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Beyond the leaves: investigating challenges of Sal and Siali leaf businesses in India

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Abstract: The present study aims to evaluate the barriers faced by indigenous entrepreneurs in the Sal and Siali leaf business. The study was conducted in West Singhbhum, a tribal-dominated district of Jharkhand. 272 responses from indigenous entrepreneurs were collected from six villages: Bila, Baraebir, Bara, Dewanbir, Gobindpur and Bhalurangi of respective Sonua and Goilkera blocks in Jharkhand. The result highlighted that indigenous entrepreneurs do not face any significant issues or challenges while collecting leaves from forests. However, they face challenges during the processing of leaves into the final products and selling and marketing of leaves as well as finished products. This study will also help the indigenous practitioners in removing the barriers and providing accurate solutions for the benefit of indigenous entrepreneurs. Policymakers should offer inclusive infrastructure for the processing and curing of raw leaves into finished goods and streamline the marketing platforms for products made out of Sal and Siali leaves.

Keywords: Sal leaf; Siali leaf; indigenous; entrepreneurs; barriers; modelling; challenges; Jharkhand; forest; tribes; India.

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1 Introduction

Entrepreneurship is the foundation of the economic system. It is an important pillar for the growth and development of the economy (Tretiakov et al., 2020; Wood and Davidson, 2011; Colbourne, 2017). Entrepreneurs are central to advancement, the creation of employment, and the formation of a significant proportion of the global economy's and societies' wealth (Nayak, 2019). Entrepreneurial activities offer an opportunity to build a much more durable and viable route for the economic development of countries and neighbourhoods in the long-term (Saboo, 2019). Indigenous entrepreneurship is the formation, monitoring, and growth of novel enterprises by indigenous people. There is indigenous entrepreneurship in indigenous territories, reservations, and urban centres. These entrepreneurial endeavours are linked to the ethnic and cultural heritage of indigenous entrepreneurs (Mahapatra et al., 2005; Kora, 2019). In addition, it suffuses the socio-cultural framework and upbringing of such small business owners and corresponds to a deep commitment to ancient lands, regions, and resources (Dzisi, 2008; Morrison, 2008). Encouraging tribal growth and indigenous entrepreneurship are among the most critical challenges confronting native communities around the world (Dash and Behera, 2014; Rout et al., 2010). Broadening indigenous communities' economic opportunities and improving their living standards are essential for their sustainable future. Indigenous communities actively sought lower rates of unemployment, greater housing, safe drinking water, good healthcare, decent education, and high-quality infrastructural facilities (Behera, 2009; Mrabure, 2019). Without a rigorous indigenous entrepreneurship ecosystem, these indigenous communities would therefore keep struggling with severe poverty and a low income per person. The low wages and high poverty rates in indigenous communities have always been pulling their socioeconomic, financial and ecologic aspects (Shit and Pati, 2012; Yap et al., 2023).

The initiatives and inventions of indigenous entrepreneurs are indeed influenced by their indigenous culture, beliefs, religious groups, and customs. Their indigenous knowledge also offers useful insight into how to create the most viable businesses (Sarangi et al., 2022). Moreover, entrepreneurial activities can help indigenous communities to fight 'skills shortage' and obtain superior economic sovereign rights. The willingness of Indigenous communities to safeguard their heritage, traditions, and beliefs is directly linked with their capacity to create and design sustainable growth and development techniques for their societies (Shinde, 2010; Thakur and Ray, 2020). A strategy for the self-determination of an indigenous community is focused on entrepreneurship. The emerging socioeconomic and cultural perspective of indigenous communities makes them more inclined to support entrepreneurship, culminating in a rise in the number of businesses owned by natives as well as native communities (Hindle and Lansdowne, 2005; Croce, 2017).

