A STUDY OF MARKETING CHANNEL MANAGEMENT OF PESTICIDES IN PUNJAB

Research project report

Submitted to Punjab agricultural university
in partial fulfillment of the requirements
For the degree of

MASTER OF BUSINESS ADMINSTRATION (AGRIBUSINESS)
(Minor Subject: Agricultural Economics)

By

MANPREET SINGH
L-2009-BS-12-MBA(AB)

Department of Business Management
College of Basic Sciences and Humanities

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CERTIFICATE-I

This is to certify that the project report entitled, **"A Study of Marketing Channel Management of Pesticides in Punjab"**. submitted for the degree of **Master of Business Administration**, in the of **Agribusiness (Minor Subject: Agricultural Economics)** of the Punjab Agricultural University, Ludhiana is a bonafide research work carried out by **Manpreet Singh (L-2009-BS-12-MBA(AB)** under my supervision and that no part of this project report has been submitted for any other degree.

The assistance and help received during the course of the investigation have been fully acknowledged.

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Major Advisor

Dr. Ramandeep Singh

Associate professor,

Department of Business Management.

College of Basic Sciences and Humanities,

Punjab Agricultural University,

Ludhiana --141004

CERTIFICATE II

This is to certify that the project report entitled **"A Study of Marketing Channel Management of Pesticides in Punjab"** submitted by **Manpreet Singh (L-2009-BS-12-MBA-AB)** to the Punjab Agricultural University, Ludhiana, in partial fulfillment of the requirements for the degree of **Master of Business Administration**, in the subject of **Agribusiness Management** (Minor subject: Agricultural Economics) has been approved by external examiner along with the internal examiner after an oral examination on the same.

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Internal Examiner **External Examiner**

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Head of the Department

(Dr. Y.P. Sachdeva)

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Manpreet Singh

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ABSTRACT

The present study was conducted to assess the marketing channel of pesticides in Punjab with price spread in private and co-operative sector and to trend analysis of pesticides consumption for last decade from 2000-01 to 2009-10. The study was confined to Bathinda, Mansa, Muktsar and Ferozepur with maximum land holding under cotton crop, which is consuming more pesticides as compare to other crop. The study was conducted by using a structured, non-disguised schedule to take relevant data on the qualitative and quantitative aspects of the research project. Both primary and secondary data were used. The results revealed that pesticides consumption in Punjab has decreased in last decade. The study also indicated that 88 percent of pesticides were channelized through private sector and only 12 percent through co-operative sector. 75 percent of co-operative dealers had their chief source of credit as co-operative banks. On the other hand, 70.83 percent private agencies got loan from commercial banks. Although expenses of private dealers were high than co-operative. But their distributional margin was also quite high to cover all costs.

Key Words: Pesticides, Trend analysis, Price spread, Distributional margin.

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Signature of Major Advisor Signature of the Student

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Chapter I

INTRODUCTION

Agriculture is the process of producing food, feed, fibre and other desired products by cultivation of certain plants and the raising of domestic animals (livestock). Agriculture is also known as farming. The process of producing food, feed and fibre is being disturbed by insects/ pests. The unceasing struggle between man and insect enemies started even before the dawn of civilization. In spite of numerous advances made by the man in evolving new and deadly weapons to fight the war against insects, he has not succeeded in eradicating even one out of the thousands serious pests which damage his food and other agricultural products. The insects or pests attack problem has become serious since the introduction of high yielding varieties and increased irrigation facilities. Agriculture is the lynchpin of the Indian economy. Ensuring food security for more than 1 billion Indian population with diminishing cultivable land resource is a herculean task.

Pest control is therefore, a necessity for the proper growth of crops and quality of produce. Money spent on any costly input in term of fertilizers, irrigation and seeds etc. cannot give high net return in the absence of adequate control of pest attack. Most commonly used methods of pest control are mechanical, cultural, biological and chemical. Out of these chemical constitute the mainstay even in recommended integrated pest control programme.

A pesticide is any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest (Annual Report ICRA, 2008). The pesticides (of which insecticides constitute an important segment) or the agrochemicals industry primarily consists of insecticides, herbicides and fungicides. Pesticides, also referred to as agrochemicals, are chemical compounds used for crop protection. The industry manufactures two main types of products: a) technical grade pesticides (the basic concentrated chemical compound) and b) formulations from these technical grade pesticides (the usable form of pesticides). Technical grade pesticides are both manufactured locally as well as imported.

Pesticides use significantly contributes towards enhancing agricultural production and also helps to reduce the problems vector-borne disease. On the other hand, failure to adhere to the safety norms at various stages of pesticides production and use and also sometimes non-availability of credible information have caused serious concerns in the society. There are health risks harms to human, animals, or the environment because they are designed to kill or otherwise adversely affect living organisms. At the same time, pesticides are one of the vital ingredients of crop protection, and enhancing agricultural productivity.

1.1 Categories of Pesticides:

Pesticides are often referred to according to the type of pest they control. In such a classification, pesticides are normally categorized into the following major categories:

- Insecticides act against insects which feed on crops, leaves, roots, and other parts of plants;
- Herbicides (also known as weedicides) act against weeds or unwanted plants compete with the crop for nutrient, light, water and space.
- Fungicides act against bacteria, fungi, virus and mycoplasma which cause various diseases in plants.

1.2 Role of pesticides industry in sustaining India's agricultural growth:

- The pesticides/crop protection/agrochemicals industry plays a crucial role in protecting crops from damage by weeds, pests, insects and fungus, both before and after harvest. This helps to increase crop yields, which is important given the rate at which cultivable land is shrinking.
- As per the report of Agrochemicals Policy Group, an apex body of 200 crop protection companies, agricultural produce loss in 2007 due to pests was estimated at 1.40 lakh crores and that prudent pesticides use could cut losses, besides enhancing productivity.
- With the advent of the Integrating Pest Management (IPM) technique, the use of biopesticides and Genetically Modified (GM) seeds has increased. Globally, GM seeds are used mainly for commercial crops like cotton, maize, soyabean and canola. In India, Bt cotton is widely used acreage stood at 6.20 million ha for 2007, a growth of 63% over the previous year. Use of GM seeds may diminish the use of insecticides but the use of herbicides may improve.

1.3 Need for Pesticides Use

The chronic problem of food shortage faced by the country led to the adoption of new agricultural strategy in mid-sixties. The main plank of the new strategy was cultivation of high yielding varieties (HYVs) to attain self-sufficiency in foodgrains production (Daya, 1971). All the Five Year Plans have been emphasizing this very issue and priority has been given to agricultural research and development. With the adoption of high yielding varieties, special emphasis has been laid on providing more irrigation facilities, better quality seeds, improved implements and machinery, pesticides and improved cultural practices to suit different agro-climatic conditions. Inclusion of short duration varieties involved multiple cropping programmes and more intensive use of afore-mentioned inputs followed.

Intensive cultivation results in increased plant population which is conducive to rapid multiplication of insect-pests and weeds and increased incidence of diseases. The pest attack problem has become more serious since the introduction of HYVs and increased irrigation facilities The Council for Scientific and Industrial Research (CSIR) estimated that crop losses due to pests, diseases and weeds are approximately assessed to be in range of 10-30% when translated into numbers, will amount to Rs. 250-300 billion per annum, hence the use of pesticides has become imperative.

By 2020, the India will be in need of about 300 million tonnes of food grain. To meet this task the food production has to be augmented by 5 million tonnes a year. So there is a need

for extra food production which requires extra crop protection from pests. Modern agriculture will be realised only if crops are protected from pests, weeds and diseases. Pest control is, therefore, necessary to sustain the increased level of production.

1.4 History of Pesticides Use in India

Despite being tenth industrial power in the world, India remains a poor country with low per capita income. India being thickly populated constitutes about 15 per cent of the world's population and 2.5 per cent of the total geographical area of the earth. About 45 per cent of the total area is available for cultivation in the country. Right from the ancient times agriculture has been the main occupation of Indian people. Indian economy is agro-based with 18 per cent of the gross national product (GNP) at current price being contributed by agricultural sector (Annual Report ICRA, 2008). About 70 per cent of the total population is directly or indirectly employed in agriculture. The prosperity of the industrial sector is also closely linked with agriculture. Agricultural base of the country must be strengthened-to-achieve-accelerated-economic-growth.

Before the advent of modern selective pesticides, pests were controlled by mechanical and cultural practices. Pesticides have been recognised as an important input in modern agriculture, when the pest menace has magnified. Use of pesticides for the control of mosquitoes in India dates back to pre-Independence period. All the pesticides used in India prior to 1951 were imported. The money spent on pesticides import was about Rs. 6 million. Use of pesticides in India started on small scale by importing DDT for malaria control which was followed by the use of Benzene Hexachloride now Hexachlorocyclohexane (BHC, HCH) for locust control in 1948. Use of pesticides in agriculture in India began in 1949. (Pesticides industry in India, started in 1952 as private sector undertaking (ICI) at Rishra near Calcutta.) In 1954, Hindustan Insecticides Limited (HIL) was established to manufacture Dichloro-di-Phenyl Tri-chloro-ethane (DDT) for the malaria control scheme. By 1958, India was manufacturing five basic pesticides indigenously with production totaling about 5460 tonnes. In 1989-90, the number of indigenously manufactured pesticides rose to 62 and production totaled 65800 tonnes (Ministry of Industry, l990) At present, 209 pesticides have been registered in India. A Registration Committee has been constituted under Section 5 of the Insecticides Act, 1968 to register insecticides after scrutinizing formulae, verifying claims of efficacy and safety to human beings and animals, specify the precautions against poisoning and any other function incidental to these matters.

The Indian pesticides agrochemical industry is fragmented with more than 60 technical grade pesticides being manufactured indigenously by 125 producers consisting of around 60 large and medium scale enterprises (including about 10 MNCs) and more than 500 pesticides formulators spread all over the country. The organized sector comprises

multinational corporations(MNCs) and Indian players. Besides the presence of MNCs such as Monsanto, Bayer, and Syngenta, there are many major Indian player such as United Phosphorous, Excel industries, and Rallis India.

India is fourth largest producer of agrochemicals after USA, Japan and China. The agrochemicals market in India is estimated Rs. 4500 crores annually. The per hectare consumption of pesticide is low in India at 381 grams when compared to the world average of 500 grams. While the consumption of pesticides in countries like Taiwan and Japan is 17.0 kg/ha and 11.0 kg/ ha respectively. Low consumption of pesticides can be attributed to fragmented land holdings, low level of irrigation, dependence on monsoons, low awareness among farmers about the benefits of usage of pesticides etc. the share of the global protection market is only 7% in India. (Annual Report ICRA, 2008).

Pesticides consumption in India ranks 10th in the world having total consumption around 500 million tonnes. About 95 per cent of the pesticides requirement is indigenously Produced. Indian agrochemical market value reached $3.6 billion in 2009, among which domestic market and exports contribute approximately 50% each. Import is approximately above $500 million. However the domestic industry is making effort in bringing new and improved products and formulations which ensure high margins.

