

# A Study on the Distribution of Insecticides in Semi-Urban Markets and Usage Patterns of Farmers in Rural Areas

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**Abstract:** *The present research study examines the insecticide distribution network in semi-urban markets and the farmer's use pattern in rural India. Agriculture is a crucial sector of the Indian economy and insecticides help in pest management to enhance productivity. But the efficacy of insecticides is not only determined by the quality of the product, but timely supply and usage by farmers as well.*

*This research explores the insecticide marketing channel structure, manufacturers, distributors, wholesalers and retailers and their influence on supply in semi-urban markets. It further examines the attitudes of rural farmers, their knowledge and decision-making practices, and their reliance on retailers and other informal sources of information.*

*The study pinpoints problems such as inconsistent supply, counterfeiting, inadequate technical know-how, incorrect handling and use, and safety concerns. It examines the influence of socio-economic aspects, availability and price on farmers' buying, usage and perception of insecticides.*

*The research proposes better distribution channels, monitoring, training and awareness programs to encourage safe and appropriate usage of insecticides by farmers. This research seeks to improve crop production, farmer safety and promote sustainable agriculture..*

**Keywords:** Tackling Pest Problems, Semi-Urban Markets, Farming Habits, Agri-Inputs, Distribution Channels, Farmer Behaviour, Accessibility and Availability, Awareness, Sustainable Agriculture, Pest Management, Crop Protection

## I. INTRODUCTION

### 1.1 Introduction

Agriculture is one of the critical industries of the Indian economy that employs millions of people. Insecticides are widely used by farmers to prevent pests and diseases, increase crop productivity and achieve food security. Insecticides are critical inputs for farmers, particularly with rising pest resistance and climate change.

Semi-urban markets are important gateways for the distribution of farm inputs like insecticides. These markets are responsible for connecting producers and farmers by providing products through distributors, wholesalers and retailers. But the distribution network in these markets is often semi-organized, giving rise to problems like poor supply, price instability, and poor quality or fake products.

Conversely, rural farmers have diverse patterns of insecticides. Some farmers lack information about scientific pest management, recommended doses, application techniques and other precautions. They may therefore rely on insecticide retailers, fellow farmers or their own experience. This may result in misuse or overuse of insecticides, leading to economic, health and environmental problems.



Availability and price of insecticides also play a significant role in farmers' practices. Farmers' buying behavior is influenced by their low purchasing power, seasonality and proximity to markets. Furthermore, lack of awareness regarding safety measures and handling practices pose greater risks from insecticide use.

In such a situation, it is necessary to understand the distribution in semi-urban markets and farmer-practices in rural areas. This research focuses on highlighting the supply chain gaps, farmer behavior, and recommending strategies to improve the effectiveness of distribution and safe usage of insecticides.

### **1.2. Scope of the Study**

The research is based on studying the marketing patterns of insecticides in the semi-urban markets and the use of insecticides by farmers. It includes factors such as distribution, availability, price and farmers' knowledge.

It also includes aspects like knowledge, misuse and supply problems. The research is expected to provide insights for better distribution and safe usage of insecticides leading to enhanced farm productivity and sustainable pest management.

## **II. REVIEW OF LITERATURE**

### **2.1 Review of Literature**

Pimentel, D. (2005)

Stressed that insecticides are crucial in enhancing agricultural production via protection of crops. However, the study also highlighted that incorrect and over-use of insecticides can cause environmental and economic damage, so it is important to use insecticides correctly.

Dinham, B. (2003)

Studied the distribution of pesticides in developing nations, finding that lack of effective regulation, monitoring and availability of fake or substandard quality products have a negative effect on farmers and agricultural productivity.

Feder, G. et al. (2004)

Addressed agricultural extension systems and highlighted the consequences of lack of training and awareness of farmers in the inefficient use of farm inputs (including insecticides).

Gupta, P. K. (2004)

Talked about pesticide toxicity and exposure in India, and mentioned that improper practices and ignorance among farmers result in health hazards and chronic effects.

Ntow, W. J. et al. (2006)

Examined the current use of pesticides and found that farmers do not practice safety procedures, like using personal protective equipment, which presents various environmental and health risks.

Atreya, K. (2008)

Studied farmers' practices and showed that the lack of education and awareness leads to the misuse and mishandling of pesticides in rural communities.

Kishi, M. (2005)

Noted chronic exposure of pesticides causes health problems among farmers, particularly in developing countries where farmers rarely follow precautionary measures.

## **III. RESEARCH METHODOLOGY**

### **3.1 Research Design**

The research design is the design that explains how the study is conducted, how the information is gathered, analysed and interpreted. The research design of this study is mostly descriptive-analytical. This study has two parts: the first part is about the distribution of insecticides in semi-urban markets. The second is farmers' usage of insecticides.

