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Bridging nutrition gaps: Impact of ICSSR-funded interventions among tribal communities in Odisha

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Abstract

This paper presents findings from an Indian Council of Social Science Research (ICSSR)-funded study examining the nutritional and socio-economic status of tribal beneficiary (B) and non-beneficiary (NB) households across three aspirational districts of Odisha-Kandhamal, Koraput and Rayagada. The study was designed to generate empirically grounded social science evidence on the differential outcomes between households receiving institutional support and those outside the programme net. A multi-stage random sampling technique was employed to select 60 beneficiary and 60 non-beneficiary respondents from each district ($n = 360$). Data were collected using a pre-tested structured interview schedule and analysed using mean scores, independent samples t-test and chi-square test. Beneficiaries recorded significantly higher mean scores on socio-economic, psychological and impact variables across all three districts. Non-beneficiaries exhibited greater extension contact, indicating a potential outreach gap. A significantly higher proportion of beneficiaries fell in the medium and high nutritional impact categories ($p < 0.01$). The findings offer policy-relevant insights for strengthening community-based nutrition interventions in tribal Odisha.

Keywords: ICSSR, nutritional status, tribal communities, food security, Odisha, social science research

Introduction

Medicinal plants have greatly gained importance in the management and treatment of human diseases, globally ^[1]. It constitutes the main source of primary healthcare in most rural populations, especially in many African countries, due to its affordability and availability. However, as the usage of these medicinal plants becomes more widespread around the world, there are questions and misgivings about the quality, efficacy, and safety of the products utilized in the health sector ^[2, 3, 4]. These concerns have hampered the sensible use and validation of bio-products derived. Tribal communities in India continue to face severe nutritional deprivation, compounded by socio-economic marginalisation and limited access to institutional services. The Indian Council of Social Science Research (ICSSR), established in 1969 under the Ministry of Education, Government of India, funds empirical social science research to generate evidence for policy formulation and programme design. ICSSR-sponsored field studies in tribal regions have increasingly focused on understanding the differential outcomes between households connected to institutional support mechanisms and those outside the programme net.

Odisha's Kandhamal, Koraput and Rayagada districts are among the most nutritionally vulnerable aspirational districts in India, characterised by high concentrations of Scheduled Tribe (ST) populations, poor dietary diversity and weak institutional linkages. This ICSSR-funded study investigates the differential socio-economic, communication, psychological and nutritional impact between tribal beneficiary and non-beneficiary respondents across these three districts, with a view to generating actionable social science evidence for programme strengthening.

Numerous studies corroborate the persistent health disparities, including high rates of malnutrition and anemia, faced by tribal communities in India, often exacerbated by their geographical isolation and socio-economic marginalization (Kshatri *et al.*, 2025; Kshatriya & Acharya, 2016, p. 1) ^[7, 8].

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These challenges are particularly pronounced in regions like Odisha, home to a significant number of particularly vulnerable tribal groups, where food insecurity and inadequate access to balanced diets contribute significantly to widespread malnutrition and anemia (Bhoi & Acharya, 2024; Kumar *et al.*, 2023, p. 135) ^[1, 9]. This dual burden of malnutrition, encompassing both chronic energy deficiency and micronutrient deficits alongside emerging diet-related non-communicable diseases, underscores the complex nutritional transition occurring within these indigenous populations (Ghosh-Jerath *et al.*, 2025, p. 2) ^[4]. The simultaneous manifestation of under nutrition, over nutrition, and micronutrient deficiency, known as the triple burden of malnutrition, continues to affect these populations at high levels, with progress in tackling it being unacceptably slow (Singh *et al.*, 2023, p. 2) ^[13]. These complex nutritional landscapes necessitate targeted interventions that consider the unique dietary patterns, cultural practices, and socio-economic determinants specific to each tribal group to effectively mitigate the long-term health consequences (Roy, 2023, p. 7) ^[12]. (Das *et al.*, 2024) ^[3] The high prevalence of poverty and low literacy rates among these communities further compounds these issues, hindering access to essential health and nutrition services (Bisai & Bose, 2012, p. 4; Mitchell *et al.*, 2023, p. 650) ^[2, 11].

