



# **Cost and Return in Black Gram Cultivation among Members of Farmer Producer Organization in Tamil Nadu, India**

**Nandhaana Nallusamy Ilango<sup>a</sup>, R. Parimalarangan<sup>b\*</sup> and M. Kalpana<sup>a</sup>**

<sup>a</sup> *Anbil Dharmalingam Agricultural College and Research Institute, Tamil Nadu Agricultural University, Trichy, Tamil Nadu, India.*

<sup>b</sup> *Tamil Nadu Agricultural University, Coimbatore 641003, Tamil Nadu, India.*

## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

## **Article Information**

DOI: 10.9734/IJECC/2021/v11i1130548

### Editor(s):

(1) Dr. Jean Béguinot, University of Burgundy, France.

### Reviewers:

(1) S. Jaffar basha, Acharya N G Ranga Agricultural University, India.

(2) Henrykus Sihaloho, Universitas Katolik Santo Thomas, Indonesia.

Complete Peer review History, details of the editor(s), Reviewers and additional Reviewers are available here:

<https://www.sdiarticle5.com/review-history/77183>

**Original Research Article**

**Received 01 October 2021**

**Accepted 01 December 2021**

**Published 07 December 2021**

## **ABSTRACT**

Farmer producer companies normally carry out the activities such as production, harvesting, processing, procurement, grading, handling, marketing, selling, export of primary produce of the members or import of goods or services for their benefit. The present study was conducted in Theni District of Tamil Nadu. Primary as well as secondary data on black gram were collected for this present study. Simple statistical analysis such as arithmetic mean and percentage analysis and Compound growth rate analysis was worked out. Among operational costs, the cost of human labour accounted the highest share (36.03 per cent) in Black gram cultivation. Total cost of cultivation of black gram among the sample farmers of FPO in the study area was Rs. 46477.26/ha. The net return realised from Black gram cultivation was Rs. 21722.74/ha.

*Keywords: FPO; Pulses; compound annual growth rate; Cost and returns.*

## 1. INTRODUCTION

In India, FPOs are mainly promoted by Small Farmers Agri-Business Consortium (SFAC), National Bank for Agriculture and Rural development (NABARD), Line departments of State Government, NGOs and private players. Nearly 7374 FPOs are mobilized across India. The importance of the FPOs is well understood from the fact that the year 2014 was observed as the “Year of FPO” by the Government of India. These FPOs can be formed both at state, cluster, and village levels by forming groups and registered under the Indian Companies Act, 2013 as Farmer Producer Company (FPC). Farmer producer companies normally carry out the activities such as production, harvesting, processing, procurement, grading, handling, marketing, selling, export of primary produce of the members or import of goods or services for their benefit. Farmer producer companies also renders technical services, consultancy services, training education, research and development and all other activities for the promotion of the interests of its members. The Indian government has a target of doubling the farmer’s income in seven years, which is presently on an average less than Rs1.0 lakh per annum (INR 96,703 during 2015-16) to close to Rs. 2.50 lakh (INR 2,19,724) by 2022-23 by emphasizing on value addition. Among the different instruments to achieve this goal, promotion of new and scaling up of existing member-based institutions of farmers such as Farmer Producer Organizations (FPOs) has been given focus. It is expected that given the extremely small landholdings in India, promotion of FPOs can lead to economies of scale and addresses the problems of production and marketing and improve the bargaining power of farmers through backward and forward linkages. Pulses are staple protein food item for India’s vegetarian and rural population to ensure nutritional security. Pulses form an integral part of the Indian diet, providing much needed protein to the carbohydrate rich diet to the people. India is the largest producer of pulses in the world. Pulses are an important group of crops in India, which is also responsible for yielding large financial gains by amounting for a large part of the exports. India has exported 296,169.83 MT of pulses to the world for the worth of Rs. 2,116.69 Crores / 284.26 USD Millions during the year 2020-21. Countries such as USA, China, Nepal, United Arab Emirates, Algeria are major export destinations during 2020-21. (APEDA, 2021). The primary objective of this present research paper is to work out cost and returns in black

gram cultivation among the sample farmers of selected Farmer Producer Organization in Tamil Nadu.

