



## Income Diversification: A Way Towards Attracting Rural Youth in Agriculture

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### ARTICLE INFO

Keywords: ARYA project, Agriculture, Beekeeping, Mushroom, Livestock

<http://doi.org/10.48165/IJEE.2022.58422>

### ABSTRACT

Attracting and retaining rural youth in agriculture (ARYA) is operational in different Krishi Vigyan Kendras (KVKs) in Bihar and Jharkhand. Six KVKs of Bihar (Aurangabad, Vaishali, East Champaran, West Champaran, Bhojpur and Bhagalpur), and four KVKs of Jharkhand (Ranchi, Chatra and Gumla East Singhbhum) were selected from 2017 and onwards for implementation of ARYA. Present investigation was done in 2020 and compared it with 2016-17 data i.e. before ARYA. The main aim of this project was to attract and involve unemployed rural youth in farming based enterprises. Results showed that among different enterprises, total 3687 number of rural youths trained out of them, 903 youths established their own enterprises and 700 youths run the enterprises sustainably. It has been concluded that poultry farming and nursery raising in Bihar and goat farming in Jharkhand attracted much more rural youth for its income generation.

### INTRODUCTION

Agriculture is the primary source of income for rural youths of Bihar and Jharkhand. Almost 80 per cent of state's population engaged in agriculture production system. Bihar ranks 4<sup>th</sup> in vegetables production and 8<sup>th</sup> in fruits production in India (Bihar state report, September, 2021). There is good opportunity for diversified farming along with agriculture. Nowadays peoples are not interested in farming based enterprises, due to inadequate irrigation facility with marginal and low land holdings. The agricultural economy is highly dependent on climate with low investment in agricultural practices and mono cropping with paddy as dominant crop, results lowers output and less income. The state has numbers of unemployed rural youth that are migrating to urban area in search of employment. At present, small and marginal farming scale decreases due to increasing cost of cultivation, less profit from market and degrading natural resources, agriculture based entrepreneurship development has become an important area of research (Singh et al., 2014; Ray et al., 2022). Small land holding and less access to land has been one of the major factors towards poor economic condition in the rural area (Dagar & Upadhyay, 2022). By conducting different capacity building

programme related to the sector, skill of the youth entrepreneur might be enhanced where they lack the required proficiency (Arunkumar et al., 2021).

Bihar's agriculture will get better advantage if the state involves young population and convince them into agriculture sector by making them rewarding and economically satisfying. At present more than 50 per cent of total population is young and can be involved in agricultural activities. "If we tap this huge demographic dividend by making agriculture exciting for the younger generation a far better result can be achieved," told by well-known scientist and father of green revolution, M.S. Swaminathan. The leadership qualities of KVK professional contribute significantly by administrative control, academic qualification and area of specialization (Sinha et al., 2021).

Long term involvement, initiative, number of employees, entrepreneurial experience and annual income on the part of trainees contribute to the success of any enterprise in agricultural sector (Kobba et al., 2021). Similarly the trainees should be encouraged to participate in the training programmes to express themselves, for which special sessions may be arranged (Kobba et al., 2020). Agriculture along with livestock rearing is the twin occupation mainly in rural household since prehistoric era. Animal husbandry

can give impetus for generating sustainable employment, food security and rural development. A proverb “Try not to become a man of success, but rather try to become a man of value.” said by Albert Einstein. This message conveys those people who want to make more of themselves, along with new creation and product in any form to stand out. By keeping these in view, the main objective of this project was to attract and involved more and more unemployed rural youth towards farming based enterprises.

### METHODOLOGY

Bihar and Jharkhand each are divided into three agro-climatic Zones. The three agro-climatic zone of Bihar are zone-I (North-West Alluvial plains), zone-II (North-East Alluvial plains) and zone-III (South Bihar Alluvial plains). East Champaran, West Champaran and Vaishali district of Bihar come under Zone-1 and Bhagalpur, Bhojpur and Aurangabad comes under Zone-III. Jharkhand’s agro-climatic zones are central and north eastern plateau zone, western plateau zone and south eastern plateau zone. The KVKs namely Ranchi, Chatra, Gumla comes under western plateau and East Singhbhum under south eastern plateau.