Indigenous communities are dealing with an array of constraints and challenges, which include political conflicts, policy choices, inefficient government agencies, and

communities. Several policymakers, for example, are much more predisposed to inspire and facilitate indigenous communities compared to their counterparts (Behera and Nath, 2012). Furthermore, regulatory policies and actions may have a substantial effect on fostering the growth of indigenous entrepreneurship in their respective areas (Jena, 2021). However, the present study aims to evaluate the barriers faced by indigenous entrepreneurs in the Sal and Siali leaf business in West Singhbhum, a tribal-dominated district in Jharkhand. Section 2 covers the literature review of the study; Section 3 covers the conceptual model and hypothesis; whereas Section 4 discusses the methodology used in the study. Further, Section 5 explains the results and analysis and Section 6 discusses the findings of the study.

2 Literature review

Indigenous entrepreneurs are individuals who create and run an organisation leveraging their indigenous skills and resources within their local ecosystem (Mohanty and Samal, 2022). Indigenous or tribal entrepreneurship addresses a very urgent and key issue permeating indigenous communities, such as self-economic determination (Mahato et al., 2022). West Singhbhum in Jharkhand is home to marginalised forest dwellers, particularly women who are dependent on small-scale forest resources including Sal leaves, Siali leaves, and others to earn their livelihoods.

2.1 Sal leaf

Sal leaf is utilised as an eating plate after being gathered from the forest. Women prepare the plate manually by sewing 4 to 6 leaves together along with bamboo sticks. It is degradable and environmentally sustainable. The leaf items are fairly priced and economical in the market (Mahapatra and Tewari, 2005). With the ban on single-use plastics, conventional Sal leaves, which have been usually limited in rural areas, have now begun to experience a high desire for dishes and bowls prepared from Sal leaves. As a result, the advent of recycled paper and Sal leaves utility companies allude positively to the socio-economic transformation of the rural areas and provide relief for those encumbered by environmental issues (Mohanty and Samal, 2022). Khali and bowls, i.e., Dona are the primary sources of revenue for tribal women. These women contribute to the household income by travelling to the forest in the daytime, trying to collect 500–1,000 leaves a day which is enough to produce 150–250 trays. Leaf collection between September to April month, the very first phase has better quality than that of the second phase, which is generally riddled with fungal infection. Tribal women gather leaves and end up making plates and bowls to sell in the local market (Soren and Naik, 2020).

The GST used to have a direct effect on tribal groups in Jharkhand as well as other states for whom the sustenance is contingent on accumulating Sal leaf and attempting to make plates out of it. Marketing of tribal products in Jharkhand is regulated by the Tribal Cooperative Marketing Development Federation of India Limited (TRIFED). Earlier, villagers used to sell one Bhinda, i.e., 20 handmade plates to small traders for Rs.2. After the equipment was installed, the group started making at least Rs.10 from one Bhinda after pressing and wrapping (Kora, 2019). The women's collective bought approximately 5,000 plates from people in the village and transformed them into the final products

within a week. The notable thing is that none of the women in the self-help groups is educated, yet this does not lessen their resiliency (Meher et al., 2016).

2.2 *Siali leaf*

Similar to Sal leaf, it is also utilised as a feeding tray. Women prepare the plate by stitching three to five leaves with a bamboo stick. It is efficient and environmentally biodegradable (Misra and Dash, 2000). Inadequate facilities for curing and plate prepping, which further take too long (Kokkranikal and Morrison, 2002). As a consequence of the Paris Agreement on climate change, which aims for long-term environmental protection, a growing number of developed nations are shifting to biodegradable products (De Bruin and Mataira, 2018). This agreement will greatly benefit such women, as the majority of the earnings they earn from selling Siali plates are retained by the intermediaries who operate. Such middlemen, who initially paid the tribals less than Rs.10 per kg for the plates, nowadays are facing fierce rivalry from the Leaf Democracy (Peredo et al., 2004); As the pay was so marginal, attempting to make such leaf trays was a supplementary means of livelihood for such women. Bamboo pieces are utilised to weave the leaves of the readily available Siali leaves together (Dana, 2015).

