

A Study of Marketing of Pesticides and Its Effect on Agri Products in Nagpur District (2000-01 to 2005-06)

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Abstract:

Agriculture is an important activity in India and is a major contributor to nation's economy. The cropping pattern is differentiated into Kharip and Rabbi. The main agriculture productions of India are Rice, Wheat, Fruits and Vegetables, Sugar- cane, Cotton, Soyabean etc. The Indian rural population represents about 70-75% of the total population and the country is self-sufficient in the food point of view. India's agriculture production is essentially based on climatic conditions. Indeed, a good monsoon can bring a very good Agricultural productivity.

Agricultural statistics is available mostly on an all India basis or state level. In a vast country like India inter-regional and inter-district variations are so pronounced that data at macro level, many a times, do not prove to be useful. The present research is aimed to study the marketing of pesticides and its effect on agri products in Nagpur district and to evaluate the agricultural and farmers development in Nagpur district.

Keywords: *Agriculture, cropping pattern, Agricultural productivity, Marketing of Pesticides etc.*

1) Introduction:

The most sensitive issue of farmers' agricultural condition of Nagpur district has to be studied from both the angles; Social and Economical. So, this topic was selected. Generally, a question arises in our mind that after independence various objectives are set up by Government and Planning commission for

the overall development of agriculture sector but inspite of this, last five to ten years worsened the agriculture situation in Nagpur district.

To bring about increase in agriculture production and also increase in rural employment, the five year plans carried out various programmes such as community development, agriculture extension services, expansion of irrigation facilities, fertilizers, pesticides, agricultural machinery, high yielding varieties of seeds and expansion of transportation, power generation and institutional credit.

To bring about equality and justice in rural India, the strategy used was land reforms which included the removal of intermediaries like the Zamindars, the protection of tenants through tenancy legislation, ceiling of land holding and distribution of surplus land among landless laborers and marginal farmers etc.

The significance of agriculture and farmers in India arises also from the fact that development in agriculture is very essential for the development of the national economy. Any change in the agriculture sector, positive or negative has a multiplier effect on the entire Indian economy. The agriculture acts as a bull worker in maintaining food security and in the process, national security and earning GDP to Country as well. To maintain the ecological balance there is a need for sustainable and balanced development of the agriculture and

allied sectors. Recognizing the crucial role played by this sector in overall development of the country, the topic “Marketing of pesticides and its effect on agri products”, has been selected for the study.

The researcher felt the need to explore more in this highly technological but supposed to be an integral part of every farmer. This study will help the pesticides’ companies to know the requirements of the consumer for the product. The inception of the pesticides’ services will make the rural people to avail the information considering Radio and Television as an important factor for development of society as a whole. Also, to enjoy liberty to select the channels and quality of service is the right of every consumer. The reasons for the study of farmers’ help the pesticides’ companies to improve their marketing strategies by understanding issues such as

- i) The psychology of how farmers think feels reason and selects between different brands of pesticides companies.
- ii) The psychology of how farmers are influenced by his/her environment such as culture, family, media, etc.
- iii) The behaviour of farmers while purchasing or while making other marketing decisions.
- iv) How marketers can adapt and improve their marketing campaigns and marketing strategies to more effectively reach the consumer.

2) Literature Review:

An article by S. K. Thakare, Y. C. Bhatt and A. K. Kamble published in the P.K.V. Research Journal vol. 30 No.1-January 2006, states that the cotton is the important cash crop of the Vidarbha region in the state of Maharashtra. The total area under cotton cultivation in the region is more than 18 lakh hectares i.e. about 40 percent of total area of India. The crop is threatened by many pest, insect and disease. The control over them can only be achieved if the pesticides are properly applied at the correct rate and on the target. Thus, it is clear that the scientific use of pesticides is the only way to

protect crops from pest diseases for increasing agricultural yield.

An article, “The food crisis: Neglect of agriculture yields a frightening harvest” published in “Business and Economic- Facts for You”, March 2009, states that agricultural productivity can be greatly increased by the careful use of science and technology. The technology should be adapted to the needs of small farmers and expatriate scientists from developing countries should be linked to their home nations through research networks.

It is clear from the above that the overall development of agricultural sector can be achieved through adaption of new advanced technologies. Many a times there is a racket for duplicate marketing of pesticides. The products are packed and marketed under the names of branded companies. This fact has been explained in the different articles cited below:

i) An article “Growth potential of agro-chemicals” by G.P. Gandhi, published in Magazine, “Business and Economic- Facts for You” Vol.28 No. 11, describes that today a major challenge to the agro-chemical industry is the spurious products available in the market that not only eat away major chunk of the market but also exhibit more serious environmental hazards.

ii) Dr. M. S. Swaminathan, Chairman, National Commission for Farmers & M.S. Swaminathan Research Foundation in his article published in MANORAMA Year book 2006–“Towards a Hunger-Free India”, has expressed great concern about supply of spurious agricultural inputs like seeds, fertilizers and pesticides.

iii) The article published in Daily Lokmat dt. 20th August 2010, gives information about the presence of duplicate manufacturing factory/ company at Gondia. The duplicacy results in side effects/ anti/bad effects on crops such as burning of crops, loss in flush etc.

iv) That same fact has been published in Daily Lokmat 30th Nov. 2007.