During 2017, “ARYA” project was started only in East Champaran and Gumla district of Bihar and Jharkhand respectively. Later, it was extended to ten Krishi Vigyan Kendra (KVKs) of Bihar (Aurangabad, Vaishali, Bhagalpur, East Champaran, West Champaran and Bhojpur) and Jharkhand (Ranchi, Chatra, Gumla and East Singhbhum). Data related to different enterprises against income and its impact on unemployed rural youth were collected involving these KVKs in prescribed format. Key data regarding different enterprises during 2020 were collected by interacting wide range of people interlinking them with KVK. Altogether, 13 enterprises were identified and data regarding income were collected before and after establishment of these enterprises and observed their impact on livelihood security. The information and data about entrepreneurship development, youth trained and income generated were collected by participatory rural appraisal (PRA) and rapid rural appraisal (RRA) etc. as suggested by Grandstaff & Messerschmidt (1995) & Chandra et al., (1997).

### RESULTS AND DISCUSSION

The rural youths of Bihar and Jharkhand under “ARYA” successfully adopted different enterprises to get extra income for

their livelihood and family security. The KVK under different districts adopted various enterprises are shown in Table 1. On prioritization of enterprises Lac cultivation (Ranchi and Gumla) and pig farming (Chatra and Gumla) were the enterprises adopted by rural youths of Jharkhand only. While, low-cost polyhouse nursery and duck farming were adopted by rural youths of East Singhbhum. However, quail farming and banana fibre extraction unit as an enterprise has been started in Vaishali and fish farming in Bhagalpur district of Bihar. Mushroom production has been considered as best enterprises by 06 KVKs followed by apiary (Beekeeping) by 05 KVKs and poultry farming by 04 KVKs.

The rural youths of Bihar and Jharkhand trained, established and run the enterprises sustainably along with average capacity of farm enterprises are shown in Table 2. From the table it can be observed that, maximum nos. of Bihar’s rural youth trained under poultry farming followed by nursery raising. However highest number of rural youth established and run their enterprises sustainably for mushroom production in Bihar. Likewise, during 2015-16, NABARD offices of Bihar and Jharkhand started training on different enterprises viz. poultry farming, goat rearing and pig farming involving 300 SHG women for its livelihood security. Singh et al., (2010), recorded that 63 and 43 per cent trainee adopted the beekeeping and mushroom cultivation respectively for its income generation in Punjab.

#### Mushroom production unit

The nutritional advantage of mushroom together with its capacity of income and employment generation, scientist strongly promoted white button mushroom cultivation in the state. Its cultivation can be popularized among landless and unemployed rural youth by interlinking them with different farm science centre and SAU. From the Figure 1 it can be observed that, among different district under mushroom production, Aurangabad’s rural youth got highest net return/year and it was lowest in Bhojpur district after training under ARYA. Similarly, average annual income of the sampled trainees was \$ 1690 in mushroom cultivation (Singh et al., 2010).

#### Livestock enterprises

Bihar is traditionally a consumer state for non-agricultural produce, mainly of eggs and fish. Consumer’s demand of eggs,

**Table 1.** List of economically viable enterprises identified in Bihar and Jharkhand under “ARYA”

S.No.	Name of enterprises	Name of KVKs	Total No. of KVKs
1.	Mushroom production	Aurangabad, Vaishali, East Champaran, West Champaran, Bhojpur and Chatra	6
2.	Poultry farming	Aurangabad, East Champaran, Bhagalpur and West Singhbhum	4
3.	Beekeeping	West Champaran, Bhojpur, Vaishali, Ranchi and Gumla	5
4.	Goat farming	Aurangabad, Ranchi and Gumla	3
5.	Nursery Raising	West Champaran, Bhagalpur and Vaishali	3
6.	Lac Farming	Ranchi and Gumla	2
7.	Pig farming	Chatra and Gumla	2
8.	Seed production	Chatra	1
9.	Low-cost polyhouse nursery	East Singhbhum	1
10.	Banana fibre extraction	Vaishali	1
11.	Quail farming	Vaishali	1
12.	Duck farming	East Singhbhum	1
13.	Fish farming	Bhagalpur	1