## 2. METHODOLOGY

### 2.1 Study area and Sampling

The present study was conducted in Theni District of Tamil Nadu. Purposive sampling was adopted to select the sample farmers. Theni district was purposively selected for this study because Theni district comes under efficient cropping zone for pulses production in Tamil Nadu [1]. Primary as well as secondary data on black gram were collected for this present study. Sample farmers were randomly selected from the selected Farmer Producer company in Theni District of Tamil Nadu. The present study aimed at estimation of cost of cultivation of black gram in the study area. Primary data on costs and return on black gram cultivation were collected. Primary data on costs and returns in black gram cultivation were collected from 60 sample farmers of selected FPO. Secondary data on area, production and productivity of black gram in Tamil Nadu were also collected for a period of 1990-91 to 2018-19 for achieving the objectives of the study. Secondary data were collected from various sources like Season and Crop Reports and Tamil Nadu Economic Appraisal.

### 2.2 Analytical Tools

For the purpose of evaluating the objectives of the study, the following analytical tools were used for analyzing the data to draw meaningful results and conclusions. Simple statistical analysis such as arithmetic mean and percentage analysis were performed to estimate the cost and returns in black gram cultivation. Compound growth rate analysis was worked out to estimate the trends in area, production and productivity of black gram in Tamil Nadu.

#### 2.2.1 Cost of Cultivation

Primary data on farm operations like ploughing, sowing, manures and manuring, weeding, irrigation, harvesting were collected. Cost of cultivation formulae: (Total fixed cost +total variable cost), Net return formulae: Total income-cost of cultivation and cost of production formulae: Total Cost/ Quintal.

#### 2.2.2 Compound growth rate analysis

Growth of any variable indicates its past performance. Growth rate analysis is generally

used to find out the trend in a particular variable over a period of time. In this study, compound annual growth rate on area, production and productivity of black gram was estimated using the exponential growth function of the form:

$$Y_t = ab^t e^{u_t} \quad (1)$$

Where,

$Y_t$  : Known as dependent variable.

a : Intercept

b : Regression coefficient = (1+g)

t: Number years in 1, 2, ,n

$u_t$  : Error term for 't' year

Growth rates were used to measure the past performance of economic variables. Growth in area, production and productivity of Black gram was analysed using exponential growth function.(Shyamsundar G.,et al.,2019). Ordinary Least Square (OLS) technique was used to estimate the compound annual growth rate. The value of compound growth rate (g) was expressed in percentage. The formula used to work out the compound annual growth rate given below.

$$g = \{ \text{Antilog of } (b)-1 \} * 100.$$

The students't test was to test the significance of the regression coefficient.

### 3. RESULTS AND DISCUSSION

#### 3.1 Compound Annual Growth Rate in Black Gram in Tamil Nadu

Results of the study are presented in the following tables. An analysis was carried out to study the growth of area, production and productivity of Black gram in the study area for the period 1990-91 to 2018-19. Comparative analysis on compound annual growth rate among different decades indicated that there was negative growth rate in area, production and productivity during 1990-91 to 1999-2000. It was indicated that there was positive trend in area and negative tend were noticed in production and productivity during 2000-01 to 2009-10. Even though there was negative trend in area, production and productivity shown positive trend during 2010-11 to 2018-19. The growth in area, production and productivity was 0.53 percent,

3.07 percent and 1.23 percent respectively during 1990-91 to 2018-19. It was inferred from the table that the increasing trend was observed in area, production and productivity of Black gram in Tamil Nadu. (Table-1& 2),Figs. (1-3). Similarly, the study conducted by Ahlawat *et al.*, [2] showed that increase in production of blackgram was higher owing to increase in area as well as in yield.

#### 3.2 Cost of Cultivation of Black Gram among Sample Farmers of FPO

The analysis on cost of cultivation of black gram among sample farmers of FPO was presented in the following Table.3. Expenses on farm operations like ploughing, sowing, manures and manuring, weeding, irrigation, harvesting was collected and analysed and results were presented here under.

