



Empowered by Enterprise: Evaluating Livelihood Status Improvement through Attracting and Retaining Youth in Agriculture (ARYA)

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HIGHLIGHTS

- The ARYA initiative has successfully engaged rural youth in agriculture for financial gain and fostered interest in agripreneurship.
- Participants have seen a significant improvement in their livelihood status index, with an overall mean score increase from 1.6 to 1.94, reflecting a 21 per cent improvement.
- The initiative has significantly contributed profitable enterprises and enhancing overall livelihood status.
- The ARYA initiative has driven sustainable livelihoods and income with minimal investment, creating a vibrant and resilient agricultural community among rural youth.

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ABSTRACT

The ARYA initiative by ICAR has effectively engaged rural youth in agriculture, promoting financial gain and interest in agripreneurship. ARYA project has transformed the agricultural landscape by retaining rural youth in the sector and empowering them with essential skills and opportunities. This study was conducted in Puri district of Odisha during 2024, aiming to assess farmers' livelihood status of ARYA entrepreneurs. A total 120 respondents were surveyed using structured interviews and secondary data sources. The results revealed that the overall mean score of livelihood status increased by 21 per cent, demonstrating the programme's success in ensuring sustainable livelihoods and income with minimal investments. Participants have shown significant improvements in their livelihood index, social participation, and information seeking behavior. This initiative has significantly contributed to the socio-economic development of rural areas, highlighting its role in driving sustainable change and fostering a resilient agricultural community. The positive outcomes of the ARYA initiative underscore its importance in promoting sustainable agricultural practices and enhancing the overall livelihood status of the rural youth.

INTRODUCTION

India's agricultural sector has experienced a significant transformation, evolving from a food-deficit nation to one with a food surplus over the past fifty years. This notable achievement is recognized globally and has ensured food security for multiple countries. The next stage in Indian's agricultural development relies heavily on encouraging entrepreneurship among the youth.

Developing entrepreneurship within the agricultural sector is essential for introducing innovative solutions that can increase farm income, generate employment opportunities, and enhance rural prosperity. Awareness, motivation, technical skill, the right assistance from development department can strengthen the entrepreneurial capacities (Nain et al., 2013). Maximizing farm profitability is interplay of entrepreneurial competencies, entrepreneurial climate, and farmers' innovations which suggest

convergence and synergistic linkages Nain et al., (2019). Kobba et al., (2021) established that the farm sector, four determinants of entrepreneurial success were family size, land size, turnover and annual income whereas in the non-farm sectors five determinants of entrepreneurial success were long term involvement, initiative, number of employees, entrepreneurial experience and annual income. However, a major challenge lies in attracting rural youth to agricultural entrepreneurship, as there is a prevalent belief that agriculture cannot meet their profitability expectations due to the large number of small and marginal farm families (Rana et al., 2004).

Given the importance of rural youth in agriculture, ICAR launched the “Attracting and Retaining Youth in Agriculture” (ARYA) programme on July 16, 2015. The initiative aims to draw rural youth towards agriculture and keep them engaged by involving them in agricultural enterprises, turning them into agri-entrepreneurs. The main goal is to install confidence in rural youth so they view farming as a viable career option, rather than pursuing menial job in urban areas (Sahoo et al., 2023). The ARYA programme has been designed to aid both existing rural enterprises and aspiring entrepreneurs by providing capacity-building opportunities and technological support (Gowda et al., 2023). The ARYA project offers vocational training across all aspects of agriculture and related sectors (Sharma & Sharma, 2021; Sayana et al., 2022). This scheme focuses on attracting rural youth under the age of 35 to agriculture by offering income-generating opportunities and actively engaging them in agricultural activities. Youth groups serve as role models by showcasing the potential of agri-based enterprises and providing training to others. Project aimed to attract and engage an increasing number of unemployed rural youth in farming-based enterprises (Kumar et al., 2022) and transform rural youth from job seekers into job creators (Nayak et al., 2024).

