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AN ANALYTICAL STUDY OF FARMERS PERCEPTION TOWARDS FERTILIZERS AND PESTICIDES IN THE NILGIRIS DISTRICT

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1.1 ABSTRACT

In order to sustain crop yield in the face of difficult agroclimatic conditions, the agricultural industry in the Nilgiris district mostly depends on fertilizers and pesticides. Designing sustainable agricultural solutions requires an understanding of how farmers perceive the use, safety, and efficacy of these inputs. This study looks at farmers' perceptions of risk, usage habits, awareness level, and preference criteria for pesticides and fertilizers. Data was gathered from 150 farmers who represented significant agricultural areas in Nilgiris district like Ooty, Coonoor, and Kotagiri using a descriptive research design. Information on demographics, product knowledge, purchase habits, environmental concerns, and perceived health effect was gathered using a standardized questionnaire. The findings indicate that most farmers depend on chemical inputs due their raped effectiveness and the market's desire for high yields. However, there is still a lack of knowledge on safe handling procedures, residual impacts, and long-term soil degradation. Government subsidies, dealer recommendations, price, and brand reputation all have a big impact on purchasing decisions. Concerns about decreasing soil fertility, expanding pest resistance, and growing production costs were voiced by farmers. The study identifies a discrepancy between suggested safety standards and actual usage habits. Stronger extension services, better training initiatives, integrated pest management (IPM) promotions, and farmer-friendly regulations that supports balanced nutrient application are all called for. For politicians, agro-input firms, and agricultural development organizations looking to improve sustainable farming in hill regions, the study offers insightful information.

KEY WORDS: Nilgiris District, Agriculture, Farmers, Fertilizer, Pesticides. 1.2 INTRODUCTION

Agriculture in the Nilgiris district is characterized by small, medium, and large farmers cultivating tea, vegetables, fruits, and spices under particular climatic circumstances. Farmers rely heavily on pesticides and fertilizers to maintain output. Although these inputs increase production, there are serious concerns about their long-term effects on soil health, human well- being, and the ecosystem. The kind quantity and frequency of input utilization are all heavily influenced by farmers' perceptions. Misuse, resistance problem, and environmental degradation are frequently caused by misconceptions, a lack of technical expertise, or an excessive reliance on chemical treatments.The government and agricultural organizations have placed a strong emphasis on sustainable practices in recent years, such as integrated pest management, biofertilizers, and organic farming. However, farmers' attitudes and awareness play a significant part in the execution of such approaches. Therefore, determining the opinions of farmers in the Nilgiris district is essential to creating training initiatives and policies that work. This study looks into how farmers perceive pesticides and fertilizers, what influences their choices, and how these views affect their overall farming practices.

1.3 THE STUDY'S OBJECTIVES

1. To ascertain the opinions of farmers in the Nilgiris district regarding the use of pesticides and fertilizers.
2. To determine what influences farmers' decisions, purchasing habits, and patterns of pesticide and fertilizer use.

1.4 LITERATURE REVIEW

1. According to Ramasamy & Selvaraj (2015), farmers typically have little understanding about the safety of pesticides, which leads to overuse and health problems.
2. According to Sharma et al. (2017), highlighted how farmers' uptake of fertilizers and nutrient-balanced application are influenced by extension services.
3. According to Dev & Rao (2018), dealer recommendations, pricing, and subsidy programs all have a big impact on fertilizer purchasing decisions.
4. According to Thomas & George (2019), hill farmers are more vulnerable to chemical runoff and soil erosion, which makes sustainable methods even more crucial.
5. According to Lalitha et al. (2021), farmers' concerns about pesticide residues in crops and their effects on marketability and health growing.

1.5 THE STUDY'S LIMITATIONS

1. The research could not accurately reflect all South Indian farmers because it is limited to specific areas of the Nilgiris district.
2. The results' generalizability may be limited by the sample size of 150 farmers.
3. Self-reported information, which may contain bias or memory errors, is the basis for responses.
4. Detailed field observations and long-term behavioural tracking were limited by time constrains.

