

## **A STUDY ON FARMERS' AWARENESS AND PERCEPTION TOWARDS BIOFERTILIZERS**

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### **Abstract**

Biofertilizers are the preparations contain living microorganisms that can meet the essential plant nutrients when applied to the soil or seeds. The non-polluting and eco-friendly nature of Biofertilizers have made them inevitable components of organic farming. Organic farming is accepted worldwide as an effective sustainable farming practice. In India also the organic farming is gaining larger acceptance. The present study was conducted among 120 farmers of Kanjirapally Taluk to explore the farmers' awareness and perception towards biofertilizers. The analysis of the collected data revealed that farmers have lack of awareness regarding Government initiatives to promote biofertilizers, crop specific usage of biofertilizers and subsidies for biofertilizers. Farmers exhibited less perception towards results of biofertilizer application, knowledge in the application methods and role of biofertilizers in sustainable farming practices. The farmers' awareness about biofertilizers vary significantly with respect to education, monthly income, land holding, varieties of crops cultivated and the types of fertilizers applied. Multiple regression analysis revealed that the variables education, type of fertilizer applied, training received, farm size, monthly income from farming and economic motivation are significantly associated with perception of farmers.

**Key Words:** *Biofertilizers, Organic fertilizers, Sustainable farming practices.*

### **Introduction**

Green revolution was successful in meeting the immense food requirement of the country. The basic principle behind the revolutionary technique was to maximize the output with the application of chemical inputs in the soil. In the effort to maximize the outputs from the farms by the application of synthetic inputs the concern for environment and ecosystem had been

overlooked. The serious damages caused to the ecosystem and human health had been realized by the nations during the middle of the last century and the concept of sustainability gained prominence in the field of agriculture too. Organic farming that rely on organic and biofertilizers is considered as an effective sustainable farming practice. The greatest advantage of organic farming is that it can meet the essential plant nutrients without disturbing the soil and ecosystem. Biofertilizers contain living microorganisms are inevitable ingredients for organic farming. These carrier based preparations with effective strains of bacteria, fungi and algae provide the essential plant nutrients through microbial activity. The microbial activity helps in nitrogen fixation and solubilisation of phosphorous and other mineral nutrients in the soil. The water retention capacity of the soil is also enhanced by the microbial activity due to biofertilizer application. Recognizing the numerous advantages of these ecofriendly fertilizers have been actively promoted by the world nations. In our country also the Government has implemented various schemes to promote biofertilizers among the farmers.

### Review of Literature

Markam et.al., (2018) attempted to evaluate the perception of eco-friendly farming practices of paddy among tribal farmers in Balaghat district of Madhya Pradesh. Generally, the tribal farming community adopts traditional farming practices due to their low economic and educational status, also they treat land as mother. This made the researcher to study the perception of tribal farmers towards eco-friendly farming practices.

It was observed that 47.5% of the respondents had medium extent of perception, 35.8% had high and 16.67% of the respondents had high level of perception towards eco-friendly farming practices. The researcher suggested that the Government should organize more awareness programs and field demonstrations to enhance the knowledge and adoption of eco-friendly farming practices.

**NigadeD. D et.al., (2017) examined the constraints faced by sugarcane farmers in the adoption of biofertilizers. The researcher argued that due to reasonable cost and eco-friendly nature biofertilizers could be considered as close substitutes for chemical fertilizers. But the major constraints in the adoption of biofertilizers were lack of awareness, insufficient subsidies, non-availability of labour and lack of confidence regarding the results.**

Shahpasand, M.R (2014) examined the relationship between awareness of sustainable agriculture and fertilizer usage of Iranian farmers in the city of Rajasthan. The correlation analysis exhibited positive relationship between the variables of environmental pollution, soil conservation and preservation of resources, manure, ammonium sulfate, urea, ammonium nitrate fertilizers and improved agricultural practices.

M. Malarkodi and K Bharathi (2010) The study conducted at Erode district of Tamil Nadu reveals that 98% of the farmers were aware of biofertilizers, while the remaining 2% were unaware. Among the farmers who were aware of biofertilizers only 19% were aware of the crop

specific usage of biofertilizers. The study disclosed that lack of awareness regarding the application methods and the uncertainties regarding the results were the major reasons behind the reduced acceptance of biofertilizers.

### Statement of the Problem

Recognizing the prominence of biofertilizers in sustainable farming practices Governments in the State and Central have taken vigorous measures to popularize these fertilizers among the farmers. Considerable funds have been allotted by the Government in the budgets and different schemes have been introduced to promote biofertilizers among the farmers. Despite the rigorous measures undertaken the application of biofertilizers in the farms is not up to the estimated targets. Awareness and perception of farmers towards biofertilizers are considered as two major factors that can influence the procurement and application of biofertilizers in the farms by the farmers.

