

**PROSPECT OF FLORICULTURE ON SOCIO-ECONOMIC CONDITION
OF FARMERS IN GADKHALI, JASHORE, BANGLADESH**

M. R. SHAIBUR¹, H. HUSAIN² AND A. AKTER³

This study was endeavored to explore the channels through which the floriculture elevated the socio-economic profiles of farmers in Gadkhali, Jhikargachcha, Jashore based on field survey data generated by face to face interview of 200 respondents from 1 July to 15 August, 2016. Farmers of studied area considered floriculture as profitable venture. Because in our surveyed sample, 73% of the respondents achieved high yield, 16% opted for lower production cost and 11% selected less reliance on imported inputs. Socio-economic profiles improved as farmers' monthly income greater than Tk. 10,000 increased from 10% to 17%. Ownership of earthen house declined from 59% to 17% on the contrary brick-built house increased from 9% to 18%. Primary school enrolment rose from 25% to 65%. Use of electric stove increased from 0% to 25%. Usage of sanitary latrine increased considerably from 10% to 70%. Farmers chose floriculture rather than conventional farming as commercial use of arable land to grow floral products increased considerably. However, majority of the cultivators were not aware of the adverse impact of inappropriate use of pesticides on environment and a very small proportion had consciousness about the detrimental impact of pesticides on health.

Background Information: Bangladesh with a population of over 170 million within a territory of 144 thousand Km² is one of the densely populated countries in the world. About 80% of the total population lives in the rural areas whose livelihood are centered on agriculture and related activities (Bangladesh Bureau of Statistics, BBS; 2011). The total area of Jashore District is 2,606.94 Km² of which 23.39 Km² is riverine. The District lays between 22°48' and 23°22' North Latitudes and between 88°51' and 89°34' East Longitudes (BBS; 2011; Figure 1). The study was conducted in Gadkhali of Jhikargachcha Upazila (sub District) in Jashore District under Khulna Division. Jhikargachcha has a total area of 307.96 Km². According to 2011 census, population was 2,98,908 with 43,439 units of households. Average literacy rate was 27.9% which was lower than the national average of 32.4% (BBS, 2011). The annual average temperature fluctuates between 11.20 °C to 37.1 °C (Islam and Miah, 2003). These climatic factors may

^{1&3}Department of Environmental Science and Technology, Jashore University of Science and Technology, Jashore-7408, ²School of Business and Economics, North South University, Dhaka-1229, Bangladesh.

be favourable for flower production in Gadkhali. This area is well known for large scale cultivation of flowers in Bangladesh. Flower is also cultivated in different parts of the world.



Fig. 1. Pointing out the study area (Jhikargachha Upazila) in context of world. (a) Map of the World, (b) Map of Bangladesh, (c) Map of Jashore District, and (d) Map of Jhikargachha Upazila..

Floriculture is a popular practice in some African countries e.g. Kenya, Uganda and Ethiopia (Gudeta, 2012). Most of the people of African countries are poor and are used to cultivate flower for low wage income. The marginal farmer cannot maintain the minimum standard of living and most of them are victimized. In order to keep the right of the farmers they build association. The global value chain (GVC) analysis of floriculture industry in Kenya demonstrates that apart from industrial development, labor agency should be incorporated in GVC (Riisgard, 2009). Labor should be segregated from the producer at production node, so that retailer chains offer more space for labor than conventional auction strand. He also found that labor organization's power to influence the existing

governance structure of GVC is still constrained. Social standards stipulate that labor organizations are not contingent upon governance structure. Furthermore, cost-saving and timely ordering by retailers exerts additional pressure on suppliers and could enhance labor flexibility instead of strengthening labor organizations. The flower cultivation in Bangladesh is different from that in Africa.

Bangladesh being gifted with appropriate soil quality, favorable climatic condition and cheap labor has potential for producing floriculture products like wide varieties of flowers, foliage, ornamental plants of international standard (Chowdhury and Khan, 2015). Because of lower production cost as a result of reduced price of labor, the farmers are able to offer lower price of this cash crop to consumers. Bangladesh started flower or ornamental plant production in mid 1980's on commercial basis in Jashore District which produces nearly 70% of country's total production (Islam and Rahman, 2013). Despite the huge potential, this industry has not been considered as a thriving industry in agricultural sector's value added in gross domestic product (GDP). Around 1,20,000 people are involved in flower cultivation to earn their livelihood in Gadkhali. Roughly, Bangladesh spends around 3 million Bangladesh Taka (Tk.) for importing ornamental plants to meet domestic demand (Mou, 2006). On the other hand, it could utilize 15,14,000 acres of fallow land for exporting this cash crop (BBS, 2011). Floriculture industry in agricultural sector has the potential to create employment opportunities especially for women by expediting income generating activity. Several qualitative studies (Mou, 2006; Islam and Rahman, 2013) are available in this line of research in existing literature but this is the first paper to analyze the socio-economic profiles of farmers engaged in flower cultivation in Jashore District, based on face to face interview and primary data. Thus, this paper aims to fulfill the existing gap in the literature. The main objective of our study was to observe the impact of floriculture on the socio-economic profiles in Gadkhali region of Jashore.

