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Momentum of Pigeonpea Cultivation in Tripura- an Economics Analysis

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ABSTRACT

This study on production of Momentum of Pigeonpea cultivation in Tripura- an economics analysis is based on the on secondary data sources and the growth of Pigeonpea was observed over last four decades (1975-76 to 2014-15) data. The net return over Cost A_1 have been found to be ₹42534.85 per ha and the net return over Cost C_3 was ₹35179.43 per ha. The return per rupee in over Cost C_3 was found to be 2.37 which designate the Pigeonpea is a profitable enterprise for the farming community of Tripura.

1. Introduction

Pigeonpea (*Cajanus cajan* (L.) Millsp.) is an important pulse crop in Indian agriculture. Agro climatic condition of Tripura 22^0 56' to 24^0 32' N latitude, 91^0 09' to 92^0 20' E longitude favours condition of Pigeonpea in the relends in rain fed condition. Prolonged rainy days (May-September) and shallow water table supports cultivation of drought tolerant Pigeonpea with tap root system (Postel, 2000). There are several desirable of traits in Pigeonpea which separates the crop from other pulses and cultivation of the crop is fusible and profitable. In the present paper, increasing acceptance in terms of area, production and productivity of Pigeonpea by the farming community over last four decade is discussed. An attempt has also been made to analysing the cost component and study the economics of Pigeonpea cultivation in Tripura.

2. Materials and Methods

The performance study is based on secondary data compiled from various published source. Data were collected from the Directorate of Economics and Statistics (DES), Ministry of Agriculture, Government of India. For the performance study data were collected for 40 years period (1975-76 to 2014-15). The study period divided into three phases to identify the performance of the crops. As such, Period- I, Period II and overall period represented 1975-76 to 1994-95, 1994-95 to 2014-15 and 1975-76 to 2014-15 respectively. The performance of Pigeonpea crop was estimated by compound growth rate and coefficient of variation for the period I, period II and overall period of study. The compound growth rate was estimated using the exponential model.

$Y = a.b^t$

Where, Y is area, production and productivity, a is Intercept, b is Regression coefficient and t is time variable. From the estimated function, the compound growth rate was worked out by,

CGR (r) = [(Antilog (log b) – 1] x 100. Where, r is compound growth rate.

The economics of production of Pigeonpea was worked out by using Commission on Agriculture Cost and Prices (CACP) concept.

Cost A_1 = All actual expenses in cash and kind incurred in production by the producer. The items covered in cost A1 are costs on: i) hired human labour, ii) hired bullock labour., iii) owned bullock labour, iv) home produced/purchased seed, v) plant protection chemicals, vi) home produced/purchased manure, vii) fertilizers, viii) insecticides and pesticides, ix) depreciation on farm machinery, equipment and farm building, x) irrigation, xi) land revenue, land development tax and other taxes, xii) interest on working capital, xiii) interest on crop loan and xiv) miscellaneous expenses.

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Cost B_1 = Cost A_1 + Rent paid for leased-in land + Interest on value of owned capital assets (excluding land).
Cost B_2 = Cost B_1 + Rental value of owned land (net of land revenue) and rent paid for leased-in land.
Cost C_1 = Cost B_1 + Imputed value of family labour.
Cost C_2 = Cost B_2 + Imputed value of family labour.
Cost C_2* = Cost C_2 + estimated by taking into account or actual wage rate whichever is higher.
Cost C_3 = Cost C_2* + 10 per cent Cost C_2* to (on account of managerial functions performed by farmers).

3. Results and Discussions

Growth of area production and productivity of Pigeonpea during 1975-2015

Table 1. Compound growth rates of area, production and productivity

Particular	Compound Growth Rates (%)		
	Period I	**Period II**	**Overall**
Area	5.24***	5.93**	4.23**
Production	8.1***	7.12***	5.95***
Productivity	2.71***	0.9*	1.58**

Note: *, **, *** significant at 10, 5, 1 per cent level respectively

Overall growth rate of area under Pigeonpea was 4.23 per cent which was significant at 5 per cent level of significance this indicates that area under Pigeonpea is increasing over the years. As regard to period I the area under Pigeonpea was 5.24 per cent which increased 5.93 per cent on period II. The result was in conformity with results obtained by Marawar *et al.* (2003).