**Table 2.** Number of youth trained, enterprises established and run sustainably under “ARYA” in Bihar and Jharkhand

Name of enterprises	No. of Rural youths trained	No. of youths established their own entrepreneurial units	No. of youth running the entrepreneurial units in a sustainable manner	Avg. size of each entrepreneurial units (No. of bags/beehives/ seedlings etc.)
<b>Bihar</b>				
Mushroom production	322	170	117	1700
Poultry Farming	391	119	100	1200
Beekeeping	173	35	17	155
Banana fibre extraction	175	2	2	1 machine
Quail farming	275	10	10	
Fish farming	160	60	57	4000 fingerlings
Nursery raising	371	32	25	6075
Goatery	125	40	38	25
<b>Total (A)</b>	<b>1992</b>	<b>468</b>	<b>366</b>	
<b>Jharkhand</b>				
Mushroom production	135	30	15	40
Poultry Farming	180	25	18	50
Beekeeping	119	91	62	27
Low-cost poly house	220	25	19	48 sq. ft
Seed production	125	14	20	2 ha
Duck farming	186	25	14	100
Goatery	291	77	61	40
Pig farming	223	28	25	39
Lac farming	216	120	100	32
<b>Total (B)</b>	<b>1695</b>	<b>435</b>	<b>334</b>	
<b>Sub-Total (A+B)</b>	<b>3687</b>	<b>903</b>	<b>700</b>	

meats and milk increases day by day therefore, to fulfill this demand it is necessary to adopt animal-based farming enterprises. The birds involve in poultry farming are chicken, duck, quail and pigeon etc. The growth rate of 44.72 per cent per annum in poultry production draw attention and create opportunity for rural youth (business-standard.com, Feb, 2020). The eggs and meats are rich in protein, vitamin and minerals content. Their waste material is used as a source of farm manure. Poultry birds includes mainly 6 different types of chicken in which poultry birds are in highest demand (93% of total poultry population of world) followed by ducks and turkeys. Poultry producer companies members has more knowledge gain than non-members towards space requirement, quality of land for poultry shed, nutrients feed source and knowledge about vaccination (Patel et al., 2022). From the Figure 2 it can be seen that highest increase in net income/year after ARYA in Aurangabad and lowest in East Singhbhum district.

### Goat farming

Bihar is the 5<sup>th</sup> largest state in terms of goat population accounting 7.63 per cent of total India's goat population. The state's 42.6 per cent people are below poverty line and hence there is major scope of goat farming to minimize the vast gap between demand and supply of meat. There is no recognized goat breed in Bihar, but Bengal breed is well-suited in Bihar. The Black Bengal gives birth to twins, triplets, quadruplets normally in a single gestation. It is reared mainly for meat purpose, as these breeds give very less milk. Another goat breed suitable in Bihar is Barbari. However, in Jharkhand mainly two goat breeds Sirohi and Totapuri are chosen for its farming at commercial level. With low investment, it can be made profitable business for small and

marginal farmers and unemployed rural youth. Therefore, it can be popularized among them to adopt goatery as a farm enterprise. From the Figure 3 it can be observed that among three districts, Aurangabad's rural youth much benefitted from goat farming than others. Likewise, Kumar (2007) also studied about commercial goat farming, an emerging enterprise in India for income generation from small land holdings. Lack of veterinary services followed by inadequate credit facilities are the major constraints in Rajasthan, Banswara district in goat farming (Sharma & Kumar, 2022).

