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16. Analysis of Profitability of Urad (Black Gram) Farming in Dry Land of Solapur District

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Abstract

The present study was carried out in all the tehsils in Solapur district to study cost of cultivation, prices and profitability of Urad (Black Gram) production. The study was based on the primary data of 50 Urad (Black Gram) cultivators. The average per acre cost of cultivation of Urad (Black Gram) was estimated to Rs. 15721 and per quintal cost was estimated to Rs. 4609. Amongst the different items of cost, human labour cost and machine labour cost was the major components of variable cost. Rental value of owned land is the major component of cost in case of fixed costs. The average production of Urad (Black Gram) was 3.41 quintal per acre. The minimum support price for Urad (Black Gram) crop was Rs. 5700. The gross return obtained from Urad (Black Gram) crop was Rs. 19484 and Net Return was Rs. 3762 it means that Urad (Black Gram) growers earn the profit of Rs. 3762. The benefit-cost ratio of Kharif Urad (Black Gram) in sample area was 1.24. It means that farmers have invested 1 rupee in Urad (Black Gram) production and they earn 0.24 paise net profit (spread) per rupee.

Keywords: Cost, Prices, Profitability, Gross Return, Net Return, Cost Benefit Ratio, Area, Production, Productivity.

1. Introduction

Black Gram is commonly known as Urad. Black gram is one of the main pulse crop in India. Black gram has been cultivated in India since ancient times. India is the world's largest producer of black gram. India produces around 70% of the world's black gram. Black gram is originated in South Asia specifically in India. It is a drought tolerant crop which is cultivated in low rainfall. India, Pakistan, Myanmar, Thailand Bangladesh, Nepal, Kenya, Uganda, Tanzania, Argentina, Brazil are the major Urad (Black Gram) cultivating countries. The important black gram growing States in India is Madhya Pradesh, Uttar Pradesh, Andhra Pradesh, Rajasthan, Tamil Nadu and Maharashtra. Black gram is a high protein food used in many Indian dishes. It contains about 26% protein. It supplies protein requirement of vegetarian population of the country. It is consumed in the form of split pulse as well as whole pulse, which is an essential

supplement of cereal based diet. It is also a good source of calcium, phosphorus and iron. It is the most important Pulse crop in India. Black gram is also used as green manure crop. Black gram can be used as feed for cattle.

Black gram crop is Kharif crop grown in the months of June to July and harvested between February, March and April. Duration of black gram crop was 100 days. Total Estimated area under Urad (black gram) crop was 4838.18 thousand hectars, estimated production was 2727.84 thousand tonnes and productivity was 564 kg per hectar in India. In Maharashtra total area under Urad (black gram) crop was 370.09 thousand hectares, production was 172.95 thousand tonnes and productivity was 467 kg per hectar. In Solapur district total area under Urad (Black Gram) crop was 657.95 hundred hectars, production was 427.67 hundred tonnes and productivity was 650 kg. per hectar. Solapur district is also one of the Urad (Black Gram) producing districts in Maharashtra. In all the tehsils of Solapur district Urad (Black Gram) was cultivated. The present investigation was attempted to study cost of cultivation of Urad (Black Gram) production, prices for black gram production, profitability of black gram production and cost benefit ratio of black gram production in the study area.

2. Objectives of the Study

The main objective of study is to study the profitability of Urad (Black Gram) farming in dry land of Solapur district and specific objectives of the present study are as follows-

1. To analyse the cost of Urad (Black Gram) Production in the area under study.
2. To study the prices for Urad (Black Gram) Production in area under study.
3. To study the profitability of Urad (Black Gram) Production in the area under study.
4. To estimate the benefit cost ratio of Urad (Black Gram) production in study area.

3. Hypothesis

1. Urad (Black Gram) crop is not profitable.

4. Research Methodology

For the study undertaken researcher has used the multistage sampling. For the selection of sample farmers researcher has used the purposive sampling method. For selection of farmers researcher has selected non-irrigated land farmers purposefully and quota sampling method is used to select the Urad (Black Gram) crop farmer. Therefore, the researcher has used the purposive quota sampling method because there is no exact data of non-irrigated Urad (Black Gram) farmers in Solapur district. The study was conducted in Solapur district as whole. From Solapur district all 11 tehsils i.e. Pandharpur, Mangalwedha, Malshiras, Madha, Karmala, Akkalkot, Barshi, Mohol, Sangola, Solapur North & Solapur South having maximum area under

Urad (Black Gram) cultivation were selected. The study was based on primary data. Thus for present study 50 Kharif Urad (Black Gram) growers were selected as per the quota sampling method. These 50 respondents were selected from each tehsil. Data collection was made by preparing separate questionnaire/ interview schedule for Urad (Black Gram) producer.

