A REVIEW OF POULTRY DEVELOPMENT IN BHUTAN

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Abstract

Poultry farming is one of the important livestock farming components in Bhutan. This paper reviews poultry breeding and development approaches taken by Bhutan for over four decades, and propose a way forward to a sustainable poultry breeding and development programmes in Bhutan.

The poultry development programme started in Bhutan in 1961 together with the launch of first five-year plan. The main aim of the programme was to improve nutrition of the rural population and alleviate poverty through increased egg and meat production. The programme also aimed at completely replacing the local chickens with exotic and improved breeds, which are believed to be more productive. Since 1961, Bhutan took five different poultry development strategies including the present approach.

The analysis of available records and chicken population data suggest that Bhutan has not made any significant progress in the areas of poultry breeding and development programmes. Therefore, it is very important that Bhutan reviews its breeding policies and strategies. For this, research on indigenous chickens that could be used as basal germplasm for sustainable poultry breeding and development is very important.

Keywords: Bhutan, poultry, indigenous chickens, breeding programmes.
Introduction

Bhutan is a small, developing, mountainous, and mainly an agricultural country with livestock rearing as an important component of the whole farming system. More than 79% of the total population live in the rural areas. Bhutan can be divided into six agro-ecologically, zones namely wet sub-tropical, humid sub-tropical, dry sub-tropical, warm-temperate and cool temperate. In all these zones, poultry (*Gallus domesticus*) is found to be one of the important livestock components. The nationwide renewal natural resources (RNR) census conducted by Ministry of Agriculture (MoA) in 2000 also suggests the presence of poultry in the alpine region of the country. It is estimated that over 63% of the Bhutanese households in rural areas raise chickens (RNR Census, 2000). Poultry provides egg, meat, feathers, and manure to the farmers. It is an integral part of Bhutanese farming system, many of which are operated at a subsistence level.

Objectives

The main objectives of this paper is to review all the poultry breeding and development approaches taken by Bhutan for over four decades, and propose a way forward to the sustainable poultry breeding development programmes in Bhutan.

What does Poultry mean to Bhutanese?

Technically, poultry is a collective term for those species of birds that have been domesticated to reproduce and grow in captivity and that render products of economic value. They include varied species such as chicken, turkey, ducks, geese, pheasants, pigeons, quail, etc. In Bhutan, the term poultry and chickens are interchangeable as the only type of poultry reared and recorded are chickens. Only few ducks are found in the southern Bhutan.

Before the first-five year plan (1961-1965), the only poultry birds known to Bhutanese farmers were age-old flocks known as *Yubjha* meaning village chickens because of the roles they play in village life. The term village chicken has been adopted by a number of rural poultry development scientists to differentiate the local/indigenous/scavenging/free range chickens from the exotic or introduced chickens as well as from the small-scale intensive chicken production systems.

practised in rural areas (Kitalyi, 1997). From hereon, the commercial breeds introduced into Bhutan will be referred to as “exotic” chickens while crosses with local chickens is known as “improved chickens” which is suppose to be an upgraded form of local chicken with good blend of superior traits from both the parents.

**Poultry Development Approaches in Bhutan**

The history of breeding and development of Poultry in Bhutan is as old as the five-year developmental plans (Rai, 1987) started in 1961. Since then, the Royal Government of Bhutan (RGoB) has initiated five different approaches towards rural poultry breeding and development strategies.

First, the RGoB established poultry farms, one each in Samtse, Paro and Wangchutaba (Thimphu) during the first-five year plan period (Sherpa, *personal communication*). Rhode Island Red (RIR) and Australorp, both imported from Bhubaneswar, India, were the first exotic breeds introduced in Bhutan. The main objective of this approach was to generate lines of improved birds or F1s (progenies of Local Vs Exotics or *vice versa*) in the hope that they would be superior egg producers compared with the pure local breeds. The goals were to improve the nutritional standard of the rural population by supplementing additional protein requirement through increased availability of eggs and poultry meat. It was also aimed at increasing income and alleviating rural poverty (Rai, 1987). However, this strategy was not very successful and is believed to be mainly due to outbreak of diseases, particularly in those areas that are close to the Indian border (John Blake, FAO BHU/82/012 Poultry Management consultant report, quoted by Sherpa, *personal communication*).

