, vegetables, groundnut and flowers crops were major crops and in *rabi* season wheat, gram, vegetables and flower crops were major crops taken by majority of flower growers. Among the summer crops, vegetables, groundnut and flower crops were dominating crops. Sugarcane and fruit crops were the major annual crops grown by cultivators. The area allocated to tuberose was 3.11 per cent.

It can be concluded that vegetables and flower crops were grown in every season on considerable area. The cropping intensity was 182.5 per cent.

In case of Gladiolus growers the gross cropped area was 4.96 hectares of which the break up of *kharif, rabi*, summer and annual was 28.63 per cent, 27.01 per cent,. 16.33 per cent and 12.10 per cent respectively. In *kharif* season Rice, vegetables, groundnut and flower crops were major crops and in *rabi* season wheat, gram, vegetables and flower crops were taken by majority of flower growers. Among the summer crops, vegetables, groundnut and flower crops were dominating crops. Sugarcane and fruit crops were the major annual crops grown by cultivators. The area allocated to gladiolus was 1.41 per cent. The cropping intensity was 160.0 per cent

4.2 Costs and return of flower garden :

Per hectare cost of cultivation of rose, tuberose and gladiolus was calculated which involved the establishment cost and maintenance cost of both flower crops. Total of establishment and maintenance cost was taken as, per hectare cost of cultivation in case of rose and tuberose only.

4.2.1 Different farm operations and per hectare labour use there of, in rose flower production :

The various farm operations carried out in the cultivation of flower crops by selected growers and average male and female labour used for carrying out these operations for the establishment and maintenance of garden has been indicated on Table 4.5 and Table 4.6 respectively.

Table 4.5 : Per hectare operation wise human labour use for flower cultivation (Establishment of garden).

(Fig. in man days)

Operations	Rose		Tuberose	
	Male	Female	Male	Female
Land preparation	17.25 (11.49)	2.18 (1.84)	7.82 (10.15)	1.80 (1.76)
FYM application	8.75 (5.83)	5.17 (4.37)	6.5 (8.47)	7.37 (7.20)
Seed bed preparation or pitting	45.37 (30.23)	7.23 (6.11)	18.18 (23.61)	4.35 (4.25)
Planting	13.45 (8.96)	32.80 (27.71)	5.17 (2.81)	28.78 (28.15)
Weeding	3.02 (2.01)	48.64 (41.10)	0.10 (0.12)	40.42 (39.54)
Soil support	--	5.75 (4.86)	--	0.41 (0.40)
Irrigation	38.54 (25.67)	1.80 (1.52)	28.12 (36.51)	5.51 (5.39)
Plant protection	10.47 (6.97)	--	6.82 (8.86)	--
Fertilizer application	19.23 (8.81)	15.78 (13.33)	4.27 (5.55)	13.59 (13.29)
Total	150.08 (100)	119.35 (100)	77.01 (100)	102.23 (100)

(Figures in parentheses indicate percentage to total human labour)

From the Table 4.5, it is seen that, for establishment of garden, total male labour used was 150.08 mandays and female labour was 119.35 mandays. Among the various operations carried out by farmers, the labour utilization for seedbed preparation was more which was 45.37 mandays. While for the operation of irrigation male labour use was 38.54 mandays.

Table 4.6 : Per hectare operation wise human labour use for flower cultivation (maintenance of garden).

(Fig. in man days)

Operations	Rose		Tuberose	
	Male	Female	Male	Female
Weeding	1.85 (1.58)	90.63 (13.50)	2.01 (2.78)	89.90 (12.26)
Soil support	3.87 (3.30)	11.20 (1.67)	7.18 (6.66)	2.25 (0.32)
Irrigation	49.30 (42.10)	--	40.89 (56.68)	--
Plant protection	27.13 (23.17)	--	5.07 (7.02)	--
Fertilizer application	24.78 (21.16)	20.18 (3.02)	7.93 (10.99)	14 92 (2.03)
Pruning	8.06 (6.88)	5.83 (0.87)	--	--
Harvesting	2.09 (1.78)	540.16 (80.84)	9.05 (12.54)	625.80 (85.39)
Total	117.08 (100)	668.17 (100)	72.13 (100)	732.87 (100)

(Figures in parentheses indicate percentage to total human labour)

Labour utilization for different operation in maintenance of rose garden was worked out and is presented in Table 4.6. It revealed from

Fig 3. Per hectare operationwise human labour use in rose

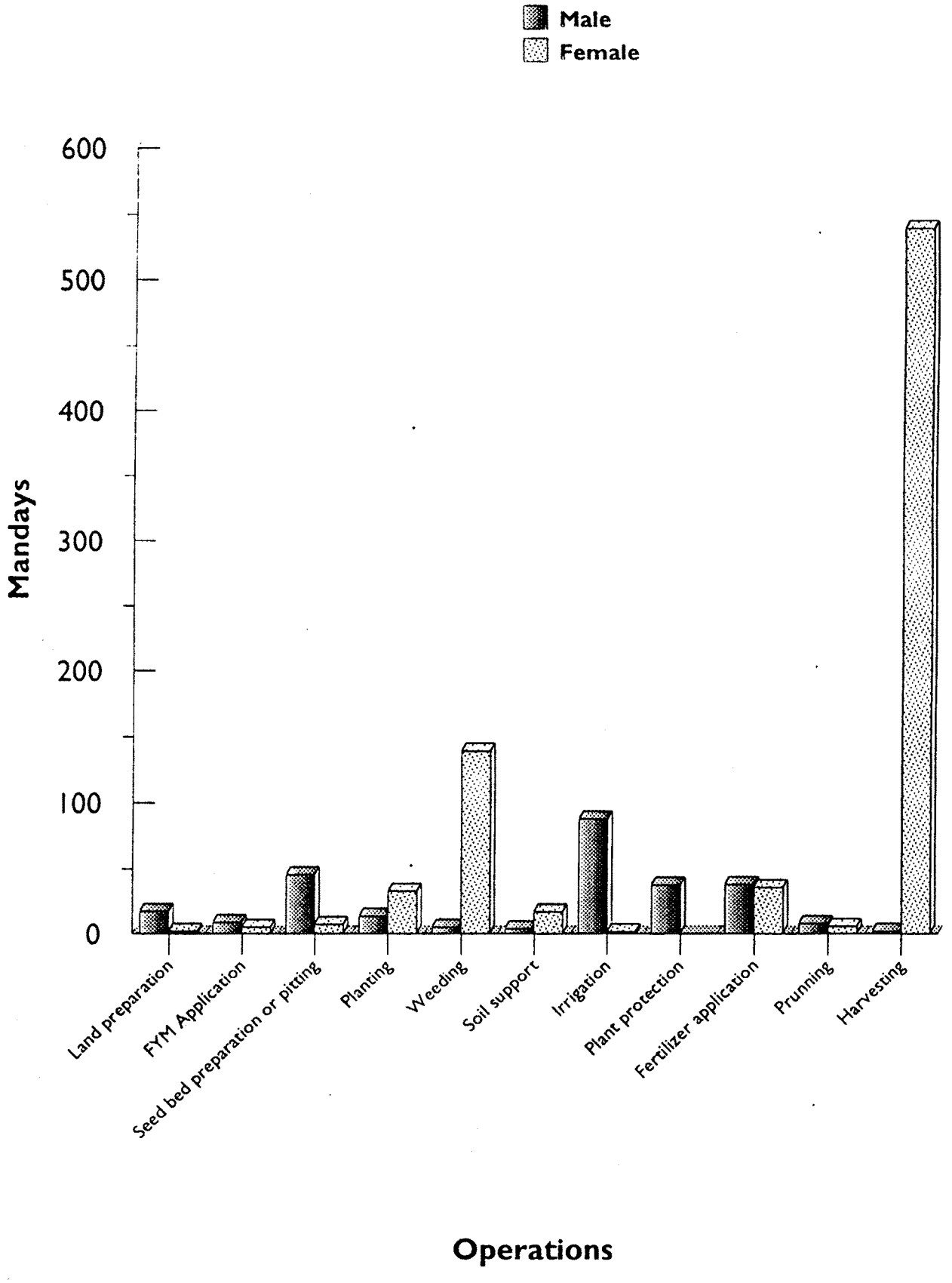


table that the labour utilization for irrigation, plant protection, fertilizer application, pruning, soil support was 42.10, 23.17, 21.16, 6.88 and 3.30 respectively. Female labour used mainly for harvesting and for weeding which was 80.84 per cent and 13.50 per cent respectively.

Operation-wise labour use for both the establishment and maintenance of garden is presented in Table 4.7. It was observed from the table that the total human labour use was 1054.51 man days in which female labour was 787.35 mandays and male labour was 267.16 mandays. Distribution of male labour for various operations was as follows, for irrigation 32.78 per cent, for plant protection 14.07 per cent, while labour utilized for fertilizer application was 14.24 per cent. Female labour was use for operation like, harvesting, weeding fertilizer application and share of them were 68.60, 17.69 and 4.57 per cent respectively. For the other operations like land preparation, FYM application, seedbed preparation, utilization of female labour was less. It can be noted that labour used for the harvesting operation was more than other operations because harvesting was 3- 4 times in the week.(Tilekar and Salunkhe, 2001)

4.2.2 Different farm operation and per hectare use thereof in tuberose Flower production :

Operation-wise labour use for the establishment of tuberose garden is given in table 4.5. It was estimated that labour utilization for irrigation was higher than other operations and it was 28.12 mandays followed by seedbed preparation (18.18 mandays). Labour utilization for fertilizer application was 5.55 per cent for male labour and 13.29 per cent

for female labour. Total utilization of female labour for various operations of establishment of garden was 102.23 mandays.

Table 4.7 : Per hectare operation wise human labour use for flower cultivation (Establishment + Maintenance of garden).

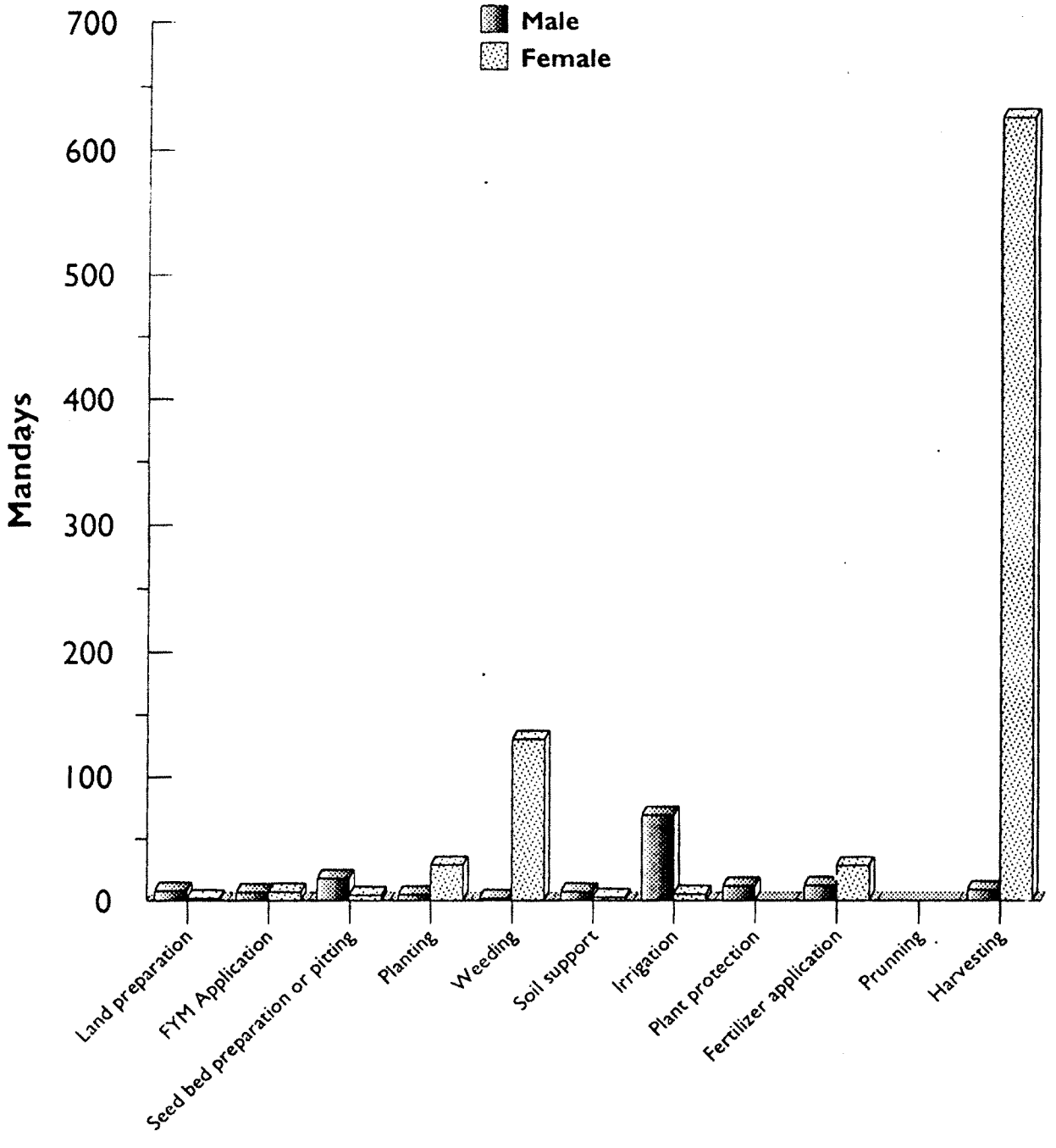
(Fig. in mandays)

Operations	Rose		Tuberose	
	Male	Female	Male	Female
Land preparation	17.25 (6.45)	2.18 (0.27)	7.82 (5.28)	1.80 (0.22)
FYM application	8.75 (3.27)	5.17 (0.66)	6.52 (4.37)	7.37 (0.88)
Seed bed preparation or pitting	45.37 (16.98)	7.23 (0.92)	18.18 (12.19)	4.35 (0.52)
Planting	13.45 (5.13)	32.80 (4.17)	5.17 (3.46)	28.78 (3.45)
Weeding	4.87 (1.83)	139.27 (17.69)	2.11 (1.41)	130.32 (15.60)
Soil support	3.87 (1.45)	16.95 (2.15)	7.18 (4.81)	2.66 (0.32)
Irrigation	87.84 (32.78)	1.80 (0.23)	69.01 (46.27)	5.51 (0.66)
Plant protection	37.60 (14.07)	--	11.89 (7.79)	--
Fertilizer application	38.01 (14.24)	35.96 (4.57)	12.2 (8.18)	28.51 (3.41)
Pruning	8.06 (3.02)	5.83 (0.74)	--	--
Harvesting	2.09 (0.78)	540.16 (68.60)	9.05 (6.07)	625.80 (74.94)
Total	267.16 (100)	787.25 (100)	149.14 (100)	835.10 (100)

(Figures in parentheses indicate percentage to total human labour)

Operation-wise labour utilization for establishment + maintenance of garden is shown in Table 4.7 for the maintenance of tuberose garden total human labour utilized were 984.24 mandays, of which

Fig 4. Per hectare operationwise human labour use in tube rose



149.14 mandays male labour and 835.10 mandays female labour. Female labour was used for the operation of weeding and for harvesting was 15.60 per cent and 74.94 per cent respectively. Among the total male labour in maintenance of garden 56.68 per cent male labour used for irrigation, while for plant protection and harvesting operation labour utilized were 5.07 and 9.05 man days which accounted 7.02 per cent and 12.54 per cent respectively.

Labour used for the various operations in total establishment plus maintenance of garden was worked out and is given in Table 4.7. Labour used for harvesting was higher than other operation and per cent share of which was 63.58 per cent. Out of total male labour use, utilization of male labour for operations like irrigation, seed bed preparation or pitting, fertilizer application was higher i.e. was 46.27, 12.19 and 8.18 per cents respectively. Total female labour used for various operations like weeding, planting, fertilizer application were 15.60, 3.45, 3.41 percents respectively.

It was concluded that the labour used for harvesting was more than any other operations because harvesting was the oftenly in the garden.