5. Result and Discussion

5.1 Estimated Cost of Cultivation and Total Cost of Urad (Black Gram) in Solapur District

**Table 4.17 Estimated Cost of Cultivation and
Total Cost of Urad (Black Gram) in Solapur District**

(₹ Per Acre)

Sr. No	Elements of cost	ATC	%	Min.	Max.	SD
1	Human Labour- Hired	2003	12.74	0	7500	1776
2	Human Labour- Family	3904	24.83	1200	18000	3262
3	Bullock Labour - Hired	203	1.29	0	8000	1348
4	Bullock Labour - Owned	0	0.00	0	0	0
5	Machine Labour - Hired	2515	16.00	350	15600	2365
6	Machine Labour - Owned	0	0.00	0	0	0
7	Seeds	857	5.45	333	10000	1348
8	Fertilizer	731	4.65	0	4800	951
9	Manure	276	1.76	0	5000	1179
10	Insecticides	429	2.73	0	2400	617
11	Irrigation (Water + Electricity Charges)	234	1.49	0	900	172
12	Crop Insurance	102	0.65	0	767	203
13	Interest on Working Capital	320	2.03	166	845	179
14	Miscellaneous	1	0.01	0	60	11
I)	Operational Cost (1 to 14)	11576	73.63	5831	42716	8040
15	Rental Value of Owned Land	3023	19.23	1500	8500	1059
16	Rent Paid on Leased land	0	0.00	0	0	0
17	Land Revenue, Cesses & Taxes	39	0.25	0	300	55
18	Depreciation of Farm Builds & Implements	122	0.78	40	400	50
19	Interest on Fixed Capital	564	3.59	210	1400	210
II)	Fixed Cost (15 to 19)	3748	23.84	1805	9540	1171
III)	Total Cost of Cultivation (I + II)	15323	97.47	9099	50156	8753
20	Packaging cost	123	0.78	20	1200	171
21	Transportation Cost	195	1.24	27	600	130
22	Sales Expenses in Market Committee	80	0.51	15	567	103
IV)	Selling and Distribution Cost (20 to 22)	398	2.53	105	1500	290
	Total Cost / Cost of Sales (III + IV)	15721	100.00	9253	50636	8861

Source: Field Survey

Variable Cost/ Operational Cost of Urad (Black Gram): In Urad production human labour cost is the major variable cost. Hired Human labour cost incurred was ₹ 2003 (12.74%) per acre, and family labour cost incurred was ₹ 3904 (24.83%) per acre. Family labour cost is more as compared to hired human labour cost. Hired Bullock labour cost incurred was ₹ 203 (1.29%) per acre and there is no owned bullock labour cost because the farmers have not owned the bullock labour. Hired machine labour cost incurred was ₹ 2515 (16.00%) per acre and there is no owned machine labour cost because the farmers have not owned the machine labour. Seeds cost incurred was ₹ 857 (5.45%) per acre for Urad production. Fertilizer cost incurred was ₹ 731 (4.65%) per acre. In case of Urad production manure cost incurred was ₹ 276 (1.76%) per acre. Insecticides cost incurred was ₹ 429 (2.73%) per acre. Irrigation cost incurred was ₹ 234 (1.49%) per acre which includes water and electricity charges. In Urad production crop insurance cost incurred was ₹ 102 (0.65%) per acre. Interest on Working capital cost incurred was ₹ 320 (2.03%) per acre and miscellaneous cost incurred was ₹ 1 (0.01%) per acre in the sample study area. The average total operational or variable cost incurred was ₹ 11576 (73.63%), minimum cost incurred was ₹ 5831, maximum cost incurred was ₹ 42716 per acre and standard deviation was 8040 in the selected sample study area. So from the variable cost analysis it was observed that human labour cost and machine labour cost is the major components of operational or variable cost.

