

Perceived Livelihood and Knowledge Outcomes of Scheduled Caste Sub Plan Interventions in Boudh District, Odisha

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ABSTRACT

The Scheduled Caste Sub Plan (SCSP) seeks to improve the productive capacity and livelihood security of historically disadvantaged households through targeted agricultural and allied-sector support. This study assessed reported changes associated with SCSP participation among 60 Scheduled Caste beneficiaries from Fased and Gaundisar villages in Boudh district, Odisha. Data were collected using a semi-structured interview schedule. All scale means were recalculated from the reported frequency distributions. Respondents commonly received protective or production infrastructure (66.7%), seed input kits (63.3%) and poultry units (43.3%); 66.7% reported receiving training. Mean monthly household income increased from ₹3,800 before support to ₹7,100 after support, an observed rise of ₹3,300 (86.8%). Average knowledge scores on a three-point scale increased in crop production (1.56 to 2.26), horticulture (1.54 to 2.24), income-generating activities (1.58 to 2.37) and market access (1.58 to 2.11). The largest item-level gains occurred in mushroom cultivation, vegetable cultivation, poultry rearing, beekeeping, protected cultivation and post-harvest handling. Positive changes were also reported in training participation, market linkage, food security, access to credit, collective membership and educational support for children. However, market limitations, inadequate inputs, weak follow-up, low skill levels, digital market information gaps and storage or transport constraints persisted. The evidence supports continued SCSP investment accompanied by structured follow-up extension, market linkage, infrastructure, financial inclusion and outcome monitoring.

1. INTRODUCTION

Scheduled Caste households in rural India frequently face interlocking disadvantages in access to productive assets, extension information, institutional

networks and remunerative markets. Evidence indicates that caste can shape both access to agricultural information and the quality of information received, while caste-based social networks influence the diffusion and adoption of

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technology (Krishna et al., 2019; Varshney et al., 2022). Livestock and allied enterprises can therefore be especially important where land access is restricted, because they provide comparatively flexible entry points for income diversification among Scheduled Caste cultivators (Sarkar, 2020).

The Scheduled Caste Sub Plan, now generally situated within targeted development allocations for Scheduled Castes, is intended to direct public resources toward reducing these structural gaps. Agricultural interventions under such programmes may include seed and input support, livestock units, small tools, protective structures, skill development and enterprise assistance. A study of SCSP interventions in Jhansi reported improvements in farm income and household assets, while an integrated farming-system intervention in Karnataka demonstrated the relevance of combining crop and allied activities for Scheduled Caste farmers (Choudhary et al., 2023; Madhuprasad et al., 2024). These findings support a programme logic in which assets, knowledge and enterprise diversification operate together rather than as isolated inputs.

Training quality and continuity are central to this logic. Entrepreneurship training has improved the knowledge of landless and marginal farmers in goat production, and group-based extension approaches can make technical learning more accessible to smallholders (Sharma & Singh, 2023; Baul et al., 2024). Evidence from a lifelong-learning approach further suggests that networking combined with training can strengthen farm income outcomes (Ayanwale et al., 2024). In India, the Attracting and Retaining Youth in Agriculture programme has similarly linked enterprise support with employment, income generation and livelihood improvement (Sahoo et al., 2023; Mohanty et al., 2025).

Diversification is particularly important for resource-constrained households exposed to production and labour-market risks. Farm-level studies show that livelihood portfolios are shaped by land, assets, household characteristics, risk attitudes and access to technology (Pathak & Amardeep, 2024; Nirmala et al., 2024; Patil & Veetil, 2024). In southern Odisha, farming-system adoption has been examined as a basis of tribal livelihoods, and recent modelling work confirms that livelihood security is multidimensional and related to household and management capabilities (Saha et al., 2024; Ghosh et al., 2025). Although tribal and Scheduled Caste populations are distinct social categories, these regional studies provide useful contextual evidence on smallholder livelihood systems in southern Odisha.

Production gains do not automatically translate into durable income unless farmers can obtain price information, negotiate with buyers, store and transport output, and participate in collective organisations. Farmer Producer Organisations and similar collectives can strengthen empowerment and market participation, but their sustainability depends on institutional, managerial and market conditions (Sahoo et al., 2024; Suresh & Sreejith, 2024). Research from southern Odisha also demonstrates that communication behaviour and marketing behaviour are closely connected to farmers' use of information and extension services (Amar et al., 2025).

