



## **Pigeon Rearing - An Investment Analysis for Secondary Income Generation to Farm Women, Landless, Marginal and Small Farmers**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. Author BM designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors TKD and BG managed the analyses of the study. Author KP managed the literature searches. All authors read and approved the final manuscript.*

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### **ABSTRACT**

Pigeon rearing not yet been considered in relation to the contribution of livestock sub-sector, though the pigeons rearing provide alternative source of animal protein. In India, majority of Hindu people believe that it brings happiness to their house. Female pigeons reach sexual maturity at about 5-7 months, laid eggs within 8–12 days after mating, the eggs hatch after 18 days of incubation. The breeding cycle in pigeons is about 2 months, when the cycle finished another breeding cycle begins consecutively. The body weight of mature brooding pigeon (male/female) ranges from 287 g to 290 g depends on the type of breed. Mortality rate of pigeon ranges from 5-15%. The Study was conducted in 4 villages of Cooch Behar district of West Bengal. 40 no. of respondents who were engaged in pigeon rearing are selected purposively. Data were collected through well design structure interviewed schedule and collected data was analyzed. The results revealed that pigeon rearing needs low investment, less care, low feed and low housing cost. The finding shows that benefit cost ratio is 8.72 at 10% of discounting rate for 12 years. Finding implied that it is an easy and economic husbandry practices which have short reproduction cycle and less disease

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occurrence. On an average, entrepreneur sale their squab at the rate of ₹ 240 per pair. Increasing the rate of pigeon farming may enhance the rate of reducing the gap of requirement of animal protein deficiency, increase income generation and may improve the socio-economic status of the rural poor community. From the findings it shows that pigeon rearing is require less initial investment and provides high income. Hence pigeon farming may be an easy, profitable, sustainable and reliable source of additional employment generation, opportunity for family labour utilization during their leisure time and way of earning quick cash income.

*Keywords: Pigeon; rearing; entrepreneurship; income generation; sustainable.*

## 1. INTRODUCTION

Pigeon rearing is a part of livestock and poultry and contributing some part in country's economy in the worldwide. Pigeon rearing is considered as a ready cash source of income during hard time and provides employment opportunities for villagers especially for poor women and educated unemployed youth [1].

In India, generally people rear pigeon for natural beautification and ornamental birds as source of recreation. In village area, pigeon rearing is practice for meat purpose in home consumption and very few people practice it for commercial purpose as income generation activity. Pigeon farming can be surely concluded that pigeon farming on the roof of the residence and in shop in urban and rural areas may be a source of earning and can contribute must to the economic development of Bangladesh. Some pigeon businessman lives on this job [2].

Hindu people believe keeping pigeon in their house brings happiness to their family In Egypt, domestic pigeons are reared in towers as domestic livestock. This entrepreneurship needs very less investment during the practice of the activity, which is very less compare to other entrepreneurship in management.

There is a large market for pigeons due to the delicious taste of their meat, which possesses abundant nutrients such as proteins, vitamins, calcium, and iron [3]. Pigeon provide an alternative source of animal protein to the human being.

The mating and brooding behavior of pigeons are differ from other domestic birds. Both parents become aggressive during brooding when the eggs have been hatched [1]. When attend to sexual maturity they build their own nest by themselves like other birds. The mortality rate of pigeon rearing is very low (12%-15%) compare to others like poultry, duckery, quill rearing etc.

Generally, they makes two nests for rearing their squabs and both the nests are alternatively used for incubating the eggs, rearing the hatched squabs and controlling a well-timed breeding cycle. Female pigeons reach sexual maturity at about 7 months, eggs are laid 8–12 days after mating and eggs are hatch after 18 days of incubation [4]. Newly birth baby pigeon are called as squab and young squabs totally depend on their parents for feeding and welfare. Hand-rearing is the most effective method for rearing squabs and has been proven to be highly successful [5]. Newly hatched squabs leave the nest within 25–32 days. The breeding cycle in pigeons is about 2 months, when the cycle finished another breeding cycle begins consecutively [6] and [7]. Squab meat is very lean, easily digestible, and richer in protein, mineral and vitamin and good for sick patients and old people. Squab meat also used as tasty, delicate and fancy meat [8] and [9]. They required very little feed because they collect food their food themselves. A diet of 15–18% crude protein improves pigeon productivity and reproductive performance [10]. The body weight of mature brooding pigeon (male/female) ranges from 287 to 290g depends on the type of breed and the rearing environment. In case death of one parent, the other parent takes care of the squabs and rears them singly [4]. The body resistance power of the pigeon is more compared with other domesticated birds. [11] Reported that the mortality rate of pigeon ranges from 5-15%. Rural women have to manage in both household as well as their outside farm. So they have very limited time engaged in a particular activity. Pigeon rearing which is required low investment care less, little feed and housing cost involved, easy and economic husbandry practices, short reproduction cycle and less disease occurrence and it is very much suitable women to start the entrepreneurship. Hence, it is easy, profitable and reliable source of additional and quick cash income generation activity where family labour can be utilized during leisure time.