Study area selection: The study was conducted in Gadkhali of Jhikargachcha Upazila in Jashore District under Khulna Division; Bangladesh (Figure 1). In Bangladesh, the flower is cultivated in different regions but in Gadkhali floriculture is popular as a livelihood of farmers. Therefore, Gadkhali was chosen as our study area.

Sampling technique and sample size: The data were collected by using random sampling technique covering almost all the areas of Gadkhali. Both male and female respondents of physically and mentally sound were asked to get the answer. Our sample included people aged between 21 to 60 years who has clear

idea about floriculture and about Gadkhali. About 200 people were included in our survey.

Method of data collection and period of study: Primary data were collected from survey responses. Questionnaires were designed to conduct face to face interview with farmers engaged in flower cultivation. The survey was conducted from 1 July to 15 August, 2016. The collected data have been coded, edited and processed in MS Excel. Cultivation procedure especially pest control system was carefully monitored during the primary data collection. Secondary data were collected from published and unpublished sources. We have used published and unpublished reports like research papers from government and non-government sources.

Analytical Technique: The average was made by simple calculation. Then the results were calculated on percentage basis. Data were collected in randomized blocks.

Terminologies Used: The 2010 was the terminal time that distinguished terms before and after. In this article before indicates the time before 2010 and after indicates time after 2010.

Age distribution and education level of respondents: Greater proportion of the participants aged from 41 to 45 years (Table 1). Around one third of the respondents were found to be illiterate. It was worth mentioning that percentage of the difference between primary and secondary school enrolment was only 3% (Table 1). Our result found that most of the people in the study area were at least literate.

Table 1. Demographic characteristics and educational level of the participants (N = 200)

Age Distribution (Years)	Respondent (%)	Education	Respondent (%)
21 - 25	12	Literate	30
26 - 30	21	Primary	22
31 - 35	10	Secondary	25
36 - 40	17	Higher Secondary	10
41 - 45	23	Graduate	13
46 - 50	13		
51 - 60	4		

N = Sample size

Table 2. Comparative study of socio-economic benefits based on farmer's perception (%)

Category	Cultivation		Category	Cultivation	
	Before	After		Before	After
Land use (Bigha)			Cooking Facilities		
(a) 1	47	5	(a) Fuel Wood	60	20
(b) 2 - 3	35	44	(b) Kerosene Stove	25	0
(c) 4 - 9	15	31	(c) Gas	15	55
(d) ≥ 10	3	20	(d) Electric Stove	0	25
Monthly income (Tk.)			Sanitation		
(a) ≤ 2000	20	0	(a) Pit latrine (without slab)	50	30
(b) 2001 - 4000	45	5	(b) Sanitary latrine	10	70
(c) 4001 - 6000	15	33	(c) Hanging	40	0
(d) 6001 - 10,000	10	45	Occupation		
(d) $\geq 10,000$	10	17	(a) Floriculture	20	70
Household Type			(b) Agriculture	60	20
(a) Earthen	59	17	(c) Others	20	10
(b) Semi-brick	32	65	SE Status		
(c) Brick built	9	18	Extreme Poor	25	0
PS Enrollment			Poor	40	10
No comment	10	10	Middle Class	30	65
			Rich	5	35

NB: PS = Primary School; SE = Socio-economic status

Land use and monthly income (Tk): It was found that flower cultivation was not popular in Gadkhali before 2010, but over the years the popularity of flower cultivation increased gradually (Table 2). Before the intensive practicing of floriculture, only 1 bigha land each was under cultivation by 47% farmers, which decreased to 5% after commercial flower production. Size of arable land amounts to ≥ 10 bigha was under cultivation by 3% farmers previously, and the percentage increased to 20% (Table 2). The range of income level from Tk 4,001 to Tk 6,000 increased by more than double (from 15% to 33%) and income level from Tk 6,001 to Tk 10,000 increase by more than 4 times. Income level greater or equals to Tk 10,000 has risen by 7%. It is worth mentioning that monthly income below Tk 2,000 has dropped to almost 0%. We thus observed that flower cultivation was found to be lucrative and profitable. As the relationship between the size of arable land under floriculture and farmers monthly income was found to be monotonically positive.

