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Cost of production of mustard crop in Banaskantha district of Gujarat

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Abstract
The study was conducted at Banaskantha districts of North Gujarat region which account 73.70% of the total mustard area of the state. Taluka, villages and sample farmers was selected by adopting multistage sampling technique. Two Talukas were purposively selected from Banaskantha district *viz.*, Tharad and Dhanera. Five villages were randomly selected from each selected taluka. Twelve mustard growing farmers were selected randomly from each selected village. Thus, total of 2 talukas, 10 villages and 120mustard growing farmers were selected for study. For this study total of 20 market functionaries were randomly selected from Dhanera and Lakhani regulated markets. Ten processors were selected from Banaskantha district. The primary data were collected by using well designed pre-tested interview schedule for the *Rabi* season of 2021-22. The secondary data were collected from the records of Ministry of Agriculture and Farmers Welfare, GoI, and Directorate of Horticulture, GoG, Gandhinagar. In Banaskantha district the average total cost of cultivation (cost C_2) per hectare on mustard farms was ₹ 49275.18. It was highest (₹ 49590.16) on large farms and lowest (₹ 48917.86) on small farms.The average gross and net returns per hectare on mustard farms amounted to ₹ 110983.56 and ₹61708.35, respectively. Major cost components were cost of irrigation (16.75%), followed by family labours(16.68%), hired human labour (12.67%),miscellaneous cost (9.79%),rental value of owned land (8.70%), tractor & machineries (7.09%), fertilizers (5.15%), manure (4.60%), seeds (2.93%), interest on fixed capital(2.07%), plant protection (1.55%), interest on working capital (1.54%), and deprecation on farm implements (1.39%). Cost of production per quintal of mustard was ₹ 2593.43 and farmers obtained ₹2.25 over one rupee from mustard cultivation.

Keywords: mustard crop, mustard area, mustard cultivation

Introduction
India is the second most populated and seventh largest country in the world. The country is rich in both natural endowments and manpower resources. The economy of the country is normally agrarian and majority of the population earns its livelihood from agriculture. It helps a lot in securing foreign exchange which in turn enables us to import capital goods and essential commodities.

Mustard is the highly important crop among the oilseed crops grown in the country. It is important not only from the point of view of its contribution to the national agricultural production, but also because of its industrial use. It is the most important oil seed crop of the country because of its utility as food for the common man and also as raw material for some industries to manufacture soaps, lubricants, textile, auxiliaries etc.

Mustard crop in India are grown in diverse agro climatic conditions ranging from north-eastern, north western hills to down south under irrigated/rain fed, timely/late sown, saline soils and mixed cropping. India account for 11 percent of the total mustard production. Indian mustard accounts for about of the 6.78 million ha and the production is 9.12 million tonnes during 2019-20. At the same time yield remain only 1345 kg per ha. In the India major mustard production states is Rajasthan (46.28%), Haryana (12.61%), Uttar Pradesh (10.50%) and Madhya Pradesh (10.03%). Rajasthan is the highest mustard producing state in the India and producing 4.22 million tonnes. However, Gujarat is having highest yield 1932 kg per ha of mustard in country, (Ministry of Agriculture and Farmers Welfare, Govt. of India, 2020).

In various districts of Gujarat, Banaskantha district ranked first in terms of area (73.70%) during 2019-20. In the Gujarat total mustard cultivation is 1.72 lakh hectares and 3.33 lakh tonnes of mustard production and productivity is 1932.25 kg per ha. The maximum contribution of district in respect of area is shared by Banaskantha (1.27 lakh ha) followed by Patan (0.19 lakh ha) and Mehsana (0.13 lakh ha) in the 2019-20.

Banaskantha district alone itself cultivated 1.27 lakh hectares and 2.55 lakh tonnes of mustard production and productivity is 2005 kg per ha. Hence, it felt necessary to study the production and marketing system of mustard in Banaskantha. Among the various Taluka of Banaskantha, Tharad rank first in terms of area and production of mustard. In the Banaskantha total mustard cultivation is 1.45 lakh hectares and 2.69 lakh tonnes of production. The maximum contribution of taluka is with respect to area is shared by Tharad (22.83%) followed by Dhanera (20.71%), Palanpur (12.04%), Lakhani (10.49%) and Vav (7.90%) for the 2021-22. Tharad and Dhanera both Taluka cultivated 43.54 percent total mustard area and production is around 43.60 percent.

Methodology

The investigation was carried out in district Banaskantha during 2021-22. In order to achieve the objectives of the present study the multistage sampling technique was adopted. In the first stage Banaskantha district was selected purposively based on maximum mustard area and at the subsequent stages, two talukas from the district was selected purposively. There after five villages from each taluka were selected randomly. Finally, from selected village, 120 mustard growing farmers were selected at random.

