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Knowledge, Attitude and Practices of Different Tribes of Garo Hills districts of Meghalaya towards Scientific Horticulture

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ABSTRACT

The study was conducted in tribal areas of Garo Hills, Meghalaya during 2013 to evaluate the knowledge attitude and practices of different tribal farmer community towards scientific horticulture. A total of 150 tribal respondents, 30 each from Rabha, Hajong, Koch, Banai and Garo tribal area were selected randomly. The selected respondents were interviewed with the help of a semi structured interview schedule. It was found that majority (48%) of the respondents have primary level of education. 83.3 per cent of the farmers cultivate in their own land except Banai tribe where almost 50 per cent of the respondents cultivate on leased land. 70.7 per cent of the respondents have annual income between Rs. 30,000/- to Rs. 60,000/- from main source. Eighty four per cent of the respondents have farming experience between 3-9 years and above 12 years. It was also revealed that 96 and 81.3 per cent of the respondents have land under vegetables cultivation and orchard is less than 0.4 ha, respectively. In the study area it was found that 49.3 per cent of the respondents have farming as primary occupation and majority (68%) of the respondents have poor level of knowledge and neutral attitude towards modern horticulture, respectively. It was also found that education, source of land and farming experience were negatively correlated with knowledge level which was mainly because with higher education, respondents loose interest in farming and their involvement in farming reduces and thus knowledge level in horticulture comes down. Results of the study revealed that knowledge, attitude and cultivation practices level were considerably low among almost all the tribes though it varied from one community to other living in a same geographical area.

Key Words: Tribal Farmers, Knowledge level, Attitude, Practices, Scientific farming, Adoption.

INTRODUCTION

The Garo Hills of Meghalaya which is bordered by state Assam and the country Bangladesh. With its undulating topography and high intensity of rainfall, suffers from erosion problem and ecosystem degradation. The tribal population is highly dependent on agriculture and horticulture for their food security and income (Meena and Punjabi, 2012)**.** In Meghalaya, the Garo Hills has highest tribal population of different communities but the area is mainly dominated by the Garo tribes. Several village of the district are the homeland of some *Indo-Mongoloid* tribes like the Hajong, Rabha, Banai, Koch, Bodo etc. (Deka *et al*, 2009).The tribal population is highly dependent on horticulture for their livelihood. The tribal people earn by forestry, shifting cultivation, settle agriculture and horticulture, and industrial labour, animal husbandry, fishing, traditional commerce including handicraft. Most of the tribal, whether young or old have limited knowledge about modern horticultural methods and food production (Nidheesh , 2010).

The main livelihood occupation for most of the Garo tribes is through horticulture/*Jhum* cultivation and the commercial commodities produced in the district are Arecanut, Cashewnut, Paddy, Maize, Ginger, Tuber crops, Vegetables and rearing of pig, dairy and poultry bird. The major sources of water for cultivation are through rivers, streams and rainfall**.** They grows paddy in plain land and

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mixed horticultural crops in *jhum* land. They were very rarely used fertilizer in their field but practices mono cropping, mulching and farm yard manure in to their field. This study was mainly undertaken to study the socio-economic status of main different tribes, the knowledge level in horticultural practices and the adoption of the modern horticultural practices by the different tribes in Garo Hills.

MATERIALS AND METHODS

The study was conducted in Garo hills districts of Meghalaya, India namely West Garo Hills, South Garo and South West Garo Hills during April to September, 2013 because the districts are dominated by different communities(Garo, Rabha, Hajong, Koch and Banai). Four blocks i.e, Dalu and Selsella in West Garo Hills, Zikzak and Betasing in South West Garo Hills and Gasuapara in South Garo Hills were selected for the study. Two village from each block were selected. The village were selected on the basis of distribution of inhabitants of the five different tribes.15 numbers of respondents were selected from each village through simple random sampling. Therefore, 30 respondents were selected from each tribe making the total number of respondents to 150. The selected respondents were interviewed with the help of a semi structured interview schedule in order to get relevant information. The data collected were tabulated and statistically analyzed using simple statistical tools to interpret the results.