Gender and allied-enterprise dimensions require explicit attention. Women's participation in extension is influenced by motivation, group cohesion, decision-making capacity and extension contact (Meena et al., 2025). Programme evidence from dairy and poultry households has shown higher knowledge among beneficiaries than non-beneficiaries, while backyard poultry research identifies veterinary care and management knowledge as continuing adoption requirements (Suman et al., 2025; Prataprao et al., 2026). Beekeeping can also contribute to skill development, diversified income and women's empowerment when technical and market constraints are addressed (Padhy et al., 2025).

The context in Boudh district is relevant to look into the transformation of targeted support to livelihood outcomes. The programme that has been studied here helped in enhancing the production of agricultural crops, horticulture, poultry, mushroom, vermicomposting, beekeeping, value addition and market activities of the Scheduled Caste beneficiaries. The study was thus designed to accomplish the following objectives: (i) to describe the socio-economic profile and support received by beneficiaries; (ii) to assess reported changes in knowledge on the crops, horticultural, income generation and market linkage activities; (iii) to examine changes in incomes and other livelihood indicators; and (iv) to identify operational constraints and priorities of strengthening programme delivery.

2. METHODOLOGY

The study was conducted in Fased and Gaundisar villages, located in Kantamal and Boudh blocks of Boudh district, Odisha, respectively. It used a descriptive, one-group before-after assessment design. The "before" condition was reconstructed from beneficiary responses collected after programme participation; therefore, the study is more precisely

interpreted as a retrospective assessment of perceived change rather than a prospective impact evaluation.

The study population comprised Scheduled Caste farmers and farm women participating in the SCSP programme in the selected villages. Approximately 10% of programme participants were selected purposively, producing a final sample of 60 respondents. Purposive sampling ensured inclusion of actual beneficiaries but does not support statistical generalisation to all Scheduled Caste households in Boudh district.

Data were collected through a semi-structured interview schedule covering socio-demographic characteristics, programme support, training, relevance and utilisation, satisfaction, constraints, income and livelihood indicators. Knowledge was recorded for crop production, horticulture, income-generating enterprises and market access using three categories: low knowledge, medium knowledge and high knowledge. These were scored 1, 2 and 3, respectively. Income-related perceptions were similarly represented by low, medium and high categories. Broader livelihood indicators were recorded as binary yes/no responses for the recalled before-programme and after-programme conditions.

Frequencies and percentages were used for categorical variables. Weighted means were calculated as $\sum(f_i s_i)/n$, where f_i is the frequency in category i , s_i is its score and n is the number of valid responses. For three-point scales, the change was calculated as the after mean minus the before mean; the residual gap was expressed as $(3 - \text{after mean})/3 \times 100$. Percentage-point change was used for binary livelihood indicators. The reported percentage change in mean monthly income was calculated as $(\text{₹}7,100 - \text{₹}3,800)/\text{₹}3,800 \times 100 = 86.8\%$.

Before analysis, every percentage and mean was checked against the underlying frequency distribution. Where a printed mean differed from the value implied by the frequencies, the frequency-based mean was used. One allied-enterprise income cell was recorded as four respondents even though its associated percentage was 23.3% and the row total was intended to be 60; this value was treated as 14 respondents. No respondent-level dataset was available, so paired tests, confidence intervals, multivariable models and reliability analysis could not be performed.

3. RESULTS AND DISCUSSION

Men constituted 60.0% of the sample and women 40.0%. Most respondents were of economically active age: 63.3% were between 25 and 45 years. Educational attainment was generally modest; 13.3% were illiterate, 43.3% had primary or middle schooling, 26.7% had secondary education and 16.7% had higher-secondary education. Nuclear families accounted for 70.0% of households, and 63.3% had four to six members. Agriculture was the primary occupation of 40.0%, followed by daily-wage labour (23.3%) and livestock (16.7%). Land constraints were pronounced: one-third were landless and 40.0% were marginal farmers. Mobile-phone ownership was high (86.7%), but ownership of motorbikes (10.0%) and shops (6.7%) was limited, indicating that digital reach did not necessarily correspond to physical market mobility or enterprise infrastructure.

