Constraints faced by the farmers in adoption of recommended practices of rice (*Oryza sativa*) cultivation in Nagaland state

ABSTRACT

Agriculture serves as a backbone for Nagaland's economy where more than one-third of the population depends on agriculture for their livelihood. About 85 per cent of the cultivable land is occupied by cereals where rice, maize and millet are the major variants produced in the state. There are two methods of cultivation mostly practiced in the state i.e., jhum (shifting cultivation) and terrace which makes about 86 per cent of the total cultivable area. With the soar in population and the growing demands for food, there is a need to improve the farming systems so as to increase the production and productivity of agriculture to meet the growing demands, which can only be achieved by adopting improved and radical farming practices by the farmers. With a sample size of 300 rice farmers, a study was conducted in six districts of Nagaland to identify the constraints faced by the farmers while adopting recommended cultivation practices of rice (irrigated and upland). An open-ended questionnaire was administered to the respondents where ranking was done for each of the constraints based on the frequency and percentage. Findings revealed that the major constraints faced by the farmers while adopting recommended cultivation practices of irrigated rice were non-availability of quality seeds, lack of proper financial assistance/subsidies and non-availability of timely farm inputs and machineries whereas major constraints for upland rice were non-availability of quality seeds, lack of proper financial assistance/subsidies and lack of marketing facilities and channels.

Keywords: Adoption, Constraints, Extension, Farmers, Recommended cultivation practices.

1. INTRODUCTION

Rice (*Oryza sativa*) is known as the "King of Cereals" as it is one of the most important cereal crops of the world and forms a staple source of food for over one-third of the world's population. Rice is a tropical crop and flourishes well in hot and humid climate. It is grown both in irrigated areas and rainfed areas where there is assured rainfall annually, hence it can be grown in kharif as well as rabi season. Rice is an important dietary component in regard to nutrition and caloric intake in humans. Rice cultivation is of immense importance for food security in Asia, where more than ninety per cent of the global rice is produced and consumed (FAO, 2010). Rice has the third-highest worldwide production (741.5 million

tonnes in 2014), after sugarcane (1.9 billion tonnes) and maize (1.0 billion tonnes) according to FAOSTAT (2017). China stands first in production of rice contributing 28 per cent of the total global rice production (FAO, 2013).

Rice is an important staple food crop of India and stands first in area under rice in the world and second to China in terms of production. Rice 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 (Directorate of Economics & Statistics, DAC&FW, 2018-19). Rice production is of great significance to India's economy and food security and also serves as the primary source of livelihood for millions of rural farmers and households.

Rice is the staple food, which occupies about 70 percent of the total area under cultivation and constitutes about 84.4 percent of the total food production in the state of Nagaland. Rice is cultivated under two farming situations namely, Jhum (rainfed) and Wet Rice Cultivation/Terrace Rice Cultivation. Under jhum condition, rice is cultivated as a mixed crop during kharif for two consecutive years and the land is kept fallow till the next jhum cycle. Sowing is done in the months of March and April and harvested in September-October in jhum fields whereas in terrace fields, transplanting is done in June-July and harvested in October-November. Jhum paddy is grown all over Nagaland whereas terrace rice is mainly grown in the districts of Dimapur, Kohima, Peren, Phek and Wokha. Wet rice cultivation is mainly practiced in foothills bordering the state of Assam. Total area under rice is 206,660 ha with a production of about 505,060 mt (Nagaland Statistical Handbook, 2018). Some of the indigenous varieties of rice grown in Nagaland are Nagaland Sinsatsu, Henigido, Akatan, Kemenhya, Ngoba, Mikotchuwakelu, Sarang, Moyatsuk, Mamen, Nagaland special etc., (Rice Resource Book Nagaland, 2007).

Alexandratos and Bruinsma (2012) indicated that agricultural production needs an increase of 60 per cent by 2050 to meet the world's consumption demand. Omonona *et al.* (2012) revealed that adoption of improved rice varieties by the farmers had a positive impact on rice productivity. Adoption of new and improved farming technologies by the farmers is a must to meet the challenges of producing sufficient crop and improve crop yield. Hassinger (1959) explained adoption as the various stages of acceptance which leads to continuous use of a practice or an idea. Raganatha *et al.* (2018) in their study of rice production technologies found out that land holding, extension participation and risk orientation had a positive and significant relationship with adoption of improved paddy practices. Also, education, land holding, farming experience and social participation had a positive and significant

