AN ECONOMIC ANALYSIS ON MARKETING OF SYSTEMIC HERBICIDE (GREEN LABEL) IN WEST CHAMPARAN DISTRICT OF BIHAR

Rohan Kumar Singh[1] and Jayant Zechariah[2]

[1]MBA (Agribusiness) and [2]Assistant Professor

Department of Agricultural Economics

Sam Higginbottom University of Agriculture, Technology and Sciences, Naini, Prayagraj

Corresponding author: rohanrathore7281821791@gmail.com

ABSTRACT

The research titled "An Economic Analysis on Marketing of Systemic Herbicide (Green Label) in West Champaran District of Bihar" was carried out to examine the marketing framework, associated costs, profit margins, and efficiency levels related to the distribution of systemic herbicides, particularly those utilized in paddy farming. Systemic herbicides, known for their ability to be absorbed and transported within plant tissues to manage weed infestations, were analyzed to determine their market dynamics in the selected study area. Madhubani block of West Champaran was chosen purposively due to its significant paddy cultivation, and a random sampling method was employed to select five percent of the herbicide-using villages. From these villages, ten percent of the farmers were randomly selected as respondents. The study identified two major marketing routes: Channel-I (Producer → Wholesaler → Consumer) and Channel-II (Producer → Wholesaler → Retailer → Consumer). In Channel-I, producers received a net return of ₹1648 after incurring a marketing cost of ₹64 and earned a margin of ₹143, leading to a price spread of ₹207 and a marketing efficiency of 7.96 percent. Channel-II, which involved an additional intermediary, showed higher marketing costs of ₹79, a larger margin of ₹223, and a broader price spread of ₹302, resulting in lower marketing efficiency of 5.46 percent. The findings demonstrated that a shorter supply chain not only reduced costs but also improved the profitability for producers. The study highlighted the importance of streamlining distribution systems to enhance marketing efficiency and farmer income.

***Keywords:** Systemic Herbicide, Marketing Efficiency, Green Label, Price Spread*

INTRODUCTION

Herbicides were chemical substances used extensively in agricultural practices to control or eliminate unwanted vegetation, particularly weeds that competed with crops for nutrients, water, and sunlight. They played a crucial role in modern farming by enhancing crop productivity and reducing the labour and cost associated with manual weeding. Herbicides were broadly categorized into two types: selective herbicides, which targeted specific weed species while sparing crops, and non-selective herbicides, which affected all plant life they contacted. Among these, systemic herbicides were especially effective, as they were absorbed through the leaves or roots and transported throughout the plant's vascular system, leading to its eventual death by disrupting essential physiological processes.

Pre-emergence herbicides were applied before the weed seeds germinated, whereas post-emergence herbicides were used after weed growth had begun. Herbicides contributed significantly to large-scale agricultural efficiency, particularly in crops such as wheat, rice, maize, and soybean. However, their use required careful management to avoid issues such as herbicide resistance in weed populations, environmental contamination, and potential health hazards to humans and animals. Regulatory guidelines and best practices were developed to ensure the safe and effective use of herbicides, including the adoption of integrated weed management practices that combined chemical and non-chemical methods. The development and commercialization of herbicides had transformed weed control strategies, making them indispensable in modern agriculture. Nevertheless, there remained a need for continued research and education to promote sustainable herbicide use that balanced productivity with environmental and public health considerations.

RESEARCH METHODOLOGY

In this study, we selected districts, blocks, villages, and respondents using targeted sampling techniques with random sampling techniques. The West Champarang district was primarily chosen to minimize logistical challenges and time constraints for investigators. Within this district, Madhubani blocks were selected in a targeted manner based on a considerable concentration of rice farmers. A comprehensive list of villages within this block is compiled, with 5% of villages with a high rice extension being randomly selected. A detailed list of rice farmers in these selected villages was prepared and divided into five groups based on the size of the landscape: slightly (less than 1 hectares), small (1 2 hectares), semi-medium (2 4 hectares), medium (4 10 hectares), and most (over 10 hectares). In the proportional random sample, 120 rice farmers were selected from this pool. Additionally, 10 wholesalers, 5 retailers, 5 consumers and 5 manufacturers were selected to examine a variety of marketing parameters, including marketing costs, marketing margins, price allocation, and marketing fulfilment. Primary data were obtained using a well-structured schedule specially developed for research, and secondary data from official records, reports, magazines, and publications were recorded in districts and log bands. Data collection was performed using in-person interviews according to survey methods. Appropriate statistical tools were used to analyse data and derive wise results. The research data were from 2024 and 2025 for the Agriculture Year.