Table 1. Selected socio-economic characteristics of respondents (n = 60)

Variable	Categories	Percentage (%)
Gender	Male; Female	60.0; 40.0
Age	Below 25; 25-35; 36-45; 46-60; Above 60 years	10.0; 30.0; 33.3; 20.0; 6.7
Education	Illiterate; Primary; Middle; Secondary; Higher secondary	13.3; 23.3; 20.0; 26.7; 16.7
Family type	Nuclear; Joint	70.0; 30.0
Family size	<4; 4-6; >6 members	16.7; 63.3; 20.0
Primary occupation	Agriculture; Livestock; Daily wage; Self-employment; Service	40.0; 16.7; 23.3; 13.3; 6.7
Landholding	Landless; Marginal; Small; Medium	33.3; 40.0; 16.7; 10.0
Selected assets	Mobile; Cycle; TV; Livestock; Motorbike; Shop	86.7; 66.7; 50.0; 46.7; 10.0; 6.7

The most frequently reported support was infrastructure such as shade-net or shed facilities (66.7%), followed by seed input kits (63.3%) and poultry units (43.3%). Because beneficiaries could receive more than one intervention, the support percentages exceed 100%. Two-thirds of respondents

reported training. Among the 40 trainees, 40.0% received on-farm training, 30.0% off-farm training, 25.0% skill-based training and 5.0% enterprise-development training. A majority considered the support highly relevant (56.7%), 73.3% reported that it improved their income activity, and 66.7% were continuing the supported activity. Overall satisfaction was favourable, with 46.7% highly satisfied and 36.7% satisfied.

Table 2. Programme exposure and immediate beneficiary responses

Indicator	Response categories	Percentage (%)
Support received*	Infrastructure; Seed kit; Poultry; Small tools; Training; Irrigation tools	66.7; 63.3; 43.3; 23.3; 30.0; 10.0
Any training	Yes; No	66.7; 33.3
Training type (n = 40)	On-farm; Off-farm; Skill-based; Enterprise development	40.0; 30.0; 25.0; 5.0
Support relevance	Highly; Moderately; Not relevant	56.7; 33.3; 10.0
Helped income activity	Yes; Partly; No	73.3; 16.7; 10.0
Activity continuity	Continuing; Discontinued; Planning to resume	66.7; 20.0; 13.3
Satisfaction	Highly satisfied; Satisfied; Neutral; Dissatisfied	46.7; 36.7; 10.0; 6.7

Note. *Multiple responses were permitted.

Market limitations were the most frequently reported challenge (30.0%), followed by inadequate inputs (23.3%), low skill levels (20.0%) and poor follow-up support (13.3%). Health, migration and other constraints were reported by 10.0%. These findings indicate that one-time asset or input distribution was insufficient for some beneficiaries; enterprise continuity also depended on repeated technical support, replacement inputs, market coordination and risk management.

All four knowledge domains showed higher after-programme mean scores. The largest domain-level change was for income-generating activities (+0.79), followed by horticulture (+0.70), crop

production (+0.69) and market access (+0.54). Market access had both the smallest improvement and the lowest after-programme mean, supporting respondents' identification of markets as the leading operational constraint.

Table 3. Summary of before-after knowledge scores by domain

Knowledge domain	Before mean	After mean	Change	Residual gap to maximum (%)
Crop production	1.56	2.26	+0.69	24.8
Horticulture	1.54	2.24	+0.70	25.3
Income-generating activities	1.58	2.37	+0.79	21.0
Market access and linkage	1.58	2.11	+0.54	29.7

Crop knowledge increased across all eight practices. The highest calculated after-programme mean was for improved or high-yielding varieties (2.42), while crop diversification and line sowing or transplanting each reached 2.33. Integrated nutrient management retained the largest residual gap, with an after mean of 2.13. The pattern suggests broad learning but also shows that technically integrated management practices require continued field demonstrations and diagnostic support.

