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Research Note

PESTICIDE MARKETING SYSTEM IN BANGLADESH

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ABSTRACT

This study is an attempt to examine marketing system and marketing efficiency of pesticides in Bangladesh. For this study, 81 traders and 22 regional offices of company were interviewed from four greater districts in Bangladesh. Company sells pesticides through their regional office to the appointed distributors who thereby sell to either wholesaler cum retailers or retailers. Finally, wholesalers and retailers dispose of their product directly to the farmers. Distributors enjoy more facilities than other traders. Both cash and credit sale are common at all level of marketing. Generally pesticides are sold at a price lower than maximum retail price (MRP) to the farmers.

Government monitoring system is not effective. The seasonal price variation arises mainly due to change in demand and this variation is less for the common used pesticides. There exist significant spatial price variation, which indicates market imperfection at all level. On an average, retailers received the highest margin or profit followed by wholesalers and distributors. The traders obtained lower profit from common pesticides of well-established company. Although total profit increases with the increase of volume of trade but it is reverse in case of per unit profit. However, return over investment is more or less same for all types of traders. Traders mentioned various problems in case of pesticides marketing.

I. INTRODUCTION

With the progressive modernization of agriculture in Bangladesh, the role of pesticides has become critically important. Modernization of agriculture implies increased use of modern inputs such as chemical fertilizer, irrigation and modern seeds, which provide a favourable climate for rapid growth of pests. Moreover, modern seeds are more susceptible to insect pests and diseases. The use of pesticides, however, carries several dangers. Non-optimal and non-judicious use of pesticides may result in a series of problems related to both loss of their effectiveness in the long run and certain externalities like pollution and health hazards. Rola and Pingali (1993) recognized that frequent application and use of very toxic chemicals increased risk of farmer health damage due to chemical exposure and indiscriminate pesticide use leads to larger pest related yield losses than not applying pesticides at all.

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Currently, government of Bangladesh, like other inputs, has withdrawn subsidies from pesticides and has placed their distribution in the hand of private traders. As a result, a number of private companies are now engaged in procurement/production and marketing of pesticides in Bangladesh. Because of few economic studies on pesticides in Bangladesh, information concerning their distribution system is scanty.

A case study in India on marketing of pesticides by Agrwal (1986) revealed that due to lack of fund, the farmers found it difficult to use the pesticides in desired quantity. Bulk breaking was an important problem as the poor farmers were unable to buy pesticides in bulk quantity. Sabur and Akter (1997) analysed some important features of existing marketing system and the use of pesticides in Bangladesh. Although total as well as per hectare use of all types of pesticides are found to increase since 1982/83, but this upward growth has been checked in the recent past of Bangladesh. The absolute as well as percentage margin of distributors was found higher than that of retailers because of distributor's lower marketing cost and imperfection of market at distributors' level. The companies, traders and farmers mentioned various problems related to pesticides marketing and use. In a study, Chand and Birthal (1997) examined the trend in pesticides use and its efficiency in Indian agriculture during pre- and post-green revolution periods. The study showed that the growth in pesticides use per hectare as well as per unit of agricultural production reached the peak during 1974-75 and started declining thereafter. Uddin (1998) concluded, based on concentration ratio, that the oligopolistic competition was present in the pesticide industry of Bangladesh. He also mentioned that the barrier of entry to this industry is very high, as huge amount of capital is needed to run this business. None of the earlier studies provided detail information on marketing system of pesticides in Bangladesh.

Several problems/questions are often raised about this input. First, optimum result from an input depends upon its supply at right quantity, in right form, at right places, at right time and right prices. About pesticides, there is a paucity of such information. Second, it is often said that the farmers are not using pesticides scientifically. Consequently, the environment is being polluted. Kwae (1986) discussed the nature of pesticides problems and effect of agricultural pesticide usage on human health, fish and wild life.

The present study is an attempt to examine the marketing system and marketing efficiency of pesticide in Bangladesh. It is believed that this study will contribute significantly in adding new knowledge on distribution of pesticides in Bangladesh.

II. METHODOLOGY

On the basis of highest pesticide use per hectare for Boro paddy, four greater districts from four divisions namely Comilla from Chittagong division, Mymensingh from Dhaka division, Jessore from Khulna division and Bogra from Rajshahi division were selected for this study. One or two Upazillas from each district was chosen based on highest pesticide used as well as IPM technology used areas. If an Upazilla where higher pesticide as well as IPM used was not found, two Upazillas, one as higher pesticides use area and another as IPM use area, were selected. Accordingly, Ishwargonj Upazilla from Mymensingh, • Sadar and Jhikargacha Upazillas from Jessore, Sadar and Sariakandi from Bogra and Burirchong and Laksham Upazillas from Comilla were selected.

Companies were ranked in descending order on the basis of their market share in the country. From the list of 28 pesticides companies, the first nine companies such as Noverties Limited, Padma Oil Company Limited, Shetu Corporation, Rohne-Poulenc Agrovet Limited, Auto Equipment Limited, McDonald Pvt. Limited, ACI limited, Alpha Agrovet Limited and SEMCO were selected for this study. Data were collected from 22 regional offices of the selected companies taking 7 from Comilla and 5 each from Bogra, Jessore and Mymensingh. It is mentioned that some of the companies in different places could not be interviewed because of their refusal to provide information.

