

UNIT 62 – UPSC - Economics of Animal Rearing

Animal rearing has significant role in development of India's economy. It is well recognized that humans depend upon animals for food and associated by-products, work and a variety of other uses. To fulfil these demands, they have tamed or held in custody species of mammals, birds, reptiles, fish and arthropods. These animals are called livestock, and rearing them has implications for occupational safety and health. This general profile of the industry includes its evolution and structure, the economic importance of different commodities of livestock, and regional characteristics of the industry and workforce. Animal Husbandry, Dairying and Fisheries sectors greatly contribute in the national economy and in the socio-economic development of the country. These sectors also support in enhancing family incomes and generating profitable occupation in the rural sector, mainly, among the landless labourers, small and marginal farmers and women, besides providing cheap nutritional food to millions of people. Livestock are the best insurance against the vagaries of nature like drought, famine and other natural disasters.



Livestock uses (Sources: DeFoliart 1992)

Commodity	Food	By-products and other uses
Dairy	Fluid and dried milk, butter, cheese and curd, casein, evaporated milk, cream, yoghurt and other fermented milk, ice cream, whey	Male calves and old cows sold into the cattle commodity market, milk as an industrial feedstock of carbohydrates (lactose as a diluent for drugs), proteins (used as a surfactant to stabilise food emulsions) and fats (lipids have potential uses as emulsifiers, surfactants and gels), offal
Cattle, buffalo, sheep	Meat(beef, mutton), edible tallow	Hides and skins (leather, collagens for sausage casings, cosmetics, wound dressing, human tissue repair), offal, work(traction),wool, hair, dung(as fuel and fertilizer), bone meal, religious objects, pet food, tallow and grease (fatty acids,

		varnish, rubber goods, soaps, lamp oil, plastics, lubricants) fat, blood meal
Poultry	Meat, eggs, duck eggs(in India)	Feathers and down, manure, (as fertilizers), leather, fat, offal, flightless bird oil(carrier for dermal path pharmaceuticals), weed control(geese in mint fields)
Pig	Meat	Hides and skins, hair, lard, manure, offal
Fish (aquaculture)	Meat	Fishmeal oil, shell, aquarium pets
Horse, other equines	Meat, blood, milk	Recreation (riding, racing), work(riding, traction), glue, dog feed, hair
Micro-livestock(rabbit, guinea pig), dog, cat	Meat	Pets, furs and skins, guard dogs, seeing eye dogs, hunting dogs, experimentation, sheep herding(by the dogs), rodent control(by cat)
Bulls		Recreation (bull fighting, rodeo riding), semen
Insects and other invertebrates (e.g. vermiculture, apiculture)	Honey, 500 species(grubs, grasshoppers, ants, crickets, termites, locusts, beetle larvae, wasps, and bees, moth caterpillars) are a regular diet among many non-western societies	Beeswax, silk, predatory insects(>5000 species are possible and 400 are known as controls for crop pests, the carnivorous, 'tox' mosquito, (Toxorhynchites spp.) larvae feeds on the dengue fever vector, vermicomposting, animal fodder, pollination, medicine, (honeybee venom to treat arthritis), scale insect products (shellac, red food dye, cochineal)

The animal production system in India is principally part of a mixed crop-livestock farming system and important for the security and survival of large numbers of poor populace. In such systems, livestock generate income, provide ample job, draught power and manure. This production system assumes special significance in economic growth, increasing income, and increasing urbanization, changes in taste and preference that have led to nutritional changes reflecting the importance of milk, meat, egg and fish.

Livestock rearing is key to poverty reduction strategies:

Livestock area support 25 per cent of gross value added in the agriculture sector. It provides self-employment to millions of people. Fast growth of this sector can be even more democratic and comprehensive than growth of the crop sector because those engaged in it are mainly small holders and the landless. Growth of livestock output averaged 4.8 per cent per annum during the Eleventh Plan. Sheep farming form an important species of livestock for India. Livestock products comprised 32 per cent of the total value of agriculture and allied activities in 2006-07.

From equity and livelihood standpoints, livestock rearing must be central of poverty lessening programmes. Livestock rearing is major livelihood and risk mitigation approach for small and marginal farmers, particularly across the rain-fed regions of India. The livestock sector has been faster than many other sectors of agriculture and if this trend continues then the sector will contribute as main sector for development of Indian economy.