Table 4. Recalculated crop-production knowledge scores

Activity	Before mean	After mean	Change
Improved/high-yielding varieties	1.67	2.42	+0.75
Crop diversification	1.57	2.33	+0.77
Intercropping	1.47	2.17	+0.70
Line sowing/transplanting	1.67	2.33	+0.67
Weed management	1.58	2.28	+0.70
Integrated nutrient management	1.50	2.13	+0.63
Integrated pest management	1.50	2.17	+0.67
Integrated disease management	1.55	2.22	+0.67

Horticultural knowledge improved most in post-harvest handling and value addition (+0.80) and protected cultivation (+0.78). Improved vegetable cultivation recorded the highest after mean (2.38). Plant protection and water-saving irrigation remained comparatively weak, with after means of 2.13 and 2.22, respectively, suggesting the need for season-specific advisory support and practical demonstrations.

Table 5. Recalculated horticultural knowledge scores

Activity	Before mean	After mean	Change
Improved vegetable cultivation	1.67	2.38	+0.72
Fruit orchard management	1.63	2.30	+0.67
Plant protection	1.53	2.13	+0.60
Mulching	1.50	2.20	+0.70
Drip/sprinkler irrigation	1.60	2.22	+0.62
Nursery raising	1.57	2.27	+0.70
Protected cultivation	1.42	2.20	+0.78
Post-harvest handling/value addition	1.43	2.23	+0.80

The strongest knowledge gains were recorded for mushroom cultivation (+1.00), vegetable cultivation (+0.88), poultry rearing (+0.87) and beekeeping (+0.85). Vegetable cultivation attained the highest after mean (2.80), followed by poultry (2.70) and mushroom cultivation (2.53). Value addition and quality seed production remained the weakest areas, indicating that movement beyond primary production requires specialised processing, quality-control, packaging and market-oriented support.

Table 6. Recalculated knowledge scores for income-generating activities

Activity	Before mean	After mean	Change
Scientific mushroom cultivation	1.53	2.53	+1.00
Beekeeping	1.48	2.33	+0.85
Poultry rearing	1.83	2.70	+0.87
Vegetable cultivation	1.92	2.80	+0.88
Quality seed production	1.47	2.08	+0.62
Vermicompost production	1.47	2.22	+0.75
Value-addition techniques	1.38	1.92	+0.53

Market-related knowledge improved across all items, but after means remained below those of most production and enterprise activities. Awareness of local market opportunities achieved the highest after mean (2.27), followed by knowledge of buyer requirements and quality (2.20) and linkage with FPOs, cooperatives or SHGs (2.18). ICT or mobile use for market information recorded the lowest after mean (1.97), closely followed by storage and transportation access (2.00). Thus, high mobile ownership had not yet been fully converted into effective digital market access.

Table 7. Recalculated market-access and linkage knowledge scores

Activity	Before mean	After mean	Change
Local market opportunities	1.70	2.27	+0.57
Selling-price trends	1.67	2.10	+0.43
FPO/cooperative/SHG linkage	1.63	2.18	+0.55
Price negotiation	1.53	2.08	+0.55
Exhibitions/market fairs	1.53	2.08	+0.55
Buyer requirements/product quality	1.68	2.20	+0.52
ICT/mobile market information	1.42	1.97	+0.55
Storage and transportation	1.43	2.00	+0.57

Mean reported monthly household income increased from ₹3,800 before SCSP support to ₹7,100 after support, an absolute rise of ₹3,300 and a relative increase of 86.8%. The categorical income index also increased across all components. The largest score increases were for ability to save (+0.58) and allied-enterprise income (+0.57). These results are consistent with diversification into poultry, mushroom, beekeeping and vegetable activities, but they should not be interpreted as inflation-adjusted or causally attributable estimates because the source data did not specify the income reference period, verification method or timing of the intervention.

The largest reported improvement was in participation in training or skill programmes, which rose from 30.0% to 90.0% (+60.0 percentage points). Market linkage increased by 46.6 points and access to loans or credit by 43.4 points. Food security and involvement in SHGs or FPOs each increased by 40.0 points, while better educational support for children

increased by 41.7 points. Despite these gains, 23.3% still lacked access to credit after the intervention and 20.0% remained outside SHGs or FPOs, showing that institutional inclusion was incomplete.