Characteristics of different tribes

Rabha community

Horticulture is also the main occupation of the *Rabha* community. Earlier they used to practice shifting cultivation but later on they shifted to settled cultivation. Besides horticulture they also engaged in forest based activities and handloom weaving. Basically the *Rabha* women are engaged in weaving since the early ages. In the ancient period when these *Rabha* tribes used to dwell in the forests, maximum of them practice shifting cultivation. Apart from these, the Rabha people are also engaged in government jobs and other occupations but their development is less as compared to other communities.

Hajong Tribes

Hazong tribes are a small tribal group spread across the north east India. This tribal group resides in North Cachar Hills district, Karbi Anglong district and in the Garo Hills of Meghalaya. The villages are located on elevated grounds close to wet paddy lands and people build their houses in clusters in the courtyard of the village headman called *`Adhikari.* Agriculture and horticulture is the primary occupation of the *Hajong* tribes. The womenfolk are skilled weavers. Almost every house here has a loom and the dresses required by the female members of the family are mostly handmade. It is custom of the *Hajong* to weave the clothes required during weddings at the family loom. *Hajongs* are also good carpenters and are experts in manufacturing of bamboo and cane products.

Koch (Rajbongshi)

Koch (Rajbongshi) community can be found in entire parts of present Assam, West Bengal, Kishanganj in Bihar, Meghalaya and country Nepal and Bangladesh. It is a tradition for *Koch Rajbongshi* to go for hunting in a group. Usually every house has a mango , Jackfruit and a small kitchen garden, a small pond where they keep fish. Koch Rajbonshi people have their ancient tradition of treatment which is not very well known to the modern world and even not known to Ayurveda Medicine Scientists. Majority of them depend on cultivation of paddy and vegetables and rearing of cattle and poultry for their food security.

Banai

The *Banai* is a sub-tribe of the Koches is regarded as a tribe of India. The *Banai* was mentioned in the census report of 1891 which states about the sub-communities of the Koches. The term "Dasgaya" actually refers to the areas on the southern tract of Garo Hills of Meghalaya and includes the villages Batabari, Kapasipara, Gasuapara, Jatrakona,

Makkabaripara etc, which had been inhabited by the *Banai* since ancient times. These areas are still referred to as Daskaniya or Dasgaya by the oldest living people of the area. Majority of them depend on cultivation of rice, vegetables and rearing of livestock but they are very much backward and lacking of knowledge in scientific crop and livestock production. The educational level among them is also low. The Government of Meghalaya recognizes the importance of horticultural sector in terms of its potential to address the key challenges of unemployment and poverty in the tribal region of Garo Hills districts. The Central Governments as well as Government of Meghalaya have undertaken a number of projects, programmes and initiatives such as an Innovative Project for Enhancement of Livelihood of Farmers to improve the a horticulture situation and reduce poverty.

RESULTS AND DISCUSSION

Educational status

Majority of the respondents (48.7%) have primary level of education where as only 0.6 per cent of the respondents have higher secondary onwards (Table1). It was evident that maximum number of respondents had primary status of education in case of *Garo, Hajong, Banai* and *Rabha* where as in *Koch* tribe, there are less number people having primary education but literate people are more. Only one respondent had higher secondary onwards but number of people who does not have even primary education among these tribe is considerably high and overall educational status is not so good.

Land holding and farming experience

It was noticed that 83.3 per cent of the respondents had their own land where as only 10.7 per cent had rented land or leased in because they are poor and marginal farmers. It was observed that almost all the respondents cultivate in their own land except *Banai* tribe (50%), because most of them does not have their own land. Further, 84.0 percent of the respondents have farming experience in between above 3 & below 9 years and above 12years of farming experience where as 13.3 and 2.7 percent have in between less than 3 years and in between above 9 and below12 years, respectively (Table 2).

