

FODDER PRODUCTION AT SAVAR DAIRY FARM : AN ECONOMIC ANALYSIS

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Summary

In this study an attempt was made to determine the cost of producing fodders at Savar Dairy Farm (SDF). For this purpose, all seasonal fodders, such as Maize, Jowar, Cowpea and Oat and all perennial fodders, such as Para and Napier were studied. The highest acreage of land was allocated to high-land Para (33.8%) and the lowest acreage (2.7%) was devoted to Cowpea. Jowar attained the highest yield (74.2 tons) per hectare and Maize attained the lowest yield (25.8 tons/h). The highest cost per hectare was attributed to Jowar (TK. 20944.18) while the lowest cost was attributed to low-land para (TK. 10349.86). The cost of production of fodder per kilogram was the highest (TK. 0.66) for Maize and the lowest for Oat (TK. 0.24). The cost of production of low-land Para was much lower than that of high land Para. The per kilogram cost of silage production was the highest (TK. 0.71) for Maize and the lowest (TK. 0.31) was for Napier. The gross return analysis further showed that the highest net margin and B:C ratio were observed for Napier followed by Low-land Para, Jowar, Oat, Cowpea, High-land Para and Maize. Therefore, those fodders whose B:C ratios and yield/ha were higher should be allocated more area of land to stimulate increased returns to SDF in the future is suggested.

(**Key Words** : Cost of Production, Gross Return, Gross Margin, Net Margin, Benefit-Cost Ratio)

Introduction

The production of high quality of fodders is a pre-requisite for rearing improved breeds of cattle. Realizing this necessity, the Central Cattle Breeding Station (CCBS) at Savar started conducting adaptive research on fodder crops along with fundamental research on animal breeding since 1959. The purpose was to evolve improved varieties of fodders suitable for the country to feed crossbred cattle.

An important objective of the Savar Dairy Farm (SDF) is to ensure adequate supply of nutrition for improved breeds of cattle through cultivation of improved forages and fodders on the farm. For this purpose, an agricultural section, a fodder research section and a fodder extension section have been developed within the farm. In recent years, the farm has been using 251.96 hectares of land (78 % of total available land) for cultivation of fodders. For the feeding of cattle both seasonal and perennial fodders are cultivated on the Farm. Different varieties of fodders grown on the farm are Maize, Napier, Para, Jowar, Cowpea and Oat.

Until recently, no systematic study was conducted on seasonal and perennial fodder cultivation at Savar Farm. There is no analysis regarding the cost of cultivation of different kind of fodders produced in different seasons. As a result it became difficult to fix the prices of different types of green fodder produced on the Farm. Therefore, a study on the cost of production of fodder at Savar Dairy Farm was undertaken. Specific objectives of the study are :

- to compare the yield of different fodders grown on the Savar Dairy Farm (SDF).
- to calculate the per hectare cost of production of fodders, and
- to calculate the per kilogram cost of preparation of silage from fodder crops.

Materials and Methods

Data on yield and cost of production of both seasonal and perennial fodders were collected from the past records of Agricultural Section of Savar Dairy Farm. All seasonal fodders, such as, Maize, Jowar, Cowpea and Oat and all perennial fodders, such as Para and Napier were chosen for the study. One senior scientific Officer and one Scientific Officer were engaged to collect information and

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it took one year to complete the work.

The study was confined during the period from 1989 to 1991 and a previously tested questionnaire was used to collect information from the farm.

The partial budget method was followed to determine the cost of fodders and silage production. Descriptive statistics such as mean, percentage etc. were used for better interpretation of data.

Estimation of cost of production of fodder crops :

The procedure used in estimating the cost of production of different fodder crops is given below :

Fixed cost :

The depreciation charges on irrigation equipments and agricultural implements, and the land use value constituted the fixed cost.

a. Depreciation of irrigation equipments and agricultural implements:

The depreciation charges were worked out following a straight line method (Shiyani et al., 1989). The total value of irrigation equipment and agricultural implements were divided by their respective useful life. The useful life was considered 20 years for irrigation equipment and 15 years for agricultural implements.

b. Depreciation of silage-pit was also calculated on the basis of straight line method. The useful life of silage-pit was considered 30 years.

c. Land use value :

The lease value of land prevailing in the study area for seasonal fodders and perennial fodders were included in it.