### Beekeeping

Apiculture has certain migratory path for honey production and colony production in Bihar (Singh et al., 1998). Its popularity increases day by day in rural area as it does not need full time laborers. Honey has good medicinal and food value. However, bee wax used in pharmaceutical, cosmetic industry and in candle making that gives extra income to the rural people. Bee venom helps in curing arthritis, rheumatic and pains. Therefore, it is beneficial for adopting beekeeping at commercial level to get good income. From the Figure 4 it can be observed that highest increase in net income/year was in Ranchi and lowest in Vaishali district after training under ARYA. They positively influenced the livelihood security of rural youth. Similarly, Singh et al., (2010) recorded average annual income of the sampled trainees of beekeeping was \$ 1800.

### Pig farming

As compared to other livestock species piggery unit give faster economic return to the farmer, due to its faster feed converting efficiency after broiler. It occupies significant status among tribal population of Eastern Indian states like Jharkhand, West Bengal,

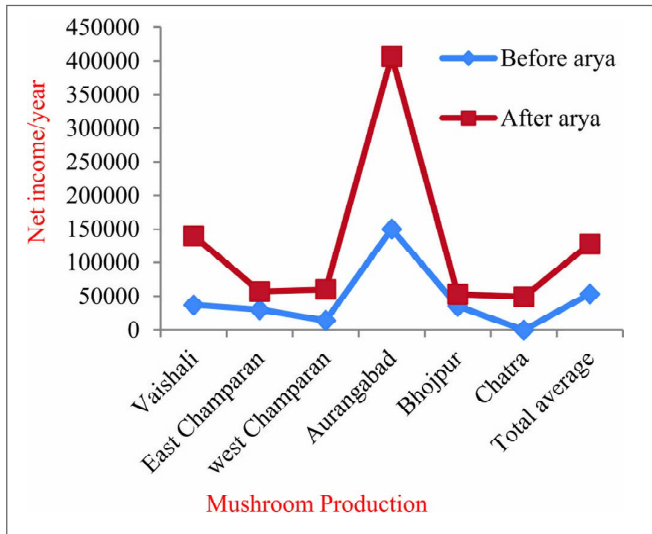


Figure 1. Net income before and after “ARYA” under mushroom production during 2020

