Research Note

Indian Journal of Extension Education
Vol. 59, No. 1 (January–March), 2023, (154-157)

ISSN 0537-1996 (Print)
ISSN 2454-552X (Online)

Cross-Cultural Comparative Analysis of Technological Gap between Tribal Pineapple Growers of Meghalaya, India

Balkho Rangsa Marak[1]*, Haobijam James Watt[2], Biswajit Lahiri[3], Rebekka Syiem[4] and Arup Kumar Bandyopadhyay[5]

[1]Assistant, Soil and Water Conservation Officer, Shillong Plantation Crops Division, Polo Hills, Lawmali, Shillong-793001, Meghalaya, India
[2]Assistant Professor, Lovely Professional University, Jalandhar, Punjab, India
[3]Associate Professor, Central Agricultural University (Imphal), Agartala, Tripura, India
[4]Horticulture Development Officer (Marketing), DOAFW, Government of Meghalaya, Shillong, Meghalaya, India
[5]Professor, BCKVV, Mohanpur, Nadia-741252, West Bengal, India
*Corresponding author email id: balkhomarak@gmail.com

ARTICLE INFO

Keywords: Technological gap, Tribal communities, Pineapple growers, Agro-economic, Extension-communication, Socio-psychological

http://doi.org/10.48165/IJEE.2023.59133

Conflict of Interest: None

ABSTRACT

The varied agro-climatic condition of Meghalaya favours cultivation of different horticultural crops, particularly different fruit crops, and pineapple is the most notable of them. The present study was conducted on 200 tribal pineapple growers of Meghalaya in the North-Eastern Himalayan region of India in the year 2017-2018. The article highlighted the technological gap among pineapple growers with special emphasis on the differences in agro-economic, socio-psychological and extension-communication characteristics between the Khasi and the Garo tribes of Meghalaya in the north-eastern Himalayan region of India. The average level of the technological gap of Garo farmers (61.78%) was slightly higher than that of Khasi farmers (57.85%). The Mann-Whitney U test reported that the mean scores of the technological gap for the farmers of West Garo Hills and Ri Bhoi were indicating a significant difference in the technological gap between the farmers of these two tribes. The study suggested the need to understand the differential characteristics of these tribes and to introduce location-specific technologies to minimize the technological gap and increase pineapple production in these tribal areas.

INTRODUCTION

Meghalaya is predominantly inhabited by three major tribal communities, namely the Khasi, Garo, and Jaintia. Based on the population of these three major tribes, the state can be classified into the Khasi Hills region, Garo Hills Region and Jaintia Hills Region. These tribes have their own unique culture, values and practices. Interestingly matrilineal system is a common practice among these three tribal communities (Lahiri & Das, 2010; Singha & Nayak, 2015). Each of these tribal community possess unique and distinct culture and tradition which made them distinguishable from each other (ICAR-National Institute of Abiotic Stress Management, 2017). Farming systems among these regions vary from one another due to varied topography and diverse climatic condition of the area. The semi-temperate climate prevails in the Shillong plateau (600m – 2000m), whereas the sub-tropical climate dominates in Garo-Hills (Meghalaya Agriculture Profile, 2006).

The varied agro-climatic condition of Meghalaya favours cultivation of different horticultural crops, particularly different fruit crops, and pineapple is the most notable of them (Marak et al., 2015; Nongbri et al., 2021). About half of India's export of pineapple production comes from the North-eastern region (Roy & Ghosh, 2022). Meghalaya produced 138701 MT of pineapple in an area of 11367 hectares in the year 2019-20 (Directorate of

