

Poultry Production Scenario in Kerala: An Overview

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India is endowed with naturally diverse plant and animal genetic resources. India and the neighbouring countries have been referred to as the original home of Red Jungle fowl (*Gallus gallus* Linn.). The present-day domestic fowl is believed to have descended from the Red Jungle Fowl. Archeological evidence suggests that domesticated chickens existed in China 8,000 years ago. The earliest evidence of domestication of fowl in India is from Mohenjodaro. Accounts of cock fighting in India from 3000 years ago indicate that chicken have been part of the culture for a long time. There is substantial evidence to show that these birds moved through Middle-East to Europe and gave rise to present day European breeds, about 2000 years ago. It has been documented from extensive survey that there are 20 indigenous (*desi*) breeds in India.

The rural people of India largely depend on farming for their main income; most often mixed crop-livestock farming system. In terms of chicken wealth, the native fowls are of socioeconomic importance to the households of this country. Small farming families, landless labourers and people with income below the poverty line are able to rear chickens with low inputs but mainly via feed resource scavenging and harvest the benefits in the way of egg and meat. The backyard poultry, mostly comprised of native fowls had undergone natural selection in their habitats over thousands of years against the vagaries of nature, making them best adapted stock for the climatic conditions of their origin. They are resistant to diseases and can survive well on scavenging and the leftover feed in the houses. During the process of evolution, these populations were also subjected to artificial selection for egg production in their home tracts by man.

It is estimated by International egg commission that there are 4.93 billion egg-laying hens in the world in 2002. Approximately 800 to 1,000 million laying hens are kept in China, 276 million in the USA, 290 million in the 15 member states of the European Union, 133 million in India and 115 million in Mexico. Egg consumption per capita per annum varies from country to country i.e., in 2002, Mexico topped with 321 eggs followed by USA, France and Portugal at 255, 248 and 186 eggs respectively; whereas, the figure for the same year for India is meager at 40 eggs.

While egg production has increased in the United States, Japan, India, and Mexico over the past four decades, most of the growth has been due to a ten fold increase in eggs in developing countries in response to rising incomes and growing populations. Between 1990 and 2005, China accounted for 64 percent of the growth in world egg production. By 2005 this China produced nearly 44 percent of the world's eggs, more than five times as many as the next largest producer, the USA. The major characteristic of egg production in China is that around 80 % of the eggs come from the smallholder poultry production systems.

Status of Rural Poultry in Kerala

India, with 46.2 billion egg production in 2005-06, ranks third in the World as per FAOSTAT data for the year 2006. Animal Husbandry Statistics data published by Govt. of India reveals that around 80 per cent of the eggs produced in India is of commercial origin. There was 300 % increase of in the population of improved variety in the last two decades; whereas, the population of *desi* birds has not registered any considerable increase during this period. However, the farming system is entirely different in Kerala even today, wherein more than 80% of chicken egg production came from the backyards of the rural families.

Poultry production in Kerala remained largely as a backyard venture with a few deep litter units scattered throughout the state. The meat output from backyard units is estimated to be well above 4000 metric tones per annum. The growth of Poultry in Kerala since 1961 is given in table 1.

Table 1. Poultry Population Trends in Kerala (1961- 2003)

Category	1961	1972	1982	1996	2003
Hen	41.83	61.55	87.62	133.70	60.22
Cocks	11.91	15.88	21.75	48.86	19.34
Chicks	33.35	41.01	35.82	73.90	30.34
Total fowls	87.09	118.45	145.19	256.46	109.9
Ducks	3.87	3.62	5.30	11.87	6.60
Others	0.10	0.01	0.34	1.12	27.60
Total poultry	91.06	122.08	150.83	269.45	144.12

The growth of poultry in Kerala up to 1996 was approximately 200% with an overall mean annual growth of 5.6%. According to the 1996 livestock census, out of the total poultry population in the state, 95.18 % are fowls, 4.41% are ducks and 0.41% forms other species of poultry. During 1961, the improved varieties of fowls were 3.89%, which went up to 47.39% in 1990. This single factor has contributed to a large extent towards productivity enhancement in the rural sector. However, an analysis of population figures shows an overall negative growth trends during 1996-2003 periods not only in poultry population but also in total livestock. Non-availability of feed, high costs of feed and feed ingredients, labour cost, imports of egg and meat from neighbouring states like Tamil Nadu and Karnataka are some of the reasons for decline in poultry population in Kerala.

Milk, meat and eggs are major contributors to livestock sector in the state economy. Egg production in the state witnessed negative growth rate (-6.18%) during the period 1996-97 to 2003-04. In general, all livestock products experienced deceleration in growth rates during the last decade and particularly since mid 1990s.

