



Research Paper

Cost structure of minor millets grown in Tribal Dang district of South Gujarat

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ABSTRACT : Minor millets are one among the traditional group of cereal crops and are cultivated in areas where they produce a more dependable harvest compared to any other crop. The present study is an effort in this direction to study all aspects of cost of cultivation of minor millets namely Kodra (*Paspalum scrobiculatum*), finger millet (*Eleusine coracana*), and Vari (*Panicum miliare*) grown in tribal and hilly area of Dang district of South Gujarat region. The primary data were collected with the help of well designed questionnaires consisting 120 sample farmers (40 farmers for each crop). To derive the results, simple average, tabular analysis and cost concept were used. The rental value of owned land and family labour combined have more than 93 per cent share in total fixed cost in selected minor millet crops. The bullock labour cost, managerial cost, manure cost and hired human labour cost have jointly more than 84 per cent share in determination of variable cost in selected minor millet crops. The overall cost of cultivation for Kodra, finger millet and Vari was found to Rs. 3187, Rs. 7378 and Rs. 7997 per hectare, respectively. The average yield per hectare of Kodra, finger millet and Vari was reported to 7.57 qtl., 14.68 qtl. and 8.69 qtl, respectively. The gross return per hectare for Kodra, finger millet and Vari was found to Rs. 3348, Rs.13580 and Rs.16950, respectively. The cost of production per quintal of Kodra, finger millet and Vari was estimated to Rs. 421, Rs. 441 and Rs. 920, respectively. The net return per hectare over cost₂ for Kodra, finger millet and vary was found to Rs. 161, Rs.6202 and Rs.8953, respectively. The bulk line cost per qtl.for Kodra, finger millet and Vari was found to Rs.390, Rs.495 and Rs.1190, respectively.

KEY WORDS : Fixed cost, Variable cost, Gross return, Minor millets

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INTRODUCTION

The transformation of agriculture to more productive systems has often been accompanied by increased production in a fewer crop species. Concurrently, the area and production of a great diversity of traditional crops have declined. Yet in many parts of the world, these traditional crops play an important role in maintaining stable and sustainable forms of agriculture. Minor millets are generally consumed by the people of low socio-economic status. The reasons for limited utilization of millets are poor grain quality characteristics, such as rough texture, high fibre content, lack of gluten and typical flavour. Despite, their nutritional superiority, utilization of millets is restricted due to non-availability of refined and processed millets in ready to eat form. Hence, millets are confined to traditional consumers

and to the people of lower strata. A majority of the millet production (80%) although is used for human food, it is also used for feeding cattle and cage birds.

Minor millet comprising the small seeded cereal crops like finger millet, little millet, kodo millet, fox tail millet and common millet are grown in India. The area of minor millet in Gujarat is over the hilly tracts of Dang, Valsad, Bharuch, Baroda, Panchmahal, Sabarkantha and Banaskantha districts. These are grown as *Kharif* rain fed crops in the least fertile hilly soil by tribal and area adjoining to hilly tract. Minor millets are the staple food for the large section of rural and working class in the state. In Gujarat Kodra is cultivated in the area of 40000 hectares. Nowadays, finger millet gets popularity among minor millets due to its high content of calcium (344mg/100g), magnesium (191mg/100g) and its different nutritive bakery products.

Table A : Nutrient composition of major cereals and millets(per 100 g edible portion; 12 % moisture)

Food	Protein (g)	Fat (g)	Ash (g)	Crude Fibre (g)	Carbo-hydrate (g)	Energy (kcal)	Ca (mg)	Fe (mg)	Thia-Min (mg)	Ribo-Flavin (mg)	Niacin (mg)
Rice	7.9	2.7	1.3	1.0	76.0	362	33	1.8	0.41	0.04	4.3
Wheat	11.6	2.0	1.6	2.0	71.0	348	30	3.5	0.41	0.10	5.1
Finger millet	7.7	1.5	2.6	3.6	72.6	336	350	3.9	0.42	0.19	1.1
Little millet	9.7	5.2	5.4	7.6	60.9	329	17	9.3	0.30	0.09	3.2
Kodo millet	9.8	3.6	3.3	5.2	66.6	353	35	1.7	0.15	0.09	2.0

Objectives :

- To work out the fixed and variable cost components per hectare.
- To find out returns and input-output ratio over different costs.
- To estimate bulk line cost.

