

Measuring the dimensions of sustainable livelihood development among indigenous women: empirical evidence from Odisha, India

Jogeswar Mahato

Indian Institute of Management Sambalpur, Sambalpur, India, and

Kumar Gaurav

National Institute of Educational Planning and Administration, New Delhi, India

Received 20 September 2023
Revised 30 November 2023
11 March 2024
7 May 2024
18 June 2024
14 August 2024
15 November 2024
18 February 2025
25 March 2025
Accepted 27 April 2025

Abstract

Purpose – The study examines and ranks the dimensions of sustainable livelihood development among indigenous women in Odisha, India.

Design/methodology/approach – This research has used a structural equation model to examine the dimensions of sustainable livelihood among indigenous women. Researchers interviewed 697 indigenous women across four districts, such as Mayurbhanj, Sundargarh, Koraput and Rayagada in Odisha, India.

Findings – The findings highlighted that (1) food and nutrition security ranks higher among others, followed by (2) clean water and sanitation, (3) income security, (4) social inclusion, (5) good health and well-being and (6) quality education in achieving sustainable livelihoods among indigenous women.

Practical implications – Policy practitioners need to focus on inclusive policies that can attain sustainable livelihoods for the tribes by inculcating existing dimensions. Policies on employment creation through entrepreneurial activities must also be encouraged across tribal areas, which in the long run may create sustainable livelihoods in India.

Originality/value – This research adds policy outcomes and literature to the existing literature by providing evidence on six important sustainable livelihood dimensions. This could bring a secure and sustainable lifestyle for indigenous women in Odisha and also in many tribal regions in the country.

Keywords Dimensions, Development, Sustainable livelihood, Indigenous, Women, Odisha

Paper type Research paper

1. Introduction

Sustainable livelihood development is a long-standing concern for policy practitioners in developing countries (McLean, 2015; Chen and Wan, 2023). In the last few decades, developing nations have sought solutions to achieve sustainable livelihood for marginalized, backward and underprivileged citizens (Natarajan *et al.*, 2022; Roy *et al.*, 2023). Against this backdrop, sustainable development goals (SDGs) were adopted by the United Nations in 2015 as a universal call to secure the environment, end poverty and ensure that all people enjoy peace and prosperity by 2030 (Akande *et al.*, 2023; Kumar *et al.*, 2023). Creativity, innovation, financial resources, technology and community engagement are essential in achieving SDGs across marginalized communities in every context (Saini *et al.*, 2023; Joosse *et al.*, 2023). Sustainable livelihood (SL) strives to shift beyond conventional meanings and methods relating to poverty alleviation (Singh and Hiremath, 2010; Henderson and Loreau, 2023). These are deemed to be inadequate or excessively limited since they centred solely on specific features or indicators of poverty, such as income inequality or failed to take into account other significant aspects of poverty, such as insecurity and societal exclusion (Krantz, 2001; Subramanian *et al.*, 2023). More attention continues to be paid to multiple factors and methods that either restrict or boost impoverished people's capacity to create a livelihood on a sustainable basis (Brocklesby and Fisher, 2003). Sustainable livelihood provides a more reasonable and cohesive approach to addressing extreme poverty (Morse *et al.*, 2013; Mahato and Jha, 2024). It contributes to formulating people-centred growth initiatives that are reactive and participative, multidimensional, vibrant and sustainable (Frankenberger and McCaston, 1998).



International Journal of Social
Economics
Vol. 53 No. 2, 2026
pp. 275-287
© Emerald Publishing Limited
e-ISSN: 1758-6712
p-ISSN: 0306-8293
DOI 10.1108/IJSE-09-2023-0725

Research on sustainable livelihoods has recently been on the rise in developing countries worldwide. [Mukisa et al. \(2020\)](#) assessed the community's sustainable livelihood capital for implementing alternative energy technologies in Uganda. [Mbatha et al. \(2021\)](#) examined "subsistence farming" as a source of sustainable livelihood development among rural communities in South Africa. [Su et al. \(2021\)](#) studied the sustainable livelihood capability and poverty alleviation measures of farm households in rural China. [Islam et al. \(2022\)](#) build mechanisms of sustainable livelihood for displaced Rohingyas and their resilience in Bangladesh. [Connor et al. \(2022\)](#) measured the impact of sustainable rice production on food security and livelihood changes in Myanmar. [Sadaf et al. \(2022\)](#) evaluated the effect of cotton production on the sustainable livelihood in Punjab, Pakistan. [Sridhara et al. \(2022\)](#) identified the "agricultural practices" as a priority for food security for the rural population in Karnataka, India. [Roy et al. \(2023\)](#) developed a sustainable livelihood security (SLS) approach for prioritizing development and understanding sustainability in West Bengal, India. This paper investigates and ranks six dimensions, such as food and nutrition security, good health and well-being, quality education, social inclusion, clean water and sanitation and income security, towards sustainable livelihood for indigenous women in Odisha, India.

The paper has the following structure. [Section 2](#) reviews the existing literature on sustainable livelihood and its approach. [Section 3](#) provides research objectives, hypotheses and methodology, [section 4](#) displays respondents' demographic information and data analysis, and [section 5](#) discusses the findings and implications followed by the conclusion, limitations and future scope in [section 6](#).