Our findings are in line with Islam and Rahman (2013). They found that rose cultivation in Jhikargachcha was profitable at firm level. Other cultivation practices e.g. mixed crop cultivation has extensively enhanced the socio-economic condition of farmers in Gopalganj District (Shaibur et al., 2019). Several factors hindered the productivity and profitability of floriculture such as inappropriate training and knowledge of cultivation, limited access to high yielding variety seedlings, infestation of insects and diseases (Haque et al., 2013; Zaman, 2013). Higher input price, lower selling price, insufficient credit facilities were found to be the major impediments and issues for higher profitability (Haque et al., 2013).

The increase in income level was actually related to the local development of the study area which resulted from commercial flower production. Usually, the farmers sell their final products to agents who sell those either in biggest wholesale market of Jashore located in Gadkhali or directly sell them to wholesale markets in capital and or other divisional cities. Transaction volume of flowers is around 1.0 to 1.5 million Tk per day in Gadkhali wholesale market (Islam and Rahman, 2013). A group of farmers sell their flowers to a farmer who acts as a representative of exporter's agent. Eventually the final products are sent to exporter's agent in Dhaka. Flowers go through further processing in Dhaka before the product is exported to foreign countries for earning currencies.

Household type and primary school enrolment (PSE): Table 2 depicts that ownership of semi-brick and fully brick constructed house have increased by more than double and double, respectively. Primary school enrolment of the family members of the farmers has also risen by 3 times after floriculture practice. Previously, most of the household structures were earthen. About one third was semi-brick built and only few were brick built. During the survey only 17% house hold was earthen. On the contrary, about 65% households' construction materials were semi-brick. The mentioned percentage almost halved (32%) and the ownership of brick-built house increased from 9 to 18% which was exactly 2 times. This abrupt change of house hold material was most probably due to increase level of income from flower cultivation. Especially, increase in real income which promoted farmers' purchasing power. Most of the farmers believe that the flower cultivation has elevated their economic condition which eventually has transformed their household type. As the economic condition improved, this ultimately helped to elevate educational attainment. People believed that they were able to spend their money for their school going children. Thus profile of the primary school enrolment also improved. Mixed crop cultivation has extensively enhanced the socio-economic condition in Gopalganj District which ultimately enhanced the household type and elevated the number of school going students (Shaibur et al., 2019).

Cooking facilities and sanitation: Previously, about 60% household used fuel wood, 25% used kerosene stove, 15% used gas cylinder and no electric stove was

used for cooking. After introducing floriculture, only 20% used fuel wood, 55% used gas cylinder and 25% used electric stove as cooking equipment (Table 2). The use of kerosene stove for cooking dropped to 0%. The changing pattern of cooking facility towards gas or electric stove is expensive. We deduced that required money was obtained from selling floral products. We found that the income level increased after introducing floriculture (Table 2). The change of cooking system reflects the ultimate change in life style of the farmers in the study area. Previously, because of insufficient access to electricity there was no use of electric stove, but after getting the access to electricity, people utilized it in using electric stove. Along with the improvement of cooking facilities, sanitation pattern was also changed. Usage of sanitary latrine was increased by 7 times after introducing floriculture (Table 2).

Occupation and socio-economic status: Floriculture got popularity among the farmers (Table 2) and simultaneously farmers were less interested in conventional agriculture. It was evident that floriculture was considered as a lucrative and profitable venture for them. We observed that the area of arable land under floriculture practice was expanded substantially. Concurrently, we also observed that socio-economic status improved as proportion of middle class increased by more than double and percentage of extreme poor declined to 0%. On the other hand, the wealthiest group revealed substantial increase from 5% to 35%.

Scenario of floriculture: Most of the farmers had been practicing floriculture around 5 years (Table 3). Before that, they did not have notion of potential benefits or advantages of floriculture. During our survey, about 90% of the farmers thought that they were better –off in terms of improved economic and social standing. About 63% farmers did not have idea about the use of fertilizer and pesticide and their negative impacts on environment. About 22% of the participating farmers had some knowledge about the proper use of pesticide. Currently, some organizations are providing motivation of using high yield varieties of flowers.

Table 3. The scenario of floriculture in surveyed sample

Involvement (Years)	%	Knowledge of pesticide using	%
(a) ≤ 1	0	(a) Do not know	63
(b) 1 - 5	49	(b) Some knowledge	22
(c) 6 - 8	31	(c) Knowledge regarding health	15
(d) ≥ 8	20	(d) Knowledge regarding environment	0
Perception regarding benefit		Economic motivation	
Yes	90	(a) Lower production cost	16
No	10	(b) Less dependent on imported inputs	11
		(c) High Yield	73

Bangladesh is a densely populated and agriculture based developing country. About 52% people of the study area were illiterate or have primary education only (Table 1). This situation needs to be changed with changing cropping pattern. Flower cultivation could be one of the best alternative options and the people of the area were involved in flower cultivation for improving social and environmental condition.

