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# Environmental awareness among tea labors towards local issues

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## ABSTRACT

*The adverse effects of hazardous chemicals used in tea gardens as well as the significant potential risks to the human life and its supporting systems are not properly recognized till now in Assam. Injudicious use of chemical fertilizers, pesticides in the tea gardens have become a cause for serious concern as it has adverse effect on soil and water environment and on its populations. Economics, social studies and environment aspects are integrated into the development processes presently by developed countries. But in India, particularly in Assam practically still there are big gap among them. This study focuses on use of common chemicals in tea gardens with hazardous characteristics and their hazards impact on populations and environmental awareness among tea labors in Golaghat district of Assam, India. It evaluates the awareness of a group of 250 tea labors from 8 tea gardens. The 250 respondents were selected based on stratified random sampling method. A set of questionnaire which comprised of 15 questions was applied as instrument for data collection. The study reveals that there a significant difference observed between two gender groups while environmental awareness results indicated that there were significant differences among different levels of education. The study concluded that increase on age and educational level would improve the level of awareness among the labors.*

**Keywords:** Tea labors, environmental awareness, environmental education, hazardous characteristics.

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## INTRODUCTION

Large scale anthropogenic activities to natural environment accelerate threats to the human beings through water scarcity, food scarcity and infectious diseases. Deterioration of soil and water quality due to geological conditions and injudicious use of agrochemicals and pesticides in tea gardens is now a serious issue in tea industries of Assam. The adverse effects of hazardous substances as well as the significant potential risks posed by them to the human life and its

supporting systems are not properly recognized till now in Assam. Economics, social studies and environment aspects are integrated into the development processes presently by developed countries. But in India, particularly in Assam practically still there are big gap among them. Awareness, knowledge, attitudes, skills and participation are the mail goal and objectives of environmental education curriculum recommended by UNO [1]. The UNESCO-UNEP International Environmental Education Programme has also emphatically pointed out to improve the effectiveness of environmental education system which has its grips on environmental pedagogy that required at present at all levels of education system [2]. The main aim of environmental educational programme is to provide scientific knowledge and insight into the real nature, scope, importance and conceptual clarification of the issues involved which is inevitable for sustainable development [3]. Environmental education is most effective in creating long-lasting behavioural changes that encourages people to explore, investigate issues and seek solutions regarding the environment and related social problems [4].

Environmental education is a recent origin in Assam. Although it is compulsory in CBSE curriculum, still Assam government has not implemented it as a compulsory subject. Environmental awareness is necessary to achieve environmental protection and restoration and public must have a basic clutch of environmental problems [5]. Today's world, national civilization is measured with the help of environmental awareness. It reflects many aspects of environmental status, such as personal consideration and behavior, public capacity, and attitude towards sustainable society as a whole [6]. Environmental education is one of the crucial means to develop people's understanding, awareness, beliefs and attitudes concerning the environment. Environmental awareness is defined as an understanding of natural systems with human social system [7]. Therefore environmental awareness is one of the challenging issues of environmental protection, sustainability and better achievements in productivity.

Tea is one of the oldest well organized and self regulated industries in India. It was started in 1834 in Assam, still the premier producing state in India. Assam contributes 15.6 percent of world tea production and 55 percent of country tea (Assam variety *Camellia sinensis var Assamica*) output. Falling exports, low growth of domestic consumption, expansion and proliferation of Tea Estates, production of larger quantities of plain and medium varieties of tea at the cost of quality tea, and increasing costs of production and marketing, precipitated sort of crisis in the Assam's tea Industry in the last ten years [8]. Golaghat District of Assam contributes 4.5 percent of country's orthodox tea and flavored tea output and more than 24 percent of states total tea production. It is estimates that 40 percent of tea bushes are over 50 years of age and 10 percent are of between 40- 50 years [9]. In course of time the number of tea plantations in Assam was steadily increasing and this created constant demand for a larger number of laborers. But the need could not be filled by the local laborers. Hence British government migrated and recruited various cultural, linguistic, ethnic groups from many other provinces mainly from Bengal, Bihar, Orissa, Madhya Pradesh, Andhra Pradesh and Tamil Nadu. Since British period these tea labors were economically, educationally belongs to backward strata of class. Relation between tea quality product and the environmental awareness among the tea labors is a matter of serious concerns at present as it is a social issue and increase in environment awareness among tea labors can increase productivity. Environmental awareness towards local environmental issues has not been explored much in tea garden localities. Therefore there is an urgent need to study the

environmental awareness among the labors of tea gardens of Assam for better and quality production of tea output.