Thus the articles discussed above deals with supply of duplicate pesticides products and

cheating of farmers which leads to their exploitation, huge and unsustainable loss in agricultural yield.

3. Research Methodology

3.1 Rationale of Study:

Agricultural development is advocated today as a basic strategy for the all-round development of the country like India. In India, according to 2001 census, more than 70-75 percent of its population lives in villages and there are over 5, 75, 000 villages. Agricultural development enjoys top most priority in the policies and programs of India. Designing and execution of agricultural development projects are an essential means of attaining certain basic objectives such as alleviation of poverty, generation of employment, spreading of literacy and provision of other basic needs in rural areas.

In Maharashtra; agriculture has been given the top priority which is the food earning occupation of crores of rural people living in the villages. The main purpose behind the identification of Nagpur district for the study is to examine how the marketing of pesticides and its use has made effect on agriculture products in Nagpur district in particular. In view of above, some villages (12 Tahsils, out of 14, excluding Nagpur rural and urban) in Nagpur district has been identified for study.

3.2 Scope of Study:

The research project reveals to investigate marketing of pesticides and its effect on agri products in Nagpur district for the period 2000-01 to 2005-06. It also helps to know the average yield and average loss in quintals/tons per acre under irrigated land for cotton, soyabean, paddy, orange etc. and under non-irrigated land for cotton and soyabean. Thus, it helps to calculate

- i) Average yield in quintals/tons per acre in last 6 years (On use of pesticides),
- ii) Average loss of yield in quintals/tons per acre in last 6 years (Due to non use of pesticides) and

- iii) Average percentage loss in last 6 years
(Due to non use of pesticides)

There are 14 tahsils in Nagpur district, which differ from each other. In each tahsils of Nagpur district, large differences in natural environment and physical resources exist. Another factor, which may lead to differences within the district, is the facility of irrigation, which is bound to influence the crop pattern. Agriculture is the foundation of our national wealth and most important sector of Indian economy because it is the main profession of about 70-75% population, which is based on agriculture. In Maharashtra state the major crops produced are cotton, soyabean, sugarcane, wheat, jowar etc. out of which the main and cash crop cotton, paddy and soyabean produced in Nagpur district. Yield of crop depends upon use of improved farming methods, environment, irrigation facilities, proper tasted seeds, technology, fertilizers, **pesticides** etc. Hence, as the very few studies in this particular sector have been carried out, the researcher felt the need to focus on this sector which has a huge potential market on the long run.

3.3 Sample Area

This chapter describes in brief about the sample area. For research study, 12 tahsils are selected out of 14 tahsils of Nagpur district (excluding Nagpur rural and urban).

4. Research Methodology:

The research work was performed in the area of 12 tahsils of Nagpur district. For the study, the data was collected from the Farmers of the Nagpur district. The area selected for study is limited to Nagpur revenue district comprising twelve Tahsils, excluding Nagpur rural and Urban.

4.1 Method of Data Collection:

The questionnaire was designed after conducting in-depth interviews with few pilot respondents. A Self-administered structured survey questionnaire was targeted to carefully select respondent farmers using cluster sampling techniques to collect primary data. For secondary data collection Annual report,

e-books Catalogues, Brochures, Agricultural Magazines, Website are used, and the conclusions are drawn on the basis of analysis.

4.2 Sampling method:

The sample of the study includes 200 cultivators from each taluka of Nagpur district, thus measuring total 2400 farmers of the district. However, out of 2400, sample of 2330 cultivators have been finalized. For removing language barrier the Marathi language is used. The sampling procedure adopted for the purpose of study was cluster sampling which involves selection of samples, universe of a group or cluster items.

4.3 Research Design:

The present study was Descriptive in nature. Accordingly, the use was made of secondary as well as primary data. Descriptive research aims at answering the 'what' and 'why' of current state of system. Descriptive Research is carried out with definite objective(s) and hence it results in definite conclusions. Apparently, the conclusions drawn from this study was descriptive in nature.

4.4 Objectives of Study:

As agriculture occupies the important position in economic as well as overall development of area, the basic objectives of topic "An analytical study of marketing of pesticides and its effect on agri products" are as below.