The ARYA programme, an innovative initiative by ICAR, has successfully attracted rural youth to agri-preneurship, ensuring their continued engagement in agriculture for profitable outcomes. Following the intervention of KVK, which promoted various agri-enterprises, rural youth were introduced to scientific methods in mushroom cultivation, beekeeping, poultry, and fish farming (Sahoo et al., 2023; Acharya et al., 2024). This exposure led to the adoption and establishment of these enterprises, aiding in income diversification and livelihood security, ultimately improving and sustaining their livelihood status.

METHODOLOGY

The current study was done in the state of Odisha. Five KVKs from Odisha namely, Cuttack, Nayagarh, Sambalpur, Ganjam and Puri carried out the ARYA programme in their respective districts. In present study, Puri and Nayagarh districts were chosen at random, where the ARYA programme has been conducted. In each district, a random sample of four enterprises were considered. The study has followed an exploratory sequential research design. The sampling procedure comprised of 15 respondents from each of the four enterprises i.e., Mushroom, Apiary, Fishery, & Poultry, thus a sample of 60 respondents from Puri district; and similarly, a sample of 60 respondents, 15 each from Mushroom, Backyard poultry, Fishery, and Nursery raising enterprises were selected. Therefore, a total of 120 respondents

were selected following stratified random sampling method in the present investigation.

The dependent variable selected for the study was livelihood status of the respondents before and after undertaking entrepreneurial activities under ARYA programme. Schedule developed by Haobijam & Ghosh (2023) was used with modification to measure the level of livelihood of youth based on the five types of assets holding human assets, social assets, financial assets, physical assets and natural assets, each measured on a 5-point continuum scale. The overall livelihood status of the rural youth engaged in various entrepreneurial activities was compared between pre-ARYA and post-ARYA period. Thereafter, the influencing factors of the rural youth's livelihood status was worked out separately for both pre and post ARYA period using correlation and multiple regression analysis.

RESULTS

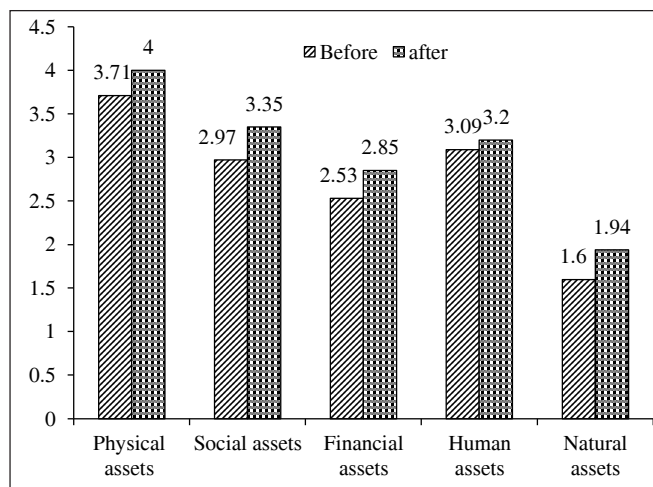
Nayagarh is the first district of Odisha where ARYA programme was initiated (2015-16). A total of 100 youths from 82 villages were involved. Forty (40) youths were involved in nursery enterprise and 20 youths each for stunted fingerling production enterprise, backyard poultry rearing and mushroom enterprise, respectively, were involved. The ARYA was initiated at KVK, Puri in the year 2018-19. A total of 130 youths from 78 villages were involved in the project covering poultry, mushroom, fishery, and apiary enterprise. The enterprises included under ARYA have demonstrated significant profitability (100.66%). On an average, the annual expenditure of these enterprises amounted to Rs. 1,44,875, while the average annual income generated was Rs 2,90,708. This indicates that these ventures have yielded a commendable financial return, making them promising options for engaging rural youth with a sustainable income.

The study assessed the perceived level of five types of the livelihood assets that farmers require to support their livelihood before and after their engagement under ARYA programme in Nayagarh and Puri district. Following the involvement in entrepreneurship under the ARYA programme, a positive change is observed in the asset ownership and general well-being of farm youth's households (Table 1 and Figure 1). The overall mean score of physical assets increased from 3.71 to 4.00, while that of social, financial, and human assets increased from 2.97 to 3.35, 2.53 to 2.85, and 3.09 to 3.20, respectively. However, the position of natural assets remained poor with improvement from 1.60 to 1.94 on 5-point continuum.