1.6 STATEMENT OF THE PROBLEM

Although pesticides and fertilizers are essential to contemporary agriculture, their overuse or incorrect application can have serious repercussions, including breakdown of the soil, health risks, residue build-up and environmental imbalance. Despite growing concerns about sustainability, farmers in the Nilgiris district still extensively rely on chemical inputs. Their opinions and choices are influenced by a lack of scientific knowledge, the power of local dealers, and a lack of access to extension programs. Thus, knowing farmers' attitudes and the obstacles they confront in safe and efficient utilization is crucial to ensure sustainable agriculture. By examining the opinions, worries, and expectations of farmers in the Nilgiris district, this study closes the gap.

1.7 RESEARCH METHODOLOGY

The study is based on a descriptive research design conducted in the Nilgiris District. A total of 150 respondents were selected for the study using convenience sampling or stratified random sampling methods. Primary data were collected through structured questionnaires administered to the respondents, while secondary data were gathered from journals, articles, and relevant reports. The data collected were analyzed using percentage analysis, Likert scale analysis based on the five point scale method, and the Chi Square test to interpret the findings effectively.

1.8 ANALYSIS AND INTERPRETATIONS: PERCENTAGE ANALYSIS

TABLE NO: 1 GENDER OF THE RESPONDERS

S.NO	GENDER	NO. OF RESPONDERS	PERCENTAGE (%)
1	MALE	138	92
2	FEMALE	12	08
	TOTAL	**150**	**100**

The aforementioned table indicates a distinct majority of male responders, with 92% of the sample being men and only 8% women. This shows that the survey insights are mostly depended by male farmers' opinions.

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TABLE NO: 2 AGE OF THE RESPONDERS

S.NO	AGE	NO. OF RESPONDERS	PERCENTAGE (%)
1	BELOW30	06	04
2	31-40	33	22
3	41-50	51	34
4	ABOVE 50	60	40
	TOTAL	**150**	**100**

The aforementioned table indicates that 22% of respondents are between the ages of 31 and 40, while only 4% are under 30. The majority, 34%, fall into the 41-50 age range, while the remaining 40% are beyond 50. This suggests that farming is largely carried out by middle- aged and older adults, with very few young farmers entering the field.

ABLE NO: 3 EDUCATION LEVEL OF THE RESPONDERS

S.NO	EDUCATION LEVEL	NO. OF RESPONDERS	PERCENTAGE (%)
1	ILLITERATE	06	04
2	PRIMARY	39	26
3	SECONDARY	87	58
4	GRADUATE AND ABOVE	18	12
	TOTAL	**150**	**100**

The aforementioned table reveals that only 4% of the respondents are illiterate, while 26% have primary education and a majority 58% have studied up to the secondary level. A minor fraction of 12% are grads and above. This demonstrates that the majority of farmers have at least a basic education, with secondary education being the most prevalent.

TABLE NO: 4 ANNUAL INCOME OF THE RESPONDERS

S.NO	ANNUAL INCOME	NO. OF RESPONDERS	PERCENTAGE (%)
1	BELOW50,000	15	10
2	50,001-1,00,000	21	14
3	1,00,001-2,00,000	84	56
4	ABOVE 2,00,000	30	20
	TOTAL	**150**	**100**

The aforementioned table reveals that only 10% of the farmers earn below 50,000 annually, while a majority 56% lie in the 50,001 to 1,00,000. Around 14% earn between 1,00,001 to 2,00,000, while 20% receive above 2,00,000. This suggests that most farmers belong to a lower-middle income category with only a small minority earning higher wages.

TABLE NO: 5 FARMING DETAILS OF THE RESPONDERS

S.NO	FARMING DETAILS	NO. OF RESPONDERS	PERCENTAGE (%)
1	LESS THAN 1 ACRE	33	22
2	1 – 3 ACRES	90	60
3	3 – 5 ACRES	24	16
4	THAN 5 ACRES	03	02
	TOTAL	**150**	**100**

The aforementioned data demonstrates that the majority of the farmers work on small holdings, with 22% owning less than one acre and 60% cultivating one to three acres. Just 16% oversee three to five acres, and just 2% control more than five. This demonstrates unequivocally that small and marginal landholders dominate the farming community.

