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A CASE STUDY ON BACKYARD POULTRY FARMING AT GOLLARAKOPPALU VILLAGE, HASSAN DISTRICT, KARNATAKA

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Abstract: The present study was conducted by analyzing the management and production performance of backyard poultry farming at Gollarakoppalu village, Hassan district, Karnataka during 2023. This comprehensive study includes primary data collection with respect to history, status, production, reasons of raising, breeds, breeding system, feeding, health, housing management and economics on backyard poultry breeds based on structured questionnaires. The results revealed thatsignificant variations among backyard poultry varieties in the farms and their adaptability to disease tolerance as well as productivity. Also, high return on investment was the major reason for adapting improved poultry breed followed by low investment and high growth rate. Further, there has been a common practice to use indigenous breeds in backyard poultry, but these days improved chicken breeds are introduced in farming because of poor and slow production of eggs by native chickens. Hence, the factors that play crucial role in inhibiting and proliferation of backyard poultry husbandry may determine the success of backyard poultry in a particular region. Thus, it can be concluded that the present study suggests key points for improved backyard poultry production.

Keywords: Backyard poultry farming, Management Practices, Production and Economics, Hassan district.

I. INTRODUCTION

Poultry provides an immense supply of food for the world's population. All over the globe, poultry meat and eggs are preferred to other kinds of animal food products for a variety of reasons(Alders, 2012). The poultry industry in the country in present era has grown rapidly on account of its low capital investment, early assured returns, short generation intervals and limited land requirements. These days, it is a highly specialized, complex, competitive business, characterized by a phenomenal growth and has become one of the fastest growing sector of Indian agriculture. It has been recognized as a vital sector for the generation of employment and highly nutritious food for ever-growing human population (Singh, 2022).Village chicken production under the free range and semi-intensive system is one of the viable alternative systems for improving the livelihood for rural households which provide additional income and supplement protein intake in rural and tribal folks (Niranjan *et al.*, 2008).

India ranks 3rd in egg production and 5th in meat production in the world and the per capital availability is 79 eggs and 3.12 kg chicken meat per annum (Rajkumar *et al.*, 2021). The availability of eggs and chicken meat is highly variable in different parts of country due to disparities in production levels and their transportation and availability between urban and rural areas (Chatterjee *et al.*, 2015).The contribution of native birds in the total poultry population has dropped from 50% about 30 years ago to about 10% now. Backyard poultry contributes the production of native fowls about 11.9 billion eggs, the improved fowls lay about 5.19 billion eggs, while other avian species produce 1.32 billion eggs in the country.

Poultry are also involved in human recreational activities in many parts of the world, from pigeon racing to cock fighting. This can frequently result in the raising of many different poultry species like local breed chickens, ducks, pigeons, game fowl and geese within the same small area of land where the owners themselves also live (Alders, 2012). Backyard poultry provide a cheap source of animal protein, generates income, and has religious or cultural values among the majority of the rural communities (Alders *et al.*, 2009).

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Backyard poultry keeping plays a major role in livelihood improvement and income generation in rural communities, women being the primary owners of the flock (Roy *et al.*, 2017). The backyard indigenous chickens provide a high quality meat and eggs as food and cash income for the majority of the people living in the rural areas (Kumar, 2013).

Livestock with poultry in broader sense is considered to be the backbone of Indian farmers. It is a major contributor in Indian economy (Nath *et al.*, 2012). In some of the developing countries including a country like India, rural poultry farming has been recognized as a paramount importance tool for income generation as well as improvement of livelihood of rural poor. Now, there is an increase in trend of growing market, infrastructure, which adds to backyard poultry for rural production which is consumed mostly at home. Backyard poultry is primarily kept for egg and meat production on a subsistence basis in rural areas of India. Farmers usually rare native type chicken having low egg and meat production potential(Roy *et al.*, 2017).