Considering the overall assets holding of the respondents, the livelihood status of the respondents has increased by about 35 per cent after engaging in the entrepreneurship under the ARYA programme. Maximum improvement is witnessed by the entrepreneurs of nursery raising enterprise in Nayagarh district. While in Puri district, the most improved livelihood status is found in case of the poultry entrepreneurs (increased by about 10%). The factors influencing the differential level of livelihood status of the rural youth before and after their engagement in entrepreneurship under the ARYA programme were revealed through the correlational and multiple regression analyses. Prior to participating in ARYA, the farmers' overall livelihood status was significantly and

Table 1. Livelihood status of the respondents before and after undertaking entrepreneurial activities under ARYA programme

Livelihood asset	Mean (SD)															
	Enterprises in Nayagarh District								Enterprises in Puri District							
	Nursery		Mushroom		Fishery		Poultry		Fishery		Poultry		Mushroom		Apiary	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
Physical Assets	3.51	3.91	3.65	4.01	3.5	3.8	3.86	4.06	3.81	4.11	3.89	4.00	3.65	4.11	3.79	3.94
Social assets	2.98	3.55	3.03	3.55	2.91	3.21	3.08	3.36	3.15	3.43	2.96	3.50	2.80	3.30	2.80	3.08
Financial assets	2.41	3.00	2.43	2.80	2.16	2.35	2.68	2.88	2.66	3.00	2.56	2.88	2.70	3.10	2.60	2.78
Human assets	2.63	3.05	2.65	3.01	2.73	3.03	3.51	3.63	3.23	3.36	3.13	3.36	3.46	3.43	3.18	3.2
Natural assets	1.58	1.74	1.64	2.09	1.69	2.06	2.01	2.48	1.90	2.00	1.76	2.10	1.48	1.54	1.25	1.41
Overall	13.11	15.25	13.40	15.46	12.99	14.45	15.14	16.41	14.75	15.90	14.30	15.84	14.09	15.48	13.62	14.41
Improvement (%)	16.32		15.37		11.24		8.39		7.80		10.77		9.87		5.80	

**Figure 1.** Livelihood status of the respondents before and after undertaking entrepreneurial activities under ARYA programme

positively correlated with their attributes like education, family size, number of earning members, average annual income from enterprise, land holding, average annual expenditure on enterprise, risk orientation, innovativeness, and decision-making power, as shown by the values of the coefficient of correlation in Table 2. These values explain that before the introduction of the ARYA programmes the young and educated farmers, who had strong risk orientation, innovativeness, and decision-making power, were involved in entrepreneurship as the beneficiaries of ARYA programme.

All the variables that demonstrated significant correlation with the overall livelihood status prior to participating in ARYA were also found to be significant with it after engaging in entrepreneurship under ARYA; additionally, the independent variables like information-seeking behaviour, and social participation are found positively significant, which indicates a substantial change brought by the implementation of the ARYA programme in terms of the information seeking behaviour and

Table 2. Correlation between attributes of the entrepreneurs and their overall livelihood status before & after engaging in entrepreneurship under ARYA programme

Independent variables	Coefficient of correlation (r)	Coefficient of correlation (r)
	before engaging in ARYA	after engaging in ARYA
Age	0.103	0.035
Education	0.300**	0.313**
Family size	0.331**	0.311**
Number of earning members	0.326**	0.415**
Social participation	0.150	0.224*
Average annual income from enterprise	0.370**	0.332**
Land holding	0.578**	0.617**
Average annual expenditure on enterprise	0.385**	0.351**
Participation group/community activities	0.174	0.150
Information seeking behaviour	0.155	0.203*
Risk orientation	0.229*	0.278**
Innovativeness	0.225*	0.214*
Achievement motivation	-0.010	-0.013
Decision making power	0.246**	0.288**
Capacity building	0.134	0.148
Mass media exposure	0.101	0.083
Personal cosmopolite information sources used	0.054	-0.029
Personal localite information sources used	0.055	0.051
Number of Trainings received	0.044	-0.031