India's leaf cutlery industry is fragmented. The Sal, Siali, and palash leaves found in the forests of central India serve as the primary raw material for biodegradable plates. With the COVID-19 pandemic causing havoc on the domestic economy all across the country, the Non-timber Forest products market has also suffered (Thakur and Ray, 2020). Tribals assemble Sal leaves, Siali leaves, mohua flowers, mango kernels, chironjee seeds, char seeds, and tamarind at this time. The hard cash earned by forest dwellers and tribal communities during summer empowers them to sustain themselves during the rainy season month and help finance agricultural activities (Shinde, 2010; Mahato and Gaurav, 2023). For their livelihoods, primitive tribes heavily rely on environmental assets like forest, water, and land. Consumable forest products gathered involve comestible leaves, wild tubers, mushrooms, bamboo shoots, and fruits and berries. A large percentage of Adivasi households rely on the forest for two to three months annually to accumulate NTFPs for use and sale (Croce, 2017). To buy groceries, poor rural people sell Siali leaves and Sal leaves. NTFPs such as mahua, tamarind, mangoes, kendu, jackfruit, amla, and harida have reduced due to rapid forest loss over the last two decades. The limited supply of NTFPs, wild edible plants, and forest greens contributes to the poor dietary patterns and earnings of primitive households. Tribal women and men gather lots of species of medicative plants and herbs to confront their medicinal requirements (Hindle and Lansdowne, 2005).

3 Conceptual model and hypothesis

Based on the aforementioned discussed literature, tribal entrepreneurs face challenges at three main stages in the Sal and Siali leaf business:

- 1 during the time of collection of leaves
- 2 at the time of leaf processing

3 selling and marketing of leaves and finished products.

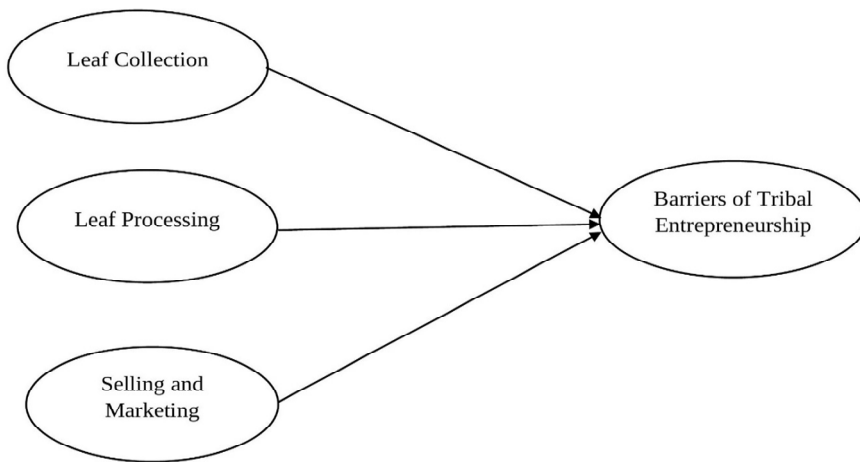
Therefore, the following three hypotheses are generated:

Hypothesis 1 (H1) Tribal entrepreneurs face challenges while collecting leaves from forests.

Hypothesis 2 (H2) Tribal entrepreneurs face challenges during the processing of leaves.

Hypothesis 3 (H3) Tribal entrepreneurs face challenges during the selling and marketing of leaves and finished products.

Figure 1 Conceptual model



4 Research methodology

The study used a quantitative research method to evaluate the barriers of tribal entrepreneurs in the Sal and Siali leaf business. The method of data collection used is multistage random sampling. The respondents of the study are indigenous entrepreneurs engaged in the Sal and Siali leaf business.

4.1 Study area and sample size

Jharkhand is one of the poorest states in the country. The majority of the total population of the state are scheduled tribes who are highly vulnerable in terms of their livelihood. The study is conducted in a tribal-dominant district of Jharkhand namely West Singhbhum. A total of 272 responses from tribal entrepreneurs were collected from six villages; Bila, Baraebir, Bara, Dewanbir, Gobindpur and Bhalurangi of Sonua and Goilkera blocks altogether.