It has been seen that livestock is providers of essential food products, draught power, manure, employment, household income and export incomes. However, it is a fact that livestock prosperity is much more equitably distributed than wealth associated with land. Thus, when assessing the inclusive growth, it should be considered that from equity and livelihood perspectives, livestock rearing is significant in poverty alleviation programmes. There are two other important aspects. Firstly, livestock rearing at the household level is mainly a women-led activity, and therefore income from livestock rearing and decisions related to management of livestock within the household are principally taken by women. Interventions in India have revealed that support for livestock rearing has contributed significantly to the empowerment of women and an increasing role in decision making at both the household and village level. Secondly, livestock rearing, particularly in the rain-fed regions of the country, is also developing as main risk mitigation strategy for poor community.

A global analysis of the livestock sector by the U.N. Food and Agriculture Organisation (FAO) was done recently and it showed that there are three overarching messages that merit discussion with reference to India.

First, although livestock products make important contributions to food security and poverty reduction for many low-income rural families, the policy and institutional framework in many countries has been unsuccessful to serve the needs of these poorest households and to get them onto the conveyor belt of development. The lack of public services in animal health that reach out to the poorest in rural areas and a failure to link small holder livestock keepers to better paying markets are two examples of common failings. The institutional and policy frameworks tend to support intensive and commercial livestock rearing, both in the provision of services and also in facilitating access to markets.

Second, livestock producers, including traditional pastoralists and smallholders, are both victims of natural resource degradation and contributors to it. Remedial action most likely lies in a mix of public goods related to environmental protection, ecosystem services and through incentives for private investment to improve animal productivity, particularly in remote regions. In the case of India, there are numerous examples of community-led interventions where community management and sustainable use of natural resources has positively impacted small holder livestock rearing.

Third, animal health services not only combat animal diseases that cause mortality and reduce animal productivity, they also shield human health because of the risk of animal to human disease transmission. Animal health systems have been ignored in various sections of the world and this has led to institutional flaws that in turn lead to poor delivery of animal health services and higher risks to livelihoods and human health. To correct this situation, it is identified that the poor face different risks and have different incentives and capacities to respond than do intensive commercial farmers. Therefore, animal health service providers have major challenge of

recognising the differences between their stakeholders and developing mechanisms to reach them all.

Dairy and Livestock Production:

Milk:

India is considered as the largest producer of milk in the world.
Plan Schemes:

Dairying is vital source of income for millions of rural people and has assumed as an important role for employment opportunities and income generating opportunities. The Government of India and state governments put great efforts to increase the productivity of milk animals and increase the per capita availability of milk. The Department of Animal Husbandry, Dairying and Fisheries has attempted the building up cooperative infrastructure, revitalization of sick dairy cooperative federations and extended support for creation of infrastructure for production of quality milk and milk products. Two important schemes being executed which include the Intensive Dairy Development Programme for increasing milk production and procurement and the National Project for Cattle and Buffalo Breeding for genetic up-gradation of bovines.

Strengthening Infrastructure for Quality & Clean Milk Production:

The scheme, introduced during October, 2003 has intended to improve of the quality of raw milk produce at the village level by creating awareness among farmers and members. Under the scheme, there is a provision for training of farmers on good milking practices and the setting up of Bulk Milk Cooler (BMC) at Dairy Cooperative Society level.

Assistance to Cooperatives:

The central sector scheme began in 1999-2000 and was intended to revitalize the sick dairy cooperative unions at the district level and cooperative federations at the State level. The rehabilitation plan is prepared by the National Dairy Development Board (NDDB) in consultation with the concerned State Dairy Federation and District Milk Union.

Dairy Venture Capital Fund (DVCF)/Dairy Entrepreneurship Development Scheme (DEDS):

The Dairy/Poultry Venture Capital Fund scheme was started in December, 2004. It has been altered and renamed as the Dairy Entrepreneurship Development Scheme (DEDS) and is implemented from September, 2010.

Cattle and Buffalo Breeding: Livestock Production:

Reports indicated that India has the largest livestock population around the globe, accounting for about half the population of buffaloes and 1/6th of the goat population. Such a large population presents a challenge wherein existing productivity levels are sustained by application of modern science and technology, incentives and policies.