2. Objectives

The specific objectives of this ICSSR-funded study were:

- To compare mean scores of beneficiary and non-beneficiary respondents on socio-economic, communication and psychological variables across Kandhamal, Koraput and Rayagada districts.
- To assess the level of nutritional impact among beneficiary and non-beneficiary tribal respondents.
- To test significant differences between groups using independent samples t-test and chi-square test.

3. Methodology

The study was conducted in Kandhamal, Koraput and Rayagada districts of Odisha, purposively selected on the basis of high Scheduled Tribe population concentration and prevalence of nutritional vulnerability. A multi-stage random sampling design was adopted in line with ICSSR research guidelines. In each district, two blocks were randomly selected, followed by two villages per block. From each village, 15 beneficiary and 15 non-beneficiary respondents were selected, yielding 60 B and 60 NB per district and a total sample of 360 respondents.

Data were collected through personal interviews using a pre-tested structured schedule covering socio-economic variables (age, education, family size, land holding, annual income, occupation), communication and institutional variables (membership of group, credit availability, information constraints, extension contact), psychological variables (nutrition knowledge score, balanced diet awareness, awareness about nutrition) and impact variables (food consumption diversity, household food security). The collected data were analysed using mean scores, independent samples t-test and chi-square test at 5% and 1% levels of significance.

4. Results

As illustrated by Table 1, the comparison of beneficiary (B) and non-beneficiary (NB) respondents within Kandhamal, Koraput, and Rayagada districts yielded statistically significant differences regarding various study variables. For socio-economic variables, education, land holding, and annual income were found to be highly significantly different ($p < 0.01$) in all the three districts, where the mean score for beneficiary respondents was higher compared to that of non-beneficiary respondents. Occupation also yielded a significant difference ($p < 0.05$); however, no significant difference could be observed regarding age and family size among respondents from the two groups. Regarding communication and institutional variables, information constraint and extension contact yielded significant differences. The level of information constraint was higher for beneficiary respondents; on the other hand, extension contact was significantly higher for non-beneficiary respondents ($p < 0.01$).

Regarding the psychological variables, knowledge regarding nutrition was significantly higher for beneficiaries in all three districts ($p < 0.01$). Balance diet knowledge showed significant variation in Kandhamal and Koraput districts, while it showed no significant difference in the Rayagada district. Knowledge about nutrition was found to show no significant difference between the two groups. With regard to impact variables, food consumption variety and food security were significantly higher for beneficiaries in all three districts ($p < 0.01$).

According to Table 2, distribution of respondents based on the impact levels of nutrition showed a marked difference between beneficiaries and non-beneficiaries in all three districts. Non-beneficiaries showed a larger percentage (45-50%) in the low impact category, while the beneficiaries were mostly in medium (50-53%) and high (30%) impact category.

Results from the chi-square test showed that there was statistical significance in the observed disparities for Kandhamal ($\chi^2 = 9.916$, $p < 0.01$), Koraput ($\chi^2 = 15.055$, $p < 0.01$) and Rayagada ($\chi^2 = 9.955$, $p < 0.01$), showing that the beneficiary.

4.3 Discussion

Beneficiary respondents under the ICSSR-funded study consistently recorded higher mean scores on education, annual income, land holding and nutrition knowledge across all three districts (Table 1). This suggests that households connected to institutional and research-backed intervention networks exhibit improved socio-economic and psychological profiles. The higher extension contact scores among non-beneficiaries point to a potential outreach gap where programme benefits are not reaching the most marginalised tribal households. Comparable findings have been reported in ICSSR-sponsored studies on tribal welfare in eastern India (Singh *et al.*, 2019; Mishra and Panda, 2021) ^[14, 10].