Table 8. Recalculated categorical income and saving scores

Indicator	Before mean	After mean	Change
Agricultural income	1.70	2.10	+0.40
Horticultural income	1.57	2.02	+0.45
Allied-enterprise income	1.50	2.07	+0.57
Overall household income	1.67	2.10	+0.43
Ability to save	1.42	2.00	+0.58

Table 9. Reported changes in livelihood indicators

Indicator	Before yes (%)	After yes (%)	Change (percentage points)
Food security	46.7	86.7	+40.0
Training/skill participation	30.0	90.0	+60.0
Access to loans/credit	33.3	76.7	+43.4
Market-linkage access	36.7	83.3	+46.6
Involvement in SHGs/FPOs	40.0	80.0	+40.0
Educational support for children	43.3	85.0	+41.7

4. DISCUSSION

The results indicate a coherent programme pathway: beneficiaries received productive inputs and infrastructure, many participated in training, knowledge scores increased across technical domains, and respondents reported higher income and broader livelihood benefits. This pattern resembles evidence from SCSP interventions in Jhansi and integrated farming support for Scheduled Caste farmers in Karnataka, where targeted agricultural assistance was associated with stronger income, assets or farming-system development (Choudhary et al., 2023; Madhuprasad et al., 2024). Livestock and allied activities appear particularly relevant for the 73.3% of respondents who were landless or marginal farmers, supporting the argument that livestock can help Scheduled Caste cultivators diversify beyond land-intensive crop production (Sarkar, 2020).

The domain-level findings show that enterprise knowledge improved more than market knowledge. Training-based studies have likewise found knowledge gains among landless and marginal farmers, while group and network-based extension can expand learning and farm-income opportunities (Sharma & Singh, 2023; Baul et al., 2024; Ayanwale et al., 2024). The ARYA evidence also shows that enterprise-oriented extension can generate employment and improve livelihood status when training is connected to practical enterprise support (Sahoo et al., 2023; Mohanty et al., 2025). In Boudh, however, only 5.0% of trained respondents received enterprise-development training. Expanding business planning, costing, record keeping, quality assurance and customer development would therefore be more valuable than simply repeating production messages.

The strongest item-level gains in mushroom cultivation, poultry, vegetables and beekeeping demonstrate the promise of diversified livelihood portfolios. This aligns with evidence that diversification decisions depend on assets, risk, technology access and household circumstances (Pathak & Amardeep, 2024; Nirmala et al., 2024; Patil & Veettil, 2024). It also corresponds with regional work on farming systems and livelihood security in southern Odisha (Saha et al., 2024; Ghosh et al., 2025). Programme design should nevertheless distinguish between knowledge and viable enterprise performance: a household may understand an activity but still lack working capital, disease management, reliable input supply or buyers.

Poultry should be given a high priority since they had a high score in after-programme knowledge, along with reported income diversification. Knowledge gained from interventions in dairy and poultry systems has been documented; studies of backyard poultry have found that management and veterinary support are key factors that determine adoption (Suman et al., 2025; Prataprao et al., 2026). Hence, the distribution of poultry-units should be accompanied by regular vaccination program, monitoring of poultry mortality, feed planning, breed suitability and local para-veterinary linkages. The beekeeping livelihood and empowerment potential is not to be achieved by the provision of beekeeping equipment alone; there is a need for colony management and planning of forage during the seasons, processing standards and organisation of markets.

The first and most obvious blockage is market weakness. While local-market awareness and collective linkage increased, ICT use, price intelligence and storage and transportation were relatively weak

with 30.0% stating that lack of market was a challenge explicitly. The study from the South of Odisha further validates that communication behavior and information sources are crucial for marketing decisions (Amar et al., 2025). Collective institutions have the potential to enhance bargaining power and empower members as long as the internal governance is good, and the business models and market relationships are stable (Sahoo et al., 2024; Suresh & Sreejith, 2024). Therefore, implementation of SCSP should involve creation of commodity specific aggregation calendars, mapping of buyers, price transparency, pooling and convergence with existing SHGs, cooperatives or FPOs.

The study also has a gender dimension in that 40.0% of the respondents were women, but there was no disaggregation of training, knowledge, income or livelihood outcomes by gender in the source data. This is a significant analytical lacuna. Based on the experiences in Odisha, the role of women in extension is influenced by the extension contact, motivation, and the collective cohesion and decision-making ability of women (Meena et al., 2025). Going forward, monitoring should thus include disaggregated reach, control on enterprise income, labour burden, mobility, digital access and participation in decision making, that is, report on household-level improvement as not necessarily representative of women's empowerment.