Analytical Tools

1. **Cost of Marketing**

$$C = Cf + Cm1 + Cm2 + Cm3 + ... + Cmn$$

2. **Margin of Market**

$$AMI = Pri - (Ppi + Cmi)$$

3. **Spread in Price**

Marketing Cost + Market Margin

4. **Efficiency of Marketing**

$$= \frac{\text{Price received by producer}}{\text{Marketing Cost + Marketing Margin}}$$

RESULTS AND DISCUSSION

Table 1: Price distribution, marketing cost, marketing margin, and marketing effectiveness for Green Label (Systemic Herbicide)

S. No.	Particulars	Green Label Value in Rs./ Litre
1.	**Wholesaler acquiring price**	**1690**
2.	**Producer's incurred price**	
i	Cost of packing	4.00
ii	Packing items cost	5.00
iii	Shipping cost	6.00
iv	Charge of the market	7.00
v	Labour cost	4.00
vi	Loading and Unloading charge	3.00
vii	Miscellaneous costs	13.00
	Total cost (i-vii)	**42.00**
3.	**Net price received by producer**	**1648**
4.	**Wholesaler sale price to Consumer**	**1855**
5.	**Marketing cost incurred by Wholesaler**	
i	Loading & Unloading charges	2
ii	Carriage up to shop	1
iii	Weighting charges	3
iv	Market charges	4
v	Transportation	5
vi	Losses & Miscellaneous charges	7
6.	**Total Marketing Cost (i-vi)**	**22.00**
7.	**Margin of Wholesaler**	**143.00**
A	**Total Marketing Cost**	**64**
B	**Total Marketing Margin**	**143**
C	**Price Spread**	**207**
D	**Marketing Efficiency**	**7.96%**

Table 1: Marketing analysis of Channel I's Green Label Herbizide showed that producers sold their products to wholesalers at a price of 1690 per liter. After deducting marketing costs such as 42 packing, transportation, labor and market costs, the net price received by the manufacturer was [1]1648 per liter. Wholesalers sold herbicides to consumers at 1,855 per liter. Wholesalers were incurred by 22 marketing costs, including costs associated with exploration, loads and various fees. The profit range achieved by wholesalers was calculated at 143. Therefore, the total marketing costs incurred in Channel I were 64 per liter, with the overall marketing margin of 143 per liter. The distributed price, defined as the difference between consumer prices and manufacturer net prices, was 207. The marketing efficiency of Channel I was calculated at 7.96%. This indicates a

relatively slow level of cost-effectiveness in the distribution process. This analysis highlights the role of each stakeholder in the marketing chain and the distribution of costs and margins, highlighting the potential to improve the efficiency of herbicide marketing systems.

Table 2: Marketing costs, marketing margins, marketing efficiency, and price distribution with Channel II green labels (systemic herbicides).

S. No.	Item Description	Amount (₹/Litre)
1.	Selling price received by producer from wholesaler	1690
2.	Breakdown of producer's marketing expenses:	
	(i) Packaging charges	4.00
	(ii) Cost of packaging materials	5.00
	(iii) Transportation expenses	6.00
	(iv) Market levies	7.00
	(v) Labour-related costs	4.00
	(vi) Loading and unloading	3.00
	(vii) Other miscellaneous expenses	13.00
	Total producer's cost (i–vii)	**42.00**
3.	Net income of producer	1648
4.	Wholesaler's selling price to retailer	1817
5.	Wholesaler's marketing expenses:	
	(i) Loading and unloading	2.00
	(ii) Local carriage to store	1.00
	(iii) Labour costs	3.00
	(iv) Market charges	4.00
	(v) Transport charges	5.00
	(vi) Losses and miscellaneous	7.00
6.	**Total marketing expense by wholesaler**	**22.00**
7.	Profit margin of wholesaler	105.00
8.	Retailer's selling price to end consumer	1950
9.	Retailer's marketing expenses:	
	(i) Loading and unloading	1.50
	(ii) Local carriage to shop	0.75
	(iii) Labour expenses	1.75
	(iv) Market-related charges	3.00
	(v) Transportation	3.50
	(vi) Other losses and minor charges	4.50
10.	**Total marketing expense by retailer**	**15.00**
11.	Profit margin of retailer	118.00
A.	**Overall marketing cost (2+6+10)**	**79.00**
B.	**Combined marketing margin (7+11)**	**223.00**
C.	**Total price spread**	**302.00**
D.	**Marketing efficiency**	**5.46%**

Table 2: The evaluation of the marketing system for Green Label Herbicide through Channel-II provided insights into the pricing and cost structure distributed across various intermediaries. The producer sold the herbicide to the wholesaler at ₹1690 per litre, incurring a total marketing expenditure of ₹42, which included expenses for packaging, transportation, labor, and miscellaneous charges. This resulted in a net realization of ₹1648 per litre for the producer. The wholesaler, bearing an additional marketing cost of ₹22, sold the product to the retailer at ₹1817 per litre, thereby earning a profit margin of ₹105. Subsequently, the retailer supplied the herbicide to the end user at ₹1950 per litre, with marketing expenses amounting to ₹15 and a corresponding profit margin of ₹118. The aggregate marketing cost incurred throughout Channel-II was ₹79, while the combined margin of intermediaries totaled ₹223. The price spread—defined as the gap between the consumer's purchase price and the producer's net earnings—was calculated at ₹302. The marketing efficiency for this channel stood at 5.46 percent, suggesting a relatively low level of efficiency in comparison to more direct marketing routes. These findings emphasize the considerable impact of intermediary costs and margins on the final retail price, underscoring the need to enhance efficiency within multi-layered distribution systems.

