

Commercial Prospects of Floriculture: A Study on Purba Medinipur District of West Bengal

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Abstract

Floriculture is a lucrative line of business and its importance is ever-increasing. In addition to the traditional lines of business floriculture is venturing into some value-added lines such as bouquets, floral baskets, pot-pouri etc. It is one of the main-stream commercial activities in some parts of West Bengal. Within the state of West Bengal Purba Medinipur and Nadia districts are the chief producers of flowers. The present study has been designed to make an evaluation of the commercial prospects of floriculture in the Purba Medinipur District. Flower producers in this area are suffering some problems in the form of scarcity of healthy planting materials, timely replacement, problem of transportation, adequate and timely credit facilities etc. Despite lack of knowledge on modern floricultural production techniques, difficulty in obtaining the latest varieties and the lack of infrastructure, the industry is continuously attracting new entrants. Demand for cut flowers is growing tremendously as more and more people are becoming aware of the beauty of flowers as decorative items. Yielding high return from a small area is improving the quality of life of farmers of this locality.

Key Words: Floriculture, standard of living, Cost-Benefit Analysis, SWOT

Introduction

Going beyond invaluable beauty, flowers have commercial value. Flower is a part of life in our country and its commercial and economic use is increasing day by day. Floriculture industry is a lucrative business comprising traditional flowers, cut flowers, pot plants, dry floral crafts and planting materials, besides value-added products like bouquets, garlands, floral baskets, floral concretes, pot-pouri and oils. It has proved to be a highly profitable agro-business generating maximum returns per unit area. The global trade of floriculture is quite promising.

Development of floriculture has assumed considerable importance for its economic uses, such as for cut-blooms and for extracting perfumes and other products. It is to be noted that Germany, U.S.A. Japan, France, Netherland, U. K. and Switzerland consumed 77 % of world's total flowers in 2008. Although India's share in world exports for floriculture produce is nominal, it is

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a fact that in 2007-08, flower was exported to around 113 countries compared to 37 countries in 1992-93. India's export of floriculture increased from Rs. 115.39 lakh to Rs. 299.41 lakh, i. e. 2.59 times from 2001-02 to 2005-06. The U.S.A, Japan, U. K., Netherland, France, Belgium Spain constituted 81% of the total value of flower exports from India in 2007-08. Demand of Flowers in the foreign market is increasing at a very fast rate and it is the right time to take the initiatives so that we can improve our foreign exchange earnings and create more employment opportunities. If we consider the foreign exchange earning potentiality of the crop, floriculture is required to be strengthened in the interest of the nation.

India is endowed with varied agro climatic conditions suitable for growing a number of flowers. The country is known for growing the traditional flowers such as rose, jasmine, marigold, chrysanthemum, tuberose and many more. Tamil Nadu, Karnataka, West Bengal, Maharashtra, Jammu and Kashmir, Sikkim and Andhra Pradesh are major flower growing states. The total area under flower crops is 89 thousand hectare, with a total production of 509 thousand MT of loose flowers and 681 million cut flowers. The volume of trade in the domestic market was around Rs. 200 crores in the beginning of the nineties, which has now grown in more than Rs. 500 crores. The trade figures have increased many folds due to significant increase in floriculture production during this period.

In our country, millions of people are engaged with the production and marketing of flowers as well as in some other related jobs. The area under flower cultivation in India increased from 53000 hectare in 1993-94 to 136000 hectare in 2007-08.

West Bengal is the third largest producer of flowers in the country. The emphasis is on cut flowers, bulbous flowers, traditional flowers and high end exotic flowers like orchids. The main flowers cultivated are rose, carnation, gerbera, tuberose, jasmine, marigold and hibiscus. Introduction of improved cultivation techniques through area expansion in these crops, intervention for green house, protected cultivation, post harvest assistance and assistance for development of planting material is sought. West Bengal has the unique advantage for floriculture Industry, and is probably the only state where all types of Agro- Climatic conditions are available. Here all types of horticultural crops are grown very productively. Presently, in West Bengal, the area under cultivation for flower crops is about 17,328 hectare as against 1,06,477 hectare at the national level. Production of loose flowers in the state is about 43,575 M.T. and production of cut flowers is about 8,766.6 lakh in numbers. At the national level, loose flower production is about 5,34,576 M.T. and cut flower production is about 25,647 lakh numbers.

