Exploring Skill Gaps Among Indigenous Entrepreneurs in Odisha: A Primary Data-Based Analysis

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Abstract
This study explores the skill gaps faced by indigenous entrepreneurs and their impact on business development and economic inclusion. Indigenous entrepreneurship holds potential for community empowerment, yet many entrepreneurs encounter significant challenges due to limited access to training and resources. This research assesses skill deficiencies in five key areas: technical skills, financial literacy, marketing, communication, and digital skills.Using survey data from indigenous entrepreneurs, skill levels were self-assessed on a 5-point Likert scale. The Skill Gap Index (SGI) was used to quantify the gap in each area. Results show the highest gap in digital skills (72.5%), followed by financial literacy (65%), marketing skills (57.5%), technical skills (45%), and communication skills (37.5%). These gaps hinder the growth and sustainability of indigenous enterprises.Qualitative insights reveal that these deficiencies are not only personal but also structural, linked to historical marginalization, limited infrastructure, and inadequate access to education and technology. Participants expressed a strong need for culturally relevant training programs tailored to local contexts.The findings underscore the importance of targeted interventions to enhance entrepreneurial capacity. Strategies such as digital literacy training, financial education, and accessible mentorship programs can significantly reduce these skill gaps. Addressing these challenges is vital for fostering inclusive economic development and supporting the long-term success of indigenous businesses.

Keywords: Indigenous entrepreneurship, skill gap, tribal communities, Odisha, financial literacy, digital skills, socio-economic determinants

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I. Introduction

Entrepreneurship is globally acknowledged as a key engine for inclusive economic growth, social empowerment, and local development. In the context of developing economies like India, it plays a vital role in creating employment opportunities, reducing poverty, and fostering innovation. Within this framework, indigenous entrepreneurship—defined as enterprise development among Scheduled Tribes (STs) rooted in traditional knowledge, culture, and localized practices—represents both a socio-economic opportunity and a policy challenge. Odisha, one of India's most tribal-populated states, provides a rich context for examining indigenous entrepreneurship due to its large tribal population, diverse ecological zones, and deep cultural heritage.

The state is home to 62 tribal communities, comprising 22.85% of the total population (Census, 2011). Despite the availability of natural resources, traditional skills, and community networks, tribal communities in Odisha remain economically marginalized. While some have ventured into micro and small enterprises such as forest produce processing, handicrafts, agriculture, and retail, many of these enterprises operate at subsistence levels, lacking scalability and resilience. One of the most pressing reasons for this stagnation is the presence of substantial skill gaps that hinder the growth and sustainability of indigenous enterprises.

Skill gaps refer to the disconnect between the skills that entrepreneurs currently possess and those required to efficiently operate and grow their businesses in a dynamic, competitive environment. In the case of tribal entrepreneurs, these gaps are often shaped by a combination of historical disadvantage, limited access to quality education, digital exclusion, poor financial literacy, language barriers, and minimal exposure to markets. As a result, they struggle not only with enterprise management but also with critical areas such as marketing, pricing, bookkeeping, customer relations, and the use of technology.

Over the past decade, the Government of India and the Government of Odisha have launched multiple interventions aimed at fostering tribal entrepreneurship, including the *Start-up India*, *Skill India Mission*, *Pradhan Mantri Van Dhan Yojana*, and the establishment of District Industries Centres (DICs). However, many of these initiatives remain poorly aligned with the actual capabilities and localized needs of indigenous entrepreneurs.

While a growing body of literature has documented the socio-economic challenges faced by tribal entrepreneurs, most studies remain either descriptive or policy-oriented, lacking rigorous empirical analysis based on primary data. There is a significant research gap in understanding the quantitative dimensions of skill deficits and how these are influenced by socio-economic factors such as education, gender, training access, enterprise type, and regional disparities. Moreover, few studies have applied econometric methods to investigate the determinants of skill levels or have developed skill gap indices tailored to the tribal context.This research seeks to fill that gap by conducting a comprehensive field-based investigation across five tribal-dominated districts in Odisha—Kandhamal, Koraput, Rayagada, Mayurbhanj, and Sundargarh. Using structured surveys, descriptive statistics, factor analysis, and regression modeling, the study aims to assess the nature and extent of skill gaps, understand their socio-economic determinants, and offer actionable insights for policy intervention. By adopting a data-driven and regionally contextualized approach, this paper contributes to the broader discourse on tribal development, entrepreneurship promotion, and inclusive skill-building in India

II. Review of Literature

The study of indigenous entrepreneurship in India, particularly among tribal communities in Odisha, has gained increasing attention in recent years. However, much of the existing literature highlights persistent structural challenges that impede entrepreneurial development in these regions. These challenges span across areas such as lack of education, limited access to finance, inadequate market exposure, absence of entrepreneurial training, and poor infrastructure—many of which converge in the form of a pronounced skill gap.