The chi-square analysis (Table 2) revealed a significantly higher proportion of beneficiaries in the medium (50-53%) and high (30%) impact categories compared to non-beneficiaries across all three districts ($p < 0.01$). Non-beneficiaries were concentrated in the low impact category (45-50%), underscoring the measurable contribution of ICSSR-linked institutional support to household-level nutritional outcomes.

Table 1: Comparative mean scores of beneficiary and non-beneficiary respondents across Kandhamal, Koraput and Rayagada districts

Variable	Kandhamal B	Kandhamal NB	t value	Koraput B	Koraput NB	t value	Rayagada B	Rayagada NB	t value
Socio-economic variables									
Age	2.18	2.05	1.39NS	2.13	2.0	1.27NS	2.2	2.05	1.63NS
Education	2.7	2.0	6.52**	2.63	1.98	6.95**	2.75	2.1	6.11**
Family Size	2.42	2.3	1.25NS	2.4	2.32	0.85NS	2.5	2.35	1.48NS
Land Holding	2.78	2.15	5.96**	2.75	2.1	6.70**	2.85	2.2	6.50**
Annual Income	3.0	2.35	6.28**	2.98	2.3	6.66**	3.05	2.4	6.95**
Occupation	2.48	2.25	2.43*	2.45	2.2	2.3*	2.55	2.3	2.77**
Communication / institutional variables									
Membership of Group	1.28	1.18	0.98NS	1.2	1.13	0.74NS	1.2	1.15	0.52NS
Credit Availability	1.35	1.4	0.48NS	1.2	1.32	1.24NS	1.2	1.35	1.64NS
Information Constraints	1.82	1.5	2.89**	1.8	1.47	3.27**	1.8	1.55	2.47*
Extension Contact	4.5	5.7	11.43**	4.4	5.77	12.569**	4.4	5.6	10.733**
Psychological variables									
Nutrition Knowledge Score	3.7	2.55	12.27**	3.6	2.45	12.316**	3.45	2.6	8.92**
Balanced Diet Awareness	2.0	1.65	3.19**	1.95	1.62	3.31**	1.56	1.75	1.85NS
Heard about Nutrition	1.32	1.5	1.83NS	1.27	1.45	1.94NS	1.33	1.52	1.83NS
Impact variables									
Food Consumption Diversity	3.6	2.6	10.14**	3.55	2.5	10.542**	3.58	2.55	9.48**
Household Food Security	3.68	2.55	12.352**	3.65	2.48	11.515**	3.66	2.5	11.986**

** Significant at 1%; * Significant at 5%; NS = Not Significant; B = Beneficiary; NB = Non-Beneficiary

Table 2: Distribution of respondents by level of nutritional impact across Kandhamal, Koraput and Rayagada districts

Impact Level	Kandhamal B	Kandhamal NB	Koraput B	Koraput NB	Rayagada B	Rayagada NB
Low	12 (20.0%)	28 (46.7%)	10 (16.7%)	30 (50.0%)	11 (18.3%)	27 (45.0%)
Medium	30 (50.0%)	22 (36.7%)	32 (53.3%)	20 (33.3%)	31 (51.7%)	22 (36.7%)
High	18 (30.0%)	10 (16.6%)	18 (30.0%)	10 (16.7%)	18 (30.0%)	11 (18.3%)

Chi-square: Kandhamal: $\chi^2=9.916$, $p=0.007$ ** | Koraput: $\chi^2=15.055$, $p=0.0005$ ** | Rayagada: $\chi^2=9.955$, $p=0.0069$ ** | ** $p<0.01$

5. Conclusion

This ICSSR-funded study demonstrates that tribal households connected to institutional support networks in Odisha exhibit significantly better nutritional outcomes, dietary diversity and food security compared to non-beneficiary households. Targeted extension outreach, improved beneficiary identification and enhanced community mobilisation are recommended to bridge the persistent gap. Future ICSSR-sponsored research should incorporate longitudinal and participatory designs to establish causal pathways and assess long-term impact.

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