Received 14-11-2022; Accepted 20-12-2022

Economics and Statistics, Government of Meghalaya, 2020). The Department of Agriculture, Government of Meghalaya, by its horticulture scheme, namely the 'Technology Mission for the Integrated Development of Horticulture', adopted various technology dissemination approaches to popularise and expand the area and production of pineapple in the state. The impact of this scheme was seen in Ri Bhoi district under the Khasi Hills region and West Garo Hills district under the Garo Hills region, having maximum production of pineapple in these districts compared to other districts in the state. Pineapple production was found economically sustainable in the state and contributed nearly eight percent of India's total pineapple production (Mathew et al., 2011). The Benefit Cost Ratio obtained was 1.61, 1.48 and 1.49 in the small, medium and large categories, and payback period from fruiting ranged from 0.85 years, 0.93 years and 0.90 years in the small, medium, and large categories of orchards (Rymbai et al., 2012). However, farmers are not always in a position to adopt all the practices recommended to them. Though the adoption of recommended technology was high, still the production was at medium to high level resulting the increase in income (Das et al., 2015). There are some gaps between the recommendations and applications of the technologies (Ray et al., 1995). There are many factors associated with the non-adoption or partial adoption of pineapple production technologies causing the technological gap, which may vary between different tribal communities due to differences in various inter-community characteristics. Understanding the farming system of each community generates necessary information for the effective transfer of need-based and location-specific technology. Therefore, it was relevant to find out the extent of the technological gap and to conduct a cross-cultural comparative analysis between the Khasi and the Garo pineapple growers of Meghalaya.

METHODOLOGY

The study was conducted on 200 tribal pineapple growers of Meghalaya in the North-Eastern Himalayan region of India in the year 2017-2018. The West Garo Hills and Ri Bhoi districts were selected purposively to represent the Garo community and Khasi community, respectively. These two districts have the highest production of pineapple as compared to other districts in the state. A multistage simple random sampling method was followed in selecting blocks, villages, and respondents. Accordingly, two blocks from each district and five villages from each block were selected for the study following random sampling technique. Collection of data was done using a semi-structured interview schedule which was pretested and developed after conducting a pilot study. The variables used for the study of agro-economic characteristics were continuous variables whereas the variables used for the socio-psychological and extension-communication characteristics were discrete variables. Therefore, paired t-test and Mann-Whitney U test were used for the analysis and interpretation of data. Moreover, the assumptions of normality were checked prior to conducting a parametric test. A parametric test was conducted only in situation where the assumptions were satisfied.

The technological gap was computed by using the technological gap index used by (Biradar, 2012). A score was assigned to the correct answer and zero for the incorrect answer or no answer to every item for quantifying the technological gap of the respondents. The formula used for the calculation of the technological gap index is given below:

$$\text{Technological gap index} = \frac{\text{Extent of Recommendation–Extent of Adoption}}{\text{Extent of Recommendation}} \times 100$$

RESULTS AND DISCUSSION

Status of technological gap of pineapple growers

The average level of the technological gap of the Garo farmers (61.78%) was found higher than that of the Khasi farmers (57.85%) (Table 1). Most of the Garo pineapple growers adopted traditional practices and had low adoption level in the scientific method of pineapple cultivation (Marak et al., 2015). The coefficient of variation was found to be 74.80 per cent and 74.20 per cent for Garo farmers and Khasi farmers, respectively. It indicated that in both cases, the variables were less consistent in their variance. Mann-Whitney U test showed that the mean scores of technological gaps recorded for the farmers of West Garo Hills and Ri Bhoi were 61.78 and 57.85, respectively. The test statistic U (3701) was found significant at 1% level. It indicated that the farmers of the West Garo Hills District had a significantly higher technological gap than the farmers of the Ri Bhoi District. Similar findings where significant difference was observed in the technological gap between guava growers of Kalyanpur village (coastal saline zone) of West Bengal and Ghoragacha village (Gangetic alluvial zone) (Ashutosh & Basu, 2008). Various constraints were also highlighted in pineapple production in West Garo Hills such as lack of knowledge about improved practices, lack of suitable agricultural development technology, lack of training facilities, the irregular visit of extension workers and unavailability of agricultural experts (Das et al., 2014; Marak et al., 2016). Besides support from the state Agriculture Department of Meghalaya, farmers of Ri Bhoi district had a better access to agricultural information and technological support due to its location in the vicinity of agricultural institutions such as ICAR-Research Complex for NEH Region, Agricultural Technology Information Centre, Krishi Vigyan Kendra and College of Post-Graduate Studies, Central Agricultural University, Umiam. Contrastingly with no agricultural research station located in the Garo Hills region, the State Agriculture Department of Meghalaya and Krishi Vigyan Kendra were the

Table 1. Status of technological gap of pineapple growers in West Garo Hills and Ri Bhoi Districts

District	Minimum (%)	Maximum (%)	Mean (%)	Standard deviation	Co-efficient of variation (%)	U	p-level
West Garo Hills	48.14	74.07	61.78	8.65	74.80	3701	0.002
Ri Bhoi	40.74	74.07	57.85	8.61	74.20		

Table 2. Paired t-test between the Garo and Khasi pineapple growers with reference to agro-economic characteristics

Agro-economic variables	Mean values		t-value
	West Garo Hills	Ri Bhoi	
Farm size	1.70	1.27	3.669**
Pineapple cultivated area	0.56	0.66	-1.890
Cropping Intensity	119.24	117.50	1.477
Annual Income	58859.00	62420.00	-0.716
Income from Pineapple	22480.00	27680.00	-1.847
Farming Experience	8.78	9.98	-1.890

main institutions that played a central role in disseminating agricultural technology to farmers in West Garo Hills.

