



# **A Study on Profile Characteristics of Rice and Maize Farmers in the State of Nagaland, India**

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## **ABSTRACT**

The present study was conducted in six selected districts of Nagaland with a sample size of 300 respondents to find out the profile characteristics namely; personal, socio-economic, communication and psychological characteristics of rice and maize farmers. The profile of the farmers revealed that more than half (59.7%) of the respondents were medium aged and were males (65.7%), less than one-third of them were illiterates (31.7%), majority belonged to nuclear family type (86%) and more than half (51.7%) of them had family size of 3-5 members. A little more than two-third (67.7%) of the farmers did cultivation as occupation, majority (46%) had marginal operational land holding, 80.67% had medium income level, more than half (57.7%) of them had 13-32 years of farming experience, less than half (49.3%) of the farmers had no membership in any organization, 47.67% of them had medium level of information sources utilization and 51.67% had medium level of extension contact. Majority (23.66%) of them had contact with ATMA officials, 67% of them visited towns for agriculture purpose. More than half (69.67%) of the respondents had medium level of

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innovativeness, 45.67% had medium level of economic motivation, 62% having medium level of scientific orientation, 56.67% having medium level of achievement motivation while 63.7% of them had moderate level of attitude towards shifting cultivation.

**Keywords:** *Maize farmers; rice farmers; personal, socio-economic, communication and psychological characteristics.*

## 1. INTRODUCTION

Indian agriculture sector is primarily dominant with small and marginal farmers with rice, wheat and maize being the major food crops cultivated in the country, respectively. India stands first in terms of cultivated area of rice in the world and second behind China in terms of production, which is grown in an area of 43.79 million hectares with a production of 112.91 million tonnes and average yield of 2578 kg per hectare [1]. While, India stands fifth in global production of maize crop and it covers an area of about 9.47 m ha with a production of 28.72 mt in India [1]. Nagaland is a small state which lies in the north-eastern part of India with a population of less than two million people. Most of the people depends on agriculture for their livelihood where crops such as rice, maize and millet are being cultivated in more than two-thirds of the total cultivable area in the state. Major food crops grown in the state are rice and maize respectively. The total area under rice is 206,660 ha with a production of about 505,060 mt whereas the total area under maize cultivation is 68960 ha with a production of about 136540 mt [2]. The population growth has been a serious concern in the country as demand of food grain increases with increase in population, which can be a threat to food security and sustainability in the long run. A study conducted by Alexandratos and Bruinsma [3] indicates that the global agricultural production will need an increase of 60 percent by 2050 to meet the world's consumption demand. So, there is a need to increase the production and productivity of food crops so as to meet the growing demands of food in the long run. These can be achieved when farmers start adopting sustainable modern and scientific agricultural practices. Growth and development in agriculture sector can be observed when farmers adopt modern agricultural technologies and improved cultivation practices [4]. Painkra et al. [5] found out that majority (64.16%) of the paddy growers belonged to small and marginal farmers which was followed by semi-medium (20%) and large (5%) farmer categories, respectively. Raganatha et al. [6] in their study on adoption of rice production technologies found out that majority (58.57%) of

the respondents had medium level of extension contact which was followed by high (27.15%) and low (14.28%) levels of extension contact, respectively. Rathod et al. [7] found out that almost half (40.00%) of the farmers had high level of scientific orientation which was followed by farmers having medium (36%) and low (24%) level of scientific orientation, respectively. Adesehinwa et al. [8] in a study stated that understanding the socio-economic factors can help in seeking solutions to reduced productivity. Keeping this in view, the present study was carried out to find out the profile characteristics of rice and maize farmers in the state of Nagaland.

## 2. METHODOLOGY

The study was conducted in six purposively selected districts of Nagaland namely Dimapur, Kohima, Wokha, Mokokchung, Tuensang and Zunheboto keeping in view the area and production of rice and maize in these districts. A multistage purposive cum random sampling design was followed for selection of the respondents. Two rural development blocks were selected randomly from each of the districts and two villages were selected randomly from each of these rural development blocks, thus making a total of 24 villages. A total of 300 rice and maize farmers were finally selected as respondents using random sampling technique. Keeping in view with the objective of the study and in consultation with various available literatures, a set of eighteen independent variables were selected for the study. The data were collected personally by the researcher through the means of personal interview technique by administering a structured schedule which were pre-tested with a small size non-sampled respondents other than the sampled respondents for the study. Statistical tools such as frequency, percentage, range, mean, standard deviation and coefficient of variance were utilized to analyse the data.

