Saudi Journal of Economics and Finance (SJEF)
Abbreviated Title: Saudi J. Econ. Fin.
A Publication by "Scholars Middle East Publishers", Dubai, United Arab Emirates

ISSN 2523-9414 (Print)
ISSN 2523-6563 (Online)

Value Chain Analysis of Sesame Varieties in Some Selected Areas of Bangladesh

R. Sultana[1*], R. Haque[2], M. H Rahman[2], M J Alam[3]
[1]Scientific officer, Bangladesh Institute of Nuclear Agriculture, BINA, Mymensingh, Bangladesh
[2]Senior Scientific officer, Bangladesh Institute of Nuclear Agriculture, BINA, Mymensingh, Bangladesh
[3]Director, Bangladesh Institute of Nuclear Agriculture, BINA, Mymensingh, Bangladesh

***Corresponding author**
R. Sultana

Article History
Received: 15.05.2018
Accepted: 30.05.2018
Published: 30.06.2018

Abstract: The study aimed to examine value chain of sesame varieties in some areas of Bangladesh. The specific objectives were i) to estimate the cost and return of Binatil-1and Binatil-2, ii) To identify the value chain of Binatil-1 and Binatil-2 iii) To determine the constraints of Binatil-1 and Binatil-2 cultivation; and iv) to suggest recommendations for policy guidelines. Both primary and secondary data were used for this study. Descriptive statistics analysis using average, percentage, ratio, etc. and value chain analysis were done in this study. The average cost of production of Binatil is BDT. 30341.08 per hectare and yield is 1.23 t ha^{-1}; which indicates to a production cost of BDT 24.81/kg. The average human labour cost was BDT 19803.83 per hectare; fertilizer cost was BDT. 3990.84 and land preparation cost was BDT 3164.84 per hectare. The cost of human labour, fertilizer and land preparation are the major cost items of Binatil production. The average price for Binatil 1& Binatil 2 was BDT 38 and net return was BDT 16306.42. In case of Binatil-1, producer share was 65 percent for value chain-I and 55 percent for value chain-II and it was 63 and 56 percent respectively for Binatil-2.
K**eywords:** Sesame, Profitability, Value chain, marketing efficiency, Price spread.

INTRODUCTION

Sesame (til) an oilseed crop and is one of the oldest crops in the world cultivating in Asia for over 5000 years [1]. The crop has early origins in East Africa and in India [2, 3]. In reality, sesame is mostly grown under moisture stress with low management input by small holders [4]. The world produces about 3 million metric tons of sesame seeds every year on an average. About 60 to 65 countries produce these seeds out of which Asian and African countries are the key sesame seeds producers. The top five sesame seeds producers countries like; Myanmar, India, China, Sudan and Tanzania produce about 70% of the total amount. Some of the other countries which too produce considerable amounts of sesame include Uganda, Nigeria, Bangladesh, Pakistan, Mexico and Thailand. The global sesame exports are estimated to be about 0.5 to 0.6 million m tons; where in India, China and Mexico are the leading sesame seeds producers & suppliers [5]. In Bangladesh it is grown in almost all districts but grows well in greater Khulna, Faridpur, Pabna, Dinajpur, Rajshahi, Jessore, Kustia, Dhaka, Jamalpur and hilly districts. It is the second major oil-producing crop in the country. Binatil 1& Binatil 2 contain about 40-52% oil. Average sesame yield in Bangladesh is about 957 kg per hectare. Currently, about 38,923 hectare of land are under sesame cultivation and annual production is about 37,260 m tons. Sesame is cultivated in both kharif and autumn seasons, but two-third sesame is produced in kharif season. High land with sandy loam is best suited for sesame cultivation.

Sesame production is increasing day by day. The highest area and production at 2015-16 were 40080.97 hectare and 37000 m tons, respectively [6]. The lowest was in 2011-12 .i.e. area 30000 hectare and production was 33198.38 m tons, respectively (Fig-1).

