



Crafting a Gender Disparity Index to Unveiling the Tea Garden Workers' Gender Dynamics

Rekha Khalkho^{1*} and Souvik Ghosh²

¹Ph.D. Scholar, ²Professor, Department of Agricultural Extension, Palli Siksha Bhavana (Institute of Agriculture), Visva-Bharati, Sriniketan, Birbhum-731236, West Bengal, India

*Corresponding author email id: rekhakhalkho34@gmail.com

ARTICLE INFO

Keywords: Gender disparity index (GDI), Gender dimensions, Gender roles, Item analysis, Tea garden workers

<http://doi.org/10.48165/IJEE.2023.59429>

Conflict of Interest: None

Research ethics statement(s):

Informed consent of the participants

ABSTRACT

Gender dynamics significantly impact tea garden workers' performance. A Gender Disparity Index (GDI) was developed for assessing gender differences within the tea plantation sector during 2022-23. The construction of GDI commenced with item analysis, employing the Likert's Technique. A total of seven dimensions were included following the Harvard analytical and Moser frameworks of gender analysis. Based on the relevancy, t statistics, and content validity, five dimensions were kept in the index, namely, activity profile, influencing factors for differential roles, gender role identification, gender need assessment, and decision-making behaviour of tea garden workers. A universe of 92 items under five dimensions was prepared, and the relevancy of each item was judged by 56 experts; subsequently, 72 items were screened on which the responses of 60 workers of non-sampled tea gardens were obtained and finally 68 items were selected under five dimensions of the index followed by testing of their content validity and reliability of the index. This GDI may be used as an effective instrument to unravel gender disparities in tea gardens and other similar plantations' estate.

INTRODUCTION

The tea plantations are mainly situated in rural and backward regions of the country, providing crucial livelihoods and employment opportunities to the local population, effectively contributing to regional economies (Shen & Chou, 2022). The socio-economic nature of the plantation sector, which depends primarily on manpower and has made few technical developments, makes it unique (Dishanka & Ikemoto, 2014; Dishanka et al., 2021; Rout & Samantaray, 2022). Employment within tea gardens often follows a family-based system, with workers committing their lifetime labour in exchange for shelter security (Das, 2016; Bhattacharyya, 2019; Sarkar, 2019b). The tea industry offers employment to both men and women, but they encounter distinct attributes, activities, and norms associated with their gender roles (Sita & Herawati, 2017). Unfortunately, women, particularly the most vulnerable section of society, face various challenges and hardships within

this industry (Sarkar et al., 2016; Roy, 2017). Gender discrimination persists, as women workers receive unequal pay, limited chances for advantage, and substandard working conditions (Bhattacharyya, 2019; Sarkar, 2019a). Women are also frequently excluded from decision-making processes and may suffer from harassment and abuse (Kubendran, 2020). Study uncovers a pyramid-shaped employment hierarchy in the tea sector, where key roles like Managers, Deputy Managers, and Assistant Managers hold central positions (Saha et al., 2019). At the bottom, over 90 per cent of the labour force, consisting of both genders, comprises permanent and temporary workers earning daily wages. This hierarchical structure is deemed exploitative, reminiscent of the British colonial system. Previously Behal (2014); Saha et al., (2019) highlighted exploitative work patterns, low wages, deplorable housing and living conditions, and the lack of collective bargaining provisions faced by workers on tea estates.

Recognizing gender roles, differences, and inequalities is crucial to improve the living conditions of tea garden workers. Various strategies and policies have been devised to address these disparities and harness their full potential (Bhati et al., 2023). Gender equity goes beyond mere gender parity, striving to offer equal opportunities to all genders, redressing historical and social imbalances, and ensuring fairness and justice in distributing resources. Measures based on gender equity are vital to uplift the lagging gender in society, and it is essential to gauge how the farming community perceives and embraces these measures. Existing assessment tools for gender disparity as mentioned by the respected Reviewer have been referred and it was found that these indexes have mostly dealt with the women empowerment with respect to production, resources, income, leadership, and time (Raj et al., 2022). Similarly, gender inequality index of UNDP uses three dimensions to measure reproductive health, empowerment, and labor market participation (UNDP, 2020). Thus, these tools fall short in capturing the unique dynamics of tea garden workers, whose gender describes roles like plucking, pesticide spraying, and pruning vary significantly across the male and female workers, thus necessitating tailored evaluations. The above mentioned text is incorporated to justify the crafting of a gender disparity index to unveiling the tea garden workers' gender dynamics.