The descriptive part paints a picture of the facts of the case in detail: supply of insecticides, distribution of insecticides and the farmers' usage pattern. The analytical part examines the causes of occurrence, investigating the factors such as



the influence of the dealer, training programs and the market efficiency that influence farmers' usage and safety measures. This provides insights into both the operational and the behavioral aspects.

### **3.2 Research Problem**

Issues in the distribution of insecticides in semi-urban markets include lack of regular supply, price fluctuations and poor quality products. Meanwhile, rural farmers face a knowledge gap on usage, and rely on retailers for advice, resulting in misuse.

This results in a mismatch between insecticide supply and use, impacting farm production, costs and health and environmental problems.

### **3.3 Objective of the study**

- To assess farmers' knowledge about different types of insecticides and their safe usage.
- To analyze the effectiveness of the supply chain in delivering insecticides to rural markets.
- To identify factors influencing the choice and use of insecticides among farmers.
- To recommend strategies for improving distribution efficiency and farmer awareness.

### **3.4 Data Sources and Tools of Data Collection**

We will use simple question sheets to interview farmers about knowledge of insecticides, use of insecticides and whether they use safety precautions. Furthermore, we will use questionnaire to confirm that farmers receive information on insecticides - from dealers, other farmers, or training programs.

### **3.5 Sampling Design**

#### **Sample Unit**

The unit of sample in this study is farmers located in rural or semi-rural areas and insecticide distributors/retailers in semi-urban places. Farmers are included to investigate their insecticide uses, knowledge and buying habits. Both the retailers or distributors are also included to understand the product supply chain, availability, and other issues related to supply. Convenient sampling method is adopted for the selection of the sample to gather relevant and useful information for the study.

#### **Sample Size**

The sample size of the study is 80. The information is collected from farmers in rural panchayats and insecticide retailers/distributors in semi-urban areas to study the distribution system and usage pattern.

### **3.6 Tools Proposed to be Used for Data Analysis**

#### **Percentage Method:**

It is a technique for changing raw data into percentages. It allows easy juxtaposition of various opinions and shows the popular view of respondents.

#### **Bar Charts:**

Bar charts are used to visually present bar data. These are used to compare multiple categories, such as the responses of farmers, the usage and distribution of the produce.

#### **Pie Charts:**

Pie charts are used to represent the share of the variables. They are useful in determining the share (or percentage of) critique results.

### **3.7 Limitations of the Study**

- The study is conducted in a specific region, which may restrict the applicability to other areas.



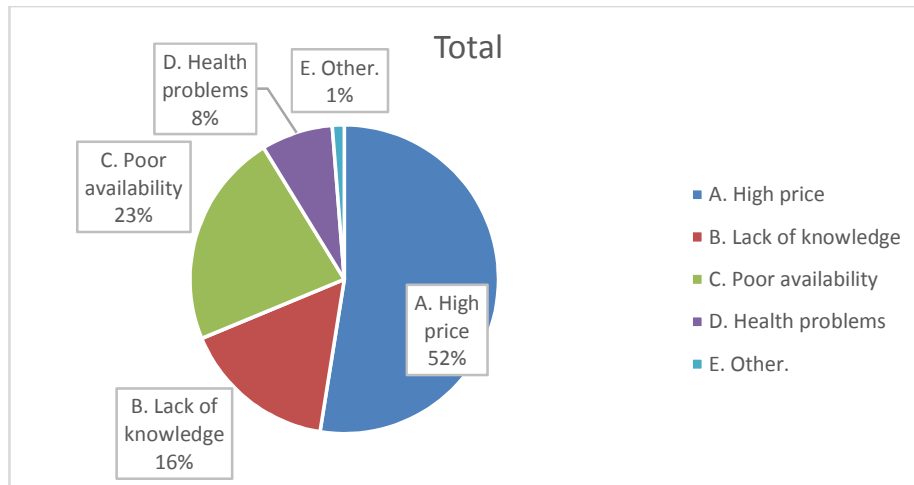
- An online form was used to collect the data, which might have restricted the access for farmers without internet connection.
- Data is self-reported, thus may contain bias or errors.
- Limited time and resources prevented a more comprehensive analysis.