Rearing Practices of Rural Poultry in Kerala

As per a recent study at Centre for Advanced studies in Poultry Science of Kerala agricultural University, the farmers rear around five birds in their households. Backyard poultry rearing is taken care of by housewives in most (90%) of the families. The stock is replenished by hatching out new chicks using broody hens. Shelter, mostly

made up of wood is provided only during night hours. The average construction cost of coops used in the backyard poultry farming was found to be around Rs. 485. The mean floor area of coop made available per bird is 0.87 sq.ft. This study also revealed that two-third of the farmers provides supplemental feeding in the form of grains, mostly of rice (75%), while others raise their chicken only on scavenging. The average quantity of supplemental feeding given by the farmers is observed to be 19.53 g per adult bird per day. Native chickens are good brooders and mothers, therefore used for propagating the stock. Farmers set an average of 10.41 eggs per broody hen for incubation. The fertility was however found to be low in backyard poultry rearing (74.29%). Majority of the farmers (57%) were found to maintain no adult males in their flock, still use the eggs for incubation. These open flocks are being believed to be mated by the cocks of neighbourhood. Sometimes the males are maintained even long after their fertile life. These could be the reasons for poor fertility encountered with backyard poultry rearing. The hatchability under natural incubation was however found to be comparable to that under artificial incubation. This explains the ability of native hens of being efficient in incubating the eggs. The backyard poultry composed mainly of native chicken possess light but compact body with sturdy legs. This enables the birds to fly to a distance of 10 to 15m in one takeoff; the quality comes handy to evade the attack of aerial predators. This study also revealed that they can fly up to a height of three to five meters to climb the tree branches when they are chased by terrestrial predators. Backyard birds, mainly males sometimes found to cover a territory circle of half-a-kilometer width. Majority of the farmers (87%) have the practice of culling their surplus males hatched out in their homestead for meat purpose before one-and-half years of age. A striking difference was noted in case of culling the females, that majority of the farmers (78.13%) do not cull the females for meat purpose but allow them to meet the natural death due to senility. This study also showed that the average chick survivability was more than 65% at the end of four weeks of age even in the hilly terrains, this shows the backyard chickens are good brooders and mothers considering the adverse climatic conditions and threat from predators at the village level.

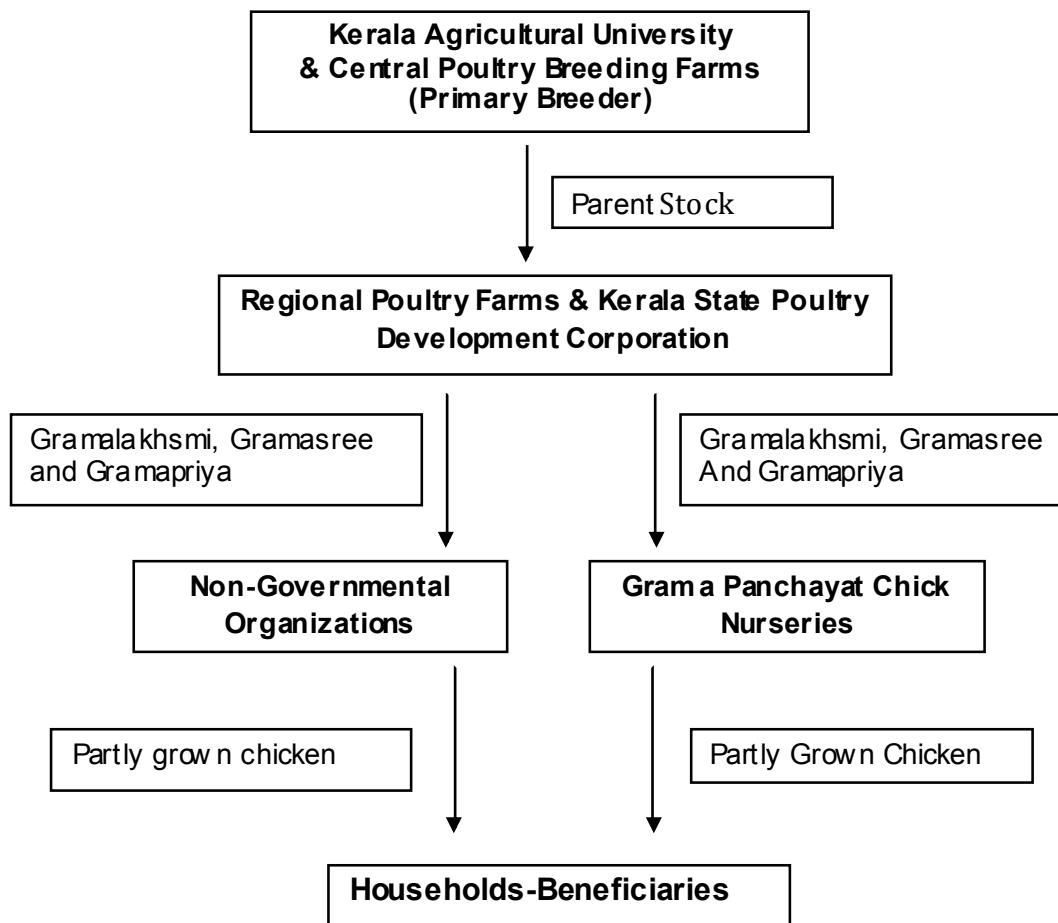
The mortality per cent in chick stage was 28.63 and among the causes for mortality in chick stage, diseases account only 7.69%, while the rest was due to predators (92.31%). The mortality in grower stage was 21.60 per cent; out of total mortality during this stage, 80 per cent was due to predators and 20 per cent was due to disease. In adult stage the mortality per cent was 45.28; out of which, 52.17 per cent of death was due to diseases and the rest by predators mainly by dogs followed by mongoose and wolves. In general, the mortality of native chicken population at chick, grower and layer in Kerala is due to predation to a greater extent. Among the predators of chick stage, aerial predators like *shikra*, crows and eagle were more common next to mongoose, nevertheless disease was of minor importance. When it comes to growing stage, the areal predators were becoming less significant, whereas, terrestrial predators like wolves, mongoose, cats and dogs gained importance in the destruction of the flock. In adult stage, the highest damage was caused by diseases followed by terrestrial predators like dogs, mongoose and wolves. It was felt by the farmers that predation is the major factor in depletion of the flock. Therefore grownup chicks if made available could be of remedy for the miseries of the backyard poultry farmers, thereby native chicken population in villages can also be increased. The study revealed that the significant disease conditions affecting the backyard chicken were respiratory diseases (25%), Ranikhet (23.44%), fowl pox (12.5%) and ectoparasitism (6.25%). Regarding disease control measures, a vast majority of 90.63% farmers did not adopt any disease prevention measures. The study on system of medicine chosen for treatment revealed

