

OVERVIEW ON EXISTING BREEDS AND ISSUES OF CONSERVING INDIGENOUS BREEDS

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India, the progenitor of the present day chicken, is a vast country having varying climatic zones. Owing to the long widespread chicken raising in the vast territory of this country and manifold ecological niches at different places, many native breeds were evolved over the years. A wide range of variations are found among these breeds in relation to body weight, plumage and skin colour, feathering and comb type. Some of the documented native breeds/ecotypes of chicken along with their distribution and main characteristics have been presented in Table-1.

Duck occupies the 2nd position among the native poultry genetic resource which constitutes about 9 % of the total poultry population. Ducks are mainly concentrated in eastern and southern states of India. Coastal areas of West Bengal, Orissa, Tamilnadu, Andhra Pradesh, Kerala and Certain parts of Assam and Bihar constitute the main breeding tracts of ducks. Some of the Indian breeds of duck which have been described are Indian Runner, Nageshwari and Sythemetete. Large no of native ducks are existing in their home tracts which are yet to be documented. Since last one decade organised work on collection, evaluation and documentation of these valuable germplasm has been initiated in the form of net work projects and a regional centre of Central Avian Research Institute has been established at Bhubaneshwar with main objective for improvement of duck. .

Need for genetic resource conservation

Most of the countries of the world are witnessing a fast decrease in the population of many native breeds and varieties of chicken, some of which are in danger of extinction. Late sexual maturity, poor egg production, slow growth, broodiness, smaller egg and body size are some disadvantages of native birds. In view of the necessity of rapid improvement in the productive capacity of poultry for eggs and meat, breeders have taken recourse to the introduction of high yielding exotic germplasm. The breeding systems adopted include crossing of exotic breed with local breeds or even total replacement of local birds with the exotic ones. As a result many different genetic combinations are being produced and there is gradual diminution and even ultimate disappearance of some of the local breeds. Native breeds are gold mines of genomes and major genes for improvement of high yielding exotic germplasm for tropical adaptability and disease resistance.

Conservation of these breeds will act as source of variation for future poultry improvement. In addition, the native germplasm have great utility for backyard poultry production.

What to be conserved ?

Once we decide to conserve, the question arises what is to be conserved. For academic and scientific reasons, all breeds and strains with minor variation are potential candidate for conservation. However the cost of infrastructure facilities involved in conservation will make it necessary to differentiate between breeds to be conserved. This decision must be made by responsible authorities such as Government of India and / or large breeding organizations. In some countries special organizations have been set up to supervise conservation of animal genetic resources. In India Bureau of Animal Genetic Resources has been assigned this job. In any case breed must be evaluated before one can decide rationally which of them to be preserved. FAO 1971 recommended that the Govt. Should study representative samples of clearly defined genetic stocks exposed to equally well defined environment. There should be common stock present in the tests at the several locations. On the basis of such tests the breeds and breed combinations that offer the most efficient production of desirable product can be identified and conserved. Bowman (1974) stressed that it is important if possible to determine the genetic relationships between breeds and to maintain those with distinctive characteristics indicative of unique genetic material irrespective of present economic importance. Aim should be to conserve as big a range of existing irreplaceable genetic variation as possible. Turner (1972) had also made the same suggestion.

Present status of evaluation and conservation

Systematic work on documentation of most of the Indian breeds of poultry is lacking. Very limited reports are available regarding the survey of a particular breed in the ecologies in which they produce. Performance of most of the breeds reported in literature are either from the flock studied at a particular centre or reports from here and there. Central Avian Research Institute, Izatnagar initiated the work on conservation of native germplasm as early as 1976. In the beginning work on evaluation of two most important indigenous breeds of chicken viz. Aseel and Kadakanath were undertaken and later on Naked neck and Frizzle native ecotypes were included in the year 1992.. Large variation was observed among various pure breeds for all the traits which showed that all these breeds/ecotypes deserve conservation. Immunocompetence study of Indian native breeds/ecotypes indicated that they have better disease resistance in comparison to exotic breeds. In genetic distance study on molecular level Kadakanath was found to be at

greater genetic distance than other three breeds/ecotypes viz. Aseel, Naked neck and Frizzle ecotypes.