Except Jessore, twenty traders were chosen from district town and selected Upazillas of each district. Because of the presence of higher number of trader, twenty-one traders were selected from Jessore. Care was taken so that all types of traders might include into the sample. Accordingly, 17 distributors, 30 wholesaler cum retailers, and 34 retailers were chosen for this study randomly. (Detail sample selection procedure is presented in Sabur & Molla, 2000)

Three sets of interview schedules for trader, regional office and head office were prepared after necessary pre-testing. Data related to 1997-98 crop season were collected during May to October 1998. Data from head office could not be collected due to their non-cooperation.

III. MARKETING SYSTEM

Marketing Channel:

Marketing channels of pesticides are presented in Fig. 1. Depending on the volume of sale and marketing activities, the participants in pesticide trade may be classified into four groups such as company, distributor, wholesaler cum retailer and retailer. They are described below.

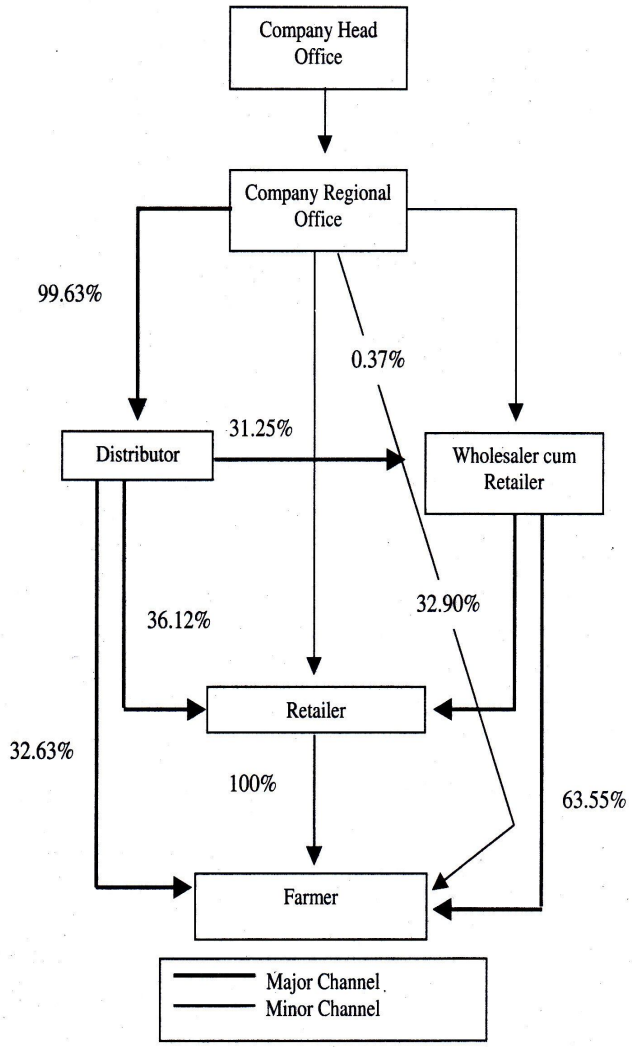
Company: Companies sell pesticides through their regional office. Company generally appoints one distributor in an Upozilla. The distributor may be same or different for different company. A person who wants to be a distributor has to apply to head office through regional office. The sale promotion officer or market promotion officer then investigates the persons' ability to be a distributor. If he is satisfied with applicants' cash money, FDR, experience etc, he recommends him for distributor. Finally, head office appoints the traders as distributor.

Company sells pesticides both in cash and credit. On an average, over 60% of product are sold in cash and the rest in credit. Most of the company sells their products in credit for a period of time after depositing some security money. But all dues must be paid after that period. Company receives dues from distributors on instalment basis. Generally, the time between two instalments period is 45 days. Over three-fourth of regional office mentioned that first delivery was made after signing contact.

Every company follows separate system of depositing security and the amount to be deposited differs across companies depending on the performance of the company, the existing demand of their product and the competition among the traders. The securities accepted by the companies are cheque, bank draft, cash money, F. D. R., insurance, C. C. loan, bank guarantee, and Pratirakha Sanchoy Patra. The highest 54% of company receive security as cheque followed by 37.50% as cash, 21% as bank draft, and 4% as mortgage of property. The security amount to be deposited ranges from Tk. 20,000 to Tk.2, 00, 000. Regional office, after collecting order from distributors, send pesticides by their own transport to the distributor's shop through sales promotion officer. In case of a company that does not have any regional office in a particular place, pesticides are sent directly from head office through sales promotion officer.

Distributor: They are large wholesale traders who mainly purchase pesticides from company and sell to wholesaler cum retailer, retailer and farmer. They buy about 90% of their product from company and sell nearly equal portions (each one-third) to

Fig. 1 Marketing Channel of Pesticides



wholesaler cum retailer, retailer and farmer (Table 1). A few distributors reportedly buy sometimes from other distributors. Generally, they purchase from company's

regional office. More than half of their product is purchased from company on credit. They sell about 60% of their products in cash to other traders. However, they sell mostly (82%) in cash to the farmers. Distributors enjoy more facilities than other traders. The facilities they enjoyed are: free transport facilities from company, credit purchase, receive more commission but pay less, receive various special bonus, get available credit from institutional sources, receive free sample, face no objection on pesticide use from farmer etc.

Wholesaler cum Retailer: Most of the wholesaler cum retailers (90%) purchase pesticide from distributors and sell either to the retailers or to the farmers. They buy two-thirds of their products from distributors and sell the same portion directly to the farmers (Table 1). Marketing/sale promotion officers sometimes develop personal relation with this type of traders and supply pesticides directly to them without providing information to the distributors by their own risk. In this case, the officer and wholesalers cum retailers share the commission. Company officers mainly supply pesticides in cash. They purchase only one-third of their product on credit from company. They sell both in cash and credit to the buyer. One-half of their products are sold to the farmers on credit.

