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MULTIDIMENSIONAL POVERTY AND TRIBAL LIVELIHOOD SUSTAINABILITY IN RURAL WEST BENGAL, INDIA: A MICRO LEVEL ANALYSIS

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INTRODUCTION:

Poverty and sustainability have become prominent catchphrases of the 20th and 21st centuries,capturing global attention.Poverty, as a concept is dynamic, evolving its definition, measurement parameters, and contributing factors according to spatio-temporal needs and circumstances. It is often regarded as a relative concept, with indicators such asstandard of living, earnings and consumptionpower used to gauge poverty at various levels(Ringen, 1988).Moreover, poverty is intertwined with the ability to fulfill diverse needs,which vary from person to person (Sen, 2017).Conversely, sustainable development has garnered both acclaim and skepticism due to its perceived idealistic nature, often considered challenging to implement in practice(Loomis, 2000).Calls for sustainable development have been echoed in conferences like the Earth summit, urging a shift in life style to ensure sustainability across all facets of human existence, while preserving the integrity of the natural environment(Priyadarshini & Abhilash, 2019).However, the practical implementation of sustainable development in everyday life remains a pressing concern. This realization also gives rise to one thinking process that it is the tribals who know best how to keep parity with the natural world. Yet, these communities are also among the most impoverished population globally(Lertzman& Vredenburg, 2005).

In India, chronic poverty exhibits significant spatial variation with certain states experiencing higher poverty rates compared to others. West Bengal, for instance, has a poverty rate of 26.1 % among its total population (Mehta & Shah, 2003).Scheduled tribe population in India are considered one of the most multidimensionally poor communities, with nearly half of this population living in poverty and marginalized condition even in the 21st century(Thorat et al., 2017).Since independence, India has made significant efforts to incorporate scheduled tribes into the country's development planning. However, these endeavors have often favored the wealthy population, resulting in the reallocation of resources from tribal inhabited areas in exchange for minimal budget allocations towards tribal

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development programs(Jones, 1978).

Consequently, despite government efforts, tribal communities in India continue to face significant challenges in education, healthcare, and socio-economic conditions and living as "world within the world" as the country portrays itself as an emerging nation, yet tribal development levels remain lower than those of African and Sub-Saharan populations(Sarkar et al., 2006).Paradoxically, while experiencing extreme poverty, tribals are often regarded as exemplars of sustainable living, having maintained harmonious relationships between nature, plants, animals and humans for generations through their knowledge, history and ceremonial practices (Pete, 2020).India is home to approximately 700 identified scheduled tribe populations, each serving as a repository of knowledge that can be leveraged to achieve sustainability in various aspects of life (Priyadarshini & Abhilash, 2019).

LITERATURE REVIEW:

The definition of development and the parameters used tomeasure it often lack relevance to the tribal lifestyle as they are predominantly shaped by non-tribal researchers. These researchers assume that the problems prevalent in the non-tribal society are also present in tribal society. Consequently, the development steps taken for tribes are based on these non-tribal perspectives, which have little connection to tribal lifestyle and knowledge. This gap between the planning process and tribal thinking has resulted in a situation where tribes have numerous developmental programs initiated by both governmental and non-governmental organizations, yetthey remain at the bottom rank of society in terms of their standard of living, per capita income, literacy, health, and work participation(Thakur & Sharma, 2012).

The definition of development itself is a matter of concern. Initially, development was strictly viewed as an economic process, but over time, it expanded to encompass society and ecology, prioritizing the betterment of human life (Landorf et al., 2008).The Brundtland commission's report, 'Our common future' introduced the concept of sustainable development as a solution to the damages inflicted on nature in the name of development. Since then, sustainable development has become a widely discussed concept, sparkling debates about whether to prioritize 'develop mostly' or 'sustain only'(Ranis et al., 2006).Researchers have identified a problem in the current non-tribal society, where economic development takes precedence over society and ecology. To achieve true sustainability and mitigate the harm caused by the development, the priority sequence should be reversed, with nature taking precedence over anything else. This approach, considering oneself as a part of natural system has been practiced by various tribal groups throughout history(Ayyanar& Ignacimuthu, 2005). However, with profit-driven dominance, triballife styles and traditional knowledge