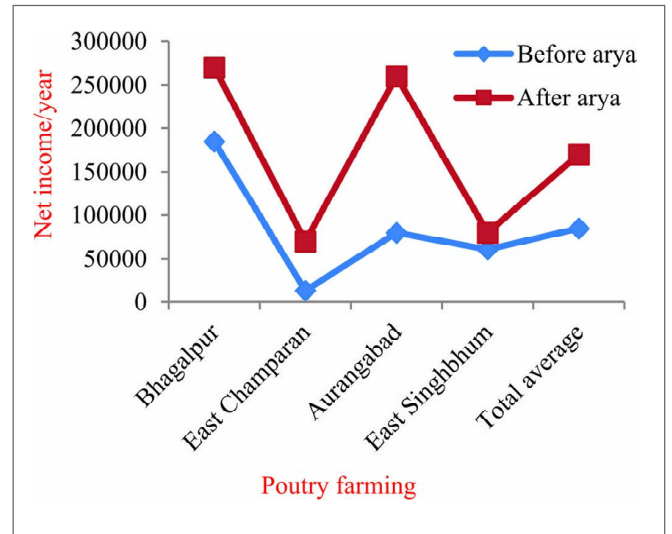


Figure 2. Net income after “ARYA” under poultry farming during 2020

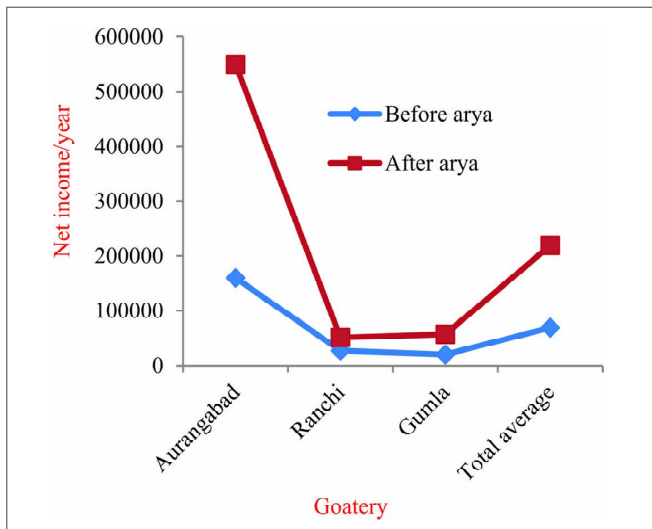


Figure 3. Net income before and after “ARYA” under goatery during 2020

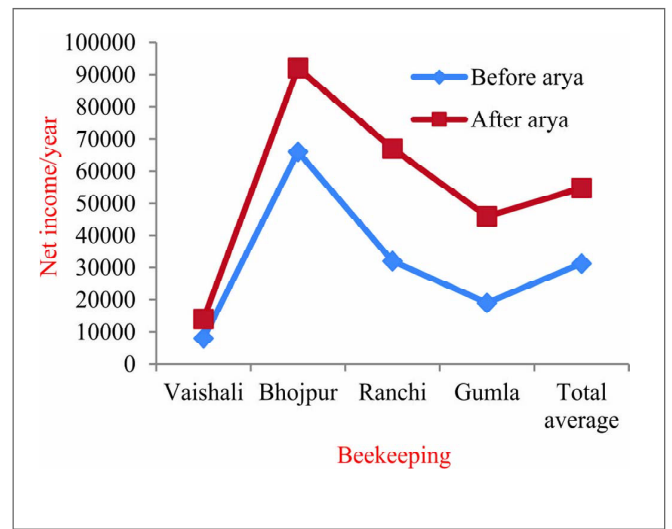


Figure 4. Net income before and after “ARYA” under Beekeeping during 2020

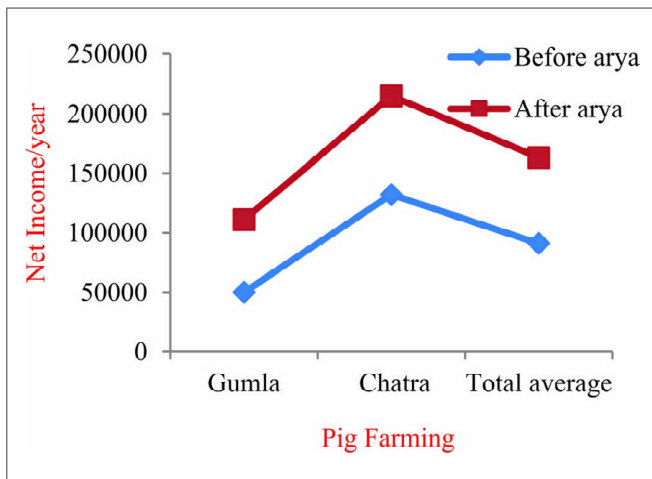


Figure 5. Net income before and after “ARYA” under Pig farming during 2020

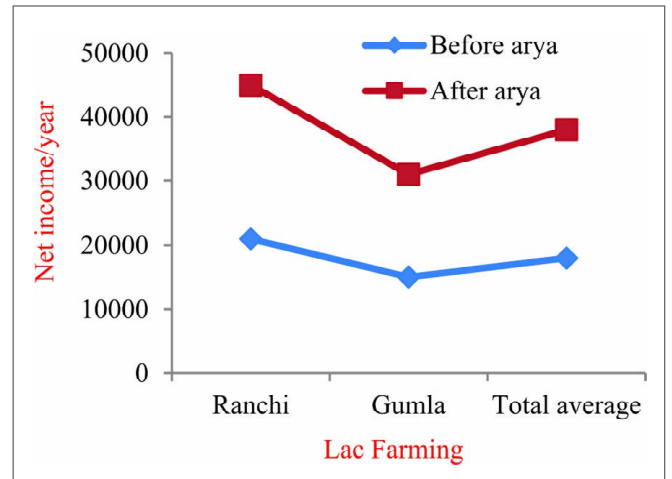


Figure 6. Net income before and after “ARYA” under Lac farming during 2020

North Eastern state and Orissa. Share of country’s pig population was 9.35 per cent by Jharkhand and 6.31 per cent by Bihar (Chauhan et al., 2016). The poor tribal of these states favored pork as main and preferential diet in bulk. Pig mainly reared by the rural poor of the lowest socio-economic strata for their livelihood security. They reared pig without following any scientific techniques for housing, feeding and vaccination. Therefore, ARYA scheme started training to rural people of Chatra & Gumla district (Jharkhand) for scientific pig breeding and meat production to get maximum income. It can be observed that the income of the rural youth increased almost 2-2.5 times after training under the project (Figure 5).