4.2.3 Different farm operations and per hectare labour use thereof in Gladiolus flower production :

In case of gladiolus, the total labour utilized were 125.10. It was estimated that male labour utilized for irrigation was high i.e. 51.75 per cent followed by plant protection 22.18 per cent and fertilizer application 17.01 per cent (Table 4.8).

Table 4.8. Per hectare operation wise human labour use for gladiolus cultivation .

(Fig. in man days)

Operations	Gladiolus	
	Male	Female
Planting	12.00 (22.18)	--
Weeding	1.20 (2.21)	13.68 (28.43)
Soil support	1.71 (8.16)	2.19 (2.63)
Irrigation	28.00 (51.75)	--
Fertilizer application	10.00 (17.01)	10.00 (12.01)
Harvesting	2.00 (3.69)	45.00 (57.03)
Total	54.10 (100)	71.00 (100)

(Figures in parentheses indicate percentage to total human labour)

While total female labour many days utilized were 71.00. of which the major share were for harvesting i.e. 57.03 per cent followed by weeding i.e. 28.43 per cent and fertilizer application i.e. 12.01 per cent.

4.2.4 Physical input used in rose garden

Physical input used for the establishment of garden is presented in Table 4.9. It was observed from the table that utilization of bullock used for various operations was 25.75 pair days, while human labour utilization was 269.43 days per hectare, FYM use was 50.00 quintals. Main item in the physical input use for establishment of garden was the planting material and it was 15000 cuttings.

Fig 5. Per hectare operation wise human labour use for gladiolus cultivation (maintenance of garden).

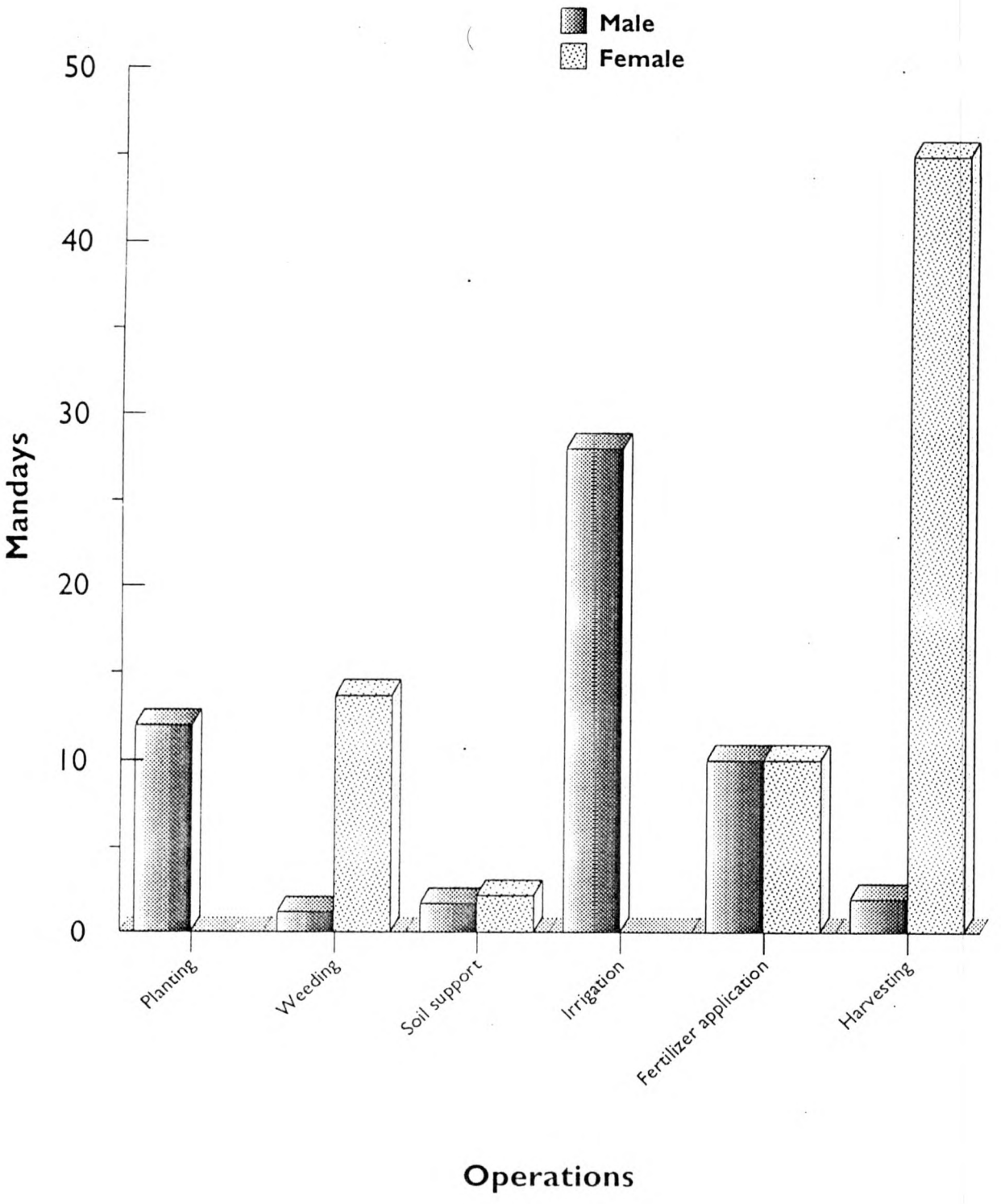


Table 4.9: Per hectare average input use in flower production (Establishment of Garden)

Input	Unit	Rose quantity or No.	Tuberose quantity or No.
Bullock labour	Pair day	25.75	15.47
Human labour	Man days	269.43	179.29
FYM	Tonns	50	40
Planting material	No.	15000	1,20,000
Irrigation	No.	35.51	15.73
Plant protection	Lit.	7.01	2.80
Fertilizers			
N	Kg	335.50	112.10
P	Kg	266.06	80.70
K	Kg	60.58	60.34
Machine labour	In Rs.	2500	1200

For the maintenance of rose garden physical input use was calculated and is presented in Table 4.10 overall 785.25 human labour days was used for maintenance of garden. Machine labour costs rupees 2500. Major expensive items of maintenance of garden were plant protection chemical and machine labour.

Table 4.10: Per hectare average input use in flower production.
(Maintanance Of Garden)

Input	Unit	Rose Quantity or No.	Tuberose Quantity or No.
Human labour	Man days	785.25	805.00
Plant protection	Lit.	7.25	2.10
Irrigation	No.	35.18	36.01
Fertilizers			
N	Kg	180.00	105.00
P	Kg	120.00	82.28
K	Kg	120.00	55.12

Physical input used in total of establishment and maintenance of garden is given in Table 4.11. Physical input used in establishment and maintenance includes the bullock labour 25.75 pair days, 1054.51 mandays of human labours. Utilization of FYM was 50 tonns. Plant protection chemicals and fertilizers, micronutrients were main items of physical input used. Fertilizer use was 515.50 kg of N, 386.06 Kg of P and 180.56 Kg of K. The machine labour cost was Rs. 2500. The requirement of irrigation was found to be 70.69 in number (Tilekar and Salunkhe ,2001)

4.2.5 Physical input used in Tuberose garden :

Physical input used in establishment of tuberose garden was calculated and is presented in Table 4.9. Use of bullock labours, human labours. FYM and planting material was 15.47 pair days, 149.14 mandays 40 tonnes and 12,0000 tubers respectively. Major expensive items were plant protection and fertilizers.

In table 4.10, physical inputs used in maintenance of tuberose garden is given. It was observed that human labours used was 805.00 mandays, plant protection used was 2.10 lit and fertilizer use was 105 kg of nitrogen.

Table 4.11: Per hectare average input use in flower production (Establishment Plus Maintanance Of Garden)

Input	Unit	Rose quantity or No.	Tuberose quantity or No.
Bullock labour	Pair day	25.75	15.47
Human labour	Man days	1054.68	984.24
FYM	Tonns	50	40
Planting material	No.	15000	120000
Irrigation	No.	70.69	51.74
Plant protection	Lit.	14.26	10.05
Fertilizers			
N	Kg	515.50	217.10
P	Kg	386.06	162.98
K	Kg	180.56	115.46
Machine labour	In Rs.	2500	1200

For total (establishment plus maintenance) cultivation of garden physical input use is given in Table 4.11. Main items of physical inputs were human labours (984.24 mandays) plant protection chemical (10.05 lit.) and fertilizers like N-217.10 kg and P-162.98 kg and K- 115.46 kg per hectare. Planting material was also one of the most important physical input which was 120000 tubers. The requirement of irrigation was

found to be 51.74 in numbers. Charges of machine labour was Rs. 1200 (Tilekar and Salunkhe 2001)

4.2.6 Physical input used in Gladiolus garden :

Physical inputs used in gladiolus garden is given in Table 4.12. Use were bullock labours, human labours, FYM and planting material was 5.25 pair day, 125.1 mandays, 22 tonnes and 110000 corms respectively. Micronutrient cost was Rs. 550 while fertilizer like N-70.18 Kg and P-82.70 Kg and K-18.82 Kg was per hectare. Planting material was also one of the most important physical input which was 1,10,000 corms. Requirement of irrigation was found to be 7.07 in numbers.

Table 4.12 : Per hectare average input use in gladiolus production

Input	Unit	Gladiolus quantity or No.
Bullock labour	Pair day	5.25
Human labour	Man day	125.1
FYM	Tonns	22
Planting material	No.	1,10,000
Irrigation	No.	7.07
Plant protection	Lit	1.00
Fertilizers		
N	Kg	70.18
P	Kg	82.70
K	Kg	18.82
Micro-nutrients	Rs.	550

4.2.7 Establishment cost of flower garden :

Establishment cost of Rose and Tuberose is shown in Table 4.13. The cost required for establishment of garden was Rs. 62804 per hectare in Rose while it was Rs. 86895 in case of tuberose.

Table 4.13:Per Hectare Establishment cost of flower garden (Rose and tuberose)

Sr. No.	Particulars	Rose		Tuberose	
		Cost	Percentage	Cost	Percentage
1.	Hired male labour	9000	14.33	4620	5.33
2.	Hired female labour	4800	7.64	4080	4.70
3.	Farm yard manure	15000	23.88	1000	11.51
4.	Bullock labour cost	3900	6.21	2250	2.59
5.	Machine labour cost	2500	3.98	1200	1.38
6.	Planting material cost	15000	23.88	59750	68.76
7.	Irrigation	2700	4.30	1125	1.30
8.	Plant protection	1260	2.00	508	0.58
9.	Nitrogen fertilizer	4020	6.40	1344	1.55
10.	Phosphorus fertilizer	3724	5.93	1118	1.29
11.	Potassium fertilizer	900	1.45	900	1.04
	Total	62804	100	86895	100

The major item of expenditure in establishment cost of Rose was planting material cost, farmyard manure, hired male labours which were 23.88 per cent, 23.88 per cent and 14.33 per cent respectively.

In case of tuberose, major item of expenditure in establishment cost was planting material cost, farm yard manure and hired male labour having 68.76 per cent, 11.51 per cent and 5.33 per cents respectively.

4.2.8 Amortization cost of Rose and Tuberose :

The per hectare amortization cost was calculated on the establishment cost and average bearing life of garden (years). The costs

were Rs. 12560.80 and Rs. 17379 per year for Rose and Tuberose respectively (Table 4.14).

Table 4.14 : Amortization cost of rose and tuberose

Sr. No.	Particulars	Rs. Per hectare	
		Rose	Tuberose
1.	Total cost of establishment	62804	86895
2.	Average bearing life of garden (years)	5	5
3.	Net establishment cost as per bearing years (Rs.)	12560.8	17379

4.2.9 Cost of cultivation of rose flowers :

In Table 4.15 cost of cultivation of rose flowers was estimated and in presented. It could be revealed from table that per hectare total cost of cultivation of rose was Rs. 107925 Rental value of land was major expensive item of cost and it accounted for 27.79 per cent of total cost of cultivation followed by hired female labour (24.76 per cent). Expenditure on amortization cost and hired human labour was Rs. 125060.80 and fertilizers was Rs. 7024 respectively which was accounted for 11.63 and 6.50 per cent respectively.

Share of cost ' A' in the total cost was 53.75 per cent cost 'B' was Rs. 105165 and was accounted for 97.44 per cent of total cost. Share of family labour was less due to engagement of some family members in service and elsewhere.

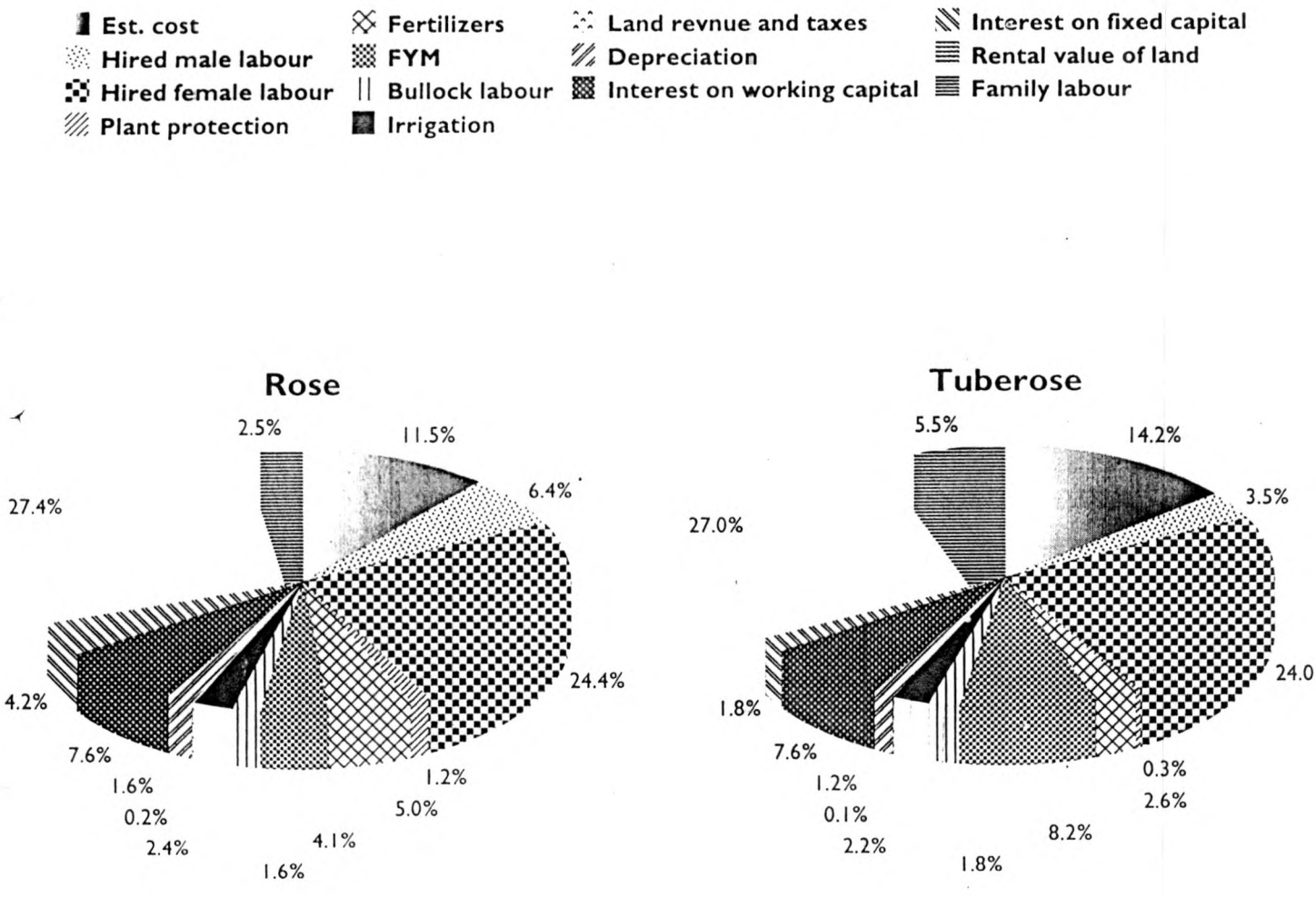
Per hectare total marketing cost of roses was Rs. 52020. Anonymous (1974-76) calculated the per hectare total cost of production of roses as Rs. 24185.66. The most expensive item of cost was labour charges which was Rs. 11916.56 per hectare (Singh,1997)

Table 4.15: Per hectare cost of cultivation of flower

(Fig. in Rs. Per ha)

Sr. No.	Particulars	Rose		Tuberose	
		Value	Percentage	Value	Percentage
1.	Hired male labour	7024	6.50	4327	3.60
2.	Hired female labour	26726	24.76	29314.8	24.42
3.	Plant protection	1260	1.16	360	0.29
4.	Fertilizers	5520	5.11	3151	2.62
5.	Farm yard manure	4500	4.16	10000	8.33
6.	Bullock labour	1800	1.66	2250	1.88
7.	Irrigation	2625	2.43	2700	2.24
8.	Land revenue and taxes	185	0.17	75	0.061
9.	Depreciation	1700	1.57	1500	1.24
10.	Interest on working capital @ 13 %	6674.2	6.18	6978.11	5.81
	Cost 'A'	58014.2	53.75	60655.9	50.54
11.	Interest on fixed capital @ 10 %	4590	4.19	2250	1.84
12.	Rental value of land	30000.00	27.38	33000	26.99
13.	Amortization cost	12560.8	11.63	17379	14.48
	Cost 'B'	105165.00	97.44	113284.9	94.40
13.	Family labour	2760	2.52	6720	5.50
	Cost 'C'	107925.00	100	120004.9	100
	Value of main produce	270000		297500	
	By produce	20000		20000	

Fig 6. Per hectare average cost of cultivation of rose and tuberose flowers



4.2.10 Cost of cultivation of Tuberose flowers :

Total cost of cultivation of tuberose was Rs. 120004.9 in which the cost 'A' and cost 'B' were accounted to Rs. 60655.9 and Rs. 113284.9 respectively. Share of rental value of land was maximum in total cost of cultivation and it was Rs. 33000. In cost of cultivation, hired female labour was major expensive item followed by amortization cost and farm yard manure. It's share in total cost was 24.42, 14.48 and 8.33 percent respectively. Total marketing cost of tuberoses was Rs. 82365.