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about their habitats have been marginalized and deemed unscientific, leading to the removal of their rights over their own land. India has also witnessed numerous instances of such activities(Jones, 1978: Xaxa & Xaxa, 2018). As a result, despite possessing the very sustainability that non-tribals are seeking now, tribal communities remain marginalized, with non-tribals attempting to provide support while seeking an escape from their own existing life styles and practices.

Therefore, this research paper aims to bridge the gap between economic development for tribes and the preservation of their sustainable lifestyles and it also seeks to determine whether poverty and sustainability have any interrelationship. So, the main objectives of this study are to assess the condition of living in tribal households within the study area and to investigate the relationship between poverty and sustainability in tribal life.

3. MATERIALS AND METHODS

3.1 Study area selection and sample size calculation

Bankura, the fourth largest district of West Bengal, is taken as the study area for this research.On the basis of this pattern of spatial distribution of tribal population, among the 22 C.D. Blocks of Bankura district, 9 blocks namely Chhatna, Saltora, Khatra, Hirbandh, Ranibandh, Sarenga, Raipur, Simlapal and Taldangra have been selected on the basis of the location quotient value of scheduled tribe population. C.D. Blocks with a LQ value more than 1 has been selected for the study. After selecting the blocks, eighteen Villages from nine C.D. Blocks of Bankura district have been selected again on the basis of the location quotient value of tribal population. From each block two villages are selected one with LQ value more than 1 and the other is less than 1. This selection method confirms inclusion of villages dominated by tribal and non-tribal population respectively. Fig.1 shows the location of the study area and Fig. 2shows the block wise location quotient value of the tribal population. The diagram shows that all the selected blocks with LQ value more than 1, are situated in the western part of the district which holds a parity with the distribution pattern of tribal population in the district. In table 1 location quotient value of tribal population of selected villages are shown. Through random sampling method sample has been chosen from each village to conduct a household survey on the basis of structured questionnaire. As the percentage of tribal household to total number of households in the selected C.D. Blocks is 31.44%, confidence interval has been calculated to be 2.47. On the basis of this, at a confidence level of 95%, 586 tribal household is the sample size for this research.

3.2 DATABASE AND METHODOLOGY

3.2.1 Multi-dimensional Poverty Index

Multi-dimensional Poverty Index is a tool for objective measurement of poverty. It was first developed by Oxford Poverty and Human Development Initiatives (OPHI) to measure

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the living condition of poor in third world countries. The index has three dimension and ten indicators which have been chosen on the basis of data availability and data comparability in the developing nations. These dimensions along with data availability and comparability, has parity with other indices like HDI and GDI and indicators have relevance with different Sustainable Development Goals (Alkire & Kanagaratnam, 2021; Alkire & Sumner, 2013). Calculation of multi-dimensional poverty index includes three aspects. The first is to identify the level of deprivation of each individual in the given indicators i.e. the aforementioned ten indicators as suggested by Alkire and Foster, 2014. Secondly the column of the matrix reveals number of individuals deprived in a particular dimension. Lastly the index attempts to find out who should be considered as poor. Aggregate value falls under a certain cut off for a particular household determines whether the household is multidimensionally poor or not. In a more detailed manner in multidimensional poverty index attempts to find out deprivation in selected dimensions(d) for selected population (n).