**Lac cultivation**

Lac is the resinous secretion of a number of lac insect mainly, *Kerria lacca*. It is produced mainly in Jharkhand which contributes

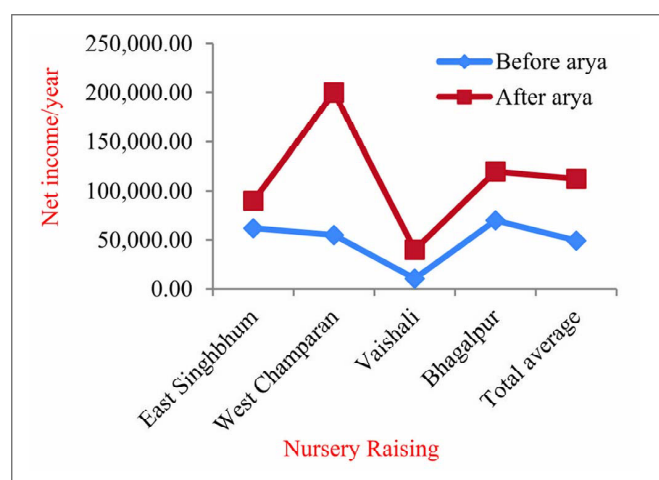
about 39 per cent of total lac production in India. There is much more availability of host trees as Palas (*Butea monosperma*), Kusum (*Schleichera oleosa*) and Ber (*Zizyphus mauritiana*) that create good opportunity to start its cultivation scientifically to get maximum return. Entrepreneurs mainly took lac as a subsidiary business but it provided much more income in low agriculture activity season (Magry et al., 2017). Total 28 per cent of agricultural income is contributed by lac production in Ranchi District told by a survey report done by Jaiswal et al., (2006). Therefore, lac is a very important alternative for entrepreneurship development in Jharkhand. From the Figure 6 it can be observed that increase in net income after ARYA was almost doubled in both district of Ranchi and Gumla.