MATERIALS AND METHODS

The present study pertains to three minor millets namely, Kodra (*Paspalum scrobiculatum*), finger millet (*Eleusine coracana*), and Vari (*Panicum miliare*) grown in tribal and hilly Dang district of South Gujarat region. The list of millet growers of Dang district was obtained from Taluka Panchayat office and from this list, the required sample of 40 farmers for each crop was selected randomly from six villages viz., Jamlapada, Chikar, Kokpatad, Baj, Khirmani and Dagadpada. Total sample size comprised of 120 farmers. Keeping in view of the objectives of the study, the primary data were collected by personal interview with the help of well designed questionnaires by survey method. The data pertained to the year 2007-2008.

To derive the conclusion, simple average and tabular analysis were used to analyze the data. The cost concept were used to work the cost of cultivation. The imputed value of owned inputs was calculated as per market rate and taken into account.

RESULTS AND DATA ANALYSIS

The results are summarized below according to objectives of the study:

Proportion of fixed cost of selected minor millet crops :

The details of proportion of fixed cost of selected minor millet crops are given in Table 1. It is revealed from the Table that the total fixed per hectare for Kodra was found to Rs. 1872. The rental value of owned land ranked first occupying 73.34 per cent in total fixed cost followed by family labour (20.57 %).

It can be seen from the Table that the total fixed cost per ha. for finger millet was found to Rs. 4330. The rental value of owned land ranked first occupying 50.18 per cent in total fixed cost followed by family labour (45.02 %).

It is apparent from Table 1 that the total fixed cost per ha. for vari was found to Rs. 4757. The rental value of owned land ranked first occupying 57.01 per cent in total fixed cost followed by family labour (39.46 %).

The overall view revealed that the rental value of owned land and family labour combined have more than 93 per cent share in total fixed cost in selected minor millet crops.

Proportion of variable cost of selected minor millet crops :

The data of proportion of variable cost are presented in Table 2. It is revealed from the Table that the total variable cost per hectare of Kodra was found to Rs. 1315. In total variable cost, the share of bullock labour was found the highest (45.63 %) followed by managerial cost (19.39 %), manures (11.41 %), hired human labour (7.98 %) etc.. Looking to the component wise variable cost data of finger millet revealed that the share of bullock labour was found the highest (42.88 %) followed by managerial cost (22.01 %), hired human labour (11.29 %), miscellaneous cost (9.22 %), etc. The total variable cost

Table 1: Proportion of fixed cost of selected minor millet crops (Rs./ha)

Sr.No.	Items	Kodra		Finger millet		Vari	
		Cost	% to total	Cost	% to total	Cost	% to total
1.	Rental value of owned land	1373	73.34	2173	50.18	2712	57.01
2.	Depreciation	54	2.88	139	3.21	112	2.35
3.	Interest on owned fixed capital	60	3.21	69	1.59	56	1.18
4.	Family labour	385	20.57	1949	45.02	1877	39.46
5.	Rent	-	-	-	-	-	-
	Total	1872	100	4330	100	4757	100

Table 2: Proportion of variable cost of selected minor millet crops (Rs./ha)