- 1) To make a comprehensive study of consumers attitude towards different pesticides products and their usage for crops in Nagpur district.
- 2) To analyze the increased percentage yield of crop by using pesticides.
- 3) To know the marketing of pesticides and its effect on agri products in Nagpur district.
- 4) To study the marketing strategies adopted by different pesticides' companies in Nagpur district.
- 5) To examine lacunas in marketing of pesticides and suggests for improved techniques and strategies for marketing of pesticides in Nagpur district.
- 6) To find the effects of use of pesticides on main cash crops in Nagpur district.

4.5 Hypothesis:

Hypothesis No. 1: Use of pesticides has increased the productivity of crops in Nagpur District.

Hypothesis No. 2: Globalization has adverse effects on marketing of (domestic company's) pesticides in Nagpur district.

4.6 Limitations of study:

Looking at the vast span of research study some limitations have been defined which are as follows

- 1) The study is limited for the period from 2000-01 to 2005-06.
- 2) The area selected for study is limited to Nagpur revenue district comprising twelve Tahsils, excluding Nagpur rural and Urban.
- 3) The study is limited to main cash crops such as Cotton, Soyabean, Paddy, and Orange.
- 4) The sample of the study includes 200 cultivators from each taluka of Nagpur district, thus measuring total 2400 farmers of the district. However, out of 2400, sample of 2330 cultivators have been finalized.

4.7 Dealers'/retailers' Network in Nagpur District:

a) Company:

Company targets the specific region. They first look for a convenient location called as 'Depot'. The regions are north, south, east and west. Companies then appoint the distributors to serve in that vicinity. Generally the distributors are deputed on the basis of their credibility in the market and services they offer. The distributors are also provided with the product knowledge from company executive.

b) Dealers/Wholesalers:

According to the soil sampler in respective regions like, Vidarbha, North Maharashtra etc. wholesalers are those who take up the agency of Pesticide Company. Normally, one wholesaler has an agency of different companies, this is because, the retailers usually ask for different brands & company products depending on the prices, margins & offer or

schemes. Dealers/wholesalers serve for region or zone. The profit margins of dealers/wholesalers for multinational company are below 3 or 3% to 5% and for domestic and international companies are upto 30% and in case of some companies, it is above 30%.

c) Retailer:

Retailer is the one who work as a link between Wholesaler (distributor) & customer. Retailer generally keeps the pesticides on the basis of brands which have demand and the product with higher margins, generally, customer has a relationship with the retailer and retailer plays a vital role in helping the farmer in selecting a particular pesticide brand.

Also, the customers prefer the retailer who levies lower or zero interest rates. In this business, the relationship management and after sales service is important to certain customers.

d) Customer:

For the pesticide products, the farmers who own or take the land under cultivation on lease they prefer to buy the pesticide depending on their experience or by the opinion of retailer or by word of mouth. Sometimes these farmers take decisions based on their knowledge and awareness about the product, which they get from the company's different promotional activities.

5. Need and Scope of Marketing of Pesticides

In Nagpur district, most of the farmers feel that use of pesticides for plants' protection is necessary. They have also been found to be aware of the ill effects of pesticides on the human health and the environment. Most of them feel that pesticides have got the beneficial impact on the crop's health and it should be used as per recommendations, and most of the times, use of the pesticides increase their income.

To overcome the problems of marketing and distribution of pesticides, there is a strong need on the part of companies to develop good marketing and distribution channels. The good marketing and distribution policies help the companies and farmers in both the ways for earning money and increasing yield

respectively. Marketing is typically seen as the task of creating, providing and delivering goods and services to consumers and business. Marketers are skilled in stimulating demand for company products. Marketing is regarded as the activity involving the buying and selling of products and services. However, as a subject of study, its approach is more than one way commodities, institutional, managerial, societal and systems approaches. Just as production and logistics, professionals are responsible for demand management.

One of the important challenges of producing agricultural crops is damageable nature of agricultural products, which brings about more losses for farmers and rural people and also decreases motive for activate presence in agricultural activities. Farmers and agricultural producers are always facing with uncertainty in production.

6. Marketing of pesticides in Nagpur district

"The sole purpose of marketing is to sell more to more people, more often and at higher prices. There is no other reason to do it." - **Sergio Zyman**

Marketing of a pesticide refers to such things as promotion (advertising, sales support etc.), pricing, market segmentation, demand forecasting, and distribution decisions. Expenditures on marketing vary between 5-10% of the retail selling price, depending on where the pesticide is in its life cycle. If, it is the first year of sale for a product, expenditures approach the higher range. Pesticides manufacturers focus marketing expenditures on the major crops (e.g., Cotton, Soybeans, Paddy, Orange, Wheat, Jowar, and Tur). Marketing of pesticides is dynamic and responsive to market conditions, competitive products, and other factors. Manufacturers rely extensively on market research, past experience, and knowledge of competitors marketing strategy to assess and forecast demand conditions. Marketing strategies are many times altered in season to respond to competition (i.e. competitor marketing programs, product introductions etc.) and changing markets (i.e. due to weather, crop

planting intentions, late planting etc.).