relationship with adoption in a study conducted by Matto *et al*. (2018). It was also noted that sources of information had strategic effect on adoption of farm technology (Panda, 2014). In research and agricultural technology, adoption of technologies by the farmers is the ultimate test and should be the ultimate goal as well. But without proper analysis of the problems and constraints encountered by the farmers, diffusion of new practices and technologies to the farmers become a hindrance as farmers are not able to solve their problems through those disseminated technologies hence there is no or very less adoption. Paris *et al.* (2010) reported that poor germination ability of rice seed, high cost of inputs, low yield and low market price were the constraints expressed by the rice farmers in Philippines. Singh and Varsheny (2010) found out that non availability of suitable high yielding varieties, high cost of HYV seeds, complexity of new practices, heavy weed growth, pest and disease incidence, high cost of inputs and labour, non-availability of trained labour, non-availability of credit facilities, lack of subsidy for inputs, lack of support price, lack of awareness of technologies, lack of conviction, non-availability of desired technology, weak extension at village level, unawareness of supplies and services offered by the Government, insufficient training programmes, lack of proper communication, lack of regulated market and lack of transport facilities were the major constraints expressed by the rice farmers. High cost of high yielding varieties seed, high cost of labour, lack of conviction in new technology, weak extension activities at the village level were some of the major constraints experienced by paddy growers identified by Oinam and Sudhakar (2014). Keeping this in view, the present study was carried out to find out the constraints faced by the farmers while adopting recommended cultivation practices of rice to improve their production and productivity hence enabling them to achieve food security and sustainability.