Table 2. Frequency of distribution of respondents in relation to their farming experience.

Farming Experience(Yrs)	Frequency	Percent
Less Than 3	4	2.7
Above 3 & below 9	63	42.0
Above 9 & below12	20	13.3
Above 12	63	42.0
Total	**150**	**100**

Marital status

The data (Table 3) revealed that 94.0 per cent of the respondents were married where as 3.3 and 2.0 per cent were single and divorced, respectively.

Table 1. Distribution of the Tribes according to their Education status.

Tribes	Education Status				
	No formal Education	Literate	Primary Education	Secondary Education	Higher Secondary onwards
Garo	6	4	18	2	0
Hajong	2	1	15	12	0
Banai	12	0	13	5	0
Rabha	0	2	20	8	0
Koch	8	10	7	4	1
Total	28 (18.7%)	17 (11.3%)	73 (48.7%)	31 (20.7%)	1 (0.6%)

Table 3. Frequency distribution of respondents in relation to their marital status.

Marital Status	Frequency	Percent
Single	5	3.3
Married	141	94.0
Divorce	1	0. 7
Widow	3	2.0
Total	**150**	**100**

Cultivation of vegetables and fruits

It was inferred that 96.0 per cent of the respondents cultivate vegetables in less than 0.4 ha of area where as only 4.0 percent cultivate in between 0.4 - 1.07 ha. Likewise, 81.0 per cent of the respondents have less than 0.4 ha of area under orchard where as only 16.0 and 2.7 per cent had in between 0.4-1.07 ha and more than 1.07-1.47 ha, respectively.

Table 4. Frequency distribution of respondents in relation to the primary occupation.

Income	Frequency	Percentage
Farming	74	49.3
Agricultural Labour	13	8.7
Non agricultural Labour	19	12.7
Service	31	20.6
Bussiness	13	8.7
Total	**150**	**100**

The data (Table 4) show that 49.3 per cent of the respondents have farming as primary occupation and only 21.3 per cent of the respondents perform agricultural or non agricultural labour. After farming, service (20.6%) and business (8.7%) was preferred by the participants.

It was found that 70.7 per cent of the respondents had annual income between Rs. 30, 000/- to 60,000/- from their main source where as only eight numbers of respondent had annual income in between Rs,1,50,000-2,00,00/ and above Rs.2,00,000/- .respectively (Table 5).

Table 5. Frequency of distribution of respondents in relation to their Annual income from primary occupation.

Yearly income (₹)	Frequency	Percent
30,000-60,000	106	70.7
60,001-90,000	18	12
90,001-1,20,000	13	8.7
1,20,001-1,50,000	4	2.7
1,50,001-2,00,000	4	2.7
Above 2,00,000	5	3.3
Total	**150**	**100**

Relationship between knowledge level of farmers with different independent variables.

It was found that education, source of land and farming experience were significantly ($P<0.01$) negatively correlated with knowledge level mainly because with higher education, respondents loose interest in farming and their involvement in farming reduces and thus, the knowledge level in agriculture also comes down. It was also found that with more farming experience lower was the knowledge level in horticulture because most of the tribal farmers are traditional bound especially elder people and their knowledge level in modern horticultural practices was less. On the other hand, it was found that type of land holding status and knowledge level in horticulture was significantly ($P<0.01$) positively correlated and was higher in case of those farmers, who have their own land (Table 6).

Table 6. Correlation between knowledge level and other independent variables.

Independent Variables	Correlation Coefficient (r)
Age	0.089
Marital Status	-0.123
Education	-0.211**
Source of Land	0.566**
Farming Experience	-0.327**
Yearly income from Main source	-0.103
Area under Vegetables	0.058
Area under Orchard	0.016

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Knowledge level in modern horticultural package and practices

The data (Table 7) indicated that 68.7 per cent of the respondents have poor level of knowledge in modern horticultural package and practices and 8.7 per cent of the respondent have very good level of knowledge. Among the five major tribes, the *Rabha* tribe were found to possess poor level of knowledge.