Despite a large number of manufacturing units engaged in the production of diverse basic agro-chemicals indigenous production of pesticides in India has always lagged behind the demand. But Certain technical grade materials (TGM) of pesticides are being imported regularly Supplies short of demand at the given time and place push up prices and result in inflow of spurious or adulterated pesticides into the market. Two types of companies exist in the crop protection market-Innovators and Generics. Innovators are the patent holders, whereas generic players manufacture off-patented products. During the last decade, the share of generic products has been increasing. The discovery and development costs of new products have also increased in the past few years. Most Indian companies manufacture off-patent pesticides, which comprises over 70% of the Indian market.

The problem of shortage of pesticides supply is primarily because of defects in the existing distribution system. An efficient system of marketing of genuine agro-chemicals in right quantity, form, place and time at prices fair to farmers (consumers), intermediaries and producers with minimum wastage is required (Sankhayan et al., 1973). The pesticides distribution system is assuming greater importance with increasing pesticides use. The distribution is being handled by various agencies such as the state department, cooperative societies and private traders. Farmers buy pesticides more often from private traders and cooperative societies than from government agencies, (PAI, 1972). Private agencies handle about 60 per cent of the total distribution work of pesticides In India (Govt. of India, 1976).

Adoption of pesticides is governed mainly by economic factors. In general, the big farmers using fertilizers adopt pesticides earlier than small farmers. The commercialization of crops encourages the use of purchased inputs like fertilizers, quality seeds, pesticides, etc. The costly inputs are generally used on cash crops. Despite there being favourable benefit- cost ratio of pesticides, the farmers do not always follow the plant protection measures unless the cash crops, high-yielding varieties and heavily fertilized crops are involved (Pesticides, 1967). It is mainly because of unwillingness and illiteracy of farmers that they do not use pesticides unless the damage is visible which, of course, is very serious.

Pesticide demand by farmers is influenced by the fo1lowing factors (Desai, 1970):

(a) The nature and intensity of pest attack

(b) The effectiveness of pesticides

(c) The yield of the crop in the absence of pest attack

(d) The price of the crop, and

(e) The cost of pesticide application

Besides these, availability of the application equipment, the distance of the market and the real cost incurred in procuring pesticide are important. Supplies play an important role in determining the pesticide demand by farmers.

1.5 History of Pesticide Use in Punjab

The Punjab state constitutes only 1.53 per cent of the total geographical area of the country. Use of pesticides in agriculture in the State began since its introduction in the country. Pesticides formulation industry in Punjab began in 1973 as private sector at Ferozepur. At present, 16 units are manufacturing pesticides out of which 3 units produce five technical grade material, viz. Fenvalerate, Cypermethrin, Butachlor , Isoproturon and Monocrotophos the other units prepare only the pesticide formulations. The actual production of pesticides (TGM) has increased from 105 tonnes in 1985-86 to 892 tonnes in (1990-91) which accounted for 849.52 per cent over the base year (1985-86).

Foodgrains production in Punjab rapidly increased from 11.9 million tonnes in 1980-81 to 25.2 million tonnes in 2000-01. This was accompanied by an increase from 3200 tonnes in 1980-81 to 7005 tonnes in 2000-01 in consumption of total pesticides in terms of Technical Grade Material which is the active ingredient in a pesticide formulation.

As the cropping pattern is becoming more intensive use of these pesticides is also increasing. Consumption of insecticide in agriculture has been increased more than 100% from 1971 to 1994-95. For instance, insecticide consumption in India, which was to the tune of 22013 tonnes has increased to 51755 tonnes by 1994-95 (www.indiastat.com). Consumption of all of these pesticides in same duration has increased more than two times, that is from 24305 tonnes to 61357 tonnes.

But in recent past, change has been observed in trends of pesticides consumption. As a consequence of adoption of bio intensive Integrated Pest Management Programme in various crops the consumption of chemical pesticide (Tech. Grade) has come down from 66.36 thousand MT during 1994-95 to 43.59 thousand MT during 2001-02 with a reduction of 27.69%(Thirty Seventh Report of Standing Committee on Petroleum and Chemicals, 2002). This trend in pesticides consumption was going on and it reached to 43.86 thousand MT in 2008-09 (www.Indiastat.com). Consumption pattern of pesticides in India is also very different from world. In India insecticide account for 76% of the total domestic market while herbicides & fungicides have a significantly higher share in the global market. There are wide ranges of regional variations in pesticide consumption in the country.

Mostly the pesticides are being used in cotton, paddy, sugarcane, orchards and vegetables, Cotton, paddy, vegetables and fruits account for over 80% of the pesticides consumption in the country. While cotton is planted on about 4.5-5% of the total cultivable area(on about 9.3 million hectares or mha), it account for about 33% pesticides consumption in India, followed by rice(23%), vegetables(9%), wheat(8%) and pulses(6%).

The demand for pesticides agro-chemical in India is seasonal and cyclical as it largely depends on agricultural production. Pesticide agro-chemicals demand is skewed in favour of kharif crops such as cotton and rice, with kharif crops accounting for around 70% of annual consumption of pesticides. The peak consumption of pesticides agro-chemicals is during July-November. The demand for pesticides can be augmented only through sustainable growth in agriculture, according to the report. With the government's focus on development of the agriculture sector, the industry may see a better future. The Indian pesticide industry is also likely to move towards the global product mix, with an increase in the use of herbicides and fungicides. Exports will continue to remain the growth driver.

The consumption of pesticides in technical grade during kharif 2010 was 3890 MT against the demand of 4500 MT. In rabi 2010-11 (upto 31.12.2010) the consumption of pesticides in technical grade is 1910 MT against the demand of 2000 MT. Thus the total consumption of pesticides in technical grade during 2010-11 is 5800 MT against the total demand of 6500 MT. The projected demand for kharif, 2010 is 4500 MT and for rabi 2011-12 is 2000MT and Biopesticides consumption in kharif 8500 Ltr. Against 10,000 Ltrs and kharif 2011-12 9000 Ltrs against 10,000Ltrs. (Anonymous d 2011)

The pesticide/insecticide supply system in Punjab is organised through private sector and co-operative sector (Dhaliwal, 1986). In punjab state the pesticides are distributed to the farmers through Government/Semi Government Agencies, Co-operative Societies and registered dealers. The total number of sale points as on 01.01.2011 are 10248, out of which

245 sale points are of State Department of Agriculture, 1050 in Co-operative and 8953 are in private sector. (Anonymous d 2011)

Pesticides marketing in India have seen a wide panorama of change from the early days of Benzenehexachloride(BHC) and Dichlorodiphenyltrichloroethane(DDT).There are various loopholes regarding the sale and distribution of pesticides, which encourage unscrupulous traders to indulge in malpractices. Strict control of quality at different levels of distribution and proper education of farmers seem to be the only way to rectify the system.

Farmers generally complain about delayed supply and non-availability of pesticides in required quantities and brand at reasonable price from the state departments of Agriculture and Horticulture. Adequate and timely supply of pesticides to farmers is vital for getting maximum benefit from their use. Farmers also complain that considerable time and costs are involved in procuring the subsidized pesticides because of lengthy and complicated procedure.

The market structure and degree of concentration of manufacturers and distributors are directly related to the efficiency of the marketing system of pesticides. The channels of distribution are continually changing their strategy to exploit the market conditions for higher profits. Prime challenge before pesticides industry is of spurious and sub-standard pesticides business which is flourishing out of proportion every year, especially in backward and far-flung areas, where farmers are illiterate. Another unwanted practice which is progressing out of proportion is that some manufacturers smuggling latest chemicals and mixing it with bio-pesticides, new molecules and selling them at high cost. This needs to be checked through some means to create healthy market competition by providing better market conditions which would benefit the used.

Rising costs of inputs, governmental duties and taxes, and the cost of capital have in one way or the other affecting growth of the industry. There are also high rates of exise duty both on intermediates and finished products, and sales taxes, which put together in some states, account for as high as 20% of the cost. The industry is also constrained by regulatory norms. There is also issue of spurious pesticides, which industry finds difficult to deal with in absence of strict enforcement by State machinery (Anonymous c 2010)

1.6 Need for Present Study

Next to Andhra Pradesh, Uttar Pradesh and Tamil Nadu, Punjab ranks fourth in pesticide (TGM) consumption in the country (PAI, 1991) The pesticide/insecticide supply system in Punjab is organised through private sector and co-operative sector (Dhaliwal, 1986).

Like other agricultural inputs, the task of marketing of pesticides is so huge that there is a scope of all the three sectors viz. public, co-operative and private sector to contribute their

best. In these systems a large number of functionaries are engaged who perform their designated responsibilities, so there should be an ideal pattern of distribution. India is importing a large quantity of pesticides which is being channelized through public and co-operative institutions. Markfed in co-operative sector plays a major role in distribution of pesticides in Punjab. It (Markfed) procure pesticides on behalf of co-operative and State Agricultural Department also supplies them on consignment basis.

In private sector, pesticides move through private distributors (wholesalers) and dealers (retailers) to farmers. In this way, a large chain of intermediaries is engaged in pesticides distribution. The supply chain management is viewed as a business philosophy that covers all aspects of business activity, the main emphasis being on vertical co-ordination to achieve sustainable competitive advantage. As a result, agribusiness firms are responding to the emerging challenges in global economy by seeking the benefit of greater collaboration with both their suppliers and customers to ensure more sustainable and profitable trading arrangements. An efficient supply chain management system provides an incentive to various stakeholders to produce/process as per changing needs of the consumers and enables production planning based on market forces. The purpose of this programme is to provide agribusiness executives with an opportunity to examine critical issues in the management of the supply chains for agricultural food products for delivering value to consumers while remaining globally competitive (Anonymous a 2008)

In order to formulate a suitable policy for better distribution system, the knowledge about the relative efficiency of existing channels of distribution is necessary. Thus, the estimation of margins at various levels of market channels is significant.

Enormous research has been done in foreign counties as well as in India on technical aspects of pest control. But only a few studies have been conducted in the field of marketing of pesticides especially from distribution and market efficiency point of view. Hence, study of the existing distribution channels and change in pesticides consumption has been attempted in the present investigation.

1.7 Objective of the study

Keeping in view the problems marring the efficient marketing of pesticides, the present study has planned with the following objectives: To examine,

1. To study the consumption trend of pesticides in Punjab.
2. To study important marketing channel and price spread as perceived by farmers.
3. To identify problem in marketing channel management and suggest possible remedies.

Chapter II

REVIEW OF LITERATURE

In India, huge losses in food grains, cash crops, 0ilseed crops, vegetables, orchards, etc. are caused by pests, diseases and weeds which have been estimated to be Rs.250-300 billon annually (Annual Report ICRA, 2008). Therefore, their control is indispensable for successful crop production. Use of agrochemical has proved to be economical, effective, convenient, and more feasible method of pest control. Consequently, many pesticides have come into market to meet the challenge of pest control. In spite of huge losses, economic studies on distribution and marketing of pesticides have been meagre in this country. This may be because of certain inherent problems associated with the economic quantification of pesticides use as there are many types of pesticides manufactured or formulated for use in different forms. Further the quantification of economic benefits occurring from the use of pesticides is a herculean task in contrast to other inputs. The literature in India and other country pertinent to the present investigation have been reviewed and presented in this chapter.

Gill and Johl (1973) found that the introduction of high yielding varieties (HYVs) and consequent increase in the cropping intensity have increase in the consumption of agrochemicals for crop production.

Vaid (1976) compared the use of pesticides for weed control in wheat and paddy in Punjab to their use only in wheat in Haryana was reported. However, consumption of pesticides did not pick up in initial stages primarily because the farmers were quite satisfied with the use of pesticides especially 2,4-D and Tok E-25.

