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Effect of ARYA Programme in Employment and Income Generation of the Rural Youths

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ABSTRACT

Rural youths are the future of India's progress in agriculture. In order to keep the interest of youths in agriculture and maintain their sustainable livelihoods, ICAR through its Agricultural Extension division has implemented Attracting and Retaining Youth in Agriculture (ARYA) programme through different identified KVKs in the country. Five KVKs from Odisha have been implementing this programme, out of which present research carried out in the Puri KVK in the year 2022, where the ARYA project has been focusing on four enterprises i.e., mushroom, poultry, apiary, fish production including fish seed with a total of 174 rural youths. After the implementation of ARYA, among the five enterprises promoted under ARYA, the performance of the mushroom enterprise gave the highest net income and highest average production. On the other hand benefit-cost ratio was higher in fishery enterprises. Various economic performance indicators showed a positive and significant relation with the social profile of the rural youths. The implementation of programme brought the convergence of several institutions to render technical support to rural youth.

INTRODUCTION

Agriculture remains fundamental to poverty reduction and economic growth especially for the developing countries for the 21st century (Pingali, 2010). Despite having one of the world's fastest-growing economies, a substantial portion of India still experiences hunger, poverty, marginalization, and social exclusion. The country's main employer, the agriculture industry, is accountable for ensuring that its workers have a sustainable and secure way of life (Som et al., 2018). India's rural population was over 70 per cent in 2007, down to 65 per cent in 2021, from about 80 per cent in the 1960s. To guarantee more equal and inclusive growth, the emphasis has been on enhancing the quality of life in rural areas (Indian Economic Survey, 2021-22). The investment in agriculture is additionally not capable to attract private firms needed in marketing, processing, input supply and finance (Brooks et al., 2013). There is decreasing interest among youth in entering agriculture as they perceive is as an outdated field with minimal financial returns (Paisley, 2013). And due to better and diverse employment opportunities in cities, better pay or a more desirable job (Foster, 2014). Since a large number of rural youths are migrating to cities in search of work, agriculture-based entrepreneurship development is an important approach to minimize the outward migration (Singh et al., 2014; Singh et al., 2016; Nain et al., 2019; Ray et al., 2022)

India had 45.6 crores migrants compared to 31.5 crore migrants in 2001. Between 2001 and 2011, while population grew by 18 per cent, the number of migrants increased by 45 per cent. In 2011, 99 per cent of total migration was internal and immigrants comprised 1 per cent, (Census, 2011). There are several concerns

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regarding getting youths involved in agriculture; in many cases, youths are not very interested in doing so since they don't consider agriculture as having many long-term career opportunities (Gandhi et al., 2001). Since 17 per cent of Indians lived in urban areas in 1951, the projected increase to 42.5 per cent by 2025 makes the migration scenario extremely concerning (Kurukshetra, 2012). So to retain the youth in agriculture requires to be made more profitable and a sustainable livelihood option. Keeping the importance of highly potential rural youth in agriculture, ICAR has initiated a programme "Attracting and Retaining Youth in Agriculture" in the year 2015 on 16th July with the focus to attract the rural youth towards agriculture and retain them by involving in agri-enterprises and making them agri-entrepreneurs. The major goal is to give rural youths the confidence they need to pursue farming as a viable career rather than seeking menial work in cities (Bairwa & Kushwaha, 2015).

Amid the corona virus outbreak and nationwide lockdown, massive reverse migration of people from urban areas to villages happened, which reiterated the focus of ARYA scheme with the several experts suggesting for full-fledged implementation of the scheme (Thakur et al., 2021) and also attain its objective to curb the rural youth migration and create productive and profitable employment. On this backdrop, present study was conducted to assess the effect of ARYA scheme in employment and income generation of the rural youths.