## 3. RESULTS AND DISCUSSION

### 3.1 Age

Table 1 revealed that majority (59.7%) of the respondents belonged to 36-59 years age category, followed by 20.3% and 20% belonging

to 60 & above and up to 35 years age category, respectively. Majority of the population in villages are found to be of the middle and old ages who are mostly dependent on agricultural activities since the young generations usually migrate to towns and cities for pursuing higher education and in search of employment opportunities. This finding is similar to that of Painkra et al. [5], Nirmala [9] and Patel et al. [10].

### 3.2 Gender

Table 2 depicts the distribution of respondents according to their gender. The result indicated that 65.7% were males and 34.3% were females. This may be due to the fact that Nagaland has a patriarchal system whereby a man is considered as the head of the family. The head of the family assumes all the responsibility in taking care of the family by involving in tougher physical activities like farming while the women take care of household and domestic chores like cooking and cleaning etc. This finding is similar to that of

Assis and Ismail [11], Rezvanfar et al. [12] and Akumbole et al. [13].

### 3.3 Education

Table 3 showing the education level of respondents revealed that 31.7% of respondents were illiterate, followed by primary school (30%), middle school (20.7%), high school (9.3%), 10<sup>th</sup> pass (4.6%) and mere percentage of 12<sup>th</sup> pass (2%) and graduates (1.7%). In this study, it is found that maximum number of the respondents were illiterate. This may be due to poor educational facilities in their villages, poor economic status, lack of interest or high dependency on farming for livelihood. Education is a very powerful tool which broadens a person's mind, understanding and increases a person's ability to make decision and solve problems. An educated farmer will have an added advantage as he can read and access various sources of information related to farming practices. This finding is similar to that of Patel et al. [10].

**Table 1. Distribution of respondents based on their age**

Category	Frequency	Percentage
Up to 35 years	60	20
36-59 years	179	59.7
60 years & above	61	20.3
Total	300	100
Mean=48.16	SD= 12.19	

**Table 2. Distribution of respondents based on their gender**

Category	Frequency	Percentage
Male	197	65.7
Female	103	34.3
Total	300	100

**Table 3. Distribution of respondents based on their educational level**

Level of Education	Frequency	Percentage
Illiterate	95	31.7
Primary school	90	30
Middle school	62	20.7
High school	28	9.3
10 <sup>th</sup> pass	14	4.6
12 <sup>th</sup> pass	6	2
Graduate	5	1.7
Total	300	100

### 3.4 Family Type

Table 4 indicates that 86% of the respondents belonged to nuclear family followed by 14% belonging to joint family. This is due to the fact that nuclear family type has been the basic form of a family in the study area where a family consists of a husband, wife and their children. Once the children attain adulthood and gets married, they leave their parent's home and start a new family of their own. This finding is similar to that of Chayal et al. [14].

### 3.5 Family Size

Table 5 revealed that more than half (51.7%) of the respondents belonged to 3-5 family size category which was followed by 29.7% of the respondents belonging to (up to 2) family size

category and 18.6% belonging to 6 & above category. This may be due to the fact that most of the younger members of the family usually migrate to towns and cities for availing education and in search of job opportunities. This finding has close similarities to that of Dhruw [16] and Barman et al. (2013).

### 3.6 Occupation

Table 6 showed that a large majority (67.7%) of the respondents were into cultivation while 26% of them also did business and 6.3% of them were in service. This is due to the fact that most of the rural people are dependent on agriculture and farming has always been their main source of income for their livelihood and sustenance since generations. This finding is similar to that of Anup et al. [15].