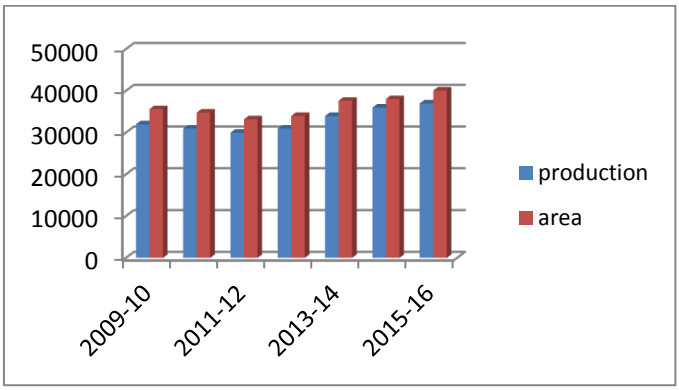

Fig-1: Sesame production in Bangladesh in different year

The challenges of sesame marketing can be addressed through a better understanding of the linkages between the farmers, traders and other actors along the commodity value chain. The value chain concept is a systems approach that draws from different disciplines; as a systems approach it combines component and functional relationships [7].

MATERIAL AND METHODS

Sampling technique

Study area

Three districts (Magura, Kustia, Jessore) were selected for sesame production and local market system survey, and Siddique Bazar of Dhaka district was selected for urban retail market survey. The study was conducted in three upazila of each district on the basis of intensive sesame cultivation area. Besides two khaja producing mill one at kumarkhali upazila from Kustia district and other at savar (Nabinagar) from Dhaka district were also selected purposively to conduct present study.

Sampling procedure

Multi-stage stratified simple random sampling techniques were followed for the selection of district, upazila, block and market for the collection data. Then the populations of block and market were grouped into different strata like; farmer, faria, bepari etc. and the simple random sampling technique was used for drawing the desired sample from each strata.

Sample size

A total of 130 respondents consisting of 90 sesame growers and 40 sesame traders were selected as a sample size. At each district, production and market information were collected from 30 farmers, 4 input dealers, 5 Farias, 5 Beparies, 5 Paikers, 9 retailers (local), 4 Arathdars. Finally, to complete the study 8 (urban) retailers of sesame were selected from Siddique Bazar of Dhaka city.

Analytical Technique

Cost and return analysis

Following profit equation was employed to assess the profitability of sesame production.

Net return/profit of producer

$$\Pi = P_F Q_F - (TVC+TFC)$$

Where,

Π = Profit of producer per hectare
P_F = Per unit price of sesame (Tk/kg)
Q_F = Quantity of sesame (kg/ha)
TVC = Total variable cost of sesame producer
TFC = Total fixed cost of sesame producer

The total cost (TC) is composed of total variable costs (TVC) and total fixed costs (TFC). TVC includes costs of human labour (both family labour and hired labour, wherein the cost of family labour was estimated by imputing market wage rate), mechanical power; seed, manure, chemical fertilizers; pesticides; and irrigation. TFC includes land rent (if owned land is used then the imputed value of market rate of land rent is applied) and interest on operating capital. The gross return (GR) is computed as total output multiplied by the market price. Profits or gross margin

(GM) is defined as GR–TVC, whereas the Net return (NR) is defined as GR–TC. Finally, the Benefit Cost Ratio (BCR) is computed as GR/TC [8].

Marketing margin of traders

Marketing Margin = Gross margin –Marketing cost
Gross Margin =Sale price- Purchase price

MARKETING PERFORMANCE

Marketing performance was evaluated using different measures of marketing efficiency as described by Shepherd [9], and Acharya and Agarwal [10]. In the present study, the efficiency of marketing was investigated by examining price spread, Producer's share, estimating efficiency. The methods for studying these estimates are given in the following.

I. Price spread = Price paid by consumers – Price received by the Producer

$$\text{II. Producers share (\%)} = \frac{\text{Price received by the Producer}}{\text{Price paid by the consumer}} \text{ X } 100$$

RESULT AND DISCUSSION

The study goes through the production and marketing system analysis of sesame aiming to fulfill the objectives of the study. The results are presented and discussed below regarding production, marketing and price related information of sesame specifically.

Cost of Sesame cultivation

The average cost of production of sesame BDT. 30342.08/ hectare and with an average yield is 1.22 T/ hectare; which indicate to a production cost of Tk.24.82/kg. The average selling price of sesame producer is BDT 38/kg. The total human labour cost is BDT. 16680, fertilizing cost is BDT. 3590.34 And irrigation cost is BDT.1145.31 per hectare. The cost of human labour, fertilizer and land preparation are the major cost items of Binatil production (Table-1).