Retailer: Retailers, the last link in the marketing chain, are petty traders who purchase pesticides mostly from the distributors and sell directly to the farmers. They buy eighty five percent of their products from distributors and the rest from wholesaler cum retailer and company (Table 1). They sell various commodities along with pesticides. In this stage, both cash and credit systems are equally important in case of transaction. Since retailers have direct contact with farmers, they have to face various objections regarding pesticides use such as low quality, ineffective in killing pests etc. from the farmers.

Farmer: Farmers are interested to purchase pesticides on credit. But they cannot purchase fully on credit. Farmers never pay all dues during crop seasons. They repay a portion of dues and at the same time purchase pesticides on credit. But they repay all dues after crop harvest. In case of poor harvest, they cannot pay the dues. In this case they pay the dues after harvest of next crop. For some farmers the dues remain unpaid year after year. But this type of incidence is very rare.

Table 1. Percentage of total product bought from and sold to different sources by different traders

(% of total product)

Type of Traders	Buy from			Sell to			
	Company	Distributor	Wholesaler cum Retailer	Distributor	Wholesaler cum Retailer	Retailer	Farmer
Company	-	-	-	99.63 (100.00)		-	0.37 (9.09)
Distributor	87.50 (100.00)	9.38 (37.50)	-	-	31.25 (62.50)	36.12 (100.00)	32.63 (100.00)
Wholesaler cum Retailer	32.42 (58.06)	66.29 (90.32)	1.29 (6.45)	-	3.55 (16.13)	32.90 (100.00)	63.55 (100.00)
Retailer	6.47 (11.76)	85.29 (97.06)	8.24 (20.59)	-	-	-	100.00 (100.00)

Figures in the parentheses indicate percentage of traders.

Transportation System:

Generally delivery van or pick up and hired truck are used to ship pesticides from factory to regional office and from regional office to distributors' shop. The company generally uses hired transports during peak period. Two-thirds of company use both own van and hired transport to ship products from head office to regional office whereas the same percentage of office use only delivery van to transport from regional office to distributors' shop. **In** three-fourth cases, both own and hired transports are used to ship products from distributors' shop to wholesalers' shops On the other hand, traders use rickshaw van, bicycle and head load to transport pesticides.

Location of Keeping Pesticides:

Mainly pesticides are stored in the factory warehouse of the company. Head office supplies pesticides to the regional office according to their demand. So more warehouses are not essential for regional office. One warehouse is possessed by 71 % of the office. Whereas 17% and 13% of them possessed 2 to 3 and 5 to 8 warehouses. The regional offices have their own or rented store house adjacent to the office. They store pesticides according to the types such as fungicides, insecticides herbicides etc. All company, especially the local companies, does not follow the international rules of selecting warehouse.

All regional offices are settled temporarily in an area. For that reason Company hires buildings for their regional office and warehouse. About 96% of warehouses are rented and the rest are either rented or owned. Most of the warehouses (83%) are

attached to the office. Only 13% regional office has separate warehouse. The average capacity of warehouse is 43 metric tons, which ranges from 4 m. tons to 450 m. tons.

Traders generally keep pesticides in their own shop. Only few of them (22%) keep pesticides in separate warehouse. Majority of the traders uses cupboard and self for keeping pesticides. Some of them keep their products on the floor. Generally liquid pesticides are kept in the cupboard and solid on the floor. Retailers keep pesticides and other products together *it)* the shop. Generally cartoon and polythin paper are used for packing pesticide5. Sometime they use sack for this purpose. Cent percent of traders use cartoon for packaging.

Method of Fixing price:

Generally company on the approval of the government fixes maximum retail prices (MRP). Cent percent of company follow this method. Some non-famous companies' regional office (13%) sells pesticides by adding cost and fixed profit to the factory price of pesticides. During peak or lean demand periods price is fixed in accordance with the market demand and supply situation. In case of high competition in the market, company fixes prices on the basis of other company's prices. Eight percent of office mentioned this type of system. Most of the regional offices (83%) reported that sale price remain same throughout the year.

Although maximum retail price (MRP) is fixed by the company, pesticides generally are not sold at that price. Seventy seven percent of traders fix sale price by adding cost and fixed profit to the purchase price. One-half of them determine price on the basis of their competitors' price. Only 35% sell pesticides at the price fixed by the company. Thirty percent of traders use bargaining method for fixing prices. More wholesaler cum retailer and retailer adopt adding cost and profit method for determining sale price. Whereas distributor sell their product at the price fixed by the company. In most cases pesticides are sold to the farmers at a price lower than MRP.

Method of Paying and Collecting Dues:

Two-thirds of the traders reported that they receiv--d products after paying dues within fixed date in one instalment. On the other hand more than one-half of them received products after paying dues partly.

About 60% of traders supply products to the buyers after paying dues within a fixed date in one instalment. More than half supply after paying dues partly. One trader adopts different methods at the same time. The distributors have to pay all

dues at or before the closing date of contact period to company. Before closing the contact period the distributors collect all dues from the wholesalers and retailers.