2. Literature review

2.1 Demographic and socioeconomic status of Odisha

Odisha is one of the country's poorest and most backward states, and despite being rich in natural and human resources, sustainable livelihood is the prime concern for the state. Southern and northern regions are relatively less developed in the state ([OES, 2022](#)). Odisha's population is not equally distributed in terms of its financial and social status. Poverty in rural Odisha is 35.69% as against 25.70% in India. Odisha is the second-largest state in terms of tribal population. Of the state's total population, 22.8% belongs to Scheduled Tribes (STs) ([Chandramouli and General, 2011](#)). Odisha's per capita income is 127,383, i.e. about 23,000 less than India's PCI (150,326 rupees). Odisha has managed to improve its ranking from 22nd in 2011–12 to 20th rank in 2019–20 in the per capita ranking of India; however, the unemployment rate is 7.1% in Odisha against 5% in India and the Labour Force Participation Rate (LFPR) is 52.1% only in rural Odisha ([OES, 2022](#)). This study has chosen four backward districts that contain the highest number of indigenous populations, i.e. Sundargarh (50.70%), Mayurbhanj (58.10%), Koraput (50.60%) and Rayagada (56%) ([Chandramouli and General, 2011](#)).

2.2 Sustainable livelihood development

The Brundtland Committee on Environment and Development introduced the concept of sustainable livelihood as an approach to unifying socioeconomic and environmental issues in a coherent, policy-relevant framework. The Conference on Environment and Development (UNCED) conducted by the United Nations in 1992 widened the idea and claimed sustainable livelihood as a broad attempt towards alleviating poverty ([Krantz, 2001](#); [Hege et al., 2019](#)). It suggested that sustainable living could be a blending component in tackling development, resource use and poverty reduction ([Fahad et al., 2023](#)). A livelihood consists of the capacities, resources and actions required to generate an adequate living ([Tabares et al., 2022](#); [Sridhara et al., 2022](#)). It is considered sustainable whenever it can endure and recover from adverse conditions and events. It also continues to enhance its strengths, wealth and operations without

compromising the basis of natural resources (Otieku *et al.*, 2017). Additionally, sustainable livelihood represents sufficient and sustainable access to resources and income that fulfils the daily needs of human beings, such as food, safe drinking water, quality of health, educational opportunities, community participation and employment (Akhtar *et al.*, 2022; Golesorkhi *et al.*, 2022; Kumar *et al.*, 2023). Six dimensions, such as food and nutrition security, good health and well-being, quality education, clean water and sanitation, social inclusion and income security, have been studied to determine the sustainability of livelihoods among indigenous women.

2.3 Sustainable livelihood approach

The study revisits the dimensions of the sustainable livelihood approach proposed by Krantz (2001) across marginal communities in India. This research further strives to contribute to the advancement of livelihood development and sustainability literature. This paper enhances the scope of the sustainable livelihood approach developed by Krantz (2001) and sustainable development goals adopted by the United Nations. Additionally, this paper will drive researchers in creating several possible ways to enhance indigenous people as “self-reliant”. A sustainable livelihood framework is a holistic approach, and its promotion substantially contributes to various socioeconomic problems like unemployment, social inequality and poverty in rural areas. Thus, this paper strives to promote the sustainable livelihood of indigenous people in Odisha, India, and this may contribute substantially towards the upliftment of marginalized populations worldwide.

Sustainable livelihood development is centred on India’s economic growth and has become a concern of discussion for the vulnerable, marginalized and impoverished communities. Existing studies witnessed that research on sustainable livelihoods across indigenous communities is scarce and focused on limited dimensions such as income generation and agriculture production in India since approaching tribal locations and tribal people is difficult due to cultural, communication and transportation barriers. This paper fills the research gap by examining and ranking six livelihood dimensions, such as food and nutrition security, good health and well-being, quality education, social inclusion, clean water and sanitation and income security for indigenous women in Odisha, India.

3. Research hypothesis and methods

The study has applied a structural equation model (SEM) to examine and rank dimensions of sustainable livelihood development (SLD) among indigenous women in Odisha, India. These are quality education, food and nutrition security, clean water and sanitation, good health and well-being, social inclusion and income security. SEM offers a more accurate estimation by focusing on a theoretical framework. It consists of a two-step analysis (1) measurement model and (2) structural model. The measurement model examines the validity and reliability of the study constructs, and their relationship is being assessed through structural model analysis (Weston and Gore, 2006).

3.1 Dimensions of sustainable livelihood development (SLD)

3.1.1 Food and nutrition security (FNS). Food security at the individual and societal level exists when people have access to physical and economic resources to meet their food requirements at all times (Krantz, 2001; Otieku *et al.*, 2017). Food security is comprised of three components: (1) availability, i.e. sufficient amounts of suitable food on reserve; (2) access, i.e. sufficient income and resources to acquire food and (3) consumption, i.e. having a healthy diet and capacity to consume nutrients in the body (Subramanian *et al.*, 2023). Food and nutrition security aims to end hunger and malnutrition in underprivileged households by enhancing the quantity and standard of food (Saini *et al.*, 2023). It ensures that all households in the backward regions have clean, nutritious and adequate food for now and in the future

(Seyfang, 2007). It also ensures sustainability in food production and adopting resilient agricultural practices, as most villagers are involved in agricultural activities (Hege *et al.*, 2019).

H11. FNS significantly impacts and ranks positively on achieving sustainable livelihoods for indigenous women.

3.1.2 *Good health and well-being (GWH)*. Good health and well-being ensure a healthy and long life for all ages (Fonseca *et al.*, 2020). Well-being is a sense of fulfilment in life associated with happiness, health and wealth. Good health corresponds to the human body's well-being and anything that can be accomplished to safeguard it from disease and intoxication (Henderson and Loreau, 2023). SDG 3 seeks universal health and well-being, especially an extensive effort to eradicate AIDS, malaria and other infectious disease epidemics by 2030. It also desires to provide universal healthcare and ensure everyone can access secure and efficient drugs and vaccinations (Subramanian *et al.*, 2023). It further seeks to minimize maternal mortality, death of newborns and children, awareness of reproductive health, family planning, and access to affordable, effective, quality and essential health services (Fahad *et al.*, 2023).

H21. GWH significantly impacts and ranks effectively in achieving sustainable livelihood.