METHODOLOGY

The study was conducted in the state of Odisha, where five KVKs are engaged in implementing ARYA programme naming Nayagarh, Puri, Sambalpur and Ganjam. These 4 KVKs coordinated entrepreneurship development and provided assistance to trained youth in establishing and operating their own enterprises. Enterprises supported by KVKs include those for growing mushrooms, raising chickens, adding value, protecting crops, beekeeping, raising pigs, raising goats, raising ducks and fishing, and making vermicompost. In the current investigation, the Puri KVK was chosen as the site where the ARYA program was launched during the year 2018–19 and has been focusing on four enterprises: mushroom, poultry, apiary, fish production, including fish seed. For the study, 174 rural youths who were having a firm (fulfilling the firm criteria mentioned in ARYA project) and working on the execution of the aforementioned four firms were selected. Only young entrepreneurs who were actively involved in the production of mushrooms, fish, honey bees, and poultry were taken into account in the study. Measurable economic performance indicators (before adopting ARYA and after adopting ARYA) were used in order to evaluate the success of the ARYA enterprises, including (i) average annual output (ii) average annual gross income (iii) average employment creation per year (iv) area (ac)/beneficiary (v), and cost of production (Rs/unit/yr). (vi) Market sale price per kilogram of the manufacturing Economic Return (Rs. per unit per year) (vii) Net Income (Rs. per unit per year) (viii) Sale value of the production in the market (Rs./kg). The data were collected with an interview schedule including all variables, developed for present study including Net annual income from ARYA enterprise, Net annual production cost from ARYA enterprise, indebtedness etc.

RESULTS AND DISCUSSION

The Puri district in Orissa has moderate and tropical climate. Humidity is high throughout the year, which is favorable to produce mushroom. The nutritional advantage of mushroom together with its capacity of income and employment generation prompted the scientists to strongly promote paddy straw mushroom (PSM), and the oyster mushroom as well.

ARYA project inculcated the practice of oyster mushroom production among the rural youths of Puri district is presented in Table 1. Average number of paddy straw mushroom increased upto 800 beds/year (58.13%). Average annual production increased upto 83.16 per cent. So far as the employment generation is concerned, mushroom enterprise increased upto 26 per cent of average employment generation/ year. Gross cost of paddy straw mushroom was Rs. 2,92,320 and net return was Rs. 1,49,520 for eight months. For oyster mushroom, the gross cost was Rs. 6,090 and net return was Rs. 3,390 in two months. The benefit cost ratio was 2.05,

Table 1. Effect of ARYA on mushroom enterprises

<table>
<tr><td colspan="3">Measurable indicator of output in suitable unit</td><td>% increase</td><td colspan="3">Economic of enterprise</td></tr>
<tr><td>Before implementation of ARYA</td><td colspan="2">After implementation of ARYA</td><td></td><td>Gross cost (Rs.)</td><td>Net return (Rs.)</td><td>BC Ratio</td></tr>
<tr><td>Avg. no. of bed/year: 1505 nos.</td><td colspan="2">Avg. no. of PSM bed/year- 2380 + avg no. of oyster bags/year- 90</td><td>58.13</td><td rowspan="5">PSM for 8 months- Rs. 2,92,320 Oyster mushroom for 2 months- Rs. 6,090</td><td rowspan="5">For PSM- Rs. 1,49,520 For oyster- Rs. 3,390</td><td rowspan="5">2.05</td></tr>
<tr><td>Avg. annual production- 1063.98 kg</td><td colspan="2">Avg. annual production-1948.8 kg</td><td>83.16</td></tr>
<tr><td>Avg. production/ bed- 0.708 kg</td><td colspan="2">Avg. production/ bed- 0.82 kg</td><td>15.81</td></tr>
<tr><td>Avg. employment generation/ annum- 160</td><td colspan="2">Avg. employment generation/ annum- 202</td><td>26</td></tr>
<tr><td>Avg. gross income/ annum- Rs. 1,38,317</td><td colspan="2">Avg. gross income/ annum- Rs. 2,98,410</td><td>115</td></tr>
<tr><td>Area (ac)/no.</td><td>Cost of production (Rs/unit/yr)</td><td>Sale value of the production in the market (Rs./kg)</td><td colspan="2">Return (Rs./unit/yr)</td><td colspan="2">Net income (Rs./ unit/ yr)</td></tr>
<tr><td>PSM (450 beds)- 21 days/cycle (8 months) Oyster mushroom (200 bags)- 2 months/ cycle</td><td>2,22,000</td><td>Rs. 150/kg PSM Rs. 40/kg Oyster mushroom</td><td colspan="2">5,02,000</td><td colspan="2">2,80,000</td></tr>
</table>

