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Assessment of cost and returns of onion growing farmers in Deogarh district, Orissa, India

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Abstract
Horticulture being the paramount importance to the Indian economy and also provide way for diversification and also generate employment to a vast workforce in Indian agriculture. Further the horticulture provides ample opportunity for the advancement of production techniques. Onion being an important horticulture crop with maximum production comes from the Maharashtra, Gujarat, and Uttar Pradesh but Orissa also cultivate onion on 333189 hectares during both season with net production of about 3.95 lakh MT in 2016 as per agricutlture statistics 2016-17, Orissa also latest NSSO survey estimated that annual requirement of onion in state is 2.32 lakh MT. It shows the production is more than the requirement so a large surplus goes in waste (Gulati, 1994). Keeping the economic view of onion production in Orissa, Reamal block of Deogarh district which contributed about 90 per cent production of onion crop to the district. Due to high cost of inputs and ignorance about improved practices general farmers cannot use the advanced technology judiciously. So, the present study took the issue of cost and return on different onion grower's farms. The primary data were classified and tabulated in the light of stated objectives of the study and analyzed as per the suitable statistics and economic tools as follows: The estimates of profitability were based on different costs and returns incurred in onion cultivation like cost A, B and C concepts. Cost studies shows that average cost of cultivation is Rs. 40423 per hectare and the bullock labour employed in onion cultivation is a major source of expenditure in total cost of cultivation. While gross income able to cover the cost which made Benefit Cost Ratio 1.94 which means the onion cultivation is beneficial for the farmer in Deogarh district of Orissa.

Keywords: Cost of cultivation of onion, B-C ratio, Onion production in Orissa

1. Introduction
Horticulture has been recognized as a vibrant sector in Indian economy which provides avenues for diversification, enhanced returns per unit area, better land and water used with opportunities for employment generation. The wide range of horticultural crops provide ample opportunities to farmers to adopted multi-layer cropping for minimizing risk of crop failure, maximizing their farm income.

Onion is one of the important horticultural crop which play an important role in enhance the farmers 'income and ultimately agricultural development in Indian economy. Most of the onion produced in India comes from the states of Maharashtra, Gujarat and Uttar Pradesh. Though, onion is also grown in Odisha. Onion is currently being cultivated on 333,189 hectares during both seasons with net production of about 3.95lakh MT in 2016 as per the report of Department of Agriculture and farmers welfare, Odisha (Agricultural statistics 2016-17, Odisha). Latest NSSO survey estimated that annual requirement onion in the state is 2.32 lakh MT. Though the state produces more onion than its annual requirement, a large amount goes waste or farmers are forced to resort to distress sale due to lack of storage facilities (Gulati, 1994). Keeping the economic view of onion production in Odisha the farmers should aware it profitability and the pattern of resources use in its cultivation is paramount important, particularly in Reamal block of Deogarh district where onion cultivation is become very popular nowadays due to higher demand in to near by cities i.e. Sambalpur and Rourkela.

Returns from the cultivation of onion farming depends on the adoption of balanced and efficient use of modern inputs for profitable production. Due to capital intensive technology adopted for onion cultivation the farmers need to borrow money from different sources of finance. Hence, the use of modern technology needs a careful management of resources before allocating the area under onion cultivation. Farmers should be well aware with different types of costs incurred and returned obtained from particular crop, for minimizing the risk factor and easily adoption of modern technology of particular crop. If farmers will have such valuable information, then they can allocate a manageable area under particular crop and can also achieve a desirable benefit.

However, wide gap prevails between the performance of technology at the field of progressive farmers'and general farmers even though after adopting the advanced technology. Due to high cost of inputs and ignorance about improved practices general farmers cannot use the advanced technology judiciously. In the wake of this condition question arises that "are investment on modern technology was proportionately enhanced the output and net return needs investigation and verification in respective of onion growing area. This is the main reason to study the cost of production.

Taking these points under concern the study carried out to assess the cost and return of onion growing farmers in Deogarh district of Orissa.