3.1.3 *Quality education (QUE)*. Quality education entails having a secure, comprehensive and long-standing learning opportunity for the vulnerable and poor. It ensures free access to education and children regularly attending school, promoting the importance of education in the family and society (Saini *et al.*, 2023). It further ensures an absolute, free, nondiscriminatory, quality education, leading to effective learning outcomes (Subramanian *et al.*, 2023). It helps eliminate gender discrimination in education and offers equal opportunities to women at different levels of education, employment, leadership and entrepreneurship (Boeren, 2019).

H31. QUE has significant impact and ranks effectively in promoting sustainable livelihood.

3.1.4 *Clean water and sanitation (CWS)*. Safe drinking water and sanitation are critical to human well-being and health (Joosse *et al.*, 2023). It contributes to good health and livelihoods and assists in building resilient communities that live in healthy environments. It ensures decreasing cases of open defecation and awareness of the health benefits of using toilets (Golesorkhi *et al.*, 2022). It further promotes hygienic behaviour in the lives of women and girls and positively impacts healthy lives (Msuya *et al.*, 2023). In addition, it ensures clean surroundings for households and minimizes the use of hazardous and untreated water (Akhtar *et al.*, 2022).

H41. CWS significantly affects and ranks positively in achieving sustainable livelihood.

3.1.5 *Social inclusion (SIN)*. Social inclusion is the process that guarantees equal opportunities to everyone, irrespective of their social background and the achievement of the greatest potential in life (Otieku *et al.*, 2017). This holistic approach seeks to establish circumstances that allow every person to indulge fully and actively in all facets of life, covering social, economic and political affairs and engagement in decision-making activities (Kumar *et al.*, 2023). It aims to enable impoverished and disadvantaged people to take advantage of the growing economic opportunities (Seyfang, 2007). Additionally, it ensures equal respect for women in society, ending all forms of social discrimination and eliminating all forms of violence, i.e. sexual exploitation and misbehaviour in public places (Fonseca *et al.*, 2020). It further ensures women's participation in management, productive employment and equal compensation (Subramanian *et al.*, 2023).

H51. SIN significantly impacts and ranks effectively in achieving sustainable livelihoods for indigenous women.

3.1.6 *Income security (INS)*. It is the condition where people have regular sources of income, stability in their income and other resources that support their livelihood, daily needs and future needs (Krantz, 2001; Otioku *et al.*, 2017). In developing countries, micro-enterprise development through the community helps generate a regular source of income that offers income sustainability and ensures sustainable livelihood (Sridhara *et al.*, 2022; Subramanian *et al.*, 2023). Self-employment promotes capacity building and economic self-reliance among rural women, which helps fight discrimination they face in their families and society (Tabares *et al.*, 2022; Mahato and Jha, 2023). Earnings from self-employment fulfil both the monetary and social needs of individuals and their families, promoting a sustainable way of living (Leisinger, 1995; Thwala *et al.*, 2023).

H61. INS significantly impacts and ranks positively on achieving sustainable livelihood among indigenous women.

3.2 Development of survey instrument

Based on the comprehensive review of existing literature, it is found that there were no reliable and well-developed measures in examining the dimensions of sustainable livelihood development among indigenous women. However, the present study has used 30 structured items developed through a comprehensive and rigorous literature review to measure the study constructs, such as food and nutrition security (FNS), good health and well-being (GWH), quality education (QUE), clean water and sanitation (CWS), social inclusion (SIN), income security (INC) and sustainable livelihood development (SLD). Constructs such as FNS, GWH, QUE and CWS were measured using four structured items each. However, SIN, INC and SLD were measured using three, five and six items. These items were measured using a seven-point Likert scale, i.e. (1 = strongly disagree to 7 = strongly agree).

3.3 Sampling strategy

A multi-stage random sampling method is used in the study to collect samples from indigenous women across four districts of Odisha, India. Firstly, the state of Odisha was selected based on the second-highest number of indigenous communities residing in India, making the state an appropriate field of research. In the second stage, four districts were selected, namely Sundargarh, Mayurbhanj, Koraput and Rayagada, which had the highest number of indigenous women in Odisha. Researchers selected four blocks from each district in the third stage, such as Kuarmunda, Jashipur, Borigumma and Bissamcuttack. These blocks had the highest number of indigenous women in their respective districts. Lastly, three villages with the most indigenous women were chosen from each block, and a random sampling technique was used for data collection.

3.4 Sample size

The study finalized four districts, Sundargarh, Mayurbhanj, Koraput and Rayagada, as survey and data collection fields using a multi-stage random sampling method in Odisha, India. Researchers visited 12 villages across the four districts with the highest indigenous women population and conducted personal interviews with 720 indigenous women. However, 23 responses out of the total responses were incomplete for reasons such as (1) left in the middle of the interview for their work and (2) did not respond to some questions and hence were omitted, and the remaining 697 responses were used for data analysis (Table 1).

Table 1. Demographic profile

Sl. no.	Particulars	Categories	Frequency (N = 697)	Percentage (%)
1	District name	Sundargarh	186	26.64
		Mayurbhanj	178	25.50
		Koraput	169	24.18
		Rayagada	165	23.63
2	Age (in years)	18–25	296	42.54
		26–35	279	40.08
		36–45	91	13.22
		46 and more	28	4.13
3	Education level	Up to class V	430	61.59
		Class VI–X	202	29.09
		Above class X	65	9.25
4	Marital status	Unmarried	98	14.08
		Married	558	80.53
		Widow	39	5.67
5	Family type	Joint	162	23.24
		Nuclear	535	76.76
6	Family members	Up to two	39	5.78
		Three to four	290	41.98
		Five and more	369	52.93
7	Monthly income (in rupees)	Up to 5,000	104	14.93
		5,001–10,000	349	50.09
		10,001–15,000	160	23.06
		15,001 and above	84	11.90

Source(s): Authors’ own work

4. Results and analysis

4.1 Demographic profile of respondents

In [Table 1](#), the demographic profile of respondents is presented in the context of their area, age, education level, marital status, family structure, children and monthly earnings. It is observed that the age group (18–25) has the highest representation (42.53%), followed by the age group (26–35). On education, 61.59% of women entrepreneurs were studied up to the primary level, i.e. up to class V, 29.09% were studied up to matriculation and 9.25% of the respondents were studied above matriculation. In terms of marital status, the respondents were married (80.53%), unmarried (14.08%) and widow (5.67%). In family type, 23.24% lives with a joint family and 76.76% lives as a nuclear family. In most cases (52.93%), respondents had more than five family members. In the context of their monthly income, 50.09% of the people were earning between 5,001 and 10,000 Indian rupees, whereas 23.06% earn between Rs. 10,001 and 15,000 and 11.90% earns Rs. 15,001 and more.