Commission:

Commission on MRP provided to traders is fixed on the basis of mutual agreement between pesticide company association and government. The present approved commission rate is 15% on MRP. But most of the companies blame each other that other company due to high competition in pesticide trade does not follow this rate. For selling more amounts of pesticides some companies offer more commission than the approved rate to the traders. Average commission extended by companies during 1993 to 1997 was found more or less same of 16%, which ranged from minimum 15% to maximum 26%.

No traders disclose correctly the commission they receive in case of pesticide trading. The distributors sell to the wholesalers or retailers after keeping 3% to 5% profit on their purchase price. The wholesalers or retailers sell to the farmers after keeping 5% to 7% profits on their purchase price.

Return of Unsold Pesticides:

About 63% of traders return unsold pesticides to company and the rest do not. Whereas only 22% take back unsold pesticides from their buyers. The traders receive other pesticides in lieu of unsold pesticides. Since company supply officially only to the distributor, majority (81%) of distributors can return expired pesticides to the company compared to other traders.

Dealership/Trade License:

All traders need license for carrying on their business. Upazilla Agriculture Officer issues dealership license for generally a period of two years considering experience in trade, educational qualification and training on pesticides use and marketing. This system of issuing license is not always followed due to the pressure of local influential group. As a result sometimes non-experienced and non-qualified persons may get license. License fee for distributor is Tk. 300 and for other traders is Tk. 75.

Promotional Activities:

Most of the regional offices (96%) are involved in promotional activities. The promotional activities include distribution of free sample, using signboard, informing buyers by their staffs etc. The annual promotional cost varies significantly among

regional offices of different companies. It is highest of Tk. 2 lakhs for Rohne Poulenc followed by Padma of Tk. 1.5 lakhs.(Table 2). The lowest cost of Tk. 15 thousand was incurred by Alpha. On an average, a company spent 0.57% of total value of pesticides sold for promotion in 1997. This percentage figure was the highest for Rohne Poulenc (3.50%) and the lowest for Auto Equipment (0.08%).

The traders are not directly involved in promotional activities. They simply hang company's leaflet, posters etc.- in their shop or supply to the other traders or farmers. Seventy three percent of the traders are involved in promotional activities. More distributors are involved in this activities compared with other traders.

Types of pesticides sold by traders:

The traders sell both solid and liquid pesticides but the quantity of solid pesticides sold is much higher than that of liquid pesticides. It is reported that about 70% to 80% of total pesticides are sold as solid. Among the solid pesticides sold by distributors, Furadan was the highest (about one-half of total quantity), followed by Basudin (16%), Thiovit (8.64%) and Diathene (6,83%). On the other hand, the highest 15.48% of total liquid pesticides are sold as Dimecron, followed by 13.71% as Nogos, 12.85% as Malathion and 10.97% as Dursban.

Unlike distributors, wholesalers and retailers sold the highest portion solid pesticides as Basudin, followed by Furadan, Sunfuran and Furataf. In case of liquid pesticides, Marshall was sold in the highest percentage, followed by Dursban, Dimecron and Sumithion.

Table 2: Annual Promotional cost incurred by different regional office in 1997

Name of company	Total value of pesticides sold (TK.)	Promotional Cost (Tk.)	Promotional cost as % of total sale
Rohne Poulenc	5711000	200000	3.50
Padma	40262000	150000	0.37
ACI	15049198	125000	0.83
Auto Equipment	15554317	11667	0.08
Shetu	10124175	20000	0.20
Macdonald	10166900	103334	1.02
Semco	24306167	75000	0.31
Alpha	1307392	15000	1.15
Average	15310143.63	87500.13	0.57

IV. MARKETING EFFICIENCY

The concept of efficiency seems simple, but it is complex to define and difficult to apply. A simple textbook definition says, "Marketing efficiency is the maximization of input-output ratio". Various authors used various indicators for measuring marketing efficiency. However, in this study the following indicators are used for measuring marketing efficiency.

(i) Monitoring of pesticide trade.

(ii) Seasonal price variation.

(iii) Spatial price variation.

(iv) Marketing cost and margin.

(v) Cost and return from trade.

Monitoring of Pesticide Trade:

Upazilla Agriculture office and Deputy Director (Agriculture) office monitor the pesticides marketing once or twice in a season. Seventy two percent of traders informed that government team came to monitor the pesticide trade. Majority of the traders reported that governmental vigilance team come once in a year. Monitoring system is not effective as the government officials do this function as their routine work.

Seasonal Price Variation:

Generally pesticides prices remain same throughout the year as mentioned by three-fourths of the traders. However, in the following cases, price may change.

a) In the peak demand period, particularly during the sowing period of Boro paddy, price of pesticides may increase.

b) Conversely, price may goes down during lean demand period.

c) Suddenly, company may raise price of their pesticides if demand expand due to epidemic of disease or severe insect attack.

d) Company generally increases price if taka is devalued or higher inflation prevails.

e) Price may be increased due to increase in production and marketing cost of company.

f) Price may goes down if competition among companies increase.

The seasonal price variation of selected pesticides is shown in Table 3.

Table 3. Seasonal Variation of pesticide prices.