Variable cost :

The variable costs included the fuel cost for ploughing harvesting, carrying, chopping etc; cost of human labour, seed and fertilizer, electricity cost for irrigation, and interest on operating capital. The interest on operating capital was calculated on the basis of prevailing bank rate and was attributed to the number of days needed for first harvesting of different fodder crops.

Returns :

In calculating returns to fodder crops, the market price of rice-straw were used since there did not exist any kind of market for buying and selling of fodders in Bangladesh like other agricultural commodities, admitting that green fodder is nutritionally and economically superior to rice-straw.

Gross margin :

It is the subtraction of variable cost from gross

returns and is divided by per unit of yield.

Net margin :

It is the difference between the gross returns and total cost of production and is divided by per unit of yield (Pervaiz et al., 1989).

Net B:C ratio :

It is the difference between gross returns and total cost and is divided by total cost of production.

Results and Discussion

Agronomical practices, distribution of land and yield of fodders :

Agronomical practices of Maize, Jowar, cowpea, Oat, Napier and Para are presented in table 1. Various agronomical practices relating to types of land, sowing/planting time, preparation of land, distance between plant to plant and line to line, doses of fertilizers used, time of harvesting after sowing/planting, time of harvesting after first cutting, seeds/seedlings/ha, number of cutting per year, average yield/ha/cutting, average production/ha/year, number of cultivation/production cycle and methods of preservation of Maize, Jowar, cowpea, Oat, Napier and Para can be seen from the table 1.

The distribution of land under each fodder and the yield/ha of different fodders grown on the Savar Dairy Farm is presented in tables 2 and 3. It can be seen from the table that high-land and low-land Para combinedly (112.90 + 423.41 ha) occupied the highest area 155.31 ha (46.6%), followed by Maize 74.72 ha (22.4%), Napier 39.56 ha (11.9%), Jowar 36.92 ha (11.1%), Oat 18.10 ha (5.4%) and Cowpea 8.79 ha (2.7%) over the years 1989-91. However, the highest yield of green fodder was achieved from Jowar (72.15 ton/ha) followed by Napier (52.31 ton/ha), Para (38.78 ton/ha), Oat (54.21 ton/ha) and Cowpea (29.63 ton/ha), during the years 1989-91. The intensity of fodder cultivation of farm was 132.4% (Total fodder cultivable area = 251.96 ha and total fodder cropped area = 333.58 ha) which was lower than the national intensity of cropping (165%).

Cost of fodder production :

Maize

The cost of production of Maize/ha is presented in table 4. It can be noticed from the table that the highest cost of production was TK. 17,775.91/ha in 1990 and the lowest was TK. 15,235.27/ha in 1989 with an average of TK. 17,022.16/ha. It is evident that the cost of production increased but did not show any specific trend. The yield

TABLE 1. AGRONOMICAL PRACTICES OF MAIZE, JOWAR, COWPEA, OAT, NAPIER AND PARA

Name of grass	Types of land	Sowing or planting time (month)	Land prep.	Dict. betw. pl.-pl. & row, Ft.	Fertilizers / ha / year			Time of harv. after 1st cut / d	Seed rate / ha	No. of cutting per yr.	AV. yield / ha / cutting (ton)	AV. yield / ha / year (ton)	No. of cult. / prod. cycle	Methods of preservation
					Urea (kg)	TSP (kg)	MP (kg)							
Maize	High, low, slopy	Mid-sept. to mid-nov.	5-7 times ploughing and laddering	1' × 1'	46.88	37.50	18.75	50-60	18.75	1	11.25	22.50	2 times	Silage
Jowar	High, low, slopy	Mid-sept. to mid-nov.	5-7 times ploughing and laddering	Sowing	37.50	28.125	9.375	60	14.63	2	22.50	90.00	2 times	Silage
Cowpea	High, slopy	Mid-sept. to mid-nov.	3-4 times ploughing and laddering	Sowing	9.375	18.75	-	40-50	14.063	1	9.375	28.125	2-3 times	Sun-drying
Oat	High, slopy	Mid-sept. to mid-nov.	5-7 times ploughing and laddering	Sowing	46.88	37.50	9.375	50-60	28.125 to 37.50	3	18.75	56.75	1 times	Sun-drying and silage
Napier	High, slopy	Mid-april to mid-oct.	4-5 times ploughing and laddering	1.5' × 3'	150.00	75.00	37.50	60-70	8.00	8-10	7.50	60.000	4-5 yrs.	Silage
Para	High, low, slopy	Mid-april to mid-oct.	4-5 times ploughing and laddering	1.5' × 1.5'	150.00	75.00	35.50	70-80	10,000	10-12	5.125	45.000	7-8 yrs.	Silage and sun-drying

Source : M. A. Khaleque Fakir, 1979. Grass cultivation, Book-let-1, CCBS, Savar, Dhaka.
TSP = Triple Super Phosphate, MP = Muriate of Potash.