Table-1: Summary on cost analysis of Sesame (Til) production in Jessore, Kushtia, Magura district
BDT ha^{-1}

Cost Component	Binatil-1	Binatil-2	Average
Hired labour (man-days/ha)	16686.13	16531.12	16608.63
Land preparation	3209.13	3120.22	3164.68
Seed	990.59	1191	1090.80
Fertilizer	3990.08	3190.6	3590.34
Insecticide	390.65	295.45	343.05
Irrigation	1198.27	1092.35	1145.31
Interest on operating capital	1336.78	1067.61	1202.20
Total variable cost	27801.63	26488.35	27144.99
Total Fixed cost	3451.37	2939.06	3195.23
Total Cost	31253.70	29430.46	30342.08

Financial profitability of Sesame production

The yield of Binatil-1 and Binatil-2 are 1.1 t/ha and 1.3 t/ha, respectively. Average gross return and net return of Binatil-1 are BDT. 45123.12 and BDT.13869.42 respectively and BDT. 481743.27 and 18743.81 for Binatil- 2 respectively**.** The benefit cost ratio (BCR) for Binatil-1is 1.44 and For Binatil-2 is 1.64, which indicated that sesame cultivation is profitable in the study areas (Table-2).

Table-2: Per hectare yield and gross return of Sesame (Til) production among the study areas

Item	Binatil-1	Binatil-2	Average
Yield (kg)	1157	1302	1229.50
Price (BDT kg^{-1})	39	37	38
Gross return (BDT ha^{-1})	45123.12	48174.27	46648.50
Total variable (BDT ha^{-1})	27801.63	26500.00	27146.29
Total cost	31253.70	29430.46	30342.08
Net Return (Full cost Basis)	13869.42	18743.81	16306.42
Benefit Cost Ratio (BCR)	1.44	1.64	1.54

Flow charts showing that highest percentage are captured by Aratdar. On average, we are consuming 47 percent and exporting percent of the total production of Binatil 1& 2. Only 15 percent are hold by retailer.

