



## Characteristics of the Farmers Using the Private Bio-Fertilizers

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### Authors' contributions

*This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.*

### Article Information

DOI: 10.9734/AJAEES/2022/v40i111704

### Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/92225>

**Original Research Article**

**Received 22 July 2022**  
**Accepted 30 September 2022**  
**Published 17 October 2022**

### ABSTRACT

In a nutshell, Bio-fertilizers provides "eco-friendly" organic agro-input which has the ability to convert nutritionally important elements from unavailable to available form through biological processes. The present study was conducted at Navsari district of South Gujarat. Total 120 respondents were selected through simple random sampling for the study. Ex-post facto research design was used for the study. The present study was conducted to study the various personal, socio-economic, Communicational and Psychological Characteristics of the farmers using of private bio-fertilizers. The result of the study revealed that majority of the respondents belonged to middle age groups with secondary level of education, were male, had small family, and had farming as their major occupation, they had medium land holding, possessed medium farming experience, and belonged to medium annual income with moderate mass media exposure and medium extension contact with membership in one organization. Further, higher scientific orientation, and moderate risk orientation, economic motivation, and had moderate management orientation too.

**Keywords:** Farmers; private bio-fertilizers; respondents; characteristics.

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## 1. INTRODUCTION

“Bio-fertilizers can fix atmospheric nitrogen through the process of biological nitrogen fixation (BNF) and solubilise plant nutrients like phosphates, potash; in addition, it also stimulates plant growth through synthesis of different growth promoting substances and has C: N ratio 20:1 indicating its stability” [1,2]. “In a nutshell, it provides “eco-friendly” organic agro-input which has the ability to convert nutritionally important elements from unavailable to available form through biological processes” [3].

“From long-ago, the chemical pesticides and fertilizers have played a vital role in improving agricultural production. Although they have a short history in modern agriculture, their instant action and low cost managed to bring them quickly into the center of attention. Thus their adverse effects on environment, plant, animal and human life have diverted the priority on eco-friendly plant protection” [4].

“Hence, in the recent years, many organic fertilizers have been introduced that act as natural stimulators for plant growth. A particular group of organic fertilizers includes outcomes based on plant growth-promoting microorganisms identified as ‘Bio-fertilizers’. These bio-fertilizers comprised efficient strains of nitrogen fixing or phosphate solubilising microorganism. Organic farming has appeared as a prime concern area globally in aspect of the growing demand for safe and healthy food, durable sustainability and issue on environmental pollution associated with random use of agrochemicals” [5].

“The rising importance of bio-fertilizers will reduce the requirement of chemical fertilizers and the result it will be helpful in the renewal of environment. Bio-fertilizer is an organic by-product containing living microorganisms arrested from plant roots or soil. Choice of bio-fertilizer is becoming increasingly popular for the replacement of chemical fertilizer in order to lower the cost of crop production, enhance the growth and crop yield by increasing the nitrogen availability and by producing certain substances, such as auxin, cytokinin and gibberellins, which are helpful in the growth of plants. Microbial activity plays a key role in agriculture because they are very significant in the movement and availability of minerals required for plant growth and ultimately lower the use of chemical fertilizers” [6,7].

There are many private bio-fertilizers available in the market like ORGA-AZOTO, ORGA-AZOS, ORGA-RHIZO, ORGAMORE, AZODAWN, MYCODAWN, and RHIZODAWN, etc. manufactured by private manufacturers like Annadata organic biotech, Surat, Algrin microbial private ltd, Banakshata, Asiadawn biocare private ltd, Surat etc.

## 2. REVIEW OF LITERATURE

Prajapati et al. [8] reported that “majority (62.00%) respondents were middle age group (36 to 55 years), whereas 27.00 per cent were old age group (above 55 years) and only 11.00 per cent were young age group (up to 35 years)”.