4.2 Measurement model

In PLS-SEM, reliability and validity of constructs are determined through the measurement model, which was calculated using the statistical software SmartPLS 4.0. In the first, Goodness of Fit (GoF) is calculated to know the rationale of the conceptual model for further analysis ([Table 2](#)). Parameters such as factor loadings, composite reliability and Cronbach’s alpha are used to check if the constructs are reliable. To check the construct’s validity, we used the average variance extracted (AVE) as indicated in [Table 3](#).

4.2.1 Model fit. The study used three parameters to examine the model fit ([Table 2](#)), i.e. standard root mean square residual (SRMR), Chi-square and Normed Fit Index (NFI). An SRMR value of 0.08 and less and an NFI value higher than 0.9 suggest a good fit ([Weston and](#)

Table 2. Model fit of the structured model

Parameters	Required levels	Model value	Remarks
SRMR	<0.08	0.051	Required level achieved
Chi-square (χ^2)	>0.01	1565.639	Required level achieved
NFI	Between 0 and 1 but >0.9 considered good fit	0.853	Moderately required level achieved

Source(s): Authors' own work**Table 3.** Result of convergent validity of the overall measurement model

Construct name	Items labels	Factor loadings	VIF	Composite reliability	Cronbach's alpha	AVE
Clean water and sanitation	CWS1	0.913	5.319	0.946	0.923	0.813
	CWS2	0.954	7.461			
	CWS3	0.869	2.395			
	CWS4	0.869	2.647			
Food and nutrition security	FNS1	0.819	2.032	0.902	0.856	0.697
	FNS2	0.841	1.890			
	FNS3	0.843	2.166			
	FNS4	0.837	1.895			
Good health and well-being	GHW1	0.683	1.421	0.881	0.820	0.650
	GHW2	0.828	1.826			
	GHW3	0.844	2.020			
	GHW4	0.858	1.997			
Income security	INC1	0.868	2.989	0.928	0.901	0.721
	INC2	0.917	4.386			
	INC3	0.882	3.050			
	INC4	0.855	2.485			
Quality education	INC5	0.709	1.518	0.914	0.878	0.730
	QUE1	0.930	4.229			
	QUE2	0.957	4.769			
	QUE3	0.832	2.204			
Social inclusion	QUE4	0.668	1.515	0.960	0.938	0.890
	SIN1	0.941	4.175			
	SIN2	0.958	5.240			
	SIN3	0.931	3.733			
Sustainable livelihood development	SLD1	0.749	1.850	0.885	0.845	0.563
	SLD2	0.751	1.899			
	SLD3	0.714	1.557			
	SLD4	0.758	1.707			
	SLD5	0.778	1.987			
	SLD6	0.751	1.890			

Source(s): Authors' own work

Gore, 2006). In our study, the value of SRMR is 0.051, i.e. less than 0.08 and NFI is 0.853, almost equivalent to 0.9. This suggests a good fit of the conceptual model for further analysis (SRMR = 0.051 and NFI = 0.853).

4.2.2 Convergent validity. Table 3 shows the convergent validity of each indicator of the respective variable. Factor loadings, composite reliability (CR > 0.7) and average variance extracted (AVE > 0.5) measure the reliability and validity (Davcik, 2014). Factor loadings of all

items, the value of Cronbach’s alpha and composite reliability are more than the threshold value, i.e. 0.7, whereas the value of AVE is greater than 0.5. Thus, all constructs are valid and reliable.

4.2.3 *Discriminant validity.* Table 4 present the analysis for discriminant validity that examines how well constructs are discriminant or dissimilar to each other. This ensures each construct is not related to each other. This is measured through Fornell–Larcker criterion (Weston and Gore, 2006). In the Fornell–Larcker criterion, the diagonal values are obtained through the square root of AVE. In our study, these values are greater than the respective raw and column values that define the dissimilarity among constructs.

4.3 Structural model assessment

Structural analysis is conducted in PLS-SEM to validate the significance of relationships among the constructs. Table 5 and Figure 1 highlight the structural path model results which are calculated using SmartPLS 4.0 software. The results reveal that food and nutrition security is a significant dimension in promoting sustainable livelihood development among indigenous women in India ($\beta = 0.312$, t -value = 5.801; $p < 0.01$). Similarly, good health and well-being are crucial as they positively contribute to sustainable livelihood development ($\beta = 0.139$, t -value = 3.247; $p < 0.010$). Furthermore, the results also highlighted that quality education is a significant dimension of sustainable livelihood ($\beta = 0.012$, t -value = 3.347; $p < 0.010$). Additionally, clean water and sanitation have also reflected similar results. It is observed that

Table 4. Fornell–Larcker criterion

Construct	AVE	CWS	FNS	GWH	INC	QUE	SIN	SLD
CWS	0.813	0.902						
FNS	0.697	0.426	0.835					
GWH	0.650	0.355	0.610	0.806				
INC	0.721	0.301	0.261	0.238	0.849			
QUE	0.730	0.020	0.037	0.059	0.037	0.854		
SIN	0.890	0.504	0.508	0.447	0.283	0.050	0.943	
SLD	0.563	0.495	0.593	0.499	0.363	0.048	0.507	0.750

