



Research Article

EXAMINE THE FACTORS INFLUENCING THE PERFORMANCE OF FARMER PRODUCER COMPANY'S (FPCS) FARMERS

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Abstract: Farmer Producer Company (FPC) is an instrument to eliminate certain problems of small and marginal farmers viz., low bargaining capacity, higher cost of cultivation, marketing risk etc. The success of a producer company depends on the performance of the member producer farmers registered under the company and there may be several factors which influence the performance of FPC farmers. The outcome of the multiple linear regression analysis revealed some potential factors which were found significant in influencing the performance of FPC farmers viz., the level of education of the respondents, family labour employed, hired labour, size of the family, adoption of the recommended production process, and farm training attended during past years. The coefficient of determination (R^2) or goodness of fit for the constructed multiple linear regression model was found to be 0.8873 and the adjusted R^2 was 0.8709.

Keywords: Farmer Producer Company (FPC), Bargaining Capacity, Cost of Cultivation, Marketing Risk, Multiple Linear Regression, Goodness of Fit

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Introduction

India is an agriculture-centric economy since more than 50 per cent of the country's population is involved in the agriculture and allied sector. The contribution of the agriculture sector was recorded as 18.80% of the country's Gross value added for the financial year 2021-22 [1]. Since most Indian farmers belong to the small and marginal farmers category in Indian agriculture and the risk-bearing ability of these farmers are generally low, therefore it is necessary to eliminate the difficulties such as low bargaining ability, higher cost of cultivation, marketing risk associated with all the farmer group to boost the Indian agriculture sector and to strengthen the livelihood of the rural populations [2,3]. To address these problems, an expert committee led by the economist Y.K. Alagh was set up by the Government of India to look into the matter. Y.K. Alagh committee introduced the concept of the Producer company to the Indian economy in the year 2002 which is a hybrid between private limited companies and cooperative societies, registered under the Company Act [4-6] where primary producer organizes among themselves [7]. It is a non-political body which provide business services to small and marginal farmers which work on the principle of self-reliance [8]. The present study was conducted for examining the factor influencing the performance of FPC Farmers, as the case of Satbhani Potato Producer Company Ltd., Assam, India.

Material and Methods

The present study was conducted in the Baghmara development block of the district of Biswanath, Assam. The study was based on the primary data collected from the 200 potato growers (120 FPC growers and 80 non-FPC growers) by the personal interview method through the pre-structured schedule. The producer company was operating in 24 villages on the selected development block. Among the operating villages, 12 villages were selected randomly from the village list provided by the company. From the selected villages, 120 farmers were selected randomly from the member list provided by the CEO of the company by proportionate allocation technique, and 80 farmers were selected randomly as non-member farmers [Table-1].

Table-1 Categorisation of sampled farmers based on land holdings

Category	Member farmers	Non-member farmers
Marginal farmers	33	21
Small farmers	41	26
Medium farmers	25	18
Large farmers	21	15
Total	120	80

Descriptive statistical analysis was employed for socio-economic data and a multiple linear regression model was used for analyzing this specific objective.

$$Y = \beta_0 X_1^{\beta_1} X_2^{\beta_2} X_3^{\beta_3} X_4^{\beta_4} X_5^{\beta_5} X_6^{\beta_6} X_7^{\beta_7} X_8^{\beta_8} X_9^{\beta_9} e^u$$

Where:

Y = Gross value of the farm output per hectare of FPC farms (Dependent variable)

β_0 = Intercept

u = Stochastic disturbance term

e = base of the natural logarithm

The following independent variables or predictors were considered for this study

X_1 = Age

X_2 = Education

X_3 = Family labour

X_4 = Hired Labour

X_5 = Family Size

X_6 = Farm Size

X_7 = Off-farm income

X_8 = Adoption of recommended production process/technologies

X_9 = Farm training attended during the past year

A log-log transformation of the multiple linear regression model was used in the following form:

$$\ln Y = \ln \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \beta_6 \ln X_6 + \beta_7 \ln X_7 + \beta_8 \ln X_8 + \beta_9 \ln X_9 + u$$

$$\ln X_8 + \beta_9 \ln X_9 + u$$

Description of the Independent Variables

Age (X_1)

Age is one of the basic characteristics of an individual linked with his maturity, physical fitness, and productivity [9].

