



## Status of water supply, Sanitation and Hygiene practices among the Tea Garden population of Assam-A case study in Barbaruah and Jamira Tea Estate of Dibrugarh District, India

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### Abstract

Assam, one of the prominent states of North Eastern Region, has its name and fame for extensive tea production, processing and export activities. Ironically, the tea garden workers which are integral part of this process and the whole Assamese society are still underprivileged section of the society. Therefore, there is every need to study the health related aspects and living status of this section of population. Whether they are getting the basic human needs in the aforesaid areas are a matter of question. Therefore this paper tries to analyze the status of water supply, sanitation and hygiene practices among the tea garden population of Assam and also trying to highlight the real problems associated with this matter.

**Keywords:** Water supply, sanitation, hygiene practice, tea garden population, Assam.

### Introduction

Assam, a state of India, is located in the north eastern region of the country. It is ranked 16<sup>th</sup> in area wise and rank 14<sup>th</sup> in population wise, compared to the whole country. Assam has the honour of sharing India's major share of tea production and export. The various tea gardens of Assam have their colonial origin starting since early 19<sup>th</sup> century. Historically, Assam has been the second commercial tea production region after southern China<sup>1</sup>. It bears the highest share of tea production and export in India. The Assam tea bush grows in a lowland region, in the valley of the Brahmaputra River, an area of clay soil rich in the nutrients of the flood plain<sup>1</sup>. The climate varies between a cool arid winter and a hot humid rainy season<sup>1</sup>. This climatic condition is ideal for growing tea. Assam is one of the most prolific tea producing regions of the world<sup>2</sup>. Each year, the tea estates of Assam collectively yield approximately 1.5 million pounds (680,400 kg.) of tea<sup>3</sup>.

**Profile of Dibrugarh District and rationale for taking this district under study:** Dibrugarh is a prominent district of upper Assam with an area of 3381 km<sup>2</sup> and a population of 1,327,748 (According to 2011 census)<sup>1</sup>. It has 7 development blocks. Tea and oil are the major revenue earners of the district<sup>1</sup>. Dibrugarh has the world's largest area covered by tea gardens<sup>1</sup>. The entire district is surrounded by tea plantations and tea factories<sup>1</sup>. It has more than 800 tea gardens and this number is increasing day by day due to the inclusion of new small and medium tea gardens by the individuals and groups. Many tea gardens are more than 100 years old<sup>3</sup>.

**Objective of the study:** The basic objective of the study is i. To know the status of water supply in the tea gardens for the workers. ii. To study the sanitation practices and its adequacy among the tea garden population. iii. To understand the hygiene practices adopted by the tea garden workers and their family and loopholes associated with it

### Methodology

The methodology of this research paper is based on both primary and secondary sources of data. Primary data is collected from two tea gardens of Barbaruah block of Dibrugarh district. The names of the studied gardens are Barbaruah Tea Estate and Jamira Tea Estate. First one is located near to the National Highway 37 and the second one is approx. 15 km away from it. The household under study (100 households; 50 each for two tea gardens) are taken randomly from various lines of the tea garden workers. There are both permanent and casual workers under the study.

Secondary data is used for general information on tea, Assam's share of it and for giving the detailed profile of the study areas. It is collected through various journals, research articles, newspaper of online and offline sources.

**Review of literature:** Medhi G.K., Hazarika N. C., Shah B. and Mahanta J. in their research paper "Study of health problems and nutritional status of tea garden population of Assam" are stating that India as a whole is experiencing health transition<sup>4</sup>. This transition can be viewed as a change of disease pattern<sup>4</sup>. The communicable diseases and epidemics are decreasing over the time, while the non-

communicable diseases (NCDs) are increasing<sup>4</sup>. But in case of poor and vulnerable groups of the society, both types of diseases are still prevalent.

Stating about the role of tea as agro based industry and contributor to state domestic product; they are further expressing that tea garden population constitutes approximately 1/5<sup>th</sup> of states total population<sup>5</sup>. Poor socio economic conditions, ignorance due to illiteracy, overcrowded and unhygienic living conditions in the residential colonies make tea garden population vulnerable to various communicable diseases and malnutrition<sup>5</sup>.

The authors did a detailed study and survey in Dibrugarh district and examined the presence of diseases like respiratory infection, diarrhea, skin infection, leprosy, filariasis, gastro-intestinal problem and back pain problem. Stroke and epilepsy problems were also recorded case wise<sup>5</sup>.