Waghmode et al. [9] studied that majority of respondents (59.00 per cent) were educated upto graduation level, followed by 18.00 per cent were educated upto secondary level and 15.00 per cent were educated upto higher secondary level and 8.00 per cent were educated upto post graduation level.

Nazuri et al. [10] reported that majority of the farmers (93.20%) were male and only 06.80 per cent were female.

Kumar et al. [11] studied that about 67.50 per cent respondents have up to 5 family members in their household and 32.50 per cent respondents have above 5 family members.

Trivedi and Patel [12] studied that 42.00 per cent respondents were daily labourer in agriculture, followed by 32.00 per cent had involved in agriculture and allied activities and 19.00 percent were house wife and only 07.00 per cent respondents have their own small and independent business.

Mistry et al. [13] reported that half of respondents were small farmers (50.00%), followed by marginal farmers (46.00%) and medium farmers (4.00 percent).

Mooventhan et al. [14] revealed that “more than half (62.00%) of the farmers were found with medium level of farming experience, followed by 27.33 per cent with high level of farming experience and 10.67 per cent of farmers possessed low level of experience in farming”.

Waghmode et al. [9] studied that “72.00 per cent of the respondents had medium level of annual income (5,33,115 Rs to 25,86,885 Rs), followed by 19.00 per cent of the respondents had low

level of annual income (upto 5,33,114 Rs) and 9.00 per cent of the respondents had high level of annual income (more than 25,86,885 Rs)".

Gautam et al. [15] found that "majority (55.56%) of the respondents had low level of mass media utilization, 22.67 per cent respondents had high level of mass media utilization and 21.77 per cent of the respondents had medium level of mass media utilization, respectively".

Dabhi et al. [16] revealed that more than half of the respondents (53.33 per cent) had medium extension contact, followed by low (28.33%) and high (18.33%) extension contact.

Panchbhai et al. [17] revealed that "36.50 per cent of the respondents had high social participation, followed by 35.00 per cent and 28.50 per cent medium and low social participation, respectively".

Dobariya et al. [18] reported that majority (57.50%) of the respondent had medium level of scientific orientation, followed by 22.50 per cent of them with high and 20.00 per cent of them were with low level of scientific orientation.

Patel et al. [19] observed that maximum number of respondents from beneficiary group (70.00%) and non-beneficiary group (50.00%) were having medium level of risk preferences.

Dalvi and Pandya [20] reported that "70.00 per cent respondents had moderate level of economic motivation followed by 20.00 per cent with low level and 10.00 per cent with higher level of economic motivation".

Nagesh et al. [21] reported that "majority (62.50%) of the respondents had medium

management orientation, followed by 21.66 per cent and 15.84 per cent of the respondents having high and low management orientation, respectively".

### 3. OBJECTIVE

(1) To study the Personal, socio-economic, Communicational and Psychological Characteristics of the farmers using of private bio-fertilizers.

### 4. METHODOLOGY

The study was conducted in Navsari district of South Gujarat with *Ex-post facto* research design. All the talukas of the Navsari district were covered under the study. Twelve villages were selected through proportionate random sampling. From each village ten respondents were selected through simple random sampling. Thus, the total respondents were 120, This study was based on the primary data which were collected from sample households on various parameters of socio-economic profile through well-structured and pretested interview schedule. The data were analysed by using tabular analysis, mean, percentage, frequency etc., to draw the meaningful conclusion.

### 5. RESULTS AND DISCUSSION

The detail of socio-economic profile of respondents' viz., Age, education, Gender, size of family, occupation, association with organizations, size of land holding, Extension contact etc. affect the economy of the farm and also the decision making about adoption of inventive techniques to a substantial extent. These aspects of sample respondents have been analyzed and presented as under:

**Table 1. Socio-economic profile of respondents**

(n = 120)			
Sr. No.	Variables	Frequency	Percent
<b>I. Personal Characteristics</b>			
1.	<b>Age</b>		
a)	Young	09	07.50
b)	Middle	75	62.50
c)	Old	36	30.00
2.	<b>Education</b>		
a)	Primary	43	35.80
b)	Secondary	61	50.80
c)	College and above	16	13.40
3.	<b>Gender</b>		
a)	Male	104	86.66
b)	Female	16	13.34

