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Impact of Modernisation on Economy of Tribal People Living in Dooars

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Abstract: *Indigenous people across the world have been affected by the modernisation through introduction of technologies. Modern technologies, especially tele-communication and computer technologies, allow indigenous groups to participate in the larger societies and economics around them. Some have not dramatically changed their ways of life, while others have completely changed self-identities, entire societies and worldviews. The tribal people of Dooars were originally a floating settler migrating from place to place for land and employment. Gradually they acquainted with the in-migrated tribal people from Chhotonagpur plateau and new form of plantation economy. To make them advanced and integrated with other people govt. initiated developmental programmes. Modernisation and modern way of livelihood and assimilation with the non-tribal people have changed their occupation and larger economy. Attempts have been made in this paper to find out the influences of modernisation in positive and negative perspectives.*

Keywords: *Indigenous, modernisation, technology, livelihood, in-migrated.*

1. INTRODUCTION

The study area, Dooars region geographically spread over along the foothill of the Himalayas. Mal subdivision of Jalpaiguri district is a part of Dooars. Nearly 40% people of this subdivision belongs to tribe. The tribal people have indigenous economy. Most of the forms of occupations were based on customs and traditions and subsistence in nature. 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. The main occupations of the primitive people were animal husbandry, basketry, fishing, hunting and gathering, and weaving. The aboriginal tribes of Dooars, namely, the Mech, Garo, Rabha, and Lepchas were the jungle dwellers who used to habituate with shifting cultivation. After introduction of tea plantation, large amount of tribal people in-migrated from Chhotonagpur plateau to this region. They were basically engaged as labourers of the tea garden in different forms i.e. plucking tea leaves, harvesting, planting tea sapling, processing, driving cars and others. 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, fishing, weaving and hunting are now not occupations at all for tribal people. Modern communication technology- the mobile phones, internet services, newspapers, and Medias have influenced many young people to alter their traditional occupations.

2. MATERIALS AND METHODS

Past records regarding livelihood of tribal people have been collected from the historical records and literatures. Present form of economic transformation have been gathered from primary data obtained from the field. One village from each 10 Gram Panchayat (GP) were taken for source of primary data. 25 households from each village under consideration were randomly selected to do the scheduled method of survey. After getting information the entire information have been analysed and tested its significance by Chi-square and Pearson's product moment correlation.

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

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

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

In case of close correspondence between two variables, the chi-square statistic (x^2) is a good measure (Mahmood, 1998).

$$x^2 = \sum_{i=1}^{n} \left[\frac{(Oi - Ei)2}{Ei} \right]$$

Where, Oi and Ei are the observed and estimated frequencies respectively of the i^{th} class.

3. RESULTS AND DISCUSSION

The following impacts were noticed in change of tribal economy through modernisation.

3.1. Impact on Tribal Occupation

Though tea gardens are the main sources of income or occupation, 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) 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 change is very insignificant. 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.

Table1. *Changes of Livelihood patterns as per respondents' opinion*

GP	No. of respondents	Changes as per respondents' opinion (%)		
		In respect of primitive occupation	Occupation since independence	Income &Food habit since independence
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
Angrabhasa-I	50	61	06	7
Sulkapara	75	65	09	8
Champaguri	125	76	08	7

Source: *Field Survey*

How much the modern economic activities influence the traditional livelihood pattern of tribal people can be statistically tested.

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

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).

Table2. *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
Angrabhasa-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*

Correlation co-efficient for table-2 is:

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

Test 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 cannot generalize this relationship for all GPs, as the number of observations in in the present case is very small. The test is carried in the following manner:

$$t = \mathbf{r}\sqrt{\frac{n-2}{1-r^2}} = \ 0.38\sqrt{\frac{10-2}{1-(38)^2}} = 1.16$$

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.

3.2. Impact on Agricultural Economy

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. The success of modern technology transfer is dependent on various factors, particularly the infrastructure for providing motivation, training, finance, processing and marketing. 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). 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

Table3. *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
Angrabhasa-I	22	68	39	18	21	56	65	41
Angrabhasa-II	20	67	41	19	18	54	64	40
Total	**20**	**50**	**38**	**20**	**20**	**58**	**59**	**38**

Source: *Field survey*

In three cases i.e. use of pump sets, chemical fertilisers, and HYV seeds, there are more than half of the tribal' 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. But changes has occurred for tribal in Dooars from migratory subsistence farming to permanent agriculture with little bit modernisation. The GPs of Lataguri, Moulani, and Angrabhasa-I are technologically more advanced in agriculture both for tribal and non-tribals than other GPs of the subdivision.

How far the modern technology and modernisation affect the economy of tribal people can be statistically tested. The Chi-square statistic is basically a method to test the correspondence between certain observed and estimated frequencies.

Table4. *Chi-Squared Test of Distribution of Modern Agricultural Tools*

Selected GP	Average number of tools (Oi)	Expected value (Ei)	Residuals (Oi - Ei)	$(Oi - Ei)^2$	$\frac{(Oi-Ei)2}{Ei}$
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
Angrabhasa-I	41	40.3	0.7	0.49	0.012
Angrabhasa-II	40	40.3	-0.3	0.09	0.002
Total	403	403	0	96.1	2.385

Source: *Computed by the Researcher*

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 (Ho) framed is as under:

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

Ha (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

Test results: Since the result indicates that the estimated value of x^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.

3.3. Outmigration for Occupation

From the closed tea gardens a few male labourer force to migrate to the different western provinces of the country, the women and young age workers are employed in different construction works such as lifting and breaking stones from the river beds etc. Due to unemployment in tea gardens hundreds of tribal girls mostly teenagers driven out of home because of the dream of a better life, have fallen prey to human trafficking. They have been trapped by local agents promising lucrative jobs in big cities of the country. After leaving home, however, these girls have become untraceable (Sumati, 2013).

4. CONCLUSION

In the Dooars region for larger society the impact of modernisation on economy of tribal people is still insignificant. But gradually there is sign of changes. There have been both positive and negative impacts of modernisation on tribal economy. Negative impact is that they have forgotten their earlier traditional practices. They were earlier nature lover but now 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, 2015). Positive changes are better earning and modern way of living which are very much essential today to live in this world where natural resources like forests, earlier source of livelihood, are gradually decreasing.

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