Sr.No.	Items	Kodra		Finger millet		Vari	
		Cost	% to total	Cost	% to total	Cost	% to total
1.	Hired human labour	105	7.98	344	11.29	340	10.49
2.	Bullock labour	600	45.63	1307	42.88	1274	39.32
3.	Seeds	63	4.79	100	3.28	54	1.67
4.	Manures	150	11.41	180	5.91	455	14.04
5.	Chemical fertilizer	-	-	68	2.23	71	2.19
6.	Irrigation	-	-	-	-	-	-
7.	Insecticides/pesticides	-	-	-	-	-	-
8.	Miscellaneous cost	69	5.75	281	9.22	218	6.73
9.	Interest on working capital	73	5.55	97	3.18	101	3.12
10.	Managerial cost	255	19.39	671	22.01	727	22.44
	Total	1315	100	3048	100	3240	100

Table 3: Yield, Cost and Returns per hectare of selected minor millet crops

Sr.No	Items	Kodra	Finger millet	Vari
1.	Main product yield			
	Main Yield in qtl.	7.57	14.68	8.69
	Av. Harvest. price/ctl.	442	863	1950
2.	By Product yield	-		
	Yield in qtl	-	751	0.00
	Value of by product in Rs		905	0.00
3.	Gross return in Rs.	3348	13580	16950
4.	Total cost (cost-c ₂)	3187	7378	7997
5.	Return/ha over different cost			
	cost A	2234	11064	14298
	cost B	801	8822	11557
	cost C ₁	546	6873	9680
	cost C ₂	161	6202	8953
6.	Cost of Production/ qtl in Rs (Main product)			
	cost A	147	110	302
	cost B	336	262	621
	cost C ₁	370	395	837
	cost C ₂	421	441	920
7.	Input-Output ratio/ha over different cost			
	cost A	1:3.01	1:5.39	1:6.46
	cost B	1:1.31	1:2.85	1:3.14
	cost C ₁	1:1.19	1:2.02	1:2.33
	cost C ₂	1:1.05	1:1.84	1:2.12

per hectare for finger millet was found to Rs. 3048.

It is apparent from Table 2 that the total variable cost per

hectare for Vari was found to Rs. 3240. In total variable cost, the share of bullock labour was found the highest (39.32 %)

Table 4: Bulk line cost of selected minor millets

Per centage coverage	Kodra	Finger millet	Vari
Production(%)	85	85	85
Farmers (%)	77	85	85
Area (%)	83	85	85
Bulk-line cost (Rs/qtl)	390	495	1190
Av.farm harvest price (Rs./qtl.)	442	863	1950

followed by managerial cost (22.44 %), manures (14.04 %), hired human labour (10.49 %) etc.

A close perusal of table revealed that the bullock labour cost, managerial cost, manure cost and hired human labour cost had vital role in determination of variable cost in selected minor millet crops. Here, it is noteworthy that there were no irrigation and insecticides/pesticides cost due to rainfed farming system along with unavailability of irrigation facility and lack of capital.

Yield, cost and returns of selected minor millet crops :

The information about yield, cost and returns of selected minor millet crops are presented in Table 3. It is observed that the average yield of Kodra was 7.57 qtl. / ha. and gross returns was Rs. 3,348. The returns over operating cost per ha. was rupees 2,234. The overall net returns over cost- C₂ was Rs. 161 per ha. The cost of production per qtl. on cost- A, cost-B and cost-C₂ was Rs. 147, Rs. 336, Rs. 421, respectively. The overall input-output ratio over cost- A, cost- B and cost-C₂ was 1:3.01, 1:1.31 and 1:1.5, respectively. The finding of yield of Kodra are in conformity with the results of Dubet *et al.*(1993).

It can be seen from Table 3 that average yield of finger millet was 14.68 qtl. / ha and gross returns was Rs. 13,580 per ha.. The return over operating cost was Rs. 11064 per ha. The overall net return over cost- C₂ was Rs. 6202 per ha. The cost of production per qtl. on cost - A, cost- B and cost-C₂ was 1:5.39, 1:2.85 and 1:1.84, respectively.