We find that conventional agriculture was shifted to floriculture. Our study finds that at present, only 20% farmers' used conventional agriculture but 70% used floriculture and 10% was reluctant to make any comments (Table 2). A study on rose cultivation in two Indian Districts of West Bengal (Howrah and Medinipur) reveals slightly contradictory findings (Majumder and Lahiri, 2012). Farmers have adopted floriculture as a secondary occupation but land size under rose cultivation has increased relative to other floral products. Both male and female are involved in floriculture. A study demonstrates that tribal women in dry lands of Western India are engaged in growing floriculture products (Agoramoorthy and Hsu, 2012). The small-scale cottage type flower industry has enabled them to earn their livelihood and to enhance local bio-diversity. Women workers have started participating in local politics and have been elected as members of village councils (Panchayati Raj). They have also mobilized themselves in dairy cooperatives, savings and credits as group members and integrated in community development process. Findings of a more recent field study by Dar and Nazki (2017) on 140 registered flower growers of two Districts of Kashmir (Srinagar and Budgam) unfold several economic constraints for farmers. Price of inputs such as fertilizers and insecticides, under developed transportation, variability of market price of the final products, little access to adequate market information, inappropriate storage facility and fluctuation in demand for final good, political uncertainty impose serious constraints for growth of the industry. On the other hand, levels of education, experience, training and probable profitability are major positive factors influencing to grow floriculture products for farm workers. Kenyan flower growers have been in the apex of initiatives to upgrade social and environmental standards in floriculture through the development of their own industry and compliance with the overseas buyers' code (Dolan et al., 2003). Overall, we draw the inference that the socio-economic profiles of the farmers involved in floriculture have progressed based on basic indicators. In the above analysis, we surmised that the cost of living in our studied union remains unchanged before and after cultivation.

Greater proportion of the participating farmers agreed that they did not have adequate knowledge on the right use of pesticides in the production process (Table 3). Only 15% were informed about its negative impact on environment. Before using fertilizer or pesticide farmers must have sufficient knowledge about the specific chemicals, otherwise it may create severe problem on health or environment. The intensive use of chemical fertilizer, pesticides and waste water

management system should be carefully monitored along with air, water and soil pollution in the production process as well as farm workers' right for health and occupational safety, improved working conditions especially for women laborer should be given utmost priority (Gudeta, 2012).

The major economic advantages are 'High Yield', lower cost of production and less reliance on imported inputs give flower growers impetus for cultivation (Table 3). According to the 'Finance for Enterprise Development and Employment Creation (FEDEC, 2014)', linkages between the cultivator and the exporter constitute several informal channels. Supply of high-quality mother plants of several varieties (such as gerbera), availability of packaging materials, specialized vehicle for quick transportation, appropriate facilities for wholesale flower market for farmers, preservation system of unsold products especially in summer are some important factors to be addressed for developing the supply chain management. This will enhance farmers' income from flower cultivation. Initially farmers used to collect the seeds and seedlings from Indian suppliers at border, now majority of the cultivators collect these from local suppliers. Farmers in Panishara Union grow their own seeds. They have access to technical and financial support from 'Rural Reconstruction Foundation' (RRF) through the project. A study on Uganda manifests all farms producers of cut flower have been able to upgrade economically in global value chain (Evers et al., 2014). This is the result of investment in technical equipment by multinational corporations like water filtering, upgrading greenhouse, restructuring production sites, introducing satellite communication system, refrigerating trucks etc (Evers et al., 2014). Moreover, governance structure of GVC is controlled by European multinationals which has enabled them to control intellectual property rights, and their direct ownership and investment and engagement with trusted producers. This has played pivotal role for economic upgrading for Ugandan producers.

Final Remarks

No doubt, floriculture promoted the monthly income, standard of household, cooking facilities, sanitation system and primary school enrollment. We found that flower cultivation had been successful in upgrading the socio-economic status of the cultivators in studied area to some extent, as this result is evident in our face to face interview with 200 farmers. It is worth mentioning that the strongest economic motivation for production is domestically produced inputs which have cost advantage and this eventually increases greater profitability. Most of the participants were not aware of the environmental impact of inappropriate use of pesticides and lower fractions of farmers have conjecture of its hazardous impact on health. Therefore, it is recommended that adequate training should be provided to farmers about the careful use of pesticides to build resilience for soil, air and water pollution. The positive impacts of commercial flower production on socio-economic lives of farmers in Gadkhali were good and

reliable examples for farmers to grow floral products in other Districts of Bangladesh.

There is an exigency of establishing state-of-the-art laboratory in the studied area which could facilitate and organize regular seminars and meetings to help the cultivators to grow floral products in sustainable manner. Concurrently, appropriate governance structure of supply chain management is needed to commercialize the flower production in large scale but definitely not at costs of social and economic welfare of farmers in remote areas of Bangladesh.

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