4.2 Procedure of data collection

The study has used a survey questionnaire consisting of four sections such as personal information and barriers of tribal entrepreneurs. Based on the comprehensive reviews of existing literature, it was found that there were no reliable and well-developed measures in examining the barriers to indigenous women entrepreneurs. Therefore, the present study used structural equation modelling to assess different barriers women entrepreneurs face in pursuing entrepreneurship. Data were collected through personal interviews by visiting the study areas. Using a seven-point Likert scale, all the constructs were measured from 1 (strongly disagree) to 7 (strongly agree) scale.

4.3 Structure equation modelling

To evaluate the hypothesis formulated in Section 3, the structure equation model is used allowing researchers to analyse the relationships simultaneously. SEM has advanced features in assessing the relationship between constructs and their indicators in one place. The structure equation modelling (SEM) generally consists of a 'measurement model' that checks the convergent validity and reliability whereas the 'structural model' is used for path analysis and hypothesis testing.

5 Results and analysis

SEM has been used to examine the hypotheses that have been formulated in the study. As SEM allows researchers to simultaneously evaluate the relationships among constructs, hence it is suitable for analysis of hypothesised relationships (Schuberth et al., 2023). The statistical application, Smart PLS 4.0 was used to evaluate the study's datasets. The study first examined the construct reliability and validity through a measurement model using the PLS-SEM algorithm. Additionally, bootstrapping was performed to examine the significance of hypothesised relationship formulated in the study.

5.1 Demographic profile of the respondents

The demographic information of the respondents is shown in Table 1 which indicates that 80% of the respondents are between 18 to 35 years of age; 78% are illiterate; 90% are married; and 83% are female. Structural equation modelling is performed using smart PLS 4 software and initially used to carry out the reliability and validity test through measurement model and further hypothesis is analysed using structural model.

5.2 Measurement model

The measurement model is used to know the factor loadings of indicators of each construct and confirmatory factor analysis (CFA) to evaluate the convergent validity and reliability; and the discriminate validity of the model. The measurement models refer to implicit or explicit models that relate their indicators to the latent variable. The reliability respective constructs is determined through a measurement model. In this, model fit statistics, factor loadings, composite reliability, and Cronbach's alpha were calculated for

reliability (Magno et al., 2022) and average variance extracted (AVE) was calculated to examine the model's validity (Hair et al., 2019).

Table 1 Demographic profile of the respondents

<i>Sl. no.</i>	<i>Demographic type</i>	<i>Components</i>	<i>Response count (N = 272)</i>
1	Village	Bila	44 (16%)
		Baraebir	41 (15%)
		Bara	52 (19%)
		Dewanbir	57 (21%)
		Gobindpur	41 (15%)
		Bhalurangi	37 (14%)
2	Age	18–25 years	104 (38%)
		25–35 years	114 (42%)
		35–45 years	46 (17%)
		45 and above	8 (3%)
3	Education	Illiterate	212 (78%)
		Primary	33 (12%)
		Secondary	27 (10%)
4	Marital status	Unmarried	27 (10%)
		Married	245 (90%)
5	Gender	Male	46 (17%)
		Female	226 (83%)
6	Number of family members	2 or less	57 (21%)
		3–5 members	185 (68%)
		6 or more	30 (11%)
7	Number of children	Single child	74 (27%)
		2 children	114 (42%)
		3 or more	84 (31%)
8	Employment	Daily wage	199 (73%)
		Self-employed	35 (13%)
		Unemployed	38 (14%)

Source: Author's own creation

5.2.1 Model fit

Three model fit measures, SRMR, chi-square, and NFI, were used to examine the model's fitness. For example, an SRMR of less than 0.08 and an NFI greater than 0.90 signifies a good fit (Hair, 2021). However, the model's SRMR is 0.072 (<0.08), and the NFI is 0.931 (>0.9), signifying the model is fit for further evaluation (Table 3).

