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Cost of cultivation and farm business basis of banana production in Allahabad district, Uttar Pradesh

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ABSTRACT

The present investigations were carried out to study the cost of cultivation and returns on different cost concepts bases of banana in Allahabad and Kaushambi districts, Uttar Pradesh which were selected on the basis of highest area and production of banana. A sample of 80 banana growing farmers from different land size categories was selected by probability proportion to number of farmers in each size group. On an average Rs 38857.28 were spent on banana per hectare. The cost of cultivation of small farm size group was highest (Rs 43222.87) followed by medium (Rs 40541.63) and large farms (Rs 33584.52). The cost of cultivation of different components like human labour accounted for the largest portion (28.43%) followed by irrigation (19.65%). The other major components were plant protection (13.67%), intercultural operations (9.52%), suckers (9.46%), rental value of land (7.72%), fertilizers (3.89%) and interest on working capital (2.61%). The cultivation of banana needs more labour use for harvesting, cutting, irrigation and sowing of suckers. The cost-benefit ratio of large farm size group was highest 1:1.81 followed by medium and small farm size groups. It was observed that the cost decreased as the size of landholding increased and vice versa.

Keywords: Cost; cultivation; farm business; return; banana

INTRODUCTION

The biggest producer of banana is India with production of 16.8 MT. Other countries producing banana over 5 MT per annum are Brazil, China, Ecuador, and Philippines. Average yield of banana worldwide is around 16 tons/ha but under more intensive production regimes the best growers can achieve 100 tons/ha (http://www.yara.in/crop-nutrition/crops/banana/key-facts/world-production/). India is the second largest producer of banana in the world next only to China. Edible varieties of banana evolved from the two species viz *Musa acuminata* and *M balbisiana* belong. At present banana is being cultivated throughout the warm tropical regions of the world (http://nhb.gov.in).

As per Kumar (2011) banana is the second most popular fruit crop in India next to mango. Now a days there is its year round availability, affordability, varietal range, taste, nutritive and medicinal value that makes banana the favourite fruit among all classes of the community. It is the oldest and commonest fruit known to the mankind. It is nutritious palatable and easily digestible. Banana is rich in carbohydrates, minerals such as calcium, potassium, Mg, Na and P. Other than fresh fruits it can be consumed as processed in various forms like chips, powder, flakes etc. Banana pseudostem is chopped and used as cattle feed. Also the leaves are used as plates. Major banana growing districts in Uttar Pradesh are Kaushambi, Allahabad, Fatehpur, Varanasi, Faizabad Jaunpur and Kanpur.

METHODOLOGY

The primary source of data collection was door to door bench-mark survey. The data for cultivation and production of banana were obtained through the

pre-tested questionnaire from the banana cultivators in Sorao Tehsil of Allahabad district. The secondary sources of data for area, production and productivity (2012 to 2016) were District Statistical Office, Allahabad; different website and various reports.

On the basis of highest area under banana the Allahabad district was purposely selected for the study because Allahabad is a leading district next to Kaushambi for banana growing in Uttar Pradesh. Of the twenty Tehsils, two Tehsils viz Soraon and Phulpur were selected purposively for the study as these Tehsils had maximum area under banana in Allahabad district. Five villages each viz Soraon, Sewaith, Tharwai, Yusuf Pur and Siswah from Soraon Tehsil and five villages viz Rampur, Tejpur, Umari, Sigra Mau and Shivpur from Phulpur Tehsil were selected purposively. A list of banana cultivators was prepared for each village for selection of the cultivators. On the basis of their area under banana cultivation cultivators were grouped into three categories viz small farmers (0.00 to 0.50 ha), medium farmers (0.6 to 0.75 ha) and large farmers (0.76 ha and above).

Evaluation cost of cultivation

The Commission for Agricultural Costs and Prices (CACP) calculates the cost of cultivation on the basis of costs generated as per following certain cost concepts:

Cost A_1: Value of hired human labour, value of owned tractor charges, value of hired tractor charges, value of hired bullock labour, value of owned bullock labour, value of owned machinery charges, value of seed (both farm produced and purchased), value of insecticides and pesticides, value of manure (owned and purchased), value of fertilizers, depreciation on implements and farm buildings, irrigation charges, land revenue, accesses and other taxes, interest on working capital, insurance charges and miscellaneous expenses (artisans etc).