Sr. No.	Variables	Frequency	Percent
4.	<b>Family size</b>		
a)	Small	77	64.20
b)	Medium	35	29.20
c)	Large	08	06.60
5.	<b>Occupation</b>		
a)	Farming	55	45.80
b)	Farming + Animal husbandry	37	30.80
c)	Farming + Animal husbandry + Service	28	23.40
<b>II . Socio-economic Characteristics</b>			
6.	<b>Landholding</b>		
a)	Small	22	18.30
b)	Medium	77	64.20
c)	Large	21	17.50
7.	<b>Farming experience</b>		
a)	Low	28	23.30
b)	Medium	82	68.40
c)	High	10	08.30
8.	<b>Annual income</b>		
a)	Low	26	21.70
b)	Medium	63	52.50
c)	High	31	25.80
<b>III Communicational Characteristics</b>			
9.	<b>Mass media exposure</b>		
a)	Lower	37	30.80
b)	Moderate	62	51.70
c)	Higher	21	17.50
10.	<b>Extension contact</b>		
a)	Low	32	26.70
b)	Medium	67	55.80
c)	High	21	17.50
11.	<b>Social participation</b>		
a)	No membership in any organization	10	08.30
b)	Membership in one organization	51	42.60
c)	Membership in more than one organization	46	38.30
d)	Holding position in organization	13	10.80
12.	<b>Scientific orientation</b>		
a)	Lower	20	16.70
b)	Moderate	44	36.60
c)	Higher	56	46.70
<b>IV. Psychological Characteristics</b>			
13.	<b>Risk orientation</b>		
a)	Lower	46	38.30
b)	Moderate	48	40.00
c)	Higher	26	21.70
14.	<b>Economic motivation</b>		
a)	Lower	46	38.30
b)	Moderate	50	41.70
c)	Higher	24	20.00
15.	<b>Management orientation</b>		
a)	Lower	31	25.80
b)	Moderate	70	58.30
c)	Higher	19	15.90

**Age:** It is clear from the data indicated in the Table 1 that out of total private bio-fertilizers user's majority of the respondents (62.50%) were in the middle age group, 7.50 per cent were in the young age group and 30.00 per cent were in the old age group. Majority of respondents (92.50%) were from middle to old age group. The results indicate that they have enough maturity and have better experience in the farming.

**Education:** It is evident from the Table 1 that 50.80 per cent of the respondents had secondary level of education followed by 35.80 per cent of them had primary level of education and 13.40 per cent had college and above level of education. In general, majority of the respondents (86.60%) had primary to secondary level of education. It is obvious from the above facts that the respondents have comprehended the importance of education as the means for improvement of overall living standard.

**Gender:** It is clear from the data indicated in the Table 1 that majority of respondents (86.66%) were male. The outcome shows that in our country the role of women in the family is enormously characterized by social structure and familial ties.

**Family size:** The data presented in Table 1 revealed that majority (64.20%) of the respondents belonged to category of small family, followed by 29.20 and 6.70 per cent were in medium and Large family categories, respectively. In general, from the above finding it could be said that majority of the respondents (93.40%) belonged to small to medium family categories. It is deduced that the respondents follow new cultivating strategies despite the fact that, still they believe in age old social characteristics of agrarian.

**Occupation:** The data presented in The Table 1 shows that slightly less than half of respondents (45.80 %) had farming as their major occupation, followed by 30.80 per cent were having farming + animal husbandry and 23.40 per cent of them had farming + animal husbandry + service, respectively. In general, the majority of the respondents (76.60%) had farming and farming + animal husbandry as their major occupations. The probable reason might be that the respondents have considered these two as supportive to sustain their livelihood and lack of other opportunity may limit them to go for some other supplementary income.