The data were collected regarding the cost of cultivation of mustard for the year 2021-22 from selected samples of farmers. The techniques used in calculating cost of cultivation were simple average, weighted average adopted for identifying and comparing output, price and net profit of selected farmers, according to their size of farms and for the whole district.

The cost concepts that have been used in farm management studies such as the Cost-A, Cost-B, Cost-C_1 and Cost-$C_2$was followed in the analysis. Various items of inputs included for various cost concepts were as under:

Cost-A: It is the actual paid out by the farmers

1. Value of the hired human labour,
2. Value of the family labour,
3. Value of the owned bullock labour,
4. Value of owned machinery labour,
5. Hired machinery charges,
6. Value of seed,
7. Value of insecticides and pesticides,
8. Value of manure,
9. Value of fertilizers,
10. Value of irrigation charges,
11. Depreciation on implements and farm buildings,
12. Land revenue, cases and other taxes,
13. Interest on working capitals and
14. Miscellaneous expenses.

Cost-B: Cost-A + Interest on fixed capital + Rental value of owned land.

Cost-C_1: Cost-B +Inputed value of family labour**.**

Cost-C_2: Cost-C_1+ 10% of Cost C_1 as management charges.

Cost-C_2 is more comprehensive and represents the total cost of cultivation. It is very important when farming is considered to be strictly commercial preposition.

Results and Discussion

This deals with the cost of cultivation of mustard incurred by the selected farmers of study area of North Gujarat (Banaskantha district). Cost of cultivation has paramount importance in determining the net income of different crops. Hence, the details of per hectare cost and various factor costs for the Production of mustard on different size of farms were studied and the results are presented in Table 1.

For better view, the results were graphically presented in Table 1. It is revealed from the table that the average total cost of cultivation per hectare of mustard farms was ₹ 49275.18. It was highest (₹ 49590.16) on large farms and the lowest (₹ 48917.86) on small farms. This was mainly due to more expendutreon hired tractor, manures and cakes, irrigation, fertilizers and pesticides by large farmers as compared to other categories of farmers. Among the different items of cost concept in average farmers, the cost of irrigation ranked first with 16.75 percent of the total cost, followed by family labours(16.68%), hired human labour (12.67%), miscellaneous cost (9.79%),rental value of owned land (8.70%), tractor & machineries (7.09%), fertilizers (5.15%), manure (4.60%), seeds (2.93%), interest on fixed capital(2.07%), plant protection
(1.55%), interest on working capital (1.54%), and deprecation on farm implements (1.39%). Results also revealed that the cost of irrigation was highest among different cost items. The share of irrigation cost in all farm categories was higher due to tube well irrigation having very deep water level.Moreover, the average yield on mustard farmswas 19.00 quintal per hectare. It was also observed that yield was high on a mediumfarm (19.08 quintal/ha) as compared to large (18.98 quintal/ha) and smallfarms (18.96 quintal/ha). It can be also seen that, the cost of cultivation was marginally higher in large farm it might be because of the raw material purchased are in more quantity and for the same the price paid may be higher.

Table 1: Details of cost of cultivation of mustard crop per hectare in Banaskantha district of Gujarat state

Particulars		Small Farmers			Medium Farmers			Large Farmers			Average Farmers		
		Physical Unit	Value (Rs.)	Total cost (%)	Physical Unit	Value (Rs.)	Total cost (%)	Physical Unit	Value (Rs.)	Total cost (%)	Physical Unit	Value (Rs.)	Total cost (%)
Hired labour (man days)		24.25	6062.60	12.39	24.57	6144.70	12.46	26.06	6517.28	13.14	24.96	6241.52	12.67
Seed (Kgs)		5.20	1300.00	2.65	6.30	1575.38	3.19	5.86	1467.39	2.96	5.79	1447.59	2.93
Manures (Kgs)		1.95	2350.08	4.80	1.87	2250.06	4.56	1.83	2201.08	4.44	1.89	2267.07	4.60
Fertilizers (Kgs)	N	66	2526.45	5.99	60	2577.58	5.23	48	2508.09	5.06	58	2537.37	5.15
	P	42			38			34			38		
	K	00			00			00			00		
Plant protection charges			643.74	1.31		853.74	1.74		788.59	1.59		762.02	1.55
Tractor & Machineries			3335.97	6.82		3591.08	7.29		3551.64	7.16		3492.89	7.09
Irrigation Charges			8245.14	16.86		8160.46	16.56		8351.61	16.84		8252.41	16.75
Miscellaneous charges			4982.35	10.20		4731.26	9.60		4762.95	9.60		4825.52	9.79

