



A COMPARATIVE STUDY OF THE FARMERS' PERCEPTION ON THE ORGANIC CULTIVATION IN SELECTED HORTICULTURAL CROPS OF NAGALAND AND MANIPUR STATES OF INDIA

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Abstract: A study on the farmers' perception on the organic cultivation for the selected horticultural crops viz. pineapple, potato and cabbage was undertaken during the period, 2018-2020 for the state of Nagaland and Manipur. The analysis of the data from the selected districts reveal that the total cultivated area is found maximum in Nagaland as compare to Manipur. The total overall land holding in Nagaland is recorded as 106.25 ha while in Manipur it is recorded as 92.18 ha. The farmers' perception regarding the land preparation for the cultivation of organic horticultural crops in the state of Nagaland and Manipur were also assessed. The result shows that in Nagaland, up to 2 ploughing is found maximum followed by 3 ploughing and very few with 4 ploughing are found for pineapple crop. While in Manipur state, maximum ploughing is recorded at marginal farmers with 2 ploughing, followed by small and medium farm size group, as 3 times ploughing is concerned, marginal farmers are maximum followed equally by small and medium, whereas 4 ploughing is concerned, very few are doing 4 & above ploughing in Nagaland for the pineapple crop. Overall, up to 2 ploughing is found maximum in both the state followed by 3 ploughing and 4 & above ploughing, respectively. For the potato crop, 3 to 4 ploughing are found maximum in both the state. Very few are adopting 5 & more ploughing for potato crop in Manipur whereas it is found maximum in medium farm size group. In case of cabbage, maximum is found with 3 & above ploughing on medium farm size followed by small and marginal in Nagaland state whereas in Manipur it is found maximum on marginal farm followed by small and medium. Less farm households practices 2 times ploughing in both the states. The extent of adoption of (FYM) farm yard manure (in t / ha) across the different farm size group of Nagaland and Manipur shows that maximum FYM is used by the medium adopters, followed by low adopter and very few are found in the high adopter of Nagaland state. With respect to the state of Manipur, maximum are medium rate adopter followed by low rate and it is least on high adopter of pineapple crop. As for potato crop is concerned, medium farms were found maximum for medium rate adopter of FYM followed by low rate and very few are under high rate of adopter in Nagaland state. As Manipur is concerned, it is also found in the same trend with maximum on medium, followed by low and least on high rate adopter of FYM for potato crop. As cabbage crop is concerned, it is also following the same trend of pineapple and potato with maximum on medium rate, followed by low rate and least on high rate on cabbage in Nagaland state. Even the Manipur also follow the same trend for cabbage crop.

Keywords- FYM, Ploughing, Adoption, Manipur, Nagaland

I. INTRODUCTION

Struggle for food has been the basis for survival ever since mankind had evolved. From the nomadic people to the settled or permanent groups or communities, agriculture or farming has becomes the only primary means or of way of existence. Indigenous peoples have different ways of life in their specific boundaries. Of these, farming in their own way for socio-economic development is considered to be an unavoidable aspect of the indigenous people living in different parts of the world. So, indigenous farming is associated with indigenous people and its various forms of indigenous cultures and agricultural practices that have been developed and practised by the Indigenous peoples. In fact, Indigenous farming is a way of life and it encompasses the social, economic, cultural and political purview too.

II. IMPORTANCE

Again, the current burgeoning issue of climate change and its impact has a fuller capacity or tendency of altering the crops-livestock's production and productivity level too. Further, climate change has also resulted in altering or changing the crop-

livestock's habitation of the present certain ecosystem. It is also estimated that the India's population will reach 1.51 billion by 2030. Again with the advancement of Health Sciences, Indian consumers are realizing on the healthy food for the future perspectives. The present Government of India also emphasizes on the Doubling of Farm Income through various technologies intervention on sustainable approach by 2022. Bringing or balancing the entire scenario on the sustainable basis requires integrated and cumulative efforts of different Stakeholders from Top to Bottom or Bottom to Top approach through indebt study and understanding of the present existing systems and their nature of resource management patterns.