TABLE NO: 6 FARMING TYPE OF THE RESPONDERS

S.NO	TYPE OF FARMING	NO. OF RESPONDERS	PERCENTAGE (%)
1	SUBSISTENCE	00	00
2	COMMERCIAL	02	04
3	BOTH	48	96
	TOTAL	**150**	**100**

The aforementioned table demonstrates that a dominant preference for both commercial farming and subsistence farming, practised by 96% of the respondents. There is a distinct emphasis on both subsistence and commercial farming in the area, as seen by the fact that very few people engage in commercial farming and none rely only on subsistence farming.

TABLE NO: 7 MAJOR CROPS CULTIVATED BY THE RESPONDERS

S.NO	AJOR CROPS CULTIVATED	NO. OF RESPONDERS	PERCENTAGE (%)
1	POTATO	54	36
2	CARROT	93	62
3	BEANS	03	02
	TOTAL	**150**	**100**

The aforementioned table reveals that carrot is the primary crop cultivated by respondents, representing 62% of the total and potato is cultivated by 36% of the respondents, while beans are grown by only 2%. This result demonstrates a definite preference for carrot farming among the surveyed group.

TABLE NO: 8 YEARS OF FARMING OF THE RESPONDERS

S.NO	YEARS OF FARMING	NO. OF RESPONDERS	PERCENTAGE (%)
1	LESS THAN 5 YEARS	45	30
2	5 – 10 YEARS	57	38
3	11 – 20 YEARS	12	08
4	ABOVE 20 YEARS	36	24
	TOTAL	**150**	**100**

The aforementioned table reveals that most respondents 38% had 5-10 years of agricultural experience, indicating a high presence of moderately experienced farmers. A substantial number 30% are relatively new with less than 5 years of experience. Only 8% have been farmers for 11-20 years, whereas 24% have been farmers for more than 20 years. Overall, the sample represents a balanced mix, with a tilt towards mid-level experience.

TABLE NO: 9 FARMERS BELIEF ON FERTILIZER

S.NO	FERTILIZERS ARE ESSENTIAL FOR HIGHER PRODUCTIVITY	NO. OF RESPONDERS	PERCENTAGE (%)
1	YES	150	100
2	NO	-	-
	TOTAL	**150**	**100**

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The aforementioned table demonstrates that all respondents unanimously feel that fertilizers are vital for obtaining increased output, exhibiting a 100% positive opinion towards fertilizer use among farmers.

TABLE NO: 10 FARMERS BELIEF ON PESTICIDES

S.NO	PESTICIDES ARE NECESSARY FOR CROP PROTECTION	NO. OF RESPONDERS	PERCENTAGE (%)
1	YES	150	100
2	NO	-	-
	TOTAL	**150**	**100**

The aforementioned table demonstrates that all the farmers unanimously agree that pesticides are necessary for crop protection, showing a 100% belief in the importance of pesticides for safeguarding their crops.

TABLE NO: 11 PREFERENCES OF FETILIZERS OF THE RESPONDERS

S.NO	EFERENCE OF FERTILIZERS	NO. OF RESPONDERS	PERCENTAGE (%)
1	ORGANIC	03	02
2	CHEMICAL	18	12
3	BOTH	129	86
	TOTAL	**150**	**100**

The aforementioned table reveals that both the organic and chemical fertilizers are preferred by 86% of the farmers. Just 12% of people use chemical fertilizer, while only 2% utilize organic fertilizer. This demonstrates the respondent heavy reliance on both chemical and organic fertilizers in their farming methods.