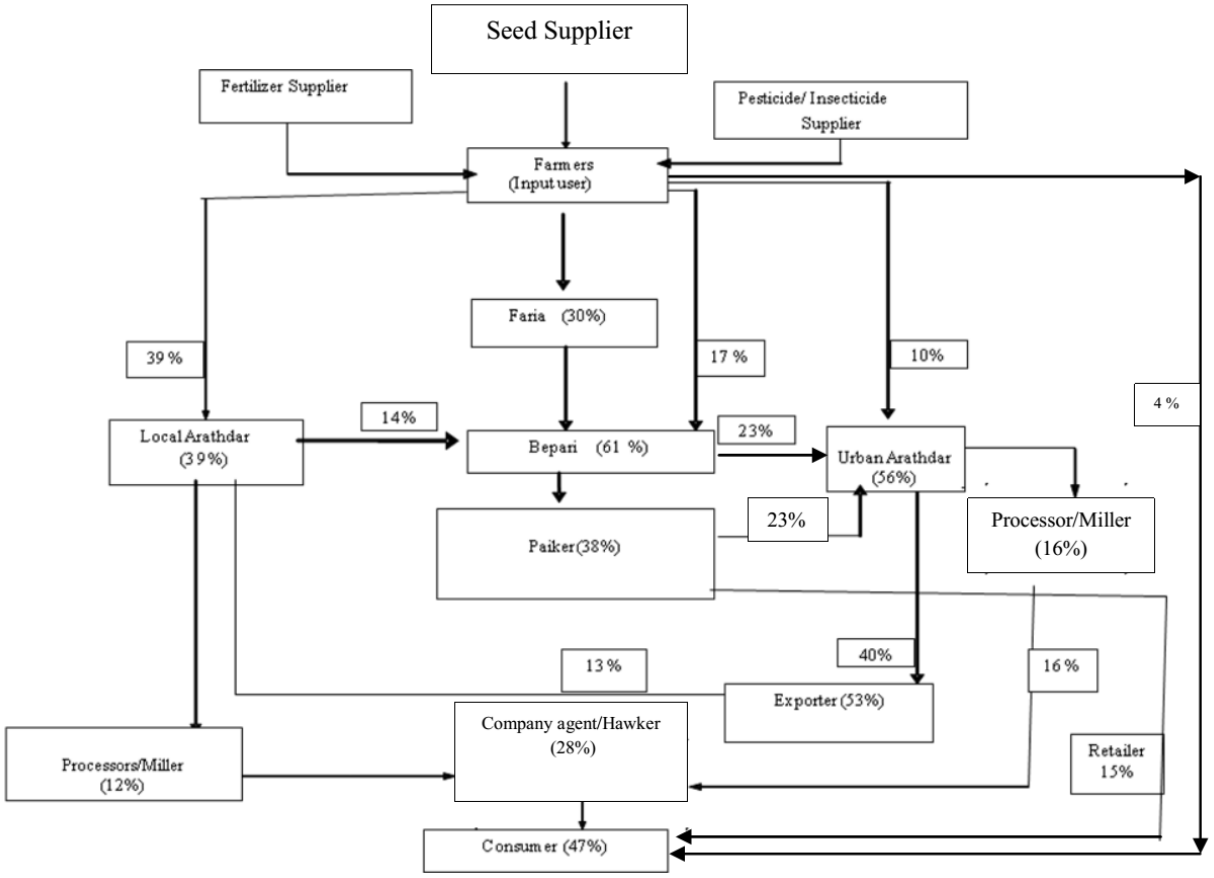

Fig-1: Flow diagram of Binatil marketing among the study areas

The following marketing chains were identified in case of sesame marketing in Bangladesh

Chain-i: Farmer > Faria > Bepari>Paiker> Urban Aratdar >Processor> Company agent >Consumer
Chain-ii: Farmer > Faria > Bepari>Paiker> Urban Aratdar >Processor> Hawker >Consumer
Chain-iii: Farmer > Faria > Bepari > Urban Aratdar >Processor> Company agent >Consumer
Chain-vi: Farmer > Faria > Bepari > Urban Aratdar >Processor> Hawker >Consumer
Chain-v: Farmer >Local Arathdar > Processor> Company agent >Consumer
Chain-vi: Farmer >Local Arathdar > Processor> Hawker >Consumer
Chain-vii: Farmer > Faria > Bepari > Paiker>Retailer>Consumer
Chain-viii: Farmer > Faria > Bepari > Paiker>UrbanAratdar > Exporter
Chain-ix: Farmer> Faria > Bepari > Urban Aratdar >Exporter
Chain-x: Farmer> Local Aratdar >Exporter
Chain-xi: Farmer >Consumer

Characteristics of actors involved in the marketing chain

Faria

Faria is a petty trader or small scale business that purchases oil seed from the producer in the village or in the local market and offer the same to the arathdar or bepari. Sometimes he sells his produce directly to the rural retailer or consumers.

Bepari

Bepari is a professional wholesale trader who make his purchase from producer at the local market, bring their consignment to the urban wholesale market and sell them to the paikar and retailer through arathdar (commission agent). Sometimes he buys til from the faria in local market.

Arathdar

Arathdaris a commission agent who has a fixed establishment and operates between bepari and retailers, or between farmer and paiker, or between bepari and paiker or between faria and bepari. They take commission from both of the parties but generally, they do not follow any standard rule to take commission.

Paiker

Wholesaler in consuming area is known as paiker, who purchase vegetables from bepari through arathdar and sell those to the retailer or consumer.

Retailer

The retailer, the last link in the marketing channel, buys til/khaja from arathdar or wholesaler/paiker/ Khaja producing company and sells these to the consumer.

Marketing margin of the different intermediaries involved in the marketing chain

Marketing margin is the difference between the price paid by the consumer and price received by the producers. It is the price of all utility adding activities and functions that are performed by the intermediaries [11]. Value is added when products pass different stages and move from one intermediary to another [12]. From table 3 it was found that farmer's selling price was Tk. 38 and after processing or adding value it become Tk. 95 for Khaja producer and Tk. 200 per kg for oil producer. It is also revealed from the study that the value addition of the Faria, Bepari, Paiker, Arathdar and retailer are BDT 311, BDT 170.77, BDT 253, BDT 512, and BDT 720 per quintal, respectively. Among the intermediaries the retailer added more value than other actors involved in the marketing chain and followed by arathdar, faria, paiker, and bepari.