Statement of the Problem

There is no denying fact that floriculture continues to generate employment opportunities to the people in rural flower growing areas thriving on agriculture related means of livelihood. Floriculture can be an enterprise from which massive employment opportunities can be generated and the quality of life of the millions of rural poor can be improved. Floriculture is such an important area from which the small-farm economy of the country and the state can absorb a sizeable amount of surplus labour in the agricultural sector as well as can earn good amount of foreign exchange for its sustenance. Floriculture is one of the untapped potentials of agriculture where West Bengal, which has been facing continuous marginalization of size of

holdings, can tap the benefits in the era of liberalization, which may give a boost to the export-profile of the country. Since floriculture demands a heavy employment of human labour for different activities of cultivation, starting from production to the ultimate sales to consumers, and is contrasted to the requirements of traditional crop production, it can generate employment opportunities to the rural people. In spite of the tremendous economic potentiality of floriculture, it remains neglected by the government, scientists, policy makers and research scholars. Statistical data of floriculture is still scattered and messy while its agronomy remains to be a matter of personal experience gained through practice and traditional farming.

In West Bengal floricultural activities are expanding with the assistance of National Horticulture Mission Fund. So far 2,500 hectares have been brought under flower cultivation. The expansion started in 2006-07 with Rs 100 crore from the National Horticulture Mission Fund. The Techno-Economic Feasibility report on the Scope of Development of Horticulture in West Bengal, prepared by Agricultural Finance Corporation Limited states that more than 5.2 million workers were engaged in various operations of the floriculture enterprise in the state starting from production to marketing, which made an approximate turnover of Rs. 245 crore of rupees annually.

To make the marginal, small farms economically viable area-specific crop diversification towards high value, labour intensive crops, viz. vegetables, fruits and flower cultivation has been suggested by research organizations. In different parts of west Bengal and in different parts of India there have been attempts to produce high value crops. But it is a mere fact that increasing marginalization of size of holdings in India as well as West Bengal's agriculture has become a matter of concern to the policy makers. Considering the changing global economic situation along with making the small and marginal farm-dominant economy more viable, there has been attempts to produce export-oriented non-conventional, high-value, labour-intensive crops like vegetables, fruits, betel and flowers. The state has ample possibilities in production of flowers.

In West Bengal among the two leading flower-producing districts, viz. Purba-medinipur and Nadia, the flower area as percentage of gross cropped area was higher in Purba-Medinipur, which is also ranked first in terms of production of total flowers for last few years. But, unfortunately, floriculture in the district still remains in its infancy. Flowers like Marigold, Rose, Jasmine, Tuberose, Season flowers yields high return from a small part of land. Rose and Season flower fetch very high prices in the local market and many farmers grow these in small areas in their homestead gardens. This can be a good alternative and economic crop for the small stakeholders.

Significance of the Study

The present study has been designed to make an evaluation of the commercial prospects of floriculture in the Purba Medinipur District. Flower producers in this area are suffering some problems; scarcity of healthy planting materials, timely replacement, problem of transportation, credit facilities etc. Sometimes the farmers fail to combat the problems raised due to the changes in climate, marketing and value addition. Every year some part of this area is affected by flood which affects a large number of flower producers. There is wastage of flowers during storage and transportation. In spite of facing several problems the farmers are able to fetch a good return from floriculture in this area. Every year some farmers are converting their land from cultivation of traditional crops to floriculture. Floriculture can able to increase income level of thousands of

families in this area because there is a great potentiality of flower production particularly in three Blocks of this district namely Kolaghat, Panskura and Sahid Matangini.

Considering the mass production of flowers in these Blocks the study has been concentrated on the problems and prospects of floriculture in this particular area. The study area is purely an agrarian region where about 56 per cent people are dependent on agricultural activities. Here land is very much fragmented into small volumes and man-land ratio is in the higher side. It has been observed that a family of 5-6 members with a land holding of say 1 acre (100 decimals) is not able to earn enough to fulfill their requirements. It has been found from the record that the growth rate of *boro* cultivation has been slowed down for last 5-6 years and eventually agricultural activities in a small part of land are not so profitable. In this locality quality of land is not suitable for multi-cropping options and hence agriculture is not supporting for the growth of standard of living. On the contrary a flower cultivator may provide considerable net profit for maintaining a small family of four or five members.