The educational status, nutritional status and sanitary practices are also surveyed in a detailed manner in this paper. They felt urgent need for intervention of Govt. health department and garden authority to reduce the diseases and improve the sanitary practices, water supply and nutritional status of the tea garden labourers. Proper education, especially health education is felt urgently important by the authors.

**Sarma G.** In this paper “A case study on socio economic condition of tea garden labourers- Lohpohia Tea Estate of Jorhat District, Assam” has stated about the causes of poverty, ignorance and illiteracy of labourers in the tea garden<sup>6</sup>. He takes the objective to study the socio-economic backwardness of labourers of the proposed tea gardens of his study<sup>6</sup>. Awareness and involvement of the labourers in common social and political aspects are also taken into purview<sup>6</sup>.

In this paper it has been stated that general living conditions of the labourers are poor and unhygienic. Most of the labourers use open space as toilets. They don't have any accessibility to safe and pure drinking water. Most of them are prone to the bad habits like drinking and consuming some other health hazardous intoxicants. Illiteracy and extreme poverty is also commonly seen. Immediate actions to uplift the socio economic condition of the labourers are highly felt necessary on the part of Govt. and tea garden owners and management authority.

**Tea tribes' welfare department, govt. of Assam** in their publication entitled “Chief Minister's Water, Sanitation and Health Programme for the Tea and Ex Tea Garden Tribes in Assam” Stated that Prevalence of gastrointestinal diseases is common in the tea gardens of Assam. Various factors are responsible for that, out of which lack of

sanitation facilities and unsafe drinking water is held as the prime cause by this paper. The publication further adds that water supply, sanitation and health facilities (shortly known as WASH facilities) are generally provided by the garden management. But often such provision is inadequate, ill managed and technically non viable with over expensive nature. A study conducted by Tea Tribes Welfare department, Govt. of Assam, noticed that, there is significantly large gap existing in the investment made by management authority in WASH facilities and the actual facilities enjoyed by the tea garden population. The study was conducted in Dibrugarh, Tinsukia and Sibsagar districts of Assam.

The study further reveals that, there is no community participation in provision of sanitation and water facilities. Therefore, tragedy of commons eventually arises and facilities provided by the tea management become unsustainable. The tea garden community has over dependence on tea management authority which is very much against the principles of community participation<sup>7</sup>. Hence, there is a strong case for generating community awareness for not only participation in use and maintenance but also common understanding of health benefits arising out of safe water and sanitation facilities<sup>7</sup>.

The article further stated some of the limitations in the tea garden areas of Assam in the smooth implementation of water supply and sanitation programme. These are i. The tea garden labourers are not categorised as APL/BPL1. As a result, rural development programmes are hard to implement in these areas<sup>7</sup>. ii. The geographical areas of the tea gardens are not in adherence to the administrative jurisdiction of gram panchayats, blocks, districts etc<sup>7</sup>. iii. The tea garden management authorities are bound to provide water and sanitation facilities to its labourers, but in the labour lines, 40% people belongs to casual labourer/non worker category. So they are excluded from the above facilities<sup>7</sup>.

**Status of water supply in tea gardens of Assam:** The overall status of water supply in Assam's tea gardens can be understood by the representative picture of the two tea gardens under study; because there is less difference in the basic nature, infrastructure and other common facility provided by various tea gardens of Assam. In the sample survey questions was asked to the selected households regarding the source, provisions and adequacy of water supply in their residential garden lines. The following results came out during the survey.

Under the survey it was found that hand pump/tube well is the most common source of water supply of the households. In both the gardens under study it is the most prominent mode of water source for the purpose of drinking and day to day uses.

**Table-1**  
**Source of water supply in the surveyed gardens**

		Source of water supply (% of household using)		Total
		Well	Hand pump/tube well	
Associated tea garden	Barbaruah tea estate	8.7%	91.3%	100%
	Jamira tea estate	25%	75%	100%

Source: sample survey

**Table-2**  
**Provision of water supply**

		Provision of water supply is made by (% of household)			Total
		Self	Tea company	Others	
Associated tea garden	Barbaruah tea estate	56.5%	39.1%	4.4%	100%
	Jamira tea estate	45%	25%	30%	100%

Source: sample survey

**Table-3**  
**Adequacy of water supply**

		Water supply is (% of household)		Total
		Adequate	Inadequate	
Associated tea garden	Barbaruah tea estate	73.9%	26.1%	100%
	Jamira tea estate	55%	45%	100%