Table 2. Effect of ARYA on poultry enterprises

Measurable indicator of output in suitable unit			% increase	Economic of enterprise		
Before adopting ARYA	After adopting ARYA			Gross cost (Rs.)	Net return (Rs.)	BCR
Avg. body wt Banaraja- 1.9 kg	Avg. body weight Banaraja- 2.1 kg		10.5	53690	23690	1.78
Avg. body wt Kadaknath- 1.45 kg	Avg. body wt Kadaknath-1.7 kg		17	100725	59725	2.39
Mortility rate- 12%	Mortility rate- 10%		-	-	-	-
Avg. gross income /annum- Banaraj- 53040 Kadaknath- 65625	Avg. gross income /annum- Banaraj- 161070 Kadaknath- 201450					
Area (ac)/no.	Cost of production (Rs/unit/yr)	Sale value of the production in the market (Rs./kg)		Return (Rs./unit/yr)	Net income (Rs./unit/yr)	
100 chicks/unit (Banaraj) 100 chicks/unit (Kadaknath)	81,000	Rs. 150/kg Banaraj (live bird) Rs. 280/ kg Kadaknath (live bird)		3,02,184	2,21,184	

which proved to be very remunerative in rural areas. The net income is highest in mushroom enterprise (Rs. 2,80,000). Mushroom enterprise were managed with minimum expenditure (less than Rs. 1 lakh/unit) and hence their profitability was very high.

Average body weight of Banaraj and Kadaknath birds was increased by 10.5 per cent and 17 per cent, respectively, after implementation of ARYA is presented in Table 2. Mortality rate was decreased by 2 per cent. Average gross income per annum of Banaraj and Kadaknath was Rs. 1,61,070 and Rs. 2,01,450, respectively. The benefit cost ratio of Banaraj was 1.78 where as for Kadaknath it was 2.39. It shows that Kadaknath breed of poultry bird provided relatively more profit. Poultry rearing involves less investment and mostly women are involved in backyard poultry rearing with native chicken. Kadaknath is a popular native chicken in India (Jaishankar, 2020).

Average honey production per box was increased upto 50 per cent after implementation of ARYA is presented in Table 3. Additional employment generation and gross income increased upto 125 per cent and 161 per cent, respectively. Average gross cost was Rs. 14,100, and net return was Rs. 4,460 for on an average 3 boxes per unit with a Benefit cost ratio of 1.31. Apiculture has certain migratory path for honey production (Singh et al., 1998). Its popularity increased day by day in rural areas as it does not require full time laborers. Honey has good medicinal and food value. Moreover, bee wax used in pharmaceutical, cosmetic industry and in candle making that gives extra income to the rural people. Bee venom helps in arthritis, pains etc. Therefore, it is beneficial for adopting beekeeping at commercial level to get good income (Kumar, 2022). Apiary enterprise does not give a sudden profit because of the seasonality, proper training and handling of the boxes, a thorough guidance from the scientist of Krishi Vigyan Kendra. Despite low colony productivity, bee keeping remains a profitable and remunerative enterprise. It is less labour intensive compared to other agricultural activities and plays an important role as an additional source of income generation and diversification for bee keepers (Al-Ghamdi, 2017).

As Puri is a coastal area and ICAR-Central Institute of Freshwater Aquaculture (CIFA) is very nearer to Puri, youths used to get more advantage for starting up a fishery enterprise. Table 4 indicates that average fish production increased upto 44.34 per cent after implementation of ARYA. Average gross return and employment generation increased upto 58.78 per cent and 26.80 per cent, respectively. Gross cost of production and net return was Rs. 1,97,600/ha/year and Rs. 2,58,900/ha/year, respectively with the benefit cost ratio is 2.31.

Fish farming has the potential to generate employment for self as well as hired manpower in a commercial enterprise unit. The employment generation spreads across its supply chain, value chain and management activities (Chandre Gowda, 2023).

Coefficient of correlation between economic performance indicator and selected social profile variables are present in Table

Table 3. Effect of ARYA on Apiary Enterprise

Measurable indicator of output in suitable unit			% increase	Economic of enterprise		
Before adopting ARYA	After adopting ARYA			Gross cost (Rs.)	Net return (Rs.)	BC Ratio
Additional employment generation per year- 12	Additional employment generation per year- 27		125	Rs. 14,100 Avg. box/ unit- 3 nos.	Rs. 4,460Avg. box/ unit- 3 nos. (support from project- Rs. 6940 & own investment Rs 2700)	1.31
Avg. honey production/box- 3 kg	Avg. honey production/box- 4.5 kg Bee colony- 2 nos./box		50			
Additional gross income- Rs. 1800/box	Additional gross income- Rs. 4700/box		161			
Area (ac)/no.	Cost of production (Rs/unit/yr)	Sale value of the production in the market (Rs./kg)		Return (Rs./unit/yr)	Net income (Rs./ unit/ yr)	
4 boxes/ unit	8000 own investment	Rs. 600/kg (honey) Rs. 1000/ bee colony		18,000	Rs. 10,000 in 2nd year of establishment	