METHODOLOGY

While developing this composite GDI, a combination of the Harvard analytical and Moser frameworks for gender analysis was utilized for identifying various dimensions. For the final inclusion of the dimensions in the index, the relevancy of each dimension was tested based on the experts' ratings. Similar approaches were used by Chaudhari et al., (2010); Mukherjee et al., (2018); Vijayan et al., (2022) in their respective studies. Dimensions with relevancy percentage (RP) above 85, relevancy weightage (RW) above 0.85, and mean relevancy score (MRS) above 2.40 were included in the index; thus, five dimensions were chosen for further consideration.

In the initial phase, a comprehensive literature review led to the creation of a list comprising 92 potential items. To ensure validation and item significance, a panel of experts linked to the tea plantation sector, including universities, colleges, KVKs, Government of India, and the Tea Board of India, were consulted. The 56 experts participated in an online survey to establish the level of relevancy. To ensure the relevance of the items, item analysis was performed. based on criteria suggested by Edward (1957). The items were screened and a total of 72 items were administered to the 60 tea garden workers of non-sampling tea gardens in Kalimpong district of West Bengal obtained their responses in terms of agreement on 3-point continuum scale; thereafter, 68 items were selected following the Likert's Summated Rating Technique (1932). To categorize the respondents based on their responses, the total summated scores of the items for each respondent were calculated and the respondents were ranked in descending order. The top 25 per cent of respondents with the highest scores formed the high group, while the bottom 25 per cent with the lowest scores constituted the low group. Each group comprised 15 respondents. t-statistics was calculated for each item considering the mean scores of high and low groups. Similar

approaches were used by Ghosh et al., (2011); Bareh & Ghosh (2016); Kumar et al., (2016) & De et al., (2023) in their respective studies. Thus 68 items with significant t-statistics were included under the five dimensions of GDI. Subsequently, the content validity of each item was tested based on significant Pearson's correlation coefficient (r) values, and reliability was worked out following the split-half techniques.

RESULTS AND DISCUSSION

Domain selection and relevancy of dimensions

The construction of the GDI started by choosing the dimensions given in both Harvard analytical and Mosser frameworks for gender analysis and as described in methodology The dimensions included in GDI were activity profile of tea garden workers (D1), factors influencing the differing roles of male and female workers (D2), decision-making behaviour (D3), gender roles in tea gardens (D4), gender-specific needs for both men and women tea garden workers (D5); two excluded dimensions were access and control profile, control and access of resources dimensions based on t value and relevancy of each dimension.

Item selection and final inclusion of items

On the basis of 56 judges who returned the evaluated set of items, a total of 72 items were retained and were subsequently considered to obtain the responses from 60 tea garden workers of non-sampling areas/ tea gardens. Experts' responses were tabulated and analysed to derive RP, RW, and the overall MRS for each item by given formulas.

$$RP = \frac{\text{Frequency score of most relevant and relevant}}{\text{Number of judges}} \times 100$$

$$RW = \frac{\text{Actual score obtained for the item}}{\text{Maximum possible score obtainable for the item}}$$

$$MRS = \frac{\text{Actual scores obtained for the item}}{\text{Number of judges responded}}$$

The estimated value of RP fallen between 80.00 (minimum) and 96.36 (maximum) percentages. A range of 0.75 (minimum) to 0.92 (maximum) score was obtained for the estimated value of RW. The calculated value of MRS was found in the range of 2.24 minimum to 2.76 maximum.

Total respondent scores were computed by summing all item scores. Respondents were ranked in descending order. To conduct item analysis, the top 25 per cent and bottom 25 per cent of respondents based on total scores were chosen as high group and low group respondents, respectively. Employing the t-test, each item was evaluated using responses from these two groups, employing a specific formula. A distribution between 2.46 and 8.62 was obtained for the computed t-value. Later, the 68 items having a t value of >3.75 were included in the final index.

Standardization of the index

Split-half method was employed to test the reliability and the reliability coefficient was obtained as 0.766.