Use of recommended horticultural practices

It was found that 80.7 per cent of the respondents used poor level of horticultural practices and which the Garo tribe found more. Only two percent of the tribes have very good level of horticultural practices (Table8).

Attitude level and other independent variables

The data (Table 9) revealed that farming experience was negatively correlated (P<0.01) with attitude level of farmer. The aged farmers with higher farming experience were mostly tradition bound and possess negative attitude towards modern agricultural practices. However, type of land holding was positively correlated with attitude level, which was significant (P<0.05). Those respondents, who have their own land have positive attitude towards modern horticultural practices.

Table 7. Distribution of the tribes according to their knowledge level.

Category			Tribes					Total
			Garo	*Hajong*	*Banai*	*Rabha*	*Koch*	
Knowledge Level	Poor	Number	20 (13.3)	23(15.3)	9(6.0)	26 (17.3)	25 (16.7)	103 (68.7)
	Average	Number	10 (6.7)	2 (1.3)	2 (1.3)	4 (2.7)	5 (3.3)	23 (15.3)
	Good	Number	0 (0.0)	4 (2.7)	7 (4.7)	0 (0.0)	0 (0.0)	11 (7.3)
	Very Good	Number	0 0.0%	1(0.7)	12 (8.0)	0 (0.0)	0 (0.0)	13 (8.7)

Figures in parenthesis represent percentage.

Table 8. Distribution of the Tribes according to the horticultural practices.

Category			Tribes					Total
			Garo	*Hajong*	*Banai*	*Rabha*	*Koch*	
Practice	Poor	Count	28 (18.7)	12 (8.0)	22 (14.7)	30 (20.0)	29 (19.3)	121 (80.7)
	Average	Count	0 (0.0)	16 (10.7)	7 (4.7)	0 (0.0)	0 (0.0)	23 (15.3)
	Good	Count	1 (0.7)	1 (0.7)	1 (0.7)	0 (0.0)	0 (0.0)	3 (2.0)
	Very Good	Count	1 (0.7)	1 (0.7)	0 (0.0)	0 (0.0)	1 (0.7)	3 (2.0)

Figures in parenthesis represent percentage.

Table 9. Correlation between attitude level and other independent variables.

Independent Variables	Correlation Coefficient (r)
Age	-0.013
Marital Status	-0.055
Education	0.091
Type of Land Holding	0.174*
Farming Experience	-.487**
Yearly income from Main source	-0.086
Area under Vegetables	0.129
Area under orchard	0.082
Attitude	1
N	150

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Correlation between farming practice level and other independent variables

An attempt has been made to find out relationship between practice level of farmers with other independent variables. The correlation existed but it was non significant (Table 10).

Regression analysis of knowledge, Attitude and Practice level (KAP) of farmers

The regression analysis of knowledge, attitude and practice level (KAP) of farmers was presented by β-values(unstandardized partial regression co-efficient), Standard Errors of unstandardized partial regression coefficients, β –values (standardized partial regression coefficients), the coefficient of multiple regression determination (R^2) and the corresponding F-values. From the table12, it was evident that type of land holding, farming experience, age, marital status, annual income from primary occupation have substantial effect on KAP level of tribal farmers. Thus, an unit change in age, marital status, type of land holding, farming experience, annual income from primary occupation will contribute a change in KAP level farmer to the extent of 0.103, -0.0152, 0.438,-0.342, 0.084 units, respectively.

Table 10. Correlation between practice level and other independent variables.

Independent Variable	Correlation Coefficient (r)
Age	-0.052
Marital Status	-0.014
Education	0.072
Type of Land Holding	0.018
Farming Experience	-0.124
Yearly income from Main source	-0.089
Area under Vegetables	-0.018
Area under Orchard	0.045
Practice	1
N	**150**

*. Correlation was significant at the 0.05 level (2-tailed).
**. Correlation was significant at the 0.01 level (2-tailed).