Table-3: Net Margin (NM) and value add of different intermediaries of Binatil Marketing

BDT Qt^{-1}

Particulars	Sale price	Purchase price	Gross Margin	Marketing cost	NM
Farmer	3800	0	-	-	
Faria	4300	3800	500	189	331
Bepari	4700	4300	400	229.33	170.77
Paiker	5100	4700	400	147	253
Aratder	5800	5100	700	178	512
Retailer	6500	5100	1400	680	720
Exporter	8600	5800	2800	-	-
Processors/Tiler khaja producer (after packaging)(only for Binatil-1)	9500	5800	3700	-	-
Processors/ (Oil producer) i) Paiker ii) Retailer	12500 15000 20000	5800 12500 15000	6700 2500 5000	-	-

Price spread and producer share in value chain

In case of Binatil-1 producer share was 65 percent for value chain-I and 55 percent for value chain-II and it was 63 and 56 percent respectively for Binatil-2. It was also observed that price spread was lower and producer share was higher in marketing chain-I than the marketing chain-II. So marketing chain-I is more efficient than marketing chain-II Table-4.

Table-4: Price spread and producer share in value chain of Binatil-1 and Binatil-2

Binatil	Chain	Consumer price	Producer price	Price spread	Producer share (%)
Binatil-1	Chain-1	60	39	21	65
	Chain-2	70	39	31	55
Binatil-2	Chain-1	58	37	21	63
	Chain-2	66	37	29	56

Constraint in Binatil production and marketing

Farmers and traders are demanding some facilities in producing and marketing these varieties which are given below:

Majority of these facilities are availability of seed at proper time (25%), providing training about sesame production (32%), disease resistant variety (20%), ensuring credit facilities (23%) from farmer side and Purity of seed (72%), transportation facilities (24%), implementation of government rules and regulation (16 %) were the major problem from trader side.

Recommendations for policy guidelines

To solve the major farmers and traders' problem following recommendations may be suggested as: i) to disease resistant variety, more research are needed ii) quality seeds should be ensure timely and iii) more extension and training services must be enhanced

CONCLUSION

The study revealed that the main actors involved in the marketing chain of sesame are producer, Faria, Bepari, Aratdar, Paiker, and retailer. It was observed from the study that both varieties are profitable and have great potentiality. Per hectare net return are BDT 18743.81 and BDT 13869.42 and BCR are 1.64 and 1.44 for Binatil-2 and Binatil-1, respectively. Binatil-1 are using in making Khaja (a delicious food) and there are huge demands for seeds of Binatil-2 especially in China and European countries. If we could increase our production, country will be benefitted.

REFERENCES

1. Bisht, I. S., Mahajan, R. K., Loknathan, T. R., & Agrawal, R. C. (1998). Diversity in Indian sesame collection and stratification of germplasm accessions in different diversity groups. *Genetic Resources and Crop Evolution*, *45*(4), 325-335.
2. Nayar, N. M., & Mehra, K. L. (1970). Sesame: its uses, botany, cytogenetics, and origin. *Economic Botany*, *24*(1), 20-31.
3. Bedigian, D. (2003). Evolution of sesame revisited: domestication, diversity and prospects. *Genetic resources and crop evolution*, *50*(7), 779-787.
4. Çağırgan, M. İ. (2006). Selection and morphological characterization of induced determinate mutants in sesame. *Field crops research*, *96*(1), 19-24.
5. Agro, H. L. (2016). https://hlagro.com/blog/the-top-5-sesame-seed-producing-countries-in-the-world
6. Statistics, B. B. O. (2017). Bangladesh Bureau of Statistics, Yearbook of Agricultural Statistics of Bangladesh. Government of the People's Republic of Bangladesh, 36-37.
7. Da Silva, C. A., & de Souza Filho, H. M. (2007). *Guidelines for rapid appraisals of agrifood chain performance in developing countries*. Rome: Food and Agriculture Organization of the United Nations.
8. Rahman, S., & Rahman, S. (2014). Exploring the potential and performance of maize production in Bangladesh. *International Journal of Agricultural Management*, *3*(2), 99-106.
9. Shepherd, G. M. (1972). Synaptic organization of the mammalian olfactory bulb. *Physiological reviews*, *52*(4), 864-917.
10. Acharya, S. S. (1998). Agricultural marketing in India: Some facts and emerging issues. *Indian journal of Agricultural economics*, *53*(3), 311.
11. Kohls, R. L., Uhl, J. N. (2005).*Marketing of agricultural products*.*9th edition*. Macmillan Publishing co., Inc., New York.
12. Alam, M. F., Palash, M. S., Mian, M. I. A., & Dey, M. M. (2012). Marketing of major fish species in Bangladesh: A value chain analysis. *Food and Agricultural Organization*, 10-23.