## 2. METHODOLOGY

The Study was conducted in four villages namely Dakhin Kalaraikuthi, Angarkata, Patlakhoa and Singimari villages of Cooch Behar district of West Bengal in India in January, 2020. 40 no. of respondents who are engaged in pigeon rearing are selected purposively for the study. From each village 10 no. of respondents were selected purposively to make sample size of 40. Primary data were collected through well designed structured interview schedule. Collected data were compiled and analyzed with simple mathematical tools. Tabular analysis for assessing the financial advantage was done in absolute term. Since pigeon rearing is a perennial investment activity, project appraisal technique or financial analysis for testing the viability was also made. Accordingly, discounting method (with 10 per cent discounting rate) was used. The following formulas are used for analysis.

$$\text{Benefit: Cost ratio} = \frac{\sum B_n / (1+r)^n}{\sum C_n / (1+r)^n}$$

$$\text{Net Present Value (NPV)} = \sum B_n / (1+r)^n - \sum C_n / (1+r)^n$$

To calculate IRR, NPV need to zero

$$\text{Internal Rate of Interest (IRR)} = \sum B_n / (1+r)^n / \sum (1+r)^n$$

Where,

$B_n$  = Discounting Benefit

$C_n$  = Discounting Cost

$n$  = Nos. of years

$r$  = discounting rate of interest (10%)

## 3. RESULTS AND DISCUSSION

### 3.1 General Characteristics of the Respondents

In the study villages, the respondents are rearing pigeon for both home consumption as well as income generation during their critical period. The rearer are in the age group of 30-45 years. The respondent are acquiring land holding size of less than 0.3 hectares and have less then very few income source. The majority of the rearer has kaccha type of house. They practice pigeon rearing their house roof side and store house (paddy house and fire wood store house). Majority of the respondent are engaged in agriculture and wages labour.

Generally, rearing of pigeon is very easy in rural area because of large area of open space and having lots of field where they can manage their food very easily. It is a profitable business if the entrepreneur can rear large numbers of pigeon for commercial purposes. The study area shows that majority of the household had more than 40 nos. of pigeon in their house. The life span of a pigeon is 12-15 years. So to analyse the cost benefit ratio, average 13 year is considered in the study.

The above table shows that the initial year involved cost of pigeon (20pair @ ₹120/piece), cost of housing, feed and miscellaneous. Pigeon rearing do not need cost of housing every year, so from second year onwards to till fourth years only cost of feed and miscellaneous was considered. Every fifth year cost of housing with feed and miscellaneous was included. In the initial the entrepreneur will get only 160 nos. of squab because pigeon needs around ±6 month to reach brooding stage for lay eggs and hatching. So in first 6th month, 40nos. of squab will obtained and another 6th month 120 nos. of squab at the rate two month of interval. Pigeon lay eggs every 2 month of interval i.e., one month for incubation and another one month for growing up of squab. From second year onwards, the entrepreneur will almost fixed nos. of squab i.e., 40 nos. at 2 month interval. Therefore, in each year the entrepreneur will receive consecutively 240 nos. of squab in a year from 20 pairs of pigeon till 12-13 years. The rate of sale of the pigeon was differing i.e. 120/- to -150/- as the time goes. The study shows that cost of expenditure is ₹ 27920.38/- and the cost of return is ₹ 243456/- after 13 years of rearing 20 pairs of pigeon.

### 3.2 Result of Investment Analysis

Benefit: Cost Ratio (BCR) = Discounting of total return / Discounting of total cost= 8.72

Net Present Value (NPV) = Discounting of total return- Discounting of total cost= ₹ 215535.62

Internal Rate of Return (IRR) : >50%

As BCR is more than one (1), NPV is positive and IRR is more than 50 per cent, the investment in pigeon rearing is economically viable. This means that if anyone is willing to invest in pigeon rearing, he/she will earn substantial profit in the long run.