Floriculture may be considered as a household bank since the flowers can be plucked and sold straight in the market when hard cash is required and this may continue for long time. The cultivation of flowers provides a continuous source of income to the farmer family. It does not require any sort of post-harvest processing for making the produce marketable. The present level of revenue may be increased by many folds if problems of the flower producers are analyzed and resolved. If merely transportation and marketing channels are developed then the revenue generated by flowers would easily exceed that generated by any major crop of the country. It is also necessary from the perspective of national economy as well as the national employment generation through proper exploitation of floriculture. The study is an attempt to assess and evaluate the economic opportunities and prospects of floriculture of this locality. This study may be helpful to the farmers to convert their land from traditional farming to floriculture after making a comparison of present earning and future earnings.

Review of Research and Development in the Subject

There is dearth of availability of literature on the subject of flower production especially in Indian context. Scattered materials relating to floriculture are available in different journals and websites. In spite of best effort any book or comprehensive research work on this topic is not found. However the following literatures have been consulted to find out the research gap.

Sarkar, Rahim and Misra (1997) have explained the use of floriculture in the Indian society in his book captioned “Floriculture in West Bengal; Problems and Prospects”. They analysed the possibilities of floriculture as one of the most profitable crop from the Indian perspective.

Randhawa and Mukhopadhaya (2010) have thoroughly investigated the production of flowers in the country. The authors critically assess the problems faced by the producers in the country in their book entitled ‘Floriculture in India’. In the same spirit, Alex Laurie (2012) has tried to give an idea on the changing pattern of floricultural activities in the country. He also discusses about how plants grow in our country. The author also has discussed about the different soil pattern, fertilizer used and horticultural taxonomy in the country in his book ‘Floriculture-Fundamentals and Practices’.

S Prasad (2010) in his book 'Commercial Floriculture' has discussed about the world scenario of floriculture vis-à-vis in India. Eiri Board (2008) has dealt with the process of flower production in the country in his book named 'Floriculture Handbook'. Anil Verma (2012) has discussed on the post harvest technologies for commercial production of flowers in India in his book 'Post harvest technologies for commercial Floriculture' D Sengupta (2009) had detected the problems faced by the Indian flower producers in marketing of flowers in his book "Floriculture Marketing in India". He has also suggested some remedial measures that could be adopted to tackle such problems.

G S Randhwa (2008) has discussed on the pattern of production of flowers in the country in his book "Floriculture in India". S Prasad (2005) has vividly discussed the commercial floricultural production in India and he has successfully correlated the process of expansion of floricultural activities in the book captioned "Commercial Floriculture".

In Indian Horticulture Database Website, different types of information are available regarding volume of production and sales of various flowers produced in West Bengal. From the website of the Department of Food Processing Industries and Horticulture, Government of West Bengal, information is available on production and marketing of flowers in our state. From the website of Export Statistics for Agro & Food Products information is available regarding the earning of foreign exchange through floriculture. From the website of the Agricultural & Processed Food Products Export Development Authority information is available regarding the steps taken by the government for development of floriculture.

Objectives of the Study

Since the study relates to the development of floriculture in the small-farm economy of West Bengal, first of all, main flowers of West Bengal and the districts producing those have been identified. According to statistics, in terms of the flower area as percentage of gross cropped area and production of flowers, Purba-Medinipur District is highest among the districts of West Bengal for last few years. That is why the district has been selected for the study. Floriculture of this area expedites the process of development. We have started to identify the social and economic changes occurring gradually in the life of the people of this particular area due to floricultural activities. Under the above perspective the study has tried to analyze the characteristics of the flower growing farmers, their net earnings from the enterprise and the problems faced by them in flower cultivation in the district of Purba-Medinipur. The study is based on collected primary data from field survey on the villages of the Purba-Medinipur District comprising the different economic classes of flower-producers based on their operational landholdings. The objectives of the study are as follows:

- 1) To compare the costs and the returns of floriculture with other traditional crops
- 2) To develop micro-model using cost-benefit analysis of a particular land which may be converted from traditional crops to floriculture
- 3) To identify the constraints in flower farming
- 4) To suggest suitable strategies for improvement of floricultural activities

Methodology of the Study

In order to address the broad objectives, in the initial stage the study has examined the theoretical understanding of the process. After thorough literature survey and consulting books and journals

relevant to this topic, the study has formulated the theoretical aspect of the problem. At the later stage an empirical study is being undertaken through field survey in the selected villages of the district chosen. A two stage stratified random sampling method has been adopted in the selection of the final sample. In the first stage, ten villages have been selected from three flower-producing blocks of the district namely; Kolaghat, Panskura and Sahid Matangini. These are Khanadihi, Pulsita, Mihitukri and Barisha of Kolaghat block, Manur, Satyeswar and Mahatpur of Panskura block and Sonamui, Khukurdaha and Jagannathpur village of Shahid Matangini block. It has been found from the Agriculture Department of Purba Medinipur Zila Parishad that ten villages of this district are producing more than seventy per cent of the flowers. These ten villages are known for mass production of quality flowers and for this reason they have been chosen as the study area. In each village, at the second stage, an exhaustive list of farmers practicing floriculture has been prepared. From primary investigation it has been found that nearly 3000 farmers are producing flowers in these ten villages. From each village, ten per cent flower-producing farmers have been selected at random using Simple Random Sampling without Replacement to arrive at the final sample for the study. So the sample size is 300 farmers. Data is being collected from the respondents in relation to the landholding pattern, occupational pattern, type of farming, average costs per acre of different flowers, labour requirements, average net income from different flowers, standard of living etc. through structured and guided enquiry schedule. The farmers have been divided into four size classes in the following manner:

Type of Farmer	Size of landholdings(in acres)
Marginal	Up to 1.00 acre
Small	Above 1.00 to 3.00 acre
Medium	Above 3.01to 5.00 acre
Large	Above 5.00 acre

At the later stage the value of the variables has been calculated using suitable technique and the average values has been compared with the district and state figures. For undertaking this type of statistical analysis and data processing Microsoft Excel and SPSS (Statistical Package for Social Scientists) has been used. The data processing consists of office editing, data entry and computer programming. Computer based checks has been done to clean the data and to remove inconsistencies. At the final stage a Cost Benefit analysis of floriculture has been made in order to formulate a micro model for ascertainment of profitability of flower cultivation in 1 acre of land vis a vis traditional agriculture crops. This analysis is based on the capital budgeting techniques viz. Net Present value, Average Rate of Return, Profitability Index, Pay Back Period. The study also tries to find out the factors on which profitability per acre of the farmers (Y_t) depends. A multiple regression has been used to find out these factors.

$$Y_t = \alpha + \beta_1 X_{1t} + \beta_2 X_{2t} + \epsilon_t \quad ; \text{ Where } \epsilon_t \text{ is the error term.}$$

Area under cultivation (X_{1t}) and types of flower cultivated (X_{2t}) by the farmers are used as independent variables.

Comparative cost-benefit analysis

An analysis of the pattern of occupation of the sample households reveals that the majority of flower-producing farmers fall under the category of marginal and small size class holdings less than one acre. They are mainly poor farmers and they meet their labour requirement through the

employment of family members. Farmers apart from floriculture also cultivate paddy and vegetables. But it is needless to say that they depend on floriculture because of higher income prospects. Farmers falling under the category of medium and large class (one to five acres of holding) mainly cultivate more than two types of crop in a large area and employ labourers at the time of requirement. It has also been found that most of the farmers cultivate more than one flower. Some cultivators produce only one flower like rose or season flower due to their specialized knowledge and skills. Most of the flower producers cultivate more than one flower in order to reduce the risk factor associated with single flower-cropping. In case of any problem they can set off the loss suffered from one flower by the profit from other flower. It has been found that the highest percentage of cultivators produces the combination of rose, marigold and jasmine. It has also been found that one or two family members generally engaged in the floricultural activities particularly in case of small and marginal flower producer families. Some flower producers have an area of more than 3 or 4 acres of land. In that case sometimes all the family members are engaged in floricultural activities. There are varieties of works involved e.g. picking of flowers, washing them, treatment with chemicals, packaging, transportation, marketing and selling etc. Generally they distribute the entire work among themselves.