Table 1, 2, and 3 displayed items alongside their corresponding Relevancy Percentage, Relevancy Weightage, and Mean Relevancy Scores. It comprises 68 deliberately chosen items, spanning five dimensions, to effectively measure gender disparity within the tea sector with a harmonious blend of positive and negative content, ensuring impartial responses. Among these, 21 items are grouped under the domain of activity profile, 20 items to assess gender-related needs, 10 targeting gender role identification, 9 for scrutinizing decision-making behaviour, and 8 for comprehending influencing factors. This index administered to both male and female tea workers to reveal the gender dynamics of tea garden workers. Following a similar methodology, Chaudhari et al., (2010);

Mukherjee et al., (2018) & Roy et al., (2022) also developed indices to assess entrepreneurial behaviour of dairy farmers, farmers' attitudes towards Farmers Producing Companies (FPCs), and FPC role performance respectively. Similarly, Raj et al., (2022) delved into gender empowerment among cassava farmers in Kanyakumari district of Tamil Nadu, considering empowerment domains such as production, resources, income, leadership, and time. Roy et al., (2022) devised an empowerment index for women's Self-Help Groups (SHGs), employing it to analyse 290 SHGs in North 24 Parganas, West Bengal. This GDI may be used as an effective instrument to unravel gender disparities in tea gardens and other similar plantations' estate.

Table 1. Selected items under the dimension- activity profile of tea garden workers

Dimension/Items	RP	RW	MRS	t value	r value
Activity profile (D1)	93.91	0.90	2.49	7.740**	0.851**
Field activity in a tea garden					
Land preparation	89.09	0.85	2.56	5.551**	0.873**
Infilling operation	87.27	0.84	2.51	5.667**	0.881**
Transplanting operation	87.27	0.82	2.47	3.372**	0.833**
Creation of drainage	85.45	0.82	2.47	8.271**	0.906**
Manuring	85.45	0.82	2.47	4.504**	0.890**
Tipping activity	85.45	0.80	2.40	4.019**	0.800**
Plucking	89.09	0.82	2.47	3.378**	0.781**
Sprinkler irrigation	85.45	0.79	2.36	4.504**	0.875**
Spraying pesticides	87.27	0.82	2.47	3.378**	0.890**
Weeding	83.64	0.80	2.40	4.163**	0.828**
Pruning activities	85.45	0.82	2.45	6.497**	0.878**
Hoeing activity	87.27	0.82	2.47	5.551**	0.920**
Transporting of the plucked leaves	81.82	0.77	2.31	8.017**	0.892**
Factory activities					
Operation of machines	83.64	0.78	2.35	6.816**	0.848**
Withering activity	89.09	0.78	2.33	4.946**	0.884**
Rolling operation	85.45	0.78	2.35	5.828**	0.880**
Fermenting of tea leaves	83.64	0.77	2.31	6.623**	0.907**
Drying activity	85.45	0.81	2.42	5.551**	0.869**
Sorting of tea leaves	87.27	0.81	2.44	8.017**	0.912**
Packaging	83.64	0.78	2.33	8.017**	0.927**
Transportation activities	80.00	0.75	2.25	6.816**	0.874**

** Significant at 0.01% level of significance

Table 2. Selected items under the dimensions-influencing factor, decision-making behaviour, and gender roles of tea garden workers

Dimensions/Items	RP	RW	MRS	t value	r value
Influencing factor (D2)	96.39	0.90	2.71	5.114**	0.787**
Community norms	94.55	0.88	2.65	4.163**	0.776**
Social hierarchy	94.55	0.88	2.65	4.163**	0.776**
Lack of literacy	94.55	0.86	2.58	3.710**	0.761**
Men dominance	92.73	0.81	2.44	3.679**	0.653**
Legal parameters	87.27	0.78	2.35	3.889**	0.726**
Higher exposure of men	90.91	0.83	2.49	4.163**	0.731**
Being trained	89.09	0.80	2.40	5.491**	0.810**
Differential wages for men and women	90.91	0.86	2.58	4.192**	0.792**
Decision-making behaviour (D3)	94.55	0.91	2.40	7.578**	0.877**
Household expenditure	89.09	0.81	2.44	4.946**	0.750**
Expenditure on education of child, health, etc.	92.73	0.83	2.49	4.837**	0.776**
Savings and capital transactions	87.27	0.84	2.51	5.667**	0.852**
Small non-interest loans	85.45	0.80	2.40	8.628**	0.851**

Table 2 contd...