2. METHODOLOGY

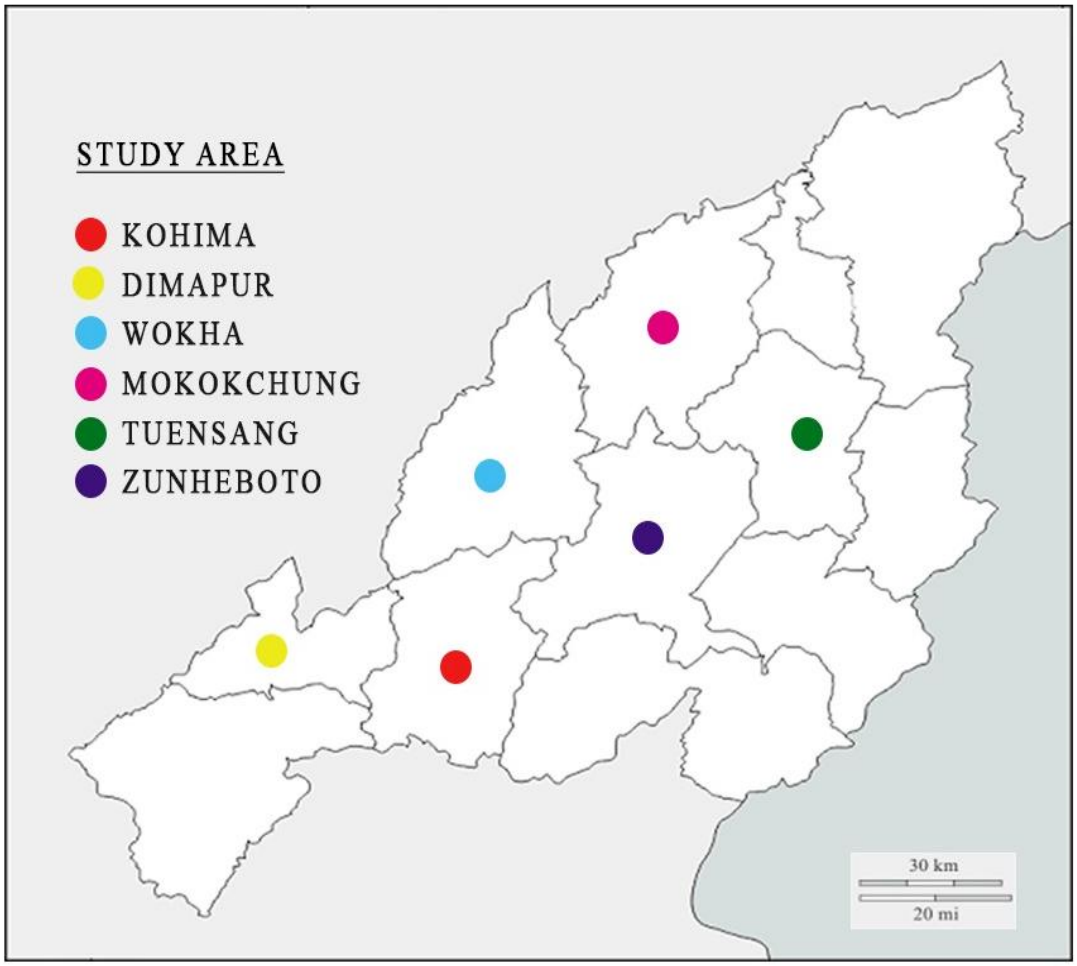

FIG. 1. MAP OF NAGALAND INDICATING THE DISTRICTS UNDER STUDY

The study was carried out in the state of Nagaland. A multistage purposive cum random sampling design was followed for selection of the respondents. Six districts *viz.*, Dimapur, Kohima, Wokha, Mokokchung, Tuensang and Zunheboto were selected purposively for the study keeping in view the area and production of rice in these districts. Two rural development blocks were selected randomly from each district and from each rural development blocks, two villages were selected randomly thus making a total of 24 villages. A total of 300 rice farmers were finally selected as respondents using random sampling technique. The data were collected personally by the researcher through the means of personal interview technique by administering a structured schedule. The constraints faced by the rice farmers were collected through an open-ended questionnaire where ranking was done for each of the constraints based on the frequency and percentage.

3. FINDINGS AND DISCUSSIONS

Table 1. Constraints while adopting recommended cultivation practices of irrigated rice

(N=150)

Sl. No.	Constraints	Frequency	Percentage	Rank
1.	Non-availability of quality seeds	147	98	I
2.	Lack of proper financial assistance and subsidies	146	97.33	II
3.	Non-availability of timely farm inputs and machineries	144	96	III
4.	Lack of marketing facilities and channels	140	93.33	IV
5.	Lack of storage facilities and processing units	135	90	V
6.	Pest and disease incidence	133	88.66	VI
7.	High cost of fertilizers	122	81.33	VII
8.	Lack of result-oriented trainings and demonstrations	121	80.66	VIII
9.	Poor rural roads and lack of proper transportation facilities	120	80	IX
10.	Lack of knowledge of government schemes and incentives	110	73.33	X
11.	Lack of proper interactions between farmers and extension service providers	105	70	XI
12.	Poor irrigation and drainage facilities	95	63.33	XII
13.	Lack of soil testing facilities	92	61.33	XIII
14.	Lack of technical knowledge and skills	90	60	XIV
15.	Poor economic condition	80	53.33	XV