III. JUSTIFICATION

The North-Eastern states of India are inhabited by several Indigenous people having various cultural, political, social and economic values. The region has a rich flora and fauna and is considered as biodiversity Hotspot of many crops. North-Eastern region has a huge potential for growth and development in agriculture and allied sectors as the region is endowed with various Indigenous socio-economic aspect of farming. The Apatani; Bun; Zabo; Zero Tillage and Fruit-Based system of farming can be mentioned. The region is considered or assumes as low uses of synthetic inputs and even some states are declared as Organic states and many more are on the pipeline of organic states. In fact, majority of the agricultural land areas are declared as "Organic by Default" and even some states are also considered as less or minimum inorganic user states.

Manipur and Nagaland are the two adjoining states out of the seven states of North-Eastern States of India. These states are inhabited by many Indigenous people having special or peculiar system of social and economic life. Zhuming; Zabo; Zero-Tillage and Fruit-Based Farming system are some of the exemplified ones and many system are still left untouched in many pockets or areas from extensive study.

Bringing the agricultural scenario of these two states on the sustainability forum; assessing the various form and system of existing agricultural practices and their recommended practices that have been existing and adopted/ adopting is the need of the hour so as to come up with the concrete findings and recommendations for future course of action and a handy manual for the Planners and Policy makers is the real core of the study. Thus, a thorough study and understanding of various *Indigenous Agricultural Practices* of these two agriculturally important states has been taken up on the theme "A Comparative Study of the Farmers' Perception on the organic cultivation of the selected horticultural crops of Nagaland and Manipur of India" so as to assess the sustainability of such practices in the region.

IV. OBJECTIVES

1. To study the socio-economic determinants of the respondent's farm households
2. To assess the farmers' information and perception on the organic cultivation for the selected horticultural crops

V. REVIEW OF LITERATURES

Meena and Punjabi (2012) indicated that majority of farmers perceived knowledge regarding use of FYM, urea & DAP, line sowing and seed replacement technologies, while minority of farmers possessed knowledge regarding use of green manure & micro elements, broadcasting, cultivation of fruits and vegetable crops and making compost/vermi-compost. Further, it was also observed that the majority of farmers perceived climatic changes, uneven distribution and uncertain behaviour of the rainfalls, declining level of ground water on their farms and non-remunerative price of crops during last ten years.

Panneerselvam et al. on their (2012) research on the Indian farmers' experience with and perceptions of organic farming to investigate the perceived relevance, benefits and barriers to a conversion to organic agriculture in three different Indian contexts-in Tamil Nadu, Madhya Pradesh and Uttarakhand states revealed that conventional producers identified production and marketing barriers as the main constraints to adopting organic farming, while the age and education of the farmer were not deemed a problem. Lack of knowledge and lack of institutional support were other barriers to conversion.

Singh and Maharjan (2013) analyzed the farmer's perception on yield and income from organic vegetable farming in Kathmandu valley and Chitwan district of Nepal. The study have shown that less than half of respondent perceived increased yield in organic vegetables. It also indicates their perception is positively related to experience of practicing organic farming and negatively to having large-sized farms. Thus, support should be provided during initial years as yield improves only in later years. Access to premium market assures increased income and compensates for decreased yield of organic vegetables. In this regard, consumer awareness on appearance of organic vegetables should be emphasized which could help establish and boost local organic vegetable market.

Sudheer (2013) found that organic farming is more profitable for farmers in terms of costs and returns, than chemical farming. An analysis of the farmers' perception of organic farming reveals that electronic media (mostly television agricultural programmes presented in the local language) is the prime motivator for them to adopt this method and all the organic farmers in the sample have been practicing this method for over six years. Organic farmers believed that organic farming improves soil fertility and their profits in the long run. They expressed the view that the certification process is very difficult and expensive. Certification would allow them to potentially sell their produce at a premium price. Organic farmers indicated that government support services are needed for marketing their produce through special markets and that targeted support services and awareness programmes would be welcomed.