5.2.2 Construct reliability and validity

Reliability and validity represent two of the most essential concepts in measurement. It is reliable if a measurement tool or equipment can repeatedly measure the same attribute with the same findings. When employing a measurement tool, we often need to be sure that it will provide us with accurate results over time (Schuberth et al., 2023). Validity, in general, is a measure of how reliable your representation of something is. More specifically, validity in data collection refers to the extent to which your conclusions accurately reflect the phenomenon attempting to quantify (Magno et al., 2022).

Table 2 Challenges faced by the tribal entrepreneurs

<i>Constructs</i>	<i>Indicators of measurement</i>	<i>Response count</i>
Collection of leaf (LeC)	Sal trees are tall and leaves are out of reach	89%
	Siali trees are seen in the dense forest which is risky	72%
	Leaves got damaged due to pest	78%
Processing of leaf (LeP)	Manual processing of Sal leaf is time-consuming and less demand	65%
	Do not have sufficient funds to buy machinery	56%
	Lack of skill restricts us towards using machinery	34%
Selling and marketing (SM)	Local agents buy our products at low price	62%
	TRIFEDs give a fair price but are unavailable	56%
	Adivasi melas are rarely organised	67%

Source: Author's own creation

Table 3 Model fit

<i>Sl. no.</i>	<i>Measure of indices</i>	<i>Recommended criterion</i>	<i>Model value</i>	<i>Remarks</i>
1	Standard root mean square residual (SRMR)	<0.8	0.068	Accepted
2	Chi-square	>0.01	953.553	Accepted
3	Normed Fit Index (NFI)	Between 0 to 1 but >0.9 is considered a good fit	0.907	Accepted

Source: Author's own creation

Table 4 shows the convergent reliability and validity of each construct. Factor loadings, AVE (AVE > 0.5) and composite reliability (CR > 0.7) are used to measure the convergent validity of a variable. Factor loadings of each indicator are greater than 0.7 (Table 3); Cronbach's alpha and composite reliability of every construct are also more than 0.7 whereas the value of AVE is greater than 0.5. Thus, the measurement model is reliable and valid.

5.2.3 Discriminant validity

Table 5 and 6 show the discriminant validity which refers to how well items distinguish different concepts across construct. In other words, it assures whether each construct of the theoretical model should not be related to each other. Studying discriminant validity has become necessary for analysing correlations between latent variables. The HTMT

criterion and cross-loading investigation are the prevalent methods for assessing discriminant validity in variance-based structural equation modelling, such as partial least squares (Franke and Sarstedt, 2019). Magno et al. (2022) recommended the HTMT criterion to evaluate discriminant validity. The HTMT is an estimator for the correlation between two latent variables. Discriminant validity between two reflective constructs could be established if the HTMT value is less than 0.90. Therefore, the present study examines the discriminant validity using the HTMT matrix and cross-loading. In the HTMT matrix, the values of each construct are less than 0.90 (Table 5). This indicated that each construct is distinct from the others in the group and is valid for further analysis.

Table 3 Factor loadings of items

<i>Code</i>	<i>Indicators of measurement</i>	<i>Factor loadings</i>
BTE1	Marketing of tribal products is the major concern	0.907
BTE2	Employment and livelihood are severely affected	0.905
BTE3	The source of income gets minimised and leads to poverty	0.839
LC1	Sal trees are tall and leaves are out of reach	0.818
LC2	Siali trees are seen in the dense forest which is risky	0.785
LC3	Leaves got damaged due to pest	0.705
LP1	Manual processing of Sal leaf is time-consuming and less demand	0.831
LP2	Do not have sufficient funds to buy machinery	0.874
LP3	Lack of skill restricts us towards using machinery	0.741
SM1	Local agents buy our products at low price	0.943
SM2	TRIFEDs give a fair price but are unavailable	0.958
SM3	Adivasi melas are rarely organised	0.936