4.2.11 Cost of cultivation of Gladiolus flowers

Total cost of cultivation of gladiolus was Rs. 87077.54 in which the cost 'A' and cost 'B' were accounted as Rs. 54177.54 and Rs. 85977.54 respectively. Share of planting material was maximum in total cost of cultivation and it was Rs. 35000 (40.19 per cent). While other expensive items were rental value of land followed by hired human labour and FYM. It's share in total cost was 34.45, 6.31, 6.30 per cents respectively. Total marketing cost of gladiolus was Rs. 28787.

4.2.12 Profitability of rose flowers production

Per hectare yield of rose and it's profitability was calculated and presented in Table 4.18. It was seen from the table that per hectare gross return was Rs. 2,90,000. Cost 'A', cost 'B' and cost 'C' were calculated as Rs. 58014.20, Rs. 105165.00, Rs 107925.00, respectively. Estimated farm business income, which showed profit on cost 'A' was 231985.8 while profit on cost 'B' i.e. family labour income was Rs. 184835.00. Net profit per hectare was Rs. 182075.00 and input-output ratio was 1: 2.68 (Subrahmanyam, 1989)

Table 4.16: Per hectare cost of cultivation of gladiolus

(Fig. in Rs.)

Sr. No.	Particulars	Gladiolus	
		Value	Percentage
1.	Hired male labour	2700	3.10
2.	Hired female labour	2800	3:21
3.	Machine labour	2200	2.52
4.	Plant protection	180	0.20
5.	Fertilizers	1656	1.90
6.	Farm yard manure	5500	6.30
7.	Bullock labour	750	0.86
8.	Planting material	35000	40.19
9.	Irrigation	525	0.60
10.	Land revenue and taxes	90	0.10
11.	Depreciation	1200	1.37
	Total	52401	60.17
12.	Intrest on working capital @ 13 %	1776.54	2.04
	Cost 'A'	54177.54	62.21
13.	Intrest on fixed capital @ 10 %	1800	2.06
14.	Rental value of land	30000	34.45
	Cost 'B'	85977.54	98.73
15.	Family labour	1100	1.27
	Cost 'C'	87077.54	100
16.	Value of main produce	143000	
	By produce	20000	

Fig 7 Per hectare average cost of cultivation of gladiolus flowers

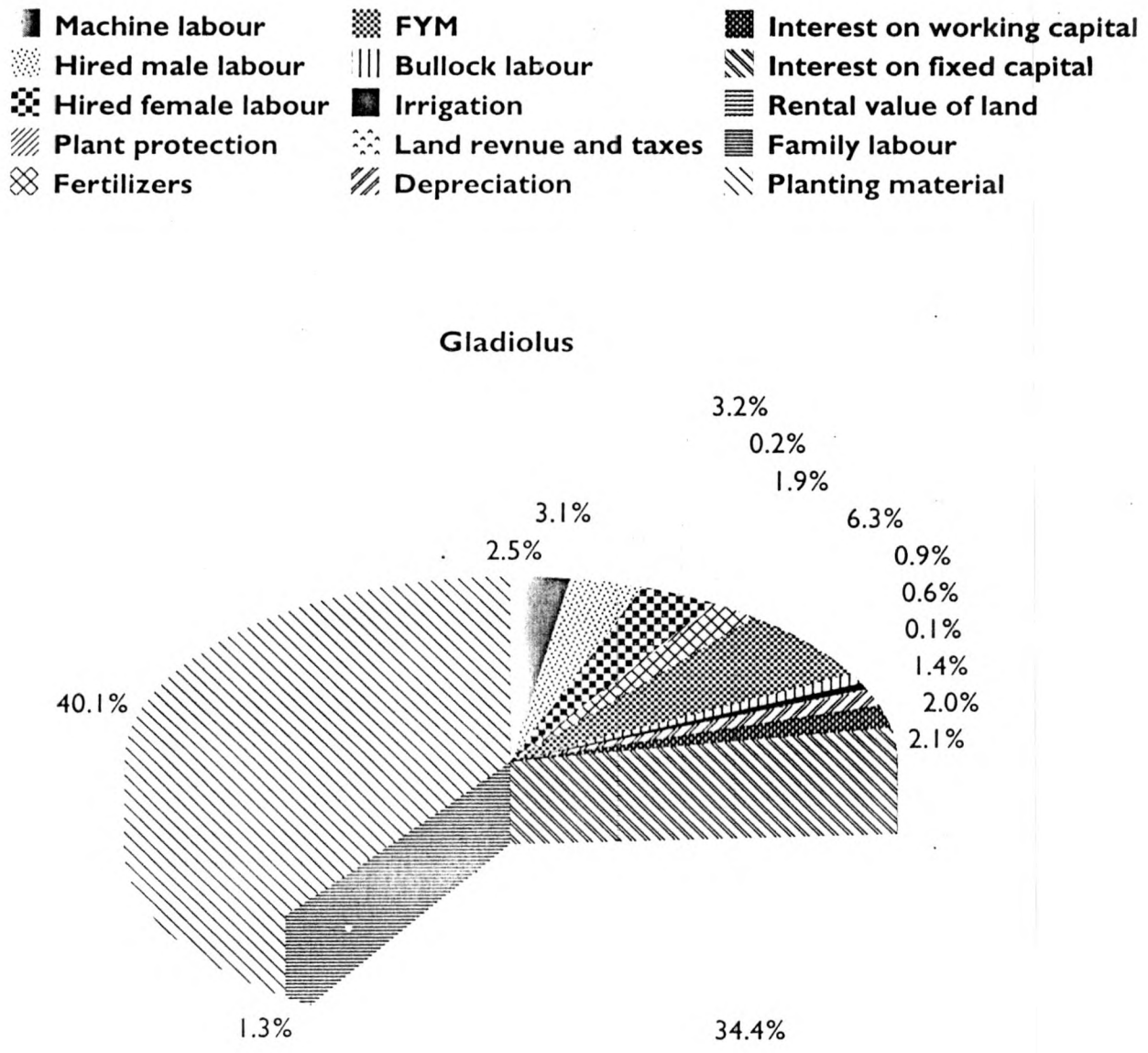


Table 4.17. Marketing cost of rose, tuberose and gladiolus

Sr. No	Particulars	Rose (per 100 flowers)		Tuberose (per kg)		Gladiolus (per 100 flower)	
		Marke-ting cost	Perce-ntage	Marke-ting cost	Perce-ntage	Marke-ting cost	Perce-ntage
1	Packing	0.68	7.06	0.92	9.49	3.60	13.75
2	Loading	0.24	2.49	0.32	3.30	0.49	1.87
3	Transportation	3.24	33.64	3.56	36.74	6.50	24.84
4	Unloading	0.24	2.49	0.32	3.30	0.49	1.87
5	Handling, weighing and grading	0.14	1.45	0.54	5.57	1.40	5.35
6	Commission charges	5.00	51.92	3.75	38.70	13.00	49.68
7	Miscellaneous expenses	0.09	0.95	0.28	2.90	0.69	2.64
	Total	**9.63**	**100**	**9.69**	**100**	**26.17**	**100**

4.2.13 Profitability of Tuberose flowers production.

Calculated cost 'A', cost 'B' and cost 'C' of tuberose were as Rs. 58014.2.07 Rs. 113284.90 and Rs.120004.09 respectively. Gross income of tuberose flowers was Rs. 3,17,500 per hectare.

While family labour income and farm business income (table 4.18) were Rs. 204215.10 and Rs. 256844.10 respectively. Net income estimated to Rs. 197495.10. Input output ratio was 1:2.64 (Koranne and Naik, 1997).

4.2.14 Profitability of Gladiolus flowers production :

Per hectare Cost 'A', cost 'B' and cost 'C' of gladiolus were as Rs. 54,177.54, Rs. 85977.54 and Rs. 87077.54 respectively. Gross income of gladiolus flowers was Rs. 1,63,000 per hectare. While family labour income and farm business income were Rs. 77022.46 and Rs. 1,08,822.46. Input-output ratio was found to be 1:1.87. These are presented in Table 4.18.

Table 4.18: Per hectare average profitability of rose, tuberose and gladiolus flowers

Sr. No.	Particulars	Rose	Tuberose	Gladiolus
1.	Cost 'A'	58014.2	60655.9	54177.54
2.	Cost 'B'	105165.0	113284.9	85977.54
3.	Cost 'C'	107925.0	120004.9	87077.54
4.	Gross income	290000	317500	163000
5.	Farm business income (Gross income - cost A)	231985.8	256844.1	108822.46
6.	Family labour income (Gross income - cost B)	184835.0	204215.1	77022.46
7.	Net income (profit at cost C)	182075.0	197495.10	75922.46
8.	Marketing cost	52020.0	82365.0	28787
9.	Net profit (net income – marketing cost)	130055.0	115130.1	47135.46
10.	Input output ratio	2.68	2.64	1.87

4.3.1 Resource productivity in rose production :

Cobb-Douglas type of production function was fitted to the data and regression coefficient of various explanatory variables were estimated and presented in Table 4.19. It is obvious that regression coefficient of area of rose garden (0.94) was found positive and significant at one percent level of significance. While regression coefficient of phosphorus and potassium were negative and non-significant. Regression coefficient of hired male labour was negatively significant. It is inferred that increase in the area of rose garden by one per cent on geometric mean would increase production of rose by 0.94 per cent. Likewise if farm yard manure and nitrogen were increased by one percent it will lead to increase the production of rose by 0.68 and 1.08 per cent. In short, elasticity of production due to farm yard manure and nitrogen was found to be 0.68 and 1.08 per cent. Intercept of production was 9.8683. The value of R^2 was 0.88 which indicated that 88 per cent variation in rose production, was explained by selected independent variables. "F" value was highly significant (16.8156). in other words, there was effect of all explanatory variables together on rose production. The sum of regression coefficient was found to be 1.5068, which indicated an increasing return to scale.

In general, it can be concluded that there is scope to increase area, use of FYM and Nitrogen in the production of rose.

Table 4.19 : Estimates of Cobb-Douglas Production Function in rose production

Independent variables	Regression coefficient (bi)	Standard error bi (SE)	't' value
Area of garden (X1)	0.9401	0.2179	4.3141**
Hired male labour (X2)	-0.6975	0.1253	-5.5658**
Farm yard manure (X3)	0.6838	0.2317	2.9503**
Nitrogen (X4)	1.0818	0.2785	3.8831**
Phosphorus (X5)	-0.1684	0.2280	-0.7390
Potassium (X6)	-0.3330	0.2287	-1.4560

Intercept (a) = 9.8683 'F' value = 16.8156
R2 = 0.883 Return to scale = 1.5068
** Significant at 1 per cent level.

4.3.2 Resource use efficiency in rose production :

Marginal value products of various inputs used in rose production were calculated and compared with their respective prices and are put in Table 4.20. It was observed that MVP of area of rose garden was Rs. 1151.64 followed by hired male labours and FYM which were Rs. 1156.06, Rs 2036.85 respectively. It is worth mentioning here that MVP to price ratio of Nitrogen was as high as 70.16 followed by FYM (10.18) and area of garden (1.046). It implied that there is scope to increase the input use of those variables wherein the MVPs were higher than the price. Accordingly in rose cultivation the area, FYM and Nitrogen contributed significantly to the production of roses and hence the area expansion and use of FYM, Nitrogen is recommended.

Table 4.20. Marginal value productivities of various inputs with their prices in rose production.

Sr No	Independent variable with its unit	Geometric mean of the input (in respective unit)	MVP of input	Price of the input Rs/unit	MVP to price ratio
1	Area of garden (R)	14.76	1151.64	1100	1.046
2	Hired male labour (days)	15.64	-1156.06	60	-19.26
3	Farm yard manure (tonnes)	6.07	2036.85	200	10.18
4	Nitrogen (kg)	23.23	842.01	12	70.16
5	Phosphorus (kg)	15.15	-200.97	13	-15.45
6	Potassium (kg)	11.33	-531.41	15	-35.41

Note : Geometric mean (Y) of rose production in garden was 5,40,000 flowers and price of it was Rs. 0.50 per flower.

4.3.3 Resource productivity in Tuberose Production :

Regression coefficients of various independent variables for tuberose production were presented in Table 4.21. It is obvious that regression coefficient of area of garden (0.593) was found positive and highly significant area at five percent level of significance. It inferred that if area of tuberose garden was increased by five per cent on geometric mean level the production would increase by 0.593 per cent. In other words, if the garden was increased by five per cent, the production would increase by 0.593 per cent. Likewise if FYM and Nitrogen were increased by one per cent it will lead to increase the production of tuberose by 0.37 per cent and

0.26 percent. While regression coefficient of hired male labour, phosphorus and potassium were negative and non – significant.

Table 4.21 : Estimates of Cobb-Douglas Production Function in tuberose production

Independent variables	Regression coefficient (bi)	Standard error bi (SE)	't' value
Area of garden (X1)	0.5938	0.2557	2.3218*
Hired male labour (X2)	-0.0835	0.0784	-1.0647
Farm yard manure (X3)	0.3769	0.0733	5.1379**
Nitrogen (X4)	0.2628	0.0627	4.1855**
Phosphorus (X5)	-0.0671	0.0775	-0.8652
Potassium (X6)	-0.0330	0.0571	-0.5785

Intercept (a) = 7.5115 'F' value = 239.140
R2 = 0.991 Return to scale = 1.0499
* Significant at 5 per cent level.
** Significant at 1 per cent level.

The value of R^2 was 0.991 which indicated that 99 per cent variation in tuberose production was explained by selected independent variables. F value was highly significant 239.14. In other words, there was effect of all explanatory variable together on tuberose production. The sum of regression coefficient was found to be 1.0499, which showed increasing returns to scale.

4.3.4 Resource use efficiency in Tuberose Production :

In Table 4.22 the marginal value products of various inputs used in tuberose were calculated and compared with respective prices. It was observed that MVP of area of tuberose garden was Rs. 1876.25. It is

worth mentioning here that MVP to area was much higher than the price followed by Nitrogen (67.75), FYM (14.65). Hence, there is scope to increase the area under tuberose cultivation and Nitrogen, FYM use.