participation in various social organisations while indulging in the entrepreneurial activities under the ARYA programme. Multiple regression analysis between attributes of the rural youth and their overall livelihood status before and after engaging in entrepreneurship under ARYA programme was done to reveal the functional relationship between the attributes and overall livelihood status. The 19 independent variables together accounted for 48.50% of the variation in the overall livelihood status prior to participating in the ARYA programme, out of which, total farm land ($p=0.001$), and education level ($p=0.025$) was having significant functional relationship with overall livelihood status (Table 3).

Multiple regression analysis between attributes of the entrepreneurs and their overall livelihood status after engaging in entrepreneurship under ARYA programme reveals that the 19 attributes determine a 56.70 per cent variation in the overall livelihood status following participation in the ARYA programme (Table 4). While total farm land was found to be highly significant ($p=0.000$), the social participation ($p=0.050$), education level ($p=0.018$), and personal localite information sources use ($p=0.038$) were found to have significant functional relationship with the overall livelihood status at the 5% level of significance. Therefore, to improve the farmers' prospects of living, these factors must be prioritized.

DISCUSSION

In the present investigation, five types of enterprises such as nursery, apiary, mushroom, poultry and fishery are studied from the perspective of entrepreneur engaged under ARYA programme

in Puri and Nayagarh district of Odisha. The livelihood status of the engaged rural youth has improved by 10 per cent; the gain in social assets, financial assets and natural assets is found relatively more as compared to physical and human assets. Among the enterprises, the nursery enterprises have resulted an improvement of 16 per cent in livelihood status of entrepreneurs in Nayagarh district. Mushroom enterprise has resulted an improvement of 15 per cent and 10 per cent in livelihood status of entrepreneurs in Nayagarh and Puri district, respectively. An improvement of 7% in livelihood status is found in case of entrepreneurs engaged in fishery enterprise in Nayagarh and poultry enterprise in Puri district, respectively. Similar to the findings of present study few of the past studies also revealed the impact of ARYA programme, Sahoo et al., (2023) found the mushroom enterprise has best among other four enterprises with the highest net income and highest average production. However, they found highest benefit cost ratio in case fishery enterprise. Gowda et al., (2023) found nursery enterprises gained highest net income per unit. The nursery enterprise can produce earnings every day to the entrepreneurs. Production cycle is short for most of the fruits and vegetable seedlings and hence provides the opportunity for regular income generation. In the same study, it is reported that the fishery enterprise has the capability to generate employment for self as well as hired manpower in a commercial enterprise unit. Kumar et al., (2022) in their investigation on ARYA programme in the state of Bihar and Jharkhand stated that highest increase in net annual income was in apiary enterprise in Ranchi district of Jharkhand and lowest in Vaishali district of Bihar after training under ARYA

Table 3. Multiple regression analysis between attributes of the entrepreneurs and their overall livelihood status before engaging in entrepreneurship under ARYA programme

	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	10.475	2.678		3.912	0.000
Age	0.033	0.031	0.094	1.077	0.284
Level of education	0.280	0.123	0.181	2.274	0.025
Family size	0.447	0.297	0.154	1.506	0.135
No. of earning members	0.179	0.224	0.086	0.800	0.425
Social participation	0.156	0.168	0.073	0.928	0.356
Average annual income from enterprise	2.040E-06	0.000	0.182	0.888	0.376
Total farm land	0.429	0.130	0.334	3.297	0.001
Average annual expenditure on enterprise (Rs)	8.221E-07	0.000	0.045	0.229	0.819
Participation in group/community activities	0.011	0.041	0.022	0.266	0.791
Information seeking behaviour	-0.019	0.060	-0.028	-0.322	0.748
Risk taking behaviour	0.069	0.055	0.104	1.249	0.215
Innovativeness	0.047	0.056	0.068	0.837	0.405
Achievement motivation	0.002	0.072	0.002	0.027	0.978
Decision making power	0.052	0.069	0.066	0.750	0.455
Capacity building	0.002	0.103	0.002	0.019	0.985
Mass media exposure	-0.002	0.016	-0.011	-0.112	0.911
Personal cosmopolite	0.078	0.112	0.070	0.693	0.490
Personal localite	-0.111	0.149	-0.078	-0.743	0.459
Number of Trainings received	-0.111	0.172	-0.067	-0.644	0.521
Model Summary					
Model	R	R Square	Std. Error of the Estimate		
1	.696 ^a	0.485	1.429		

