

Chapter-6

IMPACT OF MODERN TECHNOLOGY ON TRIBAL PEOPLE

6.1 Introduction

Technology can be defined as the purposeful application of information in the design, production, and utilization of goods and services, and in the organization of human activities. It is the use of scientific knowledge for practical purposes or applications, whether in industry or in our everyday lives. Modern technology is the improved product of the application of science. The human beings started to use technology with the conversion of natural resources into simple tools. Discovery of wheels in early civilisation was the premier invention of technology of mankind. With the passage of time, technology has become very vital to human beings for survival and development of knowledge.

Indigenous people across the world have been affected by the introduction of technologies from foreign cultures for hundreds of years. Some have not dramatically changed their ways of life, while others have completely changed self-identities, entire societies and worldviews. Modern technologies, especially telecommunication and computer technologies, allow indigenous groups to participate in the larger societies and economics around them.

The tribal people of Dooars were originally a floating settler migrating from place to place for land and employment. At early period they (Lepcha, Garo, Mech, Rabha) were migrated from north and north-eastern states and settled in the forest and hill areas of Dooars and Terai region and Santal, Oraon, Malpahari, Mahali, Munda, from eastern, central states and Chhotonagpur region and settled in Dooars and many other places of West Bengal. The tribal communities in Dooars are mainly engaged in tea garden as labour and small amount of them are engaged in agriculture and small industrial activities. Gradually, they started to accustom themselves with the new ecological condition. But they remain isolated from other caste community. This isolation makes them underdeveloped and backward. After independence, the situation has been changed due to modernisation which includes industrialisation and urbanisation and implementation of some tribal welfare schemes taken by the central and state governments. To make them advanced and integrated with other people and to introduce themselves with modern world many development programmes have been taken. The welfare schemes inspired them to accept new and modern technology and changed their attitude of thinking.

6.2 Social Impact of Modern Technology

A tribal society is a primitive society living in early period of human history. There has not been any change of tribes in their belief, life style and religion which prevent them from mixing with any outsider or educated community whom they greatly dislike. They have their own social functions and festivals where they sing and dance in characteristic body movements in the same dress by girls, the males playing on musical gadget like drums, metallic gongs, flutes etc. A tribe is an endogamous group, as distinct from a clan who is exogamous. All tribe members are related by blood, have their own political organization which has a chief who exercises authority over all the members, even recommending marriage of young boys with girls whom they have found suitable for marriage. Each tribe is guided by their own religion which is based on totemism, magic and fetishism i.e. believing in god being embedded in a special tree or a peculiar strange animal.

Modern technology and modern means of communication technology changed the social customs, religious behaviours, demographic structure of the societies of the tribal people.

6.2.1 Impact on Religion and Customs

Tribes were animism in religion which is very much separate from all the other traditional religions of the world. Most of the tribes in Dooars believe that they are Hindus. The tribes of Mal subdivision now are gradually being converted to Christianity by the influence of welfare activities of the missionaries. From the field study it is clear that 66% are believers of Hinduism, 31% are Christianity, and 3% are animists. With change of religion, the associated characteristics of religious behaviours of tribal people have also been changed. The performances of dances, songs are influenced by the modern rhythmic instruments replacing many of their age old handmade instruments. The traditional tribal musical instruments are simple and produce rhythmic sounds. Following are few examples of tribal traditional musical instruments (Deogaonkar, 2003):

- a) **Tirio bamboo flute**, a bamboo flute with seven holes. It is viewed as symbols of love and seduction.
- b) **Dhodro banam** bowed instrument, a bowed instrument carved out of a single log wood of a tree. It consists with a belly covered with an animal skin on which rests the bridge (sadam, lit, horse), an open chest (korom), a short neck (hotok) and a head (bohok).

- c) **Madol or tumdak** is a double-sided barrel drum, a two faced drum with body brunt clay. Both heads the left one broader than the right are covered by bullock hide and are beaten by the left and right hand.
- d) **Junko**, an onomatopoeic description of sounds of the ankle bells which are caste in metal in the shape of buds and tied to the feet of dancers from where they produce rhythmic sounds.
- e) **Singa**, an S-shaped wind instrument played in pairs in weddings. Made of brass of copper, it is usually constructed in the three pierces with mouthpiece at the blowing end and a conic opening at the other.
- f) **Bansuri**, a classical instrument from which melodious sound produces.
- g) **Ghungroos**, musical bells producing musical sound. Bells of different sizes are used while dancing fitted with waist or on feet ankles etc.
- h) **Ghangli**, looks like a veena.
- i) **Nagara**, a drum of most widespread and lead instrument in folk ceremonies and weddings of the tribal people.