**Figure 1:** Rhode Island Red (RIR) hen  
**Figure 2:** Australorp hen

A second approach was initiated in 1984 with the establishment of a new poultry farm at Sarpang, where pure RIR parent lines were stocked. Although the overall goal remained the same, the main strategy was to supply male stock to farmers for crossbreeding with local chickens, and to supply “fertile or hatchable” eggs for natural incubation under broody local hens (Sherpa, personal communication). Along with this, the policy of distributing exotic males in exchange for local males (Rai, 1987) was also implemented. However, even with this incentive, programme did not make any impact on the population or the development of improved rural chicken populations. The cockerels distribution programme has failed completely because areas under operation could not get rid of local cockerels to any extent (Rai, 1987), thus possible mating between local male and female birds could not be avoided. The record on the failure of “hatchable egg” programme is not available but presumably the failure could be attributed to many factors (fertility, temperature, sanitation, handling) governing the hatchability of the eggs. Unless farmers are aware or advised on the adverse effects of such factors, the programme is mostly likely to fail.

Thirdly, taking into account the egg production potential, purebred White Leghorn (WLH), the third exotic breed, was introduced to increase egg production in the village. Although, WLH is without doubt a prolific egg-producing Mediterranean breed, it could not capture the taste and eyes of the Bhutanese farmers. The reasons were that WLH is small in body size as compared to the previously introduced breeds, was prone to attacks from predators, diseases, and above all they were poor scavengers and could not thrive under village conditions. A study in Ethiopia (Demeke, 2003) suggest that mortality from hatching to maturity was higher for White Leghorn than for local chickens kept under scavenging condition, indicating that exotic chickens are subjected to considerable hazard of diseases, parasites and predators under scavenging condition. As a result, another or fourth approach had to be explored.

Fourthly, the MoA imported day old parent stock, 380 BV strain, developed in Bhubaneswar, India. They were reared and bred at two regional breeding farms (Khangkhu poultry farm at Paro & Lingmithang poultry farm at Mongar) to produce brown pullets (Figure 4) known to farmers as “Bayla” that lays brown eggs. The male identified through colour sexing at day old (males have white plumage) are usually dumped unless there is a demand in which case they are given free of charge. The brown pullets are distributed to farmers at 8 or 12 weeks of age. According to Sharma (personal communication) and other poultry scientists, this approach was initiated mainly because Bhutanese farmers prefer coloured birds to previously distributed white line as the former have good body conformation, lays brown eggs, more efficient scavengers, and are better able to defend themselves against flying predators and other animals. However, the questions are still being asked if 380 BV brown layers strain can continue to be used for crossbreeding purposes. The pedigree and the breed information on this particular strain are not available, and it will never be known because of trade right reasons. In addition, it is found to be poorly adaptable to most village conditions, less broody, sits poorly on eggs during incubation, and the poor overall reproductive efficiency at village level.

Along with this fourth strategy, an attempt to supply parent stock to farmers was made in 1999 by importing pure line RIR “hatchable” eggs from Netherlands. The eggs despatched from the Netherlands were halted three days in Bangkok, Thailand, without any cooling facilities during the hot summer months. Additionally, the eggs were not properly handled as fertile eggs. As a result, many eggs had cracked shells. The quality of the chicks hatched from the surviving eggs was not encouraging.
Therefore, this attempt to supply pure line RIR parent stock to the farmers could not be realised.

Figure 4: 380 BV or brown layers strain presently distributed to the farmers for crossbreeding and improving the productivity of rural chickens.

