

Basket of Resilience: Modernization's Impact on the Health of the Tea Tribes

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Abstract: In the relentless march towards modernity societies undergoes transformative process both in the external dynamics and in individual lives. The tea tribes bear testimony to this enduring evolution and have encountered tremendous transformation in their socioeconomic status, living conditions and decision making processes. In this research we intently gaze to the Borjuli tea estate in Sonitpur district to exhibit the impact of modernization on health of the tea tribes. Our analysis is substantiated with some selected health related parameters serving as the markers of the complex interplay between modernization and the wellbeing of the tea estate residents.

Key words: transformative, dynamics, impact, wellbeing

Introduction

Modernization is a widely contested topic. The definition encompasses governance, social system, human resources development through education, economic structure, rates of growth (Charlton and Andras 3). If we talk about the economic or technological definition of modernization than it is a transition from traditional, agricultural based societies to societies that are based on trade and industry (Irwin 597). The present study is conducted to assess the impact of modernization on the health status of the tea tribes. If we see through the history, the tribes are people who have their particular, religion, language, culture, ethnic composition etc. However the tea tribes who are named as such by the occupation they herald have undergone assimilation years after they landed to the tea gardens of Assam (Magar and Kar 27). The formation of tea tribes of Assam took place around the particular economic activity, i.e. around the tea industry of Assam (Das 1). People in waves were brought by the Britishers mainly from the central and eastern India to work in the tea gardens of Assam as bonded labourers (Yu 1). These people were brought during the colonial period by the Britishers, some of them returned back to their native land but most of them had settled in the surroundings of the garden, some in the 'coolie lines' others in the adjacent *basti* area (Sharma 1317-18). Many of them in the post colonial period have shifted to towns and cities for better opportunities (Wolf 52). From the period of migration of these people from different parts of India to the parts of upper, middle and lower Assam (Gupta 208) until contemporary period, tea tribes have undergone a dramatic change in terms of their status, their identity, rights in a different land. Moreover when these migrated to Assam many of them died during their voyages due to lower nutrition, lack of proper food, sanitation, vulnerable to different disease. Reports indicated that high mortality of the coolies on the voyage to Assam between the year 1861 and 1863 was caused by overcrowding, insufficient and improper food supply, and total negligence of cleanliness and medical care. (Chatterjee and Das Gupta 1863). The process of transporting migrants to the tea estates in Assam was torturous, and many of them lost their life en route. The report indicated that the high mortality of coolies on the voyage to Assam between 1861 and 1863 was caused by overcrowding, insufficient and improper food supply, and total neglect of cleanliness and medical care. In those years, overcrowding was so excessive that many unfortunate people were crushed overboard they did not even have space to stand (Chatterjee and Das Gupta 1863). They were brought to the tea gardens as 'coolies' or 'unfree labour' and were settled within the confinement of the 'coolie line'. Their mobility was limited within the areas of the coolie line, which restricted their contact with the outside world (LaFavre 25). Even free movement within the coolie line was not permitted for labourers. The health status of people in those coolie lines built for the workers were very poor. In fact those lines were not places of habitat, therefore low nutrition,

poor living conditions, lack of awareness, accessibility and their isolation from the mainstream people has all contributed to the unhealthy conditions of the people living in the tea gardens of Assam (Dowerah 522). Some of the common diseases observed in the tea gardens are fever, cough anemia, hypertension, skin irritation etc. Moreover acute superstitions and some unhealthy practices like alcoholism are most prevalent reasons for the poor health condition of the people (Medhi et al. 497-504).