Agro-economic characteristics between the Garo farmers and Khasi farmers

The result of Paired t-test in Table 2 showed that out of six agro-economic variables selected for the study, only farm size showed significant differences between tribal farmers of West Garo Hills District (1.70 ha) and Ri Bhoi District (1.27 ha). This indicated that the pineapple growers of the West Garo Hills District had significantly larger farm sizes than the farmers of the Ri Bhoi District.

Mann-Whitney U test was also used to assess the significant differences in socio-psychological and extension-communication characteristics between pineapple growers of two tribal communities. Results of the analysis are discussed as follows:

Socio-psychological characteristics between Garo farmers and Khasi farmers

Table 3 reflected significant differences in socio-psychological characteristics such as education, marketing orientation, risk orientation, innovation proneness, attitude towards pineapple cultivation and economic motivation between tribal farmers of West Garo Hills and Ri Bhoi. Comparative analysis of the technological gap between apple growers of Budgam, Budgam, and Baramulla districts of Kashmir showed that Budgam district had the highest technological gap due to low educational status, less innovative proneness, and lack of contact with different extension agencies (Shah et al., 2022).

Extension-Communication characteristics between Garo farmers and Khasi farmers

Analysis showed that out of five extension-communication characteristics selected for the study, a significant difference was found only in personal localite as presented in Table 3. This indicated that other extension communication variables remaining non-significant, Khasi farmers of Ri Bhoi District had significantly higher contacts with personal localite than Garo farmers of West Garo Hills District. Personal localite sources like friends and neighbours were the major sources of agricultural information among the farmers in Garo hills (Lahiri, 2016). Exposure to extension programmes such as training, Krishi Mela, farmers meeting, campaign, exhibitions etc were minimum among small and marginal pineapple growers (Roy & Bandyopadhyay, 2019).

CONCLUSION

The study highlighted gainful insights on the extent of the technological gap of pineapple growers in Meghalaya by emphasizing the differences in agro-economic, socio-psychological, and extension-communication characteristics between Garo farmers and Khasi farmers. Comparative analysis between these two tribal communities showed significant differences in variables such as farm size, education, market orientation, risk orientation, innovation proneness, attitude towards pineapple cultivation, economic motivation and personal localite. The identified differential characteristics should be considered by the extension agencies and

Table 3. Mann-Whitney U test between the Garo and Khasi pineapple growers

Socio-psychological variables	Mean scores		U	p-level
	West Garo Hills	Ri Bhoi		
Age	44.72	42.29	4313.500	0.093
Education	2.70	3.25	4074	0.024
Social Participation	0.40	0.34	4514.500	0.236
Family Type	1.11	1.05	4700	0.464
Family Size	5.82	6.41	4393.500	0.138
Planning Orientation	10.83	10.75	4941	0.885
Production Orientation	10.77	10.60	4992.500	0.985
Marketing Orientation	12.22	13.31	3955.500	0.011
Risk Orientation	10.39	10.89	4056	0.021
Innovation Proneness	2.17	2.54	3664	0.001
Attitude towards Pineapple cultivation	33.01	37.02	2024	0.001
Economic Motivation	1.93	2.29	3667.500	0.001
Extension-Communication Variables				
Mass Media Contact	4.78	4.68	4967	0.936
Extension Contact	0.37	0.38	4954	0.911
Extension Participation	0.19	0.13	4619	0.352
Personal Cosmopolite	0.39	0.44	4826	0.671
Personal Localite	3.41	5.67	1419	0.001

policymakers while planning and implementing new technology. Emphasis needs to be given to all sections of the farming community and fully equip them with skills and competency in technology dissemination. Technological gap among these tribal farmers can be minimized through introduction of need-based and socially, culturally and economically sustainable location-specific agricultural technologies.

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