The Santals and Oraons have their rich traditional folk cultures. Most of the times, the women perform the dancing and ceremonial rituals and the males play the rhythmic sets. Now the question arises, are the tribal people changing their traditional age old customs and musical instruments after advent of many modern instruments? In a study, Purkayastha (2012) opined about the Oraon tribes in Barak valley of Assam that, traditional belief and practice as a whole have been losing its appeal particularly among young tribal people, rather, they prefer to participate in national as well as regional festivals like Durga Puja, Kali Puja, Laxmi Puja, Holi etc. Now many of the tribal musical instruments are accompanied by the modern instruments. Wooden *Ghangli* of the tribes are replaced by violin; piano is used instead of bamboo made *tirio flute*. The earlier open mouth tribal songs are abolished in many cases, instead of it, there could be found modern sound system. The Santals men and women are very fond of music and dance. Archer (1946) rightly called them a ‘musical people’. They have elaborate song cycles for festival occasions and for the various stages of agricultural cycles.

Traditional Santal women dances are modernised by modern musical instruments, sound devices etc. in Dooars areas. With the impact of westernisation coupled with industrialization and urbanisation, the Santals have yielded a significant change in their life style (Mohsin, 1964). Santals’ culture is gradually languishing due to modernisation in religious believes and

modern technology (Prasad, 1971). They are now in a state of flux and in a process of putting on a new social identity and image over their crumbling norms. However, the Santals still retain the essential core of their unique socio-cultural background notwithstanding the diverse influence on them. Same incident has occurred for all other tribal groups living in Dooars.

6.2.2 Impact on Arts and Crafts

Indian tribal arts and crafts are almost entirely functional and had great utilitarian or social significance. There is very little art for art's sake in a tribal village. Art is an integral part of Santal's life. Either it is of building houses, painting it or making bowl, plate out of 'Sal' leaf or help of some braiding technique making brooms and mats, everywhere there are artistic views. The way of building of the houses, thatching the roof, decorating the floor, carving the doors and painting the walls signify a lot about the artistic skills and creativity of Santals. The Mahali tribes have a rich source of cane and bamboo materials in their arts and crafts. The items are meant for household uses. Baskets of different kinds have significant place in the tribal houses. Mahali people in Dooars use to prepare bamboo crafts. There are wood crafts popular among the tribes. The religious product includes images of familiar gods. Some craftsmen carve a single piece of wood to form an object. Clay pottery is an ancient craft in India. In some places of Dooars it is found that clay pottery has shaped the home utensils.

Modern technology has influenced the arts and crafts of the tribal people. Tribal art began gaining recognition in the late 19th century. Modern communication technology, media has nurtured their way of thinking in the broader world. As a result, the age old traditional ideas of the tribal people are well known throughout the world. Research wings are attached with their thinking and several developmental strategies are taken to promote tribal arts and crafts in every country. In modern days, as for example, various forms of decorative items are made of canes and bamboos instead of simple baskets by the Mahali tribes.

In the Dooars area, the tribal arts are not so much enlightened by the modern technology. Because they have lost their own identity due to change of their own traditional occupational practices, rather they are now mostly tea garden labourers. Besides, a significant amount of them are working in as cultivators or agricultural labourers.

6.3 Economic Impact of Modern Technology

Technology has affected the economy through direct job creation, creation of new services and industries, workforce transformation and business innovation. Compared to the

industrialised economies, the technology adopted in tribal economy is much simpler and crude. Tools are either made of user himself or are acquired for a fee from craftsmen or from manufacturing groups.

6.3.1 Impact on Occupations

The tribals have indigenous occupations. Most of the forms of occupations were subsistence in nature. The tribes of Dooars were used to practice several occupations before the introduction of modern technology or globalization. The main occupations of the primitive people were shifting cultivation, animal husbandry, basketry, fishing, hunting and gathering, and weaving. Later on in-migration from Chhotonagpur region of the tribal people took place in this region. A large section of the people of this region became tea garden labourers in different forms i.e. plucking tea leaves, harvesting, planting tea sapling, processing, driving cars and others. Besides tea garden activities, the Mahali people depend on basketry, collection of forest produce, agriculture, carrying of palanquins; the Lohars are traditionally iron workers and blacksmiths; the Mundas were used to hunting in the forests.