Growth rate of Pigeonpea production for overall period was positive and significant being 5.95 per cent which is significant at 1 per cent level of significance. During period I and period II the growth rate was also positive and significant *i.e.* 8.1 per cent and 7.12 per cent respectively. The result was in conformity with results obtained by Sharma and Dupare (2013). Productivity is most important criteria in measuring the growth of any crop output.

The success or failure of any improvement in the art of agriculture is measured by resultant increase or decrease in the productivity as seen in the Table 1 Pigeonpea productivity in Tripura for period I was positive (2.71 per cent) and significant at 1 per cent level, in period II indicated it was 0.9 per cent which was significant at 10 level of significance and at overall period the productivity also showed positive and significant (1.58 per cent) which indicated that increased in productivity of Pigeonpea.

Economics of Pigeonpea cultivation-a case study (2014-15)

In variable Costs, the expenditure was highest on human labour (₹11,737.49), followed by fertilizer (₹2471.05), plant protection (₹ 2347.50) and manures (₹ 1166.64). Thus, human labour was main component of variable Cost. The rental value of land was major component of the overhead costs (2471.05). The total variable cost and the total fixed cost was found to be ₹20230.79 and ₹5489.77 respectively. The results are in conformity with findings of Singh and Singh (2001).

The overall total cost on cultivation (Cost C_3) of Pigeonpea crop was found to be ₹25720.57 per ha, The Cost A_1 was found to be ₹18365.15 per ha, and share of Cost B_2 in total cost was 83.89 per cent. The Cost C_1 was 93.50 per cent of the total cost, which depicting a direct relationship with farm size.

Note: Minimum Support Prices (MSP) Recommended by CACP and Fixed by Government Rs=4350/Qtls (2014-15).

The overall gross return from Pigeonpea cultivation has been found to be ₹ 60900.00 per ha in study area. The net return over Cost A_1 have been found to be ₹42534.85 per ha and the net return over Cost C_3 was ₹35179.43 per ha. The return per rupee in over Cost A_1 and Cost C_3 was found to be 3.32 and 2.37 respectively.

Conclusion

The study revealed that significant growth rate of area, production and productivity under Pigeonpea crop in Tripura over last four decades. Profitability of the crop in terms of gross return, net return and return per rupee endorse the future promotion of Pigeonpea cultivation in the state of Tripura.

Table 2. Economics of Pigeonpea cultivation (₹/Ha)

Particulars	Units	₹/Ha
Variable costs		
Hired Human labour (Man days)	37.07	9266.44
Family labour (Man days)	12.36	2471.05
Bullock labour (Pair/days)	4.94	988.42
Machinery Labour (Hr.)	4.00	889.58
Seeds (Kg)	12.36	370.66
Manures (Ton)	3.00	1166.64
Fertilizer (Kg)		
N	26.00	312.00
P	54.30	760.20
K	35.60	712.00
ZnSO4	8.73	686.85
Plant Protection (lt.)	4.94	2347.50
Repairs	-	185.33
Miscellaneous charges	-	74.13
Total Variable costs		**20230.79**
Fixed costs		
Depreciation charges	-	593.05
Land revenue and taxes	-	12.36
Interest on investment	-	123.55
Interest on working capital	-	617.76
Rental Value of Land	-	2471.05
Risk premium	-	97.00
Managerial cost	-	1575.00
Total Fixed costs		**5489.77**
Cost 'A_1'	-	18365.15
Cost 'B_1'	-	19106.47
Cost 'B_2'	-	21577.52
Cost 'C_1'	-	24048.57
Cost 'C_2'	-	24145.57
Total Cost (Cost 'C_3')	-	25720.57
Gross Returns	-	60900.00
Net return over cost		
Cost 'A_1'	-	42534.85
Cost 'B_1'	-	41793.53
Cost 'B_2'	-	39322.48
Cost 'C_1'	-	36851.43
Cost 'C_2'	-	36754.43
Cost 'C_3'	-	35179.43
Returns per rupee		
Cost 'A_1'	-	3.32
Cost 'B_1'	-	3.19
Cost 'B_2'	-	2.82
Cost 'C_1'	-	2.53
Cost 'C_2'	-	2.52
Cost 'C_3'	-	2.37

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