In Nagpur district, demand forecasts are estimated based on planting intentions, historical use patterns and knowledge of changes in the marketplace. Demand forecasting is complicated by uncertainty associated with weather, commodity prices and competition. Dealers and retailers have to submit product requirements prior to the season to the manufacturers. If demand is underestimated the dealers and retailers first attempt to ensure efficiency of existing product movement in the supply chain (removal of inventory protection, inventory tracking etc.). Although it depends on the particular product, the dealers and retailers typically require a minimum of 2 to 3 weeks to obtain new product. In some cases, it is not possible to bring in additional product in-season simply because there is not sufficient global supply. None of the dealers and retailers felt that they could increase profit by intentionally shorting a market of Nagpur. Lack of ability to respond to increased demand is partially a result of rationalization of manufacturing production facilities worldwide.

Marketers from Nagpur rarely give exclusive distribution rights to pesticide dealers and retailers. To obtain good market coverage in all the 12 tahsils of Nagpur district, they generally need to sell the pesticides to all dealers and retailers. This dynamic nature of competition is evident in all major markets but is not as prevalent for minor crops such as vegetable crops.

Manufacturers in Nagpur district believe that it is crucial to personally reach out to every farmer. Manufacturers make farmers feel special by working closely with them, helping them every step of the way towards a bumper crop each year. Their field staff and field assistants are spread out all over the country, talking to dealers, retailers and farmers, educating them, guiding them and campaigning for products all the year round.

Pesticides manufacturers know that today's farmer needs that extra differentiated promotion to help him remember products. For new, specialized products, a clear brand identity has been established, using

mnemonics, slogans designs and colour schemes. They try to create associations that are close to the farmers' heart and instil confidence within him.

Manufacturers try to give every product a good beginning. Their product launches are spectacular, entertaining and always well attended. They engrave the brand name in the customers' mind forever.

Advertising has played an important vehicle for brand identity development in Nagpur district with radio, television and newspapers reaching almost every farmer. Various indigenous means of publicity such as displaying hoardings, painting walls with manufacturers' product details and decorating point of purchase outlets are also used especially during product campaigns and village fairs. Stage shows and street plays are a surefire way of making people listen and absorb. Video vans cover the Nagpur district side, displaying entertaining stories and product films to an interested and attentive audience.

An extensive database of farmers' names and addresses in all the 12 tahsils of Nagpur district enables pesticide manufacturers to send out newsletters and direct mailers. Through these mailers, they educate their farmers on good farming practices and also keep remind them of their products and their usage.

7. Marketing strategies adopted by pesticides companies in Nagpur district (2000-01 to 2005-06):

7.1 Strategy:

The word strategy has entered the field of management more recently. At first, the word was used in terms of Military Science to mean what a manager does to offset actual or potential actions of competitors. The word is still being used in the same sense, though by few only. Originally, the word - strategy has been derived from Greek 'Strategia', which means generalship. The word strategy, therefore, means the art of the general.

Strategy According to George Steiner: "Strategy is that which top management does that is of great importance to the organization."

The strategy is:

- A plan or course of actions or a set of decision rules forming a pattern or creating a common thread.

In business, as in the military, strategy bridges the gap between policy and tactics. Together, strategy and tactics bridge the gap between ends and means.



Figure No. 01:-Strategy and Tactics

7.2 The objectives of marketing strategy:

The marketing strategy has following objectives with a view to satisfy consumer needs. a) To retain old customers and cultivate new ones, to increase the sales b) To overcome specific competitive situations in the pesticides market c) To provide innovative educational programmes for education and motivation of the farmers through various modes, relating to pesticides use, time and dose in the concerned fields. d) To activate the dealers/retailers by undertaking training programmes so as to equip them in the latest development marketing techniques e) To help the management in managing by providing information and feedback about the quality of product strategies and plans being implemented consumer reactions and making demand / sale forecasting. f) To promote full range of different pesticides products g) To provide and make available (which is most important factor) the pesticides which are required by the farmers at the right time, at the doorstep of the consumer and at the right price.

(A) Product strategy:

Products are bundles of utilities or benefits to the customer. In marketing all services, such as banking, insurance, transport etc. which have no physical existences are also called 'Product'. There are some important criteria for any new product outlined below which are to positively consider enabling a new product to face the initial testing problem and stand the test of time in any explosive competitive market.

- Adequate demand
- Product should fit in the present marketing of financial structure.
- Adequate technology or expertise available
- Dynamic and suitable pricing management
- No defect in the quality of the product.
- Cost should be competitive.
- Adequate marketing effort like Advertising, Sales Promotion, adequate sales force and good distribution system etc.