**Table 4. Classification of respondent based on family type**

Family type	Frequency	Percentage
Nuclear	258	86
Joint	42	14
Total	300	100

**Table 5. Distribution of respondents based on their family size**

Category	Frequency	Percentage
Up to 2 members	89	29.7
3-5 members	155	51.7
6 members & above	56	18.6
Total	300	100
Mean= 3.90	SD= 1.90	

**Table 6. Distribution of respondents based on their occupation**

Occupation	Frequency	Percentage
Cultivation	203	67.7
Cultivation + Business	78	26
Cultivation + Service	19	6.3
Total	300	100

**Table 7. Distribution of respondents based on their operational land holding**

Category	Frequency	Percentage
Marginal (below 1 ha)	138	46
Small (1-2 ha)	84	28
Semi-medium (2-4 ha)	59	19.67
Medium (4-10)	15	5
Large (above 10 ha)	4	1.33
Total	300	100

### 3.7 Operational Land Holding

Table 7 revealed that almost half (46%) of the farmers had marginal operational land holding, followed by small (28%), semi-medium (19.67%), medium (5%) and large (1.33%) operational land holdings, respectively. This may be due to the reason of land fragmentation from one generation to another whereby land is divided among the members of the family. And moreover, the farmers usually cultivate on a smaller scale mostly for their self-consumption rather than for profit making. The more income a farmer earns, the more his operational land holding will be as a farmer can invest more farming inputs and resources. This finding is similar to that of Dhruw [16], Painkra et al. [5], Arathy [17] and Barman et al. [18].

### 3.8 Annual Income

Table 8 shows that more than half (80.64%) of the respondents had medium level of annual income, followed by 11% having high level of annual income and 8.33% having low level of annual income. An overwhelming majority of the respondents had average level of annual income as the farmers' operational land holding in the study area was small, since income is directly related to farm size of a farmer. And, also most of the farmers in the study area cultivated crops for their consumption rather than for the purpose of profit making. This finding is similar to that of Patel [19] and Anup et al. [15].

**Table 8. Distribution of respondents based on their annual income**

Category	Frequency	Percentage
Low (<Rs. 12009)	25	8.33
Medium (<Rs. 12009->Rs. 80905)	242	80.67
High (>Rs. 80905)	33	11
Total	300	100

**Table 9. Distribution of respondents based on their farming experience**

Category	Frequency	Percentage
Upto 12 years	64	21.3
13-32 years	173	57.7
33 years & above	63	21
Total	300	100
Mean=22.69	SD=10.68	

### 3.9 Farming Experience

Table 9 showed that majority (57.7%) of the respondents had 13-32 years of farming experience which was followed by 21.3% having farming experience up to 12 years and 21% having farming experience of 33 years & above. This trend may be due to the fact that young and middle-age individuals are more energetic and efficient in performing farming activities and after a certain period of time when an individual ages, the ability to work and perform physical activities greatly declines down. This finding is similar to that of Nirmala [9] and Akumbole et al. [13].

### 3.10 Social Participation

Table 10 reveals that almost half (49.3%) of the respondents had no membership, 30.3% of them had membership in one organization/SHG, 13.7% of them had membership in more than one organization and 6.7% of them were office bearers/leader of an organization. It is also revealed that almost half of the respondents did not have membership in any organization. This may be due to respondent's high involvement in farming activities and lesser social contact, respondent's low education and knowledge level or low rate of activities conducted by social organizations and institutions. This finding is similar to that of the findings of Dhruw [16] and Sivanarayana et al. [20].

**Table 10. Distribution of respondents based on their social participation**

Category	Frequency	Percentage
No membership	148	49.3
Membership in one organization/SHG	91	30.3
Membership in more than one organization	41	13.7
Office bearer/leader of an organization	20	6.7
Total	300	100

### 3.11 Information Sources Utilization

Table 11 revealed that 32% of the respondents had access to radio whereas 19% of the respondents had access to television. Around 13% of the respondents had access to newspapers, 14.33% had access to periodicals, 8.67% of the respondents having access to farm publications and 7% of the respondents had access to other sources of information. Most of the farmers used radio and television to access information related to agriculture. This may be due to poor literacy rate of the farmers as most of them are unable to read and write. Concerned departments should give focus in implementation of various educational programs for the farmers and set up proper infrastructural facilities to provide basic education to the rural areas so that they can keep up with the fast-changing world. Basic education is crucial in any developmental activities as farmers can make full use of all the available resources and technologies for overall development.