According to Plantation Labour Act 1951 every tea garden should have a hospital, and separate bathroom facilities for men and women in tea plantation. But in most of the tea gardens the labourers who visit the hospital for treatment do not know their actual health problem and many at times; the doctors do not show interest in telling them about their actual health problem (Sahoo and Konwar 61). Access to modern health care is one of the significant components for the utilization of health care services and for ensuring universal health care coverage. In tea garden areas the workers often lack access to good safe drinking water, health care, nutrition due to this there is higher mortality rate, higher risk of pregnancy related complications, low birth weight babies (43%) and higher prevalence of tuberculosis (TB), 30-40per cent compared to the general population of the state (Rajput et.al 1)

There are more than 800 tea estates in Assam (Bezborah 2) and it is a huge and difficult task to include all the tea estates while studying the impact of modernization on the health status of the tea tribes, so for that a particular tea garden Borjuli tea estate is selected for an intensive study.

2. Objectives:

- 1) To assess the health status of the tea tribe people of Borjuli tea estate
- 2) To analyse the impact of modernization on the health status of the people of study area.

3. Review of Literature:

Gallagher in his study Modernization and medical care highlights that the modern health care is a calculable resource and an essential carrier of modernity and is sharply segregated from the traditional settings. Health is transformed from a culturally vital feature of the premodern timesto a major production enterprise in modern societies. The fatalistic attitude in the traditional culture regarding health has been converted into more social value of health, its approachability by individual and the most widespread awareness of the value of health and the need to give importance to it. The introduction of modern medicine in developing societies is an important forsocal scientific analysis. The author in his paper makes a comparison between the modern hospital and the traditional bonesetter or midwife and considers it synonymous in terms of magnitude to the difference between a traditional human labour agricultural practice and modern agriculture.

Gayathri & Arjunan (2019) highlights in their paper the health afflictions faced by the tea garden workers. The workers are suffering from different diseases like hypertension, skin diseases, respiratory problems, hypertension, back pain etc. The author also highlights the need of more health care facilities in the tea estate. Moreover more health awareness camps and periodic health check up needs to be conducted. More health practitioners should be appointed to promotematernal and child health. The study undertaken by the author is a descriptive study which aims to describe the socio demographic profile the health benefits and the issues related to health ofthe tea garden workers. Karl Pearson correlation is used to find out significant relationship between age and health afflictions. About 58per cent of the sample workers suffers from continuous cough/dry cough due to working in cold climate, due to the cold weather conditions of the Nilgiris, moreover due to monotonous work 38per cent felt neck and shoulder pain and due to work pressure 48per cent of the sample workers suffers from low blood pressure. Smith (1998) in his paper states the changes that have prevailed in China's health care systempost 1978. The economic reforms have been beneficial to many people in China but there has been growing inequalities in the even distributions of resources within the society. The women section those residing in the countryside has poor accessibility to health care services. The paper also highlights about the deterioration on terms of health care that the reform has eventually brought. The erosion of old health care infrastructure and services, high rate of infant mortality, issues like no pre natal and post natal care, high cost of hospitalization all these have beared a toll on the lives of poor people. A negative effect of

restructuring in Dengs China is the rise of the inequalities of the access to health care services. There has been a change in the health care through this reform from traditional view of health care as a human right to capitalist view of health care as an object (medicine) to be purchased from the market place.

4. Database & Methodology:

The study area is selected keeping in mind the two criteria: size and the proximity of the tea garden from the nearest urban centre. The Borjuli tea estate is 28 km from the Tezpur town and has a total hectare of 556.6. A household survey is conducted in the coolie lines using simple random sampling techniques. The data regarding the health status of the workers are collected by visiting the hospital. A interview is conducted with the doctor, health assistant, nurse and Asha workers of the Borjuli tea estate. According to the govt. of Assam tea tribes <http://ttwd.assam.gov.in> there are 59 tea estates in the undivided Sonitpur district and if we divide the tea estates on the basis of size and proximity, by taking scales <600, 600-1200 and 1200> (scale taken on the basis of the size of the tea estates of the district) and <25- near and >25 far (scale taken on the basis of the distance of the tea estate from all the urban centres) than we can categorize the tea estate into (L+N, L+F), (S+N,S+F), (M+N,M+F) tea estates. The present study area comes under (S+F) tea estate. The Sonitpur district has a total population of 19.4 lakhs according to the 2011 census and the tea tribes consists of approximately 15-20 per cent of the total population of the district. The Borjuli tea estate has a total population of 6842 (garden area population) and 8278 (comprising of garden and the adjoining basti area) population.