Table 4. Effect of ARYA on fishery enterprise

Measurable indicator of output in suitable unit			% increase	Economic of enterprise		
Before adopting ARYA	After adopting ARYA			Gross cost (Rs.)	Net return (Rs.)	BCR
Avg. body wt of fish (kg)- 0.520	Avg. body wt of fish (kg)- 0.830		59.61	Rs. 1,97,600 /ha/year	Rs. 2,58,900 /ha/year	2.31
Avg. fish production (q/ha/year)- 28.75	Avg. fish production (q/ha/year)- 41.50		44.34			
Avg. gross return (Rs./ha/year)- 2,87,500	Avg. gross return (Rs./ha/year)- 4,56,500		58.78			
Avg. employment generation/ annum- 97	Avg. employment generation/ annum-123		26.80			
Area (ac)/no.	Cost of production (Rs/unit/yr)	Sale value of the production in the market (Rs./kg)		Return (Rs./unit/yr)	Net income (Rs./unit/yr)	
One ha (pond water area)	1,97,600	Rs. 115/ kg		3,84,100	1,86,500	

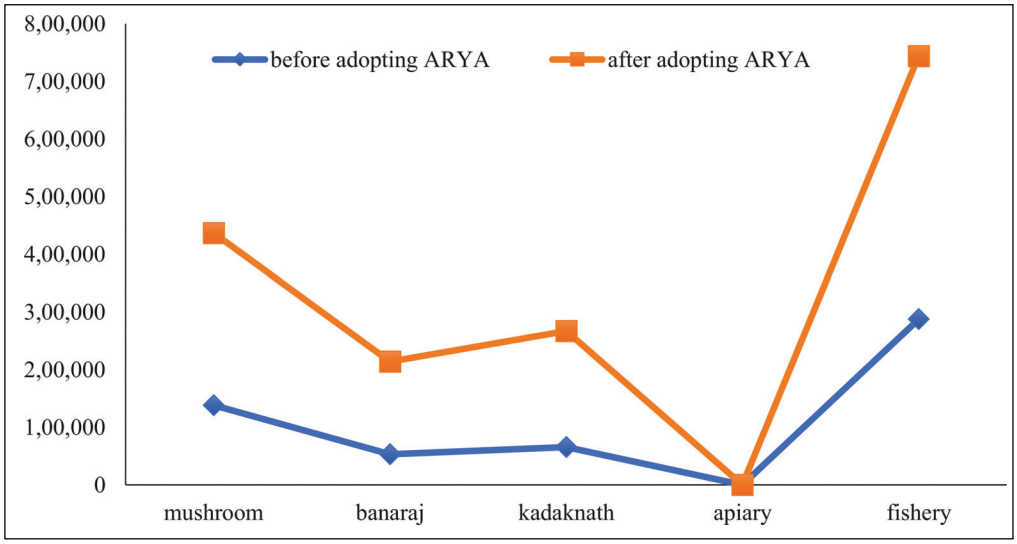

Figure 1. Average Gross Production of all the enterprises

Table 5. Correlation (r) between social profile and economic performance indicators

Economic Performance Indicators	Age	Education	Gender	Annual income
Gross Turnover	0.109*	0.142**	0.105	-0.048
Net Income	0.157**	0.117*	-0.03	0.183**
BC Ratio	-0.092	0.131**	0.150**	0.167**
Employment Generation	0.132**	0.122**	-0.052	0.096
Per Day Income	0.068	-0.013	-0.143**	0.138**

*significant at 0.05 level, **significant at 0.01 level

5. Age of the entrepreneurs are positively correlate with gross turnover, net income and employment generation. The economic performance indicators can be managed by youths with ease. Four of five economic performance indicator were positively and significantly correlate with the education of the entrepreneurs. Increased economic performance indicators are linked to higher educational levels. Women entrepreneurs had lesser per day income as indicated by the negative and significant correlation. Annual income of the entrepreneurs are positively and significantly correlate with the net income, BC ratio and per day income. Higher education among youths will result in a more stable economy, which will lessen the issue of migration.

CONCLUSION

ARYA programme has proved to be a constructive idea of the ICAR which diligently attracting rural youths towards the agri-preneurship and retaining them in agriculture for a profitable surplus. After the intervention of KVK in terms of promotion of different agri-enterprises, rural youth got the exposure of certain scientific methods of mushroom cultivation, bee keeping, poultry and fish farming that resulted in adoption and establishment of these enterprises for their income diversification and livelihood security. Therefore, profitable agri-enterprises require to be promoted through the involvement of potential rural youths which will curb the migration and provide a sustainable livelihood and income at a low investment.

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