Source: Author's own creation

Table 4 Composite validity and reliability

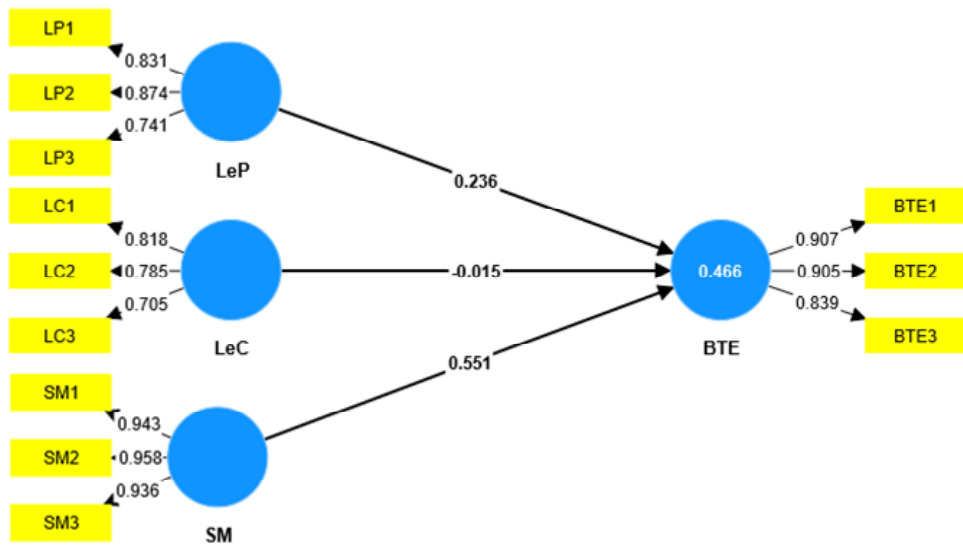
<i>Construct</i>	<i>Cronbach's alpha</i>	<i>Composite reliability</i>	<i>Average variance extracted (AVE)</i>
Barriers to tribal entrepreneurship (BTE)	0.862	0.915	0.782
Collection of leaf (LeC)	0.666	0.814	0.594
Processing of leaf (LeP)	0.752	0.857	0.668
Selling and marketing (SM)	0.941	0.962	0.894

Source: Author's own creation

Table 5 Discriminate validity (HTMT matrix)

<i>Construct</i>	<i>BTE</i>	<i>LeC</i>	<i>LeP</i>	<i>SM</i>
Barriers to tribal entrepreneurship (BTE)				
Collection of leaf (LeC)	0.505			
Processing of leaf (LeP)	0.577	0.79		
Selling and marketing (SM)	0.708	0.634	0.532	

Source: Author's own creation

Figure 2 Path coefficients and factor loadings (see online version for colours)

Source: Author's own creation

Table 6 Cross loadings of constructs

Items label	BTE	LeC	LeP	SM
BTE1	0.907	0.391	0.454	0.625
BTE2	0.905	0.378	0.459	0.636
BTE3	0.839	0.283	0.343	0.433
LC1	0.358	0.818	0.449	0.433
LC2	0.327	0.785	0.485	0.422
LC3	0.22	0.705	0.381	0.311
LP1	0.405	0.471	0.831	0.361
LP2	0.449	0.532	0.874	0.471
LP3	0.305	0.382	0.741	0.265
SM1	0.613	0.472	0.446	0.943
SM2	0.621	0.516	0.44	0.958
SM3	0.614	0.466	0.417	0.936

Source: Author's own creation

5.3 Structural model and hypothesis testing

To evaluate the relationship between the constructs, t-tests and path coefficients were determined using a bootstrapping approach. Table 7 and Figure 2 indicate the results of the structural path model. Based on the analysis, it is obtained that leaf collection is not a significant barrier for indigenous entrepreneurs ($\beta = -0.015$, t-value = 0.241; $p = 0.809$). However, leaf processing is a significant barrier for tribal entrepreneurs ($\beta = 0.236$,

t-value = 3.851; $p < 0.001$). Furthermore, the selling and marketing of leaves is also a significant barrier for tribal entrepreneurs ($\beta = 0.551$, t-value = 9.952; $p < 0.001$).