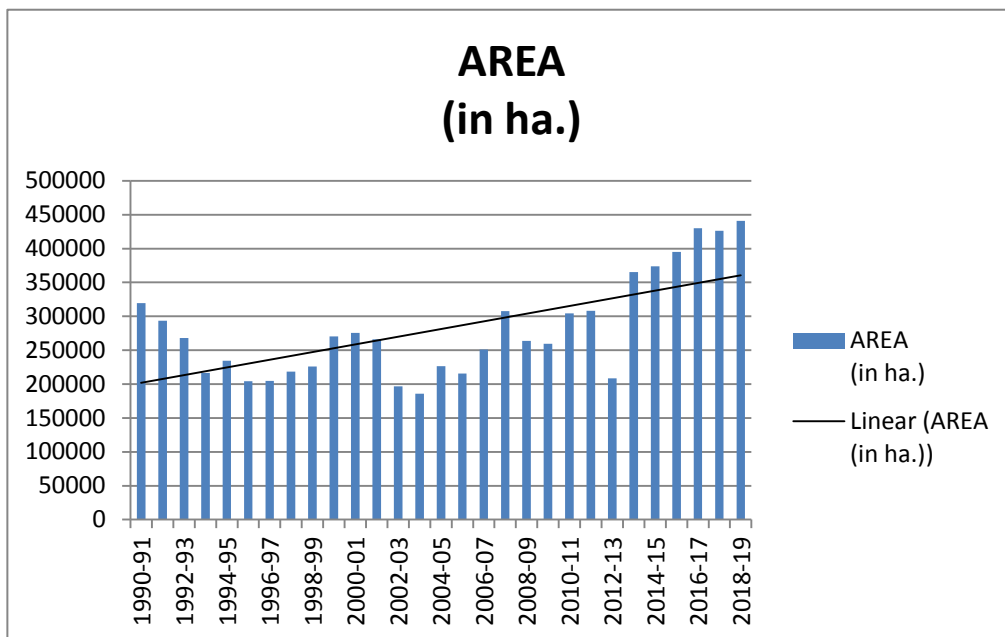
It could be seen from the Table 2 that the value of variable inputs used by the sample farms was Rs. 33446.56/ha, which accounted for 71.96 per cent of the total cost. Among operational costs, the cost of human labour accounted the highest share (36.03 per cent), followed by fertilizer and manures (10.16 per cent), machine labour (8.88 per cent), seeds (7.32 per cent), Interest on working capital (7.71 per cent) machine labour (4.51 per cent), and plant protection chemicals (1.88 per cent). From the Table it could be inferred that fixed cost was Rs. 8805.50 /ha and it formed 18.95 per cent of total cost. Among various components of fixed costs, the cost on rental value of owned land accounted the highest share (16.46 per cent), followed by interest on owned fixed capital (1.72 per cent). Total cost of cultivation of black gram among the sample farmers of FPO in the study area was Rs. 46477.26 /ha. Similar results were obtained by Shyamsundar G.,et al., [3] and Mohiuddin M. et al., [4].

The average productivity of Black gram among sample farmers was 6.20 q / ha and the cost of production was Rs. 7496.33 / Qtl. The gross return realised from the Black gram cultivation among sample farmers was Rs.68200/ha. The net return realised from Black gram cultivation was Rs. 21722.74/ha (Table. 4). Similar results were obtained by Sunandini and Devi [5], Shyamsundar G.,et al., [3], Mohiuddin M. et al., [4] and Swaminathan C.,et al., [6].

**Table 1. Area, production and productivity of Black gram in Tamil Nadu**

Year	Area (in ha.)	Production (in tonnes)	Yield (kg/ha)
1990-91	319306	134990	423
1991-92	293434	147560	503
1992-93	267771	139200	520
1993-94	216306	90630	419
1994-95	234444	122720	523
1995-96	204387	81490	399
1996-97	204627	75030	366
1997-98	218236	101820	467
1998-99	226076	117070	518
1999-2000	270180	105120	389
2000-01	275634	132500	480
2001-02	266123	104320	392
2002-03	196888	78555	399
2003-04	185736	75920	409
2004-05	226364	82998	367
2005-06	215448	70758	328
2006-07	251014	143053	570
2007-08	307515	79980	260
2008-09	263671	82983	315
2009-10	259722	98712	380
2010-11	304432	123011	404
2011-12	308263	178816	580
2012-13	208625	88706	425
2013-14	365128	310658	851
2014-15	373782	358895	960
2015-16	395186	276371	699
2016-17	429784	184610	430
2017-18	426424	301603	707
2018-19	440974	274307	622

*Source: Season and crop reports (Various issues), Govt of Tamil Nadu, India*



**Fig. 1. Area under blackgram in Tamil Nadu**

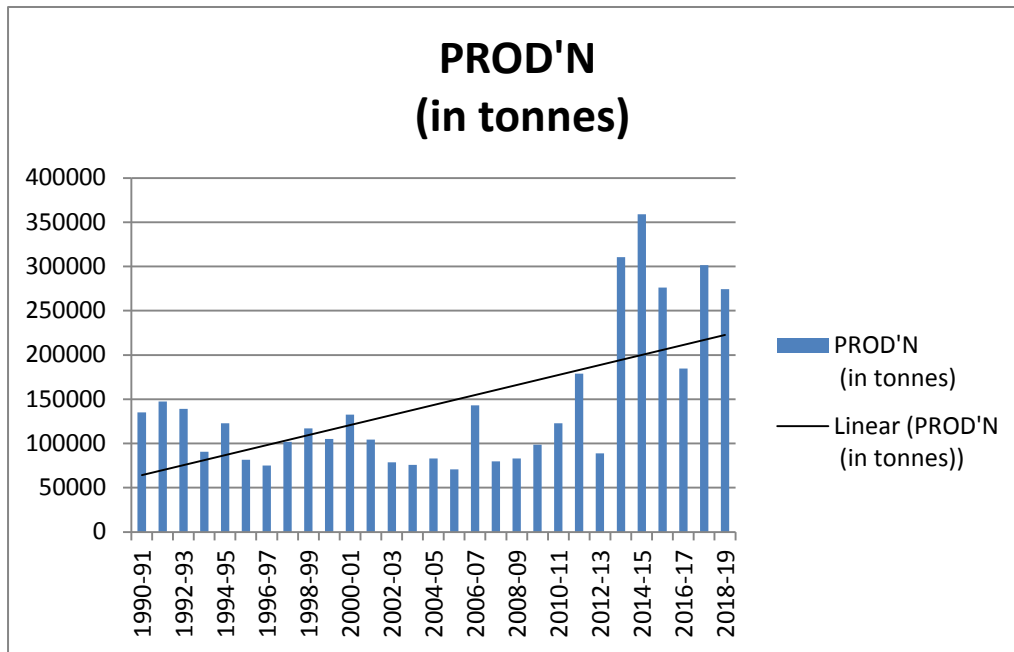


Fig. 2. Production of blackgram in Tamil Nadu

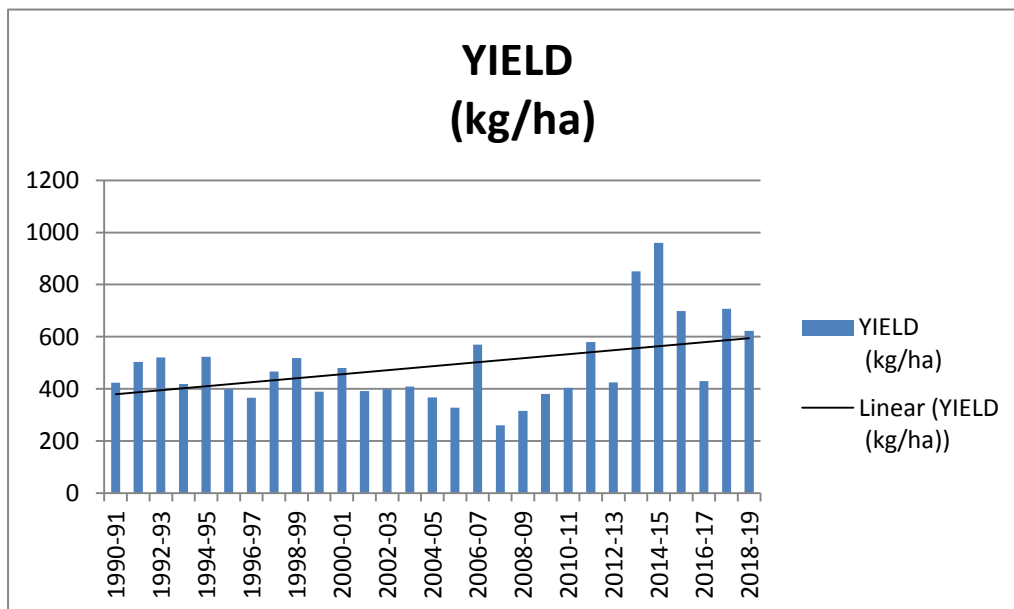


Fig. 3. Yield of blackgram in Tamil Nadu

Table 2. Compound Annual growth rate in black gram in Tamil Nadu (CAGR in %)

Period	Area	Production	Productivity
1990-91 to 1999-2000	-2.78	-3.81	-1.06
2000-01 to 2009-10	1.52	-1.46	-2.92
2010-11 to 2018-19	-3.25	10.75	3.64
1990-91 to 2018-19	0.53	3.07	1.23

**Table 3. Cost of cultivation of black gram among sample farmers of FPO (Rs/ha)**

<b>Particulars</b>	<b>Total Cost (Rs./ha)</b>
<b>I. Operational Cost</b>	
Human Labour	16746.00 (36.03)
Machine Power	4125.00 (8.88)
Seed	3400.00 (7.32)
Fertilizers and Manures	4720.00 (10.16)
Plant Protection Charges	872.00 (1.88)
Interest on working capital	3583.56 (7.71)
Total operational cost	33446.56 (71.96)
<b>II. Fixed Cost</b>	
Rental value of Owned Land	7650.00 (16.46)
Land Revenue, Taxes & Cess	15.00 (0.03)
Depreciation on Implements & Farm building	340.00 (0.73)
Interest on fixed capital	800.50 (1.72)
Total Fixed Cost	8805.50 (18.95)
Sub Total (I+II)	42252.06 (90.91)
Managerial cost @ 10%	4225.20 (9.09)
Total Cost	46477.26 (100.00)

**Table. 4. Return realized in black gram among sample farmers of FPO in Tamil Nadu**

<b>Income measures</b>	<b>Amount (Rs/ha)</b>
Total Cost	46477.26
Yield (Qtl/ha)	6.20
Cost of Production (Rs./Qtl)	7496.33
Gross Income realised	68200.00
Net Income realised	21722.74

#### 4. CONCLUSION

There was positive trend observed in area, production and productivity of Black gram in Tamil Nadu. Cost and returns analysis in black gram among sample farmers of FPO showed that cost of human labour accounted the highest share followed by fertilizer and manures, machine labour and expenditure on seeds. Proper marketing information should also be followed which influenced by providing reasonable price to the farmers to increase the return of this crop. In the study area farmers were not able to get higher return for their crops because of low productivity in black gram cultivation. Production of pulses provides nutritional security population. Hence, more focus should be given for increasing in pulses production. Government procurement for supply through public distribution system would provide adequate marketing support to growers.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

#### REFERENCES

1. Pradipa C, S.Panneerselvam Ga, Dheebakaran V, Geethalakshmi, Ragunath KP. 'Delineation of efficient pulse growing regions of Tamil Nadu', Multi logic in Science-An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering. 2018;VIII( XXVI). JULY issue, ISSN 2277-7601.
2. Ahlawat IPS, Purushottam Sharma, Ummed Singh. Production, demand and import of pulses in India, Indian Journal of Agronomy 61 (4th IAC Special issue). 2016:S33\_\_S41.

3. Shyamsundar G, Rajesh R, Parthiban JJ. Cost and Return of Black gram in Villupuram District of Tamil Nadu an Economic Analysis. *International Journal of Agriculture Sciences*, ISSN: 0975-3710 & E-ISSN: 0975-9107. 2019;11(10): 8505-8507.
4. Mohiuddin M, Akter N, Khanum R. Economics of black gram cultivation and its impact on farmer's livelihood in two selected districts of Bangladesh, SAARC J. Agri. 2018;16(2): 83-96.
5. Sunandini, Devi; *Journal of Economics, Management and Trade*. 2020;26(9): 72-77. Article no.JEMT.63679
6. Swaminathan C, Surya R, Subramanian E, Arunachalam P. Challenges in Pulses Productivity and Agronomic Opportunities for Enhancing Growth and Yield in Blackgram [Vigna mungo (L.) Hepper]: A Review. *Legume Research*; 2021. DOI: 10.18805/LR-4357

---

© 2021 Ilango et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*

*The peer review history for this paper can be accessed here:*  
<https://www.sdiarticle5.com/review-history/77183>