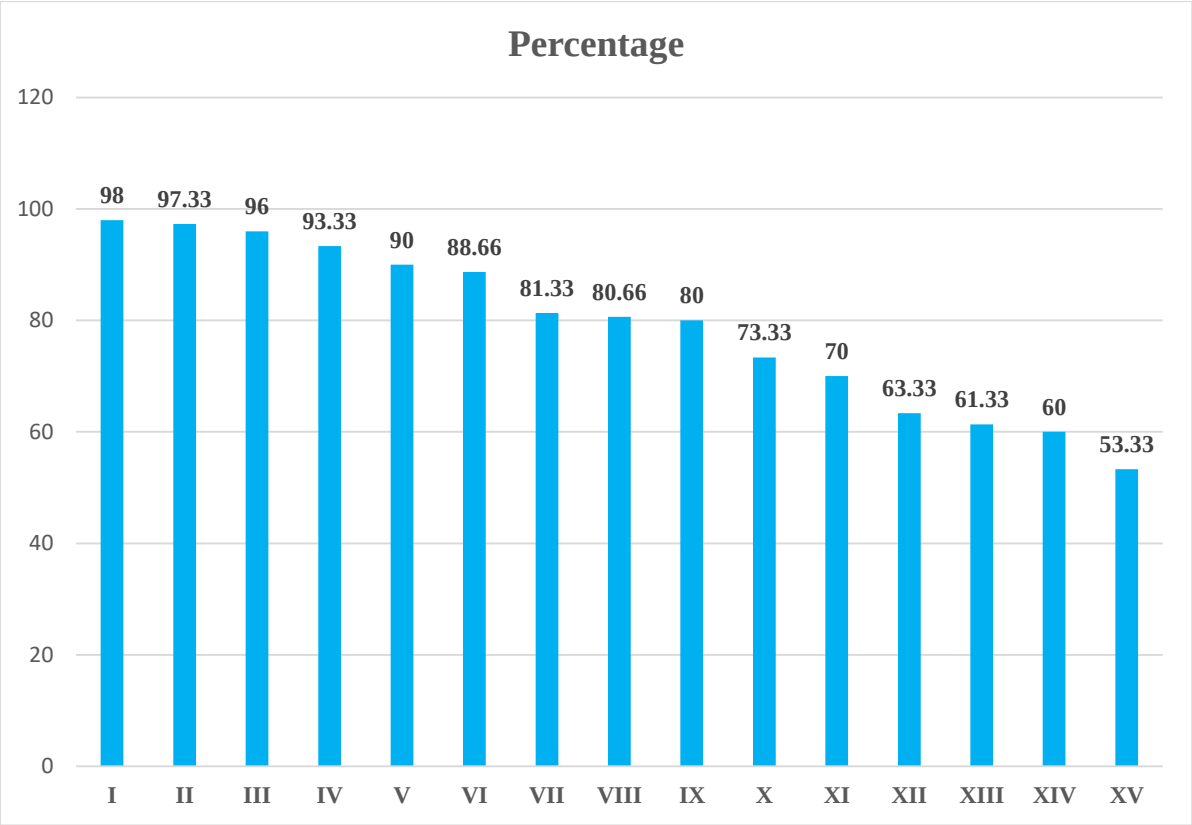

Figure 2. Graph showing the percentage of each constraints based on its ranking (irrigated rice)

Table 1 revealed that non-availability of quality seeds (I rank) was the major constraint, which was followed by lack of proper financial assistance and subsidies (II rank), non-availability of timely farm inputs and machineries (III rank), lack of marketing facilities and channels (IV rank), lack of storage facilities and processing units (V rank) were the major problems expressed by the farmers.

The other problems faced by the farmers were, pest and disease incidence (VI rank), high cost of fertilizers (VII rank), lack of result-oriented trainings and demonstrations (VIII rank), poor rural roads and lack of proper transportation facilities (IX rank), lack of knowledge of government schemes and incentives (X rank), lack of proper interactions between farmers and extension service providers (XI rank), poor irrigation and drainage facility (XII rank), lack of soil testing facilities (XIII rank), lack of technical knowledge and skills (XIV rank) and poor economic condition (XV rank).

Table 2. Constraints while adopting recommended cultivation practices of Upland rice

(N=150)

Sl. No.	Constraints	Frequency	Percentage	Rank
1.	Non-availability of quality seeds	145	96.66	I
2.	Lack of proper financial assistance and subsidies	144	96	II
3.	Lack of marketing facilities and channels	143	95.33	III
4.	Pest and disease incidence	140	93.33	IV
5.	Weather uncertainty	139	92.66	V
6.	Lack of result-oriented trainings and demonstrations	137	91.33	VI
7.	Lack of knowledge of government schemes and incentives	130	86.66	VII
8.	Lack of proper interactions between farmers and extension service providers	127	84.66	VIII
9.	High cost of fertilizers	115	76.66	IX
10.	Lack of proper irrigation and drainage facilities	110	73.33	X
11.	Lack of storage facilities and processing units	112	74.66	XI
12.	Lack of water harvesting structures	100	66.66	XII
13.	Poor rural roads and lack of proper transportation facilities	95	63.33	XIII
14.	Fear of low yield by adoption of new practices	90	60	XIV
15.	Issues related to poverty and illiteracy	88	58.66	XV