Aseel (Peela and Kagar varieties) and Kadakanath breeds are being conserved as pedigreed control population as suggested by Gowe et. al. (1959) CARI, Izatnagar. Naked neck and Frizzling genes have been transferred to layer and broiler stocks of CARI, Izatnagar. Random bred population of Kadakanath and Aseel are also being maintained at Jhabua and Jagdalpur hatchary respectively by Department of Animal Husbandry, Government of Madhya Pradesh.

Recently, National Bureau of Animal Genetic Resources (NBAGR), Karnal (Haryana) completed the initial survey on evaluation and characterization of the native breeds of chicken with the help of net work project but the same remained confined only up to the academic purposes. There is hardly any closed true breeding flock of a particular native breed (except Aseel & Kadakanath) available in its home tract or at particular centre. All the flocks are open bred and genetic dilution of the particular breed has pushed the existence of most of the native breeds of chicken in the danger of extinction.

Suggested Master plan for conservation

I. Establishment of planning and implementation committee

Conservation is a very costly affair, which needs proper planning source of regular financing and follow -up the action plan. National institution, State Governments, State Agricultural Universities, Commercial breeders as well as fancy breeders should be included in the conservation work. Standing Advisory Committee (SAC) / Avian Genetic Resource Task Force (AGRTF) should be established including members from above mentioned various organizations to plan the conservation strategies and its follow up.

II. Network project for survey and documentation of stocks

The first step in any conservation programme is to know that stocks which exists today. This is a major obstacle in developing strategies for the conservation of poultry stocks. We literally don't know what is available, at least not in a systematic and logical format. This problem is being addressed at both a national and international level. Development of national inventory of all the poultry stocks (Native, research germplasm and commercials) is essential to identify those stocks, or perhaps, even individual genes, which are most vulnerable to loss, and which have priority for conservation.

Very few breeds are known now in their home tracts which might be due to the unawareness about the particular breed available in literature. Very little general type characteristics for a particular breed is available in literature which is not sufficient to distinguish a particular breed from other. Under the prevailing situation, it would be better to evaluate and characterize the different eco-types of various breed tract region. Genetically distant ecotypes will be treated as distinct breed for conservation.

A network project will be a desirable proposition having the coordinating unit at CARI Izatnagar and centers at various agricultural universities of different states. The work plan of the network project will be as follows:

- i. Survey of the home tract of the respective breed on the basis of the questionnaire developed by NBAGR, Kamal.
- ii. Collection 250 - 500 fertile eggs/ 100 females and 20 males of each available breed ecotype in the region of the respective centre.
- iii. Multiplication of flock of each breed / ecotype and its morphological characterization and evaluation of growth, and production performance will be done at the respective centre.
- iv. Sample for measuring the immune competence status and molecular characterization will be collected by Central Avian Research Institute / NABGR). On the basis of the genetic diversity of the breed/ecotype, specific genes (if any) and recommendation of the AGTRG / standing advisory committee the particular breed / ecotype will be selected for its conservation.

Phase - II

Conservation, Improvement and utilization of native germplasm

I. Conservation / Maintenance in living form:

The breed ! ecotype which qualify for its conservation will be maintained in living form at least at two locations i.e. at its evaluation centre and at national centre for conservation. The procedure follows will be :

Each breed / eco type will be maintained on hundred Sires and Dam families basis each generation. To get this, hundred males of each breeds will be mated with hundred females on pair basis in individual cage by artificial insemination and six progenies (3 of each sex) of each family will be hatched and wing banded for

identification Total of six hundred chicks will be hatched for each breed / ecotype. Birds will be grown up to 60 - 65 weeks of age.

Next generation will be produced from single male and single female from each family with the precaution that the male of first family will be mated to female of second family and male of second family with female of third family and so on to avoid inbreeding. The second-generation male of first family will be mated with female of third family and male of second family with female of fourth family and so on. Like wise male and female pairing will be changed each generation up to hundred generation. Again the cycle will be repeated.. Maintenance of living flock for each breed / ecotype will be done at least at two locations.

II . Ex-situ conservation:

Semen. Primordial germ cells, embryos, DNA and tissue samples of selected stocks will be sent to NBAGR, Kamal for its cryopreservation

III. Improvement of Native Germplasm and its conservation in natural habitat

Improvement of few important native breed is important for its sustainable production in traditional poultry production system. Improved germplasm will be supplied to respective state government for its multiplication and distribution in its home tract for backyard poultry production. Thus stock will be conserved in its natural habitat

It would be a desirable proposition to establish a National Centre on Conservation of Avian Genetic Resources.