Intensive poultry farming has achieved impressive growth in India, but the rural poultry farming is still struggling due to their low productivity. The demand for local chickens and eggs is very high as compared to broiler and layer eggs due to their better taste, texture and flavour as perceived by the local population (Sapcota*et al.*, 2002). The native chickens varieties adopted in free range backyard conditions for centuries contribute about 11% of total egg production in India (Kumaresan *et al.*, 2008). Due to their low productivity, the contribution to total egg production is almost static for the last few decades. Unconventional feed resources like insects, ant, fallen grains, green grass, kitchen waste etc., can be efficiently converted into egg and chicken meat for human consumption that alleviates protein malnutrition in poor rural families (Khadda*et al.*, 2015).

Poultry production is one of the fastest growing food production sectors in country. Egg production in India has gone up from 2881 million in 1961 to 36500 million in 2000, while poultry meat production increased from 81000 MT to 1050000 MT during the same period. The value of poultry products produced in the country has climbed steeply from Rs.8000 million in 1980 to Rs.100000 million in 2000. The State of Andhra Pradesh stood first in poultry production followed by West Bengal, Maharashtra, Tamil Nadu, Kerala and Bihar. Total poultry population as per estimate of 2003 was 489 million (Prasad, 2015).At the same time there is need to collect, characterize and improve the native chickens for production traits which will otherwise be lost in near future by genetic erosion or due to introduction of improved varieties (Sree *et al.*, 2017)**.**

Although poultry farming has shown a very promising and rising trend in recent days, the major growth of this industry was found confined in urban or semi-urban areas of the country. By using high quality chickens breeds or native breeds is not only drawing huge attention but also acquiring popularity in the rural population to resolve the problems of hunger, malnutrition and protein deficiency. Moreover backyard poultry farming would be a potential subsidiary income source among the rural people in our country (Horst, 1998). This practice provides a high economic return with low initial investment. This small-scale poultry sector not only economically supports the rural families but also, gets the source of nutritious foods as poultry meat and eggs. Apart from these, such a small-scale local business model is ideal for the economic independence and empowerment of rural women. Backyard poultry is advantageous as it provides supplementary income in the shortest possible time with minimum ensures the availability of eggs and meat even in remote rural areas. The indigenous breeds are used better adaptable even though continuous exposures to disease incidence, inadequate quantity and quality of feed, poor housing and health care.With this background, the present pioneer study was carried out at Gollarakoppalu village, Hassan district, Karnataka.

II. MATERIALS AND METHODOLOGY

STUDY AREA

A study was conducted at Gollarakoppalu village (12^0 42'36" N longitude to $76^0$15'30"E latitude),Holenarsipura Taluk of Hassan District, Karnataka during May to September, 2023. Primary data of households were collected by using semi-structured questionnaire (includes data *viz.*, Types of poultry reared, flock size and composition, production and reproduction performance, management practices, provision of additional feed, vaccination, use of modern medication and constraints of backyard chicken production system) and individualrespondents were interviewed in order to obtain quantitative data. Further, direct observation of flocks, feeding & watering practices and poultry houses was carried out during the survey period as per the standard methods.

ETHICAL CONSIDERATIONS

Ethical considerations were followed during the data collection process. Ethical accountability towards the respondents was maintained to ensure no one was harmed in any possible way.

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CONCEPTUAL FRAMEWORK

The conceptual framework adopted in this study is built on the relationship between backyard gardening and an improvement in farm household. The production decision of a household is affected by internal and external factors. The internal factors are the household characteristics such as age, education level and household size as well as farming experience, income level and gender, while the external factors are the institutional factors such as transaction costs, extension services and land tenure.