Bhola(1979) conducted a study on factors affecting "Adoption of pesticides" and arrived at the conclusion that situational, personal and innovational factors have a far-reaching effect on the adoption of pesticides by the farmers.

Sood(1980) reported that the total pesticides market in India was Rs. 200 crores. About 72 per cent of the total market was constituted by insecticides, 25 per cent by fungicides, 3.5 per cent by weedicides, and about 2.5 per cent by other categories of pesticides. The pesticide market in the country was reported to have grown up during previous two years by over 20 per cent.

Kakkar(1981) reported that pesticide used for cotton in Punjab was Rs. 6.83 crores. The four districts of cotton belt, viz., Bathinda, Faridkot, Ferozepur and Sangrur accounted for Rs. 6.21 crores consumption of pesticides of the total supply; the remaining eight districts consumed only of Rs. 0.62 crores of the supply. In Bathinda district, highest quantity of pesticides was used followed by Faridkot district. The insecticides were the only category of pesticides used on cotton in Punjab The small categories of holdings used higher quantity of

pesticide indicating inverse relations hip between the total quantity used and land holding size, probably because of higher number of small farmers.

Chauhan (1983)The number of sale points fluctuated overtime; jt was as high as 48,031 in 1966-67 after which declined to 30,670 in 1970—71 and was 43,127 in 1982-83. The increase in number of sale points and rationalization of their location and agro-chemical availability.

Pandey (1984) reported that for efficient distribution system, the number of tiers should be decreased which would lead to the efficient working of co-operative societies. Elimination of district level wholesale society and entrusting the Mandi/Block level co-operative societies with the work of former was suggested by Pandey.

Ramaswamy and Namakumari (1984) found that the retail network in India was inadequate. The special distribution of existing outlet as much as 4,50,000 villages in India were without having retail outlet. On an average a farmer has to travel 10 kilometres to make purchases from the nearest retail outlets. In states like Andhra Pradesh, the situation was even worse.

Gupta(1985) found that although, co-operatives have been successful in making in roads in the distribution network especially in the interior and rainfed areas, they suffered from certain problems. The reduction in the margin for working capital at the retail point and extension of (NABARD) credit for fertilizers sold by the co-operatives was suggested. The aforementioned measure was anticipated to increase the share of co-operatives in the total fertilizers trade from 45 to 55 per cent.

Sridharan and Karbanda (1987) found that the efficiency of distribution channel is largely determined by the performance of the dealers. The non-availability of suitable dealers to be located in the remote areas found to be major problem resulting inefficiency of the distribution channel. The financial standing of the fertilizer dealers is one of the important factors influencing distribution efficiency.

Gupta (1988) found that the co-operatives were not given the facility of concessional interest at 11.5 per cent for distribution, because it is available only if turnover was upto Rs.25,000/ which is very low amount. As such most of the co-operatives were not able to take advantage of these credit facilities, because of their higher turnover. Furthermore, the introduction of state public sector organisation which in most cases appoints private traders as agents instead of selling directly, in the distribution process further aggravated the problem. So higher allocation was recommended by Government of India and NABARD to the co-operatives in view of their potential.

Sidhu (1988) reported that although the co-operatives had set up retail outlets in

remote villages, they were not able to maintain adequate supplies and hence were outclassed by private trade which increased the supply to 70 per cent of the total distribution in 1986—87. So it was realized that there was urgent need to expand the distribution through co-operatives.

Rao (1988) found that the preferential treatment to and higher distribution margin of co-operatives as compared to private dealers given by government was appreciable. A decline in the share of co-operative and fertilizer trade was observed from 1979-80 to 1986—87. The co-operative societies were often not able to get credit from the District Co-operative Banks owing to overdues which completely choked the flow of credit to the members of the societies.

Morgan (1990) found that the well known studying consumer behavior without considering manufacturers and retailers decision may lead to an underestimation of high sensitive consumers are to price. Similarly, modeling manufacturers decisions may lead to failure to consider the retailers joint profit maximizing effect in the analysis and an overestimation of the degree of collusion between manufacturers. In contrast considering the retailer but forgetting about manufacturers may lead to an overestimation of the way that a retailer responds to demand shocks and wrongly indicate that the retailer is not engaging in category pricing.

Singh (1990) found that the waiving off of registration fee for small dealers resulted in opening of 12,445 additional sale points. About 71 per cent of the fertilizer sale points were located in urban areas and farmers had to travel about 8 kilometres to buy the agricultural inputs of his choice. The slow growth in fertilizer sale points was due to inadequate distribution margin received by private dealers; no upward revision in the block level equated freight (BLEF) rates fixed in 1984; and fear of prosecution because of sample failure

Srivastava and Patel (1990) analyzed the growth of pesticides industry, the changes in the product mix, the problems of the constituents, and the marketing scenario. The installed capacity increased from 19,280 tonnes in 1966 to 1,02,328 tonnes in 1985-86 which shows 8.3% of annual growth. According to them, there is vast scope for accelerating pesticides consumption by diversifying to hitherto untapped regions and crops. This, however, calls for a major market development effort on the part of the industry and to ensure proper distribution at reasonable cost to farmers market development and sales promotion efforts are needed for formulated pesticides.

Barbuceanu et al (1997) reported on the use of our own agent and coordination technology to model, design and simulated global, distributed supply chains. They show by non-trivial examples how supply chains can be naturally modeled, simulated and improved in this way, within a short development time and with reduced human resources. As the agent

technology was primarily built for implementation and control of distributed systems, the simulation models can be reused with minor modifications for actually controlling distributed supply chains. They used the agent view which provides both conceptualizations and technologies to construe and construct systems that interoperate across networks linking people, organizations and machines on a single virtual platform. The supply chain of a modern enterprise is a world-wide network of suppliers, factories, warehouses, distribution centres and retailers through which raw materials are acquired, transformed into products, delivered to customers, serviced and enhanced. In order to operate efficiently, supply chain functions must work in a tightly coordinated manner. But the dynamics of the enterprise and of the world market make this difficult.

Rohini and Padmanaban (2000) carried out this studying Coimbatore district, Tamil Nadu, India with 120 sample farmers to analyze the factors responsible for brand and dealer loyalty towards pesticides. The results showed that the price of the proffered brand (X1) and efficiency of the preferred brand (X2) were significant at one percent level for brand loyalty. The factor advertisement also influenced at the brand loyalty at five percent level. With regard to dealer loyalty, factors such as credit availability (X1) and quality of product (X2) were significant at one percent level. The study showed that farmers are loyal to pesticide brands and also to pesticide dealers.

Rao and Punwar (2004) reported the need for refocusing role of supply chain for Indian agriculture. They concluded that the country has ample demonstrated in the past with the greater interface of state, technology, supply chain and farmer participation, thus increased the agricultural production. Input supply chain, extension and promotion of farm technology have played a pivotal role in raising agricultural production in the country. Indeed, it is a massive task to distribute huge volume of inputs in all nook and corner across the country over vast geographical area in time. Similarly, to translate the knowledge base acquired through research and experiments in farm technology to the farmer's field is an uphill task. But ,the channel has rendered these services quite efficiently so far, which in turn could make it possible for country to acquire self sufficiency on food front. However, of late complacency has set in the efforts of the channel at all level, which pose a serious threat for sustaining agriculture production in a long run. Therefore, members of the supply chain should realign to equip themselves to meet the needs of Indian agriculture.

Kirca et al (2005) conducted a meta-analysis that aggregates empirical findings from the market orientation literature. First the study provides a quantitative summary of the bivariate findings regarding the antecedents and the consequences of market orientation. Secondly, the authors use multivariate analysis of aggregate study effects to identify significant antedecents of market orientation and the process variables that mediate the

relation between market orientation and performance. They also found that the market orientation –performance correlation is stronger for both cost-based and revenue-based performance measures in manufacturing firms than in service firms on the basis of their study they reported with a discussion of the implications for practice and further research.

Villas-Boas and Zhao (2005) developed a model, that models develops both demand and supply sides of the market. The model demand side through a latent utility framework that allows for a no-purchase option. Accounting for both sides of the market enables the authors to check for any endogeneity problems on the demand side. They model the supply side through the profit maximizing decisions of the manufacturers and a multiproduct retailer. Accounting for both the retailer and the manufacturer decisions enables the authors to evaluate the degree of manufacturer competition, retailer manufacture interactions, and retailer product-category pricing.

Hundal *et al* (2006) stated that India ranks 10th in the world in pesticide consumption as its total consumption amounts to about 500 million tonnes. India is presently the largest manufacturer of basic pesticides among the South Asian and African countries, with the exception of Japan. The Indian pesticides market is the 12th largest in the world with a value of US$0.6 bn, which is 1.6% of the global market pie. India is one of the most dynamic generic pesticide industries in the world, having a total installed capacity of technical grade pesticides consisting of large and medium scale and 400 pesticide formulators (of all sectors) spread all over the country for use in agriculture, public health, household and plant protection. Overall, it can be said that there is a bright future for agro-chemical companies in India in the post-patent era. This paper focuses on the opportunities arising for companies dealing in pesticides because of the agrarian nature of the Indian economy. Besides, it presents a conceptual framework of the situation prevailing in the marketing of pesticides in India with special reference to Punjab.

Narula (2006) explored that the environment of pesticide industry during 1995-2005 at macro as well as micro level and also the existing strategies of firms with respect to product, market and functions. The study also aims to compare the strategies of domestic as well as multinational companies. This is an exploratory type of research which has used case research method. Pesticide manufacturing companies, Dealers and Farmers have been taken as sampling units. Multistage sampling design has been used for selection of the companies by taking form of organization and degree of vertical integration as two important parameters. The study has been supported by the primary data collected through structured questionnaires from dealers and farmers of three top pesticide consuming states. Punjab, Haryana and U.P. Secondary data has been collected from industry associations namely Pesticide Association of India, Indian Crop Protection Association, Pesticide Formulators Association of India, Govt.

organizations such as Department of Chemicals &Fertilizers, Ministry of Agriculture; Directorate of Plant Protection and Quarantine, Ministry of Agriculture; Central Insecticides Board, Department of Agriculture of various state Governments. Statistical tools such as correlation, index numbers, percentages and non-statistical tools such as SWOT analysis, Porter's analysis, Product Portfolio Matrix and competitive Profile Matrix were used for deriving the results.

Khooharo (2008) found that, it was recommended that APO-71 may be reviewed and liberal pesticide registration schemes be rationalized. Monitoring and evaluation system of pesticides may be redesigned by appointing attorneys and introducing training programs and incentives for Chemists and Inspectors. Well designed extension education programs may be made mandatory for registration of companies. Alternate methods of pest control may be encouraged in the process. Agricultural extension activities such as the farmers' field schools on IPM may be fully supported so as to optimize pesticide import bills, curtail health and environmental risks associated with the over/misuse of pesticides, and manage quality cotton production in the wake of trade globalization.