From the comparative study of the cost and returns on floriculture it has been observed that floriculture is a high profit yielding activities. A farmer having an area of one or two acre of land can earn sufficient to maintain a small family of five members. On the other hand, in these villages, profit per acre earned by the farmers from the traditional crops like paddy is only Rs. 18,000 (Aprx.) per annum. On the contrary farmers involved in floriculture can earn much better than that. Due to high return from a small area, floriculture has become the sole occupation for the small and marginal farmers for improving the quality of their lives. The farmers, learning from their experiences try to cultivate more than two or three types of flowers in their available land. This not only reduces the risk of loss but also require lesser amount of investment and working capital. They try to strike a balance between investment, labour requirements and risks to get an expected return. For example, rose is a very high earning option but it requires higher investment and working capital. On the other hand, marigold requires lesser fund and it gives lesser amount of return with low risk. Most of the farmers cultivate at least two types of flowers. The farmers have reported that flower cultivation needs a great deal of nurturing compare to any traditional crop. The risk involved is high; lack of application of proper doses of fertilizer and pesticides in time may result in severe damage.

In the study area, Mahatpur is known for production of quality season flowers like chrysanthemum, snowball, star, aster, gladiolus etc. Most of the flowers are directly sent to Mallikghat by the farmers. Some buyers from different states directly purchase flowers from the farmers after negotiation. On the other hand, in Khanadihi, farmers mainly produces rose, tuberose, marigold and jasmine. A very interesting observation during the study is that farmers do not want to increase the cultivated area after a certain limit. They are willing to restrict themselves in that size class which can be controlled by them without employing too many hired workers. Engagement of hired labour increases the cost and reduces net earnings. The farmers reported that in one acre if they want to convert the traditional agricultural land to floriculture for cultivation of season flower, then the cost of conversion is nearly Rs. 72,000. They have to spent around Rs. 75,000 as initial investment and Rs. 30,000 throughout the year as working capital in every year and they can earn a net profit of at least Rs. 1,50,000 per year for a minimum of five

years. If they produce rose, tuberose and marigold in one acre in 2:1:1 ratio, their cost and earning remains more or less like season flower.

The study also tries to find out the factors on which profitability of the farmers depends. A multiple regression has been used to find out these factors. Area under cultivation and types of flower cultivated by the farmers are used as independent variables. Results show that types of flower cultivated is negatively significant even at 1% level of significance with p value 0.002. This implies profitability decreases with the cultivation of more than one flower. It should be note worthy in this respect that the flower cultivators should concentrate on cultivation of one single flower like rose or season flower rather than to cultivate a combination of flowers. This will definitely increase the profitability of the flower cultivators.

Table: 1

Dependent Variable: Profitability in 1 acre			
	Coefficients	t stat	p value
Area under Cultivation	0.4	9.44	1.12E-18
Type of Flower Cultivated	-0.15	-3.17	0.002
Adj. R square 0.23			

It is to be mentioned that cost of conversion is a fixed cost and once the land has been prepared for cultivation of flower the only capital which is required is for plantation of flowering plants. After that they only need fertilizer, pesticides and other maintenance costs. They sell their flowers and get the money back so working capital is not a real problem for them. They have to invest for fresh plant after a certain time, say five years for rose. Once they invest they only need working capital for continuation of production. The following two tables show comparative cost-benefit analysis of different flowers (per acre) and comparative Net Present Value, Pay Back Period, Profitability Index and Average Rate of Return different flowers (per acre) in the locality.

Table: 2

Comparative cost-benefit analysis of different flowers (per acre) Amount in Rs. (Aprx.)

