**International Journal of Multidisciplinary Research and Development**
**Online ISSN: 2349-4182, Print ISSN: 2349-5979, Impact Factor: RJIF 5.72**
**www.allsubjectjournal.com**
**Volume 4; Issue 4; April 2017; Page No. 171-174**

# An economic analysis of production and marketing of black gram (URD) in Raigarh district of Chhattisgarh

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**Abstract**
An attempt has been made in this study to examine the economic analysis of black gram production and marketing in Raigarh district of Chhattisgarh state. The specific objectives of the study were 1. To study socio economic profile of the different size farm households/ groups. 2. To analyze the growth rate in area, production and productivity of black gram in Raigarh district and Chhattisgarh state. 3. To workout the costs and returns and input output ratio of different size farms household. 4. To identify Existing marketing channels, price spread and marketing efficiency in the different marketing channels. 5. To find out the constraints in the production and marketing of black gram in study area and suggest suitable measures. The present study was conducted in Baramkela block in Raigarh district of Chhattisgarh state. The primary data is collected from the black gram producers through personal interview method with the help of well prepare scheduled and questionnaire for the production and marketing year 2015-16. The growth rate of area, production and productivity of Chhattisgarh and Raigarh district was worked out by using exponential analysis. The simple mean and average method was used to work out the cost of cultivation, marketable surplus and disposal pattern of black gram crop.

**Keywords:** growth rate, cost of production, and returns, marketing margin and price spread

## 1. Introduction
Black gram is scientifically known as *Phasiolusmungo* and it is commonly known as Urad in India. India is its primary origin and is mainly cultivated in Asian countries including Pakistan, Myanmar and parts of southern Asia. About 70% of world's black gram production comes from India. Black gram is one of the most highly prized pulse crop, cultivated in almost all parts of India. In India black gram occupies 31.m ha area and contributes 18.5 mt. productions with an average productivity 451.64 kg/ha. In India black gram is mostly grown in Uttar Pradesh, Andhra Pradesh, Maharashtra, Madhya Pradesh, Chhattisgarh Tamil Nadu, Chhattisgarh, Rajasthan, Jharkhand and Odisha states which together account for about 86.78 per cent area and 86.53 per cent production. Higher productivity of black gram is obtained in Bihar (862kg per hectare) Being a proper leguminous crop, it is itself a mini-fertilizer factory, as it has unique characteristics of maintaining and restoring soil fertility through fixing atmospheric nitrogen in symbiotic association with *Rhizobium* bacteria, present in the root nodules (Ahmad *et al.,* 2001). It proves to be a great rotation crop enhancing the yield of main crop as well. It is mainly cultivated in a cereal-pulse cropping system primarily to conserve soil nutrients and utilize the left over soil moisture particularly after rice cultivation. It is short duration pulse crop (Delic *et al.,* 2010), usually flowering within 30-60 days of sowing and maturing within 60-90 days. It is generally cultivated as kharif crop but also does well in summer season as a catch crop.
In Chhattisgarh, area occupied by black gram is 93.46 thousand ha and contributes 29.00 thousand tonnes with an average productivity of 310 kg/ha (Anonymous, 2014). In Chhattisgarh black gram is mostly grown in Raigarh, Jashpur, Jagdalpur, Mahasamund, Kanker and Korba districts which together account for about 76.91 percent area and 75.04 per cent production. Higher productivity of black gram is obtained in Jashpur (410 kg/hectare).

### 1.1 Objectives of the study
1. To study socio economic profile of the different size farm households/ groups.
2. To analyze the growth rate in area, production and productivity of black gram in Raigarh district and Chhattisgarh state.
3. To workout the costs and returns and input output ratio of different size farms household.
4. To identify Existing marketing channels, price spread and marketing efficiency in the different marketing channels.
5. To find out the constraints in the production and marketing of black gram in study area and suggest suitable measure.

## 2. Material and Methods
The study on growth in area, production and productivity of black gram was purposively taken cg in Raigarh state of India. The secondary data on area under black gram, production and productivity of crops were used to analyze the trends. The time series data on area, production, productivity of black gram was available from 2004-05 onwards. Hence the analysis was covered for the period from 2004-05 to 2013- data is collected

from Directorate of Agriculture and Annual Agricultural Statistics, Chhattisgarh, A Statistical Compendium 2015, India, Directorate of Pulse Research, India, Directorate of economics and statistics Raipur, Commissioner Land Record and Settlement, Raipur, Chhattisgarh and Department of Agriculture, Raigarh. The data on area, production and productivity of black gram crops is also collected from these sources to work out the compound growth rate of area, production and productivity of black gram crop.

The growth in the area, production and productivity under different crops was estimated using the compound growth function of the form:

The compound growth rates in area, production and productivity of three black gram crops is worked out in the Chhattisgarh state and Raigarh district by fitting an exponential function. The following formula is used for this purpose.

## 3. Results and Discussion

### 3.1 Compound growth rate

The compound growth rate of Black gram during period (2004-05 to 1013-14) is presented in table 1. It is clear from figures of growth rate that though, the growth rate of productivity (0.92 %) in period (2003-04 to 2013-14) is significantly increase, the significant and negative growth rate of production (-1.15 %) is observed mainly due to negative and significant growth rate (-1.87 %) in area of this crop during period (2003-04 to 2013-14) in the state of Chhattisgarh in this 10 year.

The compound growth rate of area over the period of 10 years is estimated as -1.95 % in the Raigarh district which get success to increase the productivity of crop in the district in early due to positive and significant growth rate (1.85 %) in productivity of this crop. The district experienced negative and significant growth rate (-0.11 %) in production of this crop. It is observed that the productivity of this crop was increasing during period (2004-05 to 2013-14). During this period, the compound growth rate of productivity is estimated positive most and significant in the district (1.85 %) and state (0.92 %) as well.

**Table 1:** Compound growth rates of area, production and productivity of black gram in Raigarh district and Chhattisgarh state. (2003-04 to 2013-14)

| Crop | Particular | Chhattisgarh | Raigarh |
|---|---|---|---|
| Black gram | Area % | -1.87 | -1.95 |
| | Production % | -1.15 | -0.11 |
| | Productivity % | 0.92 | 1.85 |

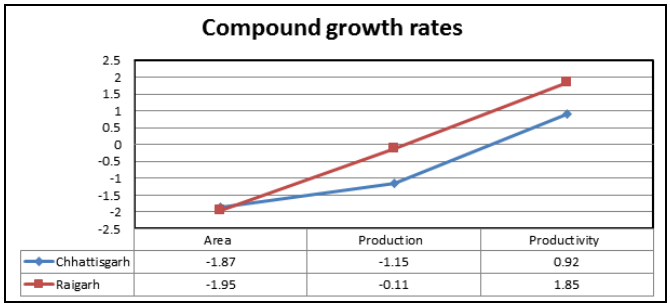


**Fig 1**

### 3.2 Cost of cultivation

The Table 2 revealed that among different size of farms, total cost incurred by the small size farms were high (Rs. 24028.76/ha) as compared to medium and large size farms (Rs. 23459.8/ha and Rs. 22643.8/ha). Sample average for total cost was Rs.23586.48 /ha in different size of farms group. The cost of human labour, fertilizers, seeds and bullock labour were the items of cost with major share in the variable costs, because most of the operations like harvesting, and weeding were human labour intensive operations and the other operations like land preparation and interculture were bullock labour intensive. The distribution of pattern of operational cost under various inputs revealed that cost of human labour was the highest in the small size farms (Rs.7500/ha), compared to medium size farms (Rs.6700/ha) and lowest on large size farms (Rs.5700/ha). Whereas, bullock labour cost was the highest in case of small size farms (Rs. 800/ha) as compared to medium (Rs. 750/ha) and large farms (Rs. 500/ha).

**Table 2:** Cost of cultivation of black gram crop at different farms (Rs./ha)

| S. No. | Particulars of Farm Operations | Size of Farms Group | | | Sample Average |
|---|---|---|---|---|---|
| | | Small | Medium | Large | |
| | (A)Variable cost | | | | |
| 1. | Hired Human Labour Charges | 3000.00 (12.49) | 3500.00 (14.92) | 4500.00 (19.87) | 3460.00 (14.74) |
| 2. | Bullock Labour Charges | 800.00 (3.33) | 750.00 (3.20) | 500.00 (2.21) | 725.50 (3.07) |
| 3. | Machinery Labour Charges | 2200.00 (9.16) | 2400.00 (10.23) | 2600.00 (11.48) | 2346.00 (9.98) |
| 4. | Cost of Seed | 2000.00 (8.32) | 1850.00 (7.89) | 1800.00 (7.95) | 1909.50 (8.10) |
| 5. | Cost of manure | 1200.00 (4.99) | 1000.00 (4.26) | 850.00 (3.75) | 1063.50 (4.50) |
| 6. | Cost of Fertilizers | 1500.00 (6.24) | 1500.00 (6.39) | 1500.00 (6.62) | 1500.00 (6.36) |
| 7. | Cost of Irrigation charges | 200.00 (0.83) | 200.00 (0.85) | 200.00 (0.88) | 200.00 (0.85) |
| 8. | Cost of Plant Protection charges | 800.00 (3.33) | 950.00 (4.05) | 1000.00 (4.42) | 890.50 (3.79) |

| | | | | | |
|---|---|---|---|---|---|
| 9. | Interest on Working Capital | 627.96 (2.61) | 729.00 (3.11) | 777.00 (3.43) | 691.64 (2.94) |
| | (B) Fixed Cost | | | | |
| 10. | Deprecation on Fixed Resources | 400.00 (1.66) | 550.00 (2.34) | 850.00 (3.75) | 538.00 (2.30) |
| 11. | Land Revenue Paid to Government | 60.00 (0.17) | 60.00 (0.17) | 60.00 (0.18) | 60.00 (0.17) |
| 12. | Interest on Fixed Capital | 760.80 (3.17) | 790.80 (3.37) | 826.80 (3.65) | 783.84 (3.33) |
| 13. | Rental Value of Own Land | 6000.00 (24.97) | 6000.00 (25.58) | 6000.00 (26.50) | 6000.00 (25.47) |
| | (C) Cost | | | | |
| 14. | Family Labour Charges | 4500.00 (18.73) | 3200.00 (13.64) | 1200.00 (5.30) | 3418.00 (14.40) |
| | Total Cost of Cultivation (A+B+C) | 24048.76 (100.00) | 23479.8 (100.00) | 22663.8 (100.00) | 23586.48 (100.00) |

**Note:** Figures in the parentheses indicate the percentages to the total cost of cultivation.

### 3.3 Cost Concepts

Reveals that cost concepts on different size of farms group per hectare. Cost A was higher in large size farms (Rs. 13927.00) followed by medium size farms (Rs. 12879.00/ha) and small size farms (Rs. 12327.96/ha) respectively. Cost B was higher in large size farms (Rs. 21463.80/ha) as compared to medium size farms (Rs. 20279.80/ha) and lowest in small size of farms (Rs. 19568.76/ha) respectively. Cost C was higher in small size farms (Rs. 24048.76/ha) and lowest in large size farms (Rs. 22663.80/ha). Sample average for Cost A, Cost B and Cost C was Rs. 12824.64/ha, Rs. 20168.48/ha and Rs. 23586.48/ha respectively in different size of farms group.

**Table 3:** Cost Concepts in Black gram crop per hectare in different Size of Farms Group (Value in Rupees)

| S. No. | Cost Concepts | Size of Farms Group | | | Sample Average |
|---|---|---|---|---|---|
| | | Small | Medium | Large | |
| 1. | Cost A | 12327.96 | 12879.00 | 13927.00 | 12824.64 |
| 3. | Cost B | 19548.76 | 20279.80 | 21463.80 | 20168.48 |
| 4. | Cost C | 24048.76 | 23479.8 | 22663.8 | 23586.48 |

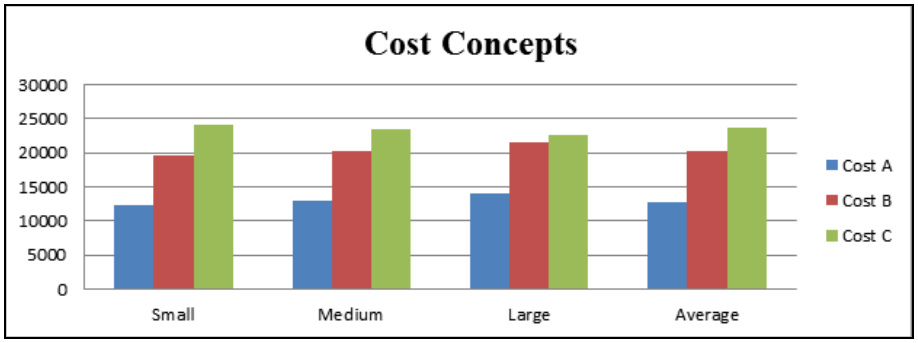


**Fig 2**

### 3.4 Income Measures

The net returns varied from Rs. 32527.24 per hectare at small farms, Rs. 40195.20 per hectare at medium farms to Rs. 43092.20 per hectare at large farms along with an average of Rs.37218.37 per hectare. Farm business income in small, medium and large size of farms group was Rs.44248.04/ha, Rs.50796.00/ha and Rs.51829.00/ha respectively. Sample average of Family labour income was Rs.40636.37/ha in different size of farms group. Sample average of Farm investment income was Rs.44002.21/ha. The input-output ratio was observed as 1:1.35 at small farms to1:1.90 at large farms.

**Table 4:** Measures of farm income

| S. No. | Income measures | Size of Farms Group | | | Sample Average |
|---|---|---|---|---|---|
| | | Small | Medium | Large | |
| 1 | Gross return (Rs./ha) | 56576.00 | 63675.00 | 65756.00 | 60804.85 |
| 2 | Net return (Rs./ha) | 32527.24 | 40195.20 | 43092.20 | 37218.37 |
| 3 | Net return (Rs./qtl) | 6759.28 | 6786.33 | 7336.03 | 6878.33 |
| 4 | Farm investment income | 39288.04 | 46986.00 | 49919.00 | 44002.21 |
| 5 | Farm business income | 44248.04 | 50796.00 | 51829.00 | 47980.21 |
| 6 | Family labour income | 37027.24 | 43395.20 | 44292.20 | 40636.37 |
| 7 | Benefit- cost ratio | 1:1.35 | 1:1.71 | 1:1.90 | 1:1.65 |

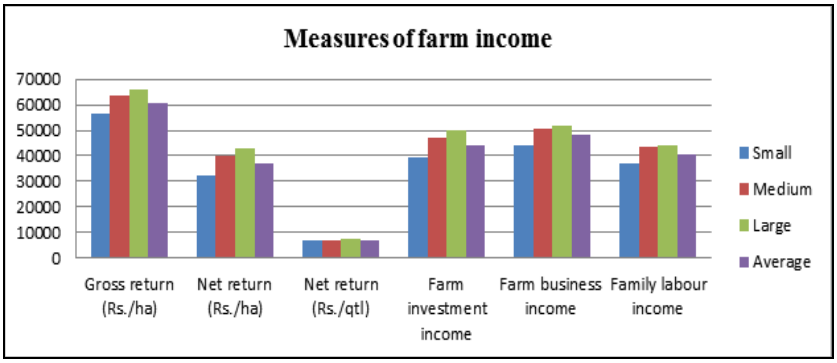


**Fig 3**

### 3.5 Marketing of black gram in different marketing channels

The table shows total Marketing Cost, marketing Margin, price spread, producer share in consumer rupee and Marketing efficiency in Different Channels. The table reveals that the total market cost was higher in channel III (Rs.496.00) compared to channel I and channel II. And the total marketing margin and price spread was also seen higher in channel III Rs.1360.00 because in the channel III there are three intermediates, where as in the channel I and channel II there is only one, and two intermediate. The producer share in consumer rupee was higher in channel I 89.15%. The marketing efficiency was higher in channel I, 62.11% respectively.

**Table 5:** Estimation of Total Marketing Cost and Marketing Margin in Different Channels (Value Rs/quintals)

| S. No. | Particulars | Channel I | Channel II | Channel III |
|---|---|---|---|---|
| 1 | Total marketing cost | 161.00 (1.46) | 346.00 (3.13) | 496.00 (3.81) |
| 2 | Total marketing margins | - | 850.00 (7.70) | 2510.00 (19.30) |
| 3 | Price spread | 161.00 (1.46) | 1035.00 (9.37) | 3000.00 (23.07) |
| 4 | Producer share in consumer rupee in % | 98.39 | 89.15 | 75.68 |
| 5 | Marketing efficiency in % | 62.11 | 10.65 | 4.33 |

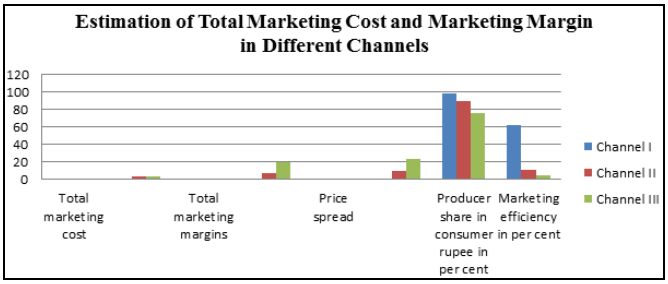


**Fig 4**

## 4. Conclusions

The study shows that the production and marketing of Black gram in Raigarh district. The main objective of the study is to analyze, socio economic characteristic of sample respondents, economics of Black gram production, price spread and constraints in production and marketing of Black gram. The results revealing that the socio economic status of the respondents found to be moderate with primary education, well economic back ground and greater access to all the assets. Economics of Black gram production is more profitable in large size farms as compared to medium size farms and small size farms.

The study indicated that there is scope to increase the producer's share in consumer's rupee by making the market more effective so that the number of intermediaries is to be restricted and marketing costs and marketing margins to be reduced. This will be the way for making Black gram cultivation more lucrative. Major constraints in production was found that high cost of labour and less awareness about new technologies among different farms size group followed by a huge price fluctuation was the major marketing constraint in Black gram.

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