III. RESULTS AND DISCUSSION

The present study was carried out on backyard poultry farm in selected site, the available flocks breeds are nearly eight different species. When the chicks are broughtthey were kept under artificial heat climate until 21 days. The species lived in the backyard poultry farm are usually cross breeds not the original breeds of poultry.Giriraja, Vanaraja, Black plumage, Gramapriya, Siciliana, *Robusta maculata*, *Robusta lionata*and Aseel chicken are scientifically classified as *Gallusgallusdomesticus* belongs to the order Galliformes and family Phasianidae.Table 1shows the classification and characteristic features of backyard poultry breeds in the experimental farm. In this farm total 600 species of chicken breeds are present where highest is Giriraja (120), Vanaraja (110), Black plumage (80), Gramapriya (100), Siciliana (30), *Robusta maculate* (50),*Robusta lionata*(50)and Aseel (60). Figure 1 represents percent occurrence of percentage occurrence of different poultry breeds of backyard poultry farm at Gollarakoppalu, Hassan district, Karnataka.The management practices of backyard poultry farm which is compared with other backyard poultry farm in same village is depicted in Table 2. The backyard poultry farm contributes mixed poultry and crops with small scale extensive scavenging production system under the area of 1.5acres. The livestock raised regularly with local and cross breeds nearly 600 (200 Males and 400 Females) for the purpose of meat and egg production. The poultry housing is free range and night shelter with conventional materials. The poultry breeds are regularly subjected to veterinary services. In order to achieve this,simple housing is required for backyard poultry farming but, it should be needed for the comfort, protection from sun, rain, predators and efficient production of eggs and meat. Thus, proper housing is one of the per-requisites of sound poultry farming and a good housing is comfortable, safe, economical and convenient. In the visited backyard poultry farm, free range system is practiced the birds are let loose in day time for foraging and at night sheltered in shed. The poultry house were equipped with housing materials like grass, wood and mesh. It is free from water seepage and moisture and floor is elevated land (minimum 2ft) and free from water crack thus it is easily cleaned. The height of the poultry house is generally 7 to 8ft, here the centre height is 9 to 12ft with slope in either side. Brooder house having easy ventilation and wire netting which is used for open ventilation is noticed. Provision of bulb fitted above the ground due to keep the cheeks warm. In this backyard poultry farm both the natural and artificial brooding (to care day old chick up to growing period) system is carried out. In artificial brooding of chicks artificial heat is provided by different heat sources like electricity, gas, sawdust etc. In this backyard poultry farming the feed cost input is considered to be minimum. In this poultry farm, the birds are let loose for scavenging in the open areas during the day time inside the separate limited boundary(Shashi Pal *et al.*, 2020) reported that the backyard poultry breeds feed on insects, termites, seeds of grasses and weeds, leftover grains, crop residues and household wastes for their protein, energy, minerals and vitamins requirements. Majority the feed for birds are prepared by ingredients like maize, millet, broken rice, rice bran, wheat bran, groundnut meals and cereals as well as wastage of pulses etc. In this farm feeding is practiced two times in a day (morning and evening) if birds are in confined area. The balanced ration is formulated with local available ingredients is given to reduce the feed cost.

Table 3 represents the average daily feed intakes (g) per bird of backyard poultry breeds at Gollarakoppalu. In the time interval of 1st to 9th week of age Giriraja consumes (14.5g, 19g, 24g, 28g, 35g, 39g, 42g, 47g, 56g) Vanaraja - (10g, 18g, 22g, 26g, 30g, 36g, 40g, 45g, 50g) Black plumage - (13.2g, 14.5g, 19g, 24g, 30g, 34g, 38g, 42g, 49g) Gramapriya - (12g, 13.2g, 19g, 23g, 27g, 35g, 39g, 42g, 48g) Siciliana - (14g, 17g, 26g, 30g, 34g, 39g, 40.2g, 46g, 52g) *Robusta maculata* - (15g, 15.8g, 21g, 29g, 31g, 37g, 42g, 49g, 56g) *Robusta lionata*- (15.2g, 19g, 22g, 30g, 34g, 39g, 46g, 50g, 55g) and Aseel - (10g, 17g, 22g, 28g, 32g, 39g, 42g, 47g, 56g) of feed which together includes maize, millet, rice bran, groundnut meals and cereals. Table 5shows the total intake of feed of different backyard poultry breeds. For every week interval nearly 4-5g of feed will be increase during growth face. The capacity of feed intake is different in every backyard poultry breeds which depends upon their adaptability. For better health care in backyard poultry farming birds should be vaccinated against viral diseases. The diseases that mostly affect the birds are Ranikhet disease, Marek's disease etc,. vaccination schedule is followed in backyard poultry production system where the disease prevalence to protect birds from the diseases at farm and it is done timely and regularly (Shashi Pal *et al*,. 2020)Vaccination schedule for poultry bird is given in Table 6showed that Marek's HVT Vaccine is given for day old chicken to fight against Marek's disease. Infectious brutal vaccine is given for day old chicken while releasing in brooder. IBD killed and Debeaking vaccination is done on 6th, 7th, and 10th day age of poultry bird. Deworming of birds for parasites is done at 9th week to maintain a healthy and worm free flock.