Table 4.22 : Marginal value productivities of various inputs with their prices in tuberose production.

Sr No	Independent variable with its unit	Geometric mean of the input (in respective unit)	MVP of input	Price of the input Rs/unit	MVP to price ratio
1	Area of garden (R)	16.93	1876.25	1100	1.70
2	Hired male labour (days)	12.54	-356.20	60	-5.93
3	Farm yard manure (tonnes)	6.88	2930.53	200	14.65
4	Nitrogen (kg)	17.29	813.09	12	67.75
5	Phosphorus (kg)	16.52	-217.28	13	-16.71
6	Potassium (kg)	8.30	-212.68	15	-14.71

Note : Geometric mean (Y) of tuberose production in garden was 1432.25 kg and its price Rs. 37.35 per kg.

4.3.5 Resource productivity in Gladiolus Production

Regression coefficients of various independent variables for Gladiolus production were estimated and presented in Table 4.23. It is obvious that regression coefficient of area of gladiolus garden (1.5818) was found positive and highly significant at one percent level of significance. It inferred that if the area of gladiolus garden was increased by one per cent on geometric mean level, the production of gladiolus would increase by 1.5818 per cent. In other words, if the garden area were increased by one per cent, the production would increase by 1.58 per cent. Likewise

phosphorus was increased by one per cent it would lead to increase the production of gladiolus by 1.20 per cent. While regression coefficient of hired male labour and potassium were negative and non-significant. Regression coefficient of Nitrogen was positive but non-significant.

Table 4.23 : Estimates of Cobb-Douglas Production Function in gladiolus production

Independent variables	Regression coefficient (bi)	Standard error bi (SE)	't' value
Area of garden (X1)	1.5818	0.4774	3.3131**
Hired male labour (X2)	-0.5637	0.4113	-1.3704
Farm yard manure (X3)	0.2291	0.1524	1.5033
Nitrogen (X4)	0.2900	0.3979	0.7287
Phosphorus (X5)	1.2059	0.3755	3.2110**
Potassium (X6)	-0.0539	0.1446	-0.3727

Intercept (a) = 7.3356 'F' value = 4.4871
R2 = 0.669 Return to scale = 2.6892
** Significant at 1 per cent level.

The value of R^2 was 0.669, which indicated that 66 per cent variation in gladiolus production was explained by selected independent variables, "F" value was significant (4.4871). In other words, there was effect of all explanatory variable together on gladiolus production. The sum of regression coefficient was 2.6892, which was indicating as increasing returns to scale.

4.3.6 Resource use efficiency in Gladiolus Production :

In Table 4.24, the marginal value products of various inputs used in gladiolus were calculated and compared with respective prices. It

was observed that MVP of area of gladiolus garden was 239.88 and MVP of phosphorus and Nitrogen were 452.55 and 64.04 respectively. It is worth mentioning here that MVP to phosphorus and Nitrogen was much higher than the price which were P (34.81) and N (5.33). Hence there is scope to increase area under gladiolus cultivation and use of phosphorus, nitrogen.

Table 4.24 :. Marginal value productivities of various inputs with their prices in gladiolus production.

Sr No	Independent variable with its unit	Geometric mean of the input (in respective unit)	MVP of input	Price of the input Rs/unit	MVP to price ratio
1	Area of garden (R)	6.83	239.88	1100	0.22
2	Hired male labour (days)	2.996	-194.88	60	-3.24
3	Farm yard manure (tonnes)	1.77	134.06	200	0.67
4	Nitrogen (kg)	4.69	64.04	12	5.33
5	Phosphorus (kg)	2.76	452.55	13	34.81
6	Potassium (kg)	1.11	-50.29	15	-3.35

Note : Geometric mean (Y) of gladiolus production in garden was 1,10,000 flowers and its price Rs. 1.30 per flower.

4.4 Marketing of flowers

In marketing of flowers, different functionaries like commission agent cum wholesaler and retailer performed the various functions before reaching the produce in the hand of final consumers. Marketing activities in regard to flower marketing in terms of costs, margin and price spread have been interpreted as follows:

4.4.1 Channels for marketing of flowers

There are two main marketing channels for marketing of flower:

a) Channel – I (producer – commission agent cum wholesaler – retailer – consumer)

b) Channel – II (producer – retailer – consumer)

4.4.2 Marketing cost incurred by flower grower

Per 100 flowers marketing cost incurred by flower producer through different channels in regard to rose, tuberose (per kg) and gladiolus flowers and is presented in Table 4.25. It was observed that per 100 flowers marketing cost rose was higher in channel – II (producer- retailer – consumer) than channel – I (producer – commission agent cum wholesaler – retailer – consumers). The marketing cost of producer in channel I was Rs. 6.00 and Rs. 6.30 in channel II. Per hectare marketing cost of rose flower was Rs. 52020.

Table 4.25: Item wise marketing cost incurred by flower growers

Sr. No.	Particulars	Rose		Tuberose		Gladiolus	
		Channel		Channel		Channel	
		I	II	I	II	I	II
1.	Labour charges @ Rs. 50/day	5.00 (83.33)	5.00 (79.36)	2.56 (82.58)	2.55 (82.25)	4.00 (88.89)	4.20 (84.00)
2.	Grading	1.00 (16.67)	1.30 (20.64)	0.55 (17.42)	0.55 (17.74)	0.50 (11.11)	0.80 (16.00)
	Total	6.00 (100)	6.30 (100)	3.10 (100)	3.10 (100)	4.50 (100)	5.00 (100)

(Figures in parentheses indicate percentage to total cost of marketing of producer)

As regard to marketing cost of producer of tuberose in channel was Rs. 3.10 which was equal to cost of producer of tuberose in channel II.

It can be concluded that marketing cost of producer was higher in channel – II for both rose and gladiolus flowers. Here large share was observed in case of labour charge expenditure. Per hectare marketing cost of tuberose worked out as Rs. 82365.

It can be concluded that in gladiolus large share was observed in case of labour expenditure. The marketing cost of producer in channel-I was Rs. 4.50 and Rs. 5.00 per 100 flower in channel-II. Per hectare marketing cost of gladiolus worked out as Rs. 28787 (Tilekar and Salunkhe, 2001)

4.4.3 Marketing cost incurred by intermediaries :

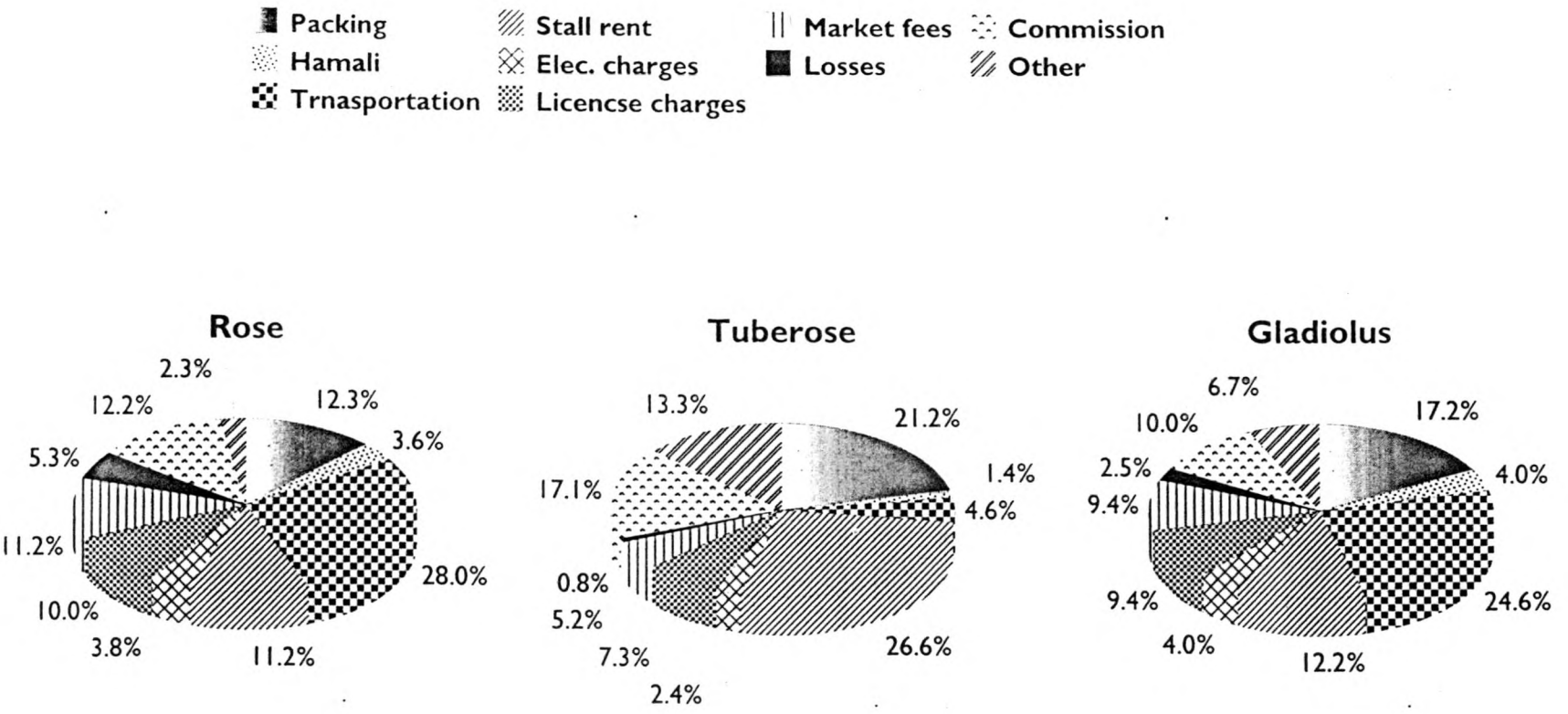
Per 100 flowers marketing cost of flower (irrespective of species) incurred by commission agent cum wholesaler and retailer were calculated and are presented in Table 4.26. It was observed from the table that, marketing cost of commission agent cum wholesaler in case of roses was Rs. 9.82 for 100 flowers. In total marketing cost of commission agent cum wholesaler, share of transportation, commission and packaging was predominant and shared 28,12.32 and 12.22 per cent respectively.

In case of tuberoses, marketing cost of commission agent cum wholesaler was slightly lower than rose flowers and which was Rs. 3.68 for one kg of flowers. Of which stall rent, packaging and commission were the expensive items and their share was 26.63, 21.19 and 17.12 per cent respectively.

Table 4.26 : Itemwise cost of marketing incurred by various intermediaries.

Sr No	Particulars	Rose		Tuberose		Gladiolus	
		Amount (Rs)	% to total cost	Amount (Rs)	% to total cost	Amount (Rs)	% to total cost
I.	**Commission agent cum wholesaler**						
1.	Packing	1.21	12.32	0.78	21.19	1.82	17.22
2.	Hamali	0.35	3.56	0.05	1.36	0.42	3.98
3.	Transportation	2.75	28.00	0.17	4.62	2.60	24.64
4.	Stall rent	1.11	11.20	0.98	26.63	1.29	12.23
5.	Electricity charges	0.37	3.76	0.09	2.44	0.42	3.98
6.	License charges	0.98	09.97	0.27	7.33	0.98	9.37
7.	Market fees	1.10	11.20	0.19	5.16	0.98	9.37
8.	Losses	0.52	5.29	0.03	0.80	0.26	2.46
9.	Commission	1.20	12.22	0.63	17.12	1.07	10.02
10.	Other	0.23	2.32	0.49	13.32	0.71	6.73
	Total	9.82	100	3.68	100	10.53	100
II.	**Retailer**						
1.	Packing	1.52	14.92	0.57	19.58	1.77	15.91
2.	Hamali	0.31	3.04	0.05	1.71	0.53	4.76
3.	Transportation	2.79	27.37	0.73	25.08	2.83	25.44
4.	Stall rent	1.41	13.83	0.32	10.99	1.31	11.78
5.	Electricity charges	0.63	6.18	0.20	6.87	0.54	4.85
6.	License charges	1.10	10.79	0.25	8.59	0.98	8.81
7.	Storage charges	0.39	3.80	0.31	10.65	1.01	9.08
9.	Losses	1.09	10.69	0.38	13.05	1.29	11.60
10.	Other	0.95	9.32	0.10	3.43	0.86	7.73
	Total	10.19	100	2.91	100	11.12	100

Fig 8. Itemwise cost of marketing incurred by commission agent-cum-wholesaler



In case of gladiolus, marketing cost of commission agent cum wholesaler was higher than tuberose which was Rs. 10.55 for 100 flowers. Transportation, packaging, stall rent were the expensive items and their share was 24.64 , 17.22 and 12.23 per cent respectively. Marketing cost of retailer is also presented in Table 4.26. The total marketing cost of retailer in case of rose flower was Rs.10.19. Among all the items of expenditure, share of transportation, package was 27.37 and 14.92 per cent respectively and was dominant.

It is also evident from the Table 4.26 that total cost of marketing incurred by retailer in tuberoses was Rs. 2.91. In total cost share of transportation and packing was found to be 25.08 and 19.58 per cent respectively and these were the major items in the total cost.

In case of gladiolus, total cost of marketing incurred by retailer was Rs. 11.12. In total cost, share of transportation and packing was found to be 25.44 and 15.91 per cent respectively and these were the major items in the total cost. Suryawanshi and Kahade (1979)

4.4.4 Producer's share in consumer's rupee in rose marketing

Per 100 flowers, average marketing cost, marketing margin, price spread of rose flower in different channels were calculated and are presented in Table 4.27. From the table it was observed that net price received by rose flower grower in channel – II was higher (Rs. 40.70) and price paid by consumer was more in channel-I (Rs. 83.08) While producer's share in consumer's rupee was more in channel – II (49.62 per cent). It can be concluded that channel – II was more benefited to rose grower than channel -I. Price spread was Rs. 44.08 in channel-I and Rs.