**Table 1. Cost and benefit ratio of rearing of 20 pairs of pigeon for 13 years at the rate of 10% of discounting**

Year	Item	Expenditure			Return			
		Amount (₹)	Discounting of 10%	Discounting cost (₹)	Item	Amount (₹)	Discounting of 10%	Discounting return (₹)
0	Cost of housing, feed & miscellaneous	7000	1	7000	Sale 160 nos. of squab @ □120/pc	19200	1	19200
1	Cost of feed & miscellaneous	2000	0.91	1818.18	sale 240 nos. of squab @ □120/pc	28800	0.91	26208
2	Cost of feed & miscellaneous	4200	0.83	3471.07	sale 240 nos. of squab @ □120/pc	28800	0.83	23904
3	Cost of feed & miscellaneous	2600	0.75	1953.41	sale 240 nos. of squab @ □130/pc	31200	0.75	23400
4	Cost of housing, feed & miscellaneous	3800	0.68	2595.45	sale 240 nos. of squab @ □130/pc	31200	0.68	21216
5	Cost of feed & miscellaneous	2600	0.62	1614.39	sale 240 nos of squab @ □140/pc	33600	0.62	20832
6	Cost of feed & miscellaneous	2600	0.56	1467.63	sale 240 nos. of squab @ □140/pc	33600	0.56	18816
7	Cost of feed & miscellaneous	2800	0.51	1436.84	sale 240 nos. of squab @ □140/pc	33600	0.51	17136
8	Cost of feed & miscellaneous	3000	0.47	1399.52	sale 240 nos. of squab @ □150/pc	36000	0.47	16920
9	Cost of housing, feed & miscellaneous	4400	0.42	1866.02	sale 240 nos. of squab @ □150/pc	36000	0.42	15120
10	Cost of feed & miscellaneous	3000	0.39	1156.62	sale 240 nos. of squab @ □160/pc	38400	0.39	14976
11	Cost of feed & miscellaneous	3200	0.35	1121.580478	sale 240 nos. of squab @ □160/pc	38400	0.35	13440
12	Cost of feed & miscellaneous	3200	0.32	1019.61	sale 240 nos. of squab @ □160/pc	38400	0.32	12288
	Total Cost			27920.38	Total Return			243456

The in view of finding out the income per year and per month, the results of investment analysis have been used which shows that

Income per year= ₹17961.30

Income per month= ₹1496.78

The above economics in pigeon rearing shows that monthly income is around ₹ 1500/- if 20 pair of pigeon is reared. The income of the entrepreneurship totally depends on nos. or size of the pigeon reared by the entrepreneur. The study shows that the investment analysis is viable and sustainable for long term.

#### Marketing Status:

- ❑ Farmers can sale their product directly to neighbor, middleman and weekly market.
- ❑ Average price of pigeon is ₹240/pair where as black colour pigeon are sale @ ₹300-350/pair.
- ❑ Price of black pigeon goes higher during puja time.
- ❑ Healthy pure white colour pigeon are sale @ ₹ 500-700/pc because some people believe that it brings peace in their house.

#### Advantage:

- At the age of six months onwards, they start laying eggs and produce at least 2 squab/ month.
- Pigeons can be rear easily in yard or roof of the house.
- Requirement of pigeon feed is low because in most cases, they collect food by themselves.
- Pigeon and squab meat is tasty, nutritious and has a great demand in the market places and others.
- Maximum profit can be obtained with minimum investment.
- Most cases, profit can be seen in the business within 3-4 months.
- Occurrence of disease comparatively low and management less.
- Provides good fertilizer for nearby crops, garden and household plants.
- It acts as predator by eating different types of insects.
- Squab's meat is good for patients and old people.
- Pigeon farming is profitable as well as entertaining.
- Pigeon farming can be a great source of income for small, marginal, landless people and farm women.

#### 4. LIMITATION

- ❖ Pigeon farming are not well organized in the rural areas.
- ❖ Most of the villagers rear pigeon in small scale in scavenging system following tradition method and provide supplementary feeding only.
- ❖ Farmers rear desi (*indigenous*) pigeon and having no idea about high yielding breed.

#### 5. CONCLUSION

Pigeon rearing is a profitable business with minimum initial investment and skill. Price of meat is high and marketing is not a problem. Low rate of mortality and less care or management, the entrepreneurship is more sustainable. Introduction of improve breeds will ensure better income and employment opportunity. Increasing the rate of pigeon farming may enhance the rate of reducing the gap of animal protein consumption/deficiency and may improve the socio-economic status of the rural poor community. Rural women are involved both in household work as well as in farm activity and due to this reason they have limited time to devote on any entrepreneurship which can provide good amount of return to them. So, pigeon rearing is a risk free, suitable and sustainable entrepreneurship for the rural women, landless, marginal and small farmers for its low initial investment. Pigeon rearing will be more popular in future, if government takes little initiative to train farmers, creates awareness and ensured loans.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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