Looking at the number of birds distributed (Table 1) to the farmers and the chicken population trend over the years (Table 1 & Figure 5 & 6), Bhutan has not made any significant progress in the poultry breeding and development strategies. In all these approaches, the crossbreeding of exotics with native chickens or vice versa were left solely to the farmers, many of whom did not have sound knowledge on supplied birds as well as required breeding knowledge. The farmers relied on random natural mating rather than planned crossbreeding strategy. Although diseases are a major limiting factor, there was also lack of professional extension intervention, with poor delivery of rural poultry husbandry techniques and breeding programmes. This may be due to lack of professional human resources and lack of proper cross breeding coordination at the central level.

In spite of all these experiences, the fifth approach included in the rural poultry development plan of the 9FYP (MoA, 2001) has been recently initiated. This approach is somehow repetition of the earlier development plan with very little modification. According to MoA (2001), the Government will import brown layers day old chicks, rear them in the two regional farms, and distribute to the farmers at 8 to 12 weeks of age. Together with this strategy, a pure line RIR grandparent stock will be imported from neighbouring country. It will be reared and bred at the newly developed breeding farm at Gelephu to produce pure line parent stock. This pure line RIR parent stock will be distributed to the farmers to produce their own replacement stock. However, the performance of brown layers and its thriving ability in the rural

condition was not encouraging in the past. The RIR distribution is not a new idea and it has already been tried in the past without success. The numbers of exotic and improved breeds did not increased and there is no evidence to suggest that crossbreeding has taken place. So from the past experiences, it can be predicted that even the fifth approach is not likely to make any impact on the overall chicken development in Bhutan.

**Chicken Population Development Trend**

The number of exotic birds distributed or sold to farmers by the Government during the past five-year plan periods are given in Table 1:

**Table 1:** Number of birds distributed to farmers during the past five-year plans. *(Source: Rai, 1987; Sherpa, personal communication)*

<table>
<thead>
<tr>
<th>Plan</th>
<th>Years</th>
<th>No. of birds distributed</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>1961-1965</td>
<td>200</td>
</tr>
<tr>
<td>Second</td>
<td>1965-1971</td>
<td>2,477</td>
</tr>
<tr>
<td>Thirds</td>
<td>1971-1976</td>
<td>14,250</td>
</tr>
<tr>
<td>Fourth</td>
<td>1976-1981</td>
<td>23,000</td>
</tr>
<tr>
<td>Fifth</td>
<td>1981-1987</td>
<td>56,008</td>
</tr>
<tr>
<td>Sixth</td>
<td>1987-1992</td>
<td>34,568</td>
</tr>
<tr>
<td>Seventh</td>
<td>1992-1997</td>
<td>84,593</td>
</tr>
<tr>
<td>Eight</td>
<td>1997-2002</td>
<td>74,485</td>
</tr>
</tbody>
</table>

The total poultry population in Bhutan was estimated to be 152,488 in 1981 (Rai, 1987), and 230,723 in 2000 (RNR Census, 2000). There is an increase of 66% over the last two decades (Figure 5).

The number of poultry in Bhutan has fluctuated over the years (Figure 5). There was a steady increase in the chicken population from 1981 up to 1988. The number drastically drops from 1988 to 1993, and between 1999 and 2000.
This reduction is believed to be attributable to outbreak of diseases. The diseases such as Gumboro or IBD, Mareks, Corrrhyza, Fowl Pox, and internal parasitic disease (especially Coccidiosis) are some of the problems faced by Bhutanese farmers (Tshering, personal communication) but most threatening of all has been Newcastle disease (ND), a major constraint to village chicken production in Bhutan (Alders, 2002). The ACIAR-supported (Alders, 2002) thermostable 1-2 ND vaccine launched in May 2001 has yet to make any impact. ND is also reported to be the single greatest pathological constrains in village chickens of north, west and central Africa (Bell, 2002; George, 2002; Musiime, 2002; Olabode et al., 2002) and south Asia (Gunaratne et al., 2002; Lwin, 2002; Nguyen, 2002). In most cases, ND wipes out whole flocks belonging particularly to farmers who do not have access to ND vaccines.