Fig 9. Itemwise cost of marketing incurred by retailer

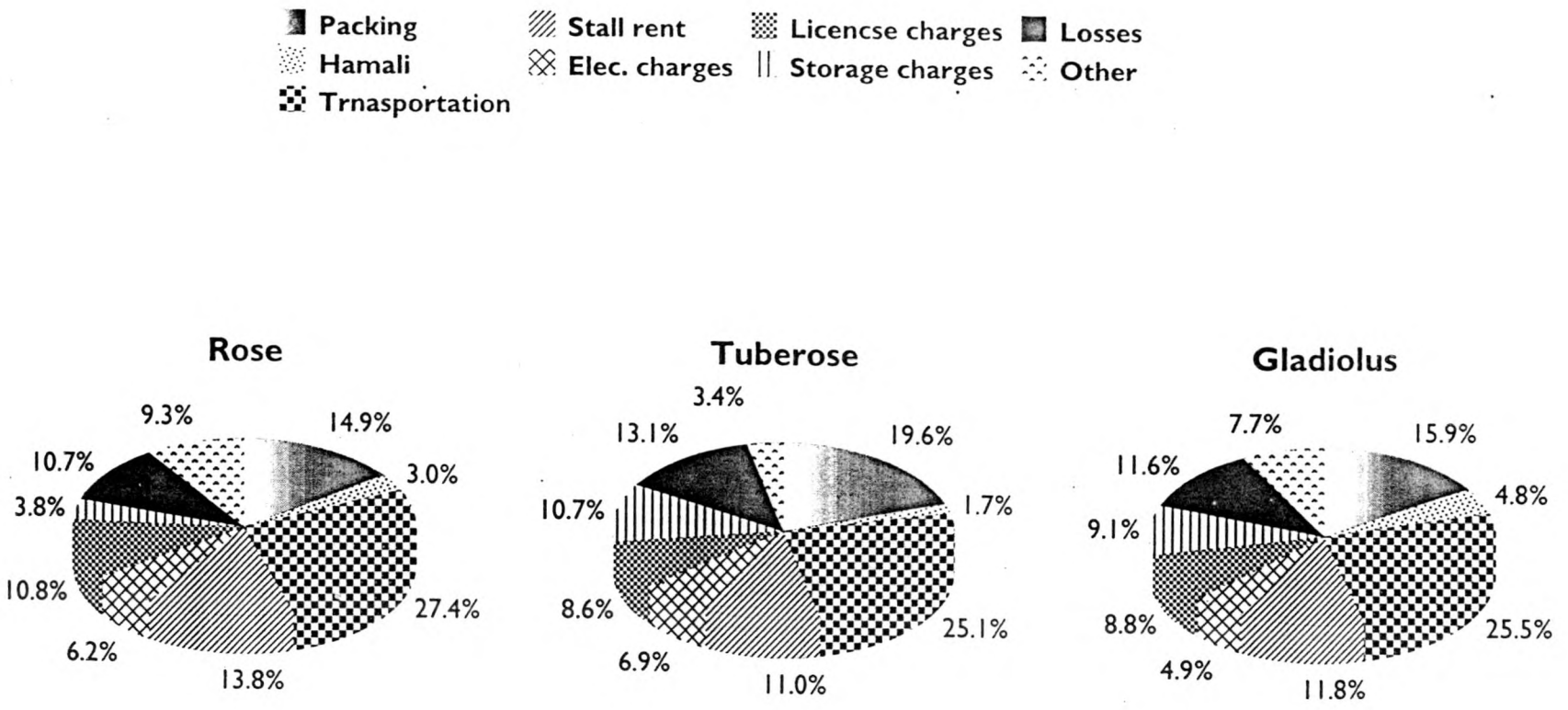


Table 4.27:Average price spread in rose, tuberose and gladiolus flowers marketing

Sr No	Particulars	Rose (Rs./100 flowers)		Tuberose (Rs./kg)		Gladiolus (Rs./100 flowers)	
		I	II	I	II	I	II
1.	Sale price received by flower grower	45.00 (54.16)	47.00 (57.29)	35.00 (61.52)	38.00 (74.30)	130 (68.37)	135 (78.85)
2.	Marketing cost incurred by flower grower	6.00 (7.22)	6.30 (7.68)	3.10 (6.06)	3.10 (6.06)	4.50 (2.36)	5.00 (2.92)
3.	Net price received by flower growers	39.00 (46.94)	40.70 (49.62)	31.90 (56.07)	34.90 (68.24)	125.50 (66.01)	130 (75.93)
4.	Price paid by commission agent cum wholesaler	45 (54.16)	--	35.00 (61.52)	--	130 (68.37)	
5.	Marketing cost incurred by commission agent cum wholesaler	9.82 (11.81)	--	3.68 (6.46)	--	10.55 (5.54)	
6.	Net margin of commission agent cum wholesaler	8.02 (9.65)		7.20 (12.65)		18.23 (9.55)	
7.	Price paid by retailer	62.84 (75.63)	47.00 (57.29)	45.88 (80.64)	38.00 (74.30)	158.78 (83.51)	135 (78.85)
8.	Marketing cost incurred by retailer	10.91 (12.26)	10.19 (12.26)	2.91 (5.69)	2.91 (5.69)	11.12 (5.84)	11.12 (6.40)
9.	Net margin of retailer	10.05 (12.05)	10.92 (12.82)	8.10 (14.23)	10.23 (20.00)	20.22 (10.63)	25.09 (14.65)
10.	Price paid by consumer	83.08 (100)	82.03 (100)	56.89 (100)	51.14 (100)	190.12 (100)	171.21 (100)
11	Total marketing cost	26.01	16.45	9.69	6.01	26.17	16.12
12.	Total marketing margin	18.07	10.92	15.30	10.23	38.45	25.09
13.	Price spread	44.08	41.33	24.99	16.24	64.62	41.21
14.	Producer's share in consumer's rupee (%)	46.94	49.62	56.07	68.24	66.01	75.93

41.33 in channel-II Share of commission agent cum wholesaler and retailer in channel – I was 9.65 per cent and 12.05 per cent respectively. In channel – II share of retailer was 12.82 per cent.

Table 4.28: Price received by producers in various seasons.

Sr. No	Particulars	Rose (per 100 flowers)		Tuberose (per kg)		Gladiolus (per 100 flowers)	
		Channel		Channel		Channel	
		I	II	I	II	I	II
1.	Rainy	37.00	39.00	27.00	29.00	95.00	98.00
2.	Winter	52.00	56.00	42.00	45.00	163.00	191.00
3.	Summer	46.00	44.00	36.00	40.00	132.00	116.00
	Average	45.00	47.00	35.00	38.00	130.00	135.00

In Table 4.28 price received per 100 flowers by producer in various seasons was calculated and are presented. The price received by producer in Winter season in both channels was more than other seasons. Price received in winter season in channel-I and channel – II was Rs. 52 and Rs.56 respectively. Price received in rainy and summer season in channel-I was Rs. 37 and Rs. 46 respectively. While in channel – II. It was Rs. 39 and Rs 44 in rainy and summer season respectively. It was noted that price received by producer in winter season was higher and channel – I was found to be beneficial.

Price paid by consumers in various seasons for 100 flowers was presented in Table 4.29. In rainy, winter and summer season price paid by consumer in channel – I was Rs. 69.07, Rs. 97.01 and Rs. 83.01 respectively. While price paid by consumer in channel – II was Rs. 63.02, Rs. 94.06 and Rs. 89.02 in rainy, winter and summer season respectively.

Table 4.29: Price paid by consumers in various seasons.

Sr. No	Particulars	Rose (per 100 flowers)		Tuberose (per kg)		Gladiolus (per 100 flowers)	
		Channel		Channel		Channel	
		I	II	I	II	I	II
1.	Rainy	69.07	63.02	37.27	32.89	123.40	105.23
2.	Winter	97.01	94.06	67.89	66.27	221.05	211.83
3.	Summer	83.01	89.02	65.51	54.26	165.91	196.57
	Average	83.08	82.03	56.89	51.14	150.12	171.21

4.4.5 Producer's share in consumer's rupee in Tuberose flowers marketing

Per kg of flowers price spread in relation to various channels was calculated and presented in Table 4.27. Sale price received by flower grower was Rs. 35 and Rs. 38 in channel – I and channel – II respectively. While net price received by grower was Rs. 31.90 in channel – I and Rs. 34.90 in channel – II. Price paid by consumer in channel – I was Rs. 56.89 and in channel – II it was Rs. 51.14 producer's share in consumer's rupee was 56.07 per cent and 68.24 per cent respectively. Total marketing cost was 9.69 in channel –I and Rs. 6.01 in channel – II. Price spread in channel – I was Rs. 24.99 and Rs. 16.24 in channel – II. It can be noted that on basis of producer's share in consumer's rupee channel – II was more beneficial to tuberose flower growers than channel – I. Net margin of commission agent cum wholesaler and retailer in channel-I was 12.65 per cent and

14.23 per cent respectively. While net margin of retailer in channel – II was 20 per cent.

Price received by producer in various seasons is given in Table 4.28. Price received by tuberose growers in winter season in channel-I was Rs. 42 and in channel –II it was Rs 45. In rainy and summer season, price received by tuberose growers in channel – I was Rs. 27, Rs. 36 and in channel – II. It was Rs. 29 and Rs. 40 respectively. It was observed that price received by producer in winter season was more in both the channels of marketing while channel – II was more profitable than channel- I.

Price paid by consumer in various seasons was presented in Table 4.29. It was seen from the table that, price paid by consumer in winter season was higher in both seasons i.e Rs. 67.89 in channel – I and Rs. 66.27 in channel – II.

4.4.6 Producer's share in consumer's rupee in Gladiolus flowers marketing

Per 100 flowers price spread in relation to various channel-I is presented in Table 4.27. Sale price received by flower grower was Rs. 130 and Rs. 135 in channel – I and channel – II respectively, while net price received by grower was Rs. 125.50 in channel – I and Rs. 130 in channel – II. Price paid by consumer in channel – I was lower (Rs. 190.12) than in channel – II (Rs. 171.21). Producer's share in consumer's rupee was 66.01 per cent and 75.93 per cent in channel-I and II respectively. Total marketing cost was Rs. 26.17 in channel – I and Rs. 16.12 in channel – II. Price spread in channel – I was Rs. 64.62 and Rs. 41.21 in channel – II. It can be noted that on the basis of producer's share in consumer's rupee

, channel – II was more beneficial to gladiolus flower growers than channel – I. Net margin of commission agent cum wholesaler and retailer in channel –I was 9.55 per cent and 10.63 per cent respectively. While net margin of retailer in channel – II was 14.65 per cent.

Price received by producer in various seasons is given in Table 4.28. Price received by gladiolus grower in winter season in channel – I was Rs. 163 and in channel – II it was Rs. 191. In rainy and summer season price received by gladiolus growers in channel – I was Rs. 95, Rs. 132 and in channel – II it was Rs. 98 and Rs. 116, respectively. It was observed that price received by producer in winter season was more in both the channels of marketing, while channel – II was more profitable than channel – I.

Price paid by the consumer in various seasons is presented in Table 4.29. It was observed from the table that price paid by consumer in winter season was higher in both the channels for all the flowers studied. Papal (1976).

4.5 Export of flowers

The floriculture consisting of cultivation and trade of cut flowers, cut foliage, potted plants, garden-bedding plants, Planting materials, services etc. has become an important sector, experiencing rapid change the world over. For many of the world's economics, like India, the most important economic activity of the population is working in agriculture. Some of these countries have slowly graduated from being agriculture based to being industrial or service-based. But in others, the farmers have shifted from food production into production of ornamentals

like flowers, bulbs, plants etc. consumption of flowers in most countries is rising associated with income development. Rising demand has resulted in development of new production centres in Latin-America, Africa and Asia, which were traditionally in USA, Japan, Italy, the Netherlands and Colombia. In Asia, India and China, besides Thailand are moving in the direction of more intensive horticulture. In India, floriculture has been associated with culture and heritage since very ancient time and has long tradition of growing flowers. Commercial floriculture is only a decade old. Focussed attention of Government, enthusiasm of entrepreneurs, growing demand in domestic and overseas market have resulted in unprecedented growth.

In India, it has been a time honoured and traditional activity, largely for religious purpose. Now it is poised for a transformation wing to increase in demand due to urbanization, innovative technology, policy environment and above all, growing consciousness and demand for quality flowers. At international level with increasing consumption, production has increased and non-traditional areas have emerged as important players in floriculture. However, the data suggested that there is a growing trade in floriculture across the global. In the last decade, farmers big or small have taken up floriculture with enthusiasm adopting improved cultivars and technologies. Introduction of greenhouse technology, new cultivars and support for post harvest handling have led to a new wave in growth of floriculture in the country.

India has shown a significantly of playing significant role in world market. Apart from increasing the domestic demand in last five years

export has also increased significantly. Besides potted plants, Indian Roses, camation, orchids and chrysanthemums are important cut flowers. Production system of flowers has also shown significant change. Protected cultivation, even for domestic market is becoming popular in view of quality of produce and season of availability. However, floriculture has to grow dynamically addressing all the issues emerging fully backed by policy environment and research to advance sustainability.

India floriculture industry has more or less established itself in the national and international market after initial struggle. The quantum jump witnessed in production and trade of floriculture products is due to second research system, focussed attention of Government coupled with innovative entrepreneurs.

India is among the important agriculture-based economy in the developing world and has in the recent years recognized the importance of floriculture as a segment of agri-business. With more than 80,000 ha. India is the leading country for floriculture in terms of area. Many feel the figures are high. Considering that flower growing is practiced on very small holdings in most parts of the country. Perhaps large share of the floriculture area goes unreported. But does this large area devoted to floricultural activity provide any significant edge to us in the burgeoning floriculture trade in the world estimated to be worth 50,000 crores US dollars. Our export of floricultural products worth less than 3 crores US dollars, gives us the answers. This however, does give us an idea of the potential religious offerings for centuries. Today, even if 1 % of our 1,00 crores population

spends one rupee on purchase of flowers, we should have a domestic market worth more than Rs. 3, crores.

4.5.1 Area and production

The area under different flower crops and production are inadequate primarily due to that commercial flower growing is a recent activity. The flowers are grown all over the country on 88,607 ha which increased from 29.352 ha in 1992. All the states in the country have the tradition of growing flowers but the commercial growing of flowers is presently confined to Karnataka, Tamil Nadu, Andhra Pradesh, West Bengal, Maharashtra, Rajasthan, Uttar Pradesh, Delhi and Haryana. However, in Maharashtra, Madhya Pradesh and Uttar Pradesh, there is much higher level of floricultural activities than what is indicated by the area.

Almost all of the area reported is under open field flower production. It is only in the last 5 years or so that the with start of several export-oriented enterprises in the country. Some area around 400 ha has come under protected cultivation. This area is likely to increase to about 600 ha in the next few years. Of the total area, two third area is devoted to production of traditional flowers like marigold, jasmine, roses, chrysanthemum, tuberose etc. Flowers like orchids, athuriums, liliums, gerbera and several more bulbous flowers are increasingly being grown both for exports as well as domestic markets. Greenhouse cultivation of flowers in India is increasingly practiced for off season production and also for improved quality.

The production of flowers is estimated to be more than 5 lakh tonnes of loose flowers and over 680 million cut flowers with stems (Table 4.30). As in many instances, the production from small farms goes unreported, the figures mentioned may not be very realistic. The information about the production value and the trade in flowers are not documented. However, some estimates suggested that trade of flowers is to the tune of Rs. 250 crore, and Delhi market alone put the trade value at more than Rs. 50 crores. Although quantitative data on trade value of flowers in the country during different time frame is not available yet from the availability of flowers in all the cities and growing number of florists are indicative of very high rate of growth.

Table 4.30. State wise area and production of flowers in India during 1998-99 to 1999-2000.

State	Area (ha)		Production			
	1998-99	1999-2000	1998-99		1999-2000	
			Loose flowers (tonnes)	Cut flowers (lakh no.)	Loose flowers (tonnes)	Cut flowers (lakh no.)
Andhra Pradesh	8357.00	18087.00	32000	---	126609.00	---
Delhi	3450.00	3450.00	21007	---	21007.00	---
Haryana	2250	2250.00	40500	760.00	40500.00	760.00
J & K	75.00	42.00	46	5.80	7.00	17.40
Karnataka	20780.00	20801.00	124290	---	124440.00	---
Madhya Pradesh	1956.00	1387.00	1170	---	832.00	---
Maharashtra	4979.00	6600.00	38582	---	28336.00	---
Rajasthan	2353.00	2353.00	2389	---	2389.00	---
Tamil Nadu	17750.00	18120.00	133125	---	142250.00	---
West Bengal	10500.00	13227.00	17685	5312.00	14644.00	5678.00
Others	1522.00	4390.00	7564	350.20	8179.00	350.00
Total	73972.00	88607.00	418848	6428.20	509193.60	6806.00

4.5.2 International scenario

Growing and consumption of flowers and potted plants is evident in, almost every country as a tradition, but its expansion as a trade got the boost in last 2 decades. There has been a tremendous surge in the demand of floriculture products with increasing expandable income and globalization of economy. Noticeable feature of the global floriculture had been the development and expansion of floriculture in non-traditional regions. Netherlands, Italy, Germany and Japan had strong tradition for growing and consumption of flowers. The concept of commercial floriculture perpetuated across the world from these regions. New Production centres are developing in Latin America, Africa and also in Asia to meet the demand of consuming countries and also to expand domestic market commensurating with improved economic conditions. Countries in these region derive their competitiveness from low cost, high level of investment and rapid innovation. These countries produce highly qualitative floricultural products with low-cost price which have favourable place in the markets of Western Europe, America and Japan. Globalization of economy has brought expanding income, which in tun promoting more consumption of floricultural products and hence more per capita use of floriculture. Emergence of new production centres had made floriculture more competitive and this in turn in benefiting the ultimate consumers. The impact of globalization can be seen on floriculture in the forms of low prices and high quality of products.

4.5.3 Consumption and production

Consumption of flowers had increased manifold. Total world export of floricultural products in 2000 was of US $ 7,662,924,000. The Netherlands remained world's largest exporter of floricultural products.

With a share of almost 50 % of the total exports. However, export of floricultural products has been declining and this is common feature in almost all the traditional floricultural counties. Other major exporters of floricultural products are Colombia, Italy, Belgium, Denmark etc. Noticeable feature of the world export market has been emergence of Latin American and African nations in the major top 10 exporters of floricultural products (Table 4.31).