**Nursery raising**

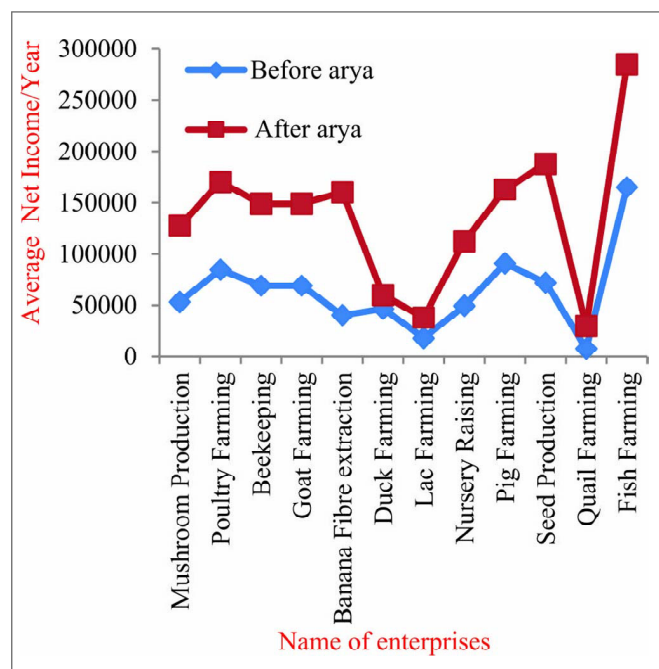
Nursery is a place where plants are grown and multiplied for further use in the main field. It is a pre requisite to meet the demand of quality seedlings and nursery management is a tool to carry out the various activities in successful way (Krishnan et al., 2014). There is great scope of nursery raising and its management for commercial cultivation of any horticultural crops in the state. Keeping in view, the training under ARYA was given in the selective district to enhance economical status of rural youth. The increase in net income under Nursery raising after ARYA was presented in Figure 7.

**Economic impact of different enterprises on income diversification after ARYA**

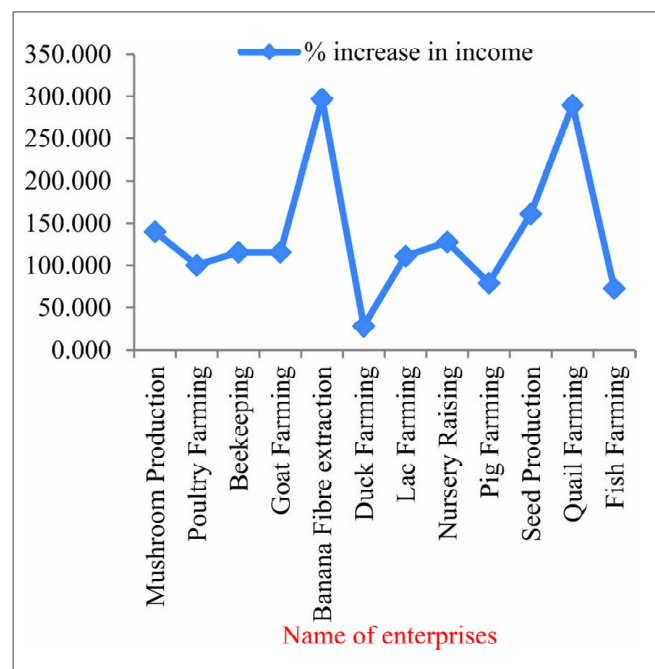
From the Figure 8 & 9 it can be clearly observed that highest increase in average net income/year and average percentage increase in income after training under “ARYA” in banana fibre extraction enterprises followed by quail farming and poultry farming.



**Figure 7.** Net income before and after “ARYA” under Nursery Raising during 2020



**Figure 8.** Average net income before and after “ARYA” against different enterprises during 2020



**Figure 9.** Average percentage increase in income after “ARYA” against different enterprises during 2020

However, the lowest percentage increment in total income was under duck farming. Likewise, training on beekeeping and mushroom cultivation was given by farm science centre, Punjab and trainers increases its income by 24 and 49 per cent, respectively (Singh et al., 2010).

### CONCLUSION

It was concluded that “ARYA” project shows positive impact on attracting and motivating unemployed rural youths of Bihar and Jharkhand. After successful training and intervention by different KVKs, rural youth adopted and established different enterprises for their income diversification and livelihood security. Mushroom production unit was established by most of the rural youth to fetch maximum income. Among 13 enterprises, running under Bihar and Jharkhand, Banana fibre extraction unit give maximum net return/year and lowest in case of duck farming as an enterprise. Therefore, all enterprises discussed above are beneficial for landless, small & marginal farmers and unemployed rural youth. By adopting these they fetch maximum return with low investment.

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