**Land holding:** It is evident from The data presented in The Table 1 shows that majority of the respondents(64.20%) belongs to medium land holding category, followed by 18.30 per cent belongs to small land holding category, while 17.50 per cent had large land holding. In general, majority of the respondents (82.50%) had medium to small land holding. The plausible explanation of this finding may be because of fragmentation of inherited land from generation to generation along with agriculture as main occupation.

**Farming experience:** The data presented in Table 1 revealed that the majority of the respondents (68.40%) had medium farming experience followed by 23.30 per cent had lower farming experience and 08.30 per cent of them had higher farming experience, respectively. In general, majority of the respondents (68.40%) had moderate farming experience because majority of the respondents were from middle age group.

**Annual income:** The data presented in Table 1 indicated that 52.50 per cent of the respondents belonged to medium annual income category, followed by 25.80 per cent belongs to high annual income category and 21.70 per cent belonged low income category. In general, it could be said that the majority of respondents (74.20%) had medium to low annual income. This might be due to more dependence on agriculture and allied enterprises for income.

**Mass media exposure:** The data presented in Table 1 revealed that majority of farmers (51.70%) belonged to moderate mass media exposure, followed by lower (30.80%) and higher (17.50%).In general, it could be said that the majority of respondents (82.50%) belonged to moderate and lower mass media exposure. This might be due to lower level of education and rapid changing of technology.

**Extension contact:** Data presented in Table 1 revealed that majority (55.80%) of the respondents had medium extension contact whereas, 26.70 and 17.50 per cent of them had low extension contact and high extension contact, respectively. In general, it could be said that the majority of the respondents (82.50%) had low to medium extension contact. The probable reason may be that the different extension institutions are not able to reach every individual of society or also respondents were not

trying to get other best sources of information for sustain their production.

**Social participation:** The data presented in Table 1 revealed that 42.60 per cent respondents had membership in one organization followed by 38.30 and 08.30 per cent of them had membership in more than one organization and no membership, respectively. Only, 10.80 per cent of them were holding the position in respective social organization. In general, the majority of the respondents (80.90%) had membership in one organization or more than one organization.

**Scientific orientation:** It is observed from Table 1 that 46.70 per cent of respondents had higher scientific orientation followed by 36.60 and 16.70 per cent had moderate and lower scientific orientation, respectively.

The data showed that the majority of respondents (83.30%) had higher to moderate level of scientific orientation.

**Risk orientation:** It is evident from Table 1 that 40.00 per cent of the respondents had moderate risk orientation, followed by 38.30 per cent had lower risk orientation and 21.70 per cent had higher risk orientation, respectively. The data also showed that majority of the respondents (78.30%) had moderate to lower level risk orientation. The existence of moderate risk orientation is indicative of the fact that, the respondents have obsession of the new services to afford and avail but not having substantial expenditure in adoption. Further, the lack of safety about the performance of the new services and poor financial condition might be the probable reasons for this.

**Economic motivation:** It is evident from Table 1 that 41.70 per cent of the respondents had moderate economic motivation, followed by 38.30 per cent had lower economic motivation and 20.00 per cent had higher economic motivation, respectively. In general, majority of the respondents (80.00%) had moderate to lower economic motivation.

**Management orientation:** It was revealed from Table 1 that majority of the respondents (58.30%) possessed moderate management orientation followed by 25.80 and 15.90 per cent had lower and higher management orientation respectively. In general, the majority of respondents (58.30%) had moderate management orientation.

## 6. CONCLUSION

It can be concluded that majority of the respondents belonged to middle age groups with secondary level of education, were male, had small family, and had farming as their major occupation, they had medium land holding, possessed medium farming experience, and belonged to medium annual income with moderate mass media exposure and medium extension contact with membership in one organization. Further, higher scientific orientation, and moderate risk orientation, economic motivation, and had moderate management orientation.

## CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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