Table 4.31. Major exporters of floricultural products

Ranking	Country	2000 ('000 US $)	1999 ('0000 US $)
1.	*Netherlands	3,810,620 (47.72)	4,078,067 (51.52)
2.	Colombia	570335 (7.44)	550,149 (6.95)
3.	*Italy	268,927 (3.50)	295,940 (3.73)
4.	*Belgium	267,603 (3.49)	273,800 (3.45)
5.	*Denmark	261,268 (3.41)	287,482 (3.63)
6.	*USA	220,871 (2.88)	217,611 (2.74)
7.	Ecuador	215,977 (2.81)	211,340 (2.67)
8.	*Germany	197,978 (2.58)	199,973 (2.52)
9.	Kenya	164,204 (2.14)	156,471 (1.97)
10.	Costa Rica	161,055 (2.10)	160,722 (2.03)
11.	Israel	154,600 (2.01)	166,999 (2.11)
22.	India	26,971 (0.35)	23,486 (0.29)
	Total	7,662,924(100)	7,914,629(100)

* Traditional floriculture centres

(Note : Figures in parentheses are percentage to total)

Source : Singh, H.P. (Jan.-March, 2002), Indian Horticulture

Western Europe accounts for more than half of the word's cut flower production. The consumption of cut flowers in European Union has stabilized. In recent years, it has shown downward trend.

Germany was the largest importing country for floricultural product (Table 4.30). It imports floricultural products worth US $ 1,457,696,000. Consumption of cut flowers in western Europe was 11 billion US $ in 1990 and 14 billion US $ in 1995 which reached to 20 billion US $ in 2001.

Table 4.32. Major importers of floriculture products

Sr.No	Country	2000 ('000 us $)	1999 ('000 US $)	Change (%)
1.	Germany	1,457,696	1,678,484	-12
2.	Italy	379,182	389,368	-3
3.	France	834,380	885,282	-6
4.	UK	845,149	867,969	-3
5.	Netherlands	741,970	747,035	-1
6.	Switzerland	362,305	343,745	5
7.	Australia	215,302	224,237	-4
8.	Belgium	280,397	290,399	-3
9.	USA	1,361,972	1,281,103	6
10.	Japan	391,616	383,830	2

Source : Singh, H.P. (Jan.-March, 2002), Indian Horticulture.

Interestingly, consumption of cut flowers is becoming more regular than in the past, when it was associated with income level and mainly based on special occasions and institutional requirements. Consumption of flowers is rising both in developed and developing countries. In India, too consumption of flowers had increased manifold with globalization of trade and better economic development. Japan ahs become

one of the largest consumers of cut flowers, in total consumption of flower as well as average per capita consumption.

However, floriculture scenario has changed very rapidly in last couple of years. Institutional demand has gone down by almost 10 % due to the declining economy but non-institutional demand is picking up. According to Japanese Flower Promotion Centre, demand for cut flowers will rise by 60 % by 2005 due to growth in the causal flower and gift markets.

In western Europe, the Netherlands, Italy, Germany, UK, Spain and France have been major production centres of flowers. The Netherlands is the leading country with an area of 8,004 ha under cut flower cultivation, more than 50 % of which is under green house/plastics.

4.5.4 Flower trade

A significant aspect of flower trade in India is the recent times has been the exports, which has shown enormous growth during last 5-6 years. The cut flower exports particularly have shown a tremendous increase during this period. This has come about with the establishment of a large number of export-oriented cut flower units around Bangalore, Pune, Delhi and Hyderabad during the last 5 years. The main product, of course, is rose, through a unit near Chennai in exporting tropical orchards. The major crops produced in India are as given in Table 4. India's domestic floriculture market has gone upto Rs. 300 crores annually and is growing at the annual rate of 20-30 per cent (Singh. A..K., 1998). Cut flower exports have increased with 25 times to Rs. 20 crores a year. The major markets for our flowers have been Europe and Japan for the floricultural products taken together. The main market has been USA.

Table 4.33. Major flower produce in India

Sr.No	Major crops	States
1.	Jasmine spp.	Tamil Nadu, Karnataka, Andhra Pradesh, Uttar Pradesh, Maharashtra.
2.	Fragrant rose	Uttar Pradesh, Tamil Nadu, Karnataka, Rajasthan, Punjab,Maharashtra.
3.	Small flower	Tamil Nadu, Karnataka, Madhya Pradesh.
4.	Chrysanthemum	Bihar, Rajasthan, Maharashtra.
5.	Tuberose	West Bengal, Tamil Nadu, Madhya Pradesh, Karnataka,Maharashtra.
6.	Crossandra	Tamil Nadu, Karnataka, Maharashtra.
7.	Orchids	North-East states, Himalaya, Kerala.

Source : Advanced Commercial Floriculture.

4.5.5 Major markets for floricultural products from India

Europe and South East Asia are very important markets for India. Europe may be more attractive to India for floriculture industry. However, Japan, Hong Kong, Singapore and other countries are also going to be important for India. The floricultural products from India can be sold in the following markets .(Table 4.34).

1. Outstanding quality flowers can be sold in Japan and Europe. particularly in winter.
2. In Singapore, Hong Kong, South Korea and Middle East buying and selling of flowers done almost throughout the year. This market may also accept good quality flowers but need not be top most quality.
3. Flower seeds can be exported to USA.
4. Europe can be an ideal place for tissue cultured plant from India.

Table 4.34. Major markets for floricultural products from India.

Sr. No.	Major markets	Floricultural products from India
1.	Japan and Europe	Outstanding quality of flowers can be sold particularly in winter
2.	Singapore, Hong Kong, South Korea and Middle East	Good quality flowers throughout the year but need not be top most quality.
3.	USA	Flower seeds
4.	Europe	Tissue cultured plants

(Source: Advanced Commercial Floriculture)

India has the following compelling reasons to enter international trade in floriculture products.

a) Annual foreign exchange earnings from floriculture products can easily be in excess of Rs. 100 crores.

b) Floriculture has an annual growth potential of 25 to 30 per cent.

c) Possess 25 to 30 times more foreign exchange earning ability than cereals or other agricultural products.

d) India is the treasure house of tropical ornamental plants.

e) Growing ornamental plants can improve ecological sustainability of Indian agriculture.

f) Floriculture is capable of attracting/retaining a large number of progressive rural population in farming.

g) Domestic supply is not affected by export in this area.

h) Floriculture can create a better future for our nation.

4.5.6 Development efforts

In view of its earlier orientation for aesthetic importance, floriculture did not receive the desired focus for developmental inputs till the last decade. Even through, some of the state governments had

introduced a few schemes in direction, major thrust was given by the government of India, during Eighth plan (1992-97). A scheme on commercial floriculture was introduced on the recommendation of Trivedi committee set up by the government in 1987-88 to prepare a plan for strengthening of this sector. In addition to the scheme, on assistance is also provided to floricultural farmers through other related schemes.

National Horticulture Board (NHB) under the ministry of Agriculture also introduced several new schemes particularly those related to infrastructural development for post-harvest handling of produce. Financial assistance provided by NHB has been instrumental in setting up of floricultural units, both for export and domestic markets. The model floriculture centres (MFCs) set up under the scheme on commercial floriculture in 15 floriculturally important states have become the focal units for development of this sector in respective areas with facilities for demonstrations, plant material generation, technology transfer and post-harvest management.

FAO also sponsored project on 'Greenhouse Technology' for small scale farmers was implemented at Bangalore, Pune and Sringar, which has given a confidence to farmers for greenhouse production of flowers. Recognizing the potential of floricultural products for exports, promotional programmes are taken up by Agricultural and Food Products Export Development Authority (APEDA), under the ministry of Commerce also.

Cold storage facilities at several gateway airports for flowers export like Delhi, Bangalore, Chennai, Mumbai, Thiruvananthapuram and Guwahati have been set up. Auction centres are also being set up in Pune, Bangalore and Delhi (Noida). To facilitate the growth of floricultural important of capital goods, availability of credit facility etc. were streamlined and simplified. All these efforts of the government created an

environment favourable for growth of the industry. Encouragement by the success witnessed in the sector, several state governments have initiated their own development programmes.

Karnataka is considering setting up a floriculture Board to coordinate the developmental efforts. Karnataka Agro Industries cooperation manages India's first flower auction centre at Bangalore. Maharashtra state agriculture marketing board has initiated several steps for technology dissemination and market support for floriculture. Himachal Pradesh Government identified floriculture as focus area under district rural development assistance programme in Kangra region. Punjab has several commercial enterprises in the area of floriculture, as a result of the support from the Punjab agro industries corporation programmes.

Kerala is developing a plan for floriculture under a flori 2020 programme, Tamil Nadu and Andhra Pradesh have taken major initiatives for floricultural development through establishment of floriculture parks TANFLORA- the Tamil Nadu Floriculture Infrastructure Park co-promoted by Tamil Nadu Industrial development corporation and private investors, with the government of India's support is soon to be implemented at a 50 ha farm in Dhampuri near Bangalore. Similar parks are also planned for Karnataka, Maharashtra and Uttaranchal in future.

4.5.7 Constraints in development

Being a new sector, floriculture faced several constraints in development. A major limiting factor for production has been the availability of quality planting material. The technology for production has been largely oriented for traditional flowers. The specific package for practices for major flower crops both for traditional and modern cut flowers under different agroclimatic conditions have also been a limiting factor. There is a focus on creation of necessary infrastructure including marketing. The efforts of government of India and several state

governments are contributing towards providing the required support. The sector has immense opportunities and challenges and is set to grow with commitment to achieve sustainability.

Evidently, floriculture is expected to grow well but have many challenges and advantages of the growth can only be harnessed with well-planned strategies.

Indian floriculture industry although with ample production base is passing through a very sensitive phase. But it is not in a no-win situation. By over coming all constraints involving in all floriculture activities, India can really push up its floriculture trade in European Market. The government should give some concessions on the occasion on coming millennium. Favourable government policy will create favourable atmosphere for the development of floriculture industry in India.

Table 4.35. Area under floriculture in different states in India (1991-92 to 1999-2000)

(Area in ha).

Name of the states	1991-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-2000
A.P.	N.A.	4886 (9.72)	5778 (10.84)	5963 (9.90)	22012 (26.87)	7616 (10.69)	8420 (11.45)	8357 (11.29)	18087 (20.41)
Delhi	812 (2.77)	15.21 (3.02)	801 (1.50)	1878 (3.13)	1866 (2.27)	1866 (2.62)	1866 (2.54)	3450 (4.66)	3450 (3.90)
Haryana	640 (2.18)	1000 (1.99)	1200 (2.25)	1460 (2.44)	1460 (1.78)	1850 (2.60)	9050 (2.65)	2250 (3.04)	22.50 (2.54)
J & K	--	--	--	--	--	133 (0.19)	167 (0.23)	75 (0.10)	42 (0.04)
Karnataka	12368 (42.14)	14253 (28.34)	15243 (28.60)	16169 (28.98)	19161 (23.39)	19656 (27.60)	20780 (28.26)	20780 (28.09)	20801 (23.48)
M.P.	226 (1.45)	815 (1.62)	915 (1.72)	1270 (2.12)	1334 (1.63)	1334 (1.87)	1334 (1.18)	1956 (2.64)	1387 (1.56)
Mahara-shtra	2880 (9.81)	NA	2275 (2.27)	3356 (5.60)	5657 (6.90)	5439 (7.64)	4786 (6.51)	4979 (6.73)	6600 (7.45)
Rajasthan	--	--	1207 (2.62)	1985 (3.31)	1985 (2.42)	2048 (2.48)	20.48 (2.78)	2353 (3.18)	2353 (2.65)
T.N.	11735 (39.98)	15095 (30.01)	12340 (23.15)	14194 (23.68)	14194 (17.33)	15856 (22.27)	16745 (22.77)	17750 (23.90)	18120 (20.44)
W.B.	--	12000 (23.86)	12610 (23.66)	12285 (20.50)	12508 (15.27)	13720 (1927)	13720 (18.66)	10500 (14.19)	13227 (4.95)
Others	419 (1.67)	722 (1.43)	928 (1.74)	1400 (2.33)	1746 (2.13)	1695 (2.38)	1720 (2.33)	1522 (2.06)	4390 (4.95)
Total	29252 (100)	50292 (100)	53297 (100)	59930 (100)	81923 (100)	71213 (100)	73536 (100)	73972 (100)	88607 (100)

Source : Agro- Economic Research Centre

(Figures in brackets indicate percentage to total)

Table 4.36 State wise production of flowers in India (1998-99 to 1999-2000)

State	Production			
	1998-99		1999-2000	
	Loose flowers (tonnes)	Cut flower (lakh no.)	Loose flowers (tonnes)	Cut flowers (lakh no.)
A.P.	32000 (7.64)	---	126609 (24.86)	---
Delhi	21007 (7.64)	---	21007 (4.13)	---
Haryana	40500 (9.76)	760.00 (11.83)	40500 (7.95)	760 (11.17)
J & K	46 (0.01)	5.80 (0.09)	7.00 (0.010)	17.40 (0.26)
Karnataka	124290 (29.67)	---	124440 (24.44)	---
M.P.	1170 (0.28)	---	832 (0.16)	---
Maharashtra	38582 (9.21)	---	28336 (5.56)	---
Rajasthan	2389 (0.57)	---	2389 (0.47)	---
T.N.	133125 (31.78)	---	142250 (27.94)	---
W.B.	17685 (4.22)	532.20 (82.63)	14644 (2.88)	5678 (83.43)
Other	7564 (1.80)	350.20 (5.45)	8174 (1.16)	350 (5.14)
Total	418848 (100.00)	6428.20 (100.00)	509193 (100.00)	6806 (100.00)

Source :Singh.H.P.(Jan-March.2002),Indian Horticulture.

Table 4.37. Country wise export of floriculture from India

(Quantity in MT's;
Value in Rs. Lakhs)

Country	1998-99		1999-2000		2000-2001	
	Quantity	Value	Quantity	Value	Quantity	Value
Nether-lands	3774.292 (20.16)	1645.20 (17.02)	70740.991 (83.87)	2739.99 (26.05)	6775.774 (27.03)	2921.00 (23.72)
USA	5424.514 (28.97)	2222.64 (23.00)	5901.216 (6.99)	1853.76 (17.62)	7336.160 (29.27)	2525.91 (20.51)
Japan	3742.034 (19.98)	1501.02 (15.53)	1132.451 (1.34)	978.46 (9.3)	2547.834 (10.16)	1140.32 (9.26)
Germany	897.275 (4.79)	983.33 (10.17)	1153.502 (1.36)	962.78 (9.15)	1568.937 (6.26)	806.25 (6.54)
UK	910.428 (4.86)	519.59 (6.12)	1138.605 (1.34)	634.39 (6.03)	1194.539 (5.96)	927.51 (7.53)
Italy	516.297 (2.75)	383.07 (3.96)	432.159 (0.51)	442.62 (4.20)	554.796 (2.21)	614.80 (4.99)
Singapore	400.244 (2.13)	282.14 (2.92)	253.566 (0.30)	342.58 (3.25)	169.172 (0.67)	209.00 (1.69)
Belgium	340.938 (1.82)	157.75 (1.63)	192.467 (0.22)	132.16 (1.25)	568.998 (2.27)	394.07 (3.20)
Sri Lanka	309.632 (1.65)	105.42 (1.09)	290.347 (0.34)	116.72 (1.10)	431.119 (1.72)	131.91 (1.07)
Australia	234.920 (1.25)	219.60 (2.27)	532.613 (0.63)	199.17 (1.89)	260.090 (1.03)	164.34 (1.33)
U.A.E.	243.619 (1.30)	147.21 (1.52)	175.034 (0.20)	175.74 (1.67)	438.684 (1.75)	263.86 (2.14)
Other (93 countries)	1976.862 (10.34)	1421.97 (14.77)	2399.908 (2.9)	1937.24 (18.49)	9013.790 (11.67)	2213.34 (18.02)
Total (104 countries)	18721.055 (100)	9660.94 (100)	84342.903 (100)	10515.61 (100)	25061.875 (100)	12312.31 (100)

(Source : APEDA 2000-2001)
Figures in brackets indicate percentage to total.