Name of pesticides	Highest priced season		Lowest priced season		Difference between highest & lowest price
	Months	Price (Tk./kg. Or Tk. /100 ml)	Months	Price (Tk./kg. Or Tk. /100 ml)	
Basudin (solid)	Jan. -Feb. & June-July	88.00	March-May & August December	85.00	3.00
Thiovit (solid)	April-May	131.00	December-January	104.00	27.00
Ridomil (solid)	Rabi (Nov.-Dec.)	124.00	Kharip (June-July)	96.00	28.00
Fenfen (liquid)	May-June	70.00	January-February	67.00	3.00
Ronaster (liquid)	Jan. to March	88.00	Kharif (June-July)	75.50	12.50
Marshal (liquid)	May-June	65.00	January-February	52.00	13.00
Suntuf (liquid)	August-September	90.00	June-July	70.00	20.00
Cimbush (liquid)	March-February & May-June	129.55	October-November	107.80	21.75

The highest price of a pesticide prevails during seasons of crops in which it is applied and the lowest during off-season. That means the prices of pesticides mostly depend on their demand. In case of solid, the seasonal price variation is less for common used pesticide such as Basudin. Whereas liquid pesticide Fenfen exhibits the lowest seasonal variation. Since pesticides are non-perishable product and can be produce any time of the year, high seasonal price variation indicates that pesticides market is away from competitive situation.

Spatial price variation of pesticides:

Coefficient of variation (C.V) of prices in different areas is used for measuring the spatial variation of prices. Among the solid pesticides, Furadan shows the lowest spatial price variation for distributors, followed by Sunfuran, Furatuf and Basudin (Table 4). The Thiovit, Indofeel, and Ridomil were attributed by higher spatial price variation. For liquid pesticides, Dursban's price variation was the lowest, followed by Diazinon. All other liquid pesticides like Megafos, Marshal, Fenfen and Dimecron, show higher spatial price variation.

Table 4 Spatial variation of Distributors' sale price of Pesticides

(Tk./Kg, or Tk./litre)

Name of Pesticides	Mymensingh		Comilla		Jessore		Bogra		All Area	
	Average	C.V.	Average	C.V.	Average	C.V.	Average	C.V.	Average	C.V.
Furadan (kg)	76.50	2.77	74.83	0.39	75.00	3.77	76.50	2.26	75.77	2.24
Sunfuran(kg)	75.00	-	72.00	-	-	-	75.00	-	74.00	2.34
Furataf (kg)	-	-	75.00	-	73.00	-	77.50	0.91	75.60	2.58
Basudin (kg)	86.50	2.45	84.00	1.68	87.00	1.63	81.00	5.01	83.90	4.43
Ridomil (kg)	-	-	710.00	1.99	-	-	994.75	17.37	899.83	22.11
Indofeel(kg)	-	-	290.00	-	290.00	-	450.00	-	370.00	24.97
Thiovit (kg)	-	-	104.67	8.83	110.00	-	165.33	31.23	131.43	33.39
Dursban (lit)	-	-	465.00	4.56	471.75	6.52	495.00	1.01	479.79	4.43
Diazinon (lit)	540.00	5.24	550.00	7.71	537.00	-	520.00	-	539.50	4.69
Nogos (lit)	488.00	2.31	453.33	10.19	431.00	0.33	492.27	4.89	467.48	7.65
Dimecron	840.00	--	800.00	-	706.00	1.20	679.00	1.59	736.13	9.02
Fenfen (lit)	-	-	966.67	5.97	770.00	-	-	-	917.50	11.88
Marshal (lit)	-	-	-	-	535.00	3.96	500.00	22.63	517.50	13.42
Megafos (lit)	-	-	470.00	24.08	-	-	549.50	0.18	523.00	13.42

Retail prices show lowest variation in case of Furataf, followed by Sunfuran, Basudin and Furadan (Table 5). The other solid pesticides exhibit higher spatial price variation. In case of liquid pesticides, unlike distributors' price, Monotaf's price

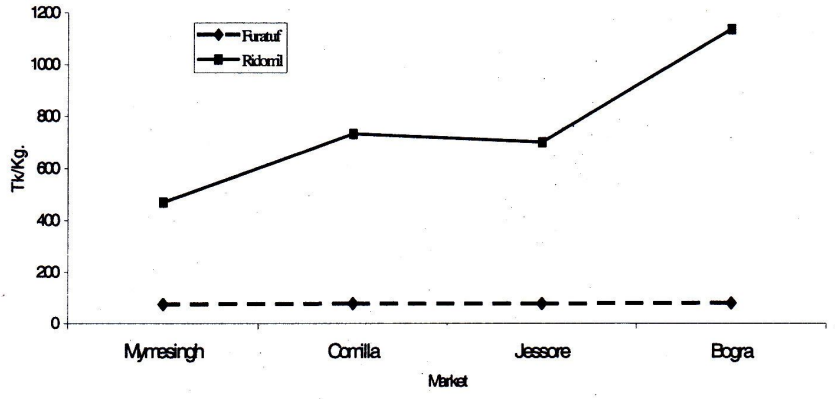
Table 5 : Spatial variation of retail price of pesticides.

(Tk./Kg, or Tk./litre)