Modern technology and modernisation has influenced the occupation of tribal people. They have given up many of their traditional occupations being influenced by the modern technology. Shifting cultivation of this region has been abolished today; fishing, weaving and hunting are now not occupations at all for tribal people. The specialised activities of basketry occupation of the Mahali people and blacksmith activities of the Lohars are now in the verge of abolition. The occupations of the tribals were based on customs and traditions. There were specific customs stressing participatory functions and specific roles to be played by each member of the family and community. They took care to preserve the ecological balances with the nature to sustain their livelihood. But exposures to modern economic practices teach them to exploit the nature and consume its products. As a result, the traditional tribal leaders often face a dilemma while accommodating modern influences (Dey, 2013). Modern communication technology- the mobile phones, internet services, newspapers, and Medias have influenced many young people to alter their traditional occupations. To earn more or to work with leisure many tribal people now-a-days engaged in diversified activities. From the field observation, it is noticed that a few household industry has been established in the tribal areas like biscuit factory, furniture houses etc. So, a few people are engaged there. Many tribal young male workers now work in other provinces who are mostly engaged in construction works. A few people are now working in nearby Siliguri or Jalpaiguri town as carpenters or masons.

There has been a change of income generating activities in the rural non-farm sectors both of tribes and non-tribes. These include the following:

- a) Training of youth in masonry, carpentry, smithy, repairs of cycles and motor cycles, tractors, pump-sets, and electrification etc.
- b) Bamboo crafts and utility articles
- c) Production of housing materials
- d) Embroidery and tailoring
- e) Establishment of grocery shops and food stalls.

The above mentioned activities are found among the tribes in areas adjacent to market, but in tea garden areas, the impact is very insignificant.

6.3.2 Impact on Agricultural Economy

The aboriginal tribes of Dooars, namely, the Mech, Garo, Rabha, and Lepchas were the jungle dwellers who used to habituate with shifting cultivation. They settled in a place for few years, cultivated in the land in their own way, after few years they shifted into another place and settled there and their life was cycling in such a way. Some tribes of Bhutanese lived there but before coming of rainy season, they left the place to save themselves. Surgeon Rennie (1970) comments, “The inhabitants chiefly consist of a tribe called the Mechis who appears to be the only people so constituted as to be capable of permanently enduring the climate.” After introduction of tea plantation, large amount of tribal people in-migrated to this region. They were basically engaged as labourers of the tea garden. However, the aboriginal tribal groups and a section of later tribal groups are now engaged in agricultural practices either in their own lands or in share cropping system to others’ land. Some of the traditional agricultural implements still persist. They are axe, hatchet, sickle, yoke, plough, crowbar, wooden hammer, flat basket etc. They get these implements either from the nearby local market and some of the implements are also made by them.

The success of technology transfer is dependent on various factors, particularly the infrastructure for providing motivation, training, finance, processing and marketing. As our target groups, who are semi-literate and economically backward, it is difficult for them to search for appropriate technologies on their own for enhancing their income. There is a need for facilitating organizations which can identify various technologies and modify them to suit the local needs before transferring them to the beneficiaries (Hegde, 2011). The farmers at present are encouraged to use scientific methods of agricultural operations and trying to produce more crops from the same piece of land. Earlier, paddy and wheat were main crops of

agriculture. But now paddy, jute, oilseeds, pulses and vegetables are cultivated. Modern technology and modernization has influenced the agricultural systems of the tribal people in some extent. Modern agriculture depends heavily on engineering, technology and the biological, physical sciences. In the field study, following information were asked to the tribal farmers about implementation of simple modern technology for agricultural field.