Source: sample survey

**Table-4**  
**Condition of toilet in the studied tea gardens**

		Toilet is (% of household using)			Total
		Sanitary	Pit	Open	
Associated tea garden	Barbaruah tea estate	52.2%	30.4%	17.4%	100%
	Jamira tea estate	30%	15%	55%	100%

Source: Sample Survey

Regarding provision of water supply, it is found that, mostly the water supply sources are self made. A substantial part of the water supply is provided by the garden management authority. But a large part of the people of our second tea garden under study (i.e. Jamira tea estate) are dependent on others water source for their day to day need. They don't have access to Tea Company's provided water source. Most important observation in this regard is that, govt. provisions of water supply in the tea gardens are totally absent in the surveyed tea gardens. Though in India and Assam there are some govt. schemes on pure water supply in the rural and urban areas like 'Swajaldhara'; these schemes are yet to reach the people working in the various tea gardens of Assam. Most likely reason for this is vagueness in the rules and regulations regarding administrative inclusion of tea gardens into various govt. specified administrative units like blocks, sub-division, gram-panchayats etc. As stated above, due to this reason there arises conflict whether the tea gardens will come under the development schemes of govt. or not.

Regarding adequacy of water supply, the condition of Barbaruah tea estate is better than Jamira tea estate. In Barbaruah tea estate, 26% of the household under study stated inadequacy of water for their drinking purpose and day to day use. But this share is high in case of Jamira tea estate (45%). Therefore, it is observed that, almost half of the households of Jamira tea estate are lacking adequate water supply.

**Sanitation condition in tea gardens of Assam:** Regarding the condition of toilets, it is unfortunate that a substantial part of the people under the study use open space as toilets which is very unhealthy and prone to various sanitation related diseases. It is clear from the table that as much as 55% households from Jamira tea estate are using open space toilets. Sanitary toilet is comparatively high (52.5%) in Barbaruah tea estate. But in the study it has been found that most of the sanitary toilets provided by govt. and Tea Company are in damaged situation due to improper construction, ill management and misuse

**Table-5**  
**Provision of toilet**

		Toilet is provided by (% of household)				Total
		Self	Company	Government	Not provided	
Assoiated tea garden	Barbaruah tea estate	34.8%	43.5%	4.3%	17.4%	100%
	Jamira tea estate	20%	0%	25%	55%	100%

Source: sample survey

**Table-6**  
**Children's habit of using toilets**

		Children use toilet?		Total
		Yes	No	
Assoiated tea garden	Barbaruah tea estate	26.1%	73.9%	100%
	Jamira tea estate	15%	85%	100%

Source: Sample Survey

**Table-7 (a)**  
**Hygiene practice before and after toilet practice**

		Do you use hygiene practices before and after toilet practice?		Total
		Yes	No	
Assoiated tea garden	Barbaruah tea estate	69.6%	30.4%	100%
	Jamira tea estate	45%	55%	100%

**Table-7 (b)**  
**Materials used for toilet related hygiene practices**

		If yes, by what?		Total
		Soap	Only water	
Assoiated tea garden	Barbaruah tea estate	93.8%	6.2%	100%
	Jamira tea estate	100%	0%	100%

Source: Sample survey

**Table-8**  
**Awareness regarding sanitation related diseases**

		Are you aware of the sanitation related diseases? (% of households)			Total
		Yes	No	A little	
Assoiated tea garden	Barbaruah tea estate	39.1%	39.1%	21.8%	100%
	Jamira tea estate	60%	40%	0%	100%

Source: Sample Survey

In the survey it is noticed that in Barbaruah tea estate the tea garden authority has provided majority of the toilets (43.5%). But provision of toilet by the tea garden authority is surprisingly lacking in the Jamira tea estate. But govt. has provided 25% toilets in Jamira tea estate.

In the tea gardens, the children are mostly not using toilets even if the household has own it. It is a major cause of various diseases of child. In our survey, it is found that children from 73.9% household in Barbaruah tea estate and 85% from Jamira tea estate are not using toilets.

Regarding hygiene practices generally followed during toilet practices, in our study, it is found that households using hygiene practices are 69.6% in case of our first tea garden into

consideration and 45% in the latter one. So the condition of Jamira tea estate regarding toilet related hygiene practice is poor in comparison to Barbaruah tea estate. Out of the persons who are using hygiene practice, majority of them use soap for that purpose. As a substantial amount of the household and people under consideration does not use any hygiene practices to be followed in toilet practice, they are prone to sanitation related diseases.