VI. SAMPLING PLAN

A multi-stage- random sampling technique have been used for the selection of sample units. Both purposive and cluster sampling method have been used for the selection districts, blocks from the states of Nagaland and Manipur and finalization of the sample size. In the last stage of sampling, the farmers who cultivate pineapple and potato& cabbage from these two states were surveyed for the selection of districts; blocks and villages. 300 farmers (150 respondent farmers from Manipur and 150 respondent farmers from Nagaland) were selected for each crop (i.e. 50 farmers/ crop) for the data collection of the above crops. Data from the respondents were subjected for tabulations and further analyzed using various statistical measures.

VII. RESULTS & DISCUSSION

7.1 Socio-economic determinants of the respondent's states

Table 1: Socio-economic determinants of the respondent's farm households:

A. Age Group of Farm households								
Sl. No	Categories	Dimapur	Kohima	Nagaland	Thoubal	Senapati	Manipur	Total
i	Upto 12 years	150	196	346	157	241	398	744
ii	13-18 years	62	167	229	45	187	232	461
iii	19-59 years	154	315	469	159	364	523	992
iv	60 & above	30	31	61	18	23	41	102
	Total	396(35)	709(64)	1105	379(31)	815(68)	1194	2299
B. Family members of Farm households								
i	5-6 members	2	16	18	0	4	4	22(7)
ii	7 to 8 members	32	64	96	40	60	100	196(65)
iii	9 to 10 members	14	13	27	10	31	41	68(22)
iv	Above 10 members	2	7	9	0	5	5	14(4)
	Total	50	100	150	50	100	150	300
C Land Holding Size of the Farm households								
i	Small	33	61	94	18	64	82	176(58)
ii	Medium	14	27	41	28	30	58	99(33)
iii	Large	3	12	15	4	6	10	25(8)
	Total	50	100	150	50	100	150	300
D. Farm Income of households								
i	Low	13	12	25	22	9	31	56(18)
ii	Medium	17	70	87	25	76	101	188(62)
iii	High	20	18	38	3	15	18	56(18)
	Total	50	100	150	50	100	150	300
E. Farmers' Debit/ Loan Status of the sample respondents								
i	Yes	18	19	37	3	22	25	62(20)
ii	No	32	81	113	47	78	125	238(79)
	Total	50	100	150	50	100	150	300
F. Head Education level of the sample respondents								
i	Illiterate	3	18	21	11	19	30	51(17)
ii	Upto Primary	14	32	46	14	30	44	90(30)
iii	Pre-matric	17	24	41	13	25	38	79(26)
iv	Matric	13	7	20	12	20	32	52(17.33)
v	Intermediate	2	10	12	0	5	5	17(5)
vi	Graduate & Above	1	9	10	0	1	1	11(3)
	Total	50	100	150	50	100	150	300

Study on the age group's of farm households for the two states show that Manipur populations are higher than Nagaland in the 3rd category (19-59 years) in regard to the age-group. Whereas comparing among the districts of Manipur, Senapati district is having the highest farm household/ population in the category 3 and Thoubal district has recorded the lowest population in the 4th category. The maximum family members are recorded in Manipur on category 2, while in Nagaland state maximum family members is recorded in category. whereas, among the district, maximum family members is recorded in Kohima district, followed by Senapati and Thoubal district, while Dimapur is found to be least on category II.

The maximum land holding size is found to be maximum in small category, followed by medium category and large category across the different farm size respectively. Among the district, maximum households are recorded in Senapati followed by Kohima and dimapur district while it was least in thoubal on Small farm group, whereas, in the medium farm group, Senapati district recorded the highest households followed by Thoubal, Kohima and Dimapur. In case of large category, Kohima district recorded the highest land holding followed by Senapati, Thoubal and Dimapur district, respectively. Comparatively the farm household's income is higher in Manipur than the Nagaland states. The study on the farmer's access to farm loans shows that the maximum no of farmer are not availing the loans from the banks and it accounts for 79% of the respondents in the two states, i.e Nagaland & Manipur

The results of the study on the head education level of the sample respondents shows that the maximum numbers of sample respondent head's education level comes under the II category (upto primary) followed by III-category (pre-matric), IV-category (matric), I-category (Illiterate), V-category (intermediate) and VI- category (graduate & above) respectively.