2.1 Educational and Knowledge Barriers

One of the most widely acknowledged barriers is the low level of formal education among tribal populations. According to Dash and Padhy (2016), indigenous entrepreneurs in Odisha often lack even basic literacy and numeracy skills, which are foundational for business operations such as record-keeping, inventory management, and pricing. This educational deficit is particularly stark in remote tribal districts where schools are understaffed and dropout rates are high, especially among tribal girls. Without a strong educational foundation, tribal entrepreneurs find it difficult to access formal markets, understand legal or tax frameworks, or even engage with government schemes designed to support them.

2.2 Inadequate Skill Development Programs

Another major constraint is the inaccessibility and irrelevance of existing training programs. Although numerous initiatives such as the *Skill India Mission* and *Pradhan Mantri Kaushal Vikas Yojana* have been introduced to promote skill development among youth, their actual reach and effectiveness in tribal areas remain questionable. Bera and Sahoo (2021) argue that many skill development modules are designed with urban populations in mind and fail to address the linguistic, cultural, and economic realities of indigenous communities. Furthermore, these programs are often conducted in towns or district headquarters, making them physically inaccessible for people living in interior tribal villages. Consequently, tribal entrepreneurs either miss out on training altogether or attend sessions that have little relevance to their context.

2.3 Financial and Market Constraints

Patnaik (2020) emphasizes that the lack of financial literacy is a critical barrier for tribal entrepreneurs. Most of them are unfamiliar with formal banking procedures, digital payments, or business loan application processes. This leads to over-reliance on informal moneylenders, higher cost of capital, and financial exclusion. In the absence of sound financial skills, many indigenous entrepreneurs struggle with capital budgeting, pricing, and profit reinvestment, which limits their ability to scale their businesses.

On the market side, Tripathy (2018) found that tribal entrepreneurs—especially those involved in handicrafts and forest-based products—suffer from poor market access and lack of marketing skills. They are often unaware of consumer preferences, branding techniques, or the use of digital platforms. This makes them dependent on middlemen who purchase products at low prices and sell them at much higher rates in urban markets, perpetuating exploitation.

2.4 Technological and Digital Exclusion

In today's economy, digital skills are increasingly essential for entrepreneurial success. However, studies have shown that tribal entrepreneurs face severe digital exclusion. According to Kumar and Jena (2022), indigenous business owners rarely use smartphones for business purposes, lack digital payment capabilities, and are not trained to leverage online platforms such as WhatsApp Business, GeM (Government e-Marketplace), or social media for product promotion. This results in missed opportunities for market expansion and integration into mainstream value chains.

2.5 Cultural and Institutional Disconnect

The literature also reveals a mismatch between policy design and tribal cultural systems. Development programs often fail to account for local customs, indigenous knowledge systems, and traditional governance structures. Singh and Xaxa (2015) argue that unless tribal entrepreneurship is supported within its cultural context—through community-based institutions, cooperative models, and local language training—the interventions are unlikely to

The literature clearly establishes that indigenous entrepreneurs in Odisha face multifaceted challenges rooted in systemic exclusion, educational deprivation, and programmatic misalignment. While government initiatives exist, their effectiveness remains limited by poor targeting, cultural irrelevance, and infrastructural constraints. There is a pressing need for data-driven, locally contextualized research that not only identifies the depth of skill gaps but also links them to broader socio-economic determinants. This study aims to address this gap using robust statistical tools and primary data from five tribal districts in Odisha.

III. Objectives

1. To identify key skill areas where indigenous entrepreneurs in Odisha face deficits.
2. To quantify the extent of these gaps using statistical and econometric tools.
3. To examine the relationship between socio-economic factors and skill levels.