Table 4.38. Country wise export of Rose from India

(Quantity in Kgs
Value in Rs.)

Country	1998-99		1999-2000		2000-2001	
	Quantity	Value	Quantity	Value	Quantity	Value
Nether-lands	1317700 (55.50)	2268021 (35.46)	2700 (0.32)	19424 (0.51)	97180 (37.14)	447488 (23.86)
Singapore	233586 (9.83)	1209071 (18.90)	39620 (4.73)	1762623 (4.65)	26010 (9.94)	95911 (5.12)
Myanmar	300000 (12.63)	754974 (11.80)	---	---	---	---
USA	100000 (4.21)	141890 (2.21)	81000 (9.67)	193497 (5.10)	48 (0.01)	26950 (1.44)
Italy	150000 (6.31)	172992 (2.70)	---	---	---	---
UK	35200 (1.48)	528364 (8.26)	101102 (12.08)	210799 (5.56)	200 (0.07)	22650 (1.21)
New Zealand	---	---	65020 (7.77)	142896 (3.77)	21760 (0.31)	47818 (2.55)
UAE	94829 (3.99)	273138 (4.27)	4900 (0.58)	40138 (1.05)	24061 (9.19)	583155 (31.10)
Germany	15000 (0.63)	15939 (0.24)	17960 (2.14)	339902 (8.97)	---	---
Other (14 countries)	142620 (5.42)	1046919 (16.16)	524505 (62.71)	2665458 (70.39)	92360 (43.34)	650939 (34.71)
Total (23 countries)	2373935 (100)	6395369 (100)	836807 (100)	3788367 (100)	261619 (100)	1874911 (100)

(Source : APEDA 2000-2001)]

Figures in brackets indicate percentage to total.

Table 4.39. Country wise export of cut flower for bouquets/fresh

(Quantity in Kgs.
Values in Rs.)

Country	1998-99		1999-2000		2000-2001	
	Quantity	Value	Quantity	Value	Quantity	Value
Nether-lands	727037 (26.70)	47845683 (19.04)	65811712 (97.21)	74776819 (25.67)	715545 (17.72)	75790580 (19.38)
Japan	534835 (19.64)	83390734 (33.20)	644707 (0.95)	81134211 (27.85)	729315 (18.06)	89766106 (22.95)
USA	284216 (10.44)	14590336 (5.80)	108995 (0.16)	6104876 (2.09)	530303 (13.13)	24299735 (6.21)
UK	201603 (7.40)	13973606 (5.56)	127186 (0.18)	8466779 (2.90)	257968 (6.39)	16275545 (4.16)
Switzerland	63959 (2.34)	6514198 (2.59)	216316 (0.31)	23333793 (8.01)	299578 (7.42)	32250402 (8.24)
Germany	218762 (8.03)	13844143 (5.51)	97357 (0.14)	6459394 (2.21)	122665 (3.03)	12451324 (3.18)
Australia	147824 (5.43)	15217840 (6.05)	127175 (0.18)	13448912 (4.61)	140563 (3.48)	12299246 (3.14)
Singapore	115661 (4.24)	16364963 (6.51)	160488 (0.23)	28877991 (9.91)	138066 (3.41)	20148823 (5.15)
UAE	111403 (4.09)	9988885 (3.97)	84146 (0.12)	10273607 (3.52)	350876 (8.69)	18906375 (4.83)
Italy	53406 (1.96)	4658620 (1.58)	84022 (0.124)	9864646 (3.38)	194882 (4.82)	2958724 (97.58)
Other (73 countries)	263642 (9.73)	24776979 (10.19)	234752 (0.396)	28533001 (9.85)	557265 (13.85)	59121367 (15.18)
Total (83 countries)	2722348 (100)	251165987 (100)	67696856 (100)	291274029 (100)	4037026 (100)	390968227 (100)

(Source : APEDA 2000-2001)]

Figures in brackets indicate percentage to total.

Table 4.40. Country wise export of other cut flowers for bouquets

(Quantity in Kgs.
Values in Rupees)

Country	1998-99		1999-2000		2000-2001	
	Quantity	Value	Quantity	Value	Quantity	Value
UAS	2924287 (35.25)	127407181 (24.96)	1784115 (34.81)	88703742 (19.99)	1884989 (29.27)	130411929 (22.92)
Netherlands	787677 (9.49)	96755781 (18.95)	1189920 (23.21)	165120963 (37.22)	1447803 (22.48)	180974191 (31.81)
Japan	2320539 (27.97)	60310696 (11.81)	49059 (0.95)	7313927 (1.64)	61225 (0.95)	10149975 (1.78)
Germany	448655 (5.40)	61636656 (12.07)	460123 (8.97)	42153897 (9.50)	407760 (6.33)	37803928 (6.64)
UK	407035 (4.90)	26859817 (5.26)	284986 (5.56)	22489159 (5.07)	613634 (9.52)	41890604 (7.36)
Spain	124747 (1.50)	10769590 (2.11)	192727 (3.76)	17220949 (3.88)	498347 (7.73)	36005001 (1.89)
Sri Lanka	225647 (2.72)	7627835 (1.49)	148775 (2.90)	6372145 (1.43)	338798 (5.26)	10779433 (1.89)
Italy	167117 (2.01)	20732883 (3.53)	179404 (3.50)	17807426 (4.01)	220241 (3.42)	21633737 (3.80)
France	163536 (1.97)	18037297 (3.53)	124723 (2.43)	11515478 (2.59)	127677 (1.98)	12723899 (2.23)
Belgium	55331 (0.66)	3873779 (0.75)	18188 (0.35)	1542597 (0.34)	238438 (3.70)	19543563 (3.43)
Other (62 countries)	670862 (8.13)	76390369 (15.54)	692666 (13.56)	63290761 (15.13)	600861 (9.36)	66887670 (16.25)
Total (72 countries)	8295433 (100)	510401884 (100)	5124686 (100)	443531044 (100)	6439773 (100)	568803930 (100)

(Source : APEDA 2000-2001)]

Figures in brackets indicate percentage to total.

Table 4.41. Country wise export of foliages/Branch/Buds not fresh

(Quantity in Kgs.
Value in Rs.)

Country	1998-99		1999-2000		2000-2001	
	Quantity	Value	Quantity	Value	Quantity	Value
UAS	1969022 (64.07)	78638429 (43.29)	1994926 (45.33)	85905854 (29.36)	2670767 (54.46)	90415046 (41.90)
Germany	153313 (4.98)	17562135 (9.66)	460297 (10.45)	45376262 (15.51)	881032 (17.96)	29020981 (13.45)
UK	237640 (7.73)	17562135 (9.66)	460297 (10.45)	30702264 (10.49)	480508 (9.79)	33222995 (15.39)
Netherlands	102228 (3.32)	13099368 (7.21)	380624 (8.64)	30072802 (10.27)	193051 (3.93)	17802085 (8.25)
Italy	132674 (4.31)	12257829 (6.74)	16873 (3.83)	16590108 (5.67)	102446 (2.08)	8787231 (4.07)
Spain	51565 (1.67)	4187699 (2.30)	133868 (3.04)	14083723 (4.81)	118215 (2.41)	9013068 (4.17)
Belgium	131424 (4.27)	8134165 (4.47)	115742 (2.62)	9014609 (3.08)	66052 (1.34)	4402244 (2.04)
France	57794 (1.88)	5734187 (3.15)	96085 (2.18)	8480058 (2.89)	34197 (0.69)	3010644 (1.39)
Other (33 countries)	237128 (7.77)	20441593 (13.52)	640133 (13.46)	52320124 (17.92)	357212 (7.34)	20077799 (9.34)
Total (43 countries)	3072788 (100)	181650817 (100)	4400845 (100)	292545504 (100)	4903480 (100)	215752093 (100)

(Source : APEDA 2000-2001)]

Figures in brackets indicate percentage to total.

Table 4.42. Country wise export of other foliages/buds for bouquets fresh from India.

Country	1998-99		1999-2000		2000-2001	
	Quantity	Value	Quantity	Value	Quantity	Value
Italy	---	---	---	---	17200 (48.02)	1269176 (43.61)
Kenya	---	---	3755 (53.52)	250416 (63.34)	---	---
Sri Lanka	---	---	---	---	6944 (19.38)	304819 (10.47)
Netherlands	---	---	---	---	5181 (14.46)	757303 (26.02)
Singapore	---	---	50 (0.71)	2805 (0.70)	---	---
UAE	---	---	3210 (45.75)	142081 (35.94)	--	--
USA	---	---	---	---	6490 (18.12)	578941 (19.89)
Total	---	---	7015 (100)	395302 (100)	35815 (100)	2910239 (100)

(Source : APEDA 2000-2001)]

Figures in brackets indicate percentage to total.

Table 4.43. Yearly value of export of floriculture product.

Year value of export of floriculture products	Value in crores	% change
1993-1994	18.83	---
1994-1995	30.38	+ 63.70
1995-1996	60.14	+ 95.06
1996-1997	63.39	+ 5.4
1997-1998	81.20	+ 28.09
1998-1999	96.60	+ 18.96
1999-2000	105.15	+ 8.86
2000-2001	123.12	+ 17.08

Government schemes and incentives

Government schemes for export of floriculture

1. Providing of inputs for plantation : inputs include planting materials, chemical fertilizers and pesticides etc. Govt. give 50 % subsidies for above inputs but not exceed then Rs. 6000/-.
2. Finance for scheme is provided through district agricultural officer.
3. To provide green house facility.

Type of green house	Expenditure per sq.m.	Subsidy (%)	Area limit	Subsidy (Rs.)
Low cost polyhouse	125	50	500 sq.m.	31500/-
Medium cost polyhouse	500	40	500 sq.m.	100000/-
High cost polyhouse	2000	10	500 sq.m.	100000/-

4. To provide production certificate.

Constraints in floriculture export development

1. Capital intensive industry

2. Industry required technology advanced infrastructure to ensure quality products.
3. A major limiting factor for production has been availability of quality planting material.
4. Lack of technical expertise.
5. Absence of cold chain from production to export.
6. Poor packing of cut flower and other products
7. Inadequate incentives to the farmers.
8. Financial support and unorganized marketing channels and their monitoring.
9. Airfreight is higher and cargo space for flower is not guaranteed by Air India.
10. Insufficient cold storage at airport.
11. Low priority in air cargo as they are bulky voluminous and perishable.

Suggestions for floriculture export development

1. Availability of finance
2. Provision of technological advanced infrastructure.
3. Provision of quality planting material to insure better production.
4. Training regarding packing and technical assistance from experts.
5. Provision of cold storage facilities at airport.
6. Financial support and organized marketing channels
7. Subsidies should be provided for airfreight
8. Incentives to farmers.
9. Top priority in air cargo to perishable products as flowers.

Constraints and suggestions of flower growers

In flower production business, flower growers were facing many problems. Important constraints with their intensities were considered according to opinion of flower growers. Likewise suggestions of flower grower were also considered so as to solve constraints as follows :

4.8 Constraints of flower growers

Table 4.44. Constraints of flower growers

(N=90)

Sr. No.	Constraints	Flower growers	Percentage
1.	Difficulties in control of pest and diseases	85	94.44
2.	Difficulties in pruning	48	53.33
3.	Difficulties in weed control	76	84.44
4.	Lack of credit facilities	64	71.11
5.	Lack of market facilities	81	90.00
6.	Non-availability of fertilizers in time	40	44.44
7.	Lack of labour force in establishment	44	48.89
8.	Non-availability of planting material in time	25	27.77
9.	Non-availability of transport facilities	9	10.00
10.	Lack of irrigation facilities	50	55.55

Various constraints of flower growers were identified in the form of frequency and percentage and presented in Table 4.42. It was observed that constraints like difficulties in control of pest and diseases

were severe problem, which was expressed by 94.44 per cent of flower growers. Lack of marketing facilities was opined by 90 per cent flower growers. The difficulties in control of weeds, lack of credit facilities were also serious constraints, which were expressed by 84.44 and 71.11 per cent of flower growers respectively. Lack of irrigation facilities, difficulties in pruning were found considerable problems, that were opined by 55.55 and 53.33 per cent of flower growers. Lack of labour force in establishment of garden was also a main problem i.e. 48.89 per cent . Problems like non-availability of transportation facilities, planting material, fertilizers in time were faced by very few farmers. Rasane and Gore (1992).

Suggestions of flower growers

Suggestions, which were opined by flower growers, were invited and are presented in Table 4.43 It is clear that about 88.88 per cent of flowers growers suggested for availability to purchase commodity from wholesale market. It is clear that about 72.22 per cent of flower growers suggested the provision of training in regard to pest control. It is fact that flower production industry is capital intensive, therefore, about 68.88 per cent of flower growers suggested reform in the scale to finance of D.C.C. bank in crop loan. About 57.77 per cent of flower growers suggested for proper utilization of available irrigation through drip irrigation system. Substitution of mechanization for human labour was suggested by 42.22 per cent of flower growers. Provision of training over pruning problem that has been expressed by 38.86 per cent of flower growers. About 35.55 per cent of flower growers suggested to supply advanced stock of required fertilizers with multipurpose co-operative society.

Table 4.45. Suggestions of flower growers

(N=90)

Sr. No.	Suggestions	Flower growers	Perce-ntage
1.	Provision of training in regards to pest control	65	72.22
2.	Provision of training over pruning problem	35	38.86
3.	Spraying of weedicide over weed control	25	27.78
4.	Reform in the scale of finance D.C.C. bank	62	68.88
5.	Farmer purchase the commodities self through in wholesale market	80	88.88
6.	Advanced stock of required fertilizers with multipurpose co-operative society	32	35.55
7.	Subdivision of mechanization of human labour	38	42.22
8.	Provision of nursery in regard to planting material	17	18.88
9.	Creation of transport facilities	8	8.88
10.	Proper utilization of available irrigation through drip irrigation system	52	57.77

Summary and Conclusion

Chapter-V

SUMMARY AND CONCLUSIONS

Floriculture is a science, which deals with cultivation of flowers and other ornamental plants. Flower is nature's beloved gift to humanity. Flowers have been associated with our social life since ancient time and used an all occasions of joy and sorrow, religious and social, love and affection. Flowers are being utilized for decoration at religious functions and ceremonies such as marriages, anniversaries, jubilees and in hotel, industry etc.

The flowers which have long stalk called cut flowers used mainly for decoration purpose. There is very good demand for cut flowers from Europe and Gulf countries. The prices of flowers being remunerative, the return from flowers are high. Cut flowers have good export trade and they are good source of earning high exchange. In our country abundant sunshine, plenty of land, availability of cheap and skilled man power are our strength for cultivation of varieties of flower. Favourable climatic conditions, availability of transport and good demand for flowers provide an ideal situation. In India, total area under floricultural crop was 88607 hectares in 2000. In India, Karnataka (20,801 hectare), Tamil Nadu (18, 120 hectares), West Bengal (13,227 hectares) and Maharashtra (6,600 hectares) are major flower cultivating states. In Pune district, area under floriculture is about 889 hectares. Major area concentrated are in Haveli, Khed and Shirur tahsils.

As our country is a member of World Trade Organisation (WTO), the scope for selling flower in foreign market is ample. The demand for flower is rising continuously due to liberalization, increase in standard of living, increase in income level, increase in educational status. Metropolitan cities like Mumbai, Calcutta, Chennai and Delhi are the major market places for flowers. Pune is developed district and infrastructure facilities are export oriented. A special flower market is available in Pune. Therefore there is minimum risk in marketing of flower. Here efforts have been made to study the economics of production and marketing of flowers with following objectives.

1. To study the socio-economic status of selected flowers cultivating families.
2. To workout cost of cultivation of selected flowers.
3. To determine resource productivity and resource use efficiency of flower.
4. To find out marketing cost, marketing margin and producer's share in consumer's rupee through various marketing channels.
5. To study export of flowers.
6. To study constraints and suggestions of flower growers.

Multistage sampling design has been used for selection of district, tahsil, villages and flower growers. Pune district was purposively selected. Tahsils were selected on the basis of area under flower cultivation. Villages were selected from selected tahsils. Sample of 30 each for rose, tuberose and gladiolus growers were selected for present study.