Table 1 Size and proximity from the nearest urban centre of Borjuli tea estate, Sonitpur district

Tea estate	Size	Proximity		
		Dhekiajuli	Tezpur	Biswanath chariali
Borjuli Tea estate	556.6 hectares	31	28	60

Methodology:

- To assess the socioeconomic condition and the overall health status of the people of Borjuli tea estate, change in growth of the health indicators yearwise for past seven years shall be taken out from the data collected from hospital and then the compound growth rate for each indicators shall be derived. In this way, the growth (whether positive or negative) can be assessed.
- To analyse the impact of modernization on the health status of the people, a z tests is conducted to assess the impact of each of the modernization variables in the overall status of the people and the level of modernity of all sample household can be assessed.

5. Results and discussion:

The Borjuli tea estate has a geographical location of 26.80 N and 92.65 degree E and is situated 30km away from the Tezpur town. The tea estate has an area of 556.6 hectares and is a part of the Borjuli panchayat under the Bahbari mouza of Rangapara block. The tea estate has been divided into two divisions Borjuli and Rangapara division. The estate is 3 km from the Rangapara which is a small town. The environment is suitable for growing tea in these regions and Borjuli tea estate is famous for its good quality of tea and is probably one among the oldest garden in that area. The garden is established in the year 1910 and is under the APPEJAY tea group.

5.1 Health status

Table 2 Table showing medical infrastructure (2021-23)

Medical infrastructure	
Doctor	1

Health assistant	1
Head nurse	1
ANM	2
Laboratory	1
Minor OT	1

Table 3 Showing data regarding health indicators for several years

Health indicators	2014	2015	2016	2017	2018	2019	2020
Total birth	103	105	91	89	101	98	103
Total death	58	51	63	41	66	55	76
M.M.R	1	Nil	Nil	Nil	Nil	Nil	Nil
Total OPD	10464	9248	10923	10399	10849	9856	9782
Total Indoor	694	595	724	826	867	842	802
Total Maternity	28	21	23	26	18	15	16
IMR(Infant mortality rate)	6	10	4	4	7	6	5

Source: Data received from Borjuli Tea Estate hospital

Table 4: Year wise growth in (per cent) and compound growth rate

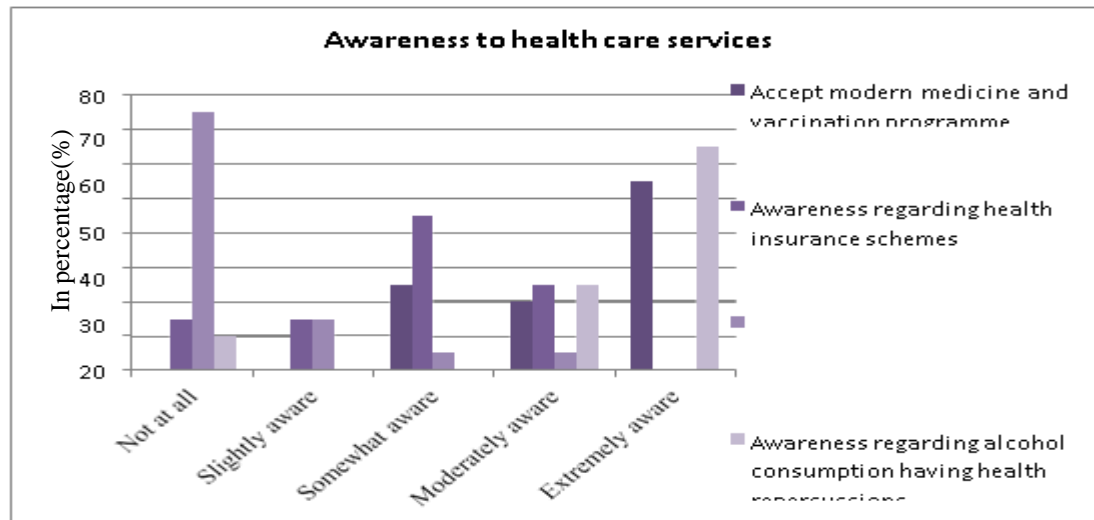
Health indicators	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	CAGR
Total birth	1.94	-13.3	-2.19	13.4	-2.97	5.10	0
Total death	-12.06	23.52	-34.92	60.9	-16.67	38.18	-4%
M.M.R	Nil	Nil	Nil	Nil	Nil	Nil	
Total OPD	-11.62	18.11	-4.79	4.32	-9.15	-0.75	1%
Total Indoor	-14.26	21.6	14.08	4.96	-2.88	-4.75	-2%
Total Maternity	-25	9.53	13.04	-30.7	-16.6	6.66	8%
IMR(Infant mortality rate)	66.6	-60	0	75%	-14.28	-16.6	3%