The multinational companies of pesticides produce many products but the main aim of the multinational company is to maintain and improve the quality of the product than the domestic and international company's products. The company uses modern instruments and exercises a strict procedure of testing or raw materials and finished product to ensure the good quality of the product. As the quality of the product is good, the sale of products of multinational companies is well above the competitor's product. The rates of the multinational companies are at par or slight above the rates of domestic and international companies. It is well clear from the survey which shows that farmers are ready to purchase the company's product. The farmers are well aware of the results and benefits of the product because all the farmers got satisfactory results with the quality and packing of the product. So, we can say that the company has a very good product strategy of maintaining a good quality and packing of the product.

Packaging strategy:

The product is generally designed to target the rural customers. The packaging is done in such a way to attract rural customers. The packaging involves the logos & symbols of Hindu God & Goddess, Colors, Plants etc. Warrantee & Demo (how to use) services are also provided. For successful marketing, goods have to be

properly packed. It is remarked as 'a salient salesman'. In recent times, a growing importance is given to this product strategy. Multinational Companies are spending larger and larger amount of money and a higher percentage of this costs on packaging, realizing that they are so effective that the return on the investment on them are very high in the form of increase in sales turnover and better price realization. However, the main function of packaging is protection from various kinds of damage such as contamination by dirt and dust, moisture gain and loss e.g. cement, insect attack e.g. In this strategy, the distributors & dealers/retailers are given a credit limit as well as offered various tour packages which generally involve foreign tours, awards, coupons and schemes. 1) With regards to sales policy, Indian companies were better than multinationals. 2) As far as services provided to the dealers/retailers/farmers are concerned, the multinationals were better than Indian companies. 3) The services provided by Indian multinationals include the field staff who regularly contacts the farmers, organizes trials at the farmers' field, provides solutions to farmers; crop protection problems are better. In Nagpur district, the strategies of pesticide companies' related to the product and market have also been studied with the discussions of farmers, dealers/retailers and executives' (employees) survey which are as follows: 1) The product portfolio of multinationals is better than domestic companies. 2) Quality of products by multinationals is better as compared to the Indian companies. 3) Companies offering wider product portfolio were better than other companies 4) Packaging is relatively not important to farmers as compared to quality, brand name.

(B)Pricing strategy

A Marketer has to fix the price considering the market situation of the price prevailing of its competitor's products. So for as pesticides companies are concerned, its main purpose is to provide proper returns to farmers and also to satisfy the consumers' needs by providing quality product which is of a good value for money in Nagpur district. Domestic and International pesticides companies have

adopted moderate pricing policy which is beneficial and affordable for farmers.

Price is the last part of equation. It includes sacrifice of purchasing power. When the consumers' benefit exceeds the price, the consumer gets real satisfaction. When the price turns out to be higher than expected elicits and uses, the consumer has past purchase experience. Seller must keep in mind the probable impact of pricing on their products. Price is an important factor in purchase decision, particularly for cost conscious buyers in Nagpur district. It governs their feasibility of marketing programme because it is the only element in a marketing mix accounting for demand and sales revenues. Price is the only variable factor determining the revenue of income. To the consumer, the price is the agreement between seller and buyers concerning what each are to receive. Price denotes the value of the products or service expressed money. Only where a buyer and a seller agree on price, then we have transfer of or exchange of goods and services leading to transfer of ownership.

In Nagpur district, the results were almost the same with the price as the most important criteria followed by quality, fellow farmer's advice and brand name, dealer's advice and distributor's service provided. Packaging of the pesticides is the least important criteria in Nagpur district. In most of the tahsils of Nagpur district, it is the price of the pesticides, which is an important criterion deciding the brand to be purchased. This is due to the fact that farmers in some tahsils of Nagpur district are having more income, having large land-holdings and are mainly using pesticides on main cash crops such as Cotton, Soyabean, Rice and Orange whereas the farmers in some tahsils of Nagpur district are having less income, hence price-sensitive.

Characteristics of pricing strategy:

1) In Nagpur district the pricing strategies of Indian companies are better than that of others. The reason for this is that Indian companies are giving more margins to the distributors, however, multinationals due to their products and quality command more premiums in market but the margin procured by the

dealers/retailers is quite less.

2) In Nagpur district, quality and branding are concerns of large landholders while dealers' opinions and peers' advice are major influencers in case of small landholders. Pricing of multinational company is generally high as they have good reputation in the market. But the prices of other brands which are new or local to market use the penetration pricing strategy for marketing of pesticides. The services provided by the multinationals in the market are as follows:

a) Margins b) Discounts c) Rebates d) Terms of delivery e) Payment term f) Credit terms and instalment purchase facilities g) Resale price maintenance etc.