Tabular analysis, log-linear, multiple regression analysis and percentage method used to analyse the data.

The result of the study are presented in the following section as, general information of flower growers, cost and returns of flowers, impact of technology on flower production, marketing of flowers, constraints and suggestions of flower growers. while export status of India also studied. In general, total holding size of rose grower was 3.41 hectares while it was 3.24 hectares in case of tuberose and 3.33 hectares in gladiolus growers. Farming was main occupation of rose and tuberose growers while farming and service both are equally distributed in gladiolus growers. Educational status of them was good. Sugarcane, groundnut vegetables, flower crops, jowar, bajara, rice, fruit crops like pomegranate, guava etc. were main crops taken by selected flower growers.

Per hectare cost of cultivation of roses was Rs. 107925 Total male labour used for establishment of garden was 150.08 mandays and female labour use was 119.35 mandays. For maintainance of garden male labours used was 117.08 mandays. Total utilization of human labours for cultivation of roses for one hectare was 1054.51 mandays.

Per hectare cost of cultivation of tuberose was Rs. 120004.9. Human labour used for establishment of garden was 149.14 mandays and it was 805.10 mandays for maintenance of garden. For total (establishment plus maintenance) cultivation of tuberose total human labour utilized was 984.24. Of which male and female labours were 149.14 and 805.10 mandays respectively.

In case of gladiolus, total cost of cultivation was Rs. 87077.54. The total human labour required were 125.10 mandays.

In relation to resource use in flower production, in case of roses area was under utilization. Similarly FYM was also under utilized. Therefore, by considering productivity of these resources MVP to price ratio of variable area was 1.046 while for FYM it was 10.18. It is clear that rupee spend on area can give the return of Rs. 1.046 while rupee spend on FYM can give return of 10.18.

In case of tuberose, area and farm yard manure were under utilization. Therefore, there was a scope to increase these resources in tuberose flowers. In other word, rupee spend on area could give returns of Rs. 1.70 while rupee spend on FYM could give return of Rs. 14.65.

In case of gladiolus, area, FYM and phosphorus were under utilization. There was a scope to increase these resources in gladiolus flowers. In other word, rupee spend on area could give return of Rs. 0.22 while rupee spend on FYM and phosphorus could give return of Rs. 0.67 and Rs. 34.81.

In comparison of flower species, per hectare yield of rose was higher than tuberose and gladiolus. Rose gave higher net income than tuberose and gladiolus.

In rose, tuberose and gladiolus marketing, channel-I (producer – commission agent cum wholesaler – retailer) and Channel – II (producer – retailer – consumer) were observed. In case of rose marketing, average marketing cost incurred by flower producer was Rs. 6.00 in channel – I and Rs. 6.30 in channel – II for 100 flowers. Total marketing

cost of roses was Rs. 52020. While marketing cost of commission agent cum wholesaler was Rs. 9.82 per 100 flowers and marketing cost of retailer was Rs. 10.19 for 100 flowers. The producer's share in consumer's rupee was 46.98 per cent in channel – I and 49.61 per cent in channel – II. It was concluded that channel – II was more benefited to producer.

In case of marketing of tuberose, marketing cost incurred by commission agent cum wholesaler was Rs. 3.68 and marketing cost incurred by retailer was Rs. 2.91. In channel – I, marketing cost incurred by producer was Rs. 3.10 and in channel – II it was Rs. 3.10. Producer's share in consumer's rupee in channel – I was 56.07 per cent and 68.24 per cent in channel – II. Marketing cost of tuberoses was 82365. The costs are per kilogram of tuberose flowers. It can be noted that channel- II was more benefited to producer than channel - I.

In case of marketing of gladiolus, marketing cost incurred by commission agent cum wholesaler was Rs. 10.55 and marketing cost incurred by retailer was Rs. 11.12. In channel – I marketing cost incurred by producer was Rs. 4.50 and in channel – II it was Rs. 5.00. Producer's share in consumer's rupee in channel – I was 66 per cent and 75.93 per cent in channel –II. Marketing cost of gladiolus was Rs 28787. From this can be noticed that channel – II was more beneficial to producer than channel I.

Export of flowers from India

Commercial floriculture is only a decade old focussed attention of Government, enthusiasm of entrepreneurs, growing demand in domestic and overseas market have resulted in unpredicted growth.

Rose and tuberose are major flowers produce in India. Today, even if 1 per cent of our 100 crores population spends one rupee on purchase of flowers, we should have a domestic market worth more than Rs. 3,500 crores.

A major limiting factor for production has been the availability of quality planting material. Another factor is non-availability of necessary infrastructure including marketing.

Difficulties in control of pest and diseases was found to be major problem of flower growers that can be solved by providing training to flower growers in regard to pest control.

Policy Implications

1. Cultivation of flowers in Western part of Maharashtra has wider scope but at present there are various constraints in the flower industry.
2. Better marketing facilities are not available, hence co-operative florist organizations should be established at the regional levels.
3. Cold storage facilities should be provided at required places.
4. Detailed studies on post harvest technology should be carried out.
5. Training to the farmers should be given regarding improved package of practices for the cultivation of flowers and post harvest technology.
6. More employment can be created through floriculture industry.
7. Flower grower has to dispose his flower produce through channel – II (producer – retailer – consumer) on priority basis rather than through other channels of marketing.

8. Quality planting material should made available through proper channel. The government should give some concessions on the occasion on coming millennium. Favourable Government policy will create favourable atmosphere for the development of infrastructure for marketing. By over coming all constraints involving in floriculture activities, India can really push up it's floriculture trade in European market.

9. Training of flower growers must be provided in regard to pest control, packaging and pruning.

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Appendix

Title : **"Economics of Production and Marketing of flowers in Pune district of Maharashtra"**

SCHEDULE – I

PRODUCTION OF FLOWERS

A) General information of farmer :

1) Name :

2) Main occupation : 3) Age :

4) Subsidiary occupation : 5) Village :

6) Tahsil :

B) Family size :

1) Male : 2) Female : 3) Children :

C) Holding size :

1) Land revenue (Rs.) : 2) Grazmog/forest land:

3) Rainfed area : 4) Irrigated area :

D) Cropping Pattern :

Sr. No	Kharif			Rabi			Summer		
	Name of crop	Irrigated (ha)	Rainfed (ha)	Name of crop	Irrigated (ha)	Rainfed (ha)	Name of crop	Irrigated (ha)	Rainfed (ha)
1									
2									
3									
4									
5									

E) Live stock :

1) Bullock : 2) Buffalo : 3) Local cow

4) Crossbreed cow : 5) Goat : 6) Other

F) Asset formation :

Sr. No	Items	Quantity	Year of purchase	Age	Present value (Rs.)
A)	Machinary				
1	Tractor				
2	Bullock Cart				
3	Power tillers				
4	Threshers				
5	Sprayer				
6	Duster				
7	Weighing balance				
8	Other				
B)	Implements				
1	Harrow				
2	Hoe				
3	Plough				
C)	Irrigated structure				
1	Well				
2	Electric Motor				
3	Others				

G) Establishment of flower Garden type (Rose / Tuberose /Gladiolus)

1) Type of garden 2) Area of garden

3) Running age of garden 4) Date of planning

Sr No	Particulars	Human labour (man/day)				Bullock labour		Machine labour	
		Family	Value (Rs)	Hired	Value (Rs)	Bullock	Value (Rs)	Hours	Value (Rs)
	Labour cost								
1	Land preparation								
2	Piting								
3	Fertilizer application								
4	Planting								
5	Irrigation								
6	Weeding								
7	Spraying								
8	Desuckering								
9	Pruning								

H) Material cost

Sr. No.	Particulars	Quantity	Value (Rs)
a)	Planting materials (cutting)		
b)	Manures in quintals		
c)	Fertilizers in kilograms		
	Nitrogen (N)		
	Phosphorus (P)		
	Potassium (K)		
d)	P.P.C. in lit/kg		
e)	Irrigation No.		

I) Operationwise labour requirement per annum for maintenance.

Sr. No	Particulars	Human labour (man/day)				Bullock labour		Machine labour	
		Family	Value (Rs)	Hired	Value (Rs)	Bullock	Value (Rs)	Hours	Value (Rs)
1	Weeding								
	I)								
	II)								
	III)								
2	Earthing								
3	Pruning								
4	Application of manures								
	I)								
	II)								
	III)								
5.	Plant protection (spraying)								
	I)								
	II)								
	III)								
6.	Disbudding								
7.	Irrigation								
	I)								
	II)								
	III)								
8.	Harvesting								
	I)								
	II)								
	III)								

J) **Material cost/annum**

Sr No	Particulars	Quantity	Value (Rs)
a)	Manures in quintals		
b)	Fertilizers in kilograms		
	Nitrogen (N)		
	Phosphorus (P)		
	Potassium (K)		
c)	P.P.C. in lit/kg		
d)	Irrigation No.		

K) Yield harvesting I) II) III)
IV) V) VI)

L) Flower marketing expenditure incurred by producer :

1. Where did you sell your commodity?

Sr. No.	Product sold to	Quantity	Price (Rs/q)	Total value (Rs)
1.	Producer-Commission agent cum wholesaler			
2.	Producer-Bagvan			
3.	Producer-Retailer			

M) Cost of marketing incurred by producer

Sr. No.	Item of cost	Material means (Rs)	Labour man/days (Rs)
a)	Packaging/packing		
b)	Loading		
c)	Transportation		
d)	Unloading		
e)	Weighing charges		
f)	Market fees		
g)	Commission charges		
	Total		

QUESTIONNAIRE FOR CONSUMER

1. Type of consume :

   I) Home use III) Halls

   II) Hotel IV) Worship

2. Consumers preference (ranks)

   1) Rose 3) Gladiolus

   3) Tuberose

3. Purchase

Sr. No.	Particulars	Weekly	Monthly	Occasional / programme
1	Bouquet			
2	Garland			
3	Decoration			
4	Flower pot			
5	Other flowers			

4) Expenditure

Sr. No.	Type of flower	Weekly	Monthly	Annual
1	Cut flowers			
2	Other flowers			
	Total flowers			

5) Purchase period

Type flower	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cut flowers												
Other flowers												

6) Preference for tuberose

7) Preference for other flowers

8) Others.

QUESTIONNAIRE FOR COMMISSION AGENT CUM WHOLE-SALER

1) Name Place :

Age : Education :

2) Business :

a) Primary

b) Secondary

3) Wholesaler and commission agent Yes/No

4) Work done

i) Sale on behalf of producer Yes/No

ii) Credit facility to producer Yes/No

iii) Send information to producer Yes/No

iv) Other Yes/No

5) Market system for price fixation

Sr. No.	Name of flower	Auction	Negotiation	Hatta system
1.	Rose			
2.	Tuberose			
3.	Gladiolus			

6) Market system good or bad?

If bad why ? Yes/No

If good why ? Yes/No

i) Simple Yes/No

ii) Time saving Yes/No

iii) Good price Yes/No

7) Annual turnover

Name of flower	Annual turnover						Total	
	Rainy		Winter		Summer			
	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price
Rose								
Tuberose								
Gladiolus								

8) Arrivals of flowers

Name of flowers	Graded	From where	Distance	From whom	Quantity
Rose					
Tuberose					
Gladiolus					

9) Packing before sale Yes/No

Packing

Material	Quantity	Rate of packing	Total cost of packing

A) Labour : Male Female

B) Wages : Male Female

10) Purchase of flowers

No	Name of flowers	Purchase			Sales		
		Rainy	Winter	Summer	Rainy	Winter	Summer
1	Rose						
2	Tuberose						
3	Gladiolus						

11) Annual cost

i)	Rent of stall	ii)	Permission
iii)	Weighing	iv)	Permanent
v)	Electricity	vi)	Telephone
vii)	Management	viii)	Postage
ix)	Taxes	x)	Miscellaneous

12) Cut flowers share in whole business Yes/No

13) Other flowers in business Yes/No

14) Increasing demand of flowers

15) Marketing problems

16) Suggestion for improvement

QUESTIONNAIRE FOR RETAILER

1) Name Place :

Age : Education :

2) Business :

c) Primary

d) Secondary

3) Retailer Yes/No

4) Work done

i) Sale on behalf of producer Yes/No

ii) Credit facility to producer Yes/No

iii) Send information to producer Yes/No

iv) Other Yes/No

5) Market system for price fixation

Sr. No.	Name of flower	Auction	Negotiation	Hatta system
1.	Rose			
2.	Tuberose			
3.	Gladiolus			

6) Market system good or bad?

If bad why ? Yes/No

If good why ? Yes/No

i) Simple Yes/No

ii) Time saving Yes/No

iii) Good price Yes/No

7) Annual turnover

Name of flower	Annual turnover						Total	
	Rainy		Winter		Summer			
	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price
Rose								
Tuberose								
Gladiolus								

8) Arrivals of flowers

Name of flowers	Graded	From where	Distance	From whom	Quantity
Rose					
Tuberose					
Gladiolus					

9) Packing before sale Yes/No

Packing

Material	Quantity	Rate of packing	Total cost of packing

C) Labour : Male Female

D) Wages : Male Female

10) Purchase of flowers

No	Name of flowers	Purchase			Sales		
		Rainy	Winter	Summer	Rainy	Winter	Summer
1	Rose						
2	Tuberose						
3	Gladiolus						

11) Annual cost

i) Rent of stall ii) Permission

iii) Weighing iv) Permanent

v) Electricity vi) Telephone

vii) Management viii) Postage

ix) Taxes x) Miscellaneous

12) Cut flowers share in whole business Yes/No

13) Other flowers in business Yes/No

14) Increasing demand of flowers

15) Marketing problems

16) Suggestion for improvement

"ECONOMICS OF PRODUCTION AND MARKETING OF FLOWERS IN PUNE DISTRICT OF MAHARASHTRA"

ABSTRACT

Name of Student : **Raut K.B.**
Research Guide : **Dr.D.N. Hedgire, Asstt. Statistician**
Reg No. : 58M / 2001A
Year of submission : 2003

A study on economics of production and marketing of flowers in Pune district was carried out with objectives to work out cost of cultivation, resource productivity, marketing cost, market margin, producers share in consumers rupee through various channels, export of flowers from India.

Multistage sampling design was used for selection of sample. A sample of 30 each of rose, tuberose and gladiolus were selected for study.

The result indicated that per hectare cost of cultivation of rose was Rs. 109557.90 of each share of cost 'A' and 'B' 65.91 per cent and 97.48 per cent respectively. The gross income was Rs. 290000 leaving a net profit of Rs. 18422.10.

As regard tuberose per hectare cost of cultivation was Rs. 122264.07 of which the contribution of cost 'A' and 'B' was 65.47 and 94.50 per cent respectively. The gross income received was Rs. 317500 and the net profit was Rs. 112870.93. In case of gladiolus per hectare cost of cultivation was Rs. 87077.54 of which contribution of cost 'A' and cost 'B' was 62.21 and 98.83 per cent respectively. The gross income received was Rs. 163000 and the net profit was Rs. 47135.46.

The Cobb- Douglas function was to examine the resource productivity and it was observed that in case of rose variable the area under garden, farm yard manure and nitrogen found significant. In case of tuberose the significant variable were area under garden, farm yard manure and nitrogen while in gladiolus the significant variable were area under garden and phosphorus. The increasing return to scale noticed in these crops. The total marketing cost for per 100 flowers incurred by flower growers was Rs. 6.30 and 5.00 in case of rose and gladiolus respectively while in case of tuberose it was Rs. 3.10 per kilogram. The cost incurred by various intermediaries revealed that wholesaler incurred Rs. 9.82, Rs. 10.55 in case of rose, gladiolus per 100 flowers respectively. While in tuberose Rs. 3.68 per kg. The respective figures for retailer was Rs. 10.19, Rs. 11.12 in rose, gladiolus and for tuberose it was Rs. 2.91 per kg.

The producer's share in consumer's rupee in case of rose, tuberose and gladiolus was 46.98 per cent 56.07 per cent and 66.00 per cent in channel I (producers commission agent cum wholesaler retailer consumer) while in channel II (producers retailer consumer) it was 49.61 per cent, 68.24 per cent and 75.93 per cent for rose, tuberose and gladiolus respectively.