#### IV. DATA ANALYSIS AND INTERPRETATION

The analysis of collected data reveals the following key observations:

##### Q1. What challenges do you face in using insecticide?

Graph No: 1

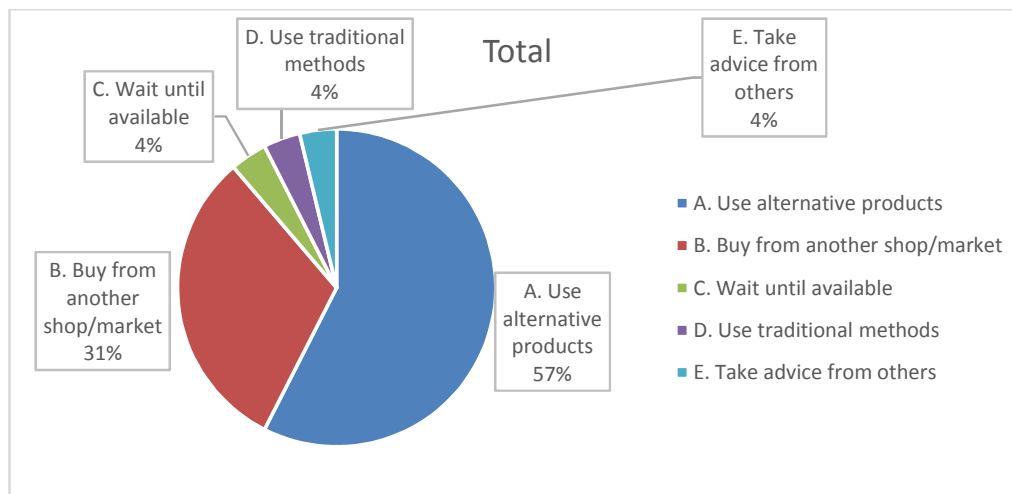


##### Interpretation:

Our results reveal that the major issue affecting farmers' use of insecticides is the price (mentioned by 42 of 80 farmers). Other factors include unavailability (18 farmers) and low knowledge (13 farmers) so lack of access to and understanding of these products. But some farmers (6) also indicated health problems, with very few other concerns. In short, the key issues are price, availability and knowledge.

##### Q2. How do you manage when insecticides are not available?

Graph No: 2

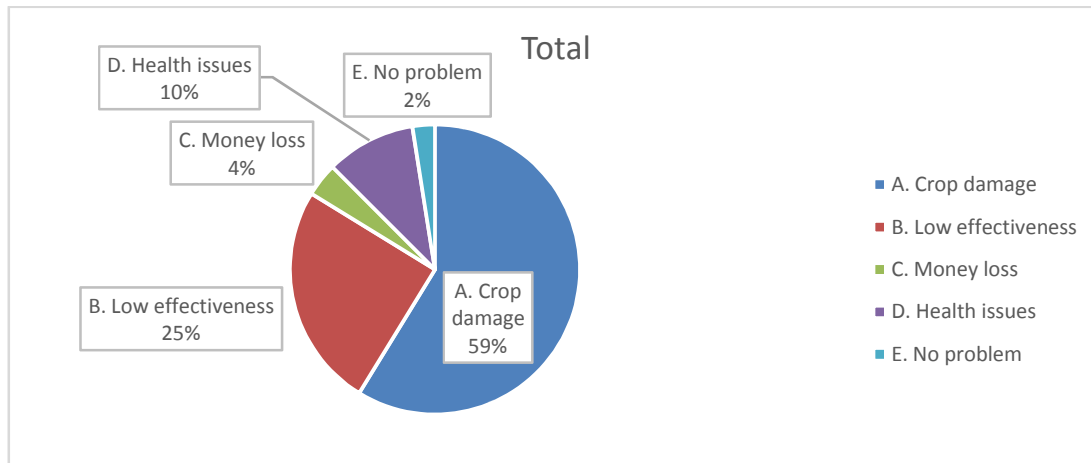


**Interpretation:**

Our research shows farmers (46 of 80) prefer to take action, getting around the scarcity of insecticides by using alternative products. Others shop around in nearby fields (25 farmers). Only a few farmers wait, resort to traditional practices or seek others' opinions (3 each). The overall tendency of farmers is towards immediate and effective measures, suggesting that improvements in supply channel availability are needed.

**Q3. What problems do you face due to fake products?**

Graph No: 3



**Interpretation:**

Our results reveal that the main issue caused by fake and poor quality insecticides is crop damage (47 respondents out of 80). Inadequate effectiveness (20) and health issues (8) were also noted. Some experienced financial loss (3) and only a few had no problems (2). In summary, fake pesticides mostly affect crop yield, suggesting the need for improved quality assurance and farmer education.

**V. CONCLUSION**

The study concludes that efficient distribution of insecticides in semi-urban markets has a significant effect on insecticide use by farmers in rural areas. Proper distribution of insecticides enables their availability in a timely manner, which facilitates timely application of insecticides and in right amounts.

The study demonstrates that there is a strong association between efficiency of distribution and proper insecticide use. Likewise, insecticide availability also strongly affects the proper usage. Farmers with greater availability of insecticides tend to adopt correct usage practices and thereby effectively control pests.

But the study also reveals the issues surrounding supply, price, availability of fake products and farmers' awareness. Farmers often rely on local vendors for product information, which can lead to misuse and risks.

So, better distribution, regular supply and awareness-raising through training are the key steps to achieve this. This will contribute to safe and efficient use of insecticides, increased crop yield and sustainable agricultural growth.

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