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

Cost B_1: Cost A_1 + interest on value of owned fixed capital assets (excluding land)

Cost B_2: Cost B_1 + rental value of owned land (net of land revenue) and rent paid on leased in land

Cost C_1: Cost B_2 + imputed value of family labour

Cost C_2: Cost C_1 adjusted to take into account valuation of human labour at market rate or statutory minimum wages rate whichever was higher

Cost C_3: Cost C_2 + value of management input at 10 per cent of total cost (C_2)

Cost of production: The cost of production was worked out by applying the following formula:

$$\text{Cost of production/q} = \frac{\text{Cost of cultivation/ha}}{\text{Quantity of main product/ha}}$$

Measures of farm business income: The farm business income was calculated as per below:

$$GI = Q_{m+} Q_n \times P_m$$

where GI= Gross income, Q_m= Main product, Q_n= Byproduct, P_m= Price

Returns over variable cost (RVC)= GI – Cost A_1

Farm business income (FBI)= GI – Cost A_2

Family labour income or family labour returns (FLI)= GI – Cost B_2

Net income (NI)= GI – Cost C_2

Management returns (MR)= Gross income – Cost C_3

$$\text{Returns per rupees (RPR)} = \frac{\text{Cost income/ha}}{\text{Cost/ha}}$$

In addition different constraints faced by cultivators in production of banana crop were also studied.

RESULTS and DISCUSSION

Table 1 shows breakup of the cost incurred by different farm size groups in various operations of banana cultivation. On an average Rs 38857.28 per hectare were spent on banana cultivation. The cost of cultivation of large farm size group was lowest (Rs 33584.52) followed by medium (Rs 40541.63) and small farm size (Rs 43222.87) group whereas among the different components of cost of cultivation human labour accounted for the largest portion (28.45%) followed by irrigation (19.65%).

The other major components were The other major components were plant protection (13.67%), intercultural operations (9.52%), suckers (9.46%),

Table 1. Per hectare resource use for banana cultivation in different size groups

Paramtere	Small	Medium	Large	Overall
Hired labour (Rs)	14524.03	13356.80	5004.31	10925.29
	(33.60)	(32.45)	(14.90)	(28.12)
Family labour (Rs)	125.11	120.02	117.87	121.05
	(0.29)	(0.29)	(0.35)	(0.31)
Machine labour (h)	16.76	16.31	18.43	17.10
	(0.03)	(0.04)	(0.05)	(0.04)
Suckers (number)	4000	3636.36	3333.33	3656.56
	(9.25)	(8.41)	(7.71)	(9.46)
Manures (q)	285.5	255.01	243.00	261.17
	(0.66)	(0.63)	(0.72)	(0.67)
Fertilizers (kg)	1541.49	1515.16	1489.14	1510.21
	(3.57)	(3.50)	(3.45)	(3.89)
Irrigation (Rs)	8073 .12	7556.14	7357.07	7636.66
	(18.68)	(18.64)	(21.91)	(19.65)
Plant protection (Rs)	4500.24	5124.23	6358.39	5309.92
	(10.41)	(12.64)	(18.93)	(13.67)
Intercultural operations (Rs)	4587.12	3541.04	3045.58	3699.91
	(10.61)	(8.73)	(9.07)	(9.52)
Land revenue (Rs)	00.00	12.01	241.87	84.06
	(0.00)	(0.03)	(0.72)	(0.22)
Depreciation (Rs)	854.24	765.50	1024.26	875.49
	(1.97)	(1.89)	(3.05)	(2.27)
Interest on working (Rs)	947.01	1015.65	1105.83	1016.04
capital	(2.19)	(2.50)	(2.87)	(2.61)
Interest on fixed capital (Rs)	768.27	857.41	1254.01	956.70
	(1.78)	(2.11)	(3.73)	(2.46)
Rental value of land (Rs)	3000.00	3000.00	3000.00	3000.00
	(6.94)	(7.39)	(8.93)	(7.72)
Total cost	43222.87	40541.63	33584.52	38857.28
	(100)	(100)	(100)	(100)

Values in parentheses are percentages

rental value of land (7.72%), fertilizers (3.89%) and interest on working capital (2.61%). The cultivation of banana requires additional labour use for harvesting and cutting, application of irrigation and transplanting/ sowing and as such the share of human labour accounted for the highest share of Rs 22456 per hectare (28.43%).