Joshi (2009) found that manufacturing firms seek continuous supplier performance improvement because this outcome makes them more competitive in downstream markets. Although manufacturing firms use a range of tools to effect continuous supplier performance improvement, the author focuses on two that are especially important- collaborative communication and control. The results from a survey of 153 manufacturer supplier dyads show that collaborative communication fosters continuous suppler performance improvement by enhancing supplier knowledge and by building supplier effective commitment. With respect to the combined effects of communication and control, the results show that capability control enhances the positive effects of both supplier knowledge and supplier effective commitment on continuous supplier performance improvement, whereas process control undermines the effect of supplier knowledge on the outcome. This pattern of results suggests that manufacturing firms should emphasize capability

Srivastava and Chakravarti (2009) conducted three experiments that examines how communication types i.e informational, relational, and coercive messages and mutual trustworthiness reputations influence sequential bargaining between an uncertain manufacturer and an informed distributor in a marketing channel. In experiment 1, bargainers use informational and relational messages to establish a positive social tenor in the interaction. Compared with when bargainers communicate only through offers and counteroffers, explicit communication produces quicker and more efficient agreements. In experiment 2, mutual reputations of high trustworthiness also produce quicker and more efficient agreements. Experiment 3 shows the effect of communication type are contingent on

the prevailing level of trustworthiness reputations in the dyad. Compared with no communication, relational messages elicit the most positive outcomes when trustworthiness reputations are high. Informal messages have a smaller but positive impact on bargaining outcomes in both trustworthiness conditions and appear to build trust.

Sharma (2010) analyzed the role of insect management in improving agriculture productivity. Increased intensity of cultivation and the introduction of new crops into non-conditional areas made our agro-ecosystems fragile and vulnerable to a wide range of insect pests. Insect-pests and diseases are one of the major constraints in achieving higher crop productivity making usages of pesticides and chemical. The extensive and indiscriminate use of chemicals for pest control has not only polluted the environment but has also triggered outbreaks of many insect pests on cotton, rice, sugarcane, vegetables and fruit crops. Moreover, a large number of insect pests have developed a high degree of resistance to insecticides, thereby assuming more problematic and unmanageable proportions, which threaten global food security. In this context that integrated pest management based on ecological principles, has emerged as a sound strategy to minimizing the damage to the crops as well as the environment.

Kumar and Zaidi (2010) reported the role of plant disease management in sustaining food security. They found the impact of pests; diseases and weeds on food supply are enormous. The losses caused by these enemies are about 35 percent. And disease alone can reduce production by more than 10 percent. The losses through the biotic stresses are greater in the developing countries. If the post harvest losses are included the situation becomes more alarming. High crop yields obtained through disease management of its various facet like economic importance of crop diseases and pests, crop losses due to plant diseases, role of chemical pesticides, alternatives of chemical of control, genetic resistance of crop plants to diseases, bio-pesticides, plant quarantine, research, education and extension and integrated pest management practices.

Qaim *et al* (2010) stated that India is among the largest agricultural societies in the world as the agricultural sector provides livelihood to the majority of its one billion people. Modern agriculture use inputs such as chemical fertilizers, pesticides, seeds of high yielding varieties and mechanization that aided in increased yields ushering an era of green revolution in the country. Synthetic pesticides are one of the major agro-inputs that significantly contributed to the agricultural production in the country. These chemicals have become an inevitable input and constitute an integral part of modern crop-management practices. Pesticides may have helped in enhancing agricultural production, but at the same time these chemicals have caused adverse effects. This paper discusses the economic and ecological implications of pesticide use in India.

Matani (2010) stated that India is second largest producer of commodities such as fruits and vegetables. One of the key issues, which require research, is the method by which we can reduce the post harvest loss, which is quite substantial at present. This would need design of cost effective, efficient, environment friendly storage system. Also, there is need for value addition to agricultural produce to maximize the agriculture return. India is likely to become the food basket to the world considering 52% of total land under cultivation as compared to global average of 11%. India is also having the labour cost advantage; organized research is growing very speedily. Because of these developments, farmers would get latest market prices and various products, weather reports and best farming practices. This paper discusses importance of effective supply chain management systems in improving retail business in Indian economy.

CHAPTER III

RESEARCH METHODOLOGY

This chapter describes the research methodology followed for this study. It includes the descriptions of research design, data collection and method of analysis of data.

3.1 RESEARCH DESIGN

3.1.1 Selection of Districts

In order to study the pesticides supply system, the areas which are consuming maximum pesticides were identified in the Punjab. Thus, Bathinda, Mansa, Muktsar and Ferozepur districts which were having the highest area under cotton, as cotton crop is consuming maximum pesticides were purposely selected. Ferozepur, Muktsar, Mansa and Bathinda had 105, 83, 63 and 113 thousand hectare land under cotton crop. (Statistical abstract Punjab 2008)

3.1.2 Selection of respondents

Out of each selected districts, 10 farmers were selected those were growing cotton crop. Thus, a sample of 40 farmers was obtained from selected districts.10 farmers from each district included the convenience sampling.

3.1.3 Selection of agencies

To study various channels of pesticides marketing and for the purpose of comparison between private and public agencies, one private distributor (wholesaler) and five private dealers (retailers) and one district Markfed branch from each selected district were chosen as per convenience. Also the information was collected from Agricultural Officers of the respective districts.

Two Agricultural cooperative service/credit societies operating under the jurisdiction of primary co-operative marketing society were selected from each district. Thus , there were 36 agencies included in the sample out of which 4 private distributors (wholesaler), 20 private dealers (retailers), 4 Co-operative wholesaler (Markfed) and 8 Co-operative retailers (Agricultural Co-operative Societies) were selected.

3.1.4 Selection of pesticides

To examine price spreads in pesticides marketing, 4 technical grade were selected on the basis of pre-test survey, which constituted 70 percent of sales of all pesticides. These were Cartap Hydrochloride4G, Imidacloprid 70% WDG, Pretilachor and Cladinofop-Propargl.

3.2 DATA COLLECTION

3.2.1 Collection of primary data

The well structured and non disguised schedules one dealing with farmers and other with distributional agencies were prepared to get the information from each selected farmer

and agencies involved in the pesticides business. The schedule contained the questions pertaining to the different aspects of the study. With the help of these schedules, the information was collected personally from each farmer and the agency. In this way the primary data were collected from farmers, private wholesalers and retailers, district Markfed branches and primary co-operative service/credit societies etc. by personal interview method.

3.2.2 Collection of Secondary Data

The secondary data to study seasonality trends in consumption of pesticides were collected for the period of 2000-01 to 2009-10 from the records of Chief Agricultural Office of Bathinda, Mansa, Muktsar and Ferozepur Districts and from the office of the Deputy Director Plant Protection and Locust Control, Punjab Chandigarh.

3.3 ANALYSIS OF DATA

Simple tabular analysis was done. Simple statistical tools such as percentages and averages were used to analyse and interpret the data. The detail of which is as follow:

3.3.1 Analysis of Trends Variation in pesticides consumption

To analysis trends variation, exponential regression analysis was used.

Trends

To analyse the trend, the pesticide consumption values were averaged out year – wise, which were then plotted on a graph. Further , to test the significance of trend of consumption over time, exponential equation of the type $Y=a.e^{bx}$ was fitted, where 'Y' indicates consumption of pesticides, 'a' indicates intercept, 'b' indicates regression coefficient and 'x' indicates the time (years). The F test was used to test the significance of overall regression in the data.

3.3.2 Marketing channels and price spreads

For examining the share in consumer's rupee of different agencies involving in marketing of pesticides, price spreads were worked out at a point of time in the selected markets. The three identified channels were manufacturer to private distributor(wholesaler), to private dealer(retailer), to farmer and manufacturer to private distributors to farmer, and manufacturer to Markfed to primary cooperative credit societies/State Agricultural Department to farmers.

Data regarding marketing costs collected in the study covered the following items:

1. Transportation
2. Overhead
3. Promotional
4. Miscellaneous (including handling and losses during transportation)

Marketing costs (in absolute and percentage) are presented separately for each kind of pesticides at all marketing levels. The following items need to be explained:

1) Overhead Costs: Expenses incurred by a dealer towards maintenance of sale forces and shop etc
2) Promotional Costs: Amount spent by the dealers for different type of promotional activities and customers services etc.
3) Distributional Margin: This is the difference between selling price of a dealer and his supply price. Distributional margin defined in this way represent the total distributional costs at dealer's level plus his profit.
4) Margin Left for Profit: It is derived by the sum of all the expenses of distribution from the distributional margin of dealer.

The net profit margin was calculated for the wholesaler and retailer for private and co-operative both. It was calculate by deducting all above mentioned costs from selling price.

$P_m = S_p - S_c$

Where,

P_m = Net profit margin

S_p = Selling price of pesticide

S_c = Sum of all costs

There were some questions where the respondents were asked to give ranks to the different attributes on their reliability. So, for their analysis, weights were given. 3 for adequacy, 2 for inadequacy and 1 for not availability of credit.

3.3.3 Extension, Promotion and Finance

To study the distributional finance, and extension-promotion of sales, the frequency distribution tabulation were prepared and simple percentages of dealers were worked out.

3.4 LIMITATIONS OF STUDY

The present study suffered from certain limitation, which are as follow:

1. Casualness of the respondent in filling the questionnaire may have led to wrong responses.
2. Biases on the part of the respondents may have crept in.
3. Lack of understanding by the dealers and retailers may led to faulty responses.
4. Results cannot be generalized.

Chapter IV

RESULT AND DISCUSSION

4.1 Trend in Pesticides Consumption

Trend is that component of variation which reveals general direction of change over a period of time. The estimation of trend is essential to study the general behavior of time series data. The trend in the consumption of pesticides in Bathinda, Mansa, Muktsar and Ferozepur districts of Punjab state was obtained by using time series data from 2000-01 to 2009-10 and result are shown in Table 1.

The whole period of study (i.e. 2000-01 to 2009-10) was divided into two periods, i.e. 2000-01 to 2004-05 and 2005-06 to 2009-10 which show different rate of change in pesticides consumption. Table 1 indicates that it had been considerable decrease in consumption of pesticides in Punjab from 2000-01 to 2009-10. During period-I decrease in consumption was not much. The decrease of 7.64 percent was reported in 2002-03. Similarly, in Mansa and Bathinda districts, the highest decrease to consumption was noticed during 2004-05 by 37.42 and 33.36 percent respectively. However in this period, there was increase in consumption of pesticides in Ferozepur and Muktsar districts over the base year.

A considerable decrease in pesticide consumption was reported during period-II. In Punjab, it was found that the consumption was decreased by 15.77 percent over base year during 2009-10. Similarly, the consumption considerably decrease during period-II, in Bathinda district, the highest decrease being 70.47 percent during 2008-09. In Mansa the highest decrease was noticed in year 2007-08 by 60.45 percent and in Muktsar during 2009-10 by 49.82 percent over the base period.

It was noticed that the consumption of pesticides in Mansa, Muktsar and Bathinda districts was decreasing by 52.08, 49.82 and 60.64 percent respectively. However there was increase in consumption in Ferozepur district by 112.39 percent over base year. But in overall Punjab consumption of pesticides was decreased by 15.77 percent during 2000-01 to 2009-10. It all because of improved certified seeds and unfavourable weather conditions for pest attack.