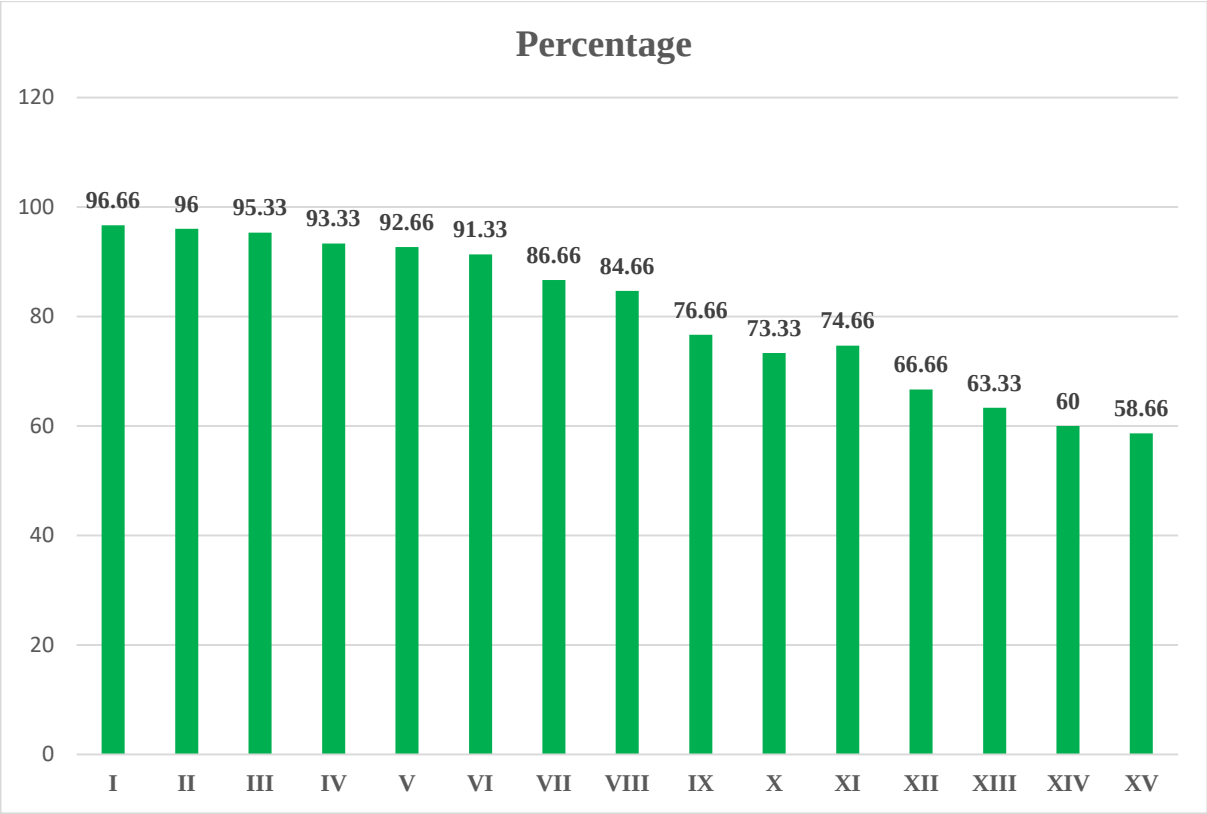

Figure 3. Graph showing the percentage of each constraints based on its ranking (upland rice)

Table 2 revealed that non-availability of quality seeds (I rank) was the major constraint, which was followed by lack of proper financial assistance and subsidies (II rank), lack of marketing facilities and channels (III rank), pest and disease incidence (IV rank), weather uncertainty (V rank) were the major problems expressed by the farmers.

The other problems were, lack of result-oriented trainings and demonstrations (VI rank), lack of knowledge of government schemes and incentives (VII rank), lack of proper interactions between farmers and extension service providers (VIII rank), high cost of fertilizers (IX rank), lack of proper irrigation and drainage facilities (X rank), lack of storage facilities and processing units (XI rank), lack of water harvesting structures (XII rank), poor rural roads and lack of proper transportation facilities (XIII rank), fear of low yield by adoption of new practices (XIV rank) and issues related to poverty and illiteracy (XV rank).

The findings in Table 1 and Table 2 are similar to that of Oinam & Sudhakar (2014), Singh and Varshney (2010) and Biswas *et al.* (2017).

4. CONCLUSION

The major constraints articulated by the farmers while adopting recommended cultivation practices of rice can only be solved when proper strategic measures are taken up by the concern department so as to solve the production constraints of the farmers thereby increasing the crop production and productivity. Proper policy measures should be taken up by the government such as timely supply of quality seeds and inputs to be made available to the farmers, provisions for credit and subsidies be made available to the farmers to take up farming activities, proper marketing linkages to be set up so that the farmers can conveniently market their produces. Good remunerative price to be established for the crops so that the farmers can meet up their farming cost and benefit from it. Improved pest and disease control through integrated pest and disease management strategies should be encouraged and timely result-oriented extension trainings and demonstration activities should be conducted so that the farming related problems of the farmers are solved. Government should focus on setting up storage facilities and processing units so that farmers won't suffer from post-harvest losses and processing of value-added products whereby increasing farmer's income. Extension agencies should organize awareness programs through trainings, campaigns, radio, television etc., so that the farmers are made aware of the various government schemes and incentives in order to avail it and benefit from it. Farmers also felt that there was lack of proper interactions between farmers and extension service providers therefore proper linkage between the farmers and extension agencies should be established by means of setting up active farmer-extension organizations and groups so that active interactions and information delivery system is maintained among them. Another common constraint voiced by the farmers was poor rural roads and lack of proper transportation facilities so concerned organization and departments should collectively work on it so that proper roads are built and proper transportation facilities are set up so that farmers can conveniently transport their goods and produce to every nook and corner of the state so that the vast majority of the people will benefit from it.

Extension and allied departments should give priority on the needs and interests of the farmers, strengthen research-extension-farmer linkage by involving farmers in decision making, design and implementation of technology, enhance farmer to farmer technology dissemination and learning, facilitate the information-delivery mechanism and make timely provision of farming inputs through extension service centres. The constraints and gaps encountered by the farmers in agricultural farming should be taken into serious consideration

and suitable solutions and strategies should be developed and put into action by concerned departments and organizations for achieving food security and sustainability.

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