(C) Promotion Strategy of pesticides companies:

The main purpose of every company is to promote sales because it is the only way to commercialize the product. Any activity towards sales promotion may be called promotion activities. Such promotion activities are advertising, sales promotion and personal selling which generally constitute the promotional mix, within the marketing mix. Before discussing advertising and sales promotion, it is better to discuss the meaning the word 'Promotion'. Perfect co-ordination among these three types of promotional activities can also secure the maximum effectiveness of the promotional strategy. Meaning-The word 'Promotion' means;

- ✓ Communicating with the buyer
- ✓ In order to strengthen buyers attitude which is favourable to the seller offering and /or to
- ✓ Change buyers attitudes which are unfavourable to the sellers offering
- ✓ With the intension of stimulating sales either immediately.

Promotion Strategy involves arranging the various get together of farmers, or product awareness program for the farmers where they are offered breakfast & tea. There are several methods of promotion which are as follows: i) Advertising ii) Sales Promotion iii) Personal Selling and iv) Publicity

i) Advertising:

Advertising means 'telling to selling'. The origin of advertising in India is not very ancient. It has started in the shape of the communication of idea to make the people aware about the business. At the early stage, the advertisement was done by the British ship personnel when they use to come to India for the business purpose to sell their product (Export). They use to seek manually or with the help of loud speakers and let the people know about their arrival with their products.

- ✓ Awareness of pesticides advertisement on Television
- ✓ Awareness of pesticides advertisement on Radio
- ✓ Print medium advertisement of pesticides
- ✓ Pesticides' advertisements on boards and hoardings

ii) Sales promotion strategy of pesticides companies:

Pesticides companies have been conducting pesticides' promotional programmes in rural areas of Nagpur district. The activities of pesticides' companies aim in increasing the pesticides production. There are some intensive promotional activities like adoption of villages and farmers' education programmes such as Pesticides' Demonstration on Farmers Field, Field Days, Krishi Melas, Seminar etc. are undertaken every year in different parts of Nagpur district.

iii) Personal Selling:

Personal selling involves interpersonal communication which aims at informing and persuading customers to know and buy products. It is a face-to face relationship between sellers and potential customers. It provides immediate feedback which helps sales persons to adapt the sales techniques to the needs of the situation. It has become a powerful promotional tool in informing, persuading and reminding the people for using improvised and effective opportunity to sales people to talk back, to answer questions and meet objections. These advantages are not available in other kinds of promotion mix.

iv) Publicity:

Publicity is a non-personal communication about the product. It reaches people because it is newsworthy. The manager may plan press releases and external communication. Publicity generates more inquiries than advertising. It is treated as a form of advertising without payment. Advertising is paid for the controlled whereas publicity is unpaid and less controlled.

(D) Physical Distribution Strategy: Every location where farming is a way of life has at least one pesticide dealers and several retailers. Pesticides' distribution network covers all the tahsils of Nagpur district with more than 1 dealers and retailers, carrying pesticides' products to the farmer's doorstep. Loyalty and trust are hallmarks of pesticides producers' long-term association with farmers which is indicated by response to pesticides products and services by the farmers. Reaching out to a vast multitude of farmers across cultural and language barriers in Nagpur district is another way of achievements of pesticides' producers. They provide the presence in all areas of the district, which allows them to be as close to customers as is possible. Pesticides' producers have Regional Offices, Area Sales Offices, Depots and Field Staff Headquarters across the country. The Field Staff (Executives) and more than 1000 Field Assistants are spread out across districts, talking to dealers, retailers and farmers and educating and guiding them.

The selection of dealers and retailers in the district is carried out on the following basis.

i) Selection of True Dealers/Retailers: Manufacturers choose distributors based on a number of criteria. Performance abilities i.e. warehousing capacity, credit worthiness, and the ability to place and receive an early order, all affect the manufacturer's decision. Another criterion is the willingness or ability of the distributor to actively promote a pesticide thereby creating a product demand that "pulls" the product through the supply chain, or the ability of the distributor to "push" the product into the retail system. A final criterion is the market coverage provided by the retailer. It is probable, however, that "true" distributors will continue to play a role in the supply chain,

in Nagpur district. The large geographic area that must be served and the smaller quantities of product that must be transported in season are most efficiently handled by companies that specialize in the task of distribution and that can gain efficiencies by distributing pesticides. Distributors indicate a wide range of accuracy for forecasting pesticide demand. Factors complicating the demand forecast were i) Weather ii) Commodity prices iii) Manufacturer and grower programs. For forecasting the demand, distributors rely on historical sales, early booking programs and planting intentions. Most distributors expected to carry more percent of inventory. Distributors must be able to provide timely delivery in-season. Frequently, the lead-time from the distributor to retailer in season is 24 hours and many have the goal of same day delivery. Distributors are active in tracking the supply of pesticide in the supply chain in terms of amounts and location. Ability to track supply varies across distributors. Many distributors and retailers have computerized inventory records and thus can tell within a few seconds how much of each product they have in stock and the location of these amounts. When pesticide supply shortages occur, this information is important for both the manufacturer and the distributor as they aim to minimize the inventory left in the supply chain at the year end.

ii) Selection of Retailers

Distributors' selection criteria for selling to retailers include

- a) Whether the retailer has warehousing;
- b) Credit worthiness;
- c) A marketing plan; and
- d) Well trained support staff.