Table 1: Trend in Pesticides Consumption in Punjab during 2000-01 to 2009-10

Year	Punjab		
	Consumption (MT) Y	Index	% Charge over base* year
Period I			
2000-01	6821	100.00	….
2001-02	7200	105.56	5.56
2002-03	6300	92.36	-7.64
2003-04	6900	101.16	1.16
2004-05	6487	95.10	-4.90
Period II			
2005-06	5970	87.52	-12.48
2006-07	5975	87.60	-12.40
2007-08	5900	86.50	-13.50
2008-09	5760	84.45	-15.55
2009-10	5745	84.23	-15.77

Source: Department of agriculture (Plant Protection and Locust Control), Punjab Chandigarh.

* Here base year is 2000-01

Trend for the consumption of pesticides in Punjab.

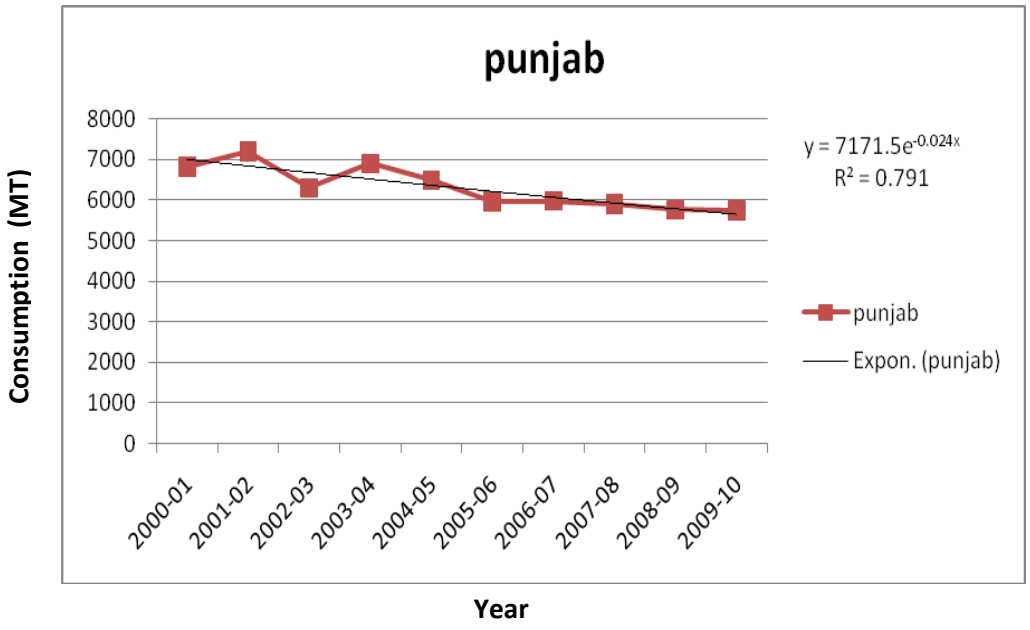


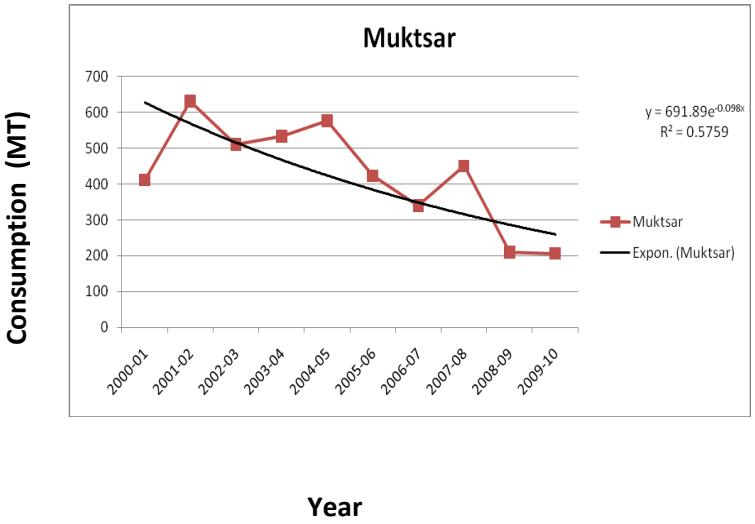
Table 2: Trend in Pesticides Consumption in Mansa, Bathinda, Muktsar and Ferozepur districts during 2000-01 to 2009-10.

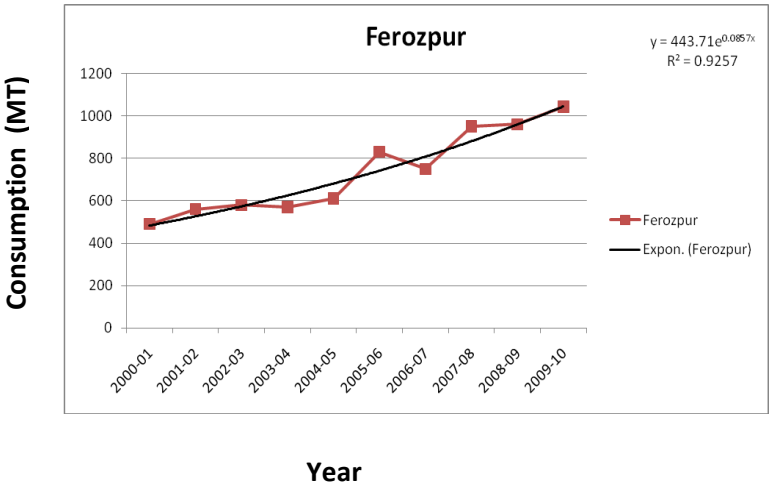
Year	Mansa			Bathinda			Muktsar			Ferozepur		
	Consumption (MT)	Index	% Charge Over Base* Year	Consumption (MT)	Index	% Charge Over Base* Year	Consumption (MT)	Index	% Charge Over Base* Year	Consumption (MT)	Index	% Charge Over Base* Year
2000-01	1646	100.00	----	714.09	100.00	----	411.20	100.00	----	490.85	100.00	----
2001-02	1680	102.07	2.07	776.43	108.73	8.73	630.50	153.33	53.33	560.65	114.22	14.22
2002-03	1430	86.88	-13.12	654.91	91.71	-8.29	510.60	124.17	24.17	580.40	118.24	18.24
2003-04	1300	78.98	-21.02	682.95	95.64	-4.36	532.90	129.60	29.60	570.50	116.23	16.23
2004-05	1030	62.58	-37.42	475.85	66.64	-33.36	576.60	140.22	40.72	610.50	124.38	24.38
2005-06	888	53.95	-46.05	310.83	43.53	-56.47	423.06	102.88	2.88	830.50	169.20	69.20
2006-07	910	55.29	-44.71	770.38	107.88	7.88	340.15	82.72	-17.28	750.40	152.88	52.88
2007-08	651	39.55	-60.45	287.60	40.28	-59.72	450.00	109.44	9.44	950.50	193.64	93.64
2008-09	788	47.87	-52.13	210.86	29.53	-70.47	210.32	51.15	-48.85	960.40	195.66	95.66
2009-10	788.7	47.92	-52.08	281.04	39.36	-60.64	206.32	50.18	-49.82	1042.50	212.39	112.39

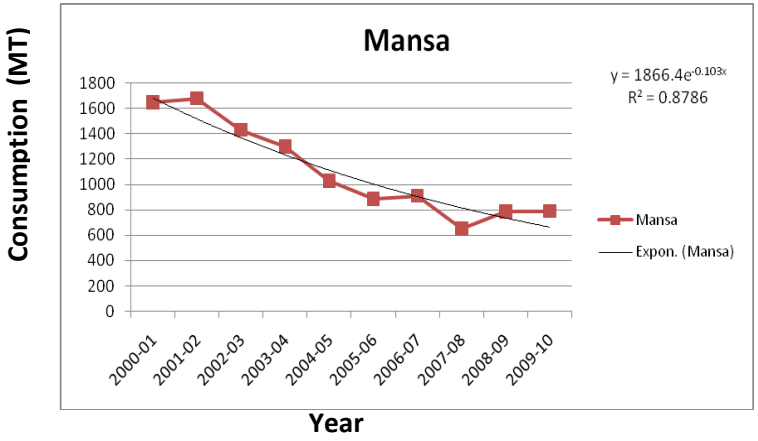
Source: Department of agriculture (Plant Protection and Locust Control), Punjab Chandigarh.

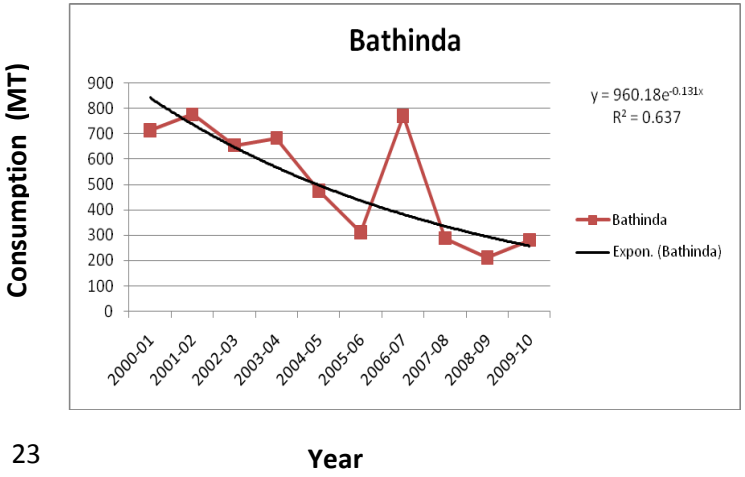
* Here base year is 2000-01

Trend for pesticides consumption in Muktsar, Ferozepur, Mansa and Bathinda









To further support the significance of trend over time, the regression analysis of the type of $Y=a.e^{bx}$ was conducted and the result are shown in Table 3. It is clear from the table that a test of significance showed that decrease in pesticides consumption was statistically significant at one percent level over period of time in the Punjab State.

Table 3 Trend Equation $Y=a.e^{bx}$ for pesticides consumption.

Area	Consumption of Pesticides	
	R^2	F cal
Punjab	0.79	30.27*
Mansa	0.88	57.90*
Bathinda	0.64	14.04*
Muktsar	0.58	10.86*
Ferozepur	0.93	99.67*

***** Significant at 1 per cent level of significance, F-critical is 5.32, df =1, 8

4.2 Marketing Channels/ Organisation Structure

The pesticides supply system in private and cooperative sectors are identified as follows:

i. The Private Sector: In private sector, pesticides are moved through the distributors (wholesalers) and dealers (retailers) to farmers.

   The manufacturers have appointed distributors (wholesalers) at tehsil and district level and retail depots at block headquarter and in important villages, having more sale of pesticides.

   The distributors receive pesticides according to the demand of retail depots which further supply the pesticides to farmers on cash payment. The distributors also supply pesticides directly to the farmers.

   The private agencies having widespread distribution channels handled 88 percent and Co-operative thus, handled only 12 percent of the pesticides annually consumed in Punjab as shown in Table 4

Table 4: Distribution of pesticides through co-operative and private agencies during April 2009-March 2010 in Punjab. (N=36)

Agencies	Pesticides distributed (Kg or litre)	Percentage share of each agency
Private	222740	88
Cooperative	30500	12

*N includes 4 private wholesalers, 20 private retailers, 4 cooperative wholesaler and 8 cooperative retailers

ii) The Co-operative Sector: The Markfed supplied the pesticides through Markfed branches, which maintain buffer stocks situated at different blocks, were controlled by Markfed district office, to Markfed retail depots and primary agricultural co-operative societies. The State Agricultural Department also received the supplies from Markfed which was distributed to farmers at subsidy.