2. Materials and Methods

2.1 Collection of data

The study concentrates on Deogarh district in Orissa which has large area under onion cultivation. Deogarh comprises three blocks viz., Barkote, Reamal and Tileibani. Out of which Reamal block was selected on the basis of coverage of maximum area under onion crop. The onion production of Reamal block was contributed about 90 per cent production of onion crop to the district.

After selection of block, a list of major onion growing villages was prepared and out of them 10 villages were selected on the basis of maximum area under onion crop. The names of villages are Maleipada, Talabahali, Nakhabahal, Timur, Babrakote, Medinpur, Naulipada, Sunaripada, Tinkbir, and Adasha. After selection of the villages, a list of onion growing farmers was prepared and finally 50 onion growers were selected randomly for the study purpose.

2.2 Analytical procedure

The primary data were classified and tabulated in the light of stated objectives of the study and analyzed as per the suitable statistics and economic tools as follows:

The estimates of profitability were based on different costs and returns incurred in onion cultivation.

2.2.1 Cost concepts

The cost of cultivation classified as recommended by, "Special expert committee on cost estimates, GOI, New Delhi", was used in this study. The cost concepts are givenbelow:

Cost A_1: It includes:

1. Value of hired humanlabour,
2. Value of hired and owned bullocklabour,
3. Value of hired and owned machinerylabour,
4. Value of owned and purchasedseed,
5. Value of fertilizers, manures andchemical,
6. Value of insecticide andpesticides,
7. Expenditure onirrigation,
8. Land revenue and taxes,
9. Interest paid on crop loan iftaken,
10. Depreciation on farm assets excludingland,
11. Interest on workingcapital,
12. Miscellaneousexpenses.

Cost A_2: It includes:
Cost A_1 + rent paid for leased in land

Cost B_1: It includes:
Cost A_2 + interest on value of owned fixed capital assets. (Excluding land)

Cost B_2: It includes:
Cost B_1 + rental value of owned land

Cost C_1: It includes:
Cost B_1+ imputed value of family labour

Cost C_2: It includes-
Cost B_2 +imputed value of family labour

2.2.2 Evaluation of farm inputs

Methods followed in evaluating different farm input for the present study are described in the following paragraphs.

i. Hired human labour

The farmers normally engage permanent farm labour on the basis yearly wages and casual labour on daily wages basis, for performing farm operations. The casual labour was evaluated on the basis of actual wages prevailed in the locality. The wages of male and female labour included payment given both in cash or kind. The value of kind components given to the labour was calculated at their prevailing market prices.

ii. Family labour

The family labour cost was evaluated at the rate of prevailing wages the locality for casual hired labour at various stages of operations.

iii. Bullock and machinery labour

Estimation of bullock and machine labour charges on actual wage prevailed in the locality were considered.For estimation of depreciation, interest on working capital, interest on fixed capital and rental value of owned land, following standard norms were used.

iv. Depreciation on farm assets

The straight-line method was used for calculating rate of depreciation. The depreciation rates for different farm assets were taken as 10% for crop period.

v. Interest on working capital

It is worked out @ 7.0 per cent for half of the duration of the crop.

vi. Interest on fixed capital

Interest is charged @ 10 per cent per annum on the value of implements, machineries, farm building, and irrigation structure and drought animals. It excludes interest on land input, because rental value of owned land is calculated separately

vii. Rental value of owned land

It is prevalent rate in the area for the same

2.2.3 Value of farmproduce

This includes the value of main product and the by product of the crop if any. The harvest price of the crop was considered for calculating the value of main produce. The value of by-product was calculated at the prevailing price in the locality.

2.2.4 Profitability concepts

For the estimation of profitability from onion, the following efficiency measures are used in thisstudy:

a. Grossincome,
b. Net farmincome,
c. Input- outputratio,

These are defined as under: -

(i) Gross income: It is defined as total value of main product +by-product.

(ii) Net farm income: It is defined as: gross income– cost„C_2"

(iii) Output – Input ratio

$$\text{Output - Input ratio} = \frac{\text{Gross income}}{\text{Cost of cultivation}}$$

3. Results and Discussion

3.1 Investment on fixed farmassets

The values of the fixed farm assets in the farming generally determine the absolute farm profitability, which is invested during the past years. The data on present average value of investment on fixed assets per farm are presented in Table 1. The data presented in Table 1 revealed that the value of the land was by and large the costliest asset among all the farm assets. On an average, total value of farm assets excluding the value of land on the sample onion growing farms was found to be Rs. 79,000 per farm.