7.2 Farmers' information and perception on the organic cultivation for the selected horticultural crops

Table 2: Farmers' Network of the sample respondents

Sl. No	Category	Dimapur	Kohima	Nagaland	Thoubal	Senapati	Manipur	Total
1	Low	4	41	45	12	37	49	94
2	Medium	20	48	68	31	59	90	158
3	High	26	11	37	7	4	11	48
	Total	50	100	150	50	100	150	300

The farmers' network regarding their farm information reveals that the Manipur state is comparatively higher in both the low & medium categories of farmer whereas it is higher in Nagaland state in the high category. In case of farmer's exposure to extension facilities, Kohima district is found to be maximum followed by Senapati, Thoubal and Dimapur districts in low category of farmers. Whereas in the medium category, Dimapur district is found to be maximum followed by Senapati, Thoubal and Kohima districts. In the high category, Dimapur district is recorded highest followed by Senapati, Kohima and Thoubal district, respectively.

Table 3: Source of Knowledge of the sample respondents

Sl. No	Category	Dimapur	Kohima	Nagaland	Thoubal	Senapati	Manipur	Total
1	Low	28	36	64	12	42	54	118
2	Medium	16	52	68	17	50	67	135
3	High	6	12	18	21	8	29	47
	Total	50	100	150	50	100	150	300

The distribution of the sample respondents and their sources of knowledge reveal that the maximum numbers of household comes in the medium-category followed by low and high categories. In the low category, Senapati district was recorded highest followed by Kohima, Dimapur and Thoubal district respectively. Whereas, in the medium category, Kohima district rank first followed by Senapati, Thoubal and Dimapur. In case of high category, Thoubal district was recorded maximum followed by Kohima, Senapati and Dimapur districts respectively.

Table 4: Frequency of the Extension Agents Visits on the sample respondent's farm

Sl. No	Category	Dimapur	Kohima	Nagaland	Thoubal	Senapati	Manipur	Total
1	Low	12	82	94	29	73	102	196(65)
2	Medium	23	13	36	17	19	36	72(24)
3	High	15	5	20	4	8	12	32(10)
	Total	50	100	150	50	100	150	300

The analysis of the frequency of the Extension personnels visited in the study areas are categorized into low, medium and high categories with the maximum numbers of respondents on the low category followed by medium and high categories respectively. In the low category, Kohima district is found to be maximum followed by Senapati, Thoubal and Dimapur districts. Whereas in the medium category, Dimapur district is found to be maximum followed by Senapati, Thoubal and Kohima districts. In the high category, Dimapur district is recorded highest followed by Senapati, Kohima and Thoubal district, respectively.

Table 5: Farmers' Training on Organic Cultivation in the sample respondents farm

Sl. No	Category	Dimapur	Kohima	Nagaland	Thoubal	Senapati	Manipur	Total
1	Low	12	19	31	29	65	94	125(41)
2	Medium	22	73	95	17	27	44	139(46)
3	High	16	8	24	4	8	12	36(12)
	Total	50	100	150	50	100	150	300

Table 5 reveals that the maximum numbers of the sample respondents are in the medium category and found highest in the Nagaland state and low in Manipur state. In the low category, Senapati district is the highest followed by Thoubal, Kohima and Dimapur, respectively; whereas in the medium category, Kohima district is found to be maximum followed by Senapati, Dimapur and Thoubal district. In case of high category, Dimapur district rank first followed equally by Senapati and Kohima and Thoubal district, respectively.