Fixed Cost of Urad (Black Gram): In the case of Urad production rental value of owned land is the major component of fixed cost. Rental value of owned land cost incurred was ₹ 3023 (19.23%) per acre in sample study area. There is no cost of rent paid on leased land because in sample area no any farmer was taken land on lease. Land revenue, cesses and taxes cost incurred was ₹ 39 (0.25%) per acre. Depreciation of farm builds and implements cost incurred was ₹ 122 (0.78%) per acre. Interest on fixed capital cost incurred was ₹ 564 (3.59%) per acre. The average total fixed cost of Urad cultivation incurred was ₹ 3748 (23.84%), minimum cost was ₹ 1805, maximum cost was ₹ 9540 per acre and standard deviation was 1171. So, from the analysis of fixed cost it was observed that rental value of owned land (19.23%) was the major component of cost in case of fixed costs. It was also observed that there was no cost of rent paid on leased in land because all the selected farmers have their own land. Land revenue, cesses and taxes (0.25%) cost was very less in fixed costs.

Total Cost of Cultivation of Urad (Black Gram): The average total cost of cultivation of Urad was ₹ 15323 (97.47%), minimum cost was ₹ 9099, maximum cost was ₹ 50156 per acre

and standard deviation was 8753. Out of total cost of cultivation operational cost was ₹ 11576 (73.63%) and fixed cost was ₹ 3748 (23.84%).

Selling and Distribution Cost of Urad (Black Gram): This table shows the marketing cost of per acre Urad production. The packaging cost was incurred ₹ 123 (0.78%) per acre in drought area of Solapur district. Majority of the Urad farmers sale their production at local markets (block and district market) the transportation cost from farm to local market was ₹ 195 (1.24%) per acre. The average sales expenses in market committee (portage, weigh & other cost) incurred was ₹80 (0.51%) per acre. Average total selling and distribution cost of Urad was ₹ 398 (2.53%), minimum cost was ₹ 105, maximum cost was ₹ 1500 per acre and standard deviation was 290 in the study area of Solapur district.

Total Cost /Cost of sales of Urad (Black Gram): In Urad farming, average total cost or cost of sales incurred was (total cost of cultivation + total marketing cost) ₹ 15721, minimum cost incurred was ₹ 9253, maximum cost incurred was ₹ 50636 per acre and standard deviation was 8861 in the study area. The share of variable cost in total cost or cost sales was ₹ 11576 (73.63%), fixed cost was ₹ 3748 (23.84%) and selling and distribution cost was ₹ 398 (2.53%). From this table it was observed that per acre cost of Urad production was ₹ 15721.

5.2. Estimated Cost of Production of Urad (Black Gram) in Solapur District

Table 4.37 Estimated Cost of Production of Urad (Black Gram) in Solapur District

(₹ Per Quintal)

Sr. No	Elements of cost	ATC	%	Min.	Max.	SD
1	Human Labour- Hired	587	12.74	0	6500	1202
2	Human Labour- Family	1144	24.83	286	10500	1794
3	Bullock Labour - Hired	59	1.29	0	1600	347
4	Bullock Labour - Owned	0	0.00	0	0	0
5	Machine Labour - Hired	737	16.00	83	5200	1019
6	Machine Labour - Owned	0	0.00	0	0	0
7	Seeds	251	5.45	60	1600	333
8	Fertilizer	214	4.65	0	2600	414
9	Manure	81	1.76	0	1333	331
10	Insecticides	126	2.73	0	1000	227
11	Irrigation (Water + Electricity Charges)	69	1.49	0	500	95
12	Crop Insurance	30	0.65	0	900	136
13	Interest on Working Capital	94	2.03	32	765	113
14	Miscellaneous	0	0.01	0	20	4
D)	Operational Cost (1 to 14)	3394	73.63	1358	28015	4574
15	Rental Value of Owned Land	886	19.23	253	5800	1005

16	Rent Paid on Leased land	0	0.00	0	0	0
17	Land Revenue, Cesses & Taxes	11	0.25	0	75	18
18	Depreciation of Farm Builds & Implements	36	0.78	8	180	37
19	Interest on Fixed Capital	165	3.59	40	860	169
II)	Fixed Cost (15 to 19)	1099	23.84	301	6887	1197
III)	Total Cost of Cultivation (I + II)	4492	97.47	1660	34902	5624
20	Packaging cost	36	0.78	19	207	27
21	Transportation Cost	57	1.24	20	300	40
22	Sales Expenses in Market Committee	23	0.51	6	106	27
IV)	Selling and Distribution Cost (20 to 22)	117	2.53	50	420	62
	Total Cost / Cost of Sales (III + IV)	4609	100.00	1710	35082	5653