From the above table, it is observed that the maternal mortality rate is almost nil for all consecutive years, however the infant mortality rate has decreased in 2016 and 2017 compared to other years. The total maternity has been less in 2019 and 2020, whereas total indoor patients have increased simultaneously in every year. The compound growth rate has been calculated for the following years for every individual health indicators, it is observed that there is negative growth in terms of death and total indoor patients in the hospital however there is positive growth in terms of total maternity, infant mortality rate(IMR) and OPD (out patient department).

5.2 Modernization variables

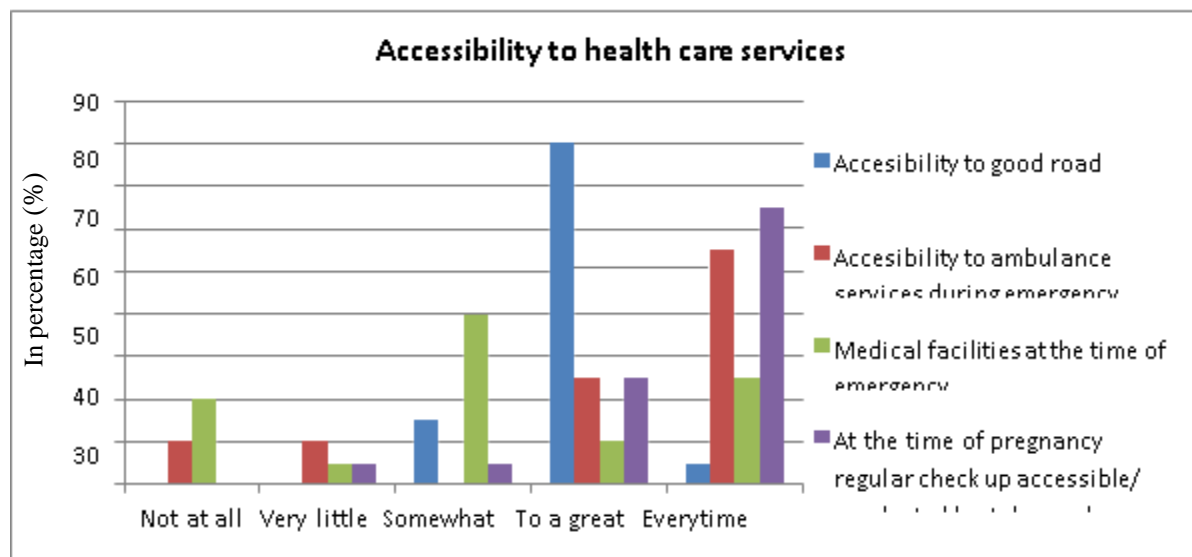
Awareness, Accessibility, Utilization of health services

Fig 1: Showing percentage of sampled household population who has awareness regarding health care services.