Dimensions/Items	RP	RW	MRS	t value	r value
Domestic work duration	85.45	0.78	2.35	6.623**	0.833**
Tea garden work duration	80.00	0.76	2.27	6.623**	0.807**
Equal wage for both male and female	89.09	0.84	2.53	5.491**	0.689**
Involvement of children or any other member	89.09	0.83	2.49	5.551**	0.769**
Socio-religious decision-making	89.09	0.82	2.47	5.667**	0.759**
Gender roles (D4)	94.55	0.91	2.51	5.794**	0.771**
Domestic roles					
Purchase household essentials	96.36	0.88	2.64	4.837**	0.774**
Livestock care	92.73	0.86	2.58	6.510**	0.809**
Leisure time	90.91	0.83	2.49	4.769**	0.724**
Import drinking water	89.09	0.84	2.51	4.266**	0.814**
Food storage	90.91	0.84	2.51	5.828**	0.805**
Community roles					
Community activities	96.36	0.88	2.65	4.837**	0.787**
Social organisation membership	92.73	0.85	2.56	4.192**	0.767**
Social gatherings	94.55	0.84	2.51	6.510**	0.813**
Religious gatherings	90.91	0.79	2.38	4.163**	0.726**
Political events	89.09	0.76	2.29	4.163**	0.828**

** Significant at 0.01% level of significance.

Table 3. Selected items under the dimension-gender needs of tea garden workers

Dimension/Items	RP	RW	MRS	t value	r value
Gender need assessment (D5)	92.73	0.88	2.65	6.408**	0.861**
Practical domestic needs					
Education is basic need	96.36	0.91	2.73	4.163**	0.530**
Health facility is important	96.36	0.90	2.71	2.876**	0.535**
Access to information is important	92.73	0.87	2.60	4.163**	0.623**
Childcare facilities is need	96.36	0.86	2.58	3.797**	0.610**
Availability of alternate income source	90.91	0.84	2.53	4.759**	0.476**
Strategic domestic needs					
Good societal status is important.	92.73	0.81	2.44	4.163**	0.580**
Ownership of resources is important for your decision making	92.73	0.84	2.53	4.769**	0.712**
Control of resources is basic need.	96.36	0.81	2.44	4.745**	0.766**
Leadership is needed.	90.91	0.85	2.55	4.76**	0.760**
House ownership is important	89.09	0.81	2.42	5.551**	0.766**
Access to credit is need	85.45	0.83	2.49	3.894**	0.715**
Practical plantation needs					
Crucial tea skills (transplanting, tipping, etc.)	92.73	0.84	2.51	4.83**	0.772**
Equipment accessibility	92.73	0.83	2.49	4.372**	0.733**
Knowledge of intercultural practices	87.27	0.78	2.35	4.769**	0.711**
Knowledge of pesticides, fertilizer, and manure application	87.27	0.80	2.40	4.769**	0.662**
Daily workplace transport	94.55	0.86	2.58	2.463**	0.707**
Strategic plantation needs					
Training/ Exposure	89.09	0.85	2.55	4.204**	0.662**
Expert advice	92.73	0.84	2.51	5.078**	0.758**
Scale-neutral wage system	92.73	0.84	2.51	4.759**	0.683**
Domestic and export market information	90.91	0.78	2.35	5.507**	0.697**

**Significant at 0.01% level of significance

CONCLUSION

The developed index covers five dimensions of disparity viz. activity profile of tea garden workers, factors influencing the differing roles of male and female workers, decision-making behaviour, gender roles in tea gardens, gender-specific needs for

both men and women tea garden workers and includes 68 items to unveil the gender dynamics of tea garden workers. Recognizing the persistence of gender disparities, especially in non-organizing sectors like plantations, the information derived from this index may be assist administrators and policymakers in making unbiased decisions while planning programs or projects to promote gender

equality. Additionally, with suitable modifications, this index could be adapted for use in different appropriate fields. The obtained results can be instrumental in devising strategies to combat gender bias in non-organizing sectors and rural communities, fostering a world that offers equal opportunities and standing for all genders.