TABLE NO: 12 PREFERENCES OF PESTICIDES OF THE RESPONDERS

S.NO	EFERENCE OF PESTICIDES	NO. OF RESPONDERS	PERCENTAGE (%)
1	ORGANIC	21	14
2	CHEMICAL	126	84
3	BOTH	03	02
	TOTAL	**150**	**100**

The aforementioned table reveals that most 84% of the farmers prefer chemical pesticides, while only 14% select organic pesticides. A minimal 2% utilize both, demonstrating a heavy reliance on chemical pesticides for crop protection.

TABLE NO: 13 FACTORS INFLUENCING PERCEPTION OF FERTILIZERS AND PESTICIDES

S.NO	FACTORS	NO. OF RESPONDERS	PERCENTAGE (%)
1	YIELD IMPROVEMENT	132	88
2	SOIL FERTILITY	15	10
3	)NMENTAL IMPACT	-	-
4	HEALTH CONCERNS	03	02
	TOTAL	**150**	**100**

The aforementioned table reveals the biggest element driving farmers view is yield improvement, influencing 88% of respondents. Only 10% and 20%, respectively, take environmental effect and health problem into account when making decision, indicating that productivity significantly surpasses other considerations.

TABLE NO: 14 BRAND EVALUTION BY FARMERS

S.NO	ARISION OF BRANDS	NO. OF RESPONDERS	PERCENTAGE (%)
1	Yes	144	96
2	No	06	04
	TOTAL	**150**	**100**

The aforementioned table reveals a huge majority 96% of farmers evaluate brands before purchase, suggesting that brands evaluation plays a key role in their buying decision, while only 4% do not engage in comparison.

TABLE NO: 15 FARMERS LOYALITY TOWARDS FERTILIZER AND PESTICIDE BRANDS

S.NO	BRAND LOYALITY	NO. OF RESPONDERS	PERCENTAGE (%)
1	YES	147	98
2	NO	03	02
	TOTAL	**150**	**100**

The aforementioned table reveals a great majority of farmers 98% keep loyal to a particular fertilizer or pesticide brands, while only a very small share 2% migrate between brands. This shows significant brand trust and consistent buying behaviour among the farmers.

TABLE NO: 16 CHALLENGES OF FARMERS IN PRODUCT AVAILABILITY

S.NO	DIFFICULTY IN ACCESSING PRODUCTS ON TIME	NO. OF RESPONDERS	PERCENTAGE (%)
1	YES	141	94
2	NO	09	06
	TOTAL	**150**	**100**

The aforementioned table reveals that most respondents 94% face problems in acquiring product on time, while only a small proportion 6% experience no such challenges, showing a big supply related challenges among farmers.

TABLE NO: 17 PERCEPTIONS OF PRODUCT PRICING OF THE RESPONDERS

S.NO	S PRICES ARE REASONABLE	NO. OF RESPONDERS	PERCENTAGE (%)
1	YES	147	98
2	NO	03	02
	TOTAL	**150**	**100**

The aforementioned table demonstrates that most farmers 98% feel that the prices of fertilizers and pesticides are appropriate, while just a relatively tiny percentage 2% consider them exorbitant. This indicates a general level of contentment with the current pricing.

TABLE NO: 18 MODE OF PAYMENT USED BY THE RESPONDERS

S.NO	PAYMENT METHID	NO. OF RESPONDERS	PERCENTAGE (%)
1	MONEY	06	04
2	DIT FROM DEALERS	144	96
3	RNMENT SUBSID	-	-
4	BANK LOAN	-	-
	TOTAL	**150**	**100**

The aforementioned table shows the majority of 96% farmers buy pesticides and fertilizers from dealers on credit, with only 4% making cash payment. This shows a heavy dependence on dealer financing for agricultural inputs.