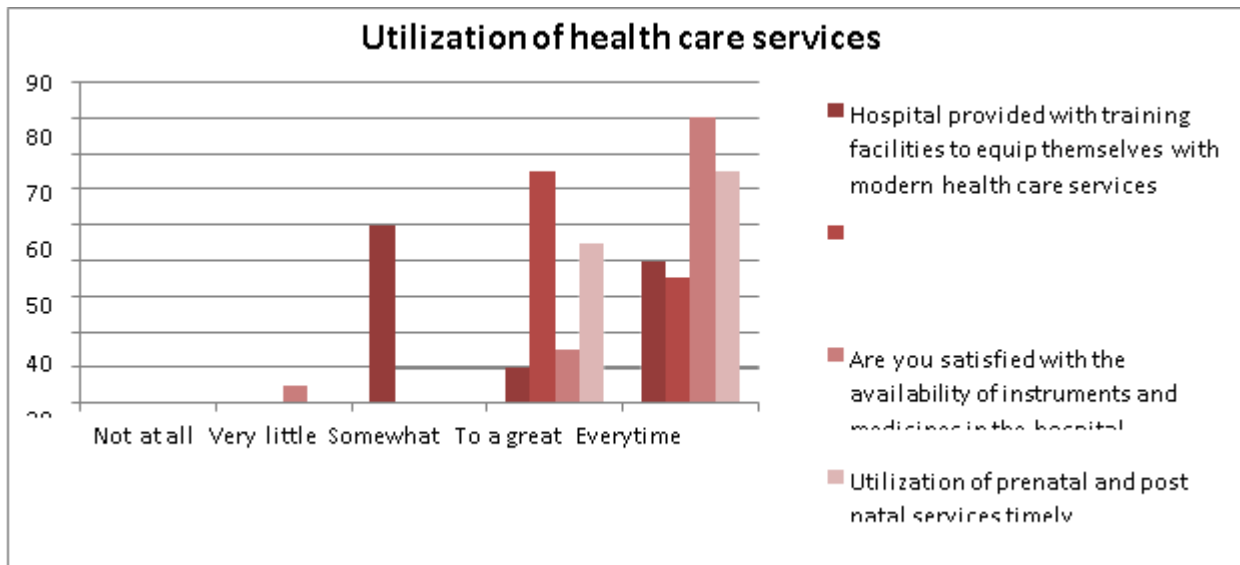
About 55per cent people were extremely aware of the modern medicines and vaccination programme, and only 20-25per cent people were somewhat and moderately aware of vaccines. About 15per cent people were unaware of any kind of health insurance schemes needed for proper health care. Moreover the women of each household were asked about their awareness regarding use of sanitary napkins and if they use it of which 65per cent people were aware about 10per cent people were not at all aware of it.

Fig 2Percentage of people having accessibility to health care services



Regarding accessibility about 70per cent people have hospital within 3-4km distance from their home, moreover the medical store is also 2-4 km from their home which shows the accessibility towards modern medicines and a distant from the traditional healing practices. Moreover about 55per cent of the people have responded highly positive regarding the emergency ambulance services. About 40per cent of the people agreed somewhat to the health services accessibility during emergency.

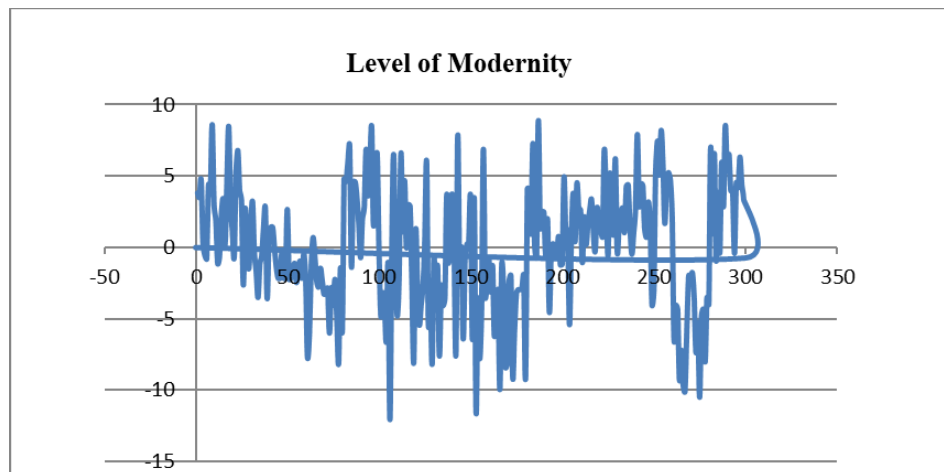
Fig: 3 Showing percentage of people utilizing health care services