The R^2 value was found to be 0.422 which means all the casual variables put together, the amount of variation in the consequent variable has to be the tune of 42.2 per cent and its F- value suggest that it was significant ($P<0.01$). So, on the basis of this regression analysis, the following model can be suggested for KAP level of tribal farmers of Meghalaya.

$$Y= 48.71+ 0.1X_1 - 0.15X_2 + 0.44X_4 - 0.34X_5 + 0.08X_8$$

Where, X_1 X_2, X_3..... X_8 are independent variables and Y is dependent variables.

Again, another attempt was made to find out any significant difference present among the five different tribes of Garo Hills in relation to their KAP level towards scientific horticulture. For this purpose, a non parametric Chi-square test(Kruskal – Wallis) has been conducted. The result of the test have been presented in the Table 13.

- Based on 150 sampled tables with starting seed 299883525.
- Kruskal- Wallis Test ;
- Grouping Variable: Tribes

Table 12. Values of regression Co-efficient of KAP Level of Famers.

Coefficients(a)				
Model		Unstandardized Coefficients		Standardized Coefficients
B		Std. Error	Beta	
1	(Constant)	48.713	15.91	-
	AGE(X_1)	3.056	2.184	0.103*
	Marital Status(X_2)	-8.784	3.883	-0.152*
	Education(X_3)	-1.006	1.423	-0.051
	Type of Land Holding (X_4)	28.394	4.681	0.438**
	Farming Experience(X_5)	-7.048	1.659	-0.342*
	Area under Vegetable(Bigha) (X_6)	1.238	7.28	0.012
	Area under orchard(Bigha) (X_7)	-0.826	3.482	-0.019
	Yearly income from primary occupation(X_8)	1.356	1.121	0.084*
a. Dependent Variable: KAP Level				

R^2=0.422; F=11.365**; **Both 5% and 1% level of significance

Table 13. Mean rank distribution of KAP level of different tribes.

Tribes		N	Mean Rank
KAP Level	Garo	30	49.55
	Hajong	30	105.12
	Banai	30	122.78
	Rabha	30	43.90
	Koch	30	56.15
Total		150	

The mean rank of the KAP level of different tribes suggested that *Banai* tribe has the highest KAP level, which was followed by *Hajong* tribe (Table 13). The KAP level of *Garo*, *Koch* and *Rabha* tribes was much lower than that of other two tribes. The Chi-square value of Kruskal-Wallis test was found to be 82.113 with P-value 0.02 at 4 degrees of freedom. The P-value was less than 0.05 which inferred that Chi- square value was significant (P<0.05) and alternate hypothesis was accepted. Thus, non- parametric Chi- square test (Kruskal – Wallis) suggested that there exists a significant difference among the different tribes of Garo Hills in terms of KAP level towards scientific horticulture.

Table 14. Kruskal – Wallis test statistics.

Test Statistics[b,c]			KAP Level
Chi-Square			82.113
Df			4
Asymp. Sig.			0.000
Monte Carlo Sig.	Sig.		0.000[a]
	95% Confidence Interval	Lower Bound	0.000
		Upper Bound	0.020

CONCLUSION

Among the five tribes, the knowledge level of all the tribes was poor accept the *Banai* tribes which has average level of knowledge. The knowledge level of all the tribal farmers on scientific horticulture is still need to be improved by imparting training

and awareness programme. As their attitude level towards scientific horticulture among all the tribes was neutral, it can be converted to favourable condition by pursuing the viable modern technology through method and result demonstration etc. In terms of practices, all the tribes still depend on traditional method. It was also found that majority of the tribal farmers never use fertilizers whether its chemical or biochemical. It was essential to make tribal farmers aware of the benefit of scientific horticulture. So, the institution, both governmental and non Governmental, need to join hand to enhance their knowledge leading to favourable attitude towards scientific horticulture and persuade them to practice the same in their life which will lead to better productivity of the horticultural crops in the Garo Hills and ultimately better livelihood for the farmers of the region.

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