that nearly one-third (32.81%) of the farmers did not treat the birds during disease outbreak; while, another one-third (31.25%) farmers depend on indigenous method. Few others depend on allopathy (20.31%) or combination of all the above methods (15.63%). The indigenous herbs being used are garlic juice and *tulsi* leaves for respiratory problems, turmeric for external application on wounds and also given internally when the birds are sick and an aromatic shrub *Premna serratifolia* (Local name: *Narimunja*) for ectoparasitism. The fruit of the thorny plant of *Pandanus sp.* (Local name: *kaitha*), which is having a very pungent smell, is also being used inside the coops to control ectoparasites; some farmers even give alcohol when the birds are sick. Regarding the services adopted for treatment, only one-fourth (25%) of the farmers seek Government institutions and the rest practice self-treatment (48.44%), while the remaining around one-fourth (26.56%) of the farmers adopted no services.

Role of public and private sector in poultry development in Kerala

Even though the traditional backyard poultry rearing is the major source of eggs and meat production in the state, it was felt of late that the expected goal of self-sufficiency could be far from reality with the native chicken having low egg production. Therefore, evolution and introduction of varieties to suit village poultry farming was taken up by the Centre for Advanced Studies in Poultry Science (CASPS) of Kerala Agricultural University. The other partners in this effort were State Animal Husbandry Department, District/Grama Panchayats. Recently Poultry Development Corporation was also stepped into rural poultry production activities. The integrated rural poultry production followed in the state is given in Figure.

Figure. Integrated Rural Poultry Production – Kerala Model



In the above said model, Centre for Advanced Studies in Poultry Science (KAU) plays significant role as the primary breeder, State Animal Husbandry Farms fulfill the role of multiplying agency of the crossbreds and Panchayat Raj Institutions and NGOs organizes the chick nurseries from where partly grown crossbred chicks reach the households. These birds are de-wormed at 6 weeks of age and given protective vaccinations against Ranikhet Disease at 7th week of age. Thereafter, the housewives need to give only medicines for deworming at bimonthly intervals. The Kerala Agricultural University released two crossbred chicken exclusively for backyard rearing. The first crossbred, christened by KAU as Gramalakshmi is an Austra-white hybrid evolved using elite germplasm available in AICRP on poultry (Mannuthy centre) and University Poultry Farm (KAU). Considering the preference of farmers towards colored birds for backyard rearing, the University Poultry Farm has developed a crossbred colour variety, 'Gramasree', involving desi/indigenous and exotic coloured birds. The Poultry Science Department of the Kerala Agricultural University has also brought out Package of Practices of Recommendation for enhancing the productivity of backyard chicken.