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Table 6shows comparative egg production performance of backyard poultry breeds at Gollarakoppalu. The average age at first egg production of Giriraja, Vanaraja, Black plumage, Gramapriya, Siciliana, *Robusta maculata, Robusta lionata* and Aseel is 152, 145, 155, 150, 162, 162, 162, 185 days and annual egg production of each breeds are maximum 51, 49, 41, 55, 59, 60, 47, 41 with average weight of egg upto 1.5 to 3.5g. Figure 2represents the percentage of annual egg production of different backyard poultry breeds i.e, Giriraja-12%, Vanaraja-12%, Black plumage-10%, Gramapriya-14%, Siciliana-15%, *Robusta maculata* -15%, *Robusta lionata*-12%, Aseel-10%. Table 7 shows the economics of rearing breeds of backyard poultry farm. The cost of shed, equipment, labor and other miscellaneous considered to be capital cost. Here cost of shed at 1sq.ft per bird for 600 poultry chickens ranges at Rs.200 per sq.ft, so the total construction cost is Rs.90,000/-. Other equipment cost includes nearly Rs.1500/- for six feeder and 3 waterer and Rs.500/- is considered for Miscellaneous purpose. Hence total capital cost is Rs.92,000/- . Rearing cost includes feeding and vaccine cost of backyard poultry breeds with including the transportation.Cost spending for feed is less due to the backyard poultry breeds eats natural feed when they left free. Cost of feeding and vaccination permits Rs.4,400/- and Rs.3000/- considered for miscellaneous cost. Hence the total recurring cost of backyard poultry birds is Rs.44,400/- . The selling price includes sales of chicken and eggs. The adult bird weighs up to 1.5 kg is cost nearly Rs.400/- and the cost of village chickens egg is Rs.10/- per egg. Hence the total selling cost is Rs.2,44,000. Total expenditure incurred for rearing 600 birds is Rs.1,36,400/-. The income generated approximately 55% i.e., Rs.1.07,600/-. Finally it can be conclude that there is more profit in the practice of backyard poultry farm with less investment.

IV. CONCLUSION

The present study examined the profitability of backyard poultry production in Gollarakoppalu, Village, Hassan district, Karnataka. It also revealed that backyard poultry production is a profitable venture in the study area. Summing up the above discussion it can be inferred that alternative poultry production for sustainable livelihood. There is a scope and perspective in the alternative poultry production which called as an *entry point* for the poverty reduction. Approach should be developed to improve village production with technological interventions. In this respect, government policies should be made which emphasize on the market system. In order to achieve maximum benefits from backyard poultry farming, strategic and systemic training is required for rural communities. Small scale backyard poultry production system is an important sustainable agricultural practice for increasing food production, food security and women empowerment and employment to the rural population.

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TABLE 1: NUMBER OF BACKYARD POULTRY BREEDS EMPLOYED AND THEIR CHARACTERS AT GOLLARAKOPPALU VILLAGE, HASSAN DISTRICT, KARNATAKA

Sl. No.	POULTRY BREEDS	No's	CHARACTERS
1.	*Giriraja*	120	Synthetic multicoloured dual purpose breed originated in India
2.	*Vanaraja*	110	Multicoloured plumage and dual purpose breed originated in India
3.	*Black plumage*	80	Dual purpose breed with solid black coloured across all feathers
4.	*Gramapriya*	100	Dual purpose breed with partridge colour
5.	*Siciliana*	30	Italian dual purpose breed with rose comb
6.	*Robusta maculata*	50	Modern Italian dual purpose breed with single comb
7.	*Robusta lionata*	50	Modern Italian dual purpose breed with single comb
8.	*Aseel*	60	Large game chicken used for cock fighting and meat