Source(s): Authors’ own work

Table 5. Hypothesis testing

Hypothesized relations	Beta coefficient (β)	Standard error (SE)	t -value	p -value	Decision
H11. Food and nutrition security → Sustainable livelihood development	0.312	0.054	5.801	0.000	Accept
H21. Good health and well-being → Sustainable livelihood development	0.139	0.043	3.247	0.001	Accept
H31. Quality education → Sustainable livelihood development	0.012	0.035	3.347	0.001	Accept
H41. Clean water and sanitation → Sustainable livelihood development	0.195	0.043	4.495	0.000	Accept
H51. Social inclusion → Sustainable livelihood development	0.145	0.045	3.262	0.001	Accept
H61. Income security → Sustainable livelihood development	0.148	0.040	3.701	0.000	Accept

Source(s): Authors’ own work

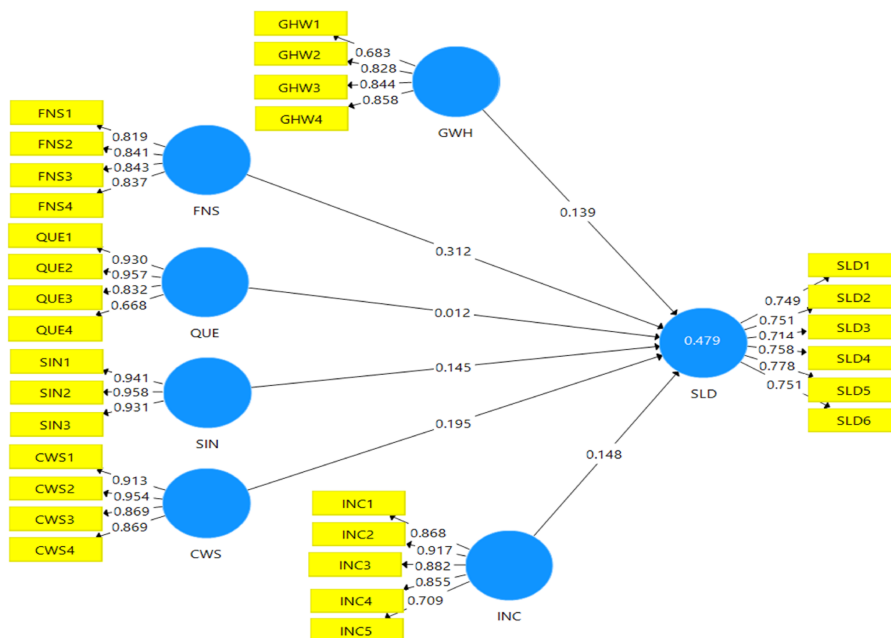


Figure 1. Structural model analysis. Source: Authors' own work

CWS is crucial in achieving sustainable livelihood development ($\beta = 0.195$, t -value = 4.495; $p < 0.001$). Moreover, social inclusion is also vital in promoting sustainable livelihood among the indigenous women, which has significant connection ($\beta = 0.145$, t -value = 3.262; $p < 0.010$). Lastly, income security is essential, as it protects indigenous women from financial shocks and uncertainties, and the results also support the same ($\beta = 0.148$, t -value = 3.701; $p < 0.001$).

5. Discussion

This section discusses the result of the structural model analysis. The ranking of dimensions is as follows according to their relevance in achieving sustainable livelihoods among indigenous women. The findings highlighted that (1) food and nutrition security ranks higher among others, followed by (2) clean water and sanitation, (3) income security, (4) social inclusion, (5) good health and well-being and (6) quality education. The findings indicate that food and nutrition security (FNS) and clean water and sanitation (CWS) are highly relevant in promoting sustainable livelihoods among indigenous women, which is aligned with the findings of [Mollier et al. \(2017\)](#) and [Bizikova et al. \(2020\)](#). In addition, good health and well-being also affect the promotion of sustainable livelihoods, partially supported by [Fernandez \(2020\)](#) and [Sweileh \(2020\)](#). The results further highlighted that quality education is significant in attaining sustainable livelihood. Quality education provides employment, regular income and decision-making that contributes to a sustainable way of living for indigenous women. This outcome is aligned with [Unterhalter \(2019\)](#), [Boeren \(2019\)](#) and [Saini et al. \(2023\)](#), who entail education as vital in attaining targets of sustainable development goals.

Clean water and sanitation also have significant and positive effects in bringing sustainable livelihoods for indigenous women, as outlined in the results, and are aligned with [Sridhara et al. \(2022\)](#) and [Subramanian et al. \(2023\)](#). Generally, indigenous women are excluded from the society due to their socioeconomic backwardness. However, our results proved that social

inclusion must be an integral part of sustainable livelihood, partially supported by [Henderson and Loreau \(2023\)](#) and [Fahad et al. \(2023\)](#). We further observed that income security has a significant and positive effect in promoting sustainable livelihoods. This is aligned with [Otieku et al. \(2017\)](#), [Mahato and Jha \(2023\)](#) and [Msuya et al. \(2023\)](#), who witnessed that income security provides safety during financial shocks and consequences to the rural population, including tribes and women.

5.1 Theoretical implication

This paper revisited the dimensions of sustainable livelihood across marginal communities in India and contributes significantly towards the advancement of sustainability and livelihood literature. Our study enhances the scope of the sustainable livelihood approach proposed by [Krantz \(2001\)](#) and sustainable development goals. The findings could provide researchers with novel ideas in making the lives of indigenous people more sustainable. A sustainable livelihood framework is a holistic approach, and its promotion substantially contributes to various socioeconomic problems like unemployment, social inequality and poverty in rural areas. Although we have conducted this study in a particular region like Odisha, India, we feel that this may be conducted across marginalized population living in developing nations worldwide.