Table 6: Numbers and Area allocated under Horticultural crops cultivation on different farm size

S. N.	Area under horticultural crops cultivation (ha)	Nagaland				Manipur			
		Marginal	Small	Medium	Total	Marginal	Small	Medium	Total
1.	Pineapple crop	14	17	19	50	18	16	16	50
2.	Potato crop	22	32	46	100	43	34	23	100
3.	Cabbage crop	21	36	43	100	42	36	22	100
Total Cultivated area (ha)		6.16	10.71	17.10	33.97	8.10	10.40	13.60	32.10
Total area (ha)		9.68	23.04	39.56	106.25	19.35	22.10	18.63	

As households is concerned it was recorded maximum on medium farm, followed by small and marginal in Nagaland, while in Manipur, marginal farmers are maximum with equal no of small and medium group for pineapple crop. For the potato crop is concerned, maximum is found on medium group followed small and marginal in Nagaland. In case of Manipur, maximum is found on the marginal followed by small and medium respectively. Again for the cabbage crop growers, it was found maximum on medium, followed by small and the least in marginal in Nagaland. As Manipur is concerned, maximum growers was found for marginal followed by small and least on medium farm size group. In totality, crops areas was worked out to be 106,25 ha and 92.18 ha in Nagaland and Manipur states respectively.

Table 7: Numbers of ploughing / Level for land preparation

Sl. No.	Numbers of Ploughing / level for land	Nagaland				Manipur			
		Marginal	Small	Medium	Total	Marginal	Small	Medium	Total
(a). Pineapple crop:									
1.	Up to 2	12	11	12	35	11	10	9	30
2.	2 to 3	2	6	5	13	5	4	4	13
3.	4 and above	0	0	2	2	2	2	3	7
Total		14	17	19	50	18	26	16	50
(b). Potato crop:									
1.	Up to 2	3	5	8	16	5	4	3	12
2.	3 to 4	17	23	31	71	36	27	18	81
3.	5 and above	2	4	7	13	2	3	2	7
(c). Cabbage crop:									
1.	Up to 2	4	5	5	14	4	3	2	9
2.	3 and above	18	27	41	96	39	31	21	91

The study of numbers of ploughing for land preparation on the selected horticultural crops of Nagaland and Manipur have been accounted and found that in Nagaland, up to 2 ploughing is found maximum followed by 3 ploughing and very few with 4 ploughing are found for pineapple crop. While in Manipur state, maximum ploughing is recorded at marginal farmers with 2 ploughing, followed by small and medium farm size group, as 3 times ploughing is concerned, marginal farmers are maximum followed equally by small and medium, whereas 4 ploughing is concerned, very few are doing 4 & above ploughing in Nagaland for the pineapple crop. Overall, up to 2 ploughing is found maximum in both the state followed by 3 ploughing and 4 & above ploughing, respectively.

For the potato crop, 3 to 4 ploughing are found maximum in both the state. For 2 ploughing, maximum are found on medium and marginal for Nagaland and Manipur respectively. Very few are adopting 5 & more ploughing for potato crop in Manipur whereas it is found maximum in medium farm size group.

In case of cabbage, maximum is found as 3 & above ploughing on medium farm size followed by small and marginal in Nagaland state whereas in Manipur it is found maximum on marginal farm followed by small and medium. Less farm households practices 2 times ploughing in both the states.

Table 8: Extent of adoption of FYM for the selected horticultural crops

Sl. No.	Average FYM rate (t/ha)	Nagaland				Manipur			
		Marginal	Small	Medium	Total	Marginal	Small	Medium	Total
(a). Pineapple crop									
1.	High rate (≥ 2.51)	0	0	1	1	0	1	2	3
2.	Medium (1.26 - 2.50)	11	12	11	34	12	11	9	32
3.	Low (up to 1.25)	3	5	7	15	6	4	5	15

(b). Potato crop:									
1.	High rate (≥ 2.51)	1	0	2	3	0	0	3	3
2.	Medium (1.26 - 2.50)	18	24	41	83	39	29	18	86
3.	Low (up to 1.25)	3	8	3	14	4	5	2	11
(c). Cabbage crop:									
1.	High rate (≥ 2.51)	0	0	4	4	1	1	2	4
2.	Medium (1.26 - 2.50)	20	23	40	83	39	28	18	85
3.	Low (up to 1.25)	2	9	2	13	3	5	3	11