Name of Pesticides	Mymensingh		Comilla		Jessore		Bogra		All Area	
	Average	C.V.	Average	C.V.	Average	C.V.	Average	C.V.	Average	C.V.
Furataf (kg)	75.00	-	76.67	3.77	76.50	2.77	79.25	3.36	78.00	3.59
Sunfuran (kg)	78.00	3.05	77.27	3.52	73.50	0.96	79.91	3.14	78.11	3.64
Basudin (kg)	87.24	2.70	85.38	4.26	87.78	3.77	85.93	6.07	86.52	4.38
Furadan (kg)	80.00	3.11	76.60	4.18	75.83	2.45	82.62	5.98	78.65	5.48
Indofeel (kg)	480	-	273.33	16.90	293.75	5.79	395.00	12.53	326.50	23.57
Ridomil (kg)	470.00	-	732.00	5.33	700.00	-	1136.92	11.99	980.50	25.58
Thiovit (kg)	164.25	67.68	105.00	-	121.30	3.89	-	-	131.67	42.24
Monotaf (lit)	560.00	-	515.00	9.61	500.00	4.00	-	-	515.00	6.70
Marshal (lit)	0	-	573.33	6.68	542.67	5.00	617.50	7.29	562.00	7.48
Megafos (lit)	-	-	-	-	517.50	6.76	580.00	10.49	544.29	9.99
Nogos (lit)	556.40	13.60	535.83	12.62	505.08	10.73	550.67	7.32	537.35	11.99
Dimecron (lit)	865.23	12.19	903.80	13.13	795.13	10.57	830.92	13.70	843.43	12.93
Dursban (lit)	480.00	0.00	532.40	22.69	475.00	8.19	527.14	6.26	511.31	15.95
Diazinon (lit)	595.73	12.31	820.00	37.94	541.40	2.93	613.33	9.49	596.06	16.86
Fenfen (lit)	860.00	-	1200.00	-	807.14	10.84	1000.00	-	871.00	17.09

variation was the lowest, followed by Marshal and Megafos. On an average, retail level price variation was found higher compared with distributors' level. Place to place price variation of common and more used pesticides such as Furadan, Furatuf and Basudin was much lower compared with less used pesticides such as Indofeel, Ridomit etc. Spatial price variation for distributors indicates that all distributors do not keep same percentage as commission. As companies supply pesticides at same price with same commission to all distributors, the price should be same if they sell after keeping same commission for them. This indicates market imperfection in both the levels.

Fig. 2. Spatial price variation of Pesticides



Marketing Cost of Company:

The average marketing cost of a company is estimated at 14.22% of total value of pesticides sold (Table 6). Among the cost items, company regional office spent the highest 38% of total marketing cost for paying salary of the staffs, followed by 26% for transporting products and 20% for paying commission to the traders. The other cost items in descending order are promotion, storage, administration and wastage.

Table 6. Average marketing cost of regional office.

Cost item	% of total sale	% of total cost
Transportation	3.69	25.95
Storage	0.83	5.84
Commission paid	2.82	19.83
Promotion	0.87	6.12
Salary	5.35	37.62
Administration	0.32	2.24
Wastage	0.17	1.20
Miscellaneous	0.17	1.20
Total	14.22	100.00

Marketing Margin of Traders:

Absolute as well as percentage margins of the selected pesticides were estimated for all types of traders and are presented in appendix tables 1 through 3. Distributors obtained the highest percentage margin of taka 10.87 from Thiovit. After Thiovit, the margins as well as net profits in descending order were obtained from Dursban, Indofeel, and Fenfen. Magafos showed the lowest margins for distributors. Wholesalers' percentage margins as well as profit were the highest for Dursban, followed by Magafos, Nogos and Fenfen. Wholesalers received the lowest margin from Indofeel. Retailers obtained the highest percentage margin as well as profit from selling Magafos. Next in descending order were Dursban, Fenfen, Indofeel and Nogos. On the other hand, Ridomil showed the lowest margin or profit for the retailers.

On an average, retailers received the highest margin or profit per Tk. 100 sale, followed by wholesalers cum retailers and distributors (Table 7). The retailers received profit of Tk. 6.59 per Tk. 100 sale whereas wholesalers and distributors received Tk. 4.60 and Tk. 4.10 respectively. The traders obtained lower margin or

Table 7 Marketing margins of different types of traders.

(Tk./kg. or Tk/litre)

Type of Traders	Average Purchase price	Average Sale price	Absolute margin	Percentage margin	Marketing cost	Net profit
Distributor	402.11	422.76	20.65 .	4.88	0.78	4.10
Wholesaler cum Retailer	404.32	430.70	26.38	6.12	1.52	4.60
Retailer	437.72	478.51	40.79	8.52	1.93	6.59

profit from the common pesticides like Basudin, Furadan, Magafos, and Dimecron etc. of well-established and reputed companies. On the other hand, higher margin was obtained from the products of new companies. The study, however, reveals that no one or two pesticides may be considered as the most profitable pesticides for all types of traders.

Cost and Return from Pesticides Trade:

Although the average profit earned by distributors was 24 times higher than retailer, their per unit profit was the lowest (Table 8). Per unit profit of wholesaler cum retailer was three times higher than that of distributor. Total profit increase with the increase of volume of trade but it is reverse in case of per unit profit. This may be happened due to the fact that most of the distributors showed profit lower intentionally. Per unit marketing cost of distributor was the lowest due to the fact that they do not incur transportation cost in case of pesticide marketing. However, return over investment was more or less same for all type of traders. Wholesalers' return over investment was slightly higher compared with other type of traders.