Regarding the utilization of pre natal post natal health services about 65per cent avail every time such services, moreover about 65 per cent of the people have received pregnancy leave at the time of childbirth about 50 per cent somewhat agreed to the training facilities provided to the health workers.Regarding health choices about 75per cent of the people go to doctor and 25per cent of people go to health assistant compounder nearby. Whereas in terms of major health issues about 85per cent of the total sampled people seek for treatment in the private hospital. A question has been in the survey schedule regarding why people opt for traditional medicines generally in the tea garden areas to which about 65per cent responded that due to their faith in traditional medicines and a very insignificant percentage responded due to unawareness regarding modern medicines and due to poor economic background

To assess the impact of modernization on the tea tribe people a survey schedule was made with questions regarding the health (awareness, accessibility and health choices) were mainly the criteria taken for study. The questions are mainly related to modernization variables to assess the level of modernity among the tea tribe people in terms of health. For these, descriptive statistics such as mean and standard deviation has been taken out for the entire 300 sample household chosen for study. Apart from takingout the individual mean and SD for each statement, a z score test was performed to assess the level of modernity among the tea tribe people of Borjuli tea estate.

Fig 4: Showing the level of modernization for 300 sampled household



In this figure, the z score values of 300 sampled household is plotted. Those values away from the mean (positive) are considered high and those away from the mean (negative) are considered low. The values which are directly on the mean are considered neither high nor low. Thus the level of modernity of each household is taken out with the help of 18 modernization questions related to awareness, accessibility and utilization and their individual z score values are tabulated and subsequently the composite z score of each household are derived out

Among 300 household almost 154 household showed low and medium level of modernity and 146 household high level of modernity. Those household where the composite z score values were negative and lower than zero were considered as low and those that were positive but are higher than zero is considered as higher level of modernity and those values which directly falls in the mean (that is zero) is considered neither high nor low i.e medium level of modernity. Further our examination dives into the impact of modernization parameters on the composite z score, ZCOM. The coefficient table shows the relationship between ZACC, ZUT, ZMHS, ZAW and ZCOM.

Table 5: Unstandardized and standardized coefficient, t value and p value

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.391E-16	.000		.000	1.000
	ZACC	1.000	.000	.716	461746374.610	.000
	ZUT	1.000	.000	.512	336810999.852	.000
	ZMHS	1.000	.000	.369	237515105.487	.000
	ZAW	.250	.000	.105	69131727.076	.000
a. Dependent Variable: ZCOM						

In the above table what is observed is that with the increase in unit in ZACC, the dependent variable ZCOM is expected to increase by 1 unit. The standard coefficient (Beta) of 0.716 indicates that ZACC has strong positive impact on ZCOM. A low p value here suggests that the relationship is statistically significant. Similarly for ZUT a unit increase in it is associated with 1 unit increase in ZCOM. With a beta of 0.512 ZUT also has a strong positive impact. Similarly for ZAW a unit increase results in a 0.250 increase in ZCOM. Here the beta of 0.105 suggests a relatively weaker positive impact on the dependent variable. Overall the model indicates that all predictor variables (ZACC, ZUT, ZMHS and ZAW has a positive and statistically significant impact on the dependent variable ZCOM. However ZAC has a stronger influence followed by ZUT, ZMHS and ZAW.

