**Socio-Economic Impact of Poultry Farming in India: A case study of Rural Youth Farmers under Attracting and Retaining Youth in Agriculture Project (ARYA)**

**ABSTRACT**

The future of India's agricultural advancement lies on its rural youth. Through its Agricultural Extension division, ICAR has implemented the Attracting and Retaining Youth in Agriculture (ARYA) initiative through several recognized KVKs around the nation in an effort to sustain youth interest in agriculture and their sustainable livelihoods. This program has been implemented in five KVKs in Odisha. The current study was conducted in the Sambalpur District KVK in 2023–2024, where the ARYA project has been working on three enterprises: scientific horticulture nursery management, backyard poultry rearing, and mushroom production, with a horizontal spread of 400 rural youths. Following ARYA's implementation, backyard poultry rearing produced the highest average production and net income out of the three businesses supported by the program. However, the firm that produced mushrooms had a higher benefit-cost ratio. The social profile of young people in rural areas was positively and significantly correlated with a number of economic performance metrics. A number of institutions came together to provide technical assistance to young people in rural areas as a result of the program's execution. Under, ARYA project poultry farming is one of the primary features chosen for the present study. With this perspective, the present study has been carried out to know the attitude of beneficiaries and non-beneficiaries of ARYA project towards chicken farming. A scale including 24 statements was created using the Likert approach to gauge attitude. Out all the technologies used in chicken farming, 12 positive and 12 negative comments were chosen and structured appropriately. The "t" values from the item analysis were used to pretest and choose the assertions. Researchers and policymakers involved in poultry farming may find the attitude scale helpful.

**Keywords:** Agriculture, Poultry Farming, agribusinesses, agriculture-based entrepreneurship

**INTRODUCTION**

Agriculture is still essential to reducing poverty and boosting the economy, particularly in emerging nations in the twenty-first century. (Pingali, 2010). Even though India's economy is among the fastest-growing in the world, a sizable section of the country still faces social exclusion, poverty, hunger, and marginalization. The agriculture sector, which employs the majority of the nation's workforce, is responsible for making sure that their living conditions are safe and sustainable. (Som et al., 2018). In 2007, more than 70% of Indians lived in rural areas; by 2021, that number had dropped to 65% from roughly 80% in the 1960s. The focus has been on improving rural communities' quality of life in order to ensure more equitable and inclusive growth. (Indian Economic Survey, 2021-22). Additionally, agricultural investment cannot draw in private companies that are required for marketing, processing, input supply, and financing. (Brooks et al., 2013). Young people are becoming less interested in pursuing careers in agriculture because they believe it to be an obsolete industry with low earnings. (Paisley, 2013). Additionally, because cities offer more varied and better career options, higher salaries, or more appealing positions (Foster, 2014). A key strategy to reduce outbound migration is the growth of agriculture-based entrepreneurship, as many young people from rural areas are moving to urban areas in pursuit of employment. (Singh et al., 2014; Singh et al., 2016; Nain et al., 2019; Ray et al., 2022) In 2001, there were 31.5 crore migrants in India; today, there are 45.6 crore. The number of migrants rose by 45% between 2001 and 2011, despite an 18% growth in the population. In 2011, domestic movement accounted for 99 percent of all migration, with immigrants making up 1 percent., (Census, 2011). There are a number of reasons why young people aren't very interested in doing so because they don't think there are many long-term job options in agriculture. (Gandhi et al., 2001). The migratory situation is very worrying because, in 1951, only 17.5% of Indians resided in urban areas; by 2025, that number is expected to rise to 42.5%. (Kurukshetra, 2012). Therefore, it must be made more profitable and a sustainable source of income in order to keep young people in agriculture. Given the significance of highly qualified rural youth in agriculture, ICAR launched the "Attracting and Retaining Youth in Agriculture" program on July 16, 2015, with the goal of luring young people from rural areas into agriculture and keeping them there by enlisting them in agribusinesses and turning them into agri-entrepreneurs. Giving rural kids the self-assurance they need to continue farming as a viable career instead of looking for menial labor in cities is the main objective. (Bairwa & Kushwaha, 2015).