TABLE 2. THE DISTRIBUTION OF LAND AND PRODUCTION OF DIFFERENT SEASONAL FODDER CROPS GROWN ON SDF IN 1989-91

Fodder Grown	Maize			Jowar			Cowpea			Oat		
	Green yield (ton)			Green yield (ton)			Green yield (ton)			Green yield (ton)		
Year	Area under crop (ha)	Total production (ton)	Production/ha (ton)	Area under crop (ha)	Total production (ton)	Production/ha (ton)	Area under crop (ha)	Total production (ton)	Production/ha (ton)	Area under crop (ha)	Total production (ton)	Production/ha (ton)
1989	31.19	1,369.899	26.758	30.00	1,898.059	63.268	6.07	121.963	20.093	—	—	—
1990	79.45	2,658.843	33.462	30.295	2,782.921	91.860	11.336	401.893	35.452	4.59	241.916	52.705
1991	93.52	1,752.230	18.736	50.469	3,532.100	69.985	9.50	273.343	28.773	49.72	2,702.040	54.345
Av.	74.72	1,926.990	25.789	36.92	2,737.693	74.149	8.97	265.735	29.629	18.10	981.318	54.207

TABLE 3. THE DISTRIBUTION OF LAND AND PRODUCTION OF DIFFERENT PERENNIAL FODDER CROPS GROWN ON SDF IN 1989-91

Fodder grown	High-land Para (Green yield)			Low-land Para (Green yield)			Napier		
Year	Area Under crop (ha)	Total Production (ton)	Production per ha (ton)	Area under crop (ha)	Total production (ton)	Production/ha (ton)	Area under crop (ha)	Total production (ton)	Production/ha (ton)
1989	112.90	4,290.200	38.00	42.41	1,695.745	37.886	39.56	2,900.320	73.314
1990	112.90	4,503.129	39.886	42.41	1,695.679	39.983	39.56	1,873.911	47.368
1991	112.90	4,283.764	37.943	42.41	1,652.293	38.960	39.56	1,434.443	36.259
Av.	112.90	4,359.031	38.609	42.41	1,651.572	38.943	39.56	2,069.558	52.314

of Maize/ha also did not show any specific trend. It was highest (33.462 ton/ha) in 1990 and was lowest (18.736 ton/ha) 1991 (table 2). There had been frequent rainfall in 1991 which delayed timely cultivation of Maize resulting in low yield.

The analysis of cost components showed that the highest cost (30.4%) was incurred for irrigation followed by human labour (23.5%), depreciation charges on fixed assets 16.0%), fuel for ploughing, harvesting, carrying and chopping (11.0%), land use (7.3%), fertilizer (5.1%), seed (3.9%) and interest on fixed and operating capital (2.9%). The average cost of production of Maize/kg was Tk. 0.66 over the reference years.

Gross return analysis of maize showed that gross margin/kg, net margin/kg and B:C ratio were Tk. 1.51, Tk. 1.35 and 1:2.09, respectively.

Jowar

The cost of production of Jowar/ha is presented in table 5. It can be noticed from the table that the highest cost of production was TK. 25,478.77/ha in 1991 and the

lowest was TK 16,347.05/ha in 1989 with an average of Tk. 20,944.18/ha. It is evident that the cost of production has shown an increasing trend over the years. The yield of Jowar/ha increased but did not show any specific trend. It was highest (91.860 ton/ha) in 1990 and was lowest (63.268 ton/ha) in 1989 (table 2).

The analysis of cost components showed that the highest cost (24.6%) was incurred for irrigation followed by human labour (23.6%), fertilizer (18.3%), depreciation charges on fixed assets (13.0%), fuel for ploughing, harvesting, carrying and chopping (8.5%), land use (6.0%), seed (3.5%) and interest on fixed and operating capital (2.6%). The cost of production of Jowar/kg was Tk. 0.28 over the years.