Table 7 Hypothesis testing

	<i>Hypothesised relations</i>	<i>Beta coefficients</i>	<i>Standard deviation</i>	<i>t-value</i>	<i>p-value</i>	<i>Decision</i>
H1	Collection of leaf (LeC) -> barriers to tribal entrepreneurship (BTE)	-0.015	0.061	0.241	0.809	Not supported
H2	Processing of leaf (LeP) -> barriers to tribal entrepreneurship (BTE)	0.236	0.061	3.851	0.000	Supported
H3	Selling and marketing (SM) -> barriers to tribal entrepreneurship (BTE)	0.551	0.055	9.952	0.000	Supported

Source: Author's own creation

6 Discussion

It is witnessed from the results that tribal entrepreneurs do not face any significant issues or challenges while collecting leaves from forests. However, they face challenges during the processing of leaves into the final products and selling and marketing of leaves and finished products. Making leaf plates from Siali leaves is a source of additional income for impoverished indigenous tribes domiciled in the nation's forest areas. The plenteous Siali creeper leaves are utilised by local women to produce shaped plates by knotting them together along with bamboo wood chips. Over 70% of tribal women in these districts are working as producers of such plates, whereby it managed to sell to grocery shops and hotels through intermediaries for a small amount of money. Earlier plastic plates replaced the use of Sal leaf plates in rural areas due to being less expensive and easy to acquire. Plastic trays, baskets, and bowl boatloads quickly became an absolute mess in towns and villages after the government decided to ban plastic use products. Poor infrastructure for curing and plate preparation delays the process of plate making.

Women's self-help groups have been active in the creation of environmentally friendly goods to assist members in augmenting their earnings. Even though plastics are prohibited in Jharkhand, single-use plastic plates, containers, and glasses are used in some regions (Dash and Behera, 2014). However, apart from the conventional leaves' trays, the women also create machine-pressed plates with just a brown paper base that can be used for buffets. They furthermore, make small bowls and trays with various cavities and in a range of dimensions (Rout et al., 2010). Indigenous peoples are classified by their multiculturalism, spurring organisations to put forward a formal definition of what it entails to be indigenous. Instead, the United Nations enumerates a wide range of features, such as language, legacy, beliefs, a deep commitment to territories, and socioeconomic, financial, and ideological systems (Misra and Dash, 2000). In the context of indigenous entrepreneurship, it is extremely important to address the matter of indigenous rights. Indigenous peoples are the residents of a region whose ethnic and cultural patterns are diversified (Hindle and Lansdowne, 2005).

7 Conclusions

Indigenous communities are dealing with an array of constraints and challenges, which include political conflicts, policy choices, inefficient government agencies, and communities. Several policymakers, for example, are much more predisposed to inspire and facilitate indigenous communities compared to their counterparts. Furthermore, regulatory policies and actions may have a substantial effect on fostering the growth of indigenous entrepreneurship in their respective areas. The present study aims to evaluate the barriers faced by indigenous entrepreneurs in the Sal and Siali leaf business in the West Singhbhum District of Jharkhand. Structural equation modelling is performed using smart PLS 4 software and initially used to carry out the reliability and validity test through measurement model and further hypothesis is analysed using a structural model. The results show tribal entrepreneurs don't face any significant challenges while collecting leaves from forests. However, they face challenges during the processing of leaves into the final products due to lack of availability of sufficient infrastructure and due to insufficient marketing chain, selling and marketing of leaves and finished products are quite complex. Hence, policymakers need to streamline the process of marketing Sal and Siali products and should provide sufficient infrastructure for the processing and curing of raw leaves into finished goods.

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