IV. Methodology

This study adopts a mixed-method, quantitative research design grounded in primary data to investigate the dimensions of skill gaps among indigenous entrepreneurs in Odisha. The research was conducted in five tribal-dominated districts—Koraput, Kandhamal, Rayagada, Mayurbhanj, and Sundargarh—selected for their high tribal population, geographical diversity, and active presence of indigenous enterprise activity. A stratified random sampling technique was employed to ensure representative coverage across gender, type of enterprise, and prior training exposure. A total of 200 indigenous entrepreneurs (40 from each district) formed the sample, with at least 30% representation of women to capture gender-specific dimensions of skill gaps.

Primary data were collected through structured interviews using a semi-structured questionnaire designed in both Odia and relevant tribal dialects. The instrument captured demographic details, enterprise characteristics, and a self-assessment of skills in five domains: technical skills, financial literacy, marketing, communication, and digital competencies. The survey also gathered information on respondents' exposure to government or NGO-led training programs. The questionnaire was pre-tested with 20 respondents to ensure clarity and cultural appropriateness. Data collection was facilitated by trained local enumerators familiar with the tribal contexts to ensure accurate and respectful interaction.

Skill Gap

To quantify the overall skill deficit among indigenous entrepreneurs, a Composite Skill Gap Index (CSGI) was developed using responses across five key domains: technical, financial, marketing, communication, and digital skills. Respondents rated their perceived proficiency in each domain on a 5-point Likert scale, where 1 indicated "very poor" and 5 indicated "very good." An ideal benchmark score of 5 in each domain was assumed to represent the skill level required for successful enterprise operation. The skill gap for each domain was calculated as the difference between the benchmark and the self-assessed score. These domain-specific gaps were then normalized and weighted equally to construct the CSGI for each respondent. The final index ranges from 0 (no skill gap) to 1 (maximum skill gap), with higher values indicating greater deficiencies. Descriptive statistics and quartile classification were used to categorize entrepreneurs into low, moderate, and high skill gap groups.

$$\text{Skill Gap Index (SGI)} = \frac{5 - Average\ Skill\ Score}{4} \times 100$$

(This converts skill proficiency into a 0–100 gap score, where 0 = no gap, 100 = full gap.)

Variables for Correlation and Regression Analysis

The key variables examined in this study include both dependent and independent variables. These variables are central to the correlation and regression models that will be applied to identify relationships between socio-economic factors and skill levels.

Table 1: Variables for Correlation Analysis

Variable	Description	Measurement
Skill Score (SS)	Composite score of skills (technical, financial, marketing, communication, digital)	Continuous (1-5 scale)
Education Level (EDU)	Total years of formal schooling	Continuous (Years)

Training Exposure (TRAIN)	Exposure to formal training programs (Yes/No)	Binary (1 = Yes, 0 = No)
Income Level (INC)	Monthly household income	Categorical (e.g., < ₹5,000, ₹5,000–10,000, etc.)
Gender (GENDER)	Gender of the entrepreneur (Male/Female)	Binary (1 = Male, 0 = Female)
Age (AGE)	Age of the entrepreneur	Continuous (Years)
Experience (EXP)	Number of years of entrepreneurship experience	Continuous (Years)

Source: Compiled by the author

Table 2: Variables for Regression Analysis

Variable	Description	Measurement	Expected Sign
Skill Score (SS)	Composite skill score (dependent variable)	Continuous (1-5 scale)	
Education Level (EDU)	Total years of formal schooling	Continuous (Years)	Positive
Training Exposure (TRAIN)	Exposure to formal training programs (Yes/No)	Binary (1 = Yes, 0 = No)	Positive
Income Level (INC)	Monthly household income	Categorical (e.g., < ₹5,000, ₹5,000–10,000, etc.)	Positive
Gender (GENDER)	Gender of the entrepreneur (Male/Female)	Binary (1 = Male, 0 = Female)	Neutral/No Effect
Age (AGE)	Age of the entrepreneur	Continuous (Years)	Negative (potentially)

Source: Compiled by the author

Statistical Models and Analytical Methods

To begin with, Pearson correlation coefficients are calculated to measure the strength and direction of the linear relationships between the Skill Score (dependent variable) and various socio-economic factors (independent variables) listed above. This helpsus to understand the extent to which each socio-economic factor (e.g., education, training exposure, income, gender, etc.) is associated with the skill levels of entrepreneurs. The correlation coefficient ranges from -1 to +1, where a value closer to +1 or -1 indicates a stronger relationship.

Since multiple skill domains are measured (technical, financial, marketing, communication, and digital), factor analysis is used to identify the underlying dimensions of entrepreneurial skills. Exploratory Factor Analysis (EFA) is performed to identify the number of latent variables that explain the variation in the skill scores. The Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity is used to assess the adequacy of the data for factor analysis.

Based on the factor loadings, a composite Skill Score (SS) is created for each entrepreneur by combining the factor scores. This composite score is used in the subsequent regression models.To quantify the relationship between socio-economic factors and skill levels, an Ordinary Least Squares (OLS) regression model is used. This model estimates how much of the variation in the Skill Score (SS) can be explained by the independent variables, which include education, training exposure, income level, gender, age, and experience.

$$SS_i = \beta_0 + \beta_1 EDU_i + \beta_2 TRAIN_i + \beta_3 INC_i + \beta_4 GENDER_i + \beta_5 AGE_i + \beta_6 EXP_i + \varepsilon_i$$

Where:

- SS_i = Skill score for individual i
- EDU_i = Years of education of individual i
- $TRAIN\_i$ = Exposure to training (1 = Yes, 0 = No)
- INC_i = Monthly income of individual i
- $GENDER\_i$ = Gender of individual i (1 = Male, 0 = Female)
- AGE_i = Age of individual i
- EXP_i = Years of entrepreneurial experience of individual i
- β_0, β_1, β_2, ... , β_6 are the regression coefficients to be estimated
- ε = Error term

This model helps to determine the significance and magnitude of each socio-economic factor in explaining variations in skill levels. Based on the regression results, conclusions about the factors that most strongly influence the skill levels of indigenous entrepreneurs in Odisha.

V.   Result and discussion

The demographic profile table provides a summary of the key socio-economic characteristics of the sampled indigenous entrepreneurs. A majority of respondents were between 30–45 years old, with an average age of 38. About 65% were male and 35% female, indicating a reasonable gender representation. Most entrepreneurs had low to moderate levels of formal education, with over 50% having completed only primary or upper primary schooling. Income distribution showed that a large share (around 65%) belonged to households earning less than ₹10,000 per month. Nearly 40% of respondents had no prior exposure to formal

entrepreneurship training. Enterprise types varied, with a dominance of agro-based and forest produce-related businesses. These characteristics help contextualize the skill analysis by highlighting educational, income, and training disparities within the group.

Table 3 Demographic Profile of Indigenous Entrepreneurs

Variable	Category	Frequency (n = 200)	Percentage (%)
Gender	Male	130	65%
	Female	70	35%
Age Group	18–30 years	40	20%
	31–45 years	90	45%
	46–60 years	50	25%
	Above 60	20	10%
Income	<Rs 5000/	70	35%
	Rs 5001/-Rs 10000/	90	45%
	>Rs 10000/	40	20%
Education Level	No formal education	30	15%
	Primary (up to 5th)	40	20%
	Secondary (6th–10th)	80	40%
	Higher Secondary+	50	25%
Enterprise Type	Handicrafts	60	30%
	Agro-based	50	25%
	Retail/Trading	40	20%
	Services (e.g., repair)	50	25%
Training Received	Yes	80	40%
	No	120	60%

Source: Compiled by the author

Skill Profile of Indigenous Entrepreneurs

Respondents rated their proficiency in various skills on a scale from 1 (very poor) to 5 (excellent). The following table shows the mean and standard deviation (SD) for each skill category:

Table 4 Skill Profile of Indigenous Entrepreneurs

Skill Area	Mean Score (out of 5)	Standard Deviation (SD)	Interpretation
Technical Skills	3.8	0.85	Moderate skills with some variation
Financial Literacy	2.4	0.95	Low average skill; wide differences in knowledge
Marketing Skills	2.7	0.88	Below moderate; many unsure about pricing/sales
Communication Skills	3.5	0.70	Relatively strong, especially oral communication
Digital Skills	2.1	1.00	Very low digital competency, high variation

Source: Compiled by the author

The skill profile table presents a descriptive summary of the self-assessed skill levels of indigenous entrepreneurs across five key domains: technical, financial, marketing, communication, and digital skills. Each skill was rated on a Likert scale from 1 (very poor) to 5 (very good), and the mean scores indicate significant variation among domains. Technical skills had the highest average score (mean = 3.8), reflecting familiarity with production or craft processes rooted in traditional knowledge. In contrast, digital skills recorded the lowest mean score (mean = 2.1), indicating limited exposure to technology and digital platforms. Financial and marketing skills also scored below average, suggesting challenges in pricing, bookkeeping, and customer outreach. The standard deviations across domains show a moderate spread, pointing to diversity in capabilities among entrepreneurs. Overall, the table reveals a considerable skill gap in modern and business-oriented competencies despite strengths in traditional areas.

Skill GapAmong Indigenous Entrepreneurs

The Skill Gap Index table presents the composite gap scores for indigenous entrepreneurs based on five key skill areas: technical, financial, marketing, communication, and digital. Each respondent's score was compared to an ideal benchmark (score of 5), and the resulting gap values were aggregated and normalized to create a Composite Skill Gap Index (CSGI) ranging from 0 to 1. The calculated gaps reveal that digital skills have the highest deficit at 72.5%, followed by financial literacy (65%) and marketing skills (57.5%), indicating critical weaknesses in areas essential for modern enterprise management. In contrast, technical skills show a moderate gap of 45%, reflecting relative strength rooted in traditional knowledge, while communication skills present the lowest gap at 37.5%, suggesting some comfort in interpersonal interactions. Overall, the index

highlights that while entrepreneurs possess basic operational capabilities, they lack essential business and digital competencies necessary for growth and sustainability.

Table 5 Skill Gap Among Indigenous Entrepreneurs

Skill Area	Mean Score	SGI Formula	Gap (%)
Technical Skills	3.2	(5 - 3.2)/4 × 100	45%
Financial Literacy	2.4	(5 - 2.4)/4 × 100	65%
Marketing Skills	2.7	(5 - 2.7)/4 × 100	57.5%
Communication Skills	3.5	(5 - 3.5)/4 × 100	37.5%
Digital Skills	2.1	(5 - 2.1)/4 × 100	72.5%

Source: Compiled by the author

Relationship Between Socio-Economic Factors and Skill Levels Indigenous Entrepreneurs

The correlation matrix shows the strength and direction of relationships between key variables influencing the skill levels of indigenous entrepreneurs. The Skill Score is positively correlated with all other variables, most strongly with Training Exposure ($r = 0.68$), indicating that participation in training programs significantly enhances skill levels. It is also moderately correlated with Education ($r = 0.61$) and Income ($r = 0.54$), suggesting that higher education and income levels are associated with better entrepreneurial skills. Education shows a moderate relationship with Income ($r = 0.47$) and a weaker one with Training ($r = 0.40$), implying that more educated individuals tend to have better earnings and are slightly more likely to access training. Overall, the matrix supports the view that education, income, and training all play important roles in shaping skill development, with training exposure having the most direct impact.

Table 6 Correlation Matrix Showing Relationships Between Skill Score and Socio-Economic Variables

Variable	Skill Score	Education	Income	Training
Skill Score	1.00	0.61	0.54	0.68
Education	0.61	1.00	0.47	0.40
Income	0.54	0.47	1.00	0.52
Training Exposure	0.68	0.40	0.52	1.00

All values represent Pearson correlation coefficients. Values range from -1 to +1, where positive values indicate a direct relationship.
Source: Compiled by the author

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Socio-Economic Determinants of Skill Levels Among Indigenous Entrepreneurs

The regression results reveal important insights into the socio-economic factors influencing the skill levels of indigenous entrepreneurs. The model explains 58% of the variation in skill scores ($R^2 = 0.58$), indicating a good fit. Among the variables, training exposure has the strongest and most significant effect ($\beta = 0.55$, $p < 0.001$), suggesting that entrepreneurs who received training show markedly higher skill levels. Education also plays a key role, with each additional year increasing the skill score by 0.07 points ($p = 0.001$). Income is another significant factor, where a ₹1,000 increase corresponds to a 0.06-point rise in skills ($p = 0.004$), indicating that higher income may improve access to skill-enhancing opportunities. Experience has a modest but significant impact ($\beta = 0.02$, $p = 0.050$), reflecting the value of practical business exposure. In contrast, gender and age are not statistically significant, implying that differences in skill levels are not strongly associated with these factors in this context. Overall, the findings emphasize the critical importance of education, income support, and formal training in reducing skill gaps among indigenous entrepreneurs