Table 4. Multiple regression analysis between attributes of the entrepreneurs and their overall livelihood status after engaging in entrepreneurship under ARYA programme

	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	15.106	2.513		6.012	0.000
Age	0.008	0.029	0.022	0.279	0.781
Level of education	0.277	0.115	0.175	2.395	0.018
Family size	0.104	0.279	0.035	0.374	0.709
No. of earning members	0.388	0.210	0.182	1.845	0.068
Social participation	0.313	0.158	0.143	1.983	0.050
Average annual income from enterprise	2.237E-06	0.000	0.195	1.038	0.302
Total farm land	0.490	0.122	0.372	4.011	0.000
Average annual expenditure on enterprise (Rs)	6.302E-07	0.000	0.034	0.187	0.852
Participation in group/community activities	-0.004	0.039	-0.008	-0.108	0.915
Information seeking behaviour	-0.010	0.056	-0.014	-0.172	0.863
Risk taking behaviour	0.066	0.052	0.098	1.280	0.203
Innovativeness	0.028	0.052	0.040	0.536	0.593
Achievement motivation	-0.035	0.067	-0.039	-0.516	0.607
Decision making power	0.085	0.065	0.107	1.316	0.191
Capacity	0.060	0.097	0.069	0.622	0.536
Mass media exposure	0.002	0.015	0.014	0.165	0.869
Personal cosmopolite sources used	0.053	0.105	0.047	0.509	0.612
Personal localite sources used	-0.295	0.140	-0.203	-2.107	0.038
Number of Trainings received	-0.028	0.161	-0.016	-0.172	0.864
Model Summary					
Model	R	R Square	Std. Error of the Estimate		
1	.753 ^a	0.567	1.341		

programme. In the present study, farmers' attributes like education, family size, number of earning members, average annual income from enterprise holding, average annual expenditure on enterprise, risk orientation, innovativeness and decision-making power are significantly and positively correlated with the overall livelihood status before practicing ARYA; additionally, another two attributes like social participation and information seeking behaviour are found significant after involvement in ARYA programme. Various economic performance indicators showed a positive and significant relation with the social profile of rural youth (Sahoo et al., 2023). Thus, present findings reiterate that ARYA programme seeks to attract youth in agriculture, enhancing their overall livelihood status (ICAR, 2019; Murthy et al., 2019). Engaging rural youths in profitable agricultural enterprises can ensure sustainable livelihood and income with minimal investment while improving their overall livelihood status (Som et al., 2018; Sahoo et al., 2023).

CONCLUSION

ICAR's ARYA initiative has notably succeeded in keeping rural youths engaged in agriculture for financial gain and fostering an interest in agri-preneurship. The initiative's impact is underscored by the increase in the overall mean score of livelihood status from 1.6 to 1.94, reflecting a 21 per cent improvement. The ARYA project stands out as a pivotal effort to transform the agricultural landscape but not only retaining rural youth in the sector but also empowering them with the necessary skills and opportunities to thrive. By ensuring profitable enterprises and enhancing overall livelihood status, the initiative has contributed significantly to the socio-

economic development of rural areas. The positive outcomes of the ARYA initiative highlight its role in driving sustainable change and fostering a vibrant and resilient agricultural community among the rural youth. Overall, the initiative has to be a cornerstone in the pursuit of sustainable agricultural practices and the upliftment of rural livelihoods.