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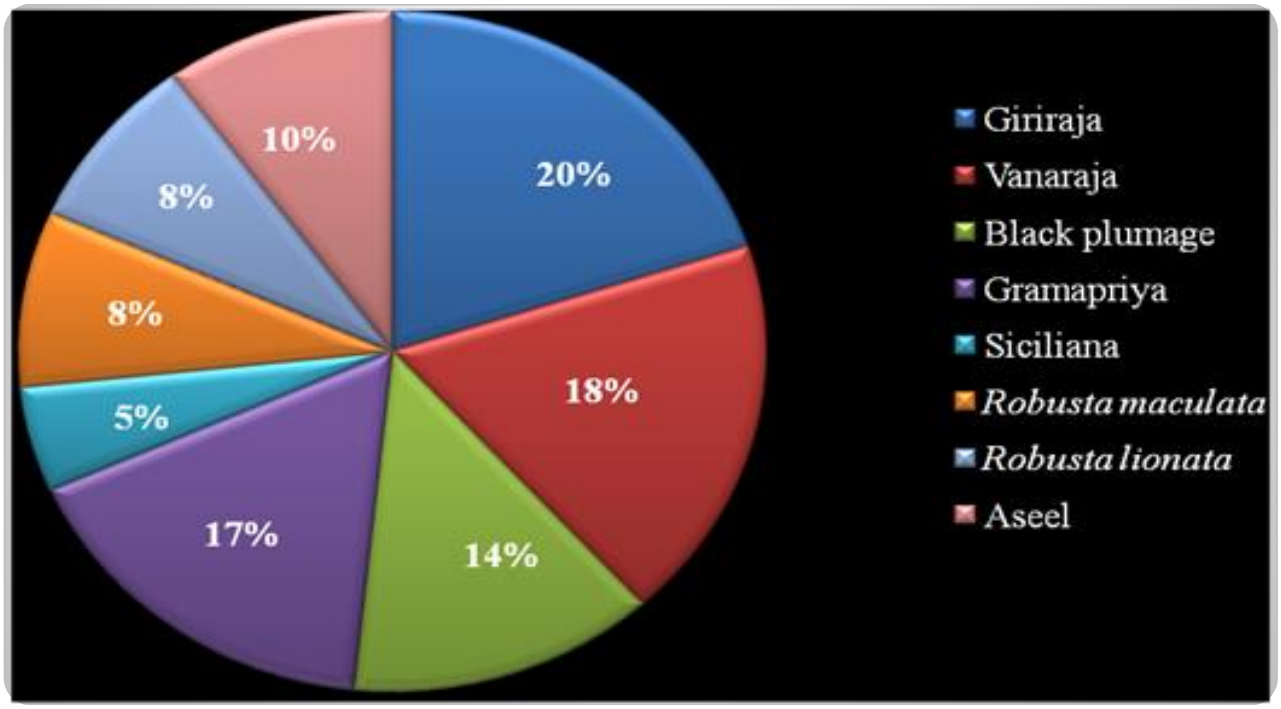

FIGURE 1: PERCENT OCCURRENCE OF DIFFERENT POULTRY BREEDS OF BACKYARD POULTRY FARM AT GOLLARAKOPPALU, HASSAN DISTRICT, KARNATAKA.

TABLE 2. MANAGEMENT PRACTICES OF BACKYARD POULTRY FARM AT GOLLARAKOPPALU, HASSAN DISTRICT, KARNATAKA

CRITERIA	BACKYARD POULTRY FARM
PRODUCTION/ FARMING SYSTEM	Mixed , poultry and crops with small-scale extensive scavenging
LIVESTOCK RAISED	Regularly
POULTRY BREEDS	Local and cross breeds
FLOCK NUMBER	600 (nearly 200 male and 400 female)
POULTRY HOUSING	Free range & night shelter with conventional materials; good quality houses
ACCESS TO VETERINARY SERVICES	Regularly
PRODUCTS	Live birds, meat, eggs
AREA DISTRIBUTED	1- 1.5 acres

TABLE 3. AVERAGE DAILY FEED INTAKES (G) PER BIRD OF BACKYARD POULTRY BREEDS AT GOLLARAKOPPALU, HASSAN DISTRICT, KARNATAKA