- a) Use of tractors or power tillers instead of traditional plough driven by bullocks for cultivating soil.
- b) Use of Pump set machines for irrigation during dry season.
- c) Use of Sprayer machine to spray insecticides and pesticides.
- d) Use of Rotary Tiller to dig soils by means of rotating blades.
- e) Use of Rice huller to remove the outer husks of grains of rice instead of foot operated rice pounder
- f) Use of Chemical fertilisers, insecticides and pesticides etc for bumper production
- g) Use of High Yielding Variety Seeds in agricultural fields

Following implements were noticed in agricultural fields of selected GPs done by the tribal farmers:

Table 6.1 Modern Agricultural Tools used by the Tribal Farmers in Mal Subdivision (%)

Name of GP \ Tools	Tractors	Irrigation Pump sets	Sprayer machines	Rotary tiller	Rice hullers	Chemical Fertiliser	HYV seeds	Average
Odlabari	20	51	32	25	30	60	60	40
Tesimla	20	40	31	21	26	60	62	37
Kranti	25	42	34	22	17	58	65	38
Chapadanga	30	42	46	19	15	67	44	38
Moulani	25	60	47	23	19	70	70	45
Lataguri	22	60	48	25	29	71	72	47
Matiali Batabari-II	20	42	32	24	33	44	71	38
Bidhannagar	21	45	36	27	32	41	69	39
Angrahasa-I	22	68	39	18	21	56	65	41
Angrahasa-II	20	67	41	19	18	54	64	40
Total	20	50	38	20	20	58	59	38

Source: Field survey, 2015

From the above table it is found that in three cases i.e. use of pump sets, chemical fertilisers, and HYV seeds, there are more than half of the tribals' uses these. Traditional plough is still popular among the tribal farmers rather than tractors or power tillers for ploughing purposes which are driven by the bullocks. Similarly, rotary tiller and rice huller

are not popular than the traditional hoe and rice pounder respectively. Sprayer machines are important to spray insecticides, the uses of such machines are gradually developing, and it is an indication of using habits of pesticides too. On an average, based on above seven parameters it can be said that modernisation has got 38% impact on agricultural economy. The above seven parameters are not sufficient to be a modern technology based agriculture. The subsistence economy still prevails in the agricultural economy among the tribals in the study area. But it has been changed dramatically for tribals in Dooars from migratory subsistence farming to permanent agriculture with little bit modernisation. The GPs of Lataguri, Moulani, and Angrahasa-I are technologically more advanced in agriculture both for tribal and non-tribals than other GPs of the subdivision.

6.3.3 Test Statistics on Impact of Modern Technology on Economy

How far the modern technology and modernisation affect the economy of tribal people should be statistically tested. There are different parameters to test significance.

Test 1. Distribution of use of modern agricultural tools: The Chi-square statistic is basically a method to test the correspondence between certain observed and estimated frequencies. In case of close correspondence between the two, the statistics chi-square (χ^2) as given below will be statistically insignificant (Mahmood, 1998).

$$\chi^2 = \sum_{i=1}^n \left[\frac{(O_i - E_i)^2}{E_i} \right]$$

Where, O_i and E_i are the observed and estimated frequencies respectively of the ith class. The shape of the distribution will vary with (n-1) which is known as its degrees of freedom.

Assumption: The Chi-Square goodness of fit test has been used to determine whether the distribution of average modern agricultural tools used by the tribal people is even or not. We make a null hypothesis that the average number of modern agricultural tools in each GPs to be equally distributed. The null hypothesis (H₀) framed is as under:

H₀ (Null Hypothesis) = There is no significance difference between the observed and expected number of modern agricultural tools in each selected GP.

H_a (Alternative Hypothesis) = There is significance difference between above two variables i.e. distribution is not even.

Df= Degree of freedom is (10-1) = 9

Significance level: 0.01, 0.05, 0.10

Table 6.2 Chi-Squared Test of Distribution of Modern Agricultural Tools

Selected GP	Average number of tools (O _i)	Expected value (E _i)	Residuals (O _i - E _i)	(O _i - E _i) ²	$\frac{(O_i - E_i)^2}{E_i}$
Odlabari	40	40.3	-0.3	0.09	0.002
Tesimla	37	40.3	-3.3	10.89	0.270
Kranti	38	40.3	-2.3	5.29	0.131
Chapadanga	38	40.3	-2.3	5.29	0.131
Moulani	45	40.3	4.7	22.09	0.548
Lataguri	47	40.3	6.7	44.89	1.114
Matiali Batabari-II	38	40.3	-2.3	5.29	0.131
Bidhannagar	39	40.3	-1.3	1.69	0.042
Angrahasa-I	41	40.3	0.7	0.49	0.012
Angrahasa-II	40	40.3	-0.3	0.09	0.002
Total	403	403	0	96.1	2.385

Source: Computed by the Researcher

Results: Since the result indicates that the estimated value of χ^2 is 2.385 which is too much smaller than that of the critical values. For (n-1) degree of freedom the tabulated value of chi square at 1% level of significance is 21.67, at 5% level of significance is 16.92. So, the null hypothesis is accepted and alternative hypothesis is rejected at 0.05 and 0.10 significance level. It confirms that there are changes in respect of impact of modern agricultural tools with a slight fluctuation.