Massive reverse migration from cities to villages during the corona virus outbreak and statewide lockdown served as a reminder of the ARYA scheme's aim, and multiple experts recommended its full-fledged implementation. (Thakur et al., 2021) could also achieve its goals of reducing young migration from rural areas and generating profitable and productive jobs. In light of this, the current study was carried out to evaluate the impact of the ARYA plan on rural youths' employment and income creation.

ICAR launched the "Attracting and Retaining of Youth in Agriculture (ARYA)" program in recognition of the critical role that rural youth play in agricultural growth, particularly when considering the nation's food security. The Prime Minister introduced this project on the ICAR foundation day in 2015, and it is being carried out by Krishi Vigyan Kendras in 25 of the nation's states. In order to control the increase in rural youth migration to cities, extra efforts will be made under this strategy to recruit young people from rural areas under the age of 35 to work in agriculture and related fields. The task of training 200 to 300 young people in agriculture-related and supplemental activities, such as poultry farming, dairying, fishing, goat rearing, mushroom production, and other related pursuits that keep the young people in rural areas either directly or indirectly involved in agriculture, has been assigned to each KVK.

In order to provide sustainable income and gainful employment in specific districts, the ARYA project aims to empower and attract young people in rural areas to engage in various agriculture, allied, and service sector enterprises. Additionally, it aims to enable farm youth to form network groups to engage in resource and capital-intensive activities such as processing, value addition, and marketing, as well as to demonstrate functional linkage with various institutions and stakeholders for the convergence of opportunities available under various schemes/programs for youth sustainable development. In a farming country like India, it is concerning that young people from rural areas are despising agriculture and relocating to towns, cities, and metropolitan areas in pursuit of better employment opportunities. It appears that young people in rural areas are disenchanted with the nation's agricultural system.

On the other hand, poultry farming is ‘raising various varieties of domestic birds commercially for the purpose of meat and eggs. For individuals, raising poultry generates revenue and job opportunities. Commercial poultry farming is an easy way for educated young people without jobs to generate a good income and job opportunities. Importing improved chicken breeds is necessary to increase the supply in order to meet the growing demand for poultry products. In several regions of the nation, it rose to become one of the most specialized businesses.

There are 851.81 million chickens in the nation overall, of which 317.07 million are raised in backyards and 534.74 million are raised for commercial purposes. The number of backyard chickens has increased by 45.8% since the last census. The overall number of poultry has grown by 16.81% since the last census. India is currently the world's third-largest producer of eggs, behind the United States and China. With an annual input of over 3.2 million tons of meat, India is also the world's fifth-largest producer of chickens. India produced approximately 3.46 million tons of poultry meat in 2016–17, up from 3.26 million tonnes in 2015–16. (Unknown, 2017–18). In 2018, the value of the Indian poultry market, which includes eggs and broilers, was INR 1750 billion (Indian Poultry Market Report 2019-Research and Market.Com). Beginning in 1999–2000, the output of eggs increased significantly, reaching 88139 million in 2016–17. According to the National Institute of Nutrition, each person should consume 180 eggs and 11 kilograms of meat annually. According to data from the Ministry of Food Processing, there are currently 3.6 kg of beef and 63 eggs available per person. Large cities consume 170 eggs on average, while small cities consume 40 eggs on average. The average number of eggs consumed in developed and undeveloped rural areas is five and twenty, respectively. In India, just 20% of people are vegetarians. (Anonymous 2017-18).