Table 6:Karl Pearson's correlation coefficient

		ZACC	ZUT	ZMHS	ZAW	ZCOM
ZACC	Pearson Correlation	1	-.056	.234**	.083	.782**
	Sig. (2-tailed)		.330	.000	.153	.000
	N	300	300	300	300	300
ZUT	Pearson Correlation	-.056	1	-.089	.114*	.451**
	Sig. (2-tailed)	.330		.124	.049	.000

	N	300	300	300	300	300
ZMHS	Pearson Correlation	.234**	-.089	1	.052	.496**
	Sig. (2-tailed)	.000	.124		.367	.000
	N	300	300	300	300	300
ZAW	Pearson Correlation	.083	.114*	.052	1	.242**
	Sig. (2-tailed)	.153	.049	.367		.000
	N	300	300	300	300	300
ZCOM	Pearson Correlation	.782**	.451**	.496**	.242**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	300	300	300	300	300

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

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

Note: ZACC represents Accessibility to health care services, ZUT represents utilization of health care services, ZMHS is modern health care services, ZAW represents awareness to towards health related services.

There is strong correlation (Pearson's $r=0.782$) between ZCOM and ZACC and the correlation is significant ($p<0.01$). The correlation between ZCOM and ZUT (Pearson's $r=0.451$) and ZCOM and ZMHS (Pearson's $r=0.496$) are highly significant. Therefore the above correlation suggests that ZCOM is strongly positively correlated with ZACC, ZUT, ZMHS and ZAW. The significant p values suggest that these relationships are not likely due to random chance.

The z score values are computed in SPSS 22 .The individual modernity scores of all the modernization variables related to health were taken out and the composite z score values of each household is computed.

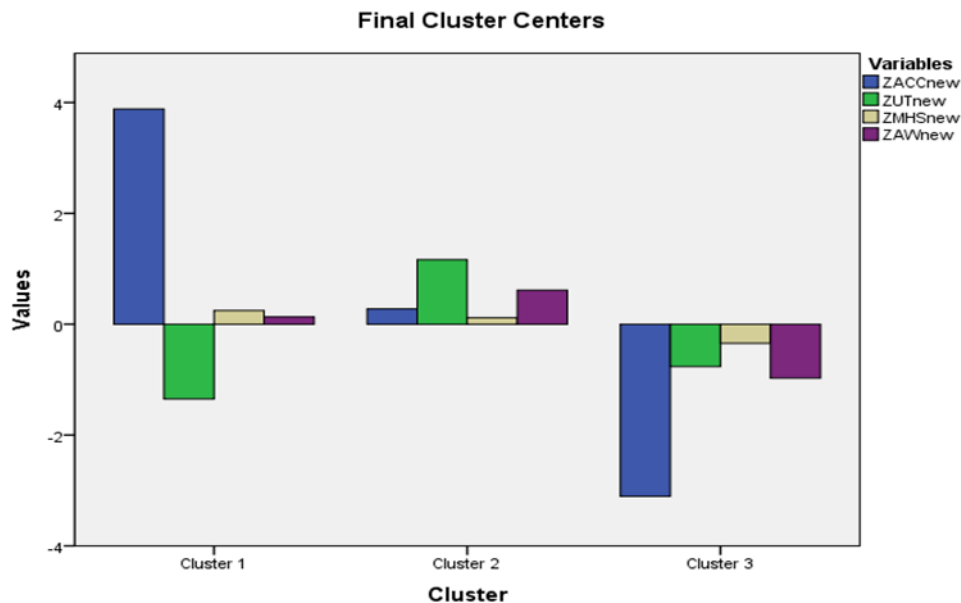
Table 7:Showing the final clusters of all the four modernization parameters.

Final Cluster Centers			
	Cluster		
	1	2	3
ZACC	3.88	.28	-3.10
ZUT	-1.35	1.16	-.77
ZMHS	.25	.12	-.34
ZAW	.13	.61	-.97

The table shows the final clusters for all the three broad modernization parameters taken for the study. The K means clustering approach is conducted to categorize respondents into distinct groups based on their responses to the survey questions. The creation of these three clusters through K-means clustering is based on the patterns and similarities found in the responses to the survey questions related to modernization and healthcare. Clustering is an unsupervised machine learning technique that groups data points (in this case, survey respondents) into clusters based on the similarity of their responses to the questions. The number of clusters is determined in advance, and each cluster represents a distinct group of respondents with similar patterns of responses.