Several states are participating in National Project for Cattle and Buffalo Breeding. The objective of this scheme is to promote genetic upgradation of bovines. Artificial Insemination (AI) centres have been assisted and equipped to function as mobile AI centres and 21,000 private AI centres have been established for delivery of breeding services. To enhance the quality of semen production, a Minimum Standard Protocol (MSP) for semen production has been enforced at all semen stations; 49 frozen semen bull station have been strengthened as per this MSP. A central Monitoring Unit (CMU) has been established for assessment of one semen stations in two years. Thirty four semen stations in the country have acquired ISO certification against 3 during 2004.

MSP for offspring testing and standard operating procedures for AI technicians has also been formulated.

Challenges in livestock sector:

The challenges for maintaining the dairy sector are as under:

1. Small herd size and poor productivity.
2. Inadequate budgetary allocation over the years for Animal Husbandry, Dairying & Fisheries.
3. Lack of equity with crop production.
4. Inadequate availability of credit.
5. Poor accesses to organized markets deprive farmers of proper milk price.
6. Poor AI service net-work.
7. Shortage of manpower and funds.
8. Limited availability of quality breeding bulls.
9. Low acceptability of AI in buffaloes.
10. Disease outbreaks: mortality & morbidity.
11. Deficiency of vaccines and vaccination set-up.
12. Induction of crossbred animals in areas poor in feed resources.
13. Majority of grazing lands are either degraded or encroached.
14. Diversion of feed and fodder ingredients for industrial use.

There is a need to support continually for further genetic upgradation programmes to meet increasing demand for milk in the country. There is further need to combine and improve the breeding infrastructure created under NPCBB, scientific programmes like Embryo Transfer Technology (ETT), Multi Ovulation Embryo Transfer Technology (MOET), Markers Assisted Selection (MAS) and development of semen sexing technology and use of sexed semen for faster propagation of elite germplasm and for increasing bovine productivity. The following policy initiatives are essential to entice investment and for further development of dairy and livestock sector:

1. Incentivize investment in this sector.
2. Increase public investment.

It has been realized that regardless of the importance of livestock in rural economy, most of the livestock proprietors are unable to tap the potential of this industry, due to lack of technical support services and incompetent backward and forward integration. India has first position in cattle and buffalo population, second in goat, third in sheep and seventh in Poultry.

Constraints of Livestock Development:

Though Government of India and State Governments has launched many programmes, they were not able to deliver the expected results. There was no significant innovation in improving the productivity both in the milk and meat sectors and in reaching the poor for their livelihood.

Major ground for the slow progress were:

1. Non-availability of superior quality breeding bulls.
2. Poor quality of semen produced by many of the laboratories.

3. Inadequate skills of paravets resulting in poor conception and infertility.
4. Inadequate support for paravets for supply of liquid nitrogen, frozen semen, health care and technical guidance.
5. Shortage of fodder resources.
6. Absence of field oriented conservation strategy for indigenous breeds.
7. Lack of coordination among various agencies engaged in livestock husbandry.
8. Poor extension services to motivate small farmers to adopt dairy husbandry for income generation.

Problems of the Poor community:

If the programme has to reach the poor and make a positive impact for its success, it is essential to resolve the problems of the poor people. The major problems of the rural families living below the poverty line (BPL) in taking advantage of the opportunities in livestock development are as under:

1. Poor quality animals needing genetic upgradation and severe culling.
2. Poor breeding services at their doorsteps, both with respect to superiority of the germplasm and timely and efficient delivery resulting in poor conception and production of inferior quality offspring.
3. Nutritional deficiency, shortage of feed and fodder.
4. Poor health conditions due to lack of preventive vaccinations and timely diagnosis of health problems.
5. Lack of coordinated efforts to eradicate common diseases.
6. High cost of veterinary services leading to neglect of sick animals.
7. Spreading of communicable diseases such as Brucellosis, TB, etc. to other animals as well as human beings in the absence of separation facilities.
8. Lack of technical guidance to farmers to improve their animal husbandry practices.
9. Poor control on technicians engaged in providing various services to farmers resulting in exploitation and lack of treatment for infertile animals.
10. Saturation of market in local milk sheds, resulting in lower price realisation and exploitation by the middlemen and private dairies.
11. Poor association between research institutions and farmers resulting in use of outdated technologies.
12. Absence of suitable policies to involve small agriculturalists.
13. Need for appropriate National Livestock Policy.