REFERENCES

- Bareh, P., & Ghosh, S. (2016). Self-help group effectiveness index and empowerment index: An analytical approach for monitoring and evaluation of SHG. *Journal of Community Mobilization and Sustainable Development*, 11(2), 182-187.
- Bhati, K., Patel, M., & Pandya, R. D. (2023). Attitude of farm families towards gender equity: development and validation of a scale. *Indian Journal of Extension Education*, 59(2), 121-123.
- Bhattacharyya, S. (2019). Socio-economic status of tea garden women workers: A case study. *International Research Journal of Multidisciplinary Studies*, 5(4), 1-5.
- Chaudhari, R. R., Hirevenkanagoudar, L. V., Hanchinal, S. N., Mokashi, A. N., Katharki, P. A., & Banakar, B. (2010). A scale for measurement of entrepreneurial behaviour of dairy farmers. *Karnataka Journal of Agricultural Sciences*, 20(4), 792-796.
- Das, N. K. (2016). Making of tea tribes in Assam: Colonial exploitation and assertion of adivasi rights. *Journal of Adivasi and Indigenous Studies*, 3(1), 1-16.
- De, H. K., Saha, G. S., Mahapatra, A. S., Mohanty, U. L., Rath, D. P., Shasani, S., & Panigrahi, A. (2023). Measuring women empowerment in aquaculture- An empirical study. *Indian Journal of Extension Education*, 59(2), 108-112.
- Dishanka, S., & Ikemoto, Y. (2014). Social development and labor productivity: The problem and a solution for the tea plantation sector of Sri Lanka. *Colombo Business Journal*, 5(1), 67-80.
- Dishanka, S., Sakurai, T., & Ikemoto, Y. (2021). Equity and efficiency in women-empowered contract farming: An explanatory case study on the tea estate sector of Sri Lanka. *Journal of Economics and Behavioural Studies*, 13(6), 40-54.
- Edwards, A. L. (1957). *Techniques of attitude scale construction*. Vakils, Feffer and Simons Private Ltd., Mumbai.
- Ghosh, S., Nanda, P., & Kumar, A. (2011). Formulation of group dynamics effectiveness index and steps to mobilise users' group for participatory water management. *Indian Journal of Extension Education*, 47(1&2), 1-7.
- Kubendran, C. (2020). Gender discrimination in tea plantation in Munnar, Kerala. *International Journal of Management*, 11, 4383-4393.
- Kumar, R., Slathia, P. S., Peshin, R., Gupta, S. K., & Nain, M. S. (2016). A test to measure the knowledge of farmers about rapeseed mustard cultivation. *Indian Journal of Extension Education*, 52(3&4), 157-159.
- Likert, R. (1932). *A technique for measurement of attitude*. Archives of Psychology, 140, 1-54.
- Mukherjee, A., Singh, P., Rakshit, S., & Burman, R. R. (2018). Development and standardization of scale to measure farmer's attitude towards farmers' producer Company. *Indian Journal of Extension Education*, 54(4), 84-90.
- Raj, A., Jaganathan, D., Prakash, P., & Immanuel, S. (2022). Women's empowerment index in cassava: An innovative tool for gender mainstreaming. *Indian Journal of Extension Education*, 58(4), 42-45.
- Rout, S., & Samantaray S. (2022). *Interplay of artificial intelligence and ecofeminism: a reassessment of automated agroecology and biased gender in the tea plantations*. Proceedings of the 2022 International Conference on Advancements in Smart, Secure and Intelligent Computing (ASSIC), Bhubaneswar, India, 22889261, 1-6.
- Roy, H., Jirli, B., & Maji, S. (2022). Measuring the role performance of farmer producer companies: An index development perspective. *Indian Research Journal of Extension Education*, 22(3), 49-57.
- Roy, S. (2017). Women labour in the tea gardens of West Bengal: Changing orientation and emerging challenges. *International Journal of Engineering Development and Research*, 5(4), 862-868.
- Saha, D., Bhue, C., & Singha, R. (2019). *Decent work for tea plantation workers in Assam: Constraints, challenges, and prospects*. Tata Institute of Social Sciences, Guwahati Campus.
- Sarkar, K. (2019a). *Low wages and gender discrimination: The case of plantation workers in West Bengal*. NLI Research Studies Series No. 136, V.V. Giri National Labour Institute, Noida.
- Sarkar, S. (2019b). Labour migration in the tea plantations: colonial and neo-liberal trajectories of plantation labour in the dooars tea belt of West Bengal. *Journal of Migration Affairs*, 2(1), 25-43.
- Sarkar, S., Chowdhury, A., Roy, P., & Chowdhury, M. (2016). Socio-economic status of the tea garden women workers: A case study from sub-Himalayan regions of West Bengal, India. *International Journal of Applied Research*, 2(10), 681-684.
- Shen, J., & Chou, R. J. (2022). Rural revitalization of Xiamei: The development experiences of integrating tea tourism with ancient village preservation. *Journal of Rural Studies*, 90, 42-52.
- Sita, K., & Herawati, E. (2017). Gender relation in tea plucking workers: A case study of gender division of labour and gender relation in Gambungtea plantation, West Java. *Sodality: Jurnal Sosiologi Pedesaan*, 5(1), 1-8.
- UNDP (2020). *Human Development Reports*. <https://hdr.undp.org/data-center/thematic-composite-indices/gender-inequality-index/#/indices/GII>
- Vijayan, B., Nain, M. S., Singh, R., & Kumbhare, N. V. (2022). Knowledge test for extension personnel on National Food Security Mission. *Indian Journal of Extension Education*, 58(2), 191-94.