Gross return analysis of Jowar revealed that gross margin/kg, net margin/kg and B:C ratio were Tk. 1.78/kg, Tk. 1.72/ka and 1:6.17, respectively.

Cowpea

The cost of production of Cowpea/ha is shown in table 6. It can be noticed from the table that the highest

TABLE 4. COST OF PRODUCTION OF MAIZE / ha AT SAVAR DAIRY FARM (1989-91)

40 Taka = 1 US Dollar

Items of cost	Cost of production (Tk./ha)			
	1989	1990	1991	Average
Fuel cost (ploughing, harvesting, carrying, chopping etc.)	1,253.57	2,714.65	1,507.81	1,877.49 (11.03)
Human labour cost	3,881.34	3,834.63	4,202.56	3,998.82 (23.49)
Seed cost	701.48	642.20	642.20	655.73 (3.85)
Fertilizer cost	959.47	885.50	791.88	863.33 (5.07)
Irrigation cost	3,475.56	5,111.07	6,150.30	5,171.15 (30.38)
Interest on operating capital @ Tk. 10% per annum)	171.19	219.80	221.58	209.44 (1.23)
Sub-Total	10,442.70	13,407.85	13,516.33	12,775.98 (75.06)
Land use value	1,250.00	1,250.00	1,250.00	1,250.00 (7.34)
Depreciation on fixed assets	3,220.52	2,834.60	2,282.47	2,723.80 (16.00)
Interest on fixed assets @ Tk. 10% per annum)	322.05	283.46	228.25	272.38 (1.60)
Sub-Total :	4,792.57	4,368.06	3,760.72	4,246.18 (24.94)
Total cost of production / ha	15,235.27	17,775.91	17,277.05	17,022.76 (100)
Cost of production Tk./kg	0.57	0.53	0.92	0.66 (0.0)
Gross return/ha @ Tk. 2000.00	53,516.00	66,924.00	37,472.00	52,636.00 (0.0)
Gross margin/kg	1.61	1.60	1.28	1.51 (0.0)
Net margin/kg (Tk.)	1.43	1.47	1.08	1.35 (0.0)
B : C ratio	2.51	2.76	1.17	2.09 (0.0)

Figures in parentheses are percentages.

TABLE 5. COST OF PRODUCTION OF JOWAR / ha AT SAVAR DAIRY FARM (1989-91)

Items of cost	Cost of production (Tk./ha)			
	1989	1990	1991	Average
Fuel cost (ploughing, harvesting, carrying, chopping etc.)	1,253.57	2,714.65	1,509.05	1,769.59 (8.45)
Human labour cost	5,314.06	3,857.72	5,388.16	4,949.50 (23.63)
Seed cost	407.55	518.07	1,074.45	741.05 (3.54)
Fertilizer cost	914.32	1,006.82	7,240.06	3,821.91 (18.25)
Irrigation cost	3,475.56	5,111.07	6,150.30	5,141.61 (24.55)
Interest on operating capital @ Tk. 10% per annum)	189.42	220.14	356.03	273.74 (1.31)
Sub-Total	11,554.48	13,428.47	21,718.05	16,698.00 (79.73)
Land use value	1,250.00	1,250.00	1,250.00	1,250.00 (5.97)
Depreciation on fixed assets	3,220.52	2,834.60	2,282.47	2,723.80 (13.01)
Interest on fixed assets @ Tk 10% per annum)	322.05	283.46	228.25	272.38 (1.30)
Sub-Total :	4,792.57	4,368.06	3,760.72	4,246.18 (20.27)
Total cost of production / ha	16,347.05	17,796.53	25,478.77	20,944.18 (100)
Cost of production Tk./kg	0.26	0.19	0.36	0.28 (0.0)
Gross return/ha @ Tk. 2000/ton	12,653.00	183,720.00	139,970.00	150,074.00 (0.0)
Gross margin/kg (Tk.)	1.82	1.85	1.69	1.78 (0.0)
Net margin/kg (Tk.)	1.74	1.81	1.64	1.72 (0.0)
B : C ratio	6.74	9.82	4.49	6.17 (0.0)

Figures in parentheses are percentages.