5.2 Practical implication

The findings of the study highlighted that (1) food and nutrition security ranks higher among others, followed by (2) clean water and sanitation, (3) income security, (4) social inclusion, (5) good health and well-being and (6) quality education. This suggests considerable policy outcomes for policymakers, government and nongovernmental organizations working towards uplifting the livelihoods of the marginalized population across developing countries. As the result suggested, clean water and sanitation rank higher among others; hence, policymakers must review existing policies to enhance the scope for providing safe water and healthy sanitation. Similarly, policies concerning other dimensions, as discussed in the study, should also be revised in order to provide sustainability to the indigenous women in their livelihood. International agencies like the World Bank, International Monetary Fund, etc. should support local government and regional organizations in promoting the novel cause of “sustainable livelihood development” across the marginalized groups of the population worldwide.

6. Conclusion, limitations and future scope

The study has applied a comprehensive and rigorous approach to examine and rank the dimensions of sustainable livelihood development among indigenous women in India. Policymakers are paying greater attention to the field of study concerned with the targets of sustainable development worldwide. The study has examined and ranked six dimensions, such as food and nutrition security (FNS), good health and well-being (GWH), quality education (QUE), clean water and sanitation (CWS), social inclusion (SIN) and income security (INC) for sustainable livelihood development (SLD) among indigenous women in Odisha. However, food and nutrition security (FNS) and clean water and sanitation (CWS) rank higher and are crucial for indigenous women to sustain their livelihood. The study has some limitations. For example, we have studied and ranked only six dimensions of SLD, offering research opportunities to explore more such dimensions. The dimensions of sustainable livelihood can be studied in different parts of developing nations, as we have covered only particular regions in Odisha, India. Women entrepreneurship and its impact may also be assessed for their socioeconomic development in developing countries.

References

- Akande, J.O., Hosu, Y.S., Kabiti, H., Ndhleve, S. and Garidzirai, R. (2023), "Financial literacy and inclusion for rural agrarian change and sustainable livelihood in the Eastern Cape, South Africa", *Heliyon*, Vol. 9 No. 6, e16330, doi: [10.1016/j.heliyon.2023.e16330](https://doi.org/10.1016/j.heliyon.2023.e16330).
- Akhtar, R., Masud, M.M. and Rahman, M.K. (2022), "Farmers' livelihood and adaptive capacity in the face of climate vulnerability", *International Journal of Social Economics*, Vol. 49 No. 5, pp. 669-684, doi: [10.1108/IJSE-04-2021-0239](https://doi.org/10.1108/IJSE-04-2021-0239).
- Bizikova, L., Jungcurt, S., McDougal, K. and Tyler, S. (2020), "How can agricultural interventions enhance contribution to food security and SDG 2.1?", *Global Food Security*, Vol. 26, 100450, doi: [10.1016/j.gfs.2020.100450](https://doi.org/10.1016/j.gfs.2020.100450).
- Boeren, E. (2019), "Understanding sustainable development goal (SDG) 4 on 'quality education' from micro, meso and macro perspectives", *International Review of Education*, Vol. 65 No. 2, pp. 277-294, doi: [10.1007/s11159-019-09772-7](https://doi.org/10.1007/s11159-019-09772-7).
- Brocklesby, M.A. and Fisher, E. (2003), "Community development in sustainable livelihoods approaches—an introduction", *Community Development Journal*, Vol. 38 No. 3, pp. 185-198, doi: [10.1093/cdj/38.3.185](https://doi.org/10.1093/cdj/38.3.185).
- Chandramouli, C. and General, R. (2011), "Census of India 2011", *Provisional Population Totals. New Delhi: Government of India*, pp. 409-413.
- Chen, Z. and Wan, P.Y.K. (2023), "Interdependence between community participation and sustainable livelihood development: community perspectives on heritage conservation in Macao", *Journal of Heritage Tourism*, Vol. 18 No. 1, pp. 1-17, doi: [10.1080/1743873x.2022.2134785](https://doi.org/10.1080/1743873x.2022.2134785).
- Connor, M., Quilloy, R., de Guia, A.H. and Singleton, G. (2022), "Sustainable rice production in Myanmar impacts on food security and livelihood changes", *International Journal of Agricultural Sustainability*, Vol. 20 No. 1, pp. 88-102, doi: [10.1080/14735903.2021.1918471](https://doi.org/10.1080/14735903.2021.1918471).
- Davcik, N.S. (2014), "The use and misuse of structural equation modeling in management research: a review and critique", *Journal of Advances in Management Research*, Vol. 11 No. 1, pp. 47-81, doi: [10.1108/JAMR-07-2013-0043](https://doi.org/10.1108/JAMR-07-2013-0043).
- Fahad, S., Nguyen-Thi-Lan, H., Nguyen-Manh, D., Tran-Duc, H. and To-The, N. (2023), "Analyzing the status of multidimensional poverty of rural households by using sustainable livelihood framework: policy implications for economic growth", *Environmental Science and Pollution Research*, Vol. 30 No. 6, pp. 16106-16119, doi: [10.1007/s11356-022-23143-0](https://doi.org/10.1007/s11356-022-23143-0).
- Fernandez, R.M. (2020), *SDG3 Good Health and Well-Being: Integration and Connection with Other SDGs*, Good Health and Well-Being, Cham, pp. 629-636.
- Fonseca, L.M., Domingues, J.P. and Dima, A.M. (2020), "Mapping the sustainable development goals relationships", *Sustainability*, Vol. 12 No. 8, p. 3359, doi: [10.3390/su12083359](https://doi.org/10.3390/su12083359).
- Frankenberger, T.R. and McCaston, M.K. (1998), "The household livelihood security concept", *Food, Nutrition and Agriculture*, pp. 30-35.
- Golesorkhi, L.-Z., Fortson, G., Harder, K. and Riedmann, T. (2022), "Centering community in COVID-19 responses: refugee women's livelihoods in a global pandemic", *International Journal of Sociology and Social Policy*, Vol. 42 Nos 3/4, pp. 289-297, doi: [10.1108/IJSSP-07-2020-0332](https://doi.org/10.1108/IJSSP-07-2020-0332).
- Hege, E., Brimont, L. and Pagnon, F. (2019), "Sustainable development goals and indicators: can they be tools to make national budgets more sustainable?", *Public Sector Economics*, Vol. 43 No. 4, pp. 423-444, doi: [10.3326/pse.43.4.5](https://doi.org/10.3326/pse.43.4.5).
- Henderson, K. and Loreau, M. (2023), "A model of sustainable development goals: challenges and opportunities in promoting human well-being and environmental sustainability", *Ecological Modelling*, Vol. 475, 110164, doi: [10.1016/j.ecolmodel.2022.110164](https://doi.org/10.1016/j.ecolmodel.2022.110164).
- Islam, M.M., Barman, A., Khan, M.I., Goswami, G.G., Siddiqi, B. and Mukul, S.A. (2022), "Sustainable livelihood for displaced Rohingyas and their resilience at Bhashan Char in Bangladesh", *Sustainability*, Vol. 14 No. 10, p. 6374, doi: [10.3390/su14106374](https://doi.org/10.3390/su14106374).
- Joose, I.R., Mantel-Teeuwisse, A.K., Suleman, F. and van den Ham, H.A. (2023), "Sustainable development goal indicator for measuring availability and affordability of medicines for