Table 1: Indian native breeds/ varieties of chicken, their habitat and specific characteristics.

Sl. No	Name	Habitat	Characteristics
1	Aseel	Andhra Pradesh is original home tract but found with cock-fighting lovers through-out the country.	A game bird well known for its pugnacity, high stamina, majestic gait and dogged fighting qualities. It is the biggest in size among native breeds which measure 28 inches from back to toe. The standard weight varies from 3 to 5 kg for cocks and 2 to 4 kg for hens. Birds are also known for its plentiful delicious and flavored meat.
2.	Ankaleshwar	Gujarat	Small single combed bird well known for its hardiness but is poor in productivity
3.	Busra	Gujarat and Maharashtra	A small to medium sized bird having non-significant character
4.	Brown Desi	Uttar Pradesh	A light to deep brown layer type single combed bird.

5.	Chittong (also known as Malay)	North-eastern states	A large bird measuring 3.5 to 4.5 kg for cocks and 3 to 4 kg for hens. The adult birds are very strong and hardy with a quarrelsome temperament and possess all characteristics of a good game bird.
6.	Daothigir	Assam	A fairly heavy breed with good juvenile growth, mostly reared by Bodo community.
7.	Denki	Andhra Pradesh	A fairly heavy breed with glossy and lustrous plumage with compressed single comb. The cocks with long necks and legs are good fighters. Birds are fairly resistant to diseases.
8.	Frizzle fowl	Hot and humid coastal regions of the country and North eastern region.	Rachis of the feather is curved due to presence of dominant Frizzle Gene(F) due to which plumage looks curly and heat dissipation is increased. Better adaptability in tropical climate especially for arid zones.
9.	Ghagus	Andhra Pradesh and Kamataka	Small sized bird with small comb and wattles. Neck is thick and throughout loose somewhat bag like appearance and shank is feathered. Some birds possess whiskers. Birds are hardy and supposed to be resistant to a number of common diseases. Birds are mostly reared by nomadic tribes.
10.	Haringhata Black	West Bengal	A small bodied black bird with typical conformation of a layer.
11.	Kadakanath	Madhya Pradesh	A medium sized egg type chicken locally known as "Kalamasi". The skin, beak, shank, toes and soles of feet of males and females are dark gray colour. Even the comb, wattle and tongue also show a purplish hue. The shining blue tinge of the earlobes adds to its unique features. The peculiarity of this breed is that most of the internal organs show the characteristic black pigmentation. Varying degree of blackish colouration is also found in the skeletal muscles, tendons, nerves, meninges, brain and bone marrow.
12.	Kalasthi	Andhra Pradesh	Birds closely resemble Denki except that these are smaller in size.
13.	Faverolla	Kashmir	Small sized birds with small comb and wattles. Feathered comb is the peculiarity of this breed.
14.	Miri	Assam	A small sized black bird, mostly reared by Miri tribe.
15.	Naked neck	Hot and humid coastal regions and North eastern states	As the name indicates neck of the birds are fully naked or only a tuft of feathers are seen on the front of the neck above crop. The resulting bare skin becomes reddish particularly in males as they approach sexual maturity. General feathering is also reduced. Adaptability of birds is increased in hot humid tropics due to better heat dissipation mechanism.
16.	Punjab Brown	Punjab and Haryana	It is meat type bird having brown plumage with a yellow beak, legs and feet. The average weight of

			male varies from 3.0 to 4.0 kg and 2.0 to 2.5 kg for males and females respectively.
17.	Tellichery	Kerala	It is small bird having black skin. Plumage colour varies from black to grey and sometimes with various combinations of colour. The meat is said to have some medicinal value.
18.	Titri		Small bird having speckled black and white feathers with yellow beak and legs. Birds are poor layers.
19.	Teni	All parts of the country	It is small size all purpose bird which suits village conditions owing to its qualities as an active forager and excellent sitter. It tolerates the high temperature.
20.	Nicobari	Nicobar group of islands	The brownish matte colour, comparatively smaller sized, short legged birds, somewhat round and compact in appearance with a stout neck. Well adapted bird in tropical environment of Nicobar islands and the good layer among native breeds.