TABLE 6. COST OF PRODUCTION OF COWPEA /ha AT SAVAR DAIRY FARM (1989-91)

Items of cost	Cost of production (Tk. / ha)			
	1989	1990	1991	Average
Fuel cost (ploughing, harvesting, carrying, chopping etc.)	1,253.57	2,714.65	1,509.05	1,959.36 (17.88)
Human labour cost	3,881.43	4,131.02	3,925.66	4,002.20 (36.53)
Seed cost	434.72	176.00	3,26.04	287.34 (2.62)
Fertilizer cost	408.51	—	735.32	351.79 (3.21)
Irrigation cost	—	—	—	—
Interest on operating capital @ Tk. 10% per annum)	99.64	117.03	108.27	110.01 (1.00)
Sub-Total	6,077.87	7,138.70	6,604.34	6,710.71 (61.25)
Land use value	1,250.00	1,250.00	1,250.00	1,250.00 (11.40)
Depreciation on fixed assets	3,220.52	2,834.60	2,282.47	2,723.80 (24.86)
Interest on fixed assets @ Tk. 10% per annum)	322.05	283.46	228.25	272.38 (2.49)
Sub-Total :	4,792.57	4,360.06	3,760.72	4,246.18 (38.75)
Total cost of production / ha	10,870.44	11,506.76	10,365.06	10,956.89 (100)
Cost of production Tk./kg	0.54	0.33	0.36	0.37 (0.0)
Gross return/ha @ Tk. 2000/ton	40,186.00	70,904.00	57,546.00	56,212.00 (0.0)
Gross margin/kg (Tk.)	1.70	1.80	1.77	1.76 (0.0)
Net margin/kg (Tk.)	1.46	1.68	1.64	1.61 (0.0)
B : C ratio	2.70	5.16	4.55	4.13 (0.0)

Figures in parentheses are percentages.

cost of production was Tk. 11,506.76/ha in 1990 and the lowest was Tk. 10,365.06/ha in 1991 with an average of Tk. 10,956.89/ha. It is evident that the cost of production did not show any specific trend. The yield of Cowpea/ha increased but did not show any specific trend. It was highest (35.452 ton/ha) in 1990 and was lowest (20.093 ton/ha) in 1989 (table 2).

The analysis of cost components showed that the highest cost (36.5%) was involved in human labour followed by depreciation charges on fixed assets (24.9%), fuel for ploughing, harvesting, carrying, chopping etc. (18.4%), land use (11.4%), interest on fixed and operating capital (3.5%), fertilizer (3.2%) and seed (2.6%). The per Kg cost of production of cowpea was Tk. 0.37 over the years.

Gross return analysis of cowpea showed that gross margin/kg, net margin/kg and B:C ratio were Tk. 1.76/kg, Tk. 1.61/kg and 1:4.13, respectively.

Oat

The cost of production of Oat/ha is presented in table 7. It can be seen from the table that the highest cost of production was Tk. 13,508.35/ha in 1990 and the lowest was Tk 12,602.46/ha in 1991 with an average of Tk.

13,113.12/ha. It is evident that the cost of production decreased in 1991 compared to 1990. The yield of Oat/ha increased. It was highest (54.345 ton/ha) in 1991 and was lowest (52.705 ton/ha) in 1990 (table 2).

Among the cost components, the highest cost (46.2%) was incurred for irrigation followed by depreciation charges on fixed assets (20.8%), fuel for ploughing, harvesting, carrying, chopping etc. (12.3%), land use (9.5%), interest on fixed and operating capital (3.2%), seed (3.0%), fertilizer (2.7%) and labour (2.3%). The cost of production of Oat/kg was Tk. 0.24 during the years under study.

Gross return analysis of Oat showed that gross margin/ka, net margin/kg and B:C ratio were Tk. 1.75/kg, Tk. 1.03/kg and 1:4.44, respectively.

