

**Introduction:**

1. While more than 10 million species of living organisms have been estimated to exist in earth, yet of them only 0.5% are birds and mammals. Within this small slice of biodiversity it is estimated that during the last 12,000 years or so, man for food and agricultural production, has domesticated about 50 species. The major share comes from only the livestock and poultry species, which are economically important. As per FAO (2002), there have been 6,300 breeds of livestock and poultry of which some 4,000 to 5,000 breeds are remaining now. Due to anthropogenic and climatic diversity, India has also been bestowed with immensely rich domestic livestock diversity. (SPS Ahalwat and SC Gupta, 2006). After the convention on Biological diversity (1993), it has become increasingly important to evaluate, document and safeguard our biological resources.

**2. Diversity itself can be classified as -**

**2.1 Ecosystem diversity:** It refers to different ecosystems such as coral reefs, tropical rain forests, temperate rain forests, deserts, grasslands, etc.,

**2.2 Species diversity:** It refers to variety of species of animals, plants and microorganisms on the earth, and

**2.3 Genetic diversity:** It refers to genetic differences within a species i.e., differences in the level of genes.

2.5 More genetic diversity within a species means greater variability and adaptability of individuals to environmental conditions. Lesser genetic diversity on the other hand leads to uniformity and thus greater susceptibility to environmental changes.

2.6 The existing wide spectrum of livestock and poultry germplasm has been created through planned strategies and named after either their features or their main breeding tract. Animal genetic diversity is part of the earth's natural heritage. Man started domestication of animals both as companions (pets) as well as for food much before he adopted agrarian practices. During prehistoric times, there are numerous archeological evidences when man used to follow the herd of animals as a pastoralist until many of them settled to agricultural farming. During past 12,000 years or so, a wide spectrum of livestock and poultry germplasm has been created through well-planned strategies and named them either according to some feature or on the location of its main breeding tract. Therefore, the loss of a breed with some unique characteristic is an irreplaceable reduction in the nature's profusion of life forms, which not only contains the set of genes but their interactions with specific environmental condition.

2.7 There is not only scientific but also economical justification of conservation of breeds. It would be a tragic commentary on mankind if at a time when scientific

programme opens up the molecular opportunities for man's selection of animals; the adapted breeds with unique characteristics are not available. There are many breeds whose unique genetic qualities are associated with the ability to survive and produce under the hardships of hostile climate and limited feed resources. The loss of such breeds means the loss of specific adaptation traits and the DNA sequences coding for this ability, which we may require to introduce in pure bio-technologically, evolved highly productive germplasm. In spite of multiple threats of change, replacement, degradation and extinction, this biodiversity of farm animals in India comprises of over 26 well described breeds of cattle, 8 buffaloes, 20 goats, 42 sheep, 8 camels, 6 horses, 17 poultry and a large number of variant of native ponies, pigs, donkeys, yaks and mithun. The mega diversity is not accidental nor it is purely natural, rather it is the outcome of thousands of years of deliberate selection and planned exposure to a range of natural conditions. (Arajava Sharma, 2006).

**3. Livestock and poultry population trends in Deccan Peninsular Zone:** India owns the world's largest population of cattle (16.25%), buffalo (56.88%), goat (16.69%), sheep (5.70%), pigs (1.91%) and poultry (5.19%) (FAO, 2002). On similar lines, the Deccan peninsular zone is endowed with rich animal genetic resources, accounting for 51.79% of cattle, 35.17% of buffaloes, 65.55% of sheep, 41.98% of goats, 33.19% of pigs and 64.94% of the poultry (AH&VS Report, 2003).

**3.1 Status in Domestic livestock diversity in Deccan Peninsular Zone:** Deccan Peninsular zone has a very diverse and dynamic genetic resource base in livestock including poultry. It possess a total of 11 breeds of cattle, 6 buffalo breeds, 9 breeds of sheep, 4 goat breeds and 4 poultry breeds in addition to other species like donkey, horses. Ducks etc. These breeds evolved over several hundred years are considered as invaluable, because in there genomes perhaps lies the solution to many of the vexing problems of man and animal. It is therefore essential in our own interest that the nation has to do everything within our means to ensure conservation of the existing Animal Genetic Resources for the future generations (Dr.M.G.Govindaiah, 2006).

**3.2 Decline in the number of certain indigenous breeds:** It may be noticed that the decline in domestic animal diversity has been progressive. In Karnataka, for example, as per a news report in 2005 Krishna Valley breed declined by over 80 percent, Deoni by 72%, Khillar by 31%, Amritmahal by 2.62%, Hallikar 40%, Indigenous buffaloes by 6.18%, sheep by 7.24%, goats by 8.02% and pigs by 18.6%. With extensive artificial insemination policies coupled with removal of indigenous bulls from the habitats with a view to ensure up gradation of cattle for increasing productivity, similar loss of numbers in indigenous breeds have occurred through out India. In this background the conservation of germplasm becomes all the more important and relevant.



**3.3 Conservation principles and procedures:** The best way to conserve the resources is within their native environment (in situ), however, it may be a huge task unless the stakeholder and farmers are not involved themselves. The indigenous animal genetic resources especially those that are less productive can only be maintained as long as their minimum feed/fodder requirement are met under zero or low input system.