REFERENCES

- Acharya, S., Sahoo, M., & Sarangi, D. (2024). Empowering rural youth in Puri district through mushroom cultivation for sustainable livelihoods. *Journal of Krishi Vigyan*, 12(1), 65-69.
- Acharya, S., Sahoo, M., Nayak, A. P., & Mishra, S. N. (2024). Fostering rural entrepreneurship and curbing migration: The ARYA project's impact on youth and agriculture in Puri, Odisha. *Indian Research Journal of Extension Education*, 24(1), 91-100.
- Chauhan, J. K., Noopur, K., Panwar, S. S., & Kumar, L. (2023). Vegetable seedlings based agri-entrepreneurship development. *Indian Research Journal Extension Education*, 23(4), 1-6.
- Gowda, M. C., Rana, R. K., Pal, P. P., Dubey, S. K., Kumar, A., Meena, M. S., & Thimmappa, K. (2023). Economic performance of enterprises promoted under ARYA and relationship with entrepreneurial competencies. *Indian Journal of Extension Education*, 59(2), 10-15.
- Haobijam, J. W., & Ghosh, S. (2023). Integrated fish farming and its influence on farm livelihoods in Manipur, India. *Aquaculture International*, 31(4), 2011-2034.
- Indian Council of Agricultural Research, 2019, *Attracting and Retaining Youth in Agriculture*. Division of Agricultural Extension, ICAR, New Delhi, pp 75.

- Kumar, A., Kumar, A., & Kumari, P. (2022). Income diversification: A way towards attracting rural youth in agriculture. *Indian Journal of Extension Education*, 58(4), 107-112.
- Kobba, F., Nain, M. S., Singh Rashmi and Mishra, J. R. (2021). Determinants of entrepreneurial success in farm and non-farm sectors: A comparative analysis. *Indian Journal of Agricultural Sciences*, 91(2), 269-273.
- Murthy, K. K., Ananda, M. R., Kumar, H. S., & Rehman, H. A. (2019). Attracting and retaining youth in agriculture (ARYA) and its components: A review. *Mysore Journal of Agricultural Sciences*, 53(3), 10-18.
- Nain, M. S., Singh, R., Sangeetha, V., Chandel, S. S., Kumar, P., & Peer, J. A. (2013). Strategies for entrepreneurship development through fruit production in J&K State. *Agricultural Science Digest*, 33(3), 165-171.
- Nain, M. S., Singh Rashmi, Mishra, J. R., Sharma, J. P., Singh, A. K., Kumar, A., Gills, R., & Suman, R. S. (2019). Maximising farm profitability through entrepreneurship development and farmers' innovations: feasibility analysis and action interventions. *Indian Journal of Agricultural Sciences*, 89(6), 1044-49. <https://doi.org/10.56093/ijas.v89i6.90833>
- Nayak, R. K., Sahoo, M., & Rout, S. K. (2024). An evaluation of entrepreneurs' knowledge of ARYA Enterprises. *Journal of Community Mobilization and Sustainable Development*, 19(Special Issue), 86-89.
- Rana, R. K., Sheoran, P., Jaryal, N., & Monga, S. (2024). Natural farming going beyond the boundary of zero budget-inspiring tale of an ARYA entrepreneur. *Just Agriculture*, 5(1), 201-209.
- 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.
- Sayana, S. S., Sreenivasulu, M., Naik, V. R., Ranjitha, P., Babu, K. M., & Shankaraiah, M. (2022). Constraints perceived by the rural youth in adoption of ARYA project (Attracting and Retaining Youth in Agriculture) interventions in Telangana state, India. *International Journal of Environment and Climate Change*, 12(12), 1321-1327.
- Sharma, S., Rathore, R. S., & Sharma, F. L. (2021). A scale to measure the attitude of beneficiaries and non-beneficiaries of ARYA project towards poultry farming. *Indian Research Journal Extension Education*, 21(2&3), 16-19.
- Som, S., Burman, R. R., Sharma, J. P., Padaria, R. N., Paul, S., & Singh, A. K. (2018). Attracting and retaining youth in agriculture: challenges and prospects. *Journal of Community Mobilization and Sustainable Development*, 13(3), 385-395.