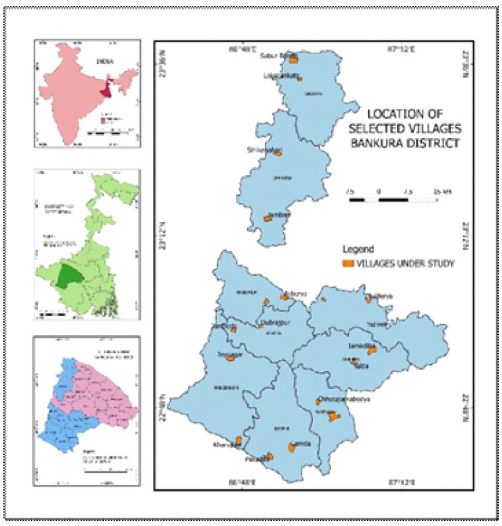

Fig 1 Location of study area

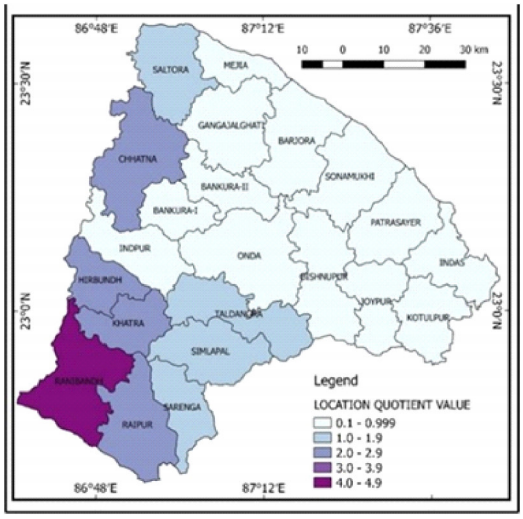

Fig 2 C.D. Block wise LQ values

Table 1: Village wise location quotient value

C.D. Block	Village Name	Number of	Total population	Tribal Household	Tribal population	Tribal population in %	Location quotient
Saltora	Lakshankata	54	268	54	268	100.00	5.29
	Sabur Bandh	329	1814	34	186	10.25	0.54
Chhatna	Sihikapahari	79	433	79	433	100.00	4.88
	Jambani	80	403	8	41	10.17	0.50
Taldangra	Balarampur	59	287	59	287	100.00	7.18
	Tulderya	160	841	17	87	10.34	0.74
Simlapal	Jamirdiha	103	464	103	464	100.00	6.72
	Talda	197	947	21	102	10.77	0.72

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Khatra	Jambeda	27	124	27	124	100.00	4.54
	Dubrajpur	109	509	12	54	10.61	0.48
Hirbandh	Rangamati	85	389	85	389	100.00	3.52
	Asberya	217	957	23	103	10.76	0.38
Raipur	Pakadihi	118	501	118	501	100.00	3.62
	Jamda	305	1272	33	139	10.93	0.40
Sarenga	Chhotajamabedya	61	292	61	292	100.00	5.23
	Kuldiha	646	2988	67	309	10.34	0.54
Ranibundh	Kharujhor	108	536	108	536	100.00	2.12
	Jaynagar	234	1093	25	117	10.70	0.23
Total		2971	14118	934	4432		

Source: District Census Handbook, Bankura, 2011

yij indicates deprivation of i individual in j dimension. Each row of the matrix shows the detail of deprivation of each individual in each dimension taken under consideration. In case of MPI d= 10 (yi= yi1, yi2,……., yid). In the same matrix the column shows the number of persons deprived in j dimension. In MPI respective dimensions and their indicators are assigned with a particular weightage. Wj represents the dimensional weightage in the calculation. So, from the first matrix dimension and person specific detail of deprivation can be gathered.

The notion of the second matrix is to identify the portion of population that should be considered as multi dimensionally poor. Zj> 0 is considered as cut off for deprivation in j dimension. The matrix of deprivation if considered as goijwhich can also be expressed as wj, the weightage assigned for dimension j. So, $g_{oij} = w_j$ when $y_{ij}<z_j$ and $g_{oij}= 0$ when $y_{ij}>z_j$. So, y_{ij} would be equivalent to wj when person i is deprived in dimension j and yij would be zero if the person is not deprived in dimension j.