Revolving Fund Project in Poultry Development

The ICAR Revolving Fund Project functioning in the CAS in Poultry Science of the Kerala Agricultural University is directly involved in the production and distribution of day old and partly grown chicks and quails to the farmers of Kerala. From the inception of the project in 1998-99, the RF project has distributed about 18.13 lakhs of quality chicks and 2.77 lakhs of quails (Table 2).

In addition, the CAS in Poultry Science facilitated in the supply of Kuttanad duck eggs to SIRD of Govt. of Assam. During the past six years about 15 lakhs of fertile eggs have been supplied. The SIRD in turn hatch and brood the ducklings and supply to the selected clusters of villages of the state to give new face to the traditional activity of backyard duck rearing. These duck varieties are now making significant contribution to the socio-economic empowerment of duck farmers in that State. Technical expertise to SIRD of Assam to reorient traditional duck rearing was also provided. The egg production has enhanced the nutritional level of children in the villages, apart from helping the women to become economically independent. This is a classical example of rural transformation.

The former President of India, Dr. APJ Abdul Kalam has shared his experience during his address at the dedication of the laboratory for the conservation of the endangered species (La Cones) in Hyderabad. 'When I think of genetic research I reminded of my visit to Gumoria village in Assam where the Self-Help Group members are developing duck rearing practices based on inputs from agricultural specialists from Kerala and with the initiative of the Assam Government. This has resulted in improving the economic condition of the whole village by improving duck productivity substantially'.

Challenges/ Constraints

The backyard poultry will remain very well as a part of the Indian households in the future also. In fact there could be a thrust in village chicken production due to increasing concern over intensive system of rearing. There is a scope for expansion of this smallholder poultry production system to meet the need for egg and meat of the country as there has been threshold reached in many intensive poultry production pockets. This holds promise for the transformation of village poultry in a big way in this

country as China witnessed in the past. As any other agribusiness, village poultry production also confronts some serious challenges to be overcome.

a. Availability of good germplasm

There is a heavy demand for backyard chicken varieties among the farmers. Concerted research efforts are to be put in more vigorously to meet this challenge. As these birds are improved varieties, the character broodiness has been virtually lost, replacement stocks are to be made available continuously from the public sector units.

b. Availability of feed

The improved backyard chicken varieties could not sustain only on scavenging. There is a need for the provision of small quantity (30g) of compounded layer feed for good performance. Making the feed available in the rural areas in small packs of 5 or 10 kgs is essential.

c. Veterinary and health services

Non-availability of veterinary aid and skilled workforce for vaccination at the village level result in the devastation of the flock by diseases mainly by New Castle disease. It is therefore improved veterinary services with disease prevention programmes are to be put in place for better results.

d. Predators

Predation is found to be the highly devastating factor to the village poultry. As the chick stage is most vulnerable, initial growing in the nurseries before distribution can to some extent solve this problem.

e. Limited Scavenging area

Small and marginal farmers are the main growers of backyard chicken, therefore, scavenging area is found to be the limiting factor. Suitable package of recommendations for rear the birds in semi-intensive system so that number of birds per households can be raised within the available land area.

f. Resistance from the neighbours

This is another factor which determines the flock size in village conditions. Modified rearing systems instead of total free-range system of rearing as discussed earlier need to be developed.

g. Government Partnership

The involvement of Govt. agencies to implement area specific projects to tailor fit the needs of different localities in terms of germplasm, feed, veterinary services etc.

h. Marketing

The backyard poultry products fetches higher price and are in heavy demand. However, creation of farmer's co-operative societies at village levels, bodies for price fixation and egg collection and marketing will enhance the profitability further

i. Biosecurity issues

At present highly pathogenic avian influenza is a serious constraint to family poultry production, which requires mass destruction of the poultry of the outbreak locality. It is therefore essential to chalk out programmes to prevent such outbreaks and methods to be adopted in such exigencies.

Table 2. Output of Revolving Fund Project (1998-99 to 2008-09)

	2008-09	2007-08	2006-07	2005-06	2004-05	2003-04	2002-03	2001-02	2000-01	1999-00	1998-99	Total
Gramalaksmi	26772	30702	74699	84221	82571	77014	70106	27156	46332	22855	45849	588277
Gramasree	29929	60446	70042	71270	60453	59170	50935	19382				421627
Gramapriya	90061	28531	45186	93392	38892		16255	20570	12344	67851	209733	622815
Giriraja	3154											3154
Quail			5839	43628	66051	70852	56043	34552				276965