### 3.12 Extension Contact

Table 12 revealed that 23.66% of the respondents had frequent contact with Agricultural Technology Management Agency (ATMA) followed by agriculture experts/KVK-SMSs (15.33%), agriculture officer/extension officer (12.33%), agri field assistant/agriculture inspector (11%) and agri-clinics (4.33%). 35.67% of them had often contact with both agriculture

officer/extension officer and agriculture experts/KVK-SMSs followed by agri field assistant (31.67%), ATMA (31.67%) and agri-clinics (27%). About 33% of them had seldom contact with agriculture officer/extension officer followed by agriculture experts/KVK-SMSs (24.66%), agri field assistant (24.33%), agri-clinics (19.67%) and ATMA (18.66%). Almost half of them (49%) had never contacted agri-clinics followed by agri field assistant (33%), ATMA (26%), agriculture experts/KVK-SMSs (24.33%) and agriculture officer/extension officer (19%).

### 3.13 Cosmo Politeness

Table 13 depicts that 36.33% of the respondents visited towns once in a month, 29% visited fortnightly, 24.33% visited once a week and 10.34% visited town occasionally. It is also found that 61% of the respondents visited towns mainly for agriculture, 32.33% visited towns related to personal/domestic purposes and 6.67% visited towns for entertainment purposes. This might be due to the fact that most of the farmers usually visit towns for their basic needs or related to farming activities such as to buy inputs etc. Also, since most of the towns are far away from the villages and there is no proper mode of transportation, farmers usually don't visit towns and cities unless it is of utmost importance. The findings show close similarities to that of the findings of Siddaram (2008).

**Table 11. Distribution of respondents based on information sources utilization (N=300)**

Category	Frequency		Percentage	
	Yes	No	Yes	No
Radio	96	204	32	68
Television	57	243	19	81
Newspaper	39	261	13	87
Periodicals	43	257	14.33	85.67
Farm Publications	26	274	8.67	91.33
Others	21	279	7	93

**Table 12. Distribution of respondents based on their extension contact (N=300)**

Source	Frequently		Often		Seldom		Never	
	F	%	F	%	F	%	F	%
Agri Field Assistant/ Agriculture Inspector	33	11	95	31.67	73	24.33	99	33
Agriculture Officer/ Extension Officer	37	12.33	107	35.67	99	33	57	19
Agriculture Experts/KVK-SMSs	46	15.33	107	35.67	74	24.66	73	24.33
Agricultural Technology Management Agency (ATMA)	71	23.66	95	31.67	56	18.66	78	26
Agri-clinics	13	4.33	81	27	59	19.67	147	49

**Table 13. Distribution of respondents based on their cosmopolitanness (N=300)**

Sl. No.	Particulars	Frequency	Percentage
<b>1</b>	<b>Frequency of visits to town</b>		
A	Once in a week	73	24.33
B	Once in a fortnight	87	29
C	Once in a month	109	36.33
D	Occasionally	31	10.34
<b>2</b>	<b>Purpose of visit to town</b>		
A	Visit relating to agriculture	183	61
B	Personal/domestic	97	32.33
C	Entertainment	20	6.67

### 3.14 Innovativeness

Table 14 shows that majority (69.67%) of the respondents had moderate level of innovativeness, followed by 16% having low level of innovativeness and 14.33% of them having high level of innovativeness. An innovative farmer is the first to introduce new ideas and methods into a farming community for better result and outcome. They not only transform their lives but that of the other farming communities as well through their innovative approaches and ideas. Innovative farmers are more keen and ready to adopt new ideas and farming techniques. The finding is similar to that of Dhruw [16], Arathy [17] and Karuppasamy [21].

### 3.15 Economic Motivation

Table 15 shows that the majority (45.7%) of the respondents had moderate level of economic motivation, followed by 34.6% having high level of economic motivation and 19.67% of them having low level of economic motivation. This may be due to the reason that the farmers did

farming merely for their sustenance rather than for economic gains and profit making. Economic motivation can play a crucial role for farmers in adopting new farming technologies. Economic gains stimulate a farmer in wanting to know more about the farming practices and adopt new technologies which can improve their livelihood through income generation. This finding is similar to the findings of Dhruw [16] and Arathy [17].