Depre.on farm implements		706.79	1.45		734.57	1.50		608.57	1.23		683.31	1.39
Int. on working capital		747.61	1.53		795.58	1.62		741.25	1.50		761.48	1.54
Cost-A		30900.73	63.16		31414.41	63.69		31498.45	63.52		31271.18	63.46
Rental value of land		4162.25	8.50		4147.28	8.42		4543.19	9.16		4284.24	8.70
Int. on fixed capital		1008.35	2.07		1056.74	2.14		996.57	2.00		1020.55	2.07
Cost-B		36071.33	73.73		36618.46	74.25		37038.21	74.68		36575.97	74.23
Family labour (man days)	33.59	8399.46	17.18	32.86	8215.75	16.66	32.17	8043.76	16.23	32.87	8219.65	16.68
Cost-C_1		44470.79	90.91		44834.18	90.91		45081.97	90.91		44795.62	90.91
10% of Cost C_1		4447.07	9.09		4483.41	9.09		4508.19	9.09		4479.56	9.09
Cost-C_2		48917.86	100.00		49317.59	100.00		49590.16	100.00		49275.18	100.00
Main produce (Output) (Qtls.)	18.96	5907.14		19.08	5823.33		18.98	5793.26		19.00	5841.96	
Gross income		111999.37			111109.13			109956.07			110983.56	
Net income		63081.51			61791.54			60365.91			61708.35	
Per quintal cost (Rs/qtl)		2580.06			2584.77			2612.75			2593.43	

The details of cost of production also shown in Table 3 indicates that large farmers (2612.75 ₹/qtl) have highest cost of production followed by medium famers (2584.77 ₹/qtl), small famers (2580.06 ₹/qtl) and average farmers (2593.43 ₹/qtl). It was observed that the percentage share of cost of hired human labour and total human labour increases with the increase in the size of holding. The analysis of different cost concepts such as cost A, cost B, cost C_1 and cost C_2 has been presented in Table 2. Results revealed that the average per hectare cost A, cost B, cost $C_1$and cost C_2 were ₹31271.18 (63.46%), ₹36575.97 (74.23%), ₹44795.62 (90.91) and ₹49275.18 (100.00%), respectively. Cost A was found out to be the highest in large farmers.

Table 2: Estimate of different costs (₹ ha^{-1}) [n=120]

Category of farms	Cost A	Cost B	Cost C_1	Cost C_2
Small	30900.73 (63.16)	36071.33 (73.73)	44470.79 (90.91)	48917.86 (100)
Medium	31414.41 (63.69)	36618.46 (74.25)	44834.18 (90.91)	49317.59 (100)
Large	31498.45 (63.52)	37038.21 (74.68)	45081.97 (90.91)	49590.16 (100)
Average	31271.18 (63.46)	36575.97 (74.23)	44795.62 (90.91)	49275.18 (100)

It can be seen from the table that cost Accounted to 63.46 percent of the total cost (Cost C_2) on average farms of mustard. It was 63.52 percent on large farms, 63.69 percent on medium farms and 63.16 percent on small farms. Cost B accounted for about 74.23 percent of the total cost of mustard cultivation. Proportionately, it increased from small farms (73.73%), medium farms (74.25%) and large farms (74.68%). Further, it can be seen from Table 4.12 that total cost of cultivation (Cost C_2) per hectare of mustard accounted to ₹ 48917.86, ₹ 49317.59 and ₹ 49590.16 on small, medium and large farm, respectively with an average of ₹ 49275.18. It can be seen from table that distribution of total cost (Cost C_2) under cost A, cost B and cost C_1 was nearly about 63.46, 74.23 and 91.91 percent, respectively. It was also observed that cost A, cost B, cost C_1 and cost C_2 increased with the increase in size of the farms.

Table 3: Cost of production per quintal and input-output ratio on the basis of different cost concepts [n=120]

Category of farmers	Cost per quintal (₹)			
	Cost A	Cost B	CostC_1	CostC_2
Small	1629.78	1902.49	2345.50	2580.06
Medium	1646.45	1919.21	2349.80	2584.77
Large	1659.56	1951.43	2375.23	2612.75
Average	1645.85	1925.05	2375.66	2593.43

It can be seen from the Table 1.3 that for average farmers per quintal cost (cost C_2) of production of mustard was ₹ 2593.43 It was the highest (₹ 2612.75) on large farms, followed by ₹ 2584.77 on medium farms and ₹ 2580.06 on small farms. Cost of production per quintal (Cost C_2) was the lowest (₹2580.06) on small farms.

Conclusion

The average total cost of cultivation per hectare on mustard farms was ₹49275.18. It was highest (₹49590.16) on large farms and lowest (₹48917.86) on small farms. The average gross return per hectare on mustard farms amounted to ₹110983.56 It varied from ₹111999.37 in small farmers to ₹109956.07 in large farmers. Average net returns per hectare over Cost A, Cost B, Cost C_1, and Cost C_2 was ₹79712.38, ₹74407.59, ₹66187.94 and ₹61708.35, respectively.

The average total cost per hectare of mustard cultivation showed rising trend with the increase in size of farm. This was mainly due to more expenditure on manures and cakes, fertilizers, plant protection chemicals and hired human labour by large farmers as compared to small and medium farmers. Cost of production per quintal of mustard was ₹2593.43.

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