

LOSS OF BIODIVERSITY WITH SPECIAL REFERENCE TO FARM ANIMALS

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ABSTRACT

Bio diversity in its broader sense is the variety of life in all its forms, levels and combinations and its interactions, consisting of species, genetic and ecosystem diversity. Farm animal genetic resources are those animal populations that are used, may be used, for the production of food and agriculture. In animal farming, production systems and its genetic diversity are having a close link and interaction. Intensification of agriculture and animal farming is having a direct impact on loss of genetic diversity in farm animal genetic resources. So the rational and sustainable way to prevent the loss is to keep the “locally adapted” breeds of animals of a particular location as a functional part of any production system, which not only assures the conservation, development of farm animal genetic resources but also ensures the sustainable food security in developing countries like India.

INTRODUCTION

The variety is the essence of life. Biodiversity is the variety of life in all its forms, levels and combinations and its interactions, consisting of species, genetic, ecosystem diversity. Agriculture biodiversity is the component of the total that contributes to the food and agriculture production,

consists of species, within species and ecosystem. Farm animal genetic resources are the species of animals used for, may be used, for production of food and agriculture and the population within each of them. The domestic animal diversity is the range of genetic differences within each breed and across all breeds within the species including species differences. The domesticated farm animals have become social and cultural elements of our life style. The diversity of the animal genetic resources results in diverse products available for humans. It only makes the mankind to survive in a wide range of ecosystems and environments from the tropics to temperate.

ROLES AND VALUES OF FARM ANIMAL GENETIC RESOURCES

Farm animals as sources of food:

The universal and most preferred value of farm animals is their contribution to food production. It provides a range of food products including meat, milk and eggs. The diversity within each product and its unique quality, contributes a wonderful variety in the final product in the table.

These animal food products also play a vital role in providing balanced diet with animal protein with excellent amino acid composition apart from calories. This will alleviate the problems of malnutrition due to animal protein in developing countries.

Farm animals as sources of energy:

Farm animals are acting as a source of renewable energy in the form of draught power. This draught is being used for agricultural operations like ploughing, irrigation, harvesting, transporting of people, agricultural products and other related works. It also spares the huge capital and recurring cost of small and marginal farmers for mechanization in the form of usage of tractors. This animal draught power is the cost effective power source for small and marginal farmers in developing countries.

Farm animals as sources of fuel and fertilizer:

In almost all parts of the world, farm animal waste is considered as a valuable source of fertilizer and fuel. Use of farm animal waste as fertilizer is an efficient way of completing “bio resource flow” of sustainable integrated farming system. As a fuel, biogas production from livestock manure is a proven renewable energy resource for domestic purpose.

Farm animals as sources of social and cultural assets:

The various communities of the world have their own life style and unique traditions, which are basically linked with farm animals with diversity. It is not always possible to estimate monetary values for these linkages and beliefs. Livestock and particular type of livestock are fundamental aspects of social and cultural identity, linked to marriage, religious practices and other community events.

Farm animals as sources of income:

Globally, in the intensive animal farming, animal products provide valuable income to the farmers in developed, developing and underdeveloped countries. The different products include, meat, milk, hides, wool, manure and draught power. Increasing the animal production in the developing countries will increase the food security also. Animal products like hides, etc., will offer significant economic development in both the developed and developing world.

STATUS OF FARM ANIMAL GENETIC RESOURCES

The domestication of animals and plants is an age-old process and time immemorial. As per FAO reports, of 50,000 known avian and mammalian species, around 30 have been extensively used in agriculture, of which 14 species accounting 90 percent of global livestock production.

The genetic diversity of nine species (Cattle, buffalo, sheep, goat, horse, pig, chicken and duck) out of fourteen may account for as many as 4000 breeds. To evaluate the genetic diversity among the farm animals, breed is the best indicator.

FARM ANIMAL GENETIC RESOURCES OF INDIA

Farm animal genetic diversity is lost at a rapid and alarming rate as a result of two key factors

- ❖ Explosive human population and its consequences, viz, urbanization and development pressures

- ❖ Rapid change of traditional production system into intensive production system

Production systems are defined as,

Function of input – output relationship over a time at a particular location. The function depends on the factors like biological, climatic, economic, social and cultural interactions that determine the production potential of the particular system.

Production system may be classified into three systems, based on the degree of human intervention,

Production system	Cause	Effect
High input-output	All rate limiting inputs are manageable	High levels of survival, reproduction, output Constraint: Managerial decisions
Medium Input-output	Partly manageable available inputs to overcome the negative effects of environment	Output limiting factors are existing Survival and reproduction are the concerns
Low Input-output	Severe pressure on more rate limiting factors influences beyond human management	Very low survival, reproduction and out put

In the developing countries like India, most agricultural production involving domestic animals is

characterized by the stress full , medium input-output or high stress low input-output system. Locally adapted breeds will continue to be valuable in this system though it is having modest production capacity in comparison with highly specialized breeds for high input production system. However, these locally adapted breeds are efficient in the use of available resources and sustainable over long term.

In the developed countries high input-output production systems are in vogue where environmental stress factors are under control. The breed selection is based on the total production efficiency. This will cause the loss of genetic diversity in terms of number of locally adapted breeds and development of highly specialized breeds only.

In short, continued use, development and conservation of locally adapted breeds may be the best choice for high stress, medium input and low input production system which is a basic and common feature of animal farming in developing countries.

IMPACT OF LOSS OF FARM ANIMAL GENETIC RESOURCES

The loss of biodiversity in farm animal genetic resources is having short and long-term negative implication.

Short term implication: Loss of locally adapted breeds

- It will minimize the capability of the farming community to breed animals for desired characters for the production system and environment.
- The local breed that evolved from diverse systems and environments offers productive qualities but also the

adaptability traits to local conditions including available fodder resources and water, climate, pest and disease resistance.

- In true sense, the production potentiality (production and adaptability traits) of locally adapted breed will be efficient than exotic breeds in medium input and high stress low input production system.
- As we are observing large variations in the productivity among the locally adapted animals and by breeding of best animals, we can achieve sustainable genetic environment for generations without much investment on introduction of exotic germplasm.

Long term implications

- ❖ ***Reduction in food security***
- ❖ ***Loss of community/country identity and its life style***
- ❖ ***More of dependence on other countries for resources***

The first and serious impact of loss of animal genetic resources is the reduction in the overall global food security. Maintaining a set of breeds for each species that is capable of producing a range of products of varying quality will help us to meet out the changing needs of our future population for variety of food.

The transformation of traditional animal farming into intensive animal farming will marginalize the small and marginal farming community from livestock enterprise. It will also pose serious problems to medium input and stress full low input production system and its viability in developing countries.

The loss of indigenous breeds negatively affects the community identity, structure and their lifestyle. Use of exotic germplasm will reduce the independence and increase the dependence of communities and country to obtain resources from outside.

CONCLUSION

High input-output breeds will continue as essential assets where farmers have the resources. But conserving and maintaining the indigenous breeds that produce in a sustainable manner under medium input and low input production system, is the relevant system for majority of the farming community in developing countries like India.

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