Fig 5:

Cluster 1, 2 and 3 of K means clustering based on responses of the respondents.



The average value for ZACC, ZMHS and ZAW in Cluster 1 is 3.88, 0.25 and 0.13 respectively. Therefore this cluster appears to represent respondents who have a overall positive attitude towards modern health care practices and accessibility. Respondents in this cluster have better access to health care facilities, prompt treatment during emergencies and are more satisfied with health care services. They tend to seek treatment for both day-to-day and major health issues from modern health care providers and are less inclined towards traditional healing practices.

The average value for ZACC in Cluster 2 is approximately 0.28 which shows having a relatively neutral or moderate attitude and awareness regarding accessibility to health care services.

The value for ZMHS which is approximately 0.12 indicates a moderate perception of the health care systems training facilities and prenatal/ postnatal services.

However the average value of 0.61 for ZAW suggest that people are more likely to seek treatment for day to day health issues and major health issues and are less inclined towards traditional practices. Thus this cluster represents a middle ground and doesnot lean strongly or against the modern health practices. They have a balanced perception of the accessibility to health care services and may not strongly incline towards modern practices or traditional healing.

The average value for ZACC in Cluster 3 is approximately -3.10. In this cluster respondents have a significantly negative attitude and awareness regarding accessibility to health care services. The values for ZUT, ZMHS, ZAW are approximately -0.77, -0.34, -0.97 respectively which indicates the respondents in this cluster having a less positive perception of the availability of health care services and instruments. They have limited access to health care services, may not receive immediate treatment during emergencies and are less satisfied with health care services. They are more inclined towards traditional healing practices and may not prefer modern health care providers.

6. Conclusion:

The health indicators studied over a period of time shows fluctuation in factors like total no. of births, deaths, maternal mortality rate, outpatient department visits, indoor patients, maternal services utilization and infant mortality rate. There was a slight decrease in the infant mortality rate in 2016 and 2017, whereas the maternal mortality remain almost negligible.

Modern health care facilities in this region remained crucial, while major of people availing facilities mostly during major health issues. With analysis what reveals itself is that the awareness, accessibility and utilization of health services play a significant role in carving the health related choices of the tea tribe population.

From analysis what is also evident is that a significant proportion of the population are highly aware of the modern medicines, vaccination programs and health care accessibility. Majority of people have hospitals and medical stores within a few kilometers reach which signifies their inclination towards modern medical practices. Further our analysis also demonstrates a strong positive correlation between the level of modernity in health related parameters and the overall modernization of the tea tribe population. The positive correlation between awareness, accessibility, utilization and modern health care practices indicates the interdependence of these factors. Moreover The K means clustering approach conducted also categorizes the respondents into distinct groups based on their responses to the survey questions. Cluster 1 represented individuals with positive stance, Cluster 2 with moderate preference, balanced perception of modern and traditional health care practices and Cluster 3 consists of individuals with limited access to health care facilities and more inclination towards traditional techniques. The study therefore emphasizes on the significant role of modernization in shaping the health status of the tea tribes in Borjuli tea estate. It highlights the importance of awareness, accessibility and utilization of modern health services in improving health care outcomes. Some community level awareness programme has been conducted like T.B awareness programme, breast feeding awareness programme, child health and education, antenatal check up awareness programme, pregnant mother nutritional programme. By understanding this dynamics, policy makers can formulate strategies to improve health care accessibility and promote modern health care practices among the tea tribe population.

Acknowledgment

We would like to express our sincere gratitude to the institution, friends and colleagues for their support. This research did not receive any specific grant from funding agencies in public, commercial or not for profit sectors.

Conflict of Interest:

The authors declare that there is no conflict of interest to disclose

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