Test 2. Impact of modern economic activities on tribal livelihood: There is another decision to be inferred that how much the modern economic activities influences the traditional livelihood pattern of tribal people. Their traditional occupation i.e food gathering and hunting is now a day's abolished. People are now dependent on tea gardens who were immigrated from Chhotonagpur plateau region. So, considering their past occupation certainly there is significant change of livelihood pattern. But if it is considered from the present position of habitation their livelihood pattern remain traditional and change is insignificant. In other way they are illiterate, poor and deprived throughout the passage of time.

Assumptions: Impact of modern economic activities on the traditional livelihood pattern of tribal people is insignificant.

Following table will highlight the conditions of their livelihood patterns and changes of traditional livelihood patterns. Samples were collected in respect of changes of primitive occupations and changes after independence. Similarly questions were asked about changes of food habits and income.

Table 6.3 Changes of Livelihood patterns as per respondents opinion

GP	No. of respondents	Percentage of respondents has given opinion		
		Occupation changed in respect of primitive occupation	Occupation changed since independence	Income & Food habit changed since independance
Bagrakot	125	75	05	05
Rangamatee	125	80	04	11
Rajadanga	50	70	08	14
Changmari	50	82	07	11
Lataguri	25	55	10	19
Bidhannagar	50	65	11	10
Indong Matiali	75	71	07	6
Angrabhaska-I	50	61	06	7
Sulkapara	75	65	09	8
Champaguri	125	76	08	7

Source: Field Survey, 2015

Pearson's product-moment correlation formula (r) is concerned with the measurement of the strength of association between variables (Das, 1997). For the purpose of correlation, Percentage changes of occupation in respect of primitive occupation is considered as independent variable (x); and Percentage of income and food habit changed since independence as dependent variable (y).

Table 6.4 Correlation coefficient between changes of occupations and livelihoods

GP	X	Y	X- \bar{x}	Y- \bar{y}	(X- \bar{x}) ²	(Y- \bar{y}) ²	(X- \bar{x}).(Y- \bar{y})
Bagrakot	75	5	5	-4.8	25	23.04	-24
Rangamatee	80	11	10	1.2	100	1.44	12
Rajadanga	70	14	0	4.2	0	17.64	0
Changmari	82	11	12	1.2	144	1.44	14.4
Lataguri	55	19	-15	9.2	225	84.64	-138
Bidhannagar	65	10	-5	0.2	25	0.04	-1
Indong Matiali	71	6	1	-3.8	1	14.44	-3.8
Angrabhaska-I	61	7	-9	-2.8	81	7.84	25.2
Sulkapara	65	8	-5	-1.8	25	3.24	9
Champaguri	76	7	6	-2.8	36	7.84	-16.8
Sum	$\bar{x}=70$	$\bar{y}=9.8$			662	161.6	-123

Source: Computed by the Researcher

In equation form, the Pearson's product moment correlation is:

$$r = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sqrt{\sum(x - \bar{x})^2(y - \bar{y})^2}}$$

Where, r = Pearson's product moment correlation, \bar{x} and \bar{y} = Mean values of x and y respectively.

Correlation co-efficient for table-6.4 is:

$$r = \frac{-123}{\sqrt{662 \times 161.6}} = -0.38$$

Results: Negative correlation between the variable indicates that there is direct negative relationship between X and Y. Although there is negative relationship but the relationship between the variable is weak. However, without applying the test of significance, we can not generalize this relationship for all GPs, as the number of observations in the present case is very small. The test is carried in the following manner:

$$t = r \sqrt{\frac{n-2}{1-r^2}} = 0.38 \sqrt{\frac{10-2}{1-(0.38)^2}} = 1.16$$

The tabulated value of t for 8 (10-2) degrees of freedom is 3.36 at 1%, 2.31 at 5% and 1.86 at 10% level of significance respectively. The computed value (1.16) is not greater than even the 10% tabulated value of t , hence the correlation coefficient is quite insignificant. Thus it may be concluded that impact of modern economic activities on the traditional livelihood pattern of tribal people is insignificant.