- children: a proof-of-concept study”, *BMJ Open*, Vol. 13 No. 4, p. e065929, doi: [10.1136/bmjopen-2022-065929](https://doi.org/10.1136/bmjopen-2022-065929).
- Krantz, L. (2001), “The sustainable livelihood approach to poverty reduction”, *SIDA. Division for Policy and Socio-Economic Analysis*, Vol. 44, pp. 1-38.
- Kumar, S., Sengupta, K. and Gogoi, B.J. (2023), “Interventions for sustainable livelihoods: a review of evidence and knowledge gaps”, *International Journal of Social Economics*, Vol. 50 No. 4, pp. 556-574, doi: [10.1108/IJSE-06-2022-0402](https://doi.org/10.1108/IJSE-06-2022-0402).
- Leisinger, K.M. (1995), “Sustainable development: a common challenge for north and south”, *International Journal of Sociology and Social Policy*, Vol. 15 Nos 8/9/10, pp. 27-64, doi: [10.1108/eb013222](https://doi.org/10.1108/eb013222).
- Mahato, J. and Jha, M.K. (2023), “Does financial inclusion promote sustainable livelihood development? Mediating effect of microentrepreneurship”, *Journal of Financial Economic Policy*, Vol. 15 Nos 4/5, pp. 485-499, doi: [10.1108/JFEP-05-2023-0134](https://doi.org/10.1108/JFEP-05-2023-0134).
- Mahato, J. and Jha, M.K. (2024), “Does social capital promote sustainable livelihood? Mediating effect of women entrepreneurship”, *International Journal of Sociology and Social Policy*, Vol. 44 Nos 5/6, pp. 448-461, doi: [10.1108/IJSSP-09-2023-0234](https://doi.org/10.1108/IJSSP-09-2023-0234).
- Mbatha, M.W., Mnguni, H. and Mubecua, M.A. (2021), “Subsistence farming as a sustainable livelihood approach for rural communities in South Africa”, *African Journal of Development Studies*, Vol. 11 No. 3, p. 55.
- McLean, J.E. (2015), “Beyond the pentagon prison of sustainable livelihood approaches and towards livelihood trajectories approaches”, *Asia Pacific Viewpoint*, Vol. 56 No. 3, pp. 380-391, doi: [10.1111/apv.12097](https://doi.org/10.1111/apv.12097).
- Mollier, L., Seyler, F., Chotte, J.L. and Ringler, C. (2017), *End Hunger, Achieve Food Security and Improved Nutrition and Promote Sustainable Agriculture: SDG 2, A Guide to SDG Interactions: From Science to Implementation*; ICSU, Paris, France.
- Morse, S., McNamara, N., Morse, S. and McNamara, N. (2013), “The theory behind the sustainable livelihood approach”, *Sustainable Livelihood Approach: A Critique of Theory and Practice*, pp. 15-60, doi: [10.1007/978-94-007-6268-8_2](https://doi.org/10.1007/978-94-007-6268-8_2).
- Msuya, R.I., Kazuzuru, B., Mataba, L. and Kessy, S.S.A. (2023), “Impact of savings and credit co-operative societies’ services on household livelihood outcomes in Mwanza and Tabora rural areas, Tanzania”, *International Journal of Social Economics*, Vol. 50 No. 3, pp. 436-451, doi: [10.1108/IJSE-01-2021-0028](https://doi.org/10.1108/IJSE-01-2021-0028).
- Mukisa, N., Zamora, R. and Lie, T.T. (2020), “Assessment of community sustainable livelihoods capitals for the implementation of alternative energy technologies in Uganda–Africa”, *Renewable Energy*, Vol. 160, pp. 886-902, doi: [10.1016/j.renene.2020.06.132](https://doi.org/10.1016/j.renene.2020.06.132).
- Natarajan, N., Newsham, A., Rigg, J. and Suhardiman, D. (2022), “A sustainable livelihoods framework for the 21st century”, *World Development*, Vol. 155, 105898, doi: [10.1016/j.worlddev.2022.105898](https://doi.org/10.1016/j.worlddev.2022.105898).
- OES (2022), ‘Odisha Economic Survey 2022-23’, Directorate of Economics and Statistics, Government of Odisha, Bhubaneswar, available at: <https://finance.odisha.gov.in/sites/default/files/2023-02/Executive%20Summary%20%28OES%29-2022-23%20Final.pdf>
- Otieku, E., Ackah, C.G. and Forkuor, D. (2017), “Motivations, income determinants and livelihood vulnerability of female teenage head porters in Kasoa, Ghana”, *International Journal of Social Economics*, Vol. 44 No. 12, pp. 2396-2408, doi: [10.1108/IJSE-10-2016-0286](https://doi.org/10.1108/IJSE-10-2016-0286).
- Roy, S., Bose, A., Basak, D. and Chowdhury, I.R. (2023), “Towards sustainable society: the sustainable livelihood security (SLS) approach for prioritizing development and understanding sustainability: an insight from West Bengal, India”, *Environment, Development and Sustainability*, Vol. 26 No. 8, pp. 1-32, doi: [10.1007/s10668-023-03456-x](https://doi.org/10.1007/s10668-023-03456-x).
- Sadaf, T., Kousar, R., Mohy Ul Din, Z., Abbas, Q., Makhdum, M.S.A. and Nasir, J. (2022), “Cotton production for the sustainable livelihoods in Punjab Pakistan: a case study of district Muzaffargarh”, *International Journal of Ethics and Systems*, Vol. 38 No. 2, pp. 191-208, doi: [10.1108/ijoes-06-2021-0115](https://doi.org/10.1108/ijoes-06-2021-0115).