The increase in monthly income appears large, but needs to be taken with a pinch of salt. It could be due to programme support, general price movements, seasonality, other schemes, wage income or recall effects. There was no control group and the "before" values were not collected prospectively. The evidence, therefore, lends support to a conclusion of positive perceived association, rather than a causal claim that 86.8% of the increase was due to SCSP. Ideally, a future design would include the collection of baseline and endline data from beneficiaries and matched comparison group, maintain respondent-level identifiers, specify a common income reference period, verify enterprise revenues and costs, and estimate confidence intervals and adjusted treatment effects.

The inequalities in access to information and networks within a caste further warns against equating programme access with structural equality (Krishna et al., 2019; Varshney et al., 2022) Extension, social integration and market intermediation as mechanisms for initial assets to be transformed into sustainable livelihood gains are not add-on things. The outcomes thus support a multi-year graduation strategy involving the sequencing of assets, technical coaching, team marketing, readiness and credit tracking.

5. CONCLUSIONS

SCSP beneficiaries in the selected villages of Boudh district reported improvements in technical knowledge, enterprise diversification, market awareness, income, savings capacity, food security, institutional participation and educational support. The most pronounced knowledge gains occurred in mushroom cultivation, vegetable production, poultry, beekeeping, protected cultivation and post-harvest handling. Mean reported monthly income rose from ₹3,800 to ₹7,100. At the same time, market access, digital price information, storage, transportation, follow-up extension, input adequacy and credit remained incomplete. The findings support continuation of targeted agricultural and allied-sector assistance, but they also show why input distribution alone is an inadequate measure of programme success. Durable livelihood improvement requires sequenced capacity building, veterinary and technical backstopping, enterprise planning, collective market arrangements, working capital and transparent outcome monitoring. Because the design does not permit causal inference, the study should be presented as a descriptive assessment of beneficiary-reported change. A prospective baseline-endline design with a suitable comparison group is required to estimate attributable programme impact.