Source: Field Survey

Variable Cost/ Operational Cost of Urad (Black Gram): In Urad production human labour cost is the major variable cost. Hired Human labour cost incurred was ₹ 587 (12.74%) per quintal, and family labour cost incurred was ₹ 1144 (24.83%) per quintal. Family labour cost is more as compared to hired human labour cost. Hired Bullock labour cost incurred was ₹ 59 (1.29%) per quintal and there is no owned bullock labour cost. Hired machine labour cost incurred was ₹ 737 (16.00%) per quintal and there is no owned machine labour cost incurred due to farmers have not owned machines. Seeds cost incurred was ₹ 251 (5.45%) per quintal for Urad production. Fertilizer cost incurred was ₹ 214 (4.65%) per quintal. In case of Urad production manure cost incurred was ₹ 81 (1.76%) per quintal. Insecticide's cost incurred was ₹ 126 (2.73%) per quintal. Irrigation cost incurred was ₹ 69 (1.49%) per quintal which includes water and electricity charges. In Urad production crop insurance cost incurred was ₹ 30 (0.65%) per quintal. Interest on Working capital cost incurred was ₹ 94 (2.03%) per quintal and miscellaneous cost incurred was ₹ 0 (0.0%) per quintal in the sample study area. The average total operational or variable cost incurred was ₹ 3394 (73.63%), minimum cost was ₹ 1358, maximum cost was ₹ 28015 per quintal and standard deviation was 4574 in the selected sample study area. So, from the variable cost analysis it was observed that human labour cost (37.57%) and machine labour cost (16%) was the major components of operational or variable cost. Cost of miscellaneous (0.01%) and crop insurance (0.30%) was very less in case of Urad production.

Fixed Cost of Urad (Black Gram): In the case of Urad production rental value of owned land was the major component of fixed cost. Rental value of owned land cost incurred was ₹886 (19.23%) per quintal in sample study area. There was no cost of rent paid on leased land because in sample area no any farmer was taken land on lease. Land revenue, cesses and taxes cost incurred was ₹11 (0.25%) per quintal. Depreciation of farm builds and implements

cost incurred was ₹36 (0.78%) per quintal. Interest on fixed capital cost incurred was ₹ 165 (3.59%) per quintal. The average total fixed cost of Urad cultivation incurred was ₹ 1099 (23.84%), minimum cost was ₹ 301, maximum cost was ₹ 6887 per quintal and standard deviation was 1197. So, from the analysis of fixed cost, it was observed that rental value of owned land (19.23%) was the major component of cost in case of fixed costs. It was also observed that there was no cost of rent paid on leased in land because all the selected farmers have their own land. Land revenue, cesses and taxes cost (0.25%) was very less in fixed costs.

Total Cost of Cultivation of Urad (Black Gram): The average total cost of cultivation of Urad per quintal was ₹ 4492 which was 97.47% of total cost or cost of sales. Minimum total cost of cultivation was ₹ 1660, maximum cost was 34902 and standard deviation was 5624. Out of total cost of cultivation operational cost was ₹ 3394 (73.63%) and fixed cost was ₹ 1099 (23.84%).

Selling and Distribution Cost of Urad (Black Gram): This table shows the selling and distribution cost of per quintal Urad production. The packaging cost incurred was ₹ 36 (0.78%) per quintal. Majority of the Urad farmers sale their production at local markets (block and district market) the transportation cost from farm to local market was ₹ 57 (1.24%) per quintal. The average sales expenses in market committee (portage, weigh & other cost) incurred was ₹ 23 (0.51%) per quintal. The average total selling and distribution cost of Urad was ₹ 117 (2.53%), minimum cost was ₹ 50, maximum cost was ₹ 420 per quintal and standard deviation was 62 in the study area of Solapur district.

Total Cost /Cost of sales of Urad (Black Gram): In Urad farming, the average total cost or cost of sales was (total cost of cultivation + total selling and distribution cost) ₹ 4609 per quintal, minimum cost was ₹ 1710 per quintal, maximum cost was ₹ 35082 per quintal and standard deviation was 5653 in the study area. The share of variable cost in total cost or cost sales was 3394 (73.63%), fixed cost was ₹ 1099 (23.84%) and marketing cost was ₹ 117 (2.53 %). From this table it was observed that per quintal cost of Urad production was ₹ 4609.