Fig. 3. Marketing margin, cost & profit of different traders

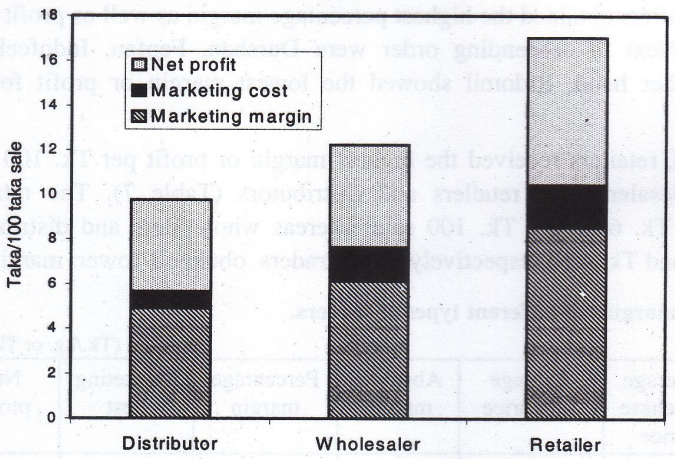


Table 8. Purchase, Sale, Cost & Profit of different Pesticides Traders

(Taka)

Particulars	Distributor	Wholesaler cum Retailer	Retailer	All
Value of all purchased	4383592	392463	170510	1054748
Value of all sold	4742084	430300	187364	1144438
Marketing cost	36817	6555	3623	10983
Net profit	321675	31282	13231	78707
Marketing cost per unit	2.56	2.75	2.70	2.70
Profit per unit	3.86	11.72	10.15	9.91
Return over investment (%)	7.28	7.84	7.60	7.38

V. MARKETING PROBLEMS

About cent percent traders mentioned some problems in the connection of pesticide trade. These are as follows:

1) **Scarcity of capital**: The traders fail to run the business properly due to scarcity of capital. The distributors face this problem seriously as they cannot pay the instalment money to the company in due time. As a result the company stop selling pesticides to them. Although there is facility to obtain loan from bank, the procedure of receiving loan is very complex. Sometimes they have to pay interest from the time before the receipt of loan. Besides, they have to incur additional hidden cost for obtaining loan.

2) **Less amount sale during off-season**: Pesticide business is seasonal. Very less amount is sold during off-season. Boro paddy period is the peak season when maximum amount of pesticides is sold.

3) **Availability of Indian pesticides**: Large amount of Indian pesticides such as Thiodin, DDT, Thionol, Action 50, Ustad etc. are sold in the border area of Bangladesh. Since the prices of these pesticides are comparatively low, farmers purchase these pesticides instead of local pesticides. Honest traders who do not sell these Indian pesticides fail to compete with those dishonest traders. Besides, government loses custom duty as these come illegally.

4) **Scarcity of necessary pesticides:** Sometimes, in spite of demand, some companies fail to supply necessary pesticides during peak period. Sometimes company suddenly raises the price of pesticide during peak period. In that case they face problem to sell pesticides at higher price to the farmers.

5) **Non-payment of reasonable commission to the traders:** Distributors do not provide reasonable commission to the traders.

6) **Availability of low quality pesticides in the market:** Some company produces low quality pesticides. So, farmers blame the traders for supplying ineffective pesticides.

7) **High competition among the traders:** As the number of the traders is more in the market, high competition exists among the traders. Besides,. many traders are doing business without dealership license.

8) **Non-receiving of dues from buyers in time:** In spite of non-receiving dues from the buyers, the traders have to repay the dues to the company.

9) **Non-payment of dues due to crop failure:** Farmers cannot pay the dues in case of poor harvest. Sometimes cent percent of dues remain unpaid due to crop failure.

10) **Sale of pesticides on credit:** The buyers do not want to purchase pesticides without credit facility. On the other hand, the traders have to sell pesticides on credit because of competitive market. As a result more amount of capital is needed for carrying on business.

11) **High transportation cost for wholesalers and retailers:** The wholesaler and retailer have to incur high transportation cost due to the fact that the company does not officially supply pesticides to them like distributors. Companies supply pesticides to distributor's shop by their own transport. Whereas, wholesaler cum retailer, retailer and farmers bring pesticides by their own arranged transport from distributor's shop.

12) **Lack of training on pesticide use:** At the time of sale the farmer ask the trader about the doses and procedure of using pesticides. But the trader cannot suggest properly to the farmers due to lack of training.

13) **Existence of adulterated pesticides:** Some adulterated pesticides factories were found in some area. From this factories adulterated pesticides are supplied after using brand name of reputed company. Since the political leaders give them shelter, the local law enforcement authority cannot take action against them.

14) **Low profit in pesticide trade:** Overall low profit is obtained from pesticide business. As a result most of the traders carry on this business as side business.

15) **Absent of separate warehouse:** No separate warehouse was found to keep pesticides by the traders. The traders sometime keep pesticides and food commodities together which is injurious to health.

16) **Problem of keeping pesticides at shop:** Since pesticides are kept in the shop for long period , bad smell and poisonous gas prevail in the shop, which is injurious to health.

VI. CONCLUSION AND RECOMMENDATION

It is found that in many places the distributors enjoy monopoly power and they do not pay reasonable commission to the other traders. It is also found that different companies appoint the same traders as their distributor. For that reason, each company should appoint different persons as distributor so that competition may increase in the market. Each company should have alternative arrangement to sell pesticides directly to wholesalers -and retailers. Company as well as government may compel the distributors to pay reasonable commission to the wholesalers and retailers.

Bank loan at low interest rate should be supplied to the traders. Previously, BADC through Rupali bank supply credit to the traders. Now alternate to this system may be developed.

Necessary training facilities should be arranged to the traders and the farmers. The farmers may or may not meet BS/TAO, but they must meet traders at the time of pesticides purchase. Every farmer came to know the doses and application procedure from the traders. That is why, the traders must be trained up by DAE personnel on pesticides use.

Government monitoring system should be strengthened so that persons producing and selling adulterated and low quality Indian pesticides may be punished. For that purpose, government vigilance team may make surprise visit at regular interval of time. New pests and diseases must be identified quickly by the concerned government officials so that company may produce new pesticide before severe pest attack.