AGE (WEEKS)	DAILY INTAKE(g) (Maize, Millet, Rice bran, Groundnut,Meals and Cereals)							
	Giriraja	*Vanaraja*	*Black plumage*	*Gramapriya*	*Siciliana*	*Robusta maculata*	*Robusta lionata*	*Aseel*
1st	14.5	10	13.2	12	14	15	15.2	10
2nd	19	18	14.5	13.2	17	15.8	19	17
3rd	24	22	19	19	26	21	22	22
4th	28	26	24	23	30	29	30	28
5th	35	30	30	27	34	31	34	32
6th	39	36	34	35	39	37	39	39
7th	42	40	38	39	40.2	42	46	42
8th	47	45	42	42	46	49	50	47
9th	56	50	49	48	52	56	55	56
TOTAL	**304.5g**	**277g**	**263.7g**	**258.2g**	**298.2g**	**295.8g**	**310.2g**	**293g**

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TABLE 4. TOTAL WEEKLYY FEED INTAKE OF BACKYARD POULTRY BREEDS AT GOLLARAKOPPALU, HASSAN DISTRICT, KARNATAKA

Sl. No.	SPECIES	TOTAL FEED INTAKE (1st TO 9th WEEK)
1.	*Giriraja*	304.5 g
2.	*Vanaraja*	277 g
3.	*Black plumage*	263.7 g
4.	*Gramapriya*	258.2 g
5.	*Siciliana*	298.2 g
6.	*Robusta maculate*	295.8 g
7.	*Robusta lionata*	310.2 g
8.	*Aseel*	293 g
TOTAL(kg)		**2.300 kg**

TABLE 5. VACCINATION SCHEDULE FOR POULTRY BREEDS AT GOLLARAKOPPALU, HASSAN DISTRICT

Sl. No	AGE	NAME OF THE VACCINE	DOSE (ml)	ROUTE OF VACCINATION
1.	Day old	Marek's HVT Vaccine	0.2	S/C
2.	Day old	IB vaccine on arrival while releasing in brooder (optional)	-	I/O
3.	5th	New castle	-	-
4.	6th ,7th day	IBD killed	0.3	S/C
5.	10th day	Debeaking	-	-
6.	14th day	IBD (Live) intermediate	0.3	I/O
7.	16-18th day	MD (HVT) freeze dried (brooder)	0.2	S/C
8.	21st day	IB (Live)	-	I/O
9.	28-30th day	Lasota booster and IBD (Live) intermediate booster	-	Eye or nostril
10.	8th week	Fowl pox	-	Wing web
11.	9th week	Deworming	-	-
12.	10th week	R2B (Live)	0.5	I/M Breast
13.	21st week	First blood testing	-	-
14.	23rd week	Second blood testing	-	-
15.	23rd week	ND + IBD	0.6	Drinking water

TABLE 6. COMPARATIVE EGG PRODUCTION PERFORMANCE OF BACKYARD POULTRY BREEDS AT GOLLARAKOPPALU,HASSAN DISTRICT, KARNATAKA

Sl. No.	Name of the breeds	Average age at first egg production	Average egg weight (g)	Average annual egg production (No's)
1.	*Giri raja*	152 days	3.22	50
2.	*Vana raja*	145 days	2.5	49
3.	*Black plumage*	155 days	1.5	40
4.	*Pepoi*	150 days	1.2	55
5.	*Siciliana*	165 days	2.5	59
6.	*Robusta maculata*	162 days	1.5	60
7.	*Robusta lionata*	162 days	1.5	46
8.	*Aseel*	185 days	1.5	41
TOTAL EGG PRODUCTION				**400**