Type of flower	Conversion cost	Initial investment	Working Capital p.a.	Net Profit p.a.
Rose	65,000	60,000	36,000	1,98,000
Season Flower	72,000	75,000	30,000	1,84,000
Tuberose	26,000	30,000	20,000	1,05,000
Marigold	20,000	24,000	15,000	95,000
Jasmine	28,000	36,000	22,000	1,02,000

Source: Field Survey by the author

Table: 3
Comparative NPV, PBP, PI and ARR of different flowers (per acre)

Type of flower	NPV (at 10%) Rs.	PBP in Years	PI	ARR
Rose	4,47,400	10 months	3.89	123%
Season Flower	2,86,280	12 months	3.29	104%
Tuberose	1,76,850	9 months	4.37	138%
Marigold	1,82,150	9 months	5.10	161%
Jasmine	1,49,340	8 months	3.75	118%

Source: Field Survey by the author

Constraints

Flower producers of this area are suffering some problems; scarcity of healthy planting materials, timely replacement, problem of transportation, credit facilities etc. Sometimes the farmers fail to combat the problems raised due to the changes in climate, marketing and value addition. The different constraints that are faced by the farmers may be classified into three categories.

The first one is environmental constraints. This includes unsuitable land situation, lack of healthy planting materials, lack of assured irrigation etc. Nearly fifty per cent of the farmers get water supply throughout the year from the canals and ponds adjacent to their agricultural land. But the rest have to depend on the shallows and rain water as source of water. In case of lack of rainfall they face severe problems. There is wastage of flowers during storage, transportation and if surplus flower are not disposed off it may cause environmental pollution.

The second one is socio-economic constraints which include lack of capital, fluctuation of price of outputs and high cost of inputs. Non availability of institutional credit is most important barrier to the farmers. Since investment per unit area in floriculture is much higher than other traditional crops, availability of finance is a pre-requisite for its successful operation for these farmers. From the field survey it is found that nearly ninety per cent sample farmers do not get financial support from government or any other agency. They have to depend on informal sector like professional money lenders. In addition to the charging of exorbitant rate of interest timely availability of required amount of loan causes problems. Since floriculture fetches high return from a small area in contrast to the traditional crop, farmers often depends on professional money lenders at a higher rate of interest.

The third constraint is infrastructural problems. Unavailability of metal road in the interior villages creates obstacle for timely delivery of flower in the market. The farmers have lack of knowledge about infestation of pest and diseases. All the farmers have reported that they have not got any government assistance through training and camp for last ten years. Absence of storage facility also compels the farmers to sell their crops at low price in the time of low demand.

In the process of marketing, a large number of market intermediaries exist in the flower market comprising whole sellers of traders, or commissioner's agent's retailers and above all exporters who undertake the export of flowers. In many cases the market structure also compels the

farmers to sell their products at reduced process. The main problem of the farmers is the crisis of fund. If the government makes arrangement of the needed fund, then the crisis may be solved. The farmers at their experiences tried to combat with the constraints. The present level of revenue may be increased by many folds if problems of the flower producers are analyzed and resolved.

SWOT Analysis

The strengths, weakness, opportunities and threats for the floricultural activities in this area are presented below:

Strengths

- Good climate enables round-the-year production of flowers.
- Rains spread over 4-5 months in most parts of this area and drought situation is very rare.
- High literacy helps in gathering new ideas and innovations faster.
- Good infrastructural facilities with roads, railway stations, airport, markets etc. help in timely access to the markets.
- Proximity to export markets like gulf countries such as UAE, Iraq, Mauritius etc. insists the producers to export their production.
- The area produces some unique flowers which have good export potential.

Weaknesses

- High wage rates increases cost of production.
- Very small land holdings reduces profit margin.
- High price of land as well as lease rental increases initial investment.
- Very little Government support reduces the confidence of the flower producers.
- Most of the producers are financially weak. So, they are, very often, skeptical to invest further.
- Exploiting role of intermediaries and *Mahajans* reduces the share of profit.
- The productivity of crops still remains lower as compared to other states.

Opportunities

- Global trade of flowers is very promising as there is an increasing demand from the foreign countries.
- With use of appropriate post-harvest technology coupled with better preservation system may increase profit margin.
- Growing demand for cut flowers needs to be tapped.
- Family members' assistance in production and marketing of flowers reduces dependence on the hired workers.
- Trends towards mixed cropping pattern are coming in a big way.

Threats

- States like Tamil Nadu, Karnataka and Maharashtra are capturing a high share of the national market due to high productivity and lower cost of production.
- Acute shortage of labour for field operations during peak seasons causes serious problems.

