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Farmers' Problems Associated with Cultivation of Sunflower: A Case Study of Barguna District, Bangladesh

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Authors' contributions

This work was carried out in collaboration between both authors. Author AB designed the work, conducted all research work and carried out the statistical analysis. Author MAM was involved in data collection and edited the manuscript. Both authors read and approved the final manuscript.

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ABSTRACT

Sunflower cultivation is a profitable enterprise to the farmers, but in the coastal part of Bangladesh sunflower is a new crop for the Rabi season. The present study was conducted to determine the socio-economic characteristics of the sunflower growers and to identify the problems facing from production to marketing in Barguna district. The study was conducted in coastal belt of Barguna district from where 100 samples were randomly collected. Descriptive statistical method was used for the analysis. The results revealed that seed, labor, irrigation and marketing of sunflower oil were top of the problems faced by the sunflower growers. Ranking of the specific problems showed that high charge of labor ranked first, salinity problem ranked second, stem rot ranked third, low market price than production cost ranked forth, training ranked fifth, high price of seed ranked sixth. Irrigation machinery, proper marketing facilities, reducing price of seed, appropriate training programs, setting up oil processing mill are the necessary solutions to overcome sunflower cultivation problems.

Keywords: Sunflower cultivation; coastal area; problems and production.

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1. INTRODUCTION

Sunflower is a recently initiated oilseed crop in Bangladesh. It is an important oil crop grown all over the world for its good quality edible oil source extracting from its seed [1]. It has large showy flower and has huge number of seeds which contain 44-45% of edible oil [2-4]. Unlike erucic acid in rapeseed, it has linolenic acid as an important constituent of sunflower oil [5-7]. Its linolenic acid is beneficial for human health and for this reason the popularity of sunflower is increasing day by day [8]. It is especially useful for heart patients, because it does not raise the cholesterol level in blood [9-11]. It contains proteins, vitamins 'A', 'D' and 'E' [12]. It also provides food for livestock. It can use soil moisture very effectively [13-15]. It has deep and branched tap root system therefore can penetrate to deeper zone aids the plant during water stress [16]. Even in the sub-soil and on heavy clay soils it utilizes moisture reserves far more effectively [17]. Sunflower is also a crop of choice for farmers due to its wider adaptability, high yield potential, shorter duration and profitability [18].

Sunflower cultivation has gained much popularity in Barguna district as many sunflower farmers are cultivating sunflower to meet family demand for edible oil as well as earning extra money. In this season sunflower cultivation were brought under 1,532 hectares of land in all six upazilas of Barguna district [19]. Barguna district falls under coastal area. In coastal areas of Bangladesh people face various constraints while cultivating agricultural crops. Some of the constraints are insufficient irrigation water, soil salinity, rough weather and so on. Sunflower cultivation is highly adaptable to coastal areas because it is tolerant of both low and high temperatures [20]. Sunflower can be grown at the salinity level of pH 8.5 and possible to cultivate within a very short time, 85-90 days [21,22].

Komol et al. (2014) found that major technological problems for sunflower cultivation were non-availability of suitable varieties, poor crop germination, lack of irrigation facilities and so on. Jaybhay et al. observed that labor problems, irrigation facilities, weed management, marketing of produce, pest and disease management were the top five constraints faced by the farmers in soybean cultivation. Dupare et al. found that non-availability of quality seed of improved varieties of soybean is the major problem experienced by the farmers. Miah et al. observed that lack of short duration rice variety, incidence of insect infestation and diseases are the major problems of oilseed cultivation. Mandal et al. found that high price of seed, unavailability of improved seed and costly irrigation were the major constraints faced by sunflower growers.

Table 1. World production of sunflower 2019/2020

Country	Production (Metric Tons)
Ukraine	16,000,000
Russia	15,305,000
European Union	9,750,000
Argentina	3,400,000
China	3,250,000
India	170,000
Pakistan	145,000

Source: USDA (2019/202)

1.1 Objectives of the Study

The specific objectives of the study were:

1. to determine the socio-economic characteristics of the sunflower growers in Barguna district
2. to identify the problems faced by sunflower producers from production to marketing stages of sunflower crop.

2. METHODOLOGY

The research was undertaken in Barguna district. The respondents were mainly sunflower growers. Standard lists of the sunflower farmers were prepared with the help of Upazilla Extension Officer. The data were collected using a well designed pretested structured interview schedule. Using simple random sampling technique 100 sunflower farmers were randomly selected. Responses were collected from the farmers on whether or not they face particular listed problems while cultivating sunflower.