5.3. Gross Returns, Net Return and Benefit-Cost Ratio of Urad (Black Gram)

Table 4.59 Gross Returns, Net Return and Benefit-Cost Ratio of Urad (₹ Per Acre)

Sr. No	Factor	Details	Returns
1	Gross Return	A) Own Consumption (in quintal)	0.02
		Price (in Rs.)	6500
		Gross Return (output* price)	130
		B) Production Sold (in quintal)	3.39
		Price (in Rs.)	5709

		Gross Return (output* price)	19354
		C) Total Production A+B (in quintal)	3.41
		Gross Return (output* price) A+B	19484
2	Net Return	Total Cost of Production	15721
		Gross Return	19484
		Net Returns (gross return- total cost)	3762
3	Benefit-Cost Ratio	Gross Return / Total Cost	1.24

Source: Field Survey

In case of Urad farming, productivity of non- irrigated Urad is 3.41 quintal per acre and farmers get averagely ₹5709 price per quintal at local market. Out of total production own consumption of Urad is 0.02 quintal per acre and production sold is 3.39 quintal per acre. Gross return of Urad is ₹ 19484 per acre out of which ₹ 19354 (99.33%) is from sell of Urad production and ₹ 130 (0.67%) is from own consumption of Urad by farmers. During the filed survey it was observed that farmer keep some Urad production for own consumption but in very less quantity. Net return of Urad production is ₹ 3762. It means that Urad growers have a spread (profit) of ₹ 3763 per acre. The benefit-cost ratio of non-irrigated Urad in sample area is 1.24. It means that farmers have invested rupee 1 in Urad production and they gain 0.24 paise net profit per rupee.

6. Hypothesis Testing

Researcher has formulated the hypotheses on the profitability of Urad (Black Gram) in area under study. This hypothesis is-

Urad (Black Gram) Crop is not profitable

To study the hypothesis Urad (Black Gram) Crop is not profitable, Researcher has used the one sample t-test to test the hypothesis and taken test value = 0.

Table 4 Profitability of Urad (Black Gram) Crop

Variable	Test value = 0						
	N	Mean	SD	SE Mean	95% Lower Bound	T	P
Urad (Black Gram)	50	11256	41909	5927	1319	1.9	0.032

The above testing of hypothesis reveals that p value of Urad (Black Gram) crops is less than the level of significance i.e. 0.05 hence it is concluded that the null hypothesis i.e. Urad (Black Gram) Crop is not profitable is rejected and the study accept the alternative hypothesis i.e. Urad (Black Gram) Crop is profitable. It concludes that Urad (Black Gram) is profitable in the area under study.

7. Conclusion

In Urad (Black Gram) cultivation, per acre average total cost or cost of sales was ₹ 15721. The share of variable cost in total cost or cost sales was ₹ 11576 (73.63%), fixed cost was ₹ 3748 (23.84%) and selling and distribution cost was ₹ 398 (2.53 %). In Urad (Black Gram) farming, per quintal average total cost or cost of sales was ₹ 4609. The share of variable cost in total cost or cost sales was 3394 (73.63%), fixed cost was ₹ 1099 (23.84%) and selling and distribution cost was ₹ 117 (2.53 %). Productivity of Kharif Urad (Black Gram) is 3.41 quintal per acre and farmers get averagely ₹ 5709 price per quintal at local market. Gross return of Urad (Black Gram) is ₹ 19484 per acre out of which ₹ 19354 (99.33%) is from sell of Urad (Black Gram) production and ₹ 130 (0.67%) is from own consumption of Urad (Black Gram) by farmers. Net return of Urad (Black Gram) production is ₹ 3762. It means that Urad (Black Gram) growers have profit (Spread) of Rs. 3762. The benefit-cost ratio of non-irrigated Urad (Black Gram) in sample area is 1.24. It means that farmers have invested rupee 1 in Urad (Black Gram) production and they earn 0.24 paise net profit per rupee. The minimum support price for Urad (Black Gram) crop was Rs. 5700. It was not sufficient to cover the cost of production. So it was suggested to government to increase the MSP of Urad (Black Gram) crop and it was also suggested to take all the costs into consideration while declaring MSP. It was suggested to farmers to increase the productivity of Urad (Black Gram) crops in area under study by using the high yield variety programme means varieties of improved seeds, enhanced application of the fertilizers and extended use of pesticides etc. because productivity of Urad (Black Gram) crop was low in the area under study.

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