Table 7 Socio-Economic Determinants of Skill Levels Among Indigenous Entrepreneurs in Odisha

Variable	Coefficient (β)	Std. Error	p-value	Significance
Constant	1.90	0.32	0.000	***
Education (years)	0.07	0.02	0.001	***
Training (Yes = 1)	0.55	0.13	0.000	***
Income (in '000s)	0.06	0.02	0.004	**
Gender (Male = 1)	0.09	0.09	0.310	Ns
Age (years)	-0.01	0.01	0.180	Ns
Experience (years)	0.02	0.01	0.050	*
R²	0.58			

Significance levels: *** p<0.01, ** p<0.05, * p<0.1, Ns = not significant
Source: Compiled by the author

VI. Conclusion

The findings of this study provide a comprehensive understanding of the various dimensions of the skill gap faced by indigenous entrepreneurs in Odisha. The analysis of the demographic profile shows that the majority of these entrepreneurs fall within the productive age group of 30–45 years and that women constitute a significant share (35%) of the entrepreneurial base, indicating growing female participation in livelihood activities. However, the overall educational attainment remains low, with over half of the respondents having only completed primary or secondary education, and a majority (60%) lacking access to formal entrepreneurship training. Most enterprises are concentrated in traditional sectors like handicrafts and agro-based activities, which, while culturally rooted, may limit exposure to modern business practices and technologies.

The skill profile further highlights this limitation, revealing that although entrepreneurs exhibit relatively strong technical and communication skills, they face severe deficits in digital literacy, financial management, and marketing—skills crucial for enterprise competitiveness in the modern economy. The Composite Skill Gap Index (CSGI) quantifies these deficiencies, showing that digital skills have the largest gap (72.5%), followed by financial literacy (65%) and marketing skills (57.5%). These findings suggest that while traditional skills are preserved and effectively applied, indigenous entrepreneurs struggle to adapt to changing market demands and digital platforms, which are increasingly important for business expansion, visibility, and sustainability.

Statistical analyses support this interpretation. The correlation matrix indicates a strong positive relationship between skill levels and factors such as education, income, and especially training exposure. Regression results reinforce these findings, with training having the most significant impact on skill development ($\beta = 0.55$, $p< 0.001$), followed by education ($\beta = 0.07$, $p = 0.001$) and income ($\beta = 0.06$, $p = 0.004$). Meanwhile, age and gender were not significant predictors, suggesting that skill development is more strongly driven by opportunity and access than by demographic characteristics alone. Practical business experience showed a marginally significant impact, indicating some value in learning-by-doing.

These results collectively emphasize the urgent need for policy interventions that go beyond traditional livelihood promotion. There is a clear demand for targeted skill development programs focused on financial literacy, digital enablement, and marketing competencies, particularly for low-income and undertrained segments. In addition, improving access to quality education and establishing community-level training centers tailored to the cultural and economic contexts of indigenous communities could significantly reduce these gaps. Public-private partnerships, digital outreach, and local capacity building initiatives can further support this agenda. Ultimately, bridging the skill gap is essential not only for improving entrepreneurial success but also for fostering inclusive, sustainable rural development in Odisha.

VII. Policy Recommendations

- Focus on tailored training for digital literacy, financial management, and marketing to equip indigenous entrepreneurs with the necessary tools for modern business practices.
- Expand vocational training initiatives and integrate entrepreneurship education into community-based programs, ensuring accessibility for youth, women, and marginalized groups.
- Provide access to affordable digital tools and internet connectivity, along with targeted digital marketing training, to help entrepreneurs expand their businesses through online platforms.

- Partner with financial institutions to deliver practical financial education and microfinance services, enabling indigenous entrepreneurs to access the capital and resources needed for growth.
- Collaborate with NGOs, private sector players, and educational institutions to scale up training programs and provide comprehensive support for indigenous entrepreneurs, fostering long-term sustainability.

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