The age of the farmers was expected to influence their performances. At the time of data collection (interview), chronological age was considered. The respondents according to age were classified into five categories.

- 20-30 years: 1
- 31-41 years: 2
- 42-52 years: 3
- 53-63 years: 4
- 63 and above: 5

Education (X₂)

The level of formal education attained by an individual tends to influence the extent to which an individual is exposed to new ideas and the outer world. Therefore, it is expected to influence the individual farmer's performance. According to formal education the respondents were classified as follows-

- 0-5 :1
- 6-10: 2
- 11 and 12: 3
- Graduate and above: 4

Family labour (X₃)

Since family labour is more productive than hired labour, therefore it may influence the farmer's performance on their respective farm. The family labour employed per hectare of potato production was considered as Man days per hectare in the analysis.

Hired labour (X₄)

Potato being a labour-intensive crop, is expected to influence the farmer's performance based on the quantity of labour employed per hectare of potato cultivation. The hired labour employed per hectare of potato production was considered as Man days per hectare in the analysis.

Family size (X₅)

The size of the family refers to the number of members present in the family. Considering the actual number of family members, the data was arranged for analysis.

Farm size (X₆)

The farm size of the selected respondents was taken in hectares.

Off-farm income (X₇)

Off-farm income earned by the respondents was considered as rupees per annum. Off-farm income may influence the farmer's performance since it facilitates access to agricultural inputs and thereby helps in production.

Adoption of recommended production process/technologies (X₈)

To ascertain the extent of adoption of recommended production process/improved technologies, the responses of respondents were collected on several selected practices as follows-

- Improved variety
- Time of planting
- Method of planting
- Selection of seed
- Seed treatment
- Seed rate
- Management of fertilizer and FYM
- Irrigation
- Plant protection measures
- Weeding and other intercultural operation

The score was assigned for the adoption of each of the production practices in the following way-

Adoption Pattern	Assigned Score
Non- adoption	0
Partial or medium adoption	1
Complete adoption	2

The total score for an individual respondent is obtained by summing up the score obtained on each production practice.

The adoption level of the respondents was measured by making use of the adoption index developed by Singhal and Vatta (2017) [10], Lestari *et al.* (2014) [11], Zanu *et al.* (2012) [12], and Rahman (2007) [13].

$$\text{Adoption index} = \frac{[(\text{Respondents total score}) / (\text{Total possible score})] \times 100}{100}$$

Depending upon the extent of adoption of recommended production practices/improved technologies, the respondents were categorized as follows:

Low adopters (up to 33%)

Partial or medium adopters (34-66%)

High adopters (67-100%)

Farm training attended during past years (X₉)

Based on the number of trainings attended by the respondents during the past years, the respondents were categorized as follows:

Nil: 0

1-2 training: 1

3-4 trainings: 2

5 and more trainings: 3

Similar categorization for trained farmers was also employed by Ghosh *et al.* (2013) [14].

Results and Discussion

To examine the factors influencing the performance of FPC farmers, a multiple linear regression model was used considering the gross value of the output per hectare as a dependent variable and age, level of education, family labour, hired labour, family size, farm size, off-farm income, adoption of recommended production process and training attended during past years as independent variables. For convenience, a log-log transformation of the regression model was carried out. The results of the regression output are presented in [Table-2].