Table 3: Comparison of marketing costs, marketing margins, marketing performance, and price distribution in marketing of green labels (systemic herbicides) via channel I and channel II in the study area.

S. No.	Particulars	Green Label (Systemic Herbicide)	
		Value in Rupees / Litre **Channel I**	Value in Rupees / Litre **Channel II**
1.	**Net price received by the producer**	1648	1648
2.	**Total marketing cost**	64	79
3.	**Total marketing margin**	143	223
4.	**Price spread**	207	302
5.	**Marketing Efficiency**	7.96%	5.46%

Table 3: The comparative assessment of marketing expenses, intermediary margins, price spread, and efficiency in the distribution of Green Label (Systemic Herbicide) through Channel-I and Channel-II exhibited notable disparities. In Channel-I, the net return to the producer stood at ₹1648 per litre, with a marketing expenditure of ₹64 and an intermediary margin of ₹143. The price spread, representing the gap between the retail price and the producer's net income, was ₹207, culminating in a marketing efficiency of 7.96%. Conversely, Channel-II—characterized by the presence of an additional intermediary (retailer)—incurred a higher marketing cost of ₹79 and a cumulative marketing margin of ₹223. The price spread expanded to ₹302, leading to a reduced marketing efficiency of 5.46%. These findings suggest that although Channel-II benefited intermediaries through higher margins, it resulted in elevated costs for consumers and diminished marketing efficiency. Thus, Channel-I emerged as a more streamlined and economical option for both producers and consumers in the selected area.

CONCLUSION

The present study on the economic evaluation of systemic herbicide (Green Label) marketing in Bihar's West Champaran district offered a detailed assessment of the distribution structure, associated costs, profit margins, and overall marketing efficiency across two key channels. Results demonstrated that the presence and number of intermediaries significantly impacted producer earnings, price spread, and system efficiency. In Channel-I (Producer → Wholesaler → Consumer), the producer secured a net return of ₹1648 per litre, while incurring a marketing cost of ₹64 and witnessing a marketing margin of ₹143. The corresponding price spread was ₹207, with a marketing efficiency of 7.96%, indicating superior performance due to minimal intermediary involvement. Conversely, Channel-II (Producer → Wholesaler → Retailer → Consumer) also provided the producer a net return of ₹1648, but the marketing cost rose to ₹79, and the total margin increased to ₹223. This led to a wider price spread of ₹302 and reduced efficiency at 5.46%. The inclusion of the retailer in Channel-II contributed to higher costs and diminished producer benefit. The study highlighted that streamlined marketing channels enhance returns to producers and control price inflation for consumers. Therefore, promoting direct and efficient marketing frameworks with limited intermediary participation is essential for improving economic outcomes for both stakeholders.

REFERENCES

Adamu Bako, & Kwame Osei (2021) "Marketing Strategies for Herbicides in Sub-Saharan Africa." *International Journal of Agribusiness Marketing, 13(2), 75–88.*

Amit Patel, & Rajeev Yadav (2020) "Adoption of Herbicides in the Indian Agricultural Sector." *Asian Journal of Agricultural Economics, 31(4), 275–287.*

Carlos Martínez, & Javier Silva (2022) "Trends in Herbicide Consumption and Marketing in Latin America." *Latin American Journal of Agricultural Economics, 11(2), 144–156.*

Harvinder Singh, & Gurpreet Kaur (2021) "Perception of Farmers on Herbicide Marketing and Usage in Punjab." *Journal of Rural Marketing, 15(3), 103–118.*

Joseph Mensah, & Richard Abeku (2020) "Market Dynamics and Challenges in Herbicide Distribution in Africa." *African Journal of Rural Development, 25(1), 67–81.*

Krishan Sharma, and Lokendra Choudhary (2022) "Role of Advertising in Herbicide Market Expansion." *Journal of Marketing Strategies, 14(1), 34–46.*

Kushwaha, V. S., et al. (2023). An Economic Analysis on Marketing and Brand Awareness of Rifit Plus (Herbicide) in Ghazipur District of Uttar Pradesh, India.

Prabir Dutta, and Sudipta Banerjee (2021) "Consumer Preferences for Organic Herbicides." *Sustainable Agriculture Reviews, 15(2), 112–123.*

Ramasamy Parasuraman, Sivasankaran Annamalai, and Pradeep Kumar (2022). "Farmers' Buying Behaviour of Herbicides and Preference Towards Weeding Operations in Tamil Nadu." *Indian Journal of Agricultural Sciences, 92(6), 748–756.*

Ravi Thakur, and Harvinder Singh (2021) "Farmers' Willingness to Pay for Herbicides." *Journal of Economic Studies, 10(2), 145–156.*

Srinivas Reddy, & Rajesh Sharma (2022) "Role of Social Media in Promoting Herbicides in India." *Indian Journal of Marketing, 52(3), 32–43.*

Syed Ahmed, and Rizwan Khan (2022) "Market Potential of Bio-Herbicides." *Environmental Agriculture Journal, 18(2), 77–90.*

*****