Napier

The cost of production of Napier/ha is presented in table 8. It can be seen from the table that the highest cost Tk. 15,935.01/ha observed in 1990 and the lowest Tk. 14,716.27/ha was in 1991 with an average of Tk. 15,401.41/ha. It is evident that the cost of production did not show any specific trend. The yield of Napier/ha has been decreasing over the years. It declined from 73.314 ton/ha

TABLE 7. COST OF PRODUCTION OF OAT / ha AT SAVAR DAIRY FARM (1989-91)

Items of cost	Cost of production (Tk. /ha)			
	1989	1990	1991	Average
Fuel cost (ploughing, harvesting, carrying, chopping etc.)	—	2,714.65	1,507.05	1,610.94 (12.28)
Human labour cost	—	370.50	396.40	302.64 (2.31)
Seed cost	—	370.50	395.20	393.10 (3.00)
Fertilizer cost	—	429.80	350.69	357.41 (2.73)
Irrigation cost	—	5,111.07	6,150.30	6,062.46 (46.23)
Interest on operating capital @ Tk. 10% per annum)	—	143.77	140.09	140.40 (1.07)
Sub-Total	—	9,140.29	8,841.74	8,866.94 (67.62)
Land use value	—	1,250.00	1,250.00	1,250.00 (9.53)
Depreciation on fixed assets	—	2,834.60	2,282.47	2,723.80 (20.77)
Interest on fixed assets @ Tk. 10% per annum)	—	283.46	228.25	272.38 (2.08)
Sub-Total :	—	4,368.06	3,760.72	4,246.18 (32.38)
Total cost of production / ha	—	13,508.35	12,602.46	13,113.12 (100)
Cost of production Tk./kg	—	0.26	0.23	0.24 (0.0)
Gross return/ha @ Tk. 2000/ton	—	105,410.00	108,690.00	71,366.00 (0.0)
Gross margin/kg (Tk.)	—	1.83	1.84	1.75 (0.0)
Net margin/kg (Tk.)	—	1.74	1.77	1.63 (0.0)
B : C ratio	—	6.80	7.62	4.44 (0.0)

Figures in parentheses are percentages.

TABLE 8. COST OF PRODUCTION OF NAPIER / ha AT SAVAR DAIRY FARM (1989-91)

Items of cost	Cost of production (Tk. / ha)			
	1989	1990	1991	Average
Fuel cost (ploughing, harvesting, carrying, chopping etc.)	1,253.57	2,714.65	1,509.05	1,825.76 (13.24)
Human labour cost	4,029.63	4,753.32	4,869.46	4,417.47 (32.04)
Seed cost	197.60	197.60	197.60	197.60 (1.43)
Fertilizer cost	111.50	1,629.01	2,296.46	1,678.99 (12.18)
Irrigation cost	1,223.34	1,501.19	1,259.33	1,327.95 (9.63)
Interest on operating capital @ Tk. 10% per annum)	78.16	103.96	101.32	94.48 (0.69)
Sub-Total	7,893.80	10,499.73	10,233.22	9,542.25 (69.20)
Land use value	1,250.00	1,250.00	1,250.00	1,250.00 (9.07)
Depreciation on fixed assets	3,220.52	2,834.60	2,282.47	2,723.80 (19.75)
Interest on fixed assets @ Tk. 10% per annum)	322.05	283.46	228.25	272.38 (1.98)
Sub-Total :	4,792.57	4,368.06	3,760.72	4,246.18 (30.80)
Total cost of production / ha	12,646.37	14,867.79	13,993.94	13,788.43 (100)
Cost of production Tk./kg	0.17	0.31	0.39	0.26 (0.0)
Gross return/ha @ Tk. 2000/ton	146,628.00	94,736.00	72,518.00	104,628.00 (0.0)
Gross margin/kg (Tk.)	1.89	1.78	1.72	1.82 (0.0)
Net margin/kg (Tk.)	1.83	1.69	1.61	1.74 (0.0)
B : C ratio	10.59	5.37	4.18	6.59 (0.0)

Figures in parentheses are percentages.

in 1989 to 36.259 ton/ha in 1991. The production cycle of Napier was for 5 years and the yield rate declined in the later years of the production cycle. The average yield of Napier was 52.314 ton/ha during 1989-91 (table 2).

The cost structure showed that human labour cost was highest (32.0%) followed by depreciation charges on fixed assets (19.8%), fuel cost for ploughing, carrying, chopping etc. (13.2%), cost of fertilizer (12.2%), irrigation cost (9.6%), land use value (9.1%), interest on fixed and operating capital (2.7%) and seed (1.4%). The cost of production of Napier was Tk. 0.26/ka.

Gross return analysis of Napier revealed that gross margin/kg, net margin/kg and B:C ratio were Tk. 1.82/kg, Tk. 1.74/kg and 1:6.59, respectively.