To accomplish the revised goal, initial step should be to devise a national policy. The Indian Livestock Policy will have to take a holistic view and explore ways to utilize the opportunities at the national and international levels. With this background, the National Livestock Development Policy should chase the following goals (Anon.1996):

1. Overall improvement in quality and efficiency to compete in the global market.
2. Facilitate resource-poor households and women to take active part in livestock development for sustainable livelihood.
3. Guarantee ecological sustainability through conservation of native breeds and control of unplanned population growth to match with available feed and fodder resources.

Strategy for Livestock Development for Benefiting Small Farmers:

To enhance the performance of various schemes, there are many recommendations for livestock husbandry. These advises can boost the production, compete in the global market and attract the landless and small farmers to take advantage of this sector for sustaining their livelihood.

1. Genetic Improvement:
 - A. Production of Superior Quality Bulls: The prime focus of all the State owned and supported farms should be on breed conservation and production of elite bull mothers and bull calves. Growers maintaining best herds of cattle and buffalo can also be involved in bull calf production through planned breeding and buy-back guarantee. Application of MOET (Super ovulation and embryo transfer technology) for production of bull mothers and bull calves should be promoted. Progeny testing of sires should be reinforced for the use of proven sire semen on a large scale.
 - B. Production of Superior Quality Semen: All the semen freezing laboratories should be registered with the Ministry of Agriculture in different regions for periodic evaluation of the quality. The bulls to be brought under semen freezing should have certification for their pedigree, performance and disease free status. There are many semen freezing laboratories, which have been recommended by the Government of India for closure as they were unable to maintain minimum expected quality. The concerned State Governments may invite interested agencies to operate such laboratories on a benefit-sharing basis.
 - C. Conservation of Genetic Resources: Proposed activities for conservation of important native breeds of cattle and buffaloes are as under:
 - Study the economics and utility of different breeds.
 - Incentive for maintaining the native breeds by compensating the costs and assurance for procurement of elite animals at a premium.
 - Procurement of elite females from farmers for bull mother farms managed by research institutions for super ovulation.
 - Use of sexed embryos for multiplication of elite progeny.

Livestock Health:

There are many infectious Diseases that can affect the production of livestock. High prevalence of various animal diseases such as Foot & Mouth Disease (FMD), Peste des Petits Ruminants (PPR), Brucellosis, Classical Swine Fever and Avian Influenza can seriously impede growth in the livestock sector. Most of these losses can be prevented through timely immunization. The Department of Animal Husbandry, Dairying & Fisheries (DADF) has introduced National Programmes for prevention and control of FMD, PPR and Brucellosis.

Similar programmes have been started to control PPR and Brucellosis. Lacks of vaccines and lack of proper cold chain facility are among the major interruptions to a quicker implementation of these programmes.

Veterinary Support Services: Most of the veterinary hospitals and polyclinics and veterinary dispensaries are not well equipped and have poor infrastructure and equipment. Additionally, the technical manpower is too insufficient to support health programmes for the huge livestock

population. The Department of Animal Husbandry, Dairying & Fisheries has initiated a programme for the "Establishment and Strengthening of existing Veterinary Hospitals and Dispensaries (ESVHD)". There is a grim need to reinforce veterinary hospital facilities for well-timed diagnosis and treatment of animal diseases.

Disease Reporting:

The present system of disease reporting is sluggish. A computerized National Animal Disease Reporting System (NADRS) linking Taluka, Block, District and State Headquarters to a Central Disease Reporting and Monitoring Unit at the Department of Animal Husbandry, Dairying & Fisheries in New Delhi has been originated in 2010-11. A faster and consistent disease reporting and processing of data will assist in the development of appropriate policies and involvement for disease prevention and containment.

Challenges:

Major challenges provoking the animal health sector include:

1. Veterinary hospitals, dispensaries and technical manpower are inadequate.
2. The disease reporting is neither timely nor complete which delays proper interventions.
3. Insufficient availability of vaccines and lack of cold storage.

Preventive measures:

The following measures will support the animal health sector:

1. Adequate veterinary disease diagnosis, epidemiology, hospital infrastructure and manpower need to be developed.
2. A strong programme for supply of sufficient veterinary vaccines is necessary.

Meat and Poultry Sector:

India has good standing in the world in goats and sheep population. Unlike the dairy sub-sector, growth in poultry production is mainly attributed to the efforts of the organized private sector, which controls over 80% of the total production in the country.