The above table clearly shows that approximately 40% household from each tea garden possess no knowledge regarding sanitation related diseases. This is vulnerable because lack of awareness makes the occurrence of such diseases more prominent.

**Table-9**  
**Prevalence of sanitation related/water borne diseases**

		Prevalence of sanitation related/water borne diseases (% of households)		Total
		Yes	No	
Associated tea garden	Barbaruah tea estate	38.1%	61.9%	100%
	Jamira tea estate	50%	50%	100%

Source: Sample Survey

**Table 10**  
**Type of sanitation related diseases (% of households facing various diseases)**

		Dysentery	Malaria	Dengue	Others	More than one diseases	Total
Associated tea garden	Barbaruah tea estate	36.4%	9.1%	9.1%	0%	45.4%	100%
	Jamira tea estate	11.1%	0%	11.1%	11.1%	66.7%	100%

Source: Sample Survey

**Table-12**  
**Preventive measures/treatment method of sanitation related diseases undertaken (% of household)**

		What are the preventive measures you have taken?		Total
		Scientific medical treatment	Traditional medicine	
Associated tea garden	Barbaruah tea estate	72.7%	27.3%	100%
	Jamira tea estate	88.9%	11.1%	100%

Source: Sample Survey

**Table-13**  
**Practice of washing hands before and after taking meal? (% of households)**

		Do you wash your hands before and after taking meal?		Total
		Yes	No	
Associated tea garden	Barbaruah tea estate	91.3%	8.7%	100%
	Jamira tea estate	100%	0%	100%

Source: Sample Survey

**Table-14**  
**Place of disposing garbage (% of households)**

		Where do you dispose of your garbage?				Total
		Outside the house	Dustbin	Drain	Any other	
Associated tea garden	Barbaruah tea estate	73.9%	8.7%	8.7%	8.7%	100%
	Jamira tea estate	50%	0%	30%	20%	100%

Source: Sample Survey

This table shows the prevalence of sanitation related diseases in the surveyed tea gardens. It shows that almost 40% and 50% household from the two tea gardens are facing sanitation related diseases respectively.

Regarding the type of diseases, the households are facing more than one sanitation related diseases. Dysentery is more prominent among them.

The households are mostly undertaking scientific medical treatment for the sanitation related diseases. It is a good sign that, the age old wrong method of superstition related treatment has been reducing day by day. The tea garden people are taking the scientific medical treatment in the tea company provided

hospitals or the govt. hospitals. In serious conditions they are referred to the nearest Assam Medical College and Hospital (AMCH) for improved treatment.

**Hygiene Practices among the tea garden population of Assam**

In the survey it was found that, the household are aware about the benefit of washing hands before and after taking meal and almost all the households are having the practice.

Regarding disposing of the garbage, scientific method is lacking in case of most of the households. Many of them used to through the garbage outside the house. Some are using the drain for disposing of the household garbage and very few are disposing it in the dustbin.

**Table-15**  
**Provision of proper drainage facility (% of households)**

		Is there any proper drainage facility?		Total
		Yes	No	
Associated tea garden	Barbaruah tea estate	8.7%	91.3	100%
	Jamira tea estate	25%	75%	100%

Source: Sample Survey

**Table-16**  
**Household cleaning practice (% of households)**

		How frequently do you clean your household?				Total
		Per day	2/3 days a week	Once in a week	Monthly	
Associated tea garden	Barbaruah tea estate	39.1%	13.3%	43.3%	4.3%	100%
	Jamira tea estate	35%	25%	25%	15%	100%

Source: Sample Survey

**Table-17**  
**Awareness regarding the benefits of hygiene practices (% of households)**

		Are you aware of the benefits of hygiene practices?		Total
		Yes	No	
Associated tea garden	Barbaruah tea estate	69.6%	30.4%	100%
	Jamira tea estate	100%	0%	100%

Source: Sample Survey

**Table-18**  
**Following of hygienic practices for taking and preparing food? (% of households)**

		Are your household members following hygienic practices for taking and preparing food?		Total
		Yes	No	
Associated tea garden	Barbaruah tea estate	78.3%	21.7%	100%
	Jamira tea estate	70%	30%	100%

Source: Sample Survey

**Table-19**  
**Condition of drinking water (% of households)**

		Drinking water is			Total
		Filtered	Boiled	Raw	
Associated tea garden	Barbaruah tea estate	0%	69.6%	30.4%	100%
	Jamira tea estate	5%	50%	45%	100%

Source: Sample Survey

**Table-20**  
**Practice of covering the utensils on which water is stored (% of households)**

		Do you cover the utensils on which you store water?		Total
		Yes	No	
Associated tea garden	Barbaruah tea estate	82.6%	17.4%	100%
	Jamira tea estate	94.7%	5.3%	100%

Source: Sample Survey

In both the study area, proper drainage facility is not there. Therefore, it is reported that, flooding situation arise in the rainy season due to lack of drainage facility.