Table-2 Estimated regression model with intercept and slope

	Coefficients	P-value
Intercept	12.263	0.000
Age (X ₁)	0.0027	0.626
Level of Education (X ₂)	0.014*	0.064
Family Labour (X ₃)	0.063***	0.000
Hired Labour (X ₄)	0.017*	0.059
Family size (X ₅)	0.055***	0.000
Farm Size (X ₆)	-0.006	0.172
Off Farm income (X ₇)	5.5E-05	0.895
Adoption of Recommended production process (X ₈)	0.020**	0.018
Farm training attended (X ₉)	0.013*	0.074
R square = 0.8873		
Adjusted R square = 0.8709		

Note: ***, **, * represents statistically significance at 1, 5, and 10 % level of probability respectively

From [Table-2] it is revealed that the coefficient of determination (R²) or the goodness of fit of the regression model was found to be 0.8873, which means 88.73 per cent of the variation in the dependent variable (Y) was accounted by the variation in selected independent variables (X_i). In other words, 88.73 per cent variation in the gross value of output per hectare is explained by the selected predictors or independent variables that fitted to the model. Similarly, R² (Adjusted) implies that 87.09 per cent variation in the gross value of output is explained by the regression model.

[Table-2] clearly depicts that independent variable like the level of education of the potato grower (X₂), family labour employed per hectare (X₃), hired labour employed per hectare (X₄), family size (X₅), adoption of the recommended production process (X₈) and farm training attended during past years (X₉) were found to be statistically significant with a positive coefficient value in each variable. Thus, these six variables were found to be influencing the performance of FPC farmers. Among the significant variables, family labour and family size have a higher impact on farmers' performance than the rest of the significant variables. On the other hand, Age (X₁), farm size (X₆), and off-farm income (X₇) have no significant effect on influencing the performance of FPC farmers, since their P-value is greater than the level of significance.

More specifically, the intercept (β) = 12.26 is the estimated average gross value of the output per hectare when no predictor variable is considered in the model.

The level of education of the farmer (X_2), hired labour (X_4), and farm training attended during past years (X_9) were found to be significant at 10 per cent probability. Adoption of the recommended production process (X_8) was found to be significant at 5 per cent level of significance while family labour employed per hectare (X_3) and family size (X_5) were found to be significant 1 per cent level of significance [Table-2].

Education level coefficient (β_2) = 0.014 implies that when the level of education of the farmers increased by 1 per cent the gross value of the farm output increased by 0.014 per cent.

Coefficient of family labour (β_3) = 0.063 implies that a 1 per cent increase in family labour employed per hectare will lead to an increment of the gross value of the output per hectare by 0.063 per cent.

Hired labour employed per hectare also has a positive impact on the performance of FPC farmers. Hired labour with a coefficient, (β_4) = 0.017 indicating that with an increase of 1 per cent in hired labour the gross value of the output per hectare will increase by 0.017 per cent.

Hassan and Suliman (2015) [15] reported the farmer's level of education and labour as the significant factors affecting the production of the crop.

Family size with a positive coefficient, (β_5) = 0.055 implies that a 1 per cent increase in the family size of the farmers will lead to an increase in the performance of the FPC farmers by 0.055 per cent.

The coefficient of adoption of the recommended production process (β_8) = 0.020 implies that if the adoption of recommended production practices increases by 1 per cent by the farmers, then there will be an increase in the gross value of their farm output per hectare by 0.020 per cent.

Farm training attended during past years (β_9 = 0.013) indicates that an increase in the number of farm training attended by 1 per cent will lead to an increase in the value of farm output by 0.013 per cent.

Conclusion

The findings of the study revealed that the level of education of the respondents, family labour employed, hired labour, size of the family, adoption of the recommended production process, and farm training attended during past years were the significant factors influencing the performance of FPC farmers. So, it can be concluded that these are some potential factors which will increase the performance of farmers as far as the farmer-producer company is concerned. The factors may vary from FPC to FPC and several new factors may also be included in the list which may be the subject of further research.

Application of research: The research can be applied as a recommendation by the govt. while promoting any farmer producer company for the satisfactory performance of the member farmers as well as the producer company.

Research Category: Agricultural Economics

Abbreviations: FPC: Farmer Producer Company

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