The data in table 1 shows that the maximum investment after land was on implements (Rs. 42,000) followed by bullock (Rs. 19,000) and farm house-cum-store (Rs. 18,000) on the sample onion growing farms of the area.

Table 1: Value of the total fixed farm assets on sample farms.

S. No.	Assets	Value (Rs.)
1	Land	2,30,0000
2	Farm house cum store	18,000
3	Bullock	19,000
4	Implements	42,000
5	Total value excluding land	79,000

3.2 Inputs use pattern in Onion cultivation

The detailed information regarding input utilization of Onion cultivation per hectare and per farm is presented in Table 2.In case of "human labour utilization" pattern, it was observed that the farmers utilized maximum days on an average 73 days per hectare for onion cultivation.

The bullock labour and machine labour utilization pattern also shows that farmers used higher of bullock labour days (13 days per hectare), while the machine labour days was 4.3 hours per hectare.

3.2.1 Yield Level

The average yield of Onion in the study area was found to be 146.36 quintal per hectare.

3.3 Cost and return of Onion cultivation

A study on economics of Onion cultivation, as important commercial crop is pertinent to find out their profitability in order to choose best alternative resources, cultivation practices and scale of production etc.

3.3.1 Cost of cultivation

As per the table 3 the average operational cost (i.e. cost A1) of Onion found to be Rs. 18949 per hectare and average cost of cultivation of the Onion is Rs. 40,423 per hectare.

Table 2: Input utilization and level of yield in different varieties of Onion cultivation

S. No.	Input utilization	Per hectare
1	Onion area (hectare)	1.00
2	Hired human labour (Days)	14
3	Family human labour (Days)	58.66
4	Total labour (Days)	73
5	Bullock pair (Days)	13
6	Machine (hours)	4.3
7	Seed(Rs)	2393.60
8	Fertilizer+Manure(Rs.)	1675
9	Irrigation (Rs.)	2687.3
10	Plant protection (Rs.)	2193.3
11	Yield(Q/Ha)	146.36

Table 3: Cost of cultivation of Onion

S. No.	Input utilization	Physical unit	Value (Rs./ha)
1	Hired human labour	14 Days	2800(6.93)
2	Bullock labour	13 Days	3900(9.65)
3	Machine labour	4.3 hours	2166.7(5.36)
4	Seed	(Rs.)	2393.7(5.92)
5	Fertilizer + Manure	(Rs.)	1675(4.14)
6	Irrigation	(Rs.)	2687.3(6.65)
7	Plant protection	(Rs.)	2193.3(5.42)
8	Interest on working capital	(Rs.)	371.33(0.92)
9	Depreciation	(Rs.)	656.67(1.62)
10	Land revenue	(Rs.)	105.33(0.26)
	Cost-A1		18949(46.87)
11	Interest on fixed capital	(Rs.)	65.67(0.16)
	Cost-B1		19015(47.04)
12	Rental value of land	(Rs.)	6000(14.84)
	Cost-B2		25015(61.88)
13	Imputed value of family labour	(Rs.)	11733(29.02)
	Cost-C1		30748(76.06)
	Cost-C2		36748(90.91)
	Cost-C3		40423(100)

Figures in parenthesis indicate percentage to total cost i.e. C3.

3.3.2 Return /profitability

Gross income, net income and B-C ratio are the basic tools employed for estimating the economics or profitability of production of the Onion crop. For this purpose, the profitability of Onion cultivation per hectare is presented in Table 4.

Table 4: Profitability of Onion

Sl.no.	Parameters	Value (Rs/ha)
1	Total cost of cultivation	40423
2	Gross income	78337.66
3	Net income	37914.33
4	B.C. Ratio	1.94

4. Conclusion

Cost studies shows that the bullock labour employed in onion cultivation is a major source of expenditure in total cost of cultivation. While gross income able to cover the cost which made Benefit Cost Ratio 1.94 which means the onion cultivation is beneficial for the farmer in Deogarh district of Orissa.

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