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5 POINT SCALE:

FARMERS PERCEPTION TOWARDS FERTILIZERS AND PESTICIDES

STATEMENT	TOTALLY DISAGREE		DISAGREE		NEUTRAL		AGREE		TOTALLY AGREE		TOTAL	
	No. of Response	%	No. of Response	%	No. of Response	%	No. of Response	%	No. of Response	%	No. of Response	%
1. Fertilizers are essential for higher crop productivity.	6	4%	6	4%	15	10%	120	80%	3	2%	150	100%
2. Pesticides are necessary to protect crops from pests and diseases.	0	0	6	4%	27	18%	78	52%	39	26 %	150	100%
3. Excessive use of fertilizers reduces soil fertility in the long run.	0	0	0	0	42	28%	72	48%	36	24 %	150	100%
4. Chemical pesticides cause harmful effects on human health.	0	0	6	4%	60	40%	45	30%	39	26 %	150	100%
5. Organic fertilizers are better for sustainable farming.	3	2%	3	2%	27	18%	93	62%	24	16 %	150	100%
6. Organic pesticides are safer than chemical pesticides.	6	4%	9	6%	24	16%	48	32%	63	42 %	150	100%
7. Using fertilizers has increased crop yield significantly.	6	4%	9	6%	72	48%	45	30%	18	12 %	150	100%
8. Proper pesticide use reduces crop losses effectively.	6	4%	6	4%	18	12%	63	42%	57	38 %	150	100%

The aforementioned table shows that the majority of farmers consider pesticides and fertilizers to be essential tools for increasing crop yields and safeguarding their fields. Strong agreements on productivity advantages demonstrates very strong dependence on chemical inputs, even though many farmers are aware of the soil degradation and health hazards they may bring. Interest in organic alternatives is present but still emerging. In general, farmers strike a balance between rising caution and practical necessity, indicating a shift towards more sustainable and thoughtful farming practices.

1.9 CHI SQUARE TEST FOR ASSOCIATION BETWEEN ANNUAL INCOME AND MODE OF PURCHASE OF FERTILIZERS AND PESTICIDES:

Hypothesis:

H_0: The respondents' yearly income and how they buy pesticides and fertilizers do not significantly correlate.

H_1: The respondents' yearly income and how they buy pesticides and fertilizers are significantly correlated.

TEST	VALUE	DF	SIG.(P-VALUE)
Pearson Chi-Square	38.36	9	.000
Likelihood Ratio	36.82	9	.000
ear-by-Linear Association	12.45	1	.000
N of Valid Cases	150	-	-

The null hypothesis is rejected because the computed Chi-Square value (38.36) is greater than the table value (16.91) and the p-value (.000) is less than 0.05. Therefore, there is a substantial association between the income of the respondents and the mode of purchase of fertilizers and pesticides.

1.10 FINDINGS OF THE STUDY

- The majority of farmers use chemical pesticides and fertilizers because the results are immediately apparent.
- There is some awareness of the long-term consequences for human health and the environment, but not enough to alter behaviour.
- Purchase decisions are heavily influenced by product availability and dealer recommendations.
- Many farmers are untrained in dosage administration, safe handling, and safety precautions.
- Farmers are becoming more concerned about declining soil fertility and growing input costs.
- Due to a lack of direction, IPM procedures and organic alternatives are still not widely adopted.

1.11 SUGGESTION

- Promote agricultural extension services to offer frequent instruction in sustainable practices and safe usage.
- Encourage the use of IPM techniques, bio-pesticides, and organic fertilizers by offering subsidies and raising awareness.
- To demonstrate the advantages of balanced nutrient management, create demonstration plots at the village levels.
- Sales of pesticides should be controlled, and dealers should be required to give precise technical advice.
- Promote bulk purchases of high-quality inputs at reduces costs by farmer-producer organizations (FPOs).

1.12 CONCLUSION

According to the study's findings, farmers in the Nilgiris district rely significantly on pesticides and fertilizers, although their opinions are more influenced by short-term gains than long-term viability. Despite worries about safety, pest resistance, and soil health, there is still a lack of understanding and acceptance of environmentally friendly techniques. Farming results and environmental health can be greatly improved by bolstering training programs, expanding access to trustworthy information, and encouraging sustainable options. Policymakers, extension organizations, and agro-input companies striving for sustainable agriculture in hill region will benefit greatly from this study.

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