Primary co-operative marketing societies collect demand from village depots and agricultural co-operative service/credit societies for kharif and rabi requirements of different types of pesticides. The Markfed at State level consolidate the requirements of a district and places intends with public and private manufacturers. Markfed supplies the subsidized pesticides with the help of Punjab Government.

Method of working

The Markfed supplied pesticides to the Markfed branches situated at different blocks on consignment-cum-credit basis according to their demand. These Markfed branches in turn, on the same basis, pass on the stocks to the agricultural service societies and retail depots. A Markfed branches sell pesticides in retail sale at its own premises to the agricultural credit/service societies of the member village against cash or against letter of authority received from co-operative bank branch or to the individual farmer against cash or crop loan.

A village co-operative society holding sub-depot sell to its own member on cash or against the authority letter received from co-operative bank branch or commercial bank banks or to the non member against cash.

4.3 Marketing Cost

The distributor's selling price and various components of marketing costs of different types of pesticides handled by private distributor are given in Table 5.

One notable feature of the data **is** that the source of supply price exceeding 90 per cent, the distributor selling price in all types of pesticides left a distributional margin of around 10 per cent of the selling price of distributor, which is enough to meet the various costs and earn good profit. In case of all type of pesticides, the margin left for profit was about 3.5 percent except in case of Pretilachlor where distributional margin was only 1.61 percent This margin is about 58 per cent of distributional margin.

The private wholesaler's margin for profit was nearly 4.17 per cent of their selling price. It was about 1.61 per cent in the case of Pretilachlor. In absolute terms the private wholesaler earned the maximum profit of about Rs 60 per kg on Imidacloprid 70% WDG and minimum profit was Rs 5 per kg on cartap- Hydrochloride 4G. Thus, the profit left to wholesaler on these pesticides was around 58.33 per cent of the distributional margin.

The expenses on overheads and promotional charges were the major costs of private wholesaler and retailer forming over 8 per cent of the distributional margin. Other important item of cost was transportation which accounting about 6 per cent of distributional margin. The miscellaneous costs accounted for about 3.9 per cent of the distributional margin in respect of all the pesticides. Thus there was more expenditure on promotion to increase the consumption of pesticides.

Similar analysis was done for private dealers (retailers) as shown in Table 6

The private dealer had also deducted about 17 percent of dealer's selling prices to meet the distributional margin. The profit margin of the private retailer was around 12.86 in case of Cartap-Hydrochloride 4G, Pretilachlor and Cladinofop-Propargyl and around 20.80 percent in case of Imidacloprid 70% WDG of the selling price. Like wholesaler, the retailer also incurred costs from its distributional margin. But it was analysis that retailer paid maximum on overheads charges, which comes around 3.88 percent for all categories of pesticides. They spent minimum on miscellaneous around 1.82 percent. Transportation and promotional charges constituted around 4.48 percent of all the pesticides.

Table 5: Component-wise Break-up of Distributor's Selling Price (2009-10)(N=4)

Private distributor (wholesaler)												
	Cartap Hydrochloride 4G (Rs/Kg)	**(%)**	**% Change To Total Dist. Margin**	**Imidacloprid 70% WDG (Rs/Kg)**	**(%)**	**% Change To Total Dist. Margin**	**Pretilachlor (Rs/Kg)**	**(%)**	**% Change To Total Dist. Margin**	**Cladinofop-Propargyl (Rs/Kg)**	**(%)**	**% Change To Total Dist Margin**
Distributor's Selling price	55	100	----	750	100	--	325	100		320	100	
Source Price	50	90.91	----	690	92.00	--	315	96.92		305	95.31	
Distributional Margin Of which:	5	9.09	100	60	8.00	100.00	10	3.08	100	15	4.69	100.00
Transportation	0.9	1.64	18	1.25	0.17	2.08	1.4	0.43	14	1.2	0.38	8.00
Overhead	0.4	0.73	8	1.1	0.15	1.83	0.8	0.25	8	1.25	0.39	8.33
Promotional	1.8	3.27	36	2.5	0.33	4.17	1.75	0.54	17.5	2	0.63	13.33
Miscellaneous	0.6	1.09	12	1.2	0.16	2.00	0.8	0.25	8	0.8	0.25	5.33
Margin left for profit	1.3	2.36	26	53.95	7.19	89.92	5.25	1.62	52.5	9.75	3.05	65.00

Table 6: Component-wise Break-up of Dealer's Selling Price (2009-10) (N=20)

Private Dealers (Retailer)												
	Cartap Hydrochloride 4G (Rs/Kg)	**(%)**	**% Change To Total Dist Margin**	**Imidacloprid 70% WDG (Rs/Kg)**	**(%)**	**% Change To Total Dist Margin**	**Pretilachlor (Rs/Kg)**	**(%)**	**% Change To Total Dist Margin**	**Cladinofop -Propargyl (Rs/Kg)**	**(%)**	**% Change To Total Dist Margin**
Dealer's Selling price	60	100		830	100		340	100		344	100	
Source Price of Which:	55	91.67		750	90.36		325	94.75		320	93.02	
Distributional Margin	5	8.33	100	80	9.64	100	15	4.37	100.00	24	6.98	100.00
Transportation	0.75	1.25	15	0.9	0.11	1.125	0.71	0.21	3.94	1	0.29	4.17
Overheads	1	1.67	20	1.8	0.22	2.25	1.5	0.44	8.33	1.1	0.32	4.58
Promotional	0.9	1.50	18	0.86	0.10	1.075	0.3	0.09	1.67	1.8	0.52	7.50
Miscellaneous	0.4	0.67	8	0.8	0.10	1	0.82	0.24	4.56	0.55	0.16	2.29
Margin left for profit	1.95	3.25	39	75.64	9.11	94.55	11.67	3.40	64.83	19.55	5.68	81.46

4.3 Price spread

Price spread is defined as the difference between the price paid by the ultimate consumers minus the prices received by the producers. In the present study costs and margins for selected pesticides were worked out at a point of time. The following channels were found common in pesticides marketing:

1 Manufacturer → Private Distributor(wholesaler) → private retailer → Farmers.

2. Manufacturer → Private Distributor(wholesaler) → Farmers.

3 Manufacturer → Markfed → Agricultural Co-operative Societies/State Agricultural Department → Farmers.

It can be observed from Table 7 that the manufacturer's share in consumer rupee for Cartap-Hydrochloride 4G, Imidacloprid 70 WDG, Pretilachlor and Cladinofop-Propargyl during 2009-10 was 83.33, 83.13, 92.64 and 88.66 respectively. Regarding the costs incurred by the distributor, it was found to be 6.05, 0.72, 1.38 and 1.51 percent of the consumer's rupee for Cartap-Hydrochloride 4G, Imidacloprid 70 WDG, Pretilachlor and Cladinofop-Propargyl respectively. The costs of Private distributor included the transportation, overhead, promotion, and miscellaneous costs etc. The wholesaler had sold the product to private dealer (retailer) by keeping a profit margin of 3.25, 6.5,1.54 and 2.83 per cent of consumer's rupee for respective pesticides The dealer (retailer) incurred the costs on transportation, overheads, Promotional and miscellaneous accounted for 6.16, 0.5, 0.96 and 1.27 per cent for Cartap-Hydrochloride 4G, Imidacloprid 70 WDG, Pretilachlor and Cladinofop-Propargyl respectively by keeping a profit margin of 2.1, 9.1, 3.4 and 5,6 per cent of consumer's rupee respectively, for above said pesticides Thus, retailer's margins were higher than wholesaler. Therefore, to improve the economic efficient of marketing, retailer's and wholesaler's margins need to be reduced.

Table 8 shows the price spreads in the second channel during 2009-10.

It can be seen from the table that the distributor also sold the pesticides directly to the farmers, by saving above said costs of transportation, overheads, promotional and other costs etc. by 5.07, 0.72, 1.38 and 1.51 percent for Cartap-Hydrochloride 4G, Imidacloprid 70 WDG, Pretilachlor and Cladinofop-Propargyl. Hence, he realized a high margin as 11.88, 16.13, 5.95 and 9.81 percent of consumer's rupee for above mentioned pesticides respectively

Table 7: Marketing Margins and Costs of Cartap-Hydrochloride 4G, Imidacloprid 70 WDG, Pretilachlor and Cladinofop-Propargyl (2009-10) in Channel I (N=24)

Channel I	Cartap Hydrochloride 4G (Rs/Kg)	Percentage (%)	Imidacloprid 70% WDG (Rs/Kg)	Percentage (%)	Pretilachlor (Rs/Kg)	Percentage (%)	Cladinofop-Propargyl (Rs/Kg)	Percentage (%)
Purchase price of distributor	50	83.33	690	83.13	315	92.65	305	88.66
Transportation	0.75	1.25	1.25	0.15	1.4	0.41	1.2	0.35
Overhead	1	1.67	1.1	0.13	0.8	0.24	1.25	0.36
Promotional	0.9	1.50	2.5	0.30	1.75	0.51	2	0.58
Miscellaneous	0.4	0.67	1.2	0.14	0.8	0.24	0.8	0.23
Margin left for profit	1.95	3.25	683.95	82.40	310.25	91.25	299.75	87.14
Sale Price Of Dist./ Purchase Price Of Dealer	55	91.67	750	90.36	325	95.59	320	93.02
Transportation	0.9	1.50	0.9	0.11	0.71	0.21	1	0.29
Overhead	0.4	0.67	1.8	0.22	1.5	0.44	1.1	0.32
Promotional	1.8	3.00	0.86	0.10	0.3	0.09	1.8	0.52
Miscellaneous	0.6	1.00	0.8	0.10	0.82	0.24	0.55	0.16
Margin left for profit	51.3	85.50	745.64	89.84	321.67	94.61	315.55	91.73
Sale Price Of dealer	60	100.00	830	100.00	340	100.00	344	100.00

*N includes 4 private wholesalers, 20 private retailers

Table 8: Marketing Margins and Costs of Cartap-Hydrochloride 4G, Imidacloprid 70 WDG, Pretilachlor and Cladinofop-Propargyl (2009-10) in Channel II (N=4)

Channel II	Cartap Hydrochloride 4G (Rs/Kg)	Percentage (%)	Imidacloprid 70% WDG (Rs/Kg)	Percentage (%)	Pretilachlor (Rs/Kg)	Percentage (%)	Cladinofop-Propargyl (Rs/Kg)	Percentage (%)
Sale Price Of Manufacturer	50	83.33	690	83.13	315	92.64	305	88.66
Transportation	0.75	1.25	1.25	0.15	1.4	0.41	1.2	0.35
Overhead	1	1.67	1.1	0.13	0.8	0.24	1.25	0.36
Promotional	0.9	1.50	2.5	0.30	1.75	0.51	2	0.58
Miscellaneous	0.4	0.67	1.2	0.14	0.8	0.24	0.8	0.23
Profit Margin	6.95	11.58	133.95	16.14	20.25	5.96	33.75	9.81
Sale Price Of distributor	60	100.00	830	100.00	340	100.00	344	100.00

In cooperative sector Markfed performed the function of wholesaler. It supplied pesticides to State Agricultural Department and Agricultural Cooperative Societies which further channelised pesticides to farmers. Table 9 indicates the price spreads in third channel for the selected pesticides during 2009-10.