High-land and low-land para

The cost of production of high-land and low-land Para /ha are presented in tables 9 & 10. It can be noticed from the tables that the average cost of production of high-land para was higher (TK. 16,363.07/ha than the low-land Para (Tk. 10,349.86/ha). This is due to the fact that the low-land Para did not require any irrigation. Moreover, the cost of production of high-land Para/ha increased but did not show any specific trend while the cost of production of low-land Para/ha has shown an increasing trend over

the years. The yield of high-land and low-land para/ha did not show any specific trend and there is no noticeable yield difference between them. The average yield/ha of high-land and low-land Para were 38.609 tons and 38.943 tons, respectively (table 2).

In the case of high-land Para, the highest cost was incurred for irrigation (30.0%), followed by human labour (23.4%), depreciation charges on fixed assets (16.7%), fuel for ploughing, harvesting, carrying, chopping etc. (11.1%), fertilizer (8.0%), land use value (7.6%), interest of fixed and operating capital (2.3%) and seed (0.9%).

For low-land Para, the highest cost (39.1%) was incurred on human labour followed by depreciation charges on fixed assets (26.3%), land use (12.1%), fuel for ploughing, harvesting, carrying, chopping etc. (11.7%), fertilizer (6.2%), interest on fixed and operating capital (3.1%) and seed (1.5%). The cost of production of Para was Tk. 0.27 (low-land) and Tk. 0.42 (high-land)/kg, respectively.

Gross return analysis revealed that gross margin/kg, net margin/kg and B:C ratio were Tk. 1.69/kg, Tk. 1.58/kg and 1:3.72 for high-land para and Tk. 1.84/kg Tk. 1.73 /kg and 1:6.53 for low-land para, respectively. It is noticeable that low-land para is more profitable than high-land para at Savar Dairy Farm.

TABLE 9. COST OF PRODUCTION OF HIGH-LAND PARA / ha AT SDF (1989-91)

Items of cost	Cost of production (Tk./ha)			
	1989	1990	1991	Average
Fuel cost (ploughing, harvesting, carrying, chopping etc.)	1,253.57	2,714.65	1,509.05	1,815.76 (11.10)
Human labour cost	3,436.83	3,908.72	4,128.46	3,824.67 (23.38)
Seed cost	154.38	154.38	254.38	154.38 (0.94)
Fertilizer cost	1,478.71	1,131.26	1,323.57	1,311.18 (8.01)
Irrigation cost	3,475.59	5,106.157	6,150.30	4,910.68 (30.01)
Interest on operating capital @ Tk. 10% per annum)	81.66	108.46	110.55	100.22 (0.61)
Sub-Total	9,880.74	13,123.63	13,376.31	12,116.89 (74.05)
Land use value	1,250.00	1,250.00	1,250.00	1,250.00 (7.64)
Depreciation on fixed assets	3,220.52	2,834.60	2,282.47	2,723.80 (16.65)
Interest on fixed assets @ Tk. 10% per annum)	322.05	283.46	228.25	272.38 (1.66)
Sub-Total :	4,792.57	4,368.06	3,760.72	4,246.18 (25.95)
Total cost of production / ha	14,673.31	17,491.69	17,137.03	16,363.07 (100)
Cost of production Tk./kg	0.39	0.44	0.45	0.42 (0.0)
Gross return/ha @ Tk. 2000/ton	76,000.00	79,772.00	75,886.00	77,218.00 (0.0)
Gross margin/kg (Tk.)	1.74	1.67	1.65	1.69 (0.0)
Net margin/kg (Tk.)	1.61	1.56	1.55	1.58 (0.0)
B : C ratio	4.18	3.56	3.43	3.72 (0.0)

Figures in parentheses are percentages.