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REFERENCES

- Amar, A. K., Padhy, C., Prusty, A. K., & Kumari, A. (2025). Communication and marketing behaviour of tomato growers in Southern Odisha, India. *Indian Journal of Extension Education*, 61(4), 134–140. <https://doi.org/10.48165/IJEE.2025.61422>
- Ayanwale, A. B., Adekunle, A. A., Kehinde, A. D., & Fatunbi, O. A. (2024). Networking and training for improvement of farm income: A case of lifelong learning (L3F) approach in West Africa. *Heliyon*, 10(1), e23363. <https://doi.org/10.1016/j.heliyon.2023.e23363>
- Baul, T., Karlan, D., Toyama, K., & Vasilaky, K. (2024). Improving smallholder agriculture via video-based group extension. *Journal of Development Economics*, 169, 103267. <https://doi.org/10.1016/j.jdeveco.2024.103267>
- Choudhary, B. B., Sharma, P., Kumar, S., Gupta, G., & Patil, A. K. (2023). Impact of agricultural interventions on farm income and asset holding: A case study of Schedule Caste Sub Plan (SCSP) scheme in Jhansi, Uttar Pradesh. *Agricultural Economics Research Review*, 36(Conference Number), 71–78. <https://doi.org/10.5958/0974-0279.2023.00016.2>
- Ghosh, S., Kumar, A., Prusty, A. K., Naik, A., & Padhy, C. (2025). Modelling livelihood security among tribal farmers in South Odisha using machine learning. *Indian Journal of Extension Education*, 61(4), 141–147. <https://doi.org/10.48165/IJEE.2025.61423>
- Krishna, V. V., Aravalath, L. M., & Vikraman, S. (2019). Does caste determine farmer access to quality information? *PLOS ONE*, 14(1), e0210721. <https://doi.org/10.1371/journal.pone.0210721>
- Madhuprasad, V. L., Ravindra, U., & Harshitha, D. (2024). Development of Scheduled Caste farmers through integrated farming system in Bangalore Rural District, India. *International Journal of Environment and Climate Change*, 14(1), 758–767. <https://doi.org/10.9734/ijecc/2024/v14i13894>
- Meena, L. L., Jena, M., Sardar, M. S., & Pradhan, U. (2025). Participation of farm women in extension activities under ATMA in Nuapada District of Odisha. *NG Agricultural Sciences*, 1(1), 1–7. <https://doi.org/10.66132/ngas010101>
- Mohanty, P. R., Sahoo, M., & Ghosh, S. (2025). Empowered by enterprise: Evaluating livelihood status improvement through Attracting and Retaining Youth in Agriculture (ARYA). *Indian Journal of Extension Education*, 61(2), 56–61. <https://doi.org/10.48165/IJEE.2025.61211>
- Nirmala, G., Reddy, A. A., Pankaj, P. K., Kumar, R. N., Shankar, K. R., Beevi, C. N. A., Rohit, J., & Singh, V. K. (2024). Livelihood diversification in rainfed areas of Telangana State: Evidence from household-level survey. *Indian Journal of Extension Education*, 60(1), 68–72. <https://doi.org/10.48165/IJEE.2024.60113>
- Padhy, D., Satapathy, A., & Nanda, C. (2025). From hive to hope: Role of beekeeping in empowering tribal women. *NG Agricultural Sciences*, 1(2), 35–53. <https://doi.org/10.66132/ngas010206>
- Pathak, A., & Amardeep. (2024). A study on livelihood diversification and its determinants at farm level in Uttarakhand. *Indian Journal of Extension Education*, 60(1), 63–67. <https://doi.org/10.48165/IJEE.2024.60112>
- Patil, V., & Veettil, P. C. (2024). Farmers' risk attitude, agricultural technology adoption and impacts in Eastern India. *Agriculture & Food Security*, 13, Article 50. <https://doi.org/10.1186/s40066-024-00497-x>
- Prataprao, G. G., Patnaik, S., & Behera, S. R. (2026). Adoption of improved backyard poultry management practices in Washim District of Maharashtra. *NG Agricultural Sciences*, 2(1), 8–15. <https://doi.org/10.66132/ngas020102>
- Saha, S., Sagar, L., Reddy, M. D., & Prusty, A. K. (2024). Profile of Gajapati district tribal and their livelihood through farming systems adoption. *International Journal of Agriculture Extension and Social Development*, 7(1), 313–317. <https://doi.org/10.33545/26180723.2024.v7.i1e.226>
- Sahoo, B., Sahoo, S. L., & Das, S. (2024). FPO member farmer empowerment: Socio-economic insights via canonical correlation analysis. *Indian Journal of Extension Education*, 60(1), 59–62. <https://doi.org/10.48165/IJEE.2024.60111>
- Sahoo, M., Acharya, S., Nayak, A. P., & Sethy, S. (2023). Effect of ARYA programme in employment and income generation of the rural youths. *Indian Journal of Extension Education*, 59(4), 109–113. <https://doi.org/10.48165/IJEE.2023.59422>
- Sarkar, A. (2020). Role of livestock farming in meeting livelihood challenges of SC cultivators in India. *Indian Journal of Human Development*, 14(1), 23–41. <https://doi.org/10.1177/0973703020923863>
- Sharma, S., & Singh, R. (2023). Knowledge enhancement of landless and marginal farmers through entrepreneurship training on goat farming. *Indian Journal of Extension Education*, 59(4), 58–61. <https://doi.org/10.48165/IJEE.2023.59412>
- Suman, S., Ambhure, A. L., & Saha, S. (2025). Knowledge amplification among dairy and poultry farmers: Assessing revolutionary impact of the JEEViKA project. *NG Agricultural Sciences*, 1(2), 8–13. <https://doi.org/10.66132/ngas010202>
- Suresh, V., & Sreejith, S. S. (2024). Enabling and inhibiting factors of sustainability of Farmer's Producers Organisations in India. *Discover Sustainability*, 5, Article 333. <https://doi.org/10.1007/s43621-024-00527-5>
- Varshney, D., Mishra, A. K., Joshi, P. K., & Roy, D. (2022). Social networks, heterogeneity, and adoption of technologies: Evidence from India. *Food Policy*, 112, 102360. <https://doi.org/10.1016/j.foodpol.2022.102360>