Table 9: Marketing Margins and Costs of Cartap-Hydrochloride 4G, Imidacloprid 70 WDG, Pretilachlor and Cladinofop-Propargyl (2009-10) in Channel III (N=12)

Channel III	Cartap Hydrochloride 4G (Rs/Kg)	Imidacloprid 70% WDG (Rs/Kg)	Pretilachlor (Rs/Kg)	Cladinofop-Propargyl (Rs/Kg)
Sale Price Of Manufacturer And Purchase Price Of Markfed	52.36	641.18	319.98	307.38
Costs Incurred By The Markfed				
Sales Tax	exempted	exempted	exempted	exempted
Surcharge On Sale Tax				
Distributional Margin @ 10.30 Percent	5.24	64.12	32.00	30.74
Sale Price Of Markfed And Purchase Price Of Agri, Deptt/Co-Operative Society	57.75	707.22	352.94	339.04
Distributional Margin @ 10 Percent	5.78	70.72	35.29	33.90
Sale Price Of Agri. Dept/Co-Operative Society	63.53	777.94	388.24	372.94
Subsidiary Rate @15 Percent	9.53	116.69	58.24	55.94
Purchase Price Of Farmer	54.00	661.25	330.00	317.00

*N includes 4 cooperative wholesaler and 8 cooperative retailers

Markfed had fixed the their distributional margins for different types of pesticides by 10.30 percent of their purchase price and for agricultural department and agricultural co-operative societies was 10 percent of their purchasing price. Sales tax/VAT, Surcharge, Octrai etc as applicable would be charged extra. Presently Sale tax and Surcharge Nil for Punjab.

The State Agricultural Department and Agricultural Co-operative Societies further supplied pesticides to farmers after keeping fixed distributional margin of 10 percent.

Agricultural societies give subsidy of 15 percent on agrochemicals. It was calculated for Cartap-Hydrochloride 4G, Imidacloprid 70 WDG, Pretilachlor and Cladinofop-Propargyl and it comes out to be Rs. 9.52, Rs 116.69, Rs. 58.23 and Rs. 55.94 respectively.

The Markfed fixed their distributional margins so high that exceed the subsidy given on pesticides. Even then twelve percent of the total pesticides moved through co-operative. This was due to the reason that financially weaker farmers can had pesticides only on the credit basis.

4.4 Pesticides distributional credit

Availability of adequate credit is recognized as an effective instrument to increase pesticides consumption in the country. The majority of farmers with small land holdings, do not possess the necessary financial resources to purchase and apply this costly input. The commercial banks as well as cooperatives have stepped up their advances to the farmers to finance their short term and long term investments. Credit in considerable volume is also required by the distributive agencies at various levels of marketing. In view of crucial importance of credit in pesticides trade, the present sources, and adequacy of credit have been analyzed.

Table 10: Source of Credit to Dealers in 2009-10 (N=36)

Credit Source	**Co-operative (wholesaler + retailer)**		**Private (wholesaler + retailer)**	
	No.	%	No.	%
Co-operative societies	9	75	4	16.67
Banks	3	25	17	70.83
Money Lenders	----	----	1	4.16
Other Sources	----	----	2	8.33
TOTAL	12	100	24	100

*N includes 4 private wholesalers, 20 private retailers, 4 cooperative wholesaler and 8 cooperative retailers

4.4.1 Source of Credit

The cooperative in Punjab do not have any major problem of distribution credit as Markfed, which procures pesticides on behalf of cooperatives also supplies them on consignment basis. The wholesalers in turn, extend the same facility to village/block level cooperative retail dealers. Thus, all along the line transactions take place on consignment basis except State Agriculture Departments which arrange credit of its own. Table 10 shows that for the cooperative agencies, cooperative credit was chief source which provided loan to

75 per cent of cooperative dealers. Whereas banks provided credit facilities only to 25 per cent of dealers. The private agencies, however, had to arrange finances on their own from commercial banks, their supplier and private money-lenders. The study showed that 70.83 per cent private agencies got loan from commercial banks, whereas cooperative and other sources advanced to 16.66 and 8.3 per cent of the private dealers. Still 4.1 percent private agencies got loan from money lenders.

4.4.2 Adequacy of Credit-Dealers Opinion

Dealer's opinion on the adequacy of credit is summarized in Table 11.

The cooperative wholesalers had reported sufficiency of credit. It was due to the fact that they had easy access to a liberal form of credit. In the study respondent gave marks to adequacy of credit out of 3, in the result it was found that mean score comes out to 2.5 i.e. only 50 percent of private wholesaler opined that available credit arrangement were adequate.

Table 11: Adequacy of credit (2009-10)

Dealer Reporting	**Wholesaler (N=8)**						
	Co-Operative				**Private**		
	Weightage (A)	**No. Of Respondent (B)**	**A*B**	**Mean Score**	**No. Of Respondent (C)**	**A*C**	**Mean Score**
Adequacy	3	4	12		2	6	
Inadequacy	2	0	0		2	4	
Not Available	1	0	0	3	0	0	2.5
TOTAL		4			4	10	
Dealer Reporting	**Retailer (N=28)**						
	Co-Operative				**Private**		
	Weightage (A)	**No. Of Respondent (B)**	**A*B**	**Mean Score**	**No. Of Respondent (C)**	**A*C**	**Mean Score**
Adequacy	3	7	21		12	36	
Inadequacy	2	1	2	2.875	3	6	2.35
Not Available	1	0	0		5	5	
TOTAL		8	23		20	47	

*N includes 4 private wholesalers, 20 private retailers, 4 cooperative wholesaler and 8 cooperative retailers

On the other hand it was found , in case of private retailers their mean score come out to 2.35 it mean they opined in favour of inadequacy of credit and co-operative retailers were quite satisfied with adequacy of credit.

4.4.3 Impact of credit on Sale

The retailers view on influence of increased flow of credit in expanding the sales of pesticides are summarized in Table 12. The expected increase in sale was analyzed as caused by : (a) expansion of credit to dealers and (b) improvement in dealers ability to provide more credit to farmers. Over 75 per cent of cooperative retailers, however, felt additional credit to them would not improve their sales. 12.5 per cent of dealers estimated less than 25 per cent increase in sales and 12.5 per cent also thought that there would be 25 to 50 per cent increase in their sales if more credit was available to them.

A higher proportion of cooperative retailers felt that more credit to the farmers was likely to have a better impact on the sales. According to 50 per cent of dealers, there would be 1 to 25 per cent increase in sales of pesticides. As against this, 37.5 per cent opined that additional credit to farmers may not improve their sales.

Unlike the cooperative, 75 per cent of the private dealers felt that more credit to them rather than the farmers would increase sales by 1 to 25 per cent, On the other hand, 25 per cent of private dealers thought that additional credit to farmers may not increase the sale as against 5 per- cent felt that more credit to farmers have a better impact on sales more than 50 percent and 55 percent private dealers felt that credit have impact with more than 25 percent.

Table 12: Impact of credit on increase in sales (2009-10) (N=28)

	Co-Operative Retailer				**Private Retailer**			
% Increase In Sale	**Credit to dealer**	**(%)**	**Credit to consumer**	**(%)**	**Credit to dealer**	**(%)**	**Credit to consumer**	**(%)**
0	6	75	3	37.5	…..	….	5	25
1-25	1	12.5	4	50	15	75	3	15
26-50	1	12.5	1	12.5	3	15	11	55
51-100	…	…	….	…..	2	10	1	5
TOTAL	8	100	8	100	20	100	20	100

*N includes 20 private retailers and 8 cooperative retailers

4.5 Extension and Promotion

An average farmer of Punjab is progressive and highly receptive to the new technology in agriculture, whether it is adoption of high yielding varieties or pesticides use. Despite this, continuous efforts are needed to propagate scientific ways of application of pesticides to sustain the use of new technology over long periods. Pesticides manufacturers and the dealers have a special role to play in the task of educating the farmers and providing consultancy services on methods, timed and dose of pesticides usage. The information on the types of promotional activities undertaken by dealers and the expenses incurred by them on such activities were analyzed and presented in Table 13, 14.

4.5.1 Promotional Expenditure of wholesaler

The promotional expenditure incurred by the wholesaler has been calculated and it is clear that if the total expenses incurred is a criterion for evaluating the dealer's performance with regard to sales promotion private wholesalers scored over the cooperatives. The promotional expenditure worked out to Rs.26600 per private wholesaler per annum. The corresponding amount was Rs. 10100 per cooperative wholesaler per annum, whereas he was not getting any amount from suppliers to meet promotional expenses.

Again judging from the amount of expenditure incurred, the most favoured form of the promotion was distribution of promotional literature, erecting sign boards/ bill boards and newspaper. These three accounted for nearly 40 percent of the expenditure. The other promotional activities commonly adopted by private wholesaler and co-operative wholesaler are participated in fairs, films and slides, exhibition and field days. Private dealers also provide technical advisory services but the entire cost were undertaken by supplier.

Table 13: Promotional expenditure by wholesalers (2009-10) (N= 8)

Sr. no.	Promotional Items		Dealer's Costs	
			Average Cost Per Dealer (Rs.)	Percentage Of Total Promotional Expenditure
1	News Paper Advertisement	Private	3000	11.27
		Cooperative	3500	34.65
2	Sign Board/Bill Board	Private	4500	16.91
		Cooperative	3000	29.70
3	Promotional Literature	Private	3000	11.27
		Cooperative	2300	22.77
4	Technical Advisory Services		----	----
5	Participation In Fair And Exhibition	Private	3000	11.27
		Cooperative	1300	12.87
6	Cinema Advertisement		----	----
7	Film And Slides		----	----
8	Field And Slides	Private	1000	6.06
		Cooperative	----	----
9	Demonstrations	Private	2000	12.12
		Cooperative	----	----
Total		Private	26600	100.00
		Cooperative	10100	100.00

*N includes 4 private wholesalers and 4 cooperative wholesaler

4.5.2 Promotional expenditure of retailer

The data on the promotional expenditure incurred by the retailers on the various promotional activities is given in Table 14.

Unlike the wholesalers, the retailers were bearing the entire cost on promotion work undertaken by them. The private retailers, like their counterparts in wholesaler trade had realised the expenditure on promotion is important for pushing up their sales. The average expenditure of a private retailers was Rs 12450 which is about six times of cooperative retailer. The cooperative dealers relied mainly on setting up on sign boards, bill boards and distributional literature. The private dealers in addition to the above had spent on advertisement in newspaper, film and slides and calendar.

Table 14: Promotional expenditure by Retailers (2009-10) (N =28)

Sr. no.	Promotional Item		Average Cost (Rs.)	Percentage Of Total Expenditure
1	Sign Board/Bill Board	Private	4000	38.09
		Cooperative	750	38.46
2	Promotional Literature	Private	2000	19.04
		Cooperative	1200	61.54
3	Newspaper Adv	Private	2500	23.80
		Cooperative	----	----
4	Film And Slides		----	----
5	Calendar	Private	2000	19.04
		Cooperative	----	-----
	Total Expenditure Per Dealer	Private	10500	100.00
		Co-Operative	1950	100.00

*N includes 20 private retailers and 8 cooperative retailers

Chapter V

SUMMARY AND CONCLUSION

5.1 SUMMARY

The insect or pest problem has become more serious since the introduction of high yielding varieties and increased irrigation facilities. To eradicate these pests various kinds of pesticides are being manufactured in India and are imported from other countries. In Punjab these pesticides are being channelized through co-operative and private institutions like Markfed in the co-operative sector, and distributors and dealers in the private sectors. Not much work has been done in this field in India, hence we attempted to study the pesticides marketing channels. The study carried out with objective to study the consumption trend for pesticides and identify important marketing channels and price spread in each channel and to identify the weaknesses, if any in marketing channel.