TABLE 10. COST OF PRODUCTION OF LOW-LAND PARA / ha AT SAVAR DAIRY FARM (1989-91)

Items of cost	Cost of production (Tk./ ha)			
	1989	1990	1991	Average
Fuel cost (ploughing, harvesting, carrying, chopping etc.)	815.82	1,460.412	1,363.83	1,213.35 (11.72)
Human labour cost	3,881.43	3,982.82	4,276.66	4,046.97 (39.10)
Seed cost	154.38	154.38	154.38	154.38 (1.49)
Fertilizer cost	580.50	4,02.86	932.23	638.53 (6.17)
Irrigation cost	—	—	—	—
Interest on operating capital @ Tk. 10% per annum)	45.27	50.00	56.06	50.44 (0.49)
Sub-Total	5,477.40	6,050.47	6,783.16	6,103.68 (58.97)
Land use value	1,250.00	1,250.00	1,250.00	1,250.00 (12.08)
Depreciation on fixed assets	3,220.52	2,834.60	2,282.47	2,723.80 (26.32)
Interest on fixed assets @ Tk. 10% per annum)	322.05	283.46	228.25	272.38 (2.63)
Sub-Total :	4,792.57	4,368.66	3,760.72	4,246.18 (41.03)
Total cost of production / ha	10,269.97	10,418.53	10,543.88	10,349.86 (100)
Cost of production Tk./kg	0.27	0.26	0.27	0.27 (0.0)
Gross return/ha @ Tk. 2000/ton	75,772.00	79,966.00	77,920.00	77,886.00 (0.0)
Gross margin/kg (Tk.)	1.86	1.85	1.83	1.84 (0.0)
Net margin/kg (Tk.)	1.73	1.74	1.73	1.73 (0.0)
B : C ratio	6.38	6.68	6.39	6.53 (0.0)

Figures in parentheses are percentages.

Cost of silage production

Silage preparation cost of Maize, Napier and Jowar is presented in table 11. It can be seen from the table that the per Kg silage preparation cost of Maize, Napier and Jowar remained uniform over the years. It was the highest

(Tk. 0.06/kg) in 1991 and the lowest (Tk. 0.04/kg) in 1989 with an average of Tk. 0.05 for each of them. The cost of silage production/kg showed that it was the highest (Tk. 0.71/kg) for Maize followed by Jowar (Tk. 0.33/kg) and Napier (Tk. 0.31/kg). The explanation is that the per

TABLE 11. COST OF SILAGE PREPARATION / kg OF MAIZE, JOWAR AND NAPIER AT SAVAR DAIRY FARM

Silage preparation cost (Tk / kg)	Maize				Jowar				Napier			
	Year											
	1989	1990	1991	Average	1989	1990	1991	Average	1989	1990	1991	Average
Fuel cost for chopping	0.011	0.012	0.012	0.013	0.011	0.012	0.015	0.013	0.011	0.012	0.015	0.013
Labour cost for handling	0.014	0.015	0.019	0.016	0.014	0.015	0.019	0.016	0.014	0.015	0.019	0.016
Amortization cost for silage pit	0.017	0.018	0.023	0.019	0.017	0.018	0.023	0.019	0.017	0.018	0.023	0.019
Total cost (Tk./kg)	0.042	0.045	0.057	0.048	0.042	0.045	0.057	0.048	0.042	0.045	0.057	0.048
Production cost (Tk./kg)	0.57	0.53	0.92	0.66	0.26	0.19	0.36	0.28	0.17	0.31	0.39	0.26
Total cost of silage production (Tk./kg)	0.61	0.58	0.98	0.71	0.30	0.24	0.42	0.33	0.21	0.36	0.45	0.31

kilogram cost of production of Maize was the highest (Tk. 0.66) followed by Jowar (Tk. 0.28) and Napier Tk. 0.26).

Conclusion

The cost analysis of all seasonal fodders, such as Maize, Jowar, Cowpea and Oat and all perennial fodders, such as Para and Napier of Savar Dairy Farm for the period of 1989-91 showed that the cost of cultivation of Jowar/ha was the highest (Tk. 20,944.18) and the cost of cultivation of Low-land Para was the lowest (Tk. 10,349.86). The per kilogram cost of production of Maize was the highest (Tk. 0.66) and the lowest was for Oat (Tk. 0.24). The highest acreage of land was allocated to high-land Para (33.8%) and the lowest acreage (2.7%) was devoted to cowpea. The highest yield (74.15 ton/ha) was recorded for Jowar and the lowest (25.79 ton/ha) was recorded for Maize. The per kilogram cost of silage production was the highest (Tk. 0.71 for Maize and the lowest (Tk. 0.31) was for Napier. To give a new impetus to production of fodders, the existing land use planning of SDF need to be changed. The fodders which have a higher yield/ha and a lower cost of production/kg as well as lower cost of production/ha should be awarded higher acreage of land.

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