The above table shows the frequency of household cleaning practices in the tea garden households.

The awareness regarding the benefits of following hygiene practice is good. About 70% in the Barbaruah tea estate and 100% surveyed household in the Jamira tea estate are aware of the benefits of hygiene practices.

Most of the household are taking hygienic practices while taking and preparing food.

**Table-21**  
**Frequency of cleaning the water storing utensils (% of households)**

		How frequently do you clean your utensils on which you store your water?				Total
		everyday	2/3 days a week	once a week	fortnightly	
Associated tea garden	Barbaruah tea estate	36.4%	4.5%	59.1%	0%	100%
	Jamira tea estate	40%	5%	45%	1%	100%

Source: Sample Survey

In case of consumption of water, water filtering process is mostly absent in most of the households. However, a substantial part of the household reported that they use boiled water for consumption purpose. Although, some of the households are drinking raw water and as their water source is not always safe, they endanger themselves and become the victim of water borne diseases by such act.

However most of the household cover the utensils in which they store their drinking water. The frequency of cleaning the utensils on which they store their water is also not bad as represented by table 21.

**Problems related to water supply, sanitation and hygiene practices:** The problems related to water supply, sanitation and hygiene practice in the tea garden areas can be easily understood by the analysis of the above tables and facts found in the surveyed areas. These problems are i. The source of water is not adequate in the tea gardens. Many household have to depend on other household and very unsafe source for their day to day needs of drinking water. ii. Many of the tea garden workers and household still use open space as toilets. This makes them prone to the sanitation related diseases. iii. Govt. and company provided toilets are inadequate and ill managed. Many a time, govt. provision of toilet is totally missing in the tea garden areas. The company provided toilets are unscientific too. iv. Hygiene practices before and after toilet practice is generally not followed by most of the people. Moreover, most of the child use open space as toilets and this makes them prone to the sanitation related diseases. v. Sanitation related diseases are also a major and common problem in the tea garden areas. 1 in every 2 surveyed household has reported the problem. The children are more vulnerable to these types of diseases. vi. Though many of the households are found following good hygiene practice regarding taking and preparing meal, drinking water etc. but problems like unscientific disposal of garbage and improper drainage are found in most of the households. vii. Most of the household members of the tea garden workers are illiterate or semi literate. Due to lack of proper, they are unaware of the proper sanitation and hygiene practices. Lack of education makes them more vulnerable to the sanitation related and some other diseases.

**Suggestions to overcome these problems:** i. The vagueness and confusion regarding the inclusion of tea gardens in the govt. administrative frameworks like Gram Panchayats, Development block and District Rural Development Agencies etc. must be

abolished. It was only after that; the tea gardens can smoothly reap the benefits of various govt. operated rural development schemes. ii. The work sphere, responsibility and investment amount of the tea garden management authority regarding the provision of water supply, sanitation and hygiene practices must be extended. At the same time it should be also kept in mind that community awareness and participation is very much essential in the successful operation and practical implementation of the measures. iii. Govt. must make some strict rules, regulations and laws if necessary for the compulsory provision of adequate water supply, sanitation facility in each tea garden. iv. The role of NGO's and other concerned institutions will be very crucial in this regard. They have to generate information and awareness regarding the sanitation and hygiene practice among the tea garden labourers and their households. v. Govt. and tea management authority must take extensive steps and heavy investment for the upliftment of education status among the tea garden workers and their family of Assam. Especially, they must focus on women education. It can generate awareness, community participation, successful implementation of health and sanitation related programmes in the tea garden areas. It will also ensure good sanitation and hygiene habit in the tea garden worker's families.

**Conclusion**

Tea garden communities are the part and parcel of our society. Without the improvement of their sanitation and hygiene practices, the overall health status of the whole society will be vulnerable. As they are in a weaker state regarding their health status and prone to sanitation and hygiene related diseases, it is the duty of the govt., tea garden authority and every concerned member of the society to improve their situation regarding this. Otherwise, their ill health driven by the insanitation habit and lack of hygiene practices will adversely affect the whole tea industry and Assam's economy.

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