### Objectives

- To understand the demographic profile of farmers of Kottayam district.
- To examine the farmers' awareness about biofertilizers
- To identify the perception of farmers towards biofertilizers.
- To identify the factors that influence the perception of farmers towards biofertilizers.

### Limitations of the Study

- The study was confined only to Kanjirapally Taluk.
- The response is limited to 120 respondents.

### Research Methodology

This descriptive study intends to understand the awareness and perception of farmers towards biofertilizers. The factors that influence perception of farmers towards biofertilizers have also been identified. The farmers of Kanjirapally comprise the population and data was collected from 120 farmers by using structured questionnaire. Simple random sampling has been adopted for the selection of respondents. The collected data was analyzed using simple percentage, weighted average ranking, Chi-Square and Multiple Regression analysis.

### Hypothesis

- The demographic variables are not associated with farmers' awareness towards biofertilizers.
- Types of fertilizer applied are not associated with awareness of farmers towards biofertilizers.
- Types of crops cultivated are not associated with awareness of farmers towards biofertilizers.

### Table I: Demographic Profile of the Respondents

Particulars	Classification	No of respondents	Percentage
Age	15-35	32	27
	35-55	48	40
	Above 55	40	33
Gender	Male	98	81
	Female	22	19
Educational Qualification	Up to SSLC	42	35
	SSLC-Graduation	51	43
	Graduation and Above	27	22
Monthly Income	Up to Rs. 10,000	62	51
	Rs. 10,000-20,000	42	35
	Above 20,000	16	14
Land Holding	1-3 Acres	67	55
	3-5 Acres	30	25
	Above 5 Acre	23	20

*Source: Primary Data*

**Table II: Farmers Awareness towards Biofertilizers**

Particular	VHA	HA	MA	A	NA	Total	Mean Score	Mean	Rank
Health benefits of bio-fertilizer application.	6	22	37	43	12	120	327	2.73	6
	30	88	111	86	12				
Non-polluting and eco-friendly nature of bio-fertilizers	7	27	39	36	11	120	343	2.86	3
	35	108	117	72	11				
Role of bio-fertilizer in improving the fertility of soil naturally	8	36	41	27	8	120	369	3.08	1

Particular	VHA	HA	MA	A	NA	Total	Mean Score	Mean	Rank
	40	144	123	54	8				
Role of bio-fertilizer in improving the life span of farm	8	24	42	36	10	120	344	2.87	2
	40	96	126	72	10				
Role of bio-fertilizer in improving the microbial activity and water retaining capacity	8	19	45	31	17	120	340	2.83	4
	40	76	135	72	17				
Crop specific usage of bio-fertilizers.	7	18	39	38	18	120	314	2.62	9
	35	72	117	72	18				
Dosage of bio-fertilizers	6	22	38	34	20	120	320	2.67	7
	30	88	114	68	20				
Source of purchase of bio-fertilizers.	8	21	43	36	12	120	337	2.81	5
	40	84	129	72	12				
Government initiatives to promote bio-fertilizers	5	21	36	36	22	120	275	2.29	10
	25	84	72	72	22				
Subsidies for bio-fertilizers.	6	19	38	32	27	120	319	2.66	8
	30	76	114	72	27				

Source: Primary Data

**VHA**-Very Highly Aware, **HA**-Highly Aware, **MA**- Moderately Aware, **A**-Aware, **NA**-Not Aware

The weighted average ranking study reveals that the mean awareness among the farmers is high for the factor role of biofertilizer in improving the fertility of the soil naturally followed by the factors role of biofertilizer in improving the life span of the farm and non-polluting and eco-friendly nature of biofertilizers. The mean awareness is observed less for Government initiatives to promote biofertilizers, crop specific usage of biofertilizers and subsidies for biofertilizers.

### Analysis of Variance

**H<sub>0</sub>**: The demographic variables are not associated with farmers' awareness towards biofertilizers

**Table III: Chi-Square Test**

Demographic Variables	Chi-Square Value	Df	Sig.
Age	2.1843	8	0.096
Gender	5.4086	4	0.248
Education	24.125	8	0.002
Monthly Income	27.18	8	0.001
Land Holding	36.04	8	0.000

*Source: Primary data*

The analysis of variance conducted reveals that for the factors Age and Gender the calculated p values are greater than .05, which means there is no significant association between farmers' knowledge about biofertilizers with respect to these variables. The null hypothesis is accepted. The calculated p values for the variables Education, Monthly income and Land holding is less than .05, therefore, the null hypothesis is rejected. There is significant association in farmers' awareness towards biofertilizers with respect to the variables Education, Monthly income and Land holding.