The extent of adoption of farm yard manure (in t / ha) across the different farm size group of Nagaland and Manipur are categorized as high (2.50 t & above), medium (1.26 t to 2.50 t) and low rate (up to 1.25 t) adopters respectively. Even for the pineapple crop, maximum FYM is used by the medium adopters, followed by low adopter and very few are found in the high adopter of Nagaland state. With respect to the state of Manipur, maximum are medium rate adopter followed by low rate and it is least on high adopter of pineapple crop. As for potato crop is concerned, medium farms were found maximum for medium rate adopter of FYM followed by low rate and very few are under high rate of adopter in Nagaland state. As Manipur is concerned, it is also found in the same trend with maximum on medium, followed by low and least on high rate adopter of FYM for potato crop. As cabbage crop is concerned, it is also following the sane trend of pineapple and potato with maximum on medium rate, followed by low rate and least on high rate on cabbage in Nagaland state. Even the Manipur also follow the same trend for cabbage crop.

CONCLUSION

Analysis of the farm households with respect to their age shows that Manipur populations are higher than Nagaland. The maximum family members are recorded in Manipur on category 2 and the same is also recorded for Nagaland. whereas, among the district, maximum family members is recorded in Kohima district, followed by Senapati and Thoubal district, while Dimapur is found to be least on category II.

The total cultivated area is found maximum in Nagaland as compare to Manipur. The total overall land holding in Nagaland is recorded as 106.25 ha while in Manipur it is 92.18 ha of land recorded as per the data, wherein on medium farm, it has maximum holding with 39.56 ha, 23.04 ha on small farm and 9.68 ha on marginal farm in Nagaland. As Manipur is concerned, small farm with 22.10 ha of land is the highest followed by marginal with 19.35 ha and it was least on medium with 18.63 ha of land. The total overall land holding in Nagaland is recorded as 106.25 ha while in Manipur it is 92.18 ha of land recorded as per the data, wherein on medium farm, it has maximum holding with 39.56 ha, 23.04 ha on small farm and 9.68 ha on marginal farm in Nagaland. As Manipur is concerned, small farm with 22.10 ha of land is the highest followed by marginal with 19.35 ha and it was least on medium with 18.63 ha of land.

In Nagaland, up to 2 ploughing is found maximum followed by 3 ploughing and very few with 4 ploughing are found for pineapple crop. While in Manipur state, maximum ploughing is recorded at marginal farmers with 2 ploughing, followed by small and medium farm size group, as 3 times ploughing is concerned, marginal farmers are maximum followed equally by small and medium, whereas 4 ploughing is concerned, very few are doing 4 & above ploughing in Nagaland for the pineapple crop. Overall, up to 2 ploughing is found maximum in both the state followed by 3 ploughing and 4 & above ploughing, respectively.

The extent of adoption of farm yard manure (in t / ha) across the different farm size group of Nagaland and Manipur shows that the farm households use the FYM and is high in medium adopters of pineapple, cabbage and potato crops in both Nagaland and Manipur.

POLICY RECOMMENDATIONS

1. The different selected horticultural activities and the adoption rate of mentioned activities is lower among the farmers across the different farm sizes. It necessities farm level education, awareness and capacity building among farmers to take the advantage and adoption of different development programmes of government in time.
2. Establishing financial framework for sustainable functioning of the selected horticultural crops and participatory planning has been found significant for upliftment of the farm household's economy.
3. During the study period, most of the farmers have been facing the transportation problems with high cost; illegal taxes and marketing infrastructures resulting in the low net income. These need immediate attention from the concerned authorities.
4. Farmers are deprived from getting the farm loans and are not well awared of the existing National Agril. Schemes for which every stakeholders must intervene for availing the facilities for creation of large employment and income generation avenues in the North-Eastern Region of India.

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