Poultry farming in India, despite of several restraints, has increased considerably during the last decade. The technological developments have transformed the role and the structure of poultry industry in India. It became one of the most specialized enterprises in many parts of the country.

In poultry development, the following three mechanisms are funded by the Department:

1. Assistance to State Poultry Farms: One time assistance is provided to strengthen farms in terms of hatchery, brooding and rearing houses, laying houses for birds with provision for feed mill and their quality monitoring and in-house disease diagnostic facilities and feed analysis laboratory.
2. Rural Backyard Poultry Development: This element predicts supply of backyard poultry to beneficiaries from Below Poverty Line (BPL) families to enable them to gain supplementary income and nutritional support.
3. Poultry Estates: Entrepreneurship abilities are to be improved through an experimental pilot project, 'Poultry Estates' in two States. It is predestined primarily for educated, unemployed youth and small farmers with some margin money, for making a profitable

venture out of various poultry related activities in a scientific and bio-secure cluster approach.

Poultry Venture Capital Fund: This scheme offers finance through NABARD for components like establishment of poultry breeding farm with low input technology birds, establishment of feed go-down, feed mill, feed analytical laboratory, marketing of poultry products, egg grading, packing and storage for export capacity, retail poultry dressing unit, egg and broiler carts for sale of poultry products and central grower unit, etc.

Central Poultry Development Organizations and Central Poultry Performance Testing Centre: The four centres of the Central Poultry Development Organizations are situated at Chandigarh (Northern Region), Bhubaneswar (Eastern Region), Mumbai (Western Region) and Bangalore (Southern Region) while one Central Poultry Performance Testing Centre is at Gurgaon, Haryana. These centres are supporting the development of poultry through the following measures:

- Availability of quality chicks of identified low-input technology poultry stocks is ensured.
- Diversification into rearing of Duck and Turkey (Southern Region), Japanese Quail (Northern and Western region) and Guinea fowl (Eastern region).
- Training of trainers, farmers, women beneficiaries, various public and private sector poultry organizations, NGOs, Banks, Cooperatives and foreign trainees etc.
- Systematic testing of various stocks available in the country to assess their performance.

The main marketing agents were recognized as wholesale dealer and contractors. Iqbaluddin (1996) stated that in most of the poultry pockets in India, marketing was still controlled by private dealers. Variation in the prices of poultry products was one of the main restrictions to make investment in the sector. Market Intervention Scheme (MIS) for procurement of eggs in Andhra Pradesh, Tamil Nadu, Punjab, Haryana, Madhya Pradesh and Rajasthan by NAFED had revealed good results, though the scale of operation is very small. Seetharaman (1996) studied the pattern of poultry development in India. He observed that out of 9 states, with well-developed poultry industry, only in two of them, i.e., in Gujarat and Maharashtra, the poultry cooperatives showed good performance. He suggested that poultry cooperatives need to be extended in all poultry producing states.

Poultry enterprises in India can markedly be grouped into two categories that include developmental poultry farms and commercial poultry farms.

1. **Developmental poultry farms:** It denotes to village/unorganized poultry production because this enterprise operates in a low scale, using less capital and traditional technology. The unit volume of production is little due to the many constraints. Though, the concept of developmental poultry is very pertinent for India's rural areas to enhance cash earnings of rural poor population. Poultry farming was included in various Central and State Government sponsored programs, such as Integrated Rural Development Program (IRDP), Special Livestock Production Program (SLPP), Tribal Development Program (TDP), etc. to popularize poultry farming in rural areas. However, the growth of developmental poultry did not succeed at Desi red level.
2. **Commercial poultry production:** The Commercial / industrial poultry production is described as large-scale enterprises where the number of birds per unit is big enough to gain maximum rewards of technological development. These enterprises present various