## METHODOLOGY

This is a community based cross sectional study. It was conducted in 8 tea gardens which were randomly selected by lottery method from 35 tea gardens in Golaghat District of Assam representing all geographical locations to avoid any biasness of the data.

### Samples

The sample for this study consisted of tea labors in eight tea gardens from Golaghat District of Assam, namely Rungagora, Borjan, Negheriting, Balijan, Banwaripur, Khomtai, Rungajaun and Behora. The sample size was chosen based on stratified random sampling method. A total of 250 tea labors (5.4 % of total population) were selected during the year 2009. Golaghat district is cartographically confined with latitudes of $25^0$45 N and $27^0$10 N and Longitudes of $93^0$30 E and $94^0$22 E. Total geographical area of the district is 3502 sq. km. It is bounded in the north by Sonitpur District on the east by Jorhat District on the south Karbi Anglong and Nagaon District and the west by Nagaland. In this study tea gardens were selected based on the annual production, ownership of the tea gardens and total area of plantation.

**Table 1: List of selected tea gardens and their status**

| Tea Gardens | Status of the Gardens |
|---|---|
| Rungagora | Public Ltd. (ABITA) |
| Negheriting | Govt. Undertaking (ABITA) |
| Rungajaun | Private Ltd. (2nd Maximum Area) (NETA) |
| Behora | Public Ltd (Maximum Production) (ABITA) |
| Banwaripur | Partnership Firm (ATPA) |
| Khomtai | Public Ltd (Maximum Area) (ITA) |
| Balijan | Proprietary (ATPA) |
| Borjan | Private Ltd. (ABITA) |

*ABITA: Assam Branch Indian Tea Association; NETA: North East Tea Association; ATPA: Assam Tea Planters Association; ITA: Indian Tea Association.*

### Instruments

A questionnaire was designed encompassing 15 questions of were distributed and discussed with them. Stratified random sampling method was applied to evaluate the subpopulations including level of education, gender and age in this work [10]. To measure environmental awareness that is the concern for what is happening in the environment, a series of questions inquiring about the global environment were asked. The acquisition of values, feelings, and motivations towards the environment, questions, regarding the environmental issues were also used. Permission was obtained from the authorities of each tea garden to carry out this study. The data were collected in two different ways, firstly from their work place at the time of working and secondly at their residences commonly known as *line*. The study was carried out October 2008 to March 2009. The questionnaires distributed among the different age group of labors as well as different

genders. The respondents had about 10 to 15 minutes to answer the questionnaire. Out of the total respondents 57% were male labors and 43% female labors. All respondents were of three types of age groups firstly between 15-25 years, 25-40 years and >40 years.

A total of 15 marks was computed whereby for 15 questions that were given, each question represents to has 1 score. If the respondent had selected the correct answer they were given 1 score and for wrong answer they will set 0 score. Respondent's awareness on environmental awareness was categorized according to the composite score of responses of fifteen questions. Respondents who score 0 to 5 have a low awareness, 6 to 10 moderate awareness, and 11 to 15 have a high awareness on environment.

**Analysis**

Descriptive statistical technique was used to analyze data from the questionnaire. Independent samples t-test was used as a test of statistical significance. The procedure was applied to compare means of the two independent groups of variables (male and female). For three groups of age including 15-25, 26-40, >40 and educational level (below VII standard and above), One Way ANOVA was applied. The collected data were analyzed utilizing the Statistical Package for the Social Sciences (SPSS-Version13.0).

## RESULTS AND DISCUSSION

Environmental awareness among respondents was assessed based on the responses to 15 questions on environmental subjects. Analysis of composite scores that computed from individual scores averages shows that majority of respondents (67.82 %) were unknown about environmental awareness, 32.18% were aware about it**.** An independent sample t-test was conducted to evaluate whether there are any difference between genders groups (male and female respondent) regarding to the environmental awareness level. The statistical t- test in this survey between the male and female groups shows the mean for male is slightly higher than female, 10.29, 9.16 and with ± SD 2.981 and ± SD 2.453 respectively and conclude no significant difference in environmental awareness between the two groups [t =0.385, p=0.600] **(Table 2)**.