**MATERIALS AND METHODS**

The present investigation was conducted in Sambalpur district of Western Odisha with an area of 6702 square kilometers. Sambalpur is located at 21°.27' North Latitude and 83°.58' East Longitude. The average elevation is 150.75 metres (494.6 ft) above the mean sea level. Sambalpur falls under the Zone-3 seismic number, which shows the possibility of an earthquake. Sambalpur lies on the bank of the river Mahanadi. The river flows to the west of the city and separates [Burla](https://en.wikipedia.org/wiki/Burla%2C_India) from Sambalpur and Hirakud. The Hirakud Dam lies upstream of Sambalpur. [Budharaja](https://en.wikipedia.org/wiki/Budharaja%22%20%5Co%20%22Budharaja) is a small reserve forest located within the city. Sambalpur experiences an extreme type of climate with hot and dry summers followed by humid [monsoons](https://en.wikipedia.org/wiki/Monsoon) and cold winters. The hot season commences from the first week of March and lasts until the second half of June. In May, the temperature rises up to 47 °C (117 °F). In December, the temperature comes down to 5 °C (41 °F). Sambalpur gets rainfall from the south western monsoon. The most pleasant months in Sambalpur are from October to February, during which time the humidity and heat are at their lowest. During this period, temperatures during the day stay below 30 °C (86 °F) and drop to about 20 °C (68 °F) at night. This season is followed by a hot summer, from March to May. The summer gives way to the monsoon season. Since 1982 as per the data available with District Emergency section, Sambalpur, there has not been a single occurrence of cyclone in Sambalpur. There are possibilities of strong winds with the speed of 53 km/h (33 mph) before the onset of monsoon. The relative humidity is high during the rainy season, generally being over 75%. After the rainy season the humidity gradually decreases and the weather becomes dry towards the winter. The best time to visit Sambalpur is between September and March. The heaviest-ever recorded rainfall in Sambalpur was 581.9 mm (22.91 in) in 1982, which was the highest ever in Odisha until September 2010. The low-lying areas areas of the Sambalpur town on Mahanadi river are prone to flooding.

The following factors led to the selection of Sambalpur district for the investigation:

1. In 25 states across the nation, the ARYA initiative was carried out through KVKs.

2. The influence of the study is evident because the ARYA project has been successfully implemented in the district for more than three years.

3. Odisha University of Agriculture and Technology has jurisdiction over the study area.

**Results and Discussion:**

According to the data in Table 1, the average flock size was 14.68 prior to implementation, which was significantly smaller than the average flock size following implementation, which is 23.56, indicating a 60.49 percent change.. The project's better training methods and increased farmers' awareness of the value of rural hens for both survival and revenue creation may be the reason for the flock's growth following training. Following instruction on many facets of chicken husbandry, Praveen et al. (2013) discovered a significant change in the average flock size before (12.4) and after (23.4). Similar findings were published by Joshi and Solanki (2018), who found that raising poultry has a favorable effect on flock size.

Data reviewed in the Table 01 demonstrates that training had a positive impact on egg production. Average egg production per bird was higher after (87.96) than before (38.92) implementation of initiative. When compared to local poultry breeds, the higher egg production may be the result of improved bird care and management, as well as the cultivation of more productive breeds like Kaberi, Kadaknath, etc. that are more suitable with the research location. The breed's ability to lay eggs was double that of the native breeds used in this experiment. A small number of Kaberi breed chicks were first introduced, and the results of their deployment demonstrate an amazing change in egg output. Additionally, Mathialagan (2014) discovered a notable difference between the average egg production before (44 eggs/bird/year) and after (62 eggs/bird/year). These findings are corroborated by Yadav and Bugaliya (2019), who also noted that the local breeds' egg production capacity was 45 eggs per bird per year, which is significantly lower than the Kaberi breed's capacity (166 eggs per bird per year). According to the findings of all these research, training significantly and favorably increases egg production.

According to the data in Table 1, the average body weight increased by 3.15 kg year following project implementation, which is significantly higher than the average body weight before to implementation, which was 1.32 kg annually. The body weight has increased significantly, changing by 138.64 percent. An increase in body weight could result from the use of better chicken farming feeding techniques. Additionally, farmers have embraced the new Kaberi breed that was introduced as part of the experiment. The weight of this breed is higher than that of traditional or local breeds. Additionally, Mathialagan (2014) discovered that the average body weight of both male and female poultry birds increased from 1 kg to 1.5 kg for the females and from 1 kg to 2 kg for the males. Similar conclusions are reached by Yadav and Bugaliya (2019), who also noted that newly adopted strains weigh more than native breeds.

A review of the data in Table 1 shows that the average meat output prior to implementation was 08.45 kg, or roughly one-third of the average meat production following implementation, which is 21.26 kg/bird/year. It is evident that the percentage has changed significantly, reaching 151.60%. This could be because new strains of the Kaberi breed have a higher body weight than the indigenous breeds, which have a lower body weight. Therefore, Kaberi has a greater chance of increasing meat production by selling poultry birds at the appropriate maturity age. Similar results were reported by Yadav and Bugaliya (2019) and Jha and Chakarbarty (2017), who similarly discovered an increase in average annual meat production following the implementation of suggested poultry interventions.

The information shown in Table 1 indicates that there has been a notable shift in income, with a change of 371.38%. The average annual income prior to implementation was Rs. 7425, which is significantly lower than the average annual income following implementation, which is Rs. 35,000. Attending all training sessions and implementing all suggested practices under the ARYA project to improve the herd size, health, housing, breeding, feeding, and marketing of poultry birds may have been the primary cause of this notable increase in income. These practices have had a positive impact on income levels and ensured increased production of eggs and poultry meat for both domestic consumption and marketing or revenue-generating purposes. Farmers' belief in their ability to realize their own potential was bolstered by training. The findings are consistent with those of Ibitoye and Onimisi (2013), Joshi and Solanki (2018), Singh et al. (2019), and Kavitha et al. (2020), who also claimed that training has a significant impact in raising chicken farming income. A paired t-test was also used to see whether there was a significant difference between the ARYA project's implementation before and after.
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Hypotheses

NH04:There is no significant difference in quantitative aspects before and after implementation of ARYA project

RH4: There is significant difference in quantitative aspects before and after implementation of ARYA project

According to Table 1 results, the t-value for the two-tailed significance level of the difference between the before and after sample means was 8.61 for flock size, 38.92 for egg production, 27.59 for meat production, 12.34 for body weight, and 17.45 for income increase. With 48 degrees of freedom and a P value less than 0.001, the results unequivocally show that there was a statistically significant difference in all five variables examined for change or improvement between the before and after implementation criteria. Based on the data, the null hypothesis was rejected because the average mean before and after implementation demonstrated a statistically significant difference at the 1% level of significance. The findings also suggest that the ARYA initiative has a favorable and substantial impact on the quantitative components of socioeconomic factors.

Nine variables were separated into two groups, namely before and after implementation, in order to determine the effect of the ARYA project on qualitative aspects of the socioeconomic improvement of poultry beneficiaries. This was accomplished by calculating the Mean Percent Score (MPS) for every variable and calculating the percentage change between the criteria before and after implementation. The findings are shown in Table No. 2.

A review of the data in Table No. 2 shows that the mean percentage score for job opportunity prior to project implementation was 25.82, which was much lower than the mean percentage score of 74.38 following project implementation. The significant percentage change of 188.07 suggests that the project is having a beneficial effect on the recipients. Vocational trainings offered by KVK under the ARYA project, which assist farmers in expanding their capacity to look for revenue-generating opportunities through chicken farming, were the primary cause of this. In the past, they raised fowl for their own domestic use, utilizing the meat and eggs. Following training, individuals began to show greater interest in it as a career path that would increase their income and employment alternatives.
A closer look at Table No. 2 shows that the MPS for management practices was 82.95 following implementation, which was relatively higher than the MPS of 42.69 before to project implementation. Through the adoption of suggested methods during training under the ARYA project, a change of 94.31% demonstrated that the initiative had a beneficial influence on improving feeding, breeding, housing, health, and marketing practices.

A more thorough examination of the data in Table No. 2 shows that migration was high prior to implementation (MPS 58.37) and decreased to MPS 34.68 following implementation. As a result, it demonstrates that the -40.59 percent decrease in migration had a positive indication of improvement, demonstrating that young people in rural areas are increasingly drawn to agriculture and related interventions, such as adopting poultry farming as a source of income, and that the number of people moving to urban areas is steadily declining as they are more likely to upgrade their careers in rural areas.

Additional analysis of the data in Table No. 2 shows that the MPS for health status increased by 9.65% from 68.59 before implementation to 61.97 after implementation. Before and after adoption, the mean percentage score for food security was 58.97 and 41.69, respectively, with a -29.30 percent change. Before and after adoption, the mean percentage score for social security was 62.58 and 73.68, respectively, with a 17.74 percent gain. Prior to implementation, the daily nutritional intake MPS was 65.44; following implementation, it grew to 82.67 MPS, representing a 26.33% change in percentage. The mean percentage score for educational status was 45.98 before and 64.95 after, with a 41.26 percent increase. Prior to and following MPS, the standard of living was 54.36 and 65.79, respectively, representing a 21.03 percent increase.

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Further it can be concluded that chicken farming training under ARYA project had a favorable and significant impact on food security, health status, nutritional intake, educational status, standard of living and social security. Positive impact on quantitative components like egg production, meat output and revenue are the main reason of direct and indirect change in these qualitative factors.

growth in income through growth in egg and meat production enhances their daily nutritional intake by delivering protein and energy supplements to family members which further ensures food security as well as improvement in their health state. Standard of living also rose due to increasing access to education and work alternatives. These all variable ultimately ensure social security to each individual at all level of livelihood security. These findings are in agreement with the findings of Islam et al. (2015), Kabir et al. (2015), Jha and Chakarbarty (2017), Kshandakar et al.(2018), sheikh et al.(2018) Singh et al.(2019) and Kavithaa et al.(2020). Additionally, they stated that raising chickens helps to lower food insecurity and youth migration, and it also supports farmers by boosting meat and egg production, which guarantees improved health, education, and nutritional security. Their social standing and level of living were also enhanced by their income increase. Adoption of improved management techniques, such as those related to breeding, housing, health, and feeding, was also positively impacted by training.

**SUMMARY AND CONCLUSION**

It was found that implementation of ARYA project exhibited a very favorable and considerable impact in term of quantitative elements of chicken farming. Following training on several facets of poultry farming practices, there is a notable rise in the flock size, body weight, ability to produce eggs and meat, and income from poultry farming. Additionally, it was discovered that the ARYA project significantly impacted the qualitative aspects of poultry farming, including increased employment, opportunities, improved management practices, family health and educational status, ensuring food security, daily nutritional intake, standard of living, and social security, as well as by lowering youth migration.

**Disclaimer (Artificial intelligence)**

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Details of the AI usage are given below:

1.

2.

3.

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**Table-1: Distribution of respondents on the basis of impact of ARYA project on poultry beneficiaries in quantitative aspects n=20**

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| --- | --- | --- | --- | --- | --- |
| **Sl. No** | **Aspects** | **Before Implementation** | **After implementation** | **% change** | **‘t’ value** |
| 1 | Flock size(no.) | 14.68 | 23.56 | 60.49 | 8.61\*\* |
| 2 | Egg production(per bird/annum) | 38.92 | 87.96 | 126.00 | 38.92\*\* |
| 3 | Meat production(Kg/annum) | 8.45 | 21.26 | 151.60 | 27.59\*\* |
| 4 | Body weight(kg/annum) | 1.32 | 3.15 | 138.64 | 12.34\*\* |
| 5 | Increase income through poultry farming | 7425 | 35000 | 371.38 | 17.45\*\* |

**Table: 2 Distribution of respondents on the basis of impact of ARYA project on poultry beneficiaries in qualitative aspects n=20**

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| --- | --- | --- | --- | --- |
| **Sl. No** | **Aspects** | **Before Implementation** | **After implementation** | **% change** |
| 1 | Employment opportunity | 25.82 | 74.38 | 188.07 |
| 2 | Management practices(breeding/ Feeding/Unit | 42.69 | 82.95 | 94.31 |
| 3 | Migration | 58.37 | 34.68 | -40.59 |
| 4 | Health status of family | 68.59 | 61.97 | -9.65 |
| 5 | Food security | 58.97 | 41.69 | -29.30 |
| 6 | Social security | 62.58 | 73.68 | 17.74 |
| 7 | Daily nutritional intake | 65.44 | 82.67 | 26.33 |
| 8 | Education status | 45.98 | 64.95 | 41.26 |
| 9 | Standard of living | 54.36 | 65.79 | 21.03 |