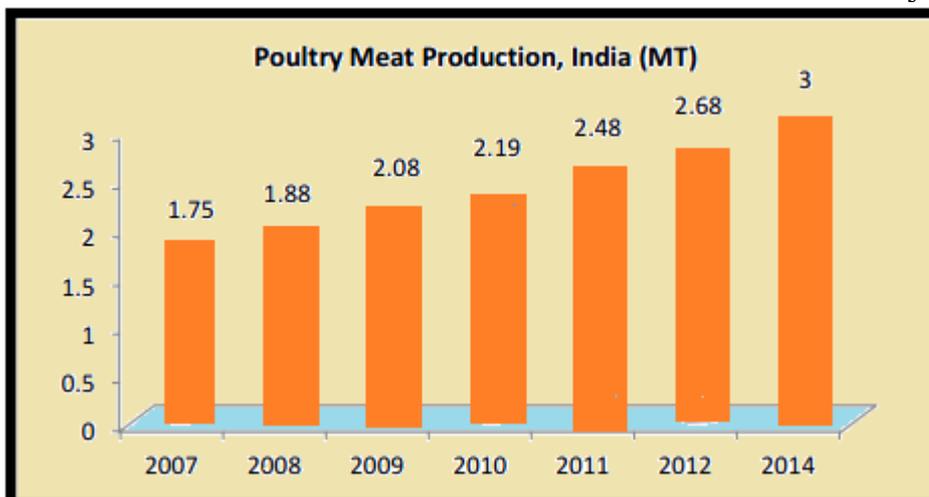
economies of scale of operation and, therefore, are able to absorb the fluctuations in demand and supply and in input cost. The development of this sector has remained highly important over the years.

The stage of poultry farming in different states / UTs was scrutinised by developing developmental indices on parameters such as layer parent stock, number of improved birds relative to the total poultry population, number of hatcheries (both in private and public sector), and performance (i.e., number of eggs produced/year). This technique was used to build indices for major poultry producing states/UTs in the country. The Poultry Development Index was built for the major poultry producing states of Indian Union. The states were categorized in ascending order of WPDI. This suggests that the state with the lowest WPDI was the first mentioned and so on. Assam & N.E. States were found in first place in the order, i.e., poultry farming is the least developed in these states, followed by Bihar, Orissa, and Himachal Pradesh, etc. Andhra Pradesh is found the most developed poultry production in India.

Reports of animal husbandry indicated that Poultry products had revealed a massive growth in the country after 1961. Egg production in that year was 2,881 million, which increased to about 30,000 millions in the year 1996. Broiler production starting from zero increased 400 million birds in the year 1996. Similarly, poultry meat, which was about 81 thousand tonnes in the year 1961, increased to 659 thousand tonnes in that same period. The increased production increased the availability of poultry products for consumption.

The growing demand for poultry products has renovated poultry production activity into a full-grown industry from a simple household/backyard activity until recently. Technological progresses have revolutionized the role and the structure of poultry industry in India. The funds assigned for poultry farming development during the various plans are minimal. Nevertheless, the poultry sector has attained production goals satisfactorily. The stage of poultry farming development in different states discloses that in most of the states, the poultry sector is still not well developed. Only few states like Andhra Pradesh, Maharashtra, Haryana, Punjab, Tamil Nadu and Gujarat have substantial poultry production.

Chart: Source: India Ministry of Agriculture, Department of Animal Husbandry, Dairy and Fisheries and State Animal Husbandry Departments, 2014



Key Challenges:

The challenges in the area of the meat and poultry are as under:

1. Maize availability and cost: maize is vital element of poultry feed, its' availability at a reasonable cost is the major problem of poultry sector.
2. Diseases: Pathogenic and emerging diseases such as AI often cause major losses both in domestic market and international trade.
3. Lack of Marketing Intelligence: There is an ominous need for realistic national marketing intelligence to bridge the gap between supply and demand of poultry & poultry products.
4. Human Resource Development: To fulfil the increasing demand of sustainable and safe production, there is a massive demand for trained and skilled manpower in poultry sector.
5. Large size of target population to be improved in terms of productivity with application of science and technology pose a formidable challenge.
6. Low level of processing and value addition in animal products.

Preventive measures to strengthen the meat and poultry sector for faster and sustainable growth is as under:

1. Long-term sustainable production measures have to be observed into to increase the production & quality of maize.
2. Active investigation, monitoring and control in case of any occurrences in rapid way.
3. Network for a realistic national and global poultry database and marketing intelligence may be developed.
4. Adequate trained manpower should be developed in the existing institutions.
5. With increasing urbanization and increasing quality consciousness, the market for scientifically produced meat products is expected to grow rapidly. The market is growing for ready-to-eat and semi-processed meat products because of a changing socio-economic scenario and an increase in exports to neighbouring countries, especially the Middle East.
6. The mechanized slaughter houses produce huge quantities of offal and digesta from the slaughtered animals which could be lucratively utilized for production of value added products, like Meat-cum-Bone Meal (MBM), Tallow, Bone Chips, