Journal of AgriSearch, 12 (3) : 180-184
An Open Access International Peer Reviewed Quaterly

ISSN : 2348-8808 (Print), 2348-8867 (Online)
https://doi.org/10.21921/jas.v12i03.15249

Empowering Tribal Women of Jharkhand: A Replicable Lac-Based Socio-Economic Model

Pradosh K Paramaguru[1], Jyotirmoy Ghosh[2*], Rahul Bakade[1] and Nirmal Kumar[3]

ABSTRACT

This study explores the implementation of a lac-based socio-economic development model aimed at empowering tribal women in Jharkhand's Khunti district. Over three consecutive years, beginning in 2020, interventions such as the introduction of drought-tolerant paddy and ragi varieties, alongside scientific lac cultivation practices, were introduced. These efforts were coupled with skill development training for lac-based handicraft production, targeting income generation during off-hours. The adoption of improved paddy and ragi varieties resulted in output increases of 1.4 and 1.6 times, respectively, compared to traditional practices. Scientific lac cultivation yielded a productivity increase to 3.2 times versus 1.2 times in conventional methods. These findings suggest that equipping tribal women with knowledge, skills, financial support, and market linkages can catalyze rural transformation and sustainable development.

Keywords: Socio-economic development, Lac-based model, Skill development, Tribal empowerment, Jharkhand

ARTICLE INFO

Received on	:	21/08/2024
Accepted on	:	18/09/2025
Published online	:	30/09/2025

INTRODUCTION

The socio-economic challenges faced by the tribal communities in Jharkhand are profound, stemming from issues like displacement, land alienation, poverty, lack of education, inadequate healthcare, and systemic discrimination (Mukhopadhyay, 2019). In Khunti district, where Scheduled Tribes (STs) make up 73.3% of the population, the situation is particularly acute. Literacy rates among ST women are significantly lower than those of ST men, with only 4% of women being literate, compared to 54.1% of men (Census of India, 2011). Many tribal women are engaged in low-wage, unorganized labor, predominantly in agriculture and forest-based livelihoods, where they face unfair compensation and limited access to financial resources

To address these challenges, targeted interventions in skill development and innovative farming practices, particularly for tribal women, are crucial. Empowering women through training in scientific cultivation and value-added lac production can enhance their financial independence and position them as change agents within their communities (Nayak et al., 2016). These initiatives can create a ripple effect of positive socio-economic transformation, potentially alleviating poverty, unemployment, and social inequality in Khunti district (Pal et al., 2013; Gope and Singh, 2017).

Lac cultivation, a traditional practice in Jharkhand, offers a promising avenue for such socio-economic development. Khunti is the third-largest lac-producing district in the state, and the integration of lac cultivation with improved agricultural practices could provide sustainable livelihoods for tribal communities (Singh et al., 2017; Yogi et al., 2021). However, there is a significant research gap in developing a lac-based farming model specifically tailored to the needs and conditions of Khunti. This study aims to fill this gap by proposing a holistic and sustainable lac-based development model that integrates improved paddy and ragi varieties with traditional lac cultivation practices (Kumar et al., 2019). By doing so, it seeks to enhance the socio-economic conditions of tribal women in Khunti and offer a replicable model for other tribal regions in India.

MATERIALS AND METHODS

The goal of this project was to double the income of tribals, particularly tribal women, by launching a lac cultivation integrated development model through KVK Khunti. Recognizing the importance of lac cultivation to tribal income generation in Khunti, the development model was executed in two phases, incorporating all socioeconomic development components for the holistic development of tribal women. The entire action plan for this development model is depicted in Fig. 1.

[1]Scientist, ICAR-National Institute of Secondary Agriculture, Ranchi, 834010
[2]Principal Scientist, ICAR-National Institute of Secondary Agriculture, Ranchi, 834010
[3]Principal Scientist, ICAR-National Institute of Secondary Agriculture, Ranchi, 834010
[*]Corresponding Author E-mail: jghoshranchi@gmail.com

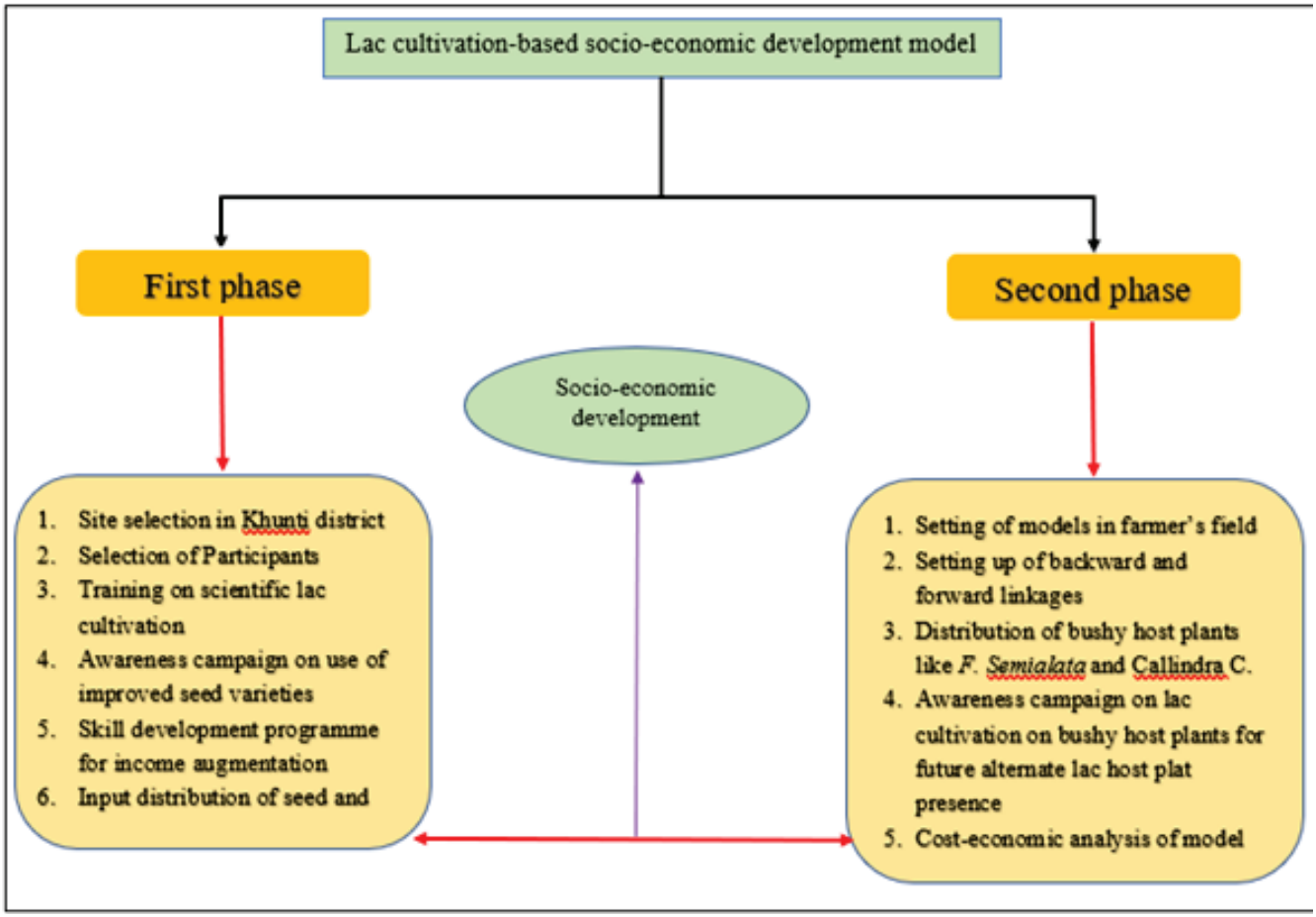

Fig. 1: Flow chart of lac cultivation integrated development model

First Phase: Execution of Lac Cultivation-Based Socio-Economic Development Model

In the first phase, the following steps were taken:

1. **Site Selection:** Sites were selected in the Khunti district where tribal women were actively engaged, but the families' socioeconomic conditions were poor due to low agricultural yields and fewer motivated male farmers.
2. **Participant Identification:** Tribal women who were interested in implementing the development plan were identified within these selected sites.
3. **Training:** The identified participants were trained in scientific lac cultivation using accessible host plants. Training also included the use of improved paddy and ragi varieties developed for higher yields suitable to their local climate.
4. **Awareness Programs:** Several awareness programs were conducted to educate tribal women on the benefits of using improved paddy and ragi varieties. These programs also emphasized the importance of scientific lac cultivation for sustainable income generation.
5. **Skill Development Programs:** Multiple skill development programs were organized throughout the region to teach tribal women how to make value-added lac-based products. Training was also provided on nursery management of bushy lac host plants such as Flemingia semialata and Callindra calothyrsus to encourage seedling enterprises.
6. **Input Distribution Program:** Towards the end of the first phase, beneficiaries were provided with improved paddy and ragi varieties, fertilizers, and pesticides. High-quality broodlac was also supplied to initiate scientific lac cultivation on available host plants, such as Kusum trees (Schleichera oleosa) and Ber (Ziziphus mauritiana), in and around their premises.

This methodical approach ensured that tribal women were not only introduced to advanced agricultural techniques but were also empowered with the skills and resources necessary to enhance their income through sustainable practices.

Second Phase: Execution of Lac Cultivation-Based Socio-Economic Development Model

The second phase focused on implementing the development model directly in farmers' fields. Key initiatives included

introducing improved drought-tolerant paddy varieties such as Sahbhagi Dhan, Swarn Shreya, Birsa Vikash Dhan 109, and IR64 DRT 1, as well as three high-yielding ragi varieties: A 404, VLS-76/79, and BM 4. Additionally, tribal women were encouraged to inoculate quality brood lac on Kusum and Ber trees in their villages. A significant aspect of the project was establishing backward and forward linkages to ensure the long-term viability of these newly established tribal enterprises.

RESULTS AND DISCUSSION

Socio-Economic Profile of Khunti District

Khunti district in Jharkhand has a significant tribal population (73.3%), with the Munda, Ho, Birhor, and Oraon tribes being prominent. The district faces challenges such as poverty, low literacy rates, and limited access to basic utilities like healthcare and education. Agriculture and forest resources are the primary sources of livelihood for these communities, but increasing pressure on land and forests has led to declining agricultural output and poverty.

Khunti district's agriculture relies heavily on rain-fed irrigation due to the absence of major rivers or irrigation canals. The hilly terrain forces farmers to depend on natural springs and streams. The district produces various Kharif and Rabi crops, including paddy, maize, ragi, wheat, potato, tomato, and brinjal. Lac cultivation, particularly Kusmi (Jethwi and Aghani) and Rangeeni (Baisakhi and Katki) strains, is also a significant part of the farming system.

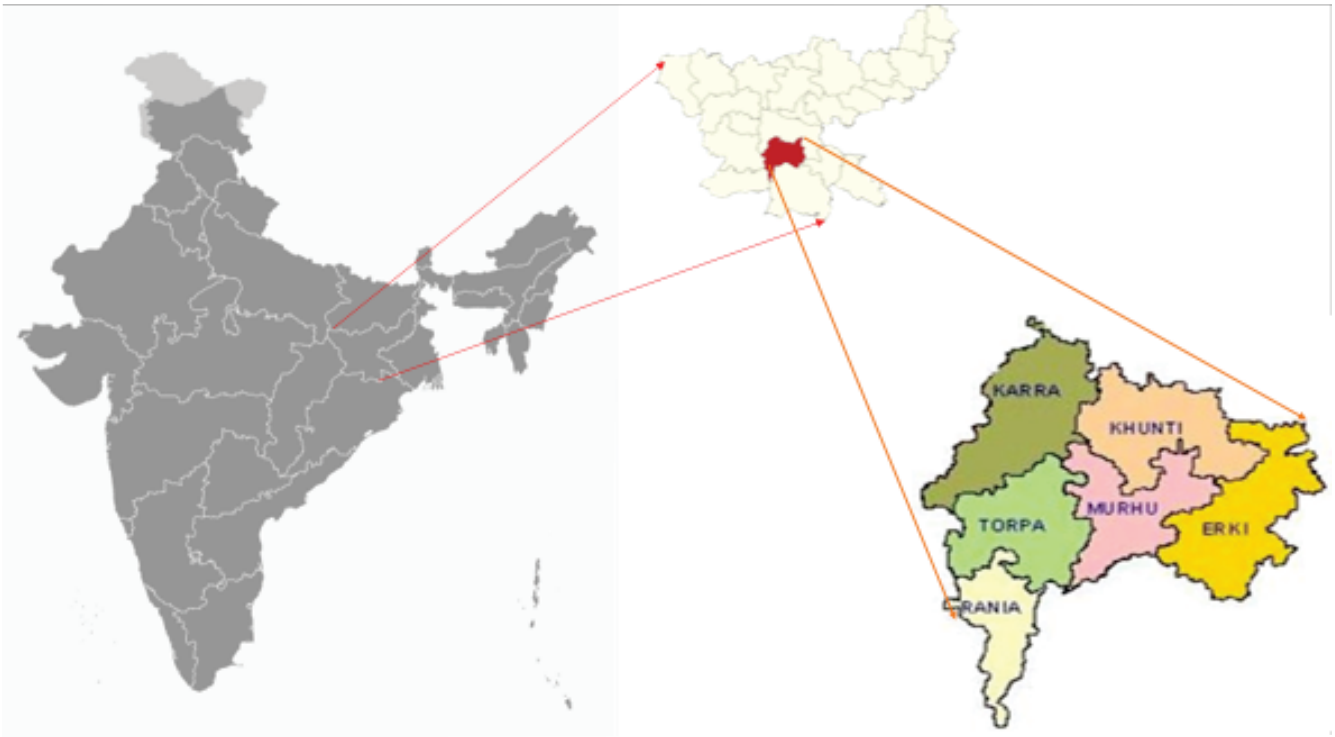

Fig. 2: Location map of Khunti district

Awareness Campaigns

In the initial phase, 22 awareness campaigns were conducted across Khunti district to promote tribal women's socio-economic growth. These campaigns introduced improved varieties of paddy, ragi, and broodlac, and educated farm women on scientific lac cultivation practices, particularly in Flemingia semialata and Calliandra calothyrsus host plant systems. Over 1,350 tribal women were trained in cultivating these improved varieties and scientific lac cultivation methods. Awareness was further raised through print, electronic media, and social media platforms.

On-Farm Trials

Khunti district, being a major producer of rice and ragi in Jharkhand, served as the site for on-farm trials (OFTs) that introduced scientific interventions into the existing cropping systems. Three types of interventions were implemented:

1. **Improved Drought-Tolerant Paddy Varieties:** Four enhanced drought-resistant varieties Sahbhagi Dhan, Swarn Shreya, Birsa Vikash Dhan 109, and IR64 DRT 1 were introduced to address erratic rainfall. Farmers were allowed to grow native rice varieties for comparison and cost-benefit analysis. Sahbhagi Dhan and Swarn Shreya outperformed other trials with an average yield of 38 q/ha (Table 1).

Table 1: Performance of drought tolerant paddy varieties during 2020-2022

Technology option	No of trials(ha)	No. of effective tillers/hill	No. of spikelet per panicle	100 grain wt.(g)	Disease/ insect pest incidence (%)	Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	B:C ratio
Sahbhagi Dhan	14	12	169	3	5	37.76	31000	73694	42694	1.38:1
Swarn Shreya	14	11	166	2	4	37.68	31000	73494	42494	1.37:1
IR64 DRT 1	14	13	162	3	6	34.22	31000	67064	36064	1.16:1
BVD 109	14	12	148	3	6	35.99	31000	70566	39566	1.28:1
Local	14	9	135	2	8	21.97	26000	43097	17097	0.66:1

2. Improved Ragi Varieties: Ragi cultivation is crucial in Khunti, providing food and income for many small and marginal farmers. Trials with improved ragi varieties, A 404, VLS-76/79, and BM 4 were conducted, with A 404 yielding the highest average yield of 13.24 q/ha (Table 2).

Table 2: Performance of improved ragi varieties during 2021-2022

Technology option	No. of trials	Yield component			Disease/ insect pest incidence (%)	Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return	B:C ratio
		No. of effective tillers/hill	No. of spikelet per panicle	Test wt. (100 grain wt.)						
A 404	24	5.7	5	3.5	9	13.24	17000	46009	28509	1.68:1
BM 4	24	4.4	4	3.1	11	9.50	17000	33991	16991	1.00:1
VLS-76/79	24	4.4	4	3.1	13	11.07	17000	37400	20400	1.20:1
Local	24	3.2	3	2.8	15	6.57	13027	22888	9861	0.76:1

3. Scientific Lac Cultivation: Lac cultivation, a significant income source for tribal women in Khunti, was also trialed. About 78 scientific lac cultivation intervention trials were conducted between 2020 and 2022, with broodlac dipping in Fipronil @1.5 ml per liter of water for 10 minutes + scientific practice yielding the highest output return of 3.1 compared to traditional practices with an output return of 1.2 (Table 3).

Table 3: Performance of scientific methods of lac cultivation and economics during 2020-2022

Technology	Beneficiaries	Yield (kg/ha)	Gross (Rs/ha)	Cost of cultivation (Rs/ha)	Net (Rs/ha)	B:C ratio
TO-1: Broodlac dipping with Fipronil @1.5 ml per lit of water for 10 to 15 minutes + Scientific practice	39	1981	673540	164267	509273	3.1:1
FP: No broodlac dipping + Farmers' practice	39	948	322320	148500	173820	1.2:1

Impact of Skill Development Programs

To further support income generation, skill development programs were organized, training 325 tribal women in making handicrafts using lac (e.g., household items, pen stands, bangles). This training enabled women to earn approximately 120 rupees per day for 3-4 hours of work. The women, in turn, encouraged and assisted others in their communities. Large-scale awareness campaigns and training in scientific lac cultivation in bushy host plants such as F. semialata and Calliandra calothyrsus were also conducted. Currently, 22 acres of land in Khunti district are utilized for cultivating these host plants (Table 4).

Table 4: Details of plantation of Flemingia semialata and Calliandra calothyrsus in in district Khunti (2020-22)

Village	Block/District	Number of beneficiaries	No. of Flemingia Semialata planted	No. of Calliandra calothyrsus planted
Silda	Khunti	4	2150	200
Roro	Murhu, Khunti	2	2000	150
Kota	Arki, Khunti	5	32000	225
Diyankel	Diyankel, Khunti	1	400	-
Total	17	36550	575	

Socio-Economic Upliftment Due to the Lac-Based Model and Other Interventions

The Lac-based socio-economic development model effectively addressed poverty, food insecurity, and environmental degradation by improving agricultural productivity, promoting sustainable resource use, and empowering tribal women. The trials and interventions increased income and job opportunities, leading to improved livelihoods and poverty reduction. The model also supported biodiversity preservation and ecosystem services by utilizing existing Kusum trees and large plantations of Semialata and Calliandra.

CONCLUSION

In conclusion, this initiative moves beyond merely documenting the challenges faced by tribal women in Jharkhand; it presents a proven, empowering pathway forward. The core of this replicable model rests on three synergistic pillars:

1. Agricultural Resilience: The successful on-farm trials of drought-tolerant paddy and ragi, combined with scientific lac cultivation, provided a stable and enhanced production base.
2. Skill and Capacity Building: Targeted training translated agricultural gains into tangible income generation, equipping women with the skills to become active economic agents.
3. Enabling Empowerment: Crucially, the integration of information, financial support, and market linkages empowered women to transcend their traditional roles and drive their own development.

The results affirm that empowering tribal women is not a standalone goal but the very engine of sustainable rural development. This lac-based socio-economic model offers a scalable and adaptable framework, holding significant promise for replication in other tribal-dominated regions, thereby transforming vulnerability into self-reliant prosperity.

REFERENCES

Census of India. 2011. Census Data on Population by Religious Communities and their Percentage. Retrieved from http://www.censusindia.gov.in/2011census/C-series/C-01.html

Gope B and Singh N P. 2017. Lac cultivation: A sustainable livelihood option for the tribal farmers in Khunti district of Jharkhand. Indian Journal of Natural Products and Resources 8(1): 33-39.

Kumar P, Mishra D, Kumar V and Singh R P. 2019. Assessment of paddy productivity and profitability under different cultivation practices in Khunti district of Jharkhand, India. Journal of Pharmacognosy and Phytochemistry 8(2): 2060-2065.

Mukhopadhyay A. 2019. Tribal Development in India: Issues and Challenges. International Journal of Social Science and Economic Research 4(7): 5164-5175.

Nayak D, Mohanty S and Pattanaik M. 2016. Lac cultivation: A potential source of livelihood for tribal communities in Jharkhand. Journal of AgriSearch 3(1): 18-22.

Pal G, Prasad N, Ghosal S, Pandey S K and Kumar M. 2013. Socio-economic Profile of lac growers in Ranchi and Khunti District of Jharkhand. Journal of Rural Agricultural Research 13(2):1-5.

Singh A K, Kumar V and Kumar S. 2017. Status, challenges and opportunities of paddy cultivation in Khunti district, Jharkhand. International Journal of Agriculture, Environment and Biotechnology, 10(1): 37-43.

Yogi R K, Kumar N and Sharma K K. 2021. Lac, Plant Resins and Gums Statistics 2020: At a Glance, ICAR-IINRG, Ranchi. Bulletin (Technical) no. 2/2022, 1-102.

Citation:

Paramaguru P K, Ghosh J, Bakade R and Kumar N.2025. Empowering tribal women of Jharkhand: A replicable lac-based socio-economic model. Journal of AgriSearch 12(3):180-184.