Income measures

The proportional estimates of different costs involved in banana cultivation for different farm size groups are depicted in Table 2. It is illustrated that the total cost of cultivation, C_2 (Rs 43222.87/hectare) of banana was highest in small size group followed by Rs 40541.63 in medium and Rs 33584.52 in large size group farms. In medium size farm group the cost A_1 was Rs 38796.76 per hectare which was highest followed by small (Rs 37511.43) and low (Rs 30456.79) in large size farm groups. In case of costs of cultivation, costs B_1 and B_2 were Rs 43097.76 and Rs 40097.76 respectively in small size farm group which were higher than the medium and large farm size groups. The cost could have increased in small size farm group due to small size of landholdings. Thus it was observed that the cost decreases as the size of landholding increases and vice versa as reported by Naduvinamani (2007).

Comparisons of different farm business incomes from banana cultivation are presented in Table 3. The returns from banana cultivation revealed that return over variable cost was highest (Rs 69029.87) with Rs 72125.63, Rs 68941.75 and Rs 66712.53 of large, medium and small farm size groups respectively. The return over variable cost increased with increase in the size of landholding. The family labour income per hectare for banana cultivation in small size group was highest (Rs 66586.42) followed by medium and large farm size groups (Rs 60054.74 and Rs 58124.52 respectively). In overall net income was Rs 64778.84 which was less than large and medium farm size groups (Rs 68457.29 and Rs 65781.21 respectively). The net

Table 2. Cost of cultivation (Rs) of banana on different farm business income basis of farm size groups

Cost	Size of group			
	Small	Medium	Large	Average
Cost A_1	37511.43	38796.76	30456.79	35352.65
Cost A_2	37511.43	38796.76	30456.79	35352.65
Cost B_1	43097.76	41796.76	30698.66	38275.88
Cost B_2	40097.76	37421.67	30816.53	35872.83
Cost C_1	40222.87	37541.63	30933.98	35887.28
Cost C_2	43222.87	40541.63	33584.52	38889.96
Cost C_3	47545.17	44595.79	36942.29	42743.00

Table 3. Returns (Rs) from cultivation of banana on different size groups per hectare

Parameter	Size of group			
	Small	Medium	Large	Average
Return over variable cost	66712.53	68941.75	72125.63	69029.87
Farm business income	66712.53	68941.75	72125.63	69029.87
Family labour income	66586.42	60054.74	58124.52	61384.94
Net income	60745.83	65781.21	68457.29	64778.84
Income over management	54671.24	59203.08	61611.56	59631.85
Returns over per rupee	1:1.57	1:1.70	1:1.81	1:1.69

income was calculated by profit per hectare after deducting the cost C_2 from gross income. The overall average income to management by cost C_3 from banana cultivation was Rs 59631.85 per hectare. The cost-benefit ratio of large farm size group was highest 1:1.81 followed by medium and small farm size groups (1:1.70 and 1:1.57 respectively). Similar observations were made by Ramchandra and Mehera (2009).

Net return on different cost concepts basis

The data given in Table 4 show that on average basis return from the cost A_1 in large size group was Rs 72125.63 that was higher than Rs 68941.75 each in medium and small size groups. The family labour income or lamily labour return B_2 (Rs 44107.53) was higher in small farm size group followed by Rs 41175.93 and Rs 33898.18 in medium and large farm size groups respectively since large farms were more efficient than medium and small farms mainly because of lower cost per unit of output. The returns per rupee of investment on small farms on cost C_2 basis were highest (Rs 41358.41) followed by Rs 38730.97 and Rs 31912.83 on medium and large farm size groups respectively. The findings of the present study are supported by the work of Rane and Bagade (2006).

Table 4. Net return (Rs) from banana cultivation on different size groups per hectare

Cost	Size of group			
	Small	Medium	Large	Average
Cost A_1	68941.75	68941.75	72125.63	69029.87
Cost A_2	66712.53	68941.75	72125.63	69029.87
Cost B_1	63712.53	65941.75	69125.63	66029.87
Cost B_2	44107.53	41175.93	33898.18	35872.83
Cost C_1	42222.87	39541.63	32933.98	41595.22
Cost C_2	41358.41	38730.97	31912.83	37112.16
Cost C_3	40136.21	34857.87	30248.06	33400.95

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