- Saini, M., Sengupta, E., Singh, M., Singh, H. and Singh, J. (2023), "Sustainable development goal for quality education (SDG 4): a study on SDG 4 to extract the pattern of association among the indicators of SDG 4 employing a genetic algorithm", *Education and Information Technologies*, Vol. 28 No. 2, pp. 2031-2069, doi: [10.1007/s10639-022-11265-4](https://doi.org/10.1007/s10639-022-11265-4).
- Seyfang, G. (2007), "Growing sustainable consumption communities: the case of local organic food networks", *International Journal of Sociology and Social Policy*, Vol. 27 Nos 3/4, pp. 120-134, doi: [10.1108/01443330710741066](https://doi.org/10.1108/01443330710741066).
- Singh, P.K. and Hiremath, B.N. (2010), "Sustainable livelihood security index in a developing country: a tool for development planning", *Ecological Indicators*, Vol. 10 No. 2, pp. 442-451, doi: [10.1016/j.ecolind.2009.07.015](https://doi.org/10.1016/j.ecolind.2009.07.015).
- Sridhara, S., Gopakkali, P., Manoj, K.N., Patil, K.K.R., Paramesh, V., Jha, P.K. and Prasad, P.V. (2022), "Identification of sustainable development priorities for agriculture through sustainable livelihood security indicators for Karnataka, India", *Sustainability*, Vol. 14 No. 3, p. 1831, doi: [10.3390/su14031831](https://doi.org/10.3390/su14031831).
- Su, F., Song, N., Ma, N., Sultanaliev, A., Ma, J., Xue, B. and Fahad, S. (2021), "An assessment of poverty alleviation measures and sustainable livelihood capability of farm households in rural China: a sustainable livelihood approach", *Agriculture*, Vol. 11 No. 12, p. 1230, doi: [10.3390/agriculture11121230](https://doi.org/10.3390/agriculture11121230).
- Subramanian, S.V., Ambade, M., Kumar, A., Chi, H., Joe, W., Rajpal, S. and Kim, R. (2023), "Progress on sustainable development goal indicators in 707 districts of India: a quantitative mid-line assessment using the national family health surveys, 2016 and 2021", *The Lancet Regional Health-Southeast Asia*, Vol. 13, 100155, doi: [10.1016/j.lansea.2023.100155](https://doi.org/10.1016/j.lansea.2023.100155).
- Sweileh, W.M. (2020), "Bibliometric analysis of scientific publications on 'sustainable development goals' with emphasis on 'good health and well-being' goal (2015-2019)", *Globalization and Health*, Vol. 16, pp. 1-13, doi: [10.1186/s12992-020-00602-2](https://doi.org/10.1186/s12992-020-00602-2).
- Tabares, A., Londoño-Pineda, A., Cano, J.A. and Gómez-Montoya, R. (2022), "Rural entrepreneurship: an analysis of current and emerging issues from the sustainable livelihood framework", *Economies*, Vol. 10 No. 6, p. 142, doi: [10.3390/economies10060142](https://doi.org/10.3390/economies10060142).
- Thwala, S., Masiya, T. and Lubinga, S.N. (2023), "Contribution of the informal sector towards sustainable livelihoods: evidence from Khayelitsha Township, Cape Town", *International Journal of Sociology and Social Policy*, Vol. 43 Nos 13/14, pp. 90-105, doi: [10.1108/IJSSP-11-2022-0289](https://doi.org/10.1108/IJSSP-11-2022-0289).
- Unterhalter, E. (2019), "The many meanings of quality education: politics of targets and indicators in SDG 4", *Global Policy*, Vol. 10 No. S1, pp. 39-51, doi: [10.1111/1758-5899.12591](https://doi.org/10.1111/1758-5899.12591).
- Weston, R. and Gore, P.A. Jr (2006), "A brief guide to structural equation modeling", *The Counseling Psychologist*, Vol. 34 No. 5, pp. 719-751, doi: [10.1177/0011000006286345](https://doi.org/10.1177/0011000006286345).

Further reading

- Toner, A. (2003), "Exploring sustainable livelihoods approaches in relation to two interventions in Tanzania", *Journal of International Development: The Journal of the Development Studies Association*, Vol. 15 No. 6, pp. 771-781, doi: [10.1002/jid.1030](https://doi.org/10.1002/jid.1030).

Corresponding author

Jogeswar Mahato can be contacted at: jogeswar.dkl7@gmail.com