Lastly through dual cut off method, within dimension cut off (zj) and cross dimensional cut off (k), it is determined who should be considered as multidimensionally poor. In this third matrix sum total of cij, considering c as the vector of deprivation, a person's deprivation in all the dimensions can be expressed through a weighted value. (Ci = dj=1goij). Person i should be considered as multidimensionally poor if Ci>k.

Multidimensional poverty index or MO can also be expressed as a product of Head count Ratio (H) and intensity of multidimensional poverty (A). H is the ratio of poor population (q/n, where q = poor population) and $A = \sum_{i=1}^{n} \mathrm{Ci}(k)/dq$ (Alkire & Santos, 2014).

3.2.2 Sustainable Livelihood Security Index (SLSI)

Sustainable livelihood is considered as a situation where nutrition and economic condition of a person available enough to secure the person from poverty (Chambers & Conway, 1991).Swaminathan has considered sustainable livelihood as a livelihood which

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provides ecological security, economic efficiency and social equity (Singh & Hiremath, 2010).The concept of sustainable development encompasses three dimensions which are ecological, economic and social. Sustainable livelihood security index is an attempt by Swaminathan and later modified by Saleth and Swaminathan to select indicators in such a manner which makes the index inclusive for all the dimensions of sustainability (Singh & Hiremath, 2010).SLSI is beneficial in many ways in comparison to other indices to measure sustainability. Indicators taken under consideration, are available for most of the region, the calculation is simple and the nature of the index is variable rather than being rigid. These characteristics go smoothly with the dynamic nature of the concept of sustainability (Saleth & Swaminathan, 1993).

The analytical framework of the index starts with considering SLSIijis the value of SLSI for ith component in jth entity. Xijis the variable for ith component in jth entity. So SLSIij can be calculated as

$$\text{SLSIij} = \frac{Xij \quad \text{MiniXij}}{MaxiXij \quad MiniXij}$$

After calculating the relative performance of each entity in comparing to the total variability of a particular component, the composite index value for each entity can be drawn by multiplying the value with the assigned weightage for each indicator. So, SLSI for a particular entity is

$$\text{SLSIj} = \frac{\sum i = 1 \; aijSLSI\text{ij}}{I}$$

Here a denotes the weightage assigned for ith indicator. Indicators chosen to comprise all the three dimensions of sustainable development, are distributed under three different indices and SLSI is the composite value of all the three indices for each entity under consideration.

Table 2 Indicators and calculation of SLSI

Indices		Indicators (i)	Weightage
SLSI= 1.00	ESI	Vegetation cover in %	W=0.11
	W=0.33	Average Depth of Ground Water in m.	W=0.11
		Extractable Bases (Ca, Mg, Na, K) in me/100g	W=0.11
	EEI	Total food grain production (quintal/bigha)	W=0.825
	W=0.33	Area under agriculture in %	W=0.825
		Work Participation in %	W=0.825
		APL Household in %	W=0.825
	SEI	Female literacy in %	W=0.11
	W=0.33	Sex Ratio	W=0.11
		Per capita food grain production (kg/yr)	W=0.11

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Source: (Singh & Hiremath, 2010)

3.3.3 Test of significance

In this research to understand the significance of the values of both the two indices for each surveyed villages, MANOVA has been performed through SPSS software to understand that whether there is any impact of tribal population concentration upon the economic, ecological and social dimension of tribal life. One set of hypotheses have been structured for this test.

Null (H0): There is no significant difference of mean values of ESI, EEI, SEI between these two groups

Alternative (H1): There is a significant difference of the mean value of ESI, EEI, SEI between these two groups

4. RESULT AND DISCUSSION

This study aims to pallet a village level study for villages selected on the basis of concentration of tribal population to showcase the dimension of poverty and livelihood security condition of the tribal population of the study area. The paper also attempts to interpret the interrelationship between condition of poverty and livelihood sustainability of the scheduled tribe population with the concentration of tribal population in the villages under study.