It is apparent that the average of yield of Vari was 8.69 q /ha and gross returns was Rs. 16,950. The return on operating cost per ha. was Rs. 14,298. The overall net returns over cost- C₂ was Rs. 8,953 ha. The cost of production per qtl. on cost- A, cost-B and cost- C₂ was Rs.302, Rs. 621 and Rs. 920, respectively. The input output ratio over cost -A, cost-B and cost- C₂ was 1:6.46, 1:3.14 and 1:2.12, respectively.

Overall look of Table 3 indicated that Vari crop was economically more beneficial (1:2.12) followed by finger millet (1:1.84) and Kodra (1:1.05).

Bulk line cost of selected millet crops :

The concepts of bulk line cost have been used and are considered of more practical importance as compared to other concepts. Since, it takes into account to some extent in the

actual distribution of cost of different farms. The bulk line cost is the unit cost which covers the cost of production 85 per cent to total production in the case of parameters commonly.

The detail of bulk line cost is given in Table 4. The bulk line cost of Kodra was found to rupees 490 and the farmers and the area cover was 77 per cent and 83 per cent, respectively. The bulk line cost of finger-millet shows that bulk line cost of rupees 495 and farmers and area cover was 85 per cent. The bulk line cost of Vari was found to rupees 1,190 and the farmers and area cover was 85 per cent. Naik (2007) also carried investigation on production and marketing of underutilized millets in Karnataka.

Summary and conclusions:

The present study was carried out with a view to estimate the cost structure, return over different costs, input-output ratio and bulk line cost of minor millets grown in tribal Dang district of south Gujarat region. The conclusions drawn from the analysis are given as under:

- The total fixed cost per hectare for finger millet, Vari and Kodra was found to Rs.4330, Rs.4757 and Rs.1872, respectively.
- The rental value of owned land and family labour combined have more than 93 per cent share in total fixed cost of selected minor millet crops.
- The total variable cost for Vari, Kodra and finger millet was estimated to Rs.3240, Rs.1315 and Rs.3048 per hectare, respectively.
- The bullock labour, managerial cost, manure cost and hired human labour cost have jointly more than 84 per cent share in total variable cost in selected minor millet crops.
- The cost of cultivation of Vari, Kodra and finger millet was found to Rs.7997, Rs.3187 and Rs.7378 per hectare, respectively.
- The average yield of Kodra was reported to 7.57 qtls. with gross return of Rs. 3348. The return per hectare over cost- A Cost-B and Cost- C₂ was found to Rs. 2234, Rs. 801 and Rs. 161, respectively. The cost of production per quintal on Cost- A, Cost-B and Cost-C₂ was accounted to Rs. 147, Rs.336 and Rs. 421, respectively. The input-output ratio over Cost- A, Cost-B and Cost-C₂ was observed to 1:3.01, 1:1.31 and 1:1.05, respectively.

- The finger millet average yield per hectare was found 14.68 qtl per ha. with gross return of Rs.13580. The return per hectare over Cost- A, Cost-B and Cost-C₂ was found to Rs. 11064, Rs 8822 and Rs.6202, respectively. The cost of production per quintal on Cost- A, Cost-B and Cost-C₂ was estimated to Rs. 110, Rs. 262 and Rs. 441, respectively. The input-output ratio over Cost- A, Cost-B and Cost-C₂ was observed to 1:5.39, 1:2.85 and 1:1.84, respectively
- The average yield of Vari per hectare was calculated 8.69 qtls. with gross income of Rs. 16950. The return per hectare over Cost- A, Cost-B and Cost-C₂ was found to Rs. 14298, Rs. 11557 and Rs.8953, respectively. The cost of production per quintal on Cost- A, Cost-B and Cost-C was estimated to Rs. 302, Rs. 621 and Rs. 920, respectively. The input-output ratio over Cost- A, Cost-B and Cost-C₂ was found to 1:6.46, 1:3.14 and 1:2.12, respectively.
- The bulk line cost per qtl. for Kodra, finger millet and Vari was found to Rs.390, Rs.495 and Rs.1190, respectively

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