Data were collected on socio-economic characteristics: age, sex, educational qualifications, professional status, annual income, farm size and so on. Collected data were analyzed using descriptive statistics such as frequency and percentage.

3. RESULTS AND DISCUSSION

3.1 Socio-economic Characteristics of the Respondents

Majority of the respondents were young and middle aged. This might be an indication that

sunflower farmers were mainly young and middle aged. The data were collected mainly from male respondents. Among sunflower growers 62% respondents had primary level of education. This may be due to more educated people were involved in diversified activities. Majority 78% respondents were involved in agricultural activities. This might be an indication that the main occupation of sunflower growers is agriculture. Approximately 52% respondents fall under medium income level category. Maximum 58% respondents had small farm size. This might be due to low land ownership as they mainly lease land from others.

3.2 Problems Faced in Sunflower Cultivation

The study revealed that labor, irrigation, marketing of sunflower oil, seed, animal disturbance, pest attack, threshing, fertilizer, and pesticide were the problems faced by the sunflower farmers. They were put in order of importance.

3.2.1 Labor problem

It was the most prevalent problem for sunflower cultivation. Almost 90% farmers reported that farmer's high charge was the major labor related problem. This might be due to good income source from other sectors. About 45% farmers stated that farmers are indifferent to labor work due to their involvement in other business such as construction, driving autorikshaw and so on. About 18% farmers reported that labor raise expectation of hospitality such as provision of (breakfast, dinner). Almost 23% farmers stated that lack of labor in proper time of sunflower cultivation (sowing, irrigating, harvesting and so on.) This might be during the peak period of cultivation labor scarcity prevails due to other agricultural cultivation. Jaybhay et al. [16] found similar result in his research.

3.2.2 Irrigation problem

Irrigation problem was the second most important problem. Almost 25% farmers

Table 2. Socio-economic characteristics of respondents

Variables	Percentage
Age	
Young aged	50
Medium aged	32
Old aged	18
Sex	
Male	100
Female	0
Educational status	
Illiterate	18
Primary	62
Secondary	16
Above secondary	04
Occupation	
Agriculture	78
Business	14
Others	08
Annual income	
Low income	40
Medium income	52
High income	08
Farm Size	
Marginal	10
Small	58
Medium	24
Large	08

Source: Field data, (2019)

Table 3. Problems faced in sunflower cultivation

S.N	Problems faced in sunflower cultivation	Frequency
(A)	**Labor problem**	
	Unavailability of labor due to their involvement in other sectors (autorikshaw, construction)	45.0
	High labor wage	90.0
	Labors high expectation for better hospitality from owner (breakfast, dinner)	18.0
	Lack of labor during proper time of sunflower cultivation (Sowing, irrigation, harvesting)	23.0
(B)	**Irrigation problem**	
	Due to canal drying	25.0
	Unavailability of irrigation machine at proper time	15.0
	Distance of water source from field	27.0
	Unavailability of rainfall after seed sowing	25.0
	High cost of machine	38.0
	Lack of modern machinery	30.0
	Lack of sweet water	10.0
	Lack of deep tube well	14.0
(C)	**Marketing of sunflower oil**	
	Low market price than production cost	75.0
	Lack of oil marketing opportunity	25.0
(D)	**Sunflower seed**	
	High price	70.0
	Unavailability of seed at proper time	45.0
	Need to be brought from distant place	15.0
	Failure of seed germination	20.0
	Problems in collected (buying)seed from market	24.0
	Lack of improved variety seed	65.0
(E)	**Animal disturbance**	
	Parrot destroy seed	43.0
	Dove destroy seed	50.0
	Goat destroy seed	30.0
	Man destroy seed	13.0
(F)	**Pest attack**	
	Virus	34.0
	Stem rot	73.0
	Black spot of leaf	13.0
(G)	**Threshing Problem**	
	Oil processing	38.0
(H)	**Fertilizer**	
	High price	36.0
(I)	**Pesticide**	
	High price	30.0
(J)	**Other con Straints**	
	Technical knowledge	65.0
	Training	72.0
	Soil test	34.0

indicated that due to canal drying irrigation had become a major problem. This might be due to lower rate of rainfall in coastal areas. About 15% farmers stated unavailability of irrigation machine