The local chicken population has always outnumbered improved chickens. Like the number of indigenous chickens in many developing countries (Kitalyi, 1997), the indigenous chickens of Bhutan today make up over 95% of the rural poultry flocks (RNR Census, 2000).

Figure 5: Change in the numbers of poultry in the last 20 years. (Source: Data for 1981-1985 are estimated from Rai, 1987; Data for 1986-1991, 1993, 1995 and 1996 are taken from CLSD, MoA; Data for 1997 from PPD, MoA; Data for 1999 is from RNR Sample survey, LUPP, MoA; Data for 2000 from RNR census, 2000)
Figure 6: The trends in the number of local and improved chickens in Bhutan. In this data, the exotic birds distributed or sold to the farmers from central farms are lumped with improved breeds. (Source: modified from RNR Census, 2000; CSO, 2001)

The breeding programme that is spanning over four decades was also initially aimed at completely replacing local chickens with improved breeds so that high egg production and better rural nutrition could be achieved. However, in terms of chicken population and increasing of exotic or improved breed of chickens, the programme did not make any significant progress. Instead, the number of indigenous chickens in Bhutan has increased dramatically (Figure 6). A similar trend is reported in many other developing countries (Kitalyi, 1997) where surveys have shown that farmers preferred to maintain their indigenous stock for social, cultural, and economic reasons.

Bhutan is not alone in adopting such poultry development strategies. Similar approaches had been used in many developing countries especially in Africa. However, all these programmes had failed. For instance, Kaiser (1987) has critically reviewed the multilateral rural poultry improvement programme in the Niger, which started in the late 1970's. The programme which was based on delivery of hatching eggs or pullets at laying age has failed due to high mortality associated with exotic stock. Similarly, Creevy (1991) reported that RIR roosters given to Mali women for poultry breeding within a major rural development programme suffered a high mortality rate. These are all consistent with Kitalyi (1997), who reported that many
rural poultry improvement programme in Africa have centred on introducing exotic blood. He stated, “with the advent of this approach, a bigger portion of funding was allocated to centralised farms for the production of either fertilised eggs, pullets or cockerels, and most projects which followed this approach were not successful”. Therefore, Bhutan must review all the past poultry development strategies including the present system and look for an alternative, suitable, and sustainable breeding system.

The Way Forward

From the facts gathered, it is evident that native chicken remains the primary chicken reared by farmers in Bhutan. It is also unequivocally evident that the introduction of exotic chicken breeds has made very little impact in the overall poultry development programmes in Bhutan. These facts warrant thorough review and study of poultry farming in Bhutan. The reasons why farmers prefer native chicken in spite of all the efforts to introduce high yielding exotic chicken, has to be found out and analysed based on which the poultry development policies and strategies may have to be reviewed. The purpose of rearing local chickens differs from region to region (Nidup et al., 2002).

In the Northwest and Northeast regions of the country, the chickens are mainly used for egg production, while in the Southern region inhabited mainly by Lhotshampas (Southern Bhutanese people of Nepalese speaking origin), farmers rear a minimum of 15-20 chickens for meat and egg purposes. Eggs produced are seldom consumed but are incubated to produce replacement stock. Further, chickens are used for sacrificial rituals in distributed pockets of Bhutan. For example, some rituals require a particular breed or strain of native chickens as in the case of native/indigenous Frizzle and Naked neck.

These categories of chicken rearing demands different policies and strategies, which could address the breeding goals and objectives. Local people participation and use of locally available resources are the two main pillars of sustainability of any development initiatives. It is unequivocal that the local chicken will have to be used as a basal germ plasm in the breeding programme for sustainable chicken production in Bhutan. For this reason, research on the genetic and production parameters of local chicken, their breeding and management to improve their productivity will have to be carried out. This will enable the formulation of sustainable poultry development through appropriate breeding policies and strategies for Bhutan.
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