6.4 Impact of Modern Technology on Tribal Livelihood

Tribal people of Dooars are also being habituated with the modern means of communication technology now-a-days. The field study shows that 58% households have at least single set of mobile phones.

With increasing literacy, newspaper are easily gone through by the young people; there are few motor bikes by which transportation become easier, so, many people can afford the nature of livelihood that deals by the other people. Many old people are there who were confined within their habitat and working place but now the young people visits many places outside their habitats. Once, dropout in school was very common, but now after the establishment of Parimal Mitra Smriti Mahavidyalaya in Mal town area, pupils are becoming educated, that influences the rapid growth of communication technology. These manifold influences have impacts a little bit on occupation structures among the tribes. Following are

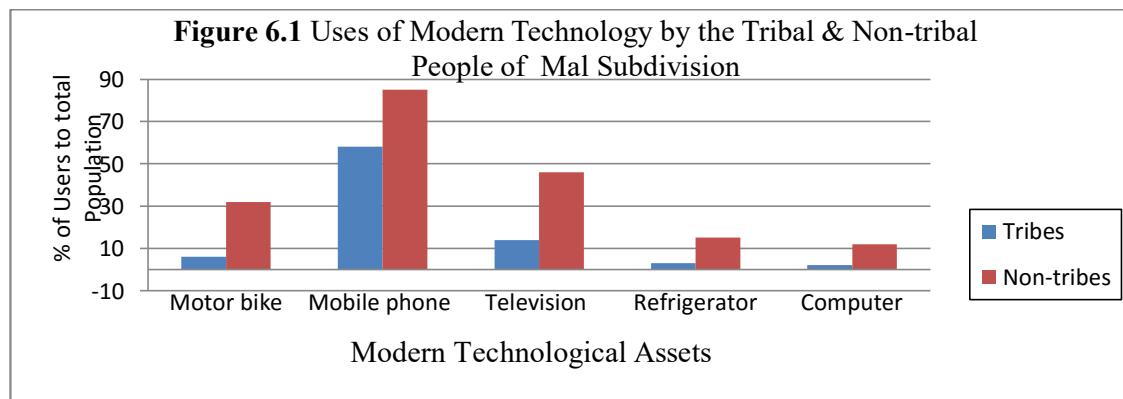
the statistical information about the use of modern means of communication technology adopted by the tribal people in Dooars area of Mal subdivision:

Table 6.5 Use of Modern Amenities by the Tribal & Non-tribal Households by Percentage

GP Name	Motor Bike		Mobile Phone		Television		Refrigerator		Computer	
	Tribe	Non-Tribe	Tribe	Non-Tribe	Tribe	Non-Tribe	Tribe	Non-Tribe	Tribe	Non-Tribe
Bagrakot	4	22	43	80	9	40	1	10	1	9
Rangamatee	4	28	41	78	10	38	2	10	1	10
Rajadanga	6	29	55	77	12	44	3	9	1	11
Lataguri	8	44	67	90	19	49	5	22	3	15
Bidhannagar	7	22	63	88	16	46	2	19	3	12
Matali Hat	8	25	60	90	16	47	3	18	2	14
Champaguri	7	27	51	85	13	49	2	18	2	11
Looksan	5	28	50	80	14	45	3	11	2	10
Total	6	32	58	85	14	46	3	15	2	12

Source: Field survey, 2015

From the above statistics, it is clear that mobile phone has become the most important communication tool in tribal society too. All other assets are very limited in their possession. The non-tribal people of the study area access more technology than that of tribal people. So, there is little impact of modern technology among the tribal people living in Mal subdivision.



6.5 Conclusion

Major occupational and techno-cultural changes have taken place in both for the tribal and non-tribal people society. Tribal arts, crafts, customs and values have been changed by

modern technology rapidly. The ethnic cultures of tribes are thus dying. The tribal groups draw their livelihood primarily from agriculture and tea plantation. Over the years, they have remained labour or worker and have not done much to effect occupational diversification. Modification due to modern technology has occurred, but it is very limited for the tribes. The neglect of the task of development of the human resources by not acquiring general education has kept them as labour and has prevented their entry into the white-collar jobs. In their occupation, there is very limited change incorporating modern means of technology. In agricultural sectors sum short of influences is there by adopting modern means of technology in agricultural field. So, it can be concluded that modern technology has played a significant role to change tribal society but upon the economy it is quite insignificant.

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