3.4 Conservation can be undertaken at three levels, viz., genetic biodiversity, species biodiversity and ecosystem biodiversity. In case of wildlife, protection can be undertaken through (a) protection of habitats/ecosystem, (b) protection of national parks and reserve forests, (c) keeping endangered species in captivity, (d) controlling pollution and (e) following the laws strictly. (Prof.MG.Govindaiah, 2006).

**3.5 Strategies and suggested approach to conservation:** The perpetuation and prosperity of animal biodiversity is directly related to their contribution to the economic benefit of the farming community. In case of large ruminants, it would be either milk or draft besides other utilities while in case of small ruminants it would be meat and / or meat / wool or milk. Considering the large ruminants and especially cattle and buffaloes, the strategy of animal biodiversity should be concentrated around improvement in milk and draft. Following are some of the strategies suggested by scientists and breeders involved in this field. (Suresh B.Gokhale, 2006).

- i. The status of the breed with respect to demographic data, geographical distribution, physical conformations of the animals, performance characteristics, socio-economic aspects of breed utilization by the stakeholders and utility of the breed need be known.
- ii. Priorities for breeds to be conserved should be determined.
- iii. Immediate steps be taken up to conserve certain breeds which are threatened or endangered due to neglect, natural disaster and other factors such as poor productivity, low marketability, etc.
- iv. A watch list needs to be prepared and published for endangered and threatened breeds and generally eroded breeds. This list should also be circulated among all concerned for necessary action.
- v. Develop and implement aggressive extension strategies for indigenous domestic animal diversity, wherever there are opportunities for their conservation and improvement.
- vi. Use of appropriate genetic tools (like field recording, cross breeding, different selection methods like Progeny testing etc.) and biotechnological methods (like Artificial Insemination, Embryo transfer, Molecular genetics etc.) is used for conservation and improvement of domestic animals.
- vii. For animal draft purpose, establishing regional drought animal power (DAP) saving centres to suggest the approaches and demonstrate the use of energy saving equipments and also provide the needed support.

- viii. Exploring communication ways (Mass media, radio, television etc.) to strongly educate farming community about the importance of draft animal power input-output implications and relevant consequences.
- ix. The breeding plans and policies be evolved taking a bottom to top approach i.e. from farmers to planners. The choice of the farmer should be considered while formulating the breeding policy in indigenous breed conservation.
- x. Production of bulls should be the responsibility of farmers and farmer organizations. To achieve this, necessary environment and support should be provided.
- xi. NGO's can play a significant role in such conservation programmes by encouraging farmers' participation in the programme, encouraging establishment of Breeder Societies. NGOs can build up new or encourage / strengthen existing grassroots level organisations to undertake the conservation programme. Many farmer groups are interested and willing (if appropriate guidance is received) to come together to work for identifying and utilizing better genotype of the breed. This could be promoted through such organizations. Undertake specific awareness programme for Domestic Animal Biodiversity concept at rural level. There have been many success stories told for crossbreds, similar stories of economic benefit from indigenous breeds be collected and disseminated for extension.

### **3.6 Focus on Participatory approach in conservation of Vechur cattle – The**

**Kerala Experience:** The foregoing paragraphs have brought out the necessity to conserve Germplasm and the methods approaches available at present for the same. In this background, **efforts taken in Kerala to conserve the Vechur cattle**, which had become nearly extinct, deserves a special mention. The conservation and characterization of Vechur cattle which was started and initiated in the late eighties **by Dr.Sosamma Iype under a team of environmentally conscious students** of the College of Veterinary and Animal Sciences and the **support of people of Vechur** and nearby areas, ensured that the "Save the Vechur cow" campaign was a success. The initial efforts would not have succeeded but for the extensive survey done by the group in the original tract. Once the animals were spotted and purchased the initial and immediate support by the Agricultural University was invaluable and eventually led to strong support by the ICAR.

**3.7** Considering that Kerala was one of the pioneering States in adoption of artificial insemination practices it was providence, that a few Vechur cattle, which had not yet been subjected to artificial insemination and consequent up gradation, could be located in the original tract. From these areas the nucleus stock was purchased and was then maintained at KAU. Studies undertaken on this stock and further multiplied including those on the physical characteristics and also on the milk production, karyotyping, etc. have helped in successful conservation and characterization of



Vechur cattle eventually ensuring its recognition as the breed.

3.8 The farmers of that tract also need to be specially complemented for maintaining such cattle even though the cross breed/upgraded cattle would have offered better economic returns to them in the short term. Their cooperation in eventually giving the identified Vechur animals to the Agricultural University and their pride in the breed being saved from extinction also deserves special mention. Vechur conservation trust is the logical conclusion to the conservation efforts, as in the longer run only with large-scale participation and involvement of Non-Governmental Organizations, interested persons and farmers any such activity can be sustained.

**3.9 Conclusion:** Conservation of native germplasm is extremely important and with the rapid decline in the numbers of various breeds of cattle, if this were not attempted in an organized, systematic and conscious manner, it would result in the loss of invaluable genetic material, which had got evolved after years of selection and stabilization. The success in conservation of Vechur cattle in a way is a very important land mark and a model which can be adopted while undertaking such conservation activities for preserving other such valuable native germplasm to the benefit of mankind.

**References: -**

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