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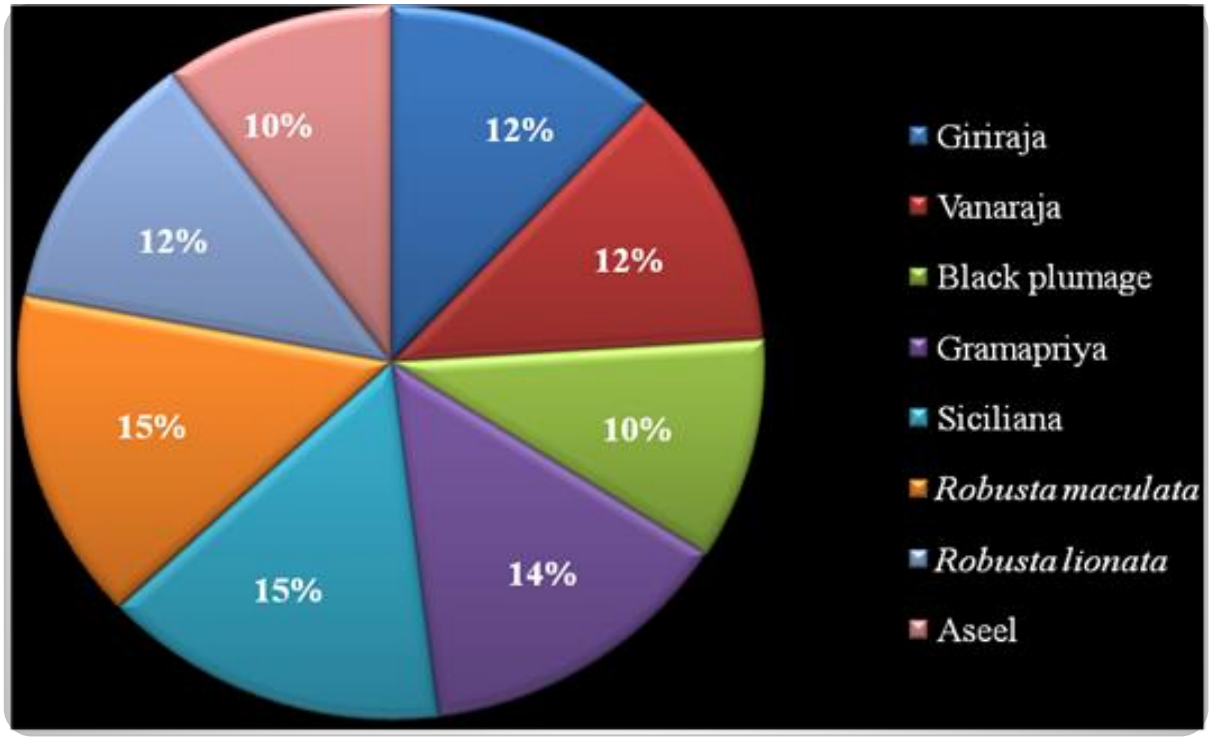

FIG.2 : PERCENTAGE OF TOTAL ANNUAL EGG PRODUCTION OF BACKYARD POULTRY BREEDS IN THE FARM AT GOLLARAKOPPALU, HASSAN DISTRICT, KARNATAKA

TABLE 7. ECONOMICS OF REARING BREEDS OF BACKYARD POULTRY FARM AT GOLLARAKOPPALU, HASSAN DISTRICT, KARNATAKA

A. Capital Cost	
Cost of construction @ 1sq.ft/bird for 600 @ Rs.150/sq.ft	Rs.90,000/-
Equipment 6 feeder & 3 waterer	Rs.1500/-
Miscellaneous	Rs.500/-
Labour cost (no labour cost)	-
Total capital cost	**Rs.92,000/-**
B. Rearing cost	
Cost of feed : birds are left free scavenging and especially kitchen-waste is used.	
Cost of feeding the birds up to 9th week - (roughly 2.300kg @ Rs.30/g/day/bird *600 birds (including transportation)	Rs.41,400/-
Miscellaneous cost (litter, medicine etc,.) Rs 5/-per bird*600	Rs.3000/-
Total recurring cost	**Rs.44,400/-**
C. Selling price	
Average body weight of birds at adult is 1.5kg/bird*600	
Rs.400/- per bird * 600	Rs.2,40,000/-
Sales of table eggs - at the rate of Rs.10/- for egg *600 birds (10*400)	Rs.4000/-
Note : not considered any mortality rate	-
Total selling cost	**Rs.2,44,000/-**
D. Total expenditure incurred for rearing 600 birds (Total A+B)	**Rs.1,36,400/-**
Profit/ Income (C-D)	**Rs.1,07,600/-**

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