at proper time. This might be due to the scarcity of machine during peak period of agricultural operations as most the farmers did not have machine of their own. Distance of water source from field reported by 27% farmers. About 25% farmers stated unavailability of rainfall after seed sowing. High cost of machine was a problem reported by 38% farmers. The reasons behind this most of the farmers are poor and so they can not buy machine. Lack of modern machinery reported by 30% farmers. Almost 10% farmers stated lack of sweet water. This might be due to falling of patuakhali district in coastal region. Lack of deep tube well reported by 14% farmers. This might be due to the large number of small and marginal sunflower farmers. Mandal et al. [23] observed similar results.

3.2.3 Marketing problem

Almost 75% farmers reported that low market price than production cost is one of the major marketing problem. This might be due to poor transportation facilities they can't contact with remote markets and had to sell sunflower oil in local markets. Lack of oil marketing opportunity stated by 25% farmers. This may be due to communication gap with markets. Similar findings were observed by Miah et al. [21], Mandal et al. [23], Jaybhay et al. [16].

3.2.4 Seed

High price of seed is the major constraint mentioned by 70% farmers. This might be due to huge price of sunflower seeds than other crops which costs Tk 1,500 to Tk 2,000 a kilogram at the local market. About 45% farmers reported unavailability of seed at proper time. This might be due to lack of proper supply of seed in the local markets. About 15% farmers reported that they need to bring the sunflower seed from distant place. This might be due to inaccessibility of sunflower seed in local markets. Failure of seed to germinate stated by 20% farmers. The reason is due to attack by different pests and diseases. Problem in seed collection (buying) stated by 24% farmers. This might be due to the lack of quality seed in markets or farmers using own cultivating seeds which have poor quality. Improved variety seeds were not available in the local market mentioned by 65% farmers. Similar findings were observed by Jaybhay et al. [16], Mandal et al. [23].

3.2.5 Birds and animals

Forty three percent farmers reported parakeet bird attack, 83% mentioned dove bird while only 13% stated bulbul bird. Sunflower farmers also faced the problem of animal attack. Thirty percent farmers reported goat while13% mentioned man. Similar findings were observed by Mandal et al. [23] and Miah et al. [21].

3.2.6 Insects and diseases

Amongst insects and diseases 34% farmers reported virus attack, 73% farmers reported stem rot. Black spot of leaf was also reported during cultivation by 13% of the farmers. It was observed that farmers did not have sufficient knowledge about pest management. This might be due to lack of training facilities of sunflower farmers. Miah et al. [21] found similar result in their study.

3.2.7 Threshing problem

About 38% farmers reported lack of oil processing machinery as a major problem. This might be due to the unavailability of machinery in the locality. They need to go remote places for oil processing.

Table 4. Ranking of constraints faced by sunflower farmers

Constraints	Percent (%)	Rank
High charge of labor	90	I
Salinity	80	II
Stem rot	73	III
Low market price than production cost	75	IV
Training	72	V
High price of seed	70	VI
Improved variety of seeds	65	VII

3.2.8 Other constraints

Almost 36% farmers stated high price of fertilizer and 30% reported high price of pesticide which ultimately increases production cost. About 80% farmers reported salinity problem. This might be due to being coastal region. Among sunflower farmers 65% reported lack of technical knowledge. The reason behind this many farmers are not aware of the improved methods of oilseed cultivation leading to lower yield. They cultivated oilseeds on the basis of their acquired knowledge because they have no formal training on oilseed cultivation. Seventy two percent of the farmers reported lack of proper training. Almost 34% farmers reported scarcity of soil test. This may be due to lack of extension service in many areas.

4. CONCLUSION AND RECOMMENDATION

The study revealed that labor, irrigation, marketing of sunflower oil, seed, animal disturbance, pest attack and so on were the top of the problems faced by the sunflower farmers. Mechanical cultivation should be started in our country to remove the labor related problems. Irrigation machinery should be made available for the farmers at lower cost. Proper marketing facilities should be made for the farmers to sell their sunflower oil. Appropriate training programs about proper sunflower cultivation should be arranged for the farmers. Salinity problem is a major problem in coastal areas. Although sunflower is medium salinity tolerant but more salinity tolerant variety should be introduced by the scientists. The government should reduce the price of sunflower seed. The government should take necessary steps to set up an oil processing mill in every coastal district.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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