**H<sub>0</sub>:** Types of fertilizer applied are not associated with awareness of farmers towards biofertilizers.

**Table IV: Chi-Square Test**

	Value	Df	Sig.
Chi-Square Value	24.125	12	0.016

*Source: Primary data*

Since the calculated p value is less than .05 for the factor type of fertilizer applied the null hypothesis is rejected. Farmers' knowledge about biofertilizers is significantly associated with the type of fertilizers applied.

**H<sub>0</sub>:** Types of crops cultivated are not associated with awareness of farmers towards biofertilizers.

**Table V: Chi-Square Test**

	Value	Df	Sig.
Chi-Square Value	23.52	8	0.003

*Source: Primary data*

Since the calculated p value is less than .05 for the factor type of crops grown the null hypothesis is rejected. Farmers' knowledge about biofertilizers is significantly associated with the type of crops cultivated.

**Table VI: Farmers Perception towards Biofertilizers**

Statements	SF	F	N	NF	SNF	Total	Mean Score	Mean	Rank
Sustainable agriculture is possible by replacing chemical fertilizers with bio-fertilizers.	15	28	33	27	17	120	357	2.96	8
	75	112	99	54	17				
Quality and healthy crop production is possible by the application of bio-fertilizers.	26	34	27	23	10	120	413	3.44	1
	130	136	81	56	10				
Application of bio-fertilizer will improve the fertility of the soil naturally.	22	38	28	22	10	120	400	3.33	2
	110	152	84	44	10				
Application of bio-fertilizer will help in improving the microbial activity and water retaining capacity of soil.	17	33	36	25	9	120	384	3.2	4
	85	132	108	50	9				
Government initiatives to promote bio-fertilizers are encouraging the farmers to purchase bio-fertilizers.	11	33	40	25	11	120	368	3.07	6
	55	132	120	50	11				
Bio-fertilizer outlets are adequate at villages.	14	32	36	28	10	120	372	3.1	5
	70	128	108	56	10				
Farmers are having confidence regarding the results of bio-fertilizer.	10	26	38	29	17	120	343	2.86	10
	50	104	114	58	17				
Farmers have sufficient knowledge regarding the application of biofertilizers.	9	29	38	32	12	120	351	2.93	9
	45	116	114	64	12				
If the Government provides more assistance during conversion period increased number of farmers will adopt bi-fertilizers.	12	28	36	32	12	120	356	2.97	7

Statements	SF	F	N	NF	SNF	Total	Mean Score	Mean	Rank
	60	112	108	64	12				
Adoption of bio-fertilizers can be improved if the Government provides more financial assistance.	17	37	30	26	10	120	385	3.21	3
	85	148	90	52	10				

Source: Primary Data

**SF-** Strongly Favorable, **F-**Favorable, **N-**Neutral, **NF-**Not Favorable, **SNF-**Strongly Not Favorable

The weighted average rank test discloses that the mean perception among the farmers is high for the fact quality and healthy crop production is possible by the application of bio-fertilizers followed by application of bio-fertilizer will improve the fertility of the soil naturally and adoption of bio-fertilizers can be improved if the Government provides more financial assistance. The mean perception is found to be less for the facts that farmers are having confidence regarding the results of bio-fertilizer, farmers have sufficient knowledge regarding the application of biofertilizers and sustainable agriculture is possible by replacing chemical fertilizers with bio-fertilizers.

**Table VIII: Multiple regression analysis of independent variables with Perception level offarmers**

Sr. No.	Characteristics	Regression Coefficient 'b'Value	't' Value
1	Age	.372	1.791 <sup>NS</sup>
2	Education	0.602	3.499 <sup>**</sup>
3	Type of fertilizer applied	5.432	2.765 <sup>**</sup>
4	Farming experience	-0.198	-0.980 <sup>NS</sup>
5	Training/orientations received	1.734	3.356 <sup>**</sup>
6	Farm size	0.000	-3.436 <sup>**</sup>
7	Frequency of fertilizer application	0.055	0.608 <sup>NS</sup>
8	Time spent for farming activities	0.469	1.637 <sup>NS</sup>
9	Monthly income from farming	0.109	1.987 <sup>*</sup>
10	Media exposure	-0.051	-0.425 <sup>NS</sup>



11	Risk orientation	0.039	0.529 <sup>NS</sup>
12	Innovation proneness	-0.588	-1.042 <sup>NS</sup>
13	Economic motivation	-0.0550	-2.130 <sup>**</sup>
14	Market orientation	0.180	0.894 <sup>NS</sup>
R <sup>2</sup> =0.391		F = 4.136 <sup>**</sup>	

Source: Primary data

Table VIII reveals that education (3.499<sup>\*\*</sup>), type of fertilizer applied (2.765<sup>\*\*</sup>), training received (3.356<sup>\*\*</sup>), farm size (-3.436<sup>\*\*</sup>), monthly income from farming (1.987<sup>\*</sup>) and economic motivation (-2.130<sup>\*\*</sup>) are found significantly associated with perception of farmers.