Retailers use a variety of marketing strategies to increase returns from retailing pesticides. Increasingly retailers are focusing on customer service extended hours, field scouting, handling of product complaints, enhanced technical expertise. Retailers also undertake advertising primarily in the form of grower meetings and direct mailings. The most effective ones are those that forge a closer relationship with the customer.

8) Marketing of pesticides and its effect on agri products in Nagpur district:

Marketing of pesticides through different Medias of advertisement and organizing trade fairs, exhibitions, krishi melavas, workshops, village adoption, test farm plot concept, farmers meetings and training camps by pesticides companies and other organizations has increased farmers' awareness of the district about good effects of use of pesticides on the agri. products for increasing yield. Thus they have learned about the benefits of pesticides and have achieved higher yield through use of pesticides.

During research study it has been observed that the marketing of pesticides in the district has played vital role in enabling and pursuing the farmers to use pesticides for controlling pests attack, diseases on crop and thus has been mainly responsible for increasing agriculture yield. The average yield on use of pesticides, loss in yield in the event pesticides is not used and percentage loss in yield in quintals /tons during the period 2000-01 to 2005-06 is calculated on the basis of questionnaires filled-in by the farmers for main cash crops under irrigated and non-irrigated land which is shown in table under below

Crop	Land	Average yield in quintals/ tons per acre in last 6 years (On use of pesticides)	Average loss of yield in quintals/ tons per acre in last 6 years (Due to non use of pesticides)	Average percentage of loss in yield (Due to non use of pesticides)
Cotton	Irrigated	7.93	4.30	54.22%
	Non-irrigated	5.06	2.67	52.76%
Soyabean	Irrigated	7.81	3.36	43.02%
	Non-irrigated	5.01	2.53	50.49%
Paddy	Irrigated	21.63	5.84	26.99%

Orange (tons)	Irrigated	6.73 (tons)	3.81 (tons)	56.61%
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Table No.1- The calculated average yield on use of pesticides, loss in yield in the event pesticides are not used and percentage loss in yield in quintals /tons during the period 2000-01 to 2005-06.

The questionnaire has been obtained from 2330 cultivators of the district. During analysis it was observed that almost all the farmers have used pesticides for plant protection. The analysis of data proves that most of the farmers are aware of the good effects of use of pesticides and thus they have used pesticides for preventing pest attacks and diseases on their crops.

In absence of use of pesticides by them the crop could have suffered the losses to the yield. Resultantly *the use of pesticides has increased the productivity of crops in Nagpur district.* Hence the hypothesis is proved.

It is evident from the above table that the average percentage of loss in yield due to non use of pesticides is of great concern, which can be avoided on use of pesticides. So far as present study is concerned, almost all 2330 farmers have used pesticides for different crops; as such huge loss has been avoided. Obviously the crop yield mentioned by the farmers is on use of pesticides and loss in yield is due to non use of pesticides for plant protection. *Thus, it is the ultimate effect of use of pesticides which has been possible only due to marketing of pesticides.*

Overall the highest consumption of agrochemicals in India is for Cotton crop nearly 40 percent, followed by Rice 31 percent, fruits comprises 15 percent. During the study it has been observed that all the major crops such as Cotton, Soyabean, Paddy, Orange etc. which comparatively consumes more pesticides are cultivated in Nagpur district on large scale. The farmers are also using pesticides for flush besides use for controlling pest attack and diseases, which results in increasing the yield of crops. Some of the farmers have mentioned the negative effects of the use of the pesticides such as burning of crops, destruction in flush, Pollution etc. The basic reasons quoted by the

farmers for these results are improper and excessive use of pesticides, high ingredients, not suitable for crops and use on wrong recommendations.

Thus, the analytical study and information given by farmers and discussions with them proves that there is vast scope for marketing of pesticides. Overall the highest consumption of agrochemicals in India is for Cotton crop nearly 40 percent, followed by Rice 31 percent, fruits comprises 15 percent. During the study it has been observed that all the major crops such as Cotton, Soyabean, Paddy, Orange etc. which comparatively consumes more pesticides are cultivated in Nagpur district on large scale. The farmers are also using pesticides for flush besides use for controlling pest attack and diseases, which results in increasing the yield of crops. Some of the farmers have mentioned the negative effects of the use of the pesticides such as burning of crops, destruction in flush, Pollution etc. The basic reasons quoted by the farmers for these results are improper and excessive use of pesticides, high ingredients, not suitable for crops and use on wrong recommendations.