Conclusion

Despite lack of knowledge on modern floricultural production techniques, difficulty in obtaining the latest varieties and the lack of infrastructure, the industry is continuously attracting new

entrants. This document is being prepared and is intended to provide general information on the opportunity for an investor in the floricultural sector to cultivate flowers for supply in its surrounding markets. Growing cut flowers, especially roses, is a very profitable business if done properly on commercial basis. Demand for cut flowers is growing tremendously as more and more people are becoming aware of the beauty of flowers as decorative items. Weddings, birthday parties, seminars, and other such social gathering events are incomplete without floral decorations. Besides earning money one also helps keep the environment clean and beautiful. A recent trend noticed is that some of the large-scale producers have direct link with the commission agents/traders and the produce is directly taken to the wholesale markets bypassing the intermediaries. In developing countries like India, bio-technology has the potential to contribute in particular to sustainable agriculture and horticultural production. The emergence of bio-technology as a powerful manipulation tools in recent times has bestowed man with power to tinker with life forms on a scale unimagined before. In the next decade, farmers around the world will have to produce more than they have done from the beginning of agriculture till now. The government, concerned authorities and the researchers have to take initiatives to focus on this untouched issue of floriculture.

From the study it can be concluded that floriculture is improving the earning capacity of the sample farmers of these villages in the district of Purba Medinipur. Yielding high return from a small area is improving the quality of life of farmers of this locality. Every year some farmers are shifting themselves from agriculture to floriculture because of expectation of higher income. The floricultural activities in this area can be expanded and income of the farmers can be improved if their problems can be solved. In this context, from our experience we may humbly submit some suggestions before the various institutional authorities associated with the floricultural activities in this district that may be considered for future course of planning.

- 1) Promoting the rapid growth of horticulture by bridging the gap of knowledge and skill both managerial and technical by training people to become entrepreneurs or self-employed in the floricultural sector.
- 2) Development of skills for employment in the floriculture unit farms and upgradation of the knowledge of departmental staff in the field.
- 3) More emphasis should be given to produce only one flower like rose or season flower.
- 4) To train up the farmers through transfer of modern technology and post harvest management of flowers.
- 5) Infusion of technology competent human resource for the development of floriculture.
- 6) Technical upgradation of the people concerned with floricultural development.
- 7) Support for area expansion, generation of planting material, replanting, training and demonstration.
- 8) The support shall also be provided to corporations to achieve productivity measures.
- 9) Arrangement of financial support in the form of subsidies, interest free loan etc.
- 10) To improve preservation and storing system of flowers particularly in Deulia and Kolaghat, the two main flowers marketing centres.
- 11) To develop selected high quality infrastructure through implementation of Biotech park, Bioinformatics park in different regions of the district.
- 12) To ensure better coordination between different R&D organizations working in the area of biotechnology and bioinformatics.

- 13) The organizations should be encouraged to enter partnership with private companies for floricultural activities.
- 14) To create an environment for growth of biotech industry by opening up the locked resources in the universities and research institutions through entrepreneurship development program.
- 15) To set up service centers either by the governments or in partnership with business groups for diagnosis of diseases by sophisticated methods.
- 16) Infrastructure support for the implementation of grass root and biotechnology programmes should be set up at the district level highlighting the needs of agriculture, animal husbandry, fisheries, waste management, biomass development for animal, poultry, fish etc. at the rural level.
- 17) To offer incentives in terms of land power and tax concessions in making, setting up biotech industries an attractive proposition.
- 18) To facilitate flow of venture capital funds and bank credit.
- 19) To spread awareness about investment opportunities in floriculture.
- 20) To set up a marketing structure to popularize and commercialize the selling and buying of flowers.
- 21) To bring more land under horticultural crops in all seasons.
- 22) Economic upliftment of small and marginal farmers through all sorts of floricultural activities.
- 23) Utilization of high, medium and low land which under waste/ barren/bushy land as well as coastal embankment, canal or road side area for floricultural purposes.
- 24) To create opportunities for employment generation for skilled and unskilled persons.
- 25) To establish convergence and synergy among multiple ongoing programs for floricultural development.

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