Maximum retail price (MRP) must be fixed by government after assessing the production and marketing cost. Steps to be taken so that no company as well as traders can raise prices of pesticides, particularly during peak period, without any reasonable cause.

Finally, Law may be enacted so that traders cannot keep pesticides and food together. Financial help may be extended to the traders so that they can build their own storehouse.

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APPENDIX

Appendix Table 1. Marketing margin of Distributors

Name of pesticides	Purchase price (Tk/kg. or lit.)	Sale price (Tk/kg. or lit.)	Absolute margin (Tk/kg. or lit.)	Percentage margin (Tk./100 Tk. Sale)	Marketing cost (Tk./100Tk. Sale)	Net profit (Tk./100Tk. Sale)
Basudin (S)	81.44	83.90	2.46	2.93	0.78	2.15
Dazinon (L)	510.67	539.50	28.83	5.34	0.78	4.56
Dimacron(L)	716.33	736.13	19.79	2.69	0.78	1.91
Dursban (L)	443.57	479.79	36.21	7.55	0.78	6.77
Fenfen(L)	867.50	917.50	50.00	5.45	0.78	4.67
Furadan (S)	72.82	75.77	2.95	3.90	0.78	3.12
Furatuf (S)	73.04	75.60	2.56	3.39	0.78	2.61
Indofeel (S)	348.50	370.00	21.50	5.81	0.78	5.03
Marshal(L)	493.00	517.50	24.50	4.73	0.78	3.95
Magafos(L)	509.40	523.00	13.60	2.60	0.78	1.82
Monotaf(L)	432.50	450.00	17.50	3.89	0.78	3.11
Nogos(L)	443.46	467.48	24.02	5.14	0.78	4.36
Ridomil (S)	852.30	899.83	47.53	5.28	0.78	4.50
Sunfuran (S)	70.00	74.00	4.00	5.41	0.78	4.63
Thiovit (S)	117.14	131.43	14.29	10.87	0.78	10.09
Average	402.11	422.76	20.65	4.88	0.78	4.10

S = Solid, L = Liquid

Appendix Table 2. Marketing margin of Wholesaler cum Retailer

Name of pesticides	Purchase price (Tk/kg. or lit.)	Sale price (Tk/kg. or lit.)	Absolute margin (Tk/kg. or lit.)	Percentage margin (Tk./100 Tk. Sale)	Marketing cost (Tk./100 Tk. Sale)	Net profit (Tk./100 Tk. Sale)
Basudin (S)	82.50	86.17	3.67	4.26	1.52	2.74
Dazinon (L)	521.43	546.92	25.49	4.66	1.52	3.14
Dimacron(L)	784.09	827.32	43.23	5.22	1.52	3.70
Dursban (L)	446.07	487.14	41.07	8.43	1.52	6.91
Fenfen(L)	778.75	838.75	60.00	7.15	1.52	5.63
Furadan (S)	73.20	77.40	4.20	5.43	1.52	3.91
Furatuf (S)	74.28	78.00	3.72	4.77	1.52	3.25
Indofeel (S)	310.71	323.57	12.86	3.97	1.52	2.45
Marshal(L)	509.23	544.62	35.38	6.50	1.52	4.98
Magafos(L)	484.29	526.67	42.38	8.05	1.52	6.53
Monotaf(L)	462.50	495.00	32.50	6.57	1.52	5.05
Nogos(L)	483.05	523.00	39.95	7.64	1.52	6.12
Ridomil (S)	870.83	913.33	42.50	4.65	1.52	3.13
Sunfuran (S)	73.33	77.23	3.90	5.05	1.52	3.53
Thiovit (S)	110.56	115.44	4.89	4.23	1.52	2.71
Average	404.32	430.70	26.38	6.12	1.52	4.60

S = Solid, L = Liquid

Appendix Table 3. Marketing margin of Retailer

Name of pesticides	Purchase price (Tk/kg. or lit.)	Sale price (Tk/kg. or lit.)	Absolute margin (Tk/kg. or lit.)	Percentage margin (Tk./100 Tk. Sale)	Marketing cost (Tk./100 Tk. Sale)	Net profit (Tk./100 Tk. Sale)
Basudin (S)	82.43	86.80	4.37	5.03	1.93	3.10
Dazinon (L)	581.30	628.00	46.70	7.44	1.93	5.51
Dimacron(L)	810.27	855.66	45.39	5.30	1.93	3.37
Dursban (L)	475.00	539.50	64.50	11.96	1.93	10.03
Fenfen(L)	885.00	1000.00	115.00	11.50	1.93	9.57
Furadan (S)	75.04	79.85	4.81	6.02	1.93	4.09
Furatuf (S)	73.70	78.00	4.30	5.51	1.93	3.58
Indofeel (S)	296.67	333.33	36.67	11.00	1.93	9.07
Marshal(L)	543.75	580.83	37.08	6.38	1.93	4.45
Magafos(L)	550.00	650.00	100.00	15.38	1.93	13.45
Monotaf(L)	500.00	555.00	55.00	9.91	1.93	7.98
Nogos(L)	488.62	546.76	58.14	10.63	1.93	8.70
Ridomil (S)	983.85	1009.29	25.44	2.52	1.93	.59
Sunfuran (S)	73.96	78.58	4.63	5.89	1.93	3.96
T'hiovit (S)	146.17	156.00	9.83	6.30	1.93	4.37
Average	437.72	478.51	40.79	8.52	1.93	6.59