The study confined to Bathinda. Mansa. Muktsar and Ferozepur which are having maximum land holding under cotton crop, which is consuming more pesticides as compare to other crop.

5.2 CONCLUSION

1. The trend in pesticides consumption shown a significant decrease after 2000-01 in Punjab as a whole as well as Bathinda, Muktsar and Mansa districts. There was decrease of 15.77 percent in Punjab during 2000-01 to 2009-10. This decrease was due to the favourable increase in production technology, high yielding or certified seeds and introduction of Bt cotton also contributing to decrease the consumption of pesticides.
2. In Punjab, pesticides are channelized through both private and co-operative sectors, but the private sector having a kind of monopoly handles 88 percent of the total pesticides consumed annually. In private sector pesticides distributors appointed at districts/tehsil level, are moved to dealers (retailers) at block/village level which dispose the products to farmers, while on co-operative system Markfed at apex level regulated the supply to state agricultural Department and Marketing Federations which, in turn, move the pesticides to their retail depots and primary co-operative credit/service societies.
3. Co-operative in Punjab do not have Major problem of distributional credit as Markfed, place orders and supplies on consignment basis to co-operative. 75 percent of co-operative dealers had their chief source of credit as co-operative banks. On the other hand, 70.83 percent private agencies got loan from commercial banks.
4. For the adequacy of credit it was observed that mean score comes out to be 3 and 2.5 for co-operative and private wholesaler. It mean co-operative and private wholesaler had quite adequate credit. In case of retailers, for co-operative retailers mean score comes out

to be 2.875 it mean they had adequate credit and on other hand private retailer had mean score 2.35 so they had inadequate credit.

5. 75 percent co-operative retailer felt that more credit to them would not improve their sales. If credit would with farmers then according to 50 percent of retailers, there would be a 1-25 percent increase in sale of pesticides. Unlike the cooperative, 75 per cent of the private dealers felt that more credit to them rather than the farmers would increase sales by 1 to 25 per cent. On the other hand, 55 percent of dealers thought that additional credit to farmers may increase the sales by 26-50 percent.
6. If the total expenses incurred is a criterion for evaluating the dealer's performance with regard to sales promotion private wholesalers scored over the cooperatives. The promotional expenditure worked out to Rs.26600 per private wholesaler per annum. The corresponding amount was Rs. 10100 per cooperative wholesaler per annum.
7. The private and co-operative retailer borne an expense of Rs. 10500 and Rs 1950 per dealer per annum.
8. There are many loopholes in existing distribution system. The main lacuna in failure of co-operative is that lead time is long in their system, receiving the demand from retailers and supplying the pesticides is lengthy one. These delays the despatches to the co-operative depots and in the mean while farmers purchase their requirements from alternative i.e. private dealers forgo the benefits of subsidy.
9. Many times some dishonest elements in agricultural co-operative societies may sell the subsidized pesticides to private dealers which, in turn, may sell to the farmers at price prevailing in private market.
10. The farmers of Punjab, dynamic and progressive in outlook, has developed brand image. Many times few brands of pesticides are available with co-operative societies, therefore, it becomes a problem for members of co-operative societies to realize on these brands. Co-operatives should have branded or effective pesticides so that farmers can save from costly and spurious pesticides which they are buying from private dealers.
11. Private dealers have higher margin than their cost incurred, which adversely effect the economics efficiency of pesticides marketing.
12. The Markfed had fixed their distributional margins so high that these exceeds the subsidy given to the farmers. The co-operative agencies should reduce their margins so that farmers can get the advantage of subsidy.

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ANNEXURE-I

SCHEDULE FOR PRIVATE WHOLE-SALER

Name of dealer:- …….

Address:-……

Ques.1: How much quantity (kg) of pesticides you have sold in year (April 2009-March 2010)?

Ans: ----------

Ques.2:- Component –wise Break up of whole seller's selling price?

Pesticides	Cartap Hydrochloride 4G (Rs/kg)	Imidacloprid 70%WDG(Rs/kg)	Pretilachlor (Rs/kg)	Cladinofop-Propargyl (Topik) (Rs/kg)
Selling Price of Distributors Of Which:				
1) Source of supply price				
2) Distributional margin of which:				
(a) Transportation cost				
(b) Overheads				
(c) Sales tax				
(d) Promotional				
(e) VAT				
(f) Miscellaneous				
(g) Margin left for profit				

Ques:-3 What is source of credit and level of its adequacy?

S.no	Source of credit	Source Used	Level of Credit Adequacy		
			Adequate	Inadequate	Credit not available
1	Co-operative				
2	Banks				
3	Money Lenders				
4	Other source				

Ques.4:- What is Promotional Expenditure?

Promotional item	Cost(Rs) (Apr2009-Mar. 2010)
1) Newspaper advertisement	
2) Sign Board	
3) Promotional literature	
4) Technical advisory services	
5) Participation in fair and exhibition	
6) Film and slides	
7) Field days	
8) Demonstration	
9) Others	

SCHEDULE FOR PRIVATE RETAILER

Name of dealer:- …….

Address:-……

Ques.1: How much quantity (kg) of pesticides you have sold in year (April 2009-March 2010)?

Ans: ----------

Ques.2:- Component –wise Break up of retailer's selling price?

Pesticides (Rs/Kg)	Cartap Hydrochloride 4G (Rs/kg)	Imidacloprid 70%WDG(Rs/kg)	Pretilachlor (Rs/kg)	Cladinofop-Propargyl (Topik) (Rs/kg)
Selling Price of Retailer Of Which:				
1)Source of supply price				
2)Distributional margin of which:				
a) Transportation cost				
b) Overheads				
c) Sales tax				
d) Promotional				
e) VAT				
f) Miscellaneous				
g) Margin left for profit				

Ques:-3 What is source of credit and level of its adequacy?

S.no	Source of credit	Source Used	Level of Credit Adequacy		
			Adequate	Inadequate	Credit not available
1	Co-operative				
2	Banks				
3	Money Lenders				
4	Other source				

Ques.4:- What is impact of credit on sales?

% increase in sales	If more credit available to the dealer	If more credit available to the farmers
0		
1-25		
26-50		
51-100		

Ques.5:- What is Promotional Expenditure ?

	Promotional item	Cost (`) (Apr2009-Mar. 2010)
1)	Newspaper advertisement	
2)	Sign Board	
3)	Promotional literature	
4)	Film and slides	
5)	Calenders	
6)	Others	

SCHEDULE FOR CO-OPERATIVE WHOLESALER (MARKFED)

Name of Co-operative society:-

…….

Address:-……

Ph. No. ……

Ques.1: How much quantity (kg) of pesticides you have sold in year (April 2009-March 2010)?

Ans: ----------

Ques.2: What is rate of distributional margin at present going on?

Ans: …….

Ques.3: Marketing margins and costs for following pesticides?

	Cartap Hydrochloride 4G (Rs/kg)	Imidacloprid 70%WDG(Rs/kg)	Pretilachlor (Rs/kg)	Cladinofop-Propargyl (Topik) (Rs/kg)
Sale price of manufacturer or				
1) Purchase price of Markfed				
Costs incurred by the Markfed				
(a) Sales tax				
(b) Surcharge on sale tax				
2) Sales price of Markfed				

Ques:-4 What is source of credit and level of its adequacy?

S.no	Source of credit	Source Used	Level of Credit Adequacy		
			Adequate	Inadequate	Credit not available
1	Co-operative				
2	Banks				
3	Money Lenders				
4	Other source				

Ques.5:- What is impact of credit on sales?

% increase in sales	If more credit available to the dealer	If more credit available to the farmers
0		
1-25		
26-50		
51-100		

Ques.6:- What is Promotional Expenditure ?

Promotional item	Cost (`)(Apr2009-Mar. 2010)
1) Newspaper advertisement	
2) Sign Board	
3) Promotional literature	
4) Others	

SCHEDULE FOR CO-OPERATIVE RETAILER

Name of co-operative society:-

…….

Address:-……

Ques.1: How much quantity (kg) of pesticides you have sold in year (April 2009-March 2010)?

Ans: ----------

Ques.2: What is subsidiary rate at present going on?

Ans: …….

Ques.3: What is rate of distributional margin at present going on?

Ans: …….

Ques.4: What are the Marketing margins and costs for following pesticides?

	Cartap Hydrochloride 4G (Rs/kg)	Imidacloprid 70%WDG(Rs/kg)	Pretilachlor (Rs/kg)	Cladinofop-Propargyl (Topik) (Rs/kg)
Sale price of Agri. Deptt. of co-operative Society				

Ques:-5 What is source of credit and level of its adequacy?

S.no	Source of credit	Source Used	Level of Credit Adequacy		
			Adequate	Inadequate	Credit not available
1	Co-operative				
2	Banks				
3	Money Lenders				
4	Other source				

Ques.6:- What is impact of credit on sales?

% increase in sales	If more credit available to the dealer	If more credit available to the farmers
0		
1-25		
26-50		
51-100		

Ques.7:- What is Promotional Expenditure?

Promotional item	Cost (`)(Apr2009-Mar. 2010)
1) Newspaper advertisement	
2) Sign Board	
3) Promotional literature	
4) Others	

SCHEDULE FOR FARMER

Name of Farmer:- …….

Address:-……

Ques.1: From where you buy the pesticides?

(a) Private Dealers □

(b) Private retailers □

(c) Co-operative wholeseller (MARKFED) □

(d) Co-operative retailers (societies) □

Ques.2 :- At what price do you purchase the following pesticides ?

Cartap Hydrochloride 4G……(Rs/kg)

Imidacloprid 70%WDG……..(Rs/kg)

Pretilachlor …….(Rs/kg)

Cladinofop-Propargyl (Topik)…… …(Rs/kg)

Ques.3 : What problems you are facing with purchase of pesticides ?

(a) Spurious pesticides
(b) Short supply
(c) High price
(d) Other(specify)

Ques:-4 What is source of credit and level of its adequacy?

S.no	Source of credit	Source Used	Level of Credit Adequacy		
			Adequate	Inadequate	Credit not available
1	Co-operative				
2	Banks				
3	Money Lenders				
4	Other source				

VITA

Name of the student	:	Manpreet Singh
Father's name	:	Mr. Jasmer Singh
Mother's name	:	Mrs. Harbhinder Kaur
Nationality	:	Indian
Date of birth	:	June 24, 1986
Permanent home address	:	Manday House, Bassi Pathana, Fatehgarh Sahib, Punjab PIN 140 412

EDUCATIONAL QUALIFICATION

Bachelor degree	:	B.Sc. Agriculture (Hons.)
University	:	Punjab Agricultural University
Year of award	:	2009
OGPA/OCPA/% marks	:	7.66
Master's degree	:	MBA(Agribusiness)
University	:	Punjab Agricultural University
Year of award	:	2011
OCPA	:	7.34
Title of the Project Report	:	A study of marketing channel management of pesticides in Punjab