Thus, the analytical study and information given by farmers and discussions with them proves that there is vast scope for marketing of pesticides to increase the agriculture production through judicious and scientific use of pesticides at proper stages studying nature of pest attack on crop and the manner prescribed by the related companies.

Hypothesis 1

Hypothesis testing by *Chi-square method*

Crop	Land	Average percentage of loss in yield	Expected percentage of loss in yield	$(o_i - e_i)$	$(o_i - e_i)^2$	$(o_i - e_i) / e_i$
		(e_i)				
		(o_i)	(Due to non use of pesticides)			

		use of pesticides)				
Cotton	Irrigated	54.22 %	47.34	6.88	47.33	0.99
	Non-irrigated	52.76 %	47.34	5.42	29.37	0.62
Soyabean	Irrigated	43.02 %	47.34	-4.32	18.66	0.39
	Non-irrigated	50.49 %	47.34	3.15	9.92	0.20
Paddy	Irrigated	26.99 %	47.34	-20.35	414.12	8.74
Orange (tons)	Irrigated	56.61 %	47.34	9.27	85.93	1.81
		284.09				12.75

Table No.173:- (Hypothesis testing by *Chi-square method*)

$$e_i = \sum o_i / N = 284.09 / 6 = 47.34$$

By using chi square method $\chi^2 = \sum_{i=1}^n (o_i - e_i)^2 / e_i = 12.75$

$$\chi^2 \text{ (Calculated)} = 12.75$$

$$\text{For } \chi^2 \text{ (Tabulated)} = 13.388$$

Therefore, from above it is clear that the value of chi-square calculated is less than chi-square tabulated for 2% level of significance and df=5. Hence the null hypothesis is accepted.

Hypothesis 2

In an age of intense competition and a race for market share, pesticides systematic penetration of the agricultural market has given pesticides' producers the much-needed impetus to be the largest provider of agro products. Today, as like multinational companies, we can assuredly say that no other types of pesticides companies have the infrastructure and capabilities to match pesticides' products reach in the rural sector. With the liberalization and globalization of the Indian economy in last decade, many multinational companies began to enter the country to tap the vast potential market of about billion farmers. The entry of multinationals had made a significant effect on the Indian agriculture marketing environment. Many

companies entered the country with the same strategies they had followed in their home countries or they alter their strategy and offer products that are significantly adapted to Indian agriculture conditions.

In today's environment of agriculture with the rapid increase in information, advertising media and domestic markets becoming saturated, it has become important for companies to market their products globally. Selecting a potential market is a crucial factor in global marketing, as the firm has to evaluate several factors like political, economic, social, technological, legal and regulatory environments before selecting a viable market. The multinational companies engaged in the agriculture business of Nagpur district has entered with exports, indirect exports, licensing, joint ventures, indirect investment etc. From the analytical study, it is clear that the Customers preference of products from multinational companies is 64% and is only because of good quality, brand name, long product range etc. It is also clear that the multinational pesticides' companies performing their business in Nagpur district **have maximum sales and holds market share of 68%**. They are betterly offering schemes, offers, foreign tours, gifts to the dealers and retailers.

Strategic alliances in the form of licensing agreements and joint ventures between an multinational and a local partner in a host country are fast becoming a means by which the multinational gets an entry into Nagpur district. The key to successful strategy implementation lies in the selection of the local partner. They are capturing the Nagpur district market by giving attention on organizing farm visits, krishi melavas, exhibitions, trade fairs, demonstration programmes etc. on large scale as compared to domestic companies working in Nagpur district. Also the multinational companies are providing better products with different prices having five ingredients, higher molecules with better results. They are entering in the Indian market with high research and development, newer technology, licensing, joint ventures and exports etc. During the research study and from analysis, it is proved that most of the farmers in the surveyed area of the district have used the products of multinational companies and provided better

results having maximum sale of pesticides. Also, the analysis of the questionnaire of executives proves that *Globalization has adverse effects on marketing of (domestic company's) pesticides in Nagpur district*. Hence, hypothesis no. 2 is proved.

9. Conclusions:

1) The crop yield mentioned by the farmers is on use of pesticides and loss in yield is due to non use of pesticides for plant protection. Thus, it is the ultimate effect of use of pesticides which has been possible only due to marketing of pesticides.

2) During the research study and from analysis, it is proved that most of the farmers in the surveyed area of the district have used the products of multinational companies and provided better results having maximum sale of pesticides. Also, the analysis of the questionnaire of executives proves that *Globalization has adverse effects on marketing of (domestic company's) pesticides in Nagpur district*. Hence, hypothesis no. 2 is proved.

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