### 3.16 Scientific Orientation

Table 16 shows that majority (62%) of the respondents had moderate level of scientific orientation, followed by 23% having high level of scientific orientation and 15% of them having low level of scientific orientation. More than half of the respondents having medium level of scientific orientation may be due to their extension contact enabling them to develop better scientific outlook. Better scientific orientation leads to better scientific understanding towards a technology leading to adoption. This finding is similar to the findings of Kumar et al. [22].

**Table 14. Distribution of respondents based on their innovativeness (N=300)**

Category	Range	Frequency	Percentage	Mean	SD	CV
Low	<19.89	48	16	24.13	4.23	17.56
Moderate	19.89-28.37	209	69.67			
High	>28.37	43	14.33			

**Table 15. Distribution of respondents based on their economic motivation (N=300)**

Category	Range	Frequency	Percentage	Mean	SD	CV
Low	<18.18	59	19.67	19.87	1.69	8.53
Moderate	18.18-21.57	137	45.67			
High	>21.57	104	34.66			

**Table 16. Distribution of respondents based on their scientific orientation (N=300)**

Category	Range	Frequency	Percentage	Mean	SD	CV
Low	<22.54	45	15	25.43	2.88	11.34
Moderate	22.54-28.31	186	62			
High	>28.31	69	23			

**Table 17. Distribution of respondents based on their achievement motivation (N=300)**

Category	Range	Frequency	Percentage	Mean	SD	CV
Low	<72.07	53	17.67	75.93	3.85	5.08
Moderate	72.07-79.79	170	56.67			
High	>79.79	77	25.66			

**Table 18. Distribution of respondents based on their attitude towards shifting cultivation (N=300)**

Category	Range	Frequency	Percentage	Mean	SD	CV
Least favorable	<62.28	49	16.33	66.32	4.03	6.08
Moderate	62.28-70.35	191	63.7			
Highly favorable	>70.35	60	20			

### 3.17 Achievement Motivation

Table 17 shows that majority (56.7%) of the respondents had moderate level of achievement motivation, followed by 25.6% having high level of achievement motivation and 17.67% of them having low level of achievement motivation. This may be due to farmers medium level of economic motivation since a farmer with high economic motivation will have a desire to achieve more. Farmer with high achievement motivation will want to achieve more, try to compete and perform better than the other farmers which may lead to the farmer adopting new improved farming practices. This finding is similar to the findings of Khuhly [23].

### 3.18 Attitude of Farmers towards Shifting Cultivation

Table 18 shows that majority (63.7%) of the respondents had moderately favorable attitude towards shifting cultivation, followed by 20%

having highly favorable attitude towards shifting cultivation and 16.33% of them having low favorable attitude towards shifting cultivation. Results indicated that most of the respondents had moderately favorable attitude towards shifting cultivation since shifting cultivation has been the most common, easiest and dominant means of cultivation practice followed in the study area since ages and the farmers were able to sustain their livelihood through this method. This finding is similar to the finding of Khuhly [24]. A good knowledge and understanding of the pros and cons of shifting cultivation practices will help the farmers in adopting the right methods and techniques in an efficient and judicious manner. There had been many debates and concerns about the possible effects of shifting cultivation on natural biodiversity, as such many interventions were made to totally eradicate the practice. Since this practice is deeply rooted into the cultures of the people, a more gradual comprehensive and sustainable strategies



should be adopted by policy makers keeping in mind of the food security, livelihood and challenges of the farmers which will be beneficial to them while also conserving the natural resources and biodiversity.

#### 4. CONCLUSION

Majority (59.7%) of the respondents belonged to 36-59 years of age group. Findings revealed that 31.7% of respondents were illiterate, followed by primary school (30%), middle school (20.7%) and high school (9.3%). Almost half (46%) of the farmers had marginal operational land holding, followed by small (28%), semi-medium (19.67%), medium (5%) and large (1.33%) operational land holdings. Majority of the respondents (57.7%) had 13-32 years of farming experience and almost half (49.3%) of the respondents had no membership in any organization. Majority of the respondents had medium level of extension contact. Majority of the respondents (67.67%) had moderate level of innovativeness, 45.7% had moderate level of economic motivation, 62% had moderate level of scientific orientation, 56.7% had moderate level of achievement motivation and 63.7% had moderately favorable attitude towards shifting cultivation. The socio-economic status of the farmers can be improved with a focus on imparting technical knowledge and training to the farmers towards a more favorable attitude towards agricultural development.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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