The distribution of the tribal population in Bankura exhibits an interesting pattern. The continuous encroachment of the non-tribal population from the east has resulted in the displacement of tribal communities to the extreme western part of Bankura, which is relatively less resourceful in nature (O'Malley, 1908).C.D. Block wise distribution of tribal population reveals thatthe concentration of S.T. population is high in the western part of the district where undulated physiography, infertile soil, less rainfall, non-perennial rivers and persistent deforestation have contributed to the natural resource limitations in the tribal habitats. As a result, the tribal communities living in these areas are already vulnerable to poverty. Furthermore, the isolation of the tribal communities from the main stream population exacerbates their vulnerability towards poverty.

Intable 3 village wise MPI values has been provided.The calculated Multidimensional Poverty Index (MPI) values based on primary data collected from selected households in the study area has the highest and lowest MPI values of 0.428 and 0.174, respectively. Both of these values are higher than the national MPI value of 0.123, indicating a more

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severe level of poverty in the villages under study.

Table 3: Village wise MPI and SLSI values

Name	Intensity of Deprivation (A)	Headcount Ratio (H)	MPI Value	ESI	EEI	SEI	SLSI
Asberya	0.411	0.428	0.176	0.216	0.694	0.304	0.405
Balarampur	0.471	0.678	0.319	0.629	0.431	0.458	0.506
Chhotajamabedya	0.456	0.852	0.388	0.445	0.481	0.541	0.489
Dubrajpur	0.300	0.605	0.182	0.303	0.624	0.784	0.570
Jambani	0.214	0.860	0.184	0.216	0.694	0.304	0.405
Jambeda	0.526	0.815	0.429	0.417	0.181	0.454	0.473
Jamda	0.300	0.660	0.198	0.309	0.686	0.513	0.502
Jamirdiha	0.291	0.913	0.266	0.506	0.497	0.107	0.370
Jaynagar	0.396	0.479	0.190	0.638	0.468	0.465	0.524
Kharujhor	0.496	0.741	0.368	0.934	0.200	0.257	0.472
Kuldiha	0.300	0.629	0.189	0.309	0.784	0.922	0.672
Lakshankata	0.444	0.815	0.362	0.521	0.561	0.366	0.483
Pakadihi	0.498	0.746	0.372	0.445	0.402	0.440	0.429
Rangamati	0.501	0.753	0.377	0.417	0.593	0.222	0.411
Sabur Bandh	0.286	0.860	0.246	0.339	0.531	0.536	0.469
Sihikapahari	0.478	0.696	0.333	0.417	0.593	0.222	0.411
Talda	0.271	0.707	0.191	0.284	0.648	0.203	0.378
Tulderya	0.360	0.483	0.174	0.469	0.691	0.848	0.669

Source: Primary survey, 2022-2023

Notably, the severity of poverty is particularly pronounced in villages where the majority of households belong to scheduled tribe population. This value has been generated from the headcount ratio and the intensity of poverty. Both the indices are calculated for each surveyed villages and the picture is quite concerning. For instance, in the village named Jamirdiha, the head countratio reaches as high as 0.91, indicating that approximately 91% of households in that village are classified as multidimensionally poor. Other villages with significant tribal population exhibit headcount ratiosclose to 80%, which is equally alarming. Examples of such villages includeLakshmankanta, Shihikapahari and Jambeda.

In comparison, villages with a lower scheduled tribe population display relatively lower head count ratio. This indicate that the prevalence of multidimensional poverty is comparatively lesser in these villages. The intensity of poverty, which indicates the number of dimensions in which multidimensionally poor households are deprived, follows a similar pattern. Village wise dimension specific deprivation shows that villages with a high tribal

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population also tend to have a greater number of households experiencing severe multidimensional poverty across various dimensions.