**Table 2: T-test for Comparing Environmental Awareness between Gender Groups**

| | Gender | N | Mean | SD | t | p |
|---|---|---|---|---|---|---|
| Total awareness Scores | Male | 143 | 10.29 | 2.981 | 0.385 | 0.600 |
| | Female | 107 | 9.16 | 2.453 | | |

This is indicates that male labors has slight higher environmental awareness than female respondents. A One Way ANOVA was conducted to investigate whether there are any differences in environmental awareness scores between different educational levels **(Table 3)**.

**Table 3: One Way ANOVA for Comparing Awareness between Educational Groups**

| Educational Level | N | Mean | SD | sig |
|---|---|---|---|---|
| Below VIII | 71 | 2.59 | 2.074 | |
| VIII-X | 166 | 9.77 | 2.341 | 0.009 |
| Higher | 13 | 10.03 | 2.647 | |

**Table 4: One Way ANOVA for Comparing Awareness between Age Group**

| Age Groups | N | Mean | SD | sig |
|---|---|---|---|---|
| 15-25 Years | 45 | 2.013 | 2.074 | |
| 26-40 Years | 109 | 8.776 | 2.341 | 0.002 |
| >40 Years | 96 | 10.713 | 2.647 | |

**Table 5: Common diseases among tea populations with in the study periods**

| **Diseases** | **Number of Incidences reported** |
|---|---|
| Cancers | 1(M-1, F-0) |
| Birth defects | 13 |
| Skin diseases | 46(M-33, F-13) |
| Respiratory diseases | 102(M-66, F-36) |
| Water born diseases | 89(M-23,F-66) |

**Table 6: Chemicals used in Tea Gardens**

| | |
|---|---|
| Nitrogenous fertilizers | Ammonium Sulphate, Ammonium Chloride, Urea. |
| Phosphatic fertilizers | SSP, TSP, Muriate of potash, Potassium Sulphate. |
| Compound fertilizer | DAP, IFFCO-10-26-26. |
| Pesticides | Burgandy mixture, Porenox Mixture, Blitox 50, DDT, Lime Water, BHC, Tedoin ,V-18 |
| Herbicides | Dicofol, 2,4-D, Glyphosate, Dalapon, Diuron, Simazine. Paraquat |
| Fungicides | Blitox (Copper oxy chloride), Endosulfan, Malathion |
| Green Manure | Medeloa, African medeloa, Dhancha |

The environmental awareness among the three level of educational levels indicates that higher than “X” standards respondents have more awareness towards environment than the other two other groups. Also results showed that there was a significant difference at the $p<0.05$ level in

environmental awareness scores for the three age groups. This is indicates that older age groups respondents have more awareness towards the environment than the two other groups **(Table 4)**.

Common incidences occur among the tea labors during the study periods and common chemicals used by tea industries are presented in the **Table 5** and **Table 6** respectively.

As the use of chemicals in tea gardens was a long back practice, it is difficult to elimination the use of hazardous chemicals in tea industries totally. In this study it was found that more than 70% tea labors were unaware about the hazardous effects of common chemicals use in tea gardens. The respondents were more concerns about environment when the environmental impacts were more specifically related to their lives i.e. diseases suffered by the respondent's or their relatives [11].

## CONCLUSION

Overall, results demonstrated that the majority of tea labors in this study had a low level of environmental awareness. Regarding gender, the present study revealed a significant difference between two genders on environmental awareness. The environmental awareness of the labors in this study showed that the increase of age and educational level regardless of gender differences have shown significant differences. Environmental awareness among gender groups showed that there was no significant difference between male and females between ages 15-25 years of age. This was due to the level of learning and interest in environmental issues has no relation with gender [6]. However, different genders have different awareness on increasing age. Earlier studies also reported such results that higher education level labors showed high awareness [12], [13]. Although overall awareness was low in this study, some of the findings in the present study gave a good indication of environmental awareness among labors which may come from the advertisement through electronic media as well from radio and televisions.

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