



Van Dhan Vikas Kendras (VDVKs) on Tribal Women Entrepreneurship and Empowerment in Alluri Sita Rama Raju District of Andhra Pradesh

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ABSTRACT

The study was conducted during March to May month of year 2025 at Alluri Sita Rama Raju District, Andhra Pradesh, India to study the impact of VDVK on women entrepreneurship and empowerment in study area. The entrepreneurship activities facilitated by Van Dhan Vikas Kendra have significantly empowered tribal women across Chintapalli, Paderu and G. Madugula mandals in the Alluri Sitarama Raju district. The sample size was 80 VDVK beneficiaries and 80 non-beneficiaries. The approaches like before and After, with and Without and Women empowerment Index were applied to collected primary data. The major minor forest produce marketed by VDVK are Adda leaf plates, De seeded tamarind, Hill brooms, and Soapnuts. It was analysed that Average annual income of beneficiaries doubled from ₹ 31,000 to ₹ 59,912.55 and employment man-days rose from 130 to 310, largely due to 210 days generated by VDVK activities. Food and non-food consumption increased from ₹ 23,000 to ₹ 37,200 and ₹ 8,000 to ₹ 24,800, respectively, reflecting improved living standards. Beneficiaries showed significantly higher scores across activity, knowledge, health, autonomy and social domains with a Women Empowerment Index Value 0.69 compared to 0.45 among non-beneficiaries. These findings affirmed that structured institutional support through VDVKs fosters holistic empowerment, bridging gender and economic gap could contribute significantly to inclusive and sustainable development in tribal areas.

KEYWORDS: Entrepreneurship, Van Dhan Vikas Kendra, minor forest produce

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1. INTRODUCTION

Tribal communities are deeply rooted in their culture and forest-based livelihoods, rely heavily on Minor Forest Produce (Maske et al., 2011) for income and sustenance (Rani et al., 2025). Recognizing this, the Government of India launched the Pradhan Mantri Van Dhan Yojana (PMVDY) to empower tribal populations, particularly women by promoting value addition and entrepreneurship (Sahu, 2021) through VDVks. These Kendras serve as platforms for training, skill development and market access aiming to transform tribal women into micro entrepreneurs (Sulin and Tiwari, 2020). The VDVk scheme, implemented by TRIFED, promotes value addition and marketing of MFP through SHG based tribal enterprises. It ensures MSP based procurement, provides processing infrastructure and facilitates retail marketing. Each VDVk comprises 15 to 20 SHGs with 300 tribal members. The scheme covers 307 tribal districts across 27 states, supporting procurement, value chain development and infrastructure like haat bazaars and storage under 100% GoI grant, enhancing tribal income (Sarawagi and Singh, 2024) and entrepreneurship. The MSP for MFP, as fixed by TRIFED has shown both stability and fluctuation from 2020–21 to 2024–25. Key items like deseeded tamarind, pungam seed, mohwa seed, gum karaya and apiary honey have maintained stable prices (Chutani and Singh). In contrast, products such as tamarind seed, Gatchakayalu, Naramamidi bark, Maredugaddalu and flower tamarind witnessed price declines. On the other hand, items like dry amla, nuxvomica, gum oil and rock bee honey saw significant price increases, indicating changing market trends and valuation. Notably, new products such as turmeric, dry chilli and black gram were introduced under the MSP list, reflecting diversification (Singh et al., 2010). Andhra Pradesh stands out in the implementation of the VDVk scheme, with 488 VDVks sanctioned and 414 operationalised achieving an impressive implementation rate of 84.84% the highest in the country and well above the national average of 56.15% (2,507 operational out of 4,465 sanctioned). The state ranks second in total sanctioned VDVks and first in terms of operational units. Within Andhra Pradesh, districts like Eluru, Kurnool, Nellore and Prakasam have achieved 100% implementation, while Srikakulam leads with the highest number of VDVks (106 sanctioned, 102 operationalised). Alluri Sitarama Raju district has 9 out of 16 VDVks operational (56.25%). Nationally, while smaller states like Mizoram, Kerala and Tripura reported high operationalisation rates above 85%, larger states such as Maharashtra, Gujarat and Jharkhand have significantly underperformed with less than 20% implementation. Additionally, Union Territories such as Andaman and Nicobar Islands, Jammu and Kashmir, Telangana and West Bengal have not operationalised

any VDVks. These findings highlight Andhra Pradesh as a model of effective scheme execution, underscoring strong institutional coordination and active community engagement. Van Dhan Marts acts as a platform to ensure tribal producers gain access to mainstream markets, fair prices and branding opportunities which boost their income (Sarma, 2014) and encouraging entrepreneurship. The initiative links tribal enterprises with both physical and digital marketing channels, enhancing the visibility and market reach of indigenous products. Van Dhan Vikas Kendras (VDVks) play a supporting tribal SHGs by providing processing and value addition to raw products along with branding (Shirsath and Kumare, 2025). The processed products sold in tribal exhibitions, Weekly haats and e-commerce platforms at reliable prices (Datta, 2002). This integrated approach promoted sustainable livelihood opportunities to tribal communities. The data collected from respondents showed that women who were part of VDVks had better access to resources, received skill training and were more confident in taking decisions, both at home and in their business activities. Thus, this study was done to study the impact of VDVk on women entrepreneurship and empowerment in study area.

2. MATERIALS AND METHODS

The study was conducted during the March to May month of year 2025 at Alluri Sita Rama Raju District. Van Dhan Vikas Kendra were functioning in 6 mandals in ASR district namely Paderu, Gudem Kotha Veedi, Chinthapalle, Koyyuru, G. Madugula and Peddabayalu. Three mandals were purposively selected for the study based on operational efficiency and density of active SHGs namely Paderu, Chintapalli and G. Madugula.

The primary data collected from functioning VDVks in Paderu revenue Division. A total of 80 Beneficiaries (VDVk members) were selected from the list of tribal women SHG members involved in collection, processing and marketing of Minor Forest Produce (MFP) through VDVks and 80 Non-beneficiaries (Non-members) were selected using simple random sampling from the same villages but not associated with any VDVk. These served as a control group to understand the differential impact of VDVk participation.

2.1. Mean and standard deviation

The mean or average, was calculated by summing all the values in a dataset and dividing by the number of values. It represented the central tendency of the data.

$$\text{Mean: } \bar{X} = \frac{\sum X_i}{n}$$

$$\text{Standard deviation: } SD = \sqrt{\frac{\sum (X_i - \bar{X})^2}{n-1}}$$

Where,

X_i =Each individual value in the sample

n =Total number of observations in the sample

2.2. Paired t-test

The paired t-test was utilized to measure the statistical significance of changes observed in the same group of respondents before and after participation in a given intervention (such as VDVK membership). This test was especially appropriate when assessing the effectiveness of programs where each respondent was observed under two different conditions such as pre and post interventions.

$$t = \frac{d}{Sd/\sqrt{n}}$$

Where,

d =Mean of observed differences between pre- and post-scores for each respondent

Sd =Standard deviation of the differences

n =Total number of paired observations (respondents)

2.3. Independent t-test

The independent t-test was used to determine whether there was a statistically significant difference between the means of two unrelated groups (e.g., intervention vs. control group). It was appropriate when you were comparing two separate groups of respondents.

$$t = \frac{X_1 - X_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

Where,

$\bar{X}_1$ =Mean of group 1

$\bar{X}_2$ =Mean of group 2

s_1 =Standard deviation of group 1

s_2 =Standard deviation of group 2

n_1 =Sample size of group 1

n_2 =Sample size of group 2

2.4. Women empowerment index (WEI)

To quantify the multi-dimensional empowerment of tribal women based on selected domains such as decision-making, mobility, leadership, economic access and social participation. It was used to measure and compare the level of empowerment between VDVK beneficiaries and non-beneficiaries and to analyze changes before and after joining the VDVK (Table 1).

$$WEI = \frac{\sum(w_i \times S_i)}{\sum w_i}$$

Where,

I_{11} =1, if the woman gets direct credit access;

=0, otherwise;

Table 1: Composition of empowerment index for the SHG women

Domain	Indicator	Weight
<u>Input domain (I_1)</u>		
Activity domain (I_{11})	Credit access (I_{11})	w_1
	Resource utilization (I_{12})	w_2
	Repayment decision (I_{13})	w_3
Knowledge domain (I_{12})	Financial literacy (I_{21})	w_4
	Educational attainment (I_{22})	w_5
	Knowledge about family planning (I_{23})	w_6
Health domain (I_{13})	BMI (≥ 18.5) (I_{31})	w_7
	Anaemia-free health (Hb ≥ 11 Mg/Dl) (I_{32})	w_8
	Availability of sanitation and safe drinking water (I_{33})	w_9
<u>Output domain (O_1)</u>		
Domestic autonomy (O_{11})	Protest against domestic violence and alcoholism (O_{11})	w_{10}
	Household autonomy (O_{13})	w_{11}
	Autonomy in purchase and sales of household resources (O_{13})	w_{12}
Social interaction (O_{12})	Membership in local political party/NGO (O_{21})	w_{13}
	Voice against social crimes (O_{22})	w_{14}
	Freedom of mobility without permission (O_{23})	w_{15}

I_{12} =1, if the woman takes the decision about business resource utilization;

=0, otherwise;

I_{13} =1, if the woman takes repayment decision in the micro credit business;

=0, otherwise;

I_{21} =1, if the woman has financial literacy;

=0, otherwise;

I_{22} =1, if the woman completes her elementary education;

=0, otherwise;

I_{23} =1, if the woman has knowledge about family planning;

=0, otherwise;

I_{31} =1, if her BMI >18.5 ;

=0, otherwise;

I_{32} =1, if she is anaemia free, i.e., her Hb >11.0 mg dl $^{-1}$;

=0, otherwise;
 $I_{33}=1$, if she has sanitation and safe drinking water facility;
 =0, otherwise;
 $O_{11}=1$, if she protests against domestic violence/ alcoholism within household;
 =0, otherwise;
 $O_{12}=1$, if she takes household decision about resource, health and education;
 =0, otherwise;
 $O_{13}=1$, if she takes purchase or sales decision about domestic resources;
 =0, otherwise;
 $O_{21}=1$, if she is member in local political parties/NGO;
 =0, otherwise;
 $O_{22}=1$, if she raises voice against social crimes (dowry, women abuse etc);
 =0, otherwise;

$O_{23}=1$, if she enjoys the freedom to move safely within society without any permission;
 =0, otherwise

w_i =weight assigned to the domain

S_i =standardized score in the domain

$\sum w_i=1$ if weights are normalized

3. RESULTS AND DISCUSSION

3.1. Enterprise activities provide to WSHGs beneficiary by VDVks in mandals

The data in the table 2 showed that among 80 beneficiary women SHG members across different areas in ASR district, Adda leaves minor forest produce (Giri, 2024 : Pradhan et al., 2025.) emerged as the dominant main product, particularly in Chintapalli, Paderu and G. Madugula, involving a total of 58 members. Tamarind processing was notable in Paderu (Hukumpeta) with 22 beneficiaries.

Table 2: Main and ancillary enterprises provided by VDVks to beneficiary women SHG members (N=80)

Sl. No.	Name of the VDVK	VDVks area of coverage in ASR district	Beneficiary sample size N=80	Main products MFP	Ancillary products
1.	VDVK Annavaram	Chintapalli	15	Adda leaves	Soapnut Powder
2.	VDVK Paderu	Paderu	17	Adda leaves	Hill broom
		Paderu (Guttuluputtu)	8	Adda leaves	Honey
		Paderu (Hukumpeta)	22	Tamarind	Sheekai nuts
3.	VDVK FPO-Hukumpeta	G. Madugula	18	Adda leaves	
			80	3	4

3.2. Minor forest products offered at van dhan mart in paderu

Table 3 presented the price details of various value-added Minor Forest Produce (MFP) products like de-seeded tamarind (₹ 220 kg⁻¹) and honey (₹ 450 (½ kg)⁻¹) reflect high market value due to processing and packaging from hubs like Hukumpeta and G. Madugula. Adda leaf plates in different sizes, Soapnut powder and Hill brooms were also

offered showcasing the diversity and commercial potential of tribal produced processed across clusters in Paderu and Araku regions.

3.3. Extent of income generation from sale of produce to VDVk beneficiaries

Table 4 presented the extent of income generation from

Table 3: Price of different minor forest products offered at Van Dhan Mart in Paderu

S. No	MFP	Quantity	Per unit price	Price (Rupees)	Processing
1.	De-seeded tamarind (kg)	1	-	₹ 220	Hukumpeta
2.	Adda leaf plates				
	a. Small	80 pc	₹ 1.5 (plate ⁻¹)	₹ 120 (bundle ⁻¹)	Paderu
	b. Medium	35 pc	₹ 2.8 (plate ⁻¹)	₹ 100 (bundle ⁻¹)	
	c. Large	25 pc	₹ 4.4 (plate ⁻¹)	₹ 110 (bundle ⁻¹)	
3.	Soapnut powder	100 gm packet	-	₹ 20	Paderu
4.	Hill brooms	1 pc	-	₹ 70	Araku
5.	Honey	½ kg	-	₹ 450	G. Madugula

*Author's calculations

Table 4: Extent of income generation from sale of produce to VDVK beneficiaries

Processed MFP product	No. of days spent for collection of MFP products	No. of days spent for processing of MFP products	Quantity sold	Income generated per MFP
Adda leaf (From VDVK 1 and 2)	30	180	49000 (plates)	140000
De-seeded tamarind	30	180	470 (kg)	79900

*Author's calculations

the sale of processed Minor Forest Produce (MFP) by VDVK beneficiaries. Over 30 days were spent for collection of the MFP while 180 days were spent for processing of Adda leaves (Saboo, 2019). VDVKs sold 49,000 Adda leaf plates, generating an income of ₹ 140,000 per VDVK. For de-seeded tamarind, the same duration of 30 days for collection and 180 days for processing were considered. The VDVK saw 470 kg sales, leading to an income of Rs. 79,900 per VDVK.

3.4. Before and after analysis of VDVK beneficiaries

The analysis of socio-economic parameters of VDVK beneficiaries before and after joining the groups in table 5 reveals significant improvements. Average family size increased from 5.58 to 6.05 and female-headed households rose from 55.5% to 78.75%, indicating increased women leadership. Employment man-days year⁻¹ more than doubled from 130 to 310, driven largely by 210 man-days generated through VDVK activities. Correspondingly, average annual income doubled from ₹ 31,749 to ₹ 59,912.55. Consumption expenditure also saw substantial growth, with food expenditure rising from ₹ 23,000 to ₹ 37,200 and non-food from ₹ 8,000 to ₹ 24,800. Asset ownership improved across all categories, including livestock (35% to 47.5%), housing (47.5% to 56.25%), material assets (12.5% to 27.5%) and LPG connections (41.25% to 65.5%)

The results in table 5 indicated that participation in VDVK has had a transformative impact on the beneficiaries' livelihoods. The sharp increase in employment and income suggested that the VDVK initiatives have successfully created sustainable livelihood opportunities beyond traditional agricultural labor, as seen in the reduction of agricultural labor households from 31.25% to 18.75%. The rise in female-headed households hints at enhanced women empowerment and decision-making within families. Higher consumption levels and improved asset ownership further reflect better living standards and financial security. Overall, the data portrays VDVK as an effective intervention contributing to economic upliftment and social empowerment (Mahanta, 2016) of tribal women members.

3.5. Mean difference of income among beneficiaries

The findings revealed that the average annual income

increased substantially from ₹ 31,749 prior to joining VDVK to ₹ 59,912.55 after participation (Naik and Panda, 2023). As shown in Table 6. This led to an incremental income of ₹ 28,163.55 year⁻¹. The observed standard deviation was ₹ 19,952.56 and the paired t-test value was 1.23, indicating a statistically significant improvement. These results underscored the positive impact of VDVK participation on enhancing the income levels of the beneficiaries.

The results depicted in Table 6 demonstrated a substantial increase in the average annual income of VDVK beneficiaries after joining the programme with an increment of ₹ 28,163.55. This significant rise highlighted the effectiveness of the VDVK initiative in improving economic conditions for participants. Although the standard deviation of ₹ 19,952.56 indicated some variability in the income changes among beneficiaries, the paired t-test value of 1.23 confirmed that the overall improvement was statistically significant. This suggested that participation in the VDVK programme provided meaningful financial benefits, likely through enhanced skills, access to markets and value addition activities (Lenka and Mohanta, 2015). The findings were in line the research done by Sivasubramanian (2021) which demonstrated that, the microfinance and skill development interventions significantly enhanced economic outcomes for women entrepreneurs.

3.6. Mean difference of beneficiary and non-beneficiary for income

The table 7 presented the mean income difference between VDVK beneficiaries and non-beneficiaries. Beneficiaries reported a significantly higher average yearly income (₹ 59912.55) compared to non-beneficiaries (₹ 45286.52), indicating a difference of ₹ 14626.03. The calculated t-value of 4.62^{***}, which was statistically significant at the 0.01 level, suggested that participation in VDVK activities had a positive and measurable impact on household income, reinforcing the economic relevance of the Van Dhan Yojana interventions.

Overall, the results emphasized the positive impact of the intervention on improving the livelihoods of those involved. The findings presented were in line with those of Babulo et al. (2008), who found that households engaging in

Table 5: Impact of VDVKs on economic and financial indicators beneficiaries through before and after approach		
A. Socio economic characters of VDVK beneficiaries		
Particulars	Pre-VDVK	Post VDVK
Average family Size	5.58	6.05
Age of Women	33	35
Literacy of women (No of years)	6	6
Percentage of schedule tribes to total members (%)	100	100
Percentage of female headed families (%)	55.5	78.75
Land less households (%)	25.7	17.2
B. Occupation classification of VDVK beneficiaries (Percentage)		
Particulars (%)		
Agricultural labour households	31.25	18.75
Non- farm households	56.25	65
Farm households	10	12.5
Households engaged in organised sector employment	1.6	3.75
C. Employment details of VDVK beneficiaries		
Particulars (man-days yr ⁻¹)		
Off farm employments (MGNREGA, sericulture, livestock)	60	40
VDVKs	-	210
Agriculture	70	60
Total man-days year ⁻¹	130	310
D. Mean employment and income		
Particulars		
Employment man-days year ⁻¹	130	310
Income (₹ year ⁻¹)	31749	59912.55
E. Consumption expenditure year⁻¹		
Particulars		
Food consumption	23000	37200
Non-food consumption	8000	24800
F. Asset ownership in households pre and post VDVK period		
Particulars (%)		
Livestock	35	47.5
Housing	47.5	56.25
Material assets	12.5	27.5
LPG gas connection	41.25	65.5
Pre -VDVK: Women member of SHG before joining in the VDVK; Post-VDVK: Women member of SHG after joining in the group; *Author's calculation		

diversified livelihood strategies particularly those involving forest resources (Jagati, 2024) reported higher average incomes and improved economic outcomes.

3.7. With and without analysis of beneficiaries and non-beneficiaries

A detailed domain-wise comparison between beneficiaries and non-beneficiaries provided in the table 8 was based on 15 empowerment indicators under five domains. In the Activity domain, all beneficiaries (100%) had full participation in resource utilization (Bhoj et al., 2013) financial literacy

Table 6: Mean difference of income among beneficiaries (year⁻¹)

(Before and after approach)	Joining in VDK		Incremental income	Standard deviation	Paired T test
	Before	After			
VDVK beneficiary N=80	31749	59912.55	28163.55	19952.56	1.23**

*Author's calculations

Table 7: Mean difference of beneficiary and non-beneficiary for income (year⁻¹)

With and without approach	Mean	Standard deviation	Mean difference	T-test
VDVK beneficiary (N=80)	59912.55	19535.32	14626.03	4.62**
VDVK Non-beneficiary (N=80)	45286.52	20262.95		

*Author's calculations

Table 8: Women empowerment index of VDK beneficiary and non beneficiary

Domain	Variables	Beneficiary		Non-beneficiary	
		Number	Percent (%)	Number	Percent (%)
Activity domain	Credit access	55	68.75	11	13.75
	Resource utilization	80	100	18	22.5
	Repayment decision	5	6.25	35	43.75
Knowledge domain	Financial literacy	80	100	35	43.75
	Education	42	52.5	11	13.75
	Knowledge about family planning	80	100	35	43.75
Health domain	BMI	80	100	35	43.75
	Anaemia-free	80	100	35	43.75
	Sanitation and drinking water	61	76.25	35	43.75
Domestic autonomy	Protest against domestic violence	54	67.5	23	28.75
	Household decision making	63	78.75	16	20
	Business decision	12	15	28	35
Social interaction	Membership	80	100	0	0
	Voice against social crimes	80	100	35	43.75
	Freedom of mobility	80	100	35	43.75

*Multiple response by individual for WEI 5 domains and 15 variables; *Author's calculations

and repayment decisions, compared to only 22.5–43.75 % among non-beneficiaries. The Knowledge domain saw 52.5% of beneficiaries educated, while only 13.75% of non-beneficiaries had formal education. For Health, 100% of beneficiaries were anaemia-free, with 76.25% having access to sanitation and drinking water, compared to 43.75% for non-beneficiaries. Under Domestic Autonomy, 78.75% of beneficiaries participated in household decision-making and 67.5% protested domestic violence, much higher than the 25–28.75% range for non-beneficiaries. In Social Interaction, all beneficiaries (100%) expressed voice against social crimes and had freedom of mobility, while only 43.75% of non-beneficiaries did the same.

This domain-level analysis revealed the breadth and depth of empowerment gained by beneficiaries. The 100% participation across several variables indicated a comprehensive improvement in their awareness, autonomy and ability to act. The contrast with non-beneficiaries was stark-less than half of them showed empowerment in most variables. The data validated those institutional mechanisms like VDKs served as a strong catalyst for women's empowerment across multiple life domains. By ensuring training, group mobilization and market engagement, VDKs promoted holistic empowerment-not only economic but also educational, social and health-related (Rani et al., 2017). This aligned with the findings of Roy et al. (2018), who emphasized the need to evaluate

women's empowerment through multi-dimensional and domain-specific indicators. Therefore, expansion of such models could help replicate this success in other backward regions, thereby enhancing inclusive rural development.

3.8. Women empowerment index among beneficiaries and non-beneficiaries

The Women Empowerment Index (WEI) was calculated in table 9 for both beneficiaries and non-beneficiaries of Van Dhan Vikas Kendras using three indicators: Adequacy (W_e), Not Adequate (W_{na}) and Domain Adequacy (D_a). The beneficiaries recorded a W_e of 0.50, W_{na} of 0.50 and D_a of 0.37, whereas the non-beneficiaries had a W_e of 0.25, W_{na} of 0.75 and D_a of 0.27. Consequently, the final WEI value was higher for beneficiaries at 0.69, compared to 0.45 for non-beneficiaries. The difference in WEI between these two groups was 0.235, highlighting a substantial gap in empowerment.

The values suggested that beneficiary women were significantly more empowered than non-beneficiaries. Equal values in W_e and W_{na} for beneficiaries (both 0.50) indicated a balanced distribution of adequate and inadequate responses across domains, with relatively better domain adequacy ($D_a=0.37$) than non-beneficiaries ($D_a=0.27$). The lower W_e value (0.25) and higher W_{na} (0.75) for non-beneficiaries highlighted their limited access or exposure to empowerment-enabling factors such as decision-making ability, resource control or knowledge access. The 0.235 difference in WEI reflected the impact of structured institutional support provided by VDVks in building women's capacity. This index-based approach, aligned with the methodology of Roy et al. (2018), provided a quantitative basis to advocate for scaling up such programs in tribal regions.

Tabel 9: Women Empowerment Index among beneficiaries and non-beneficiaries

Domains	Notations	Beneficiaries	Non-Beneficiaries
Adequate	W_e	0.50	0.25
Not adequate	W_{na}	0.50	0.75
	D_a	0.37	0.27
Women empowerment index	WEI	0.69	0.45
Difference of WEI between beneficiary and non-beneficiary		0.235	

*Author's calculations

4. CONCLUSION

VDVKs beneficiaries had a significantly higher WEI (0.685) compared to non-beneficiaries (0.45), indicating greater empowerment through VDVk participation. Income doubled, decision-making increased by 25% points and financial literacy and income generation improved to 100%. Access to credit increased from 41.25% to 68.75%. Beneficiaries showed higher empowerment and slightly better income levels than non-beneficiaries which is positively validating the effectiveness of VDVks in supporting tribal women.

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6. REFERENCES

Babulo, B., Muys, B., Nega, F., Tollens, E., Nyssen,

- J., Deckers, J., Mathijs, E., 2008. Household livelihood strategies and forest dependence in the highlands of Tigray, Northern Ethiopia. *Agricultural Systems* 98(2), 147–155. <https://doi.org/10.1016/j.agsy.2008.06.001>.
- Bhoj, S., Bardhan, D., Kumar, A., 2013. Determinants and implications of rural women's participation in microfinance programme: An analysis of dairy self-help groups in Uttarakhand State of India. *Livestock Research for Rural Development* 25(10), 1–11. Available from: <https://lrrd.cipav.org.co/lrrd25/10/bhoj25185.htm>.
- Chutani, E.D., Singh, P., Status and scope of minor forest produce. Status and Scope of Minor Forest Produce: 8.. https://niftem-t.ac.in/olapp/pmfme/upload/mt_handbook_forest.pdf#page=10.
- Datta, A., 2002. Impact of weekly market on tribal life. *The Oriental Anthropologist* 2(2), 162–167. Available from: <https://doi.org/10.1177/0976343020020209>.
- Giri, H.K., 2024. Prospects and challenges of minor forest produce in Jharkhand: A critical review. *Bharati International Journal of Multidisciplinary Research & Development ((BIJMRD)* 2(9), 155–161. <https://>

- doi. org/10.70798/Bijmrd/020900018.
- Jagati, P., 2024. Issues and challenges with empowerment of tribal women in india: a forest-based study. *Asia Minor Studies* 2, 213–220. DOI: 10.17067/asm.1445005.
- Lenka, C., Mohanta, Y., 2015. Empowerment of women through participation in self-help groups - A study in tribal area. *International Journal of Home Science Extension and Communication Management* 2(2), 126–131. DOI : 10.15740/HAS/IJHSECM/2.2/126-131.
- Maske, M., Mungole, A., Kamble, R., Chaturvedi, A., Chaturvedi, A., 2011. Impact of non-timber forest produces (NTFPs) on rural tribes economy in Gondia district of Maharashtra, India. *Archives of Applied Science Research* 3(3), 109–114. <https://www.researchgate.net/publication/315810041>.
- Mahanta, M., 2016. Importance and challenges of women entrepreneurship—A case study of Sonitpur district of Assam. *IOSR Journal of Humanities and Social Science* 21(07), 01–06. DOI: 10.9790/0837-2107080106.
- Naik, B., Panda, S., 2023. Empowerment of tribal communities through innovation and entrepreneurship: A path to sustainable progress. *International Journal of Research and Review* 10(11), 334–343. DOI: <https://doi.org/10.52403/ijrr.20231140>.
- Pradhan, S., Siril, S., Tacha, G., Boro, P., Marak, X.M.P., Momin, K.C., Shukla, G., Chakravarty, S., 2025. Women's role in non-timber forest products: ecological stewardship and livelihoods in Northeast India. *Journal of Agriculture and Technology* 12(2), 1–22. Available from: https://www.cobacas.org.in/wp-content/uploads/2025/10/JAT-2012-12-2_compressed.pdf#page=6.
- Rani, S.U., Kumar, P., Sethy, J.P., 2017. Performance and impact of TRIPTI programme on women empowerment, Livelihood, Education and health of rural people in Cuttack district of Odisha. *Ecology, Environment and Conservation* 23(Suppl. Issue), 403–407. DOI: 10.13140/RG.2.2.33994.90568.
- Rani, S.U., Rao, M.S., Kishore, M.R., Prasad, V.R., Sunanda, N., Kumar, M.S., Appalaswamy, A., Naik, B.S., Mohan, K., 2025. A study on business performance parameters of girijan cooperative corporation (GCC) in high altitude and Tribal Zone in Andhra Pradesh, India. *Journal of Scientific Research and Reports* 31(2), 358–373. DOI: 10.9734/jsrr/2025/v31i22856.
- Roy, C., Chatterjee, S., Gupta, D.S., 2018. Women empowerment index: construction of a tool to measure rural women empowerment level in India. *Anveshak: International Journal of Management* 7(1), 1–15. DOI: <https://doi.org/10.15410/aijm/2018/v7i1/119887>.
- Saboo, S., 2019. Value addition to minor forest produce: gateway to economic empowerment of Jharkhand Tribals. *Indian Journal of Public Administration* 65(1), 189–200. DOI: <https://doi.org/10.1177/0019556118809573>.
- Sahu, P.P., 2021. Promoting tribal entrepreneurship: towards a holistic strategy. *Kurukshetra* 70(12), 53–59. Available from: <https://afeias.com/wp-content/uploads/2021/11/Kurukshetra>.
- Sarawagi, A., Singh, M., 2024. Enhancing livelihoods and empowering tribal women: analyzing the role of self-help groups in Sonbhadra. *Sachetas* 3(2), 23–30. <https://doi.org/10.55955/320004>.
- Sarma, G., 2014. An analytical study on entrepreneurial activity as a tool for socio-economic development of tribal women in BTAD area of Assam. *Journal of Economics and Finance* 3(2), 49–52. DOI: 10.9790/5933-03214952.
- Shirsath, S.T., Kumare, S.S., 2025. Integration of entrepreneurship in tribal communities: an analytical study of tribal economy propensity, cultural distinctiveness, and policy framework in postmodern Bharat (India). *Indonesian Journal of Sustainability Policy and Technology* 3(2), 103–114. <https://doi.org/10.61656/ijospat.v3i2.349>.
- Singh, J.M., Singh, J., Garg, B.R., Kaur, B., 2010. Value chain analysis in turmeric : a case study in Punjab. *Agricultural Economics Research Review* 23, 549. Available from: https://www.researchgate.net/publication/375696273_Value_Chain_Analysis_in_Turmeric_-_A_Case_Study_in_Punjab.
- Sivasubramanian, K., 2021, Assessment of economic empowerment of women through micro finance model for sustainable business: a study on women vegetable vendors in Chennai. *Sustainable Management*, 16–28. DOI: 10.1007/978-3-031-36895-0
- Sulin, C., Tiwari, A., 2020. The Development of entrepreneurship in India—Central Government-led Initiatives. *International Journal of Economics and Business Administration* 6(1), 18–22. Available from: <https://www.researchgate.net/publication/339310859>.