The variables Age (1.791<sup>NS</sup>), farming experience (-0.980<sup>NS</sup>), frequency of fertilizer application (0.608<sup>NS</sup>), time spent for farming activities (1.637<sup>NS</sup>), media exposure (-0.425<sup>NS</sup>), risk orientation (0.529<sup>NS</sup>) innovation proneness (-1.042<sup>NS</sup>) and market orientation (0.894<sup>NS</sup>) were found non significantly associated with perception level of farmers.

The value of R<sup>2</sup> discloses that the select variables collectively contribute to 39.10 percent of variation in the level of farmers' satisfaction towards biofertilizers

## Findings

- It is observed that the mean awareness among the farmers is high for the factor role of biofertilizer in improving the fertility of the soil naturally followed by the factors role of biofertilizer in improving the life span of the farm and non-polluting and eco-friendly nature of biofertilizers. The mean awareness is observed less for Government initiatives to promote biofertilizers, crop specific usage of biofertilizers and subsidies for biofertilizers.
- It is learned that the mean perception among the farmers is high for the fact quality and healthy crop production is possible by the application of bio-fertilizers which will improve the fertility of the soil naturally and adoption of bio-fertilizers can be improved if the Government provides more financial assistance. The mean perception is found to be less for the facts that farmers are having confidence regarding the results of bio-fertilizer, farmers have sufficient knowledge regarding the application of biofertilizers and sustainable agriculture is possible by replacing chemical fertilizers with bio-fertilizers.
- The analysis of variance conducted reveals that there is no significant difference in farmers' knowledge about biofertilizers with respect to age and gender. The farmers' knowledge about biofertilizers vary significantly with respect to Education, Monthly income and Land holding.
- Farmers' knowledge about biofertilizers vary significantly with respect to the type of fertilizers applied and the types of crops cultivated.
- It is found that the mean perception among the farmers is high for the fact quality and healthy crop production is possible by the application of bio-fertilizers followed by application of bio-

fertilizer will improve the fertility of the soil naturally and adoption of bio-fertilizers can be improved if the Government provides more financial assistance. The mean perception is found to be less for the facts that farmers are having confidence regarding the results of bio-fertilizer, farmers have sufficient knowledge regarding the application of biofertilizers and sustainable agriculture is possible by replacing chemical fertilizers with bio-fertilizers.

- The variables education, type of fertilizer applied, training received, farm size, monthly income from farming and economic motivation are found significantly associated with perception of farmers.
- The co-efficient of determination ( $R^2$ ) of the independent variables 0.391 implies that 39.10% of total variation in perception of farmers is explained by the 14 selected independent variables. The 'F' value is found to be significant at 0.01 level due to significant association between the independent variables and perception level of farmers.

### Suggestions

- Measures shall be taken to ensure that the Government efforts to promote biofertilizers reach among the farmers. Agricultural officers of the respective area shall be entrusted to ensure that the different schemes launched by the Government shall be availed by the farmers.
- Field demonstrations shall be promoted to improve the awareness of the farmers regarding the crop specific usage of biofertilizers and dosage of biofertilizer application. Video presentations can also be used for illustrations.
- Farmers shall be educated regarding the results of biofertilizer application. The successful biofertilizer using farmers of the respective area shall be identified and motivate them to communicate the good results of biofertilizer application. The farmers shall be educated regarding the role of biofertilizers in sustainable farming practices.
- Framers shall be educated regarding the increasing demand for organic foods and equip the farmers to attain organic certification for their crops. This will help the farmers to get increased prices for their crops.
- Equip the farmers to explore the international market for organic crops. This can be attained by popularizing farmers' cooperative societies and providing training through these societies regarding export market. Exploring the international market potential will help farmers to get increased prices for their products.

### Conclusion

Biofertilizer technology in farming is gaining prominence in India and the other world nations. The capacity of biofertilizer to supply the essential plant nutrients without disturbing

the eco-system and soil structure made these fertilizers an imperative ingredient for sustainable farming practice. Though the Government have taken serious measures to promote organic farming and Biofertilizers, the adoption of these fertilizers need to be penetrated more among the farmers. The conducted study reveals that the mean awareness is observed less for Government initiatives to promote biofertilizers, crop specific usage of biofertilizers and subsidies for biofertilizers. Regarding the perception of farmers mean perception is reflected less for the results of bio-fertilizers and the knowledge in the application of biofertilizers. The variables education, type of fertilizer applied, training received, farm size, monthly income from farming and economic motivation are found significantly associated with perception of farmers. It is expected that by addressing the identified knowledge and perception issues regarding biofertilizers among the farmers through effective strategies would help in the improved application of these fertilizers in the farms.

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