Among the three dimensions of MPI index, health emerges as a dimension where all villages in the study area exhibit severe levels of deprivation. Educational scenarios and village level drinking water facilities are one dimension and one parameter under the standard of living dimension respectively where most of the villages are displaying good and improving condition. Indicators like electricity, cooking fuel, housing condition and toilet facility are showing some interesting results as most of the facilities are provided to many villages under study but the quality is extremely poor and affordability of these facilities is beyond the means of the tribal population. Consequently, although on paper they may not be considered deprivedin these parameters, in reality, they continue to face deprivation due to the lack of quality and affordability. This highlights the importance of considering the actual lived experiences and realities of the tribal population rather than solely relying on indicators that may not accurately capture their conditions. In conclusion, the research findings suggest that the surveyed tribal population is indeed affected by poverty, and the severity of poverty increases with a higher percentage of tribal population within the villages.

The analysis of Multi-dimensional Poverty Index values for the surveyed villages reveals a significant relationship between poverty and the concentration of tribal population. To understand the nature and strength of this relationship, a statistical analysis of bi-variate relationship between location quotient value which has been considered as the independent variable (x) and MPI value of the respective villages as dependent variable (y), has been calculated using Pearson's Product moment Corelation Coefficient ®(Matthews, 1981).

The analysisin fig.3 reveals a strong positive association between these two variables,with an r value of0.78. Additionally, a regression analysis using the least square method was conducted to examine the relationship further. The results show that approximately 53% of the variability in the dependent variable (MPI) can be explained by the concentration of tribal population measured through location quotient, as indicated by Rsquared value of 0.5327. This suggests that the concentration of tribal population has a substantial impact on the multi-dimensional deprivation experienced by villages.

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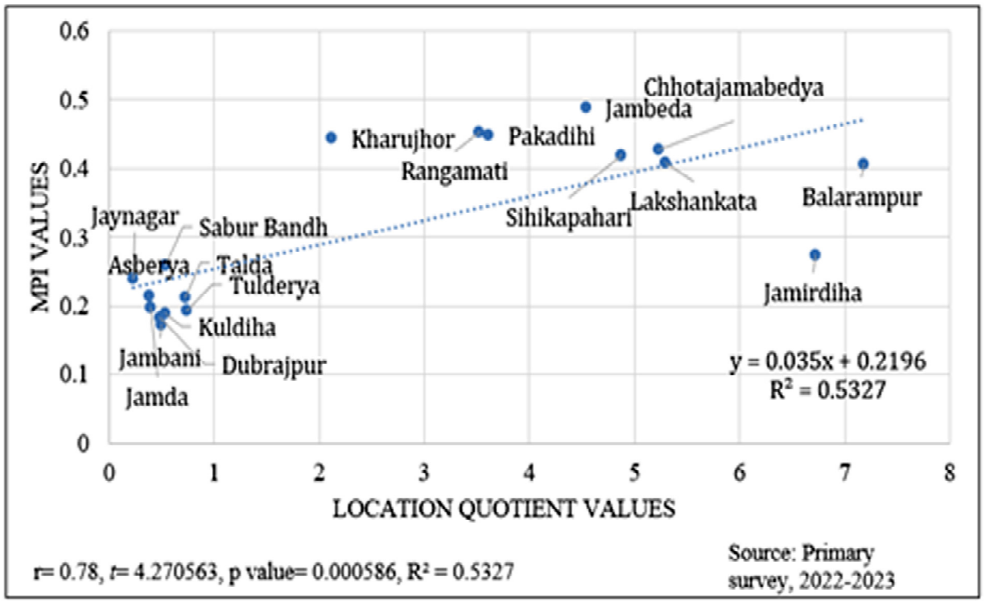
Fig 3 Relationship between MPI value & LQ of the surveyed villages



The livelihoods of tribal communities in the surveyed villages heavily rely on the available resource base. How far the utilization of these resources is sustainable can be understood through the Sustainable Livelihood Security Index (SLSI) after Saleth & Swaminathan, 1993.Table 2 describes the dimensions, indicators, and allotted weightage of the SLSI. Both primary and secondary data have been included in the calculation (Singh & Hiremath, 2010). Four indices have been computed for each village and provided in table 3 which shows that each village displayed a different standing for each index. In the previous discussion, it has been established through bivariate analysis that the proportion of tribal population has significant correlation with the Multidimensional Poverty Index (MPI) value of the villages. To determine whether the proportion of tribal population also influences the sustainability of tribal livelihoods, a MANOVA test was conducted using SPSS software, and the results are presented in table 4.(Field, 2005). In the main MANOVA table, the three index values for each village (Ecological Security Index [ESI], Economic Efficiency Index [EEI]and Social Equity Index [SEI]) were correlated with the villages categorized as either tribal-dominated or non-tribal-dominated. The table reveals that there is a significant difference in the mean values of ESI and EEI between the two categories of villages. However, the impact on SEI is found to be insignificant.

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Table 4: MANOVA calculation table

Levene's Test of Equality of Error Variances[a]								
	F	df1	df2	**Sig.**				
ESI	.165	1	16	**.690**				
EEI	1.852	1	16	**.192**				
SEI	2.757	1	16	**.116**				
Tests the null hypothesis that the error variance of the dependent variable is equal across groups. a. Design: Intercept + CATERGORY								
Tests of Between-Subjects Effects								
Source		Type III Sum of Squares	df	Mean Square	F	**Sig.**	Partial Eta Squared	Noncent. Parameter	Observed Power[d]
Catergory	**ESI**	**.151**	**1**	**.151**	**6.547**	**.021**	**.290**	**6.547**	**.671**
	EEI	**.196**	**1**	**.196**	**11.826**	**.003**	**.425**	**11.826**	**.897**
	SEI	**.182**	**1**	**.182**	**4.182**	**.058**	**.207**	**4.182**	**.485**
	EEI	.462	17						
	SEI	.881	17						
a. R Squared = .290 (Adjusted R Squared = .246), b. R Squared = .425 (Adjusted R Squared = .389)									
c. R Squared = .207 (Adjusted R Squared = .158), d. Computed using alpha = .05									

Source: Computed by author

Based on the results of the MANOVA analysis and the observations made during the primary survey, conclusion can be drawn regarding the sustainable utilization of available resources by tribal communities and the impact on their livelihoods.Significant difference in the economic condition between tribal-dominated and non-tribal-dominated villages, as shown through a simple bi-variate, confirms that the proportion of tribal population has a significant impact on economic efficiency. This suggests that tribal-dominated villages face greater challenges in achieving economic stability and efficiency compared to non-tribal dominated villages.The MANOVA analysis indicates that ecological security is higher in tribal-dominated villages. This can be attributed to the continued connection of tribal communities to their natural habitat. Despite the challenges they face, tribal communities strive to maintain their relationship with the environment, which contributes to a higher level of ecological security.In terms of social equity, certain social characteristics are maintained by tribal communities, whether they live in isolation or in proximity to non-tribal communities. For example, the sex ratio tends to be better in tribal societies, even in non-tribal neighborhoods. Female literacy, observed during primary survey, shows progress across all villages, indicating that education is an area where improvement is occurring.

So, it can be concluded that there are several problems regarding sustainable utilization of available resources by the tribals and because of that their livelihoods are becoming less sustainable than it was in the past but still the tribal villages can be considered as more ecologically secured and they are still connected to their natural habitat.

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CONCLUSION

In conclusion, this research paper sheds light on the poverty and livelihood conditions of tribal population in the study area. The findings reveal that tribal villages, particularly those with a higher concentration of tribal population, face significant economic challenges and are more prone to poverty. However, these villages also exhibit a stronger connection to their natural environment, indicating higher level of ecological security. To address these issues, it is imperative for all the stakeholders, including tribal communities, non-tribal population and the government, to adopt a more holistic and inclusive approach. Policies should consider the existing strengths of tribal populations, such as their traditional ecological knowledge and social cohesion. Economic development initiatives should be tailored to the sustainable utilization of local resources, allowing for application of traditional knowledge in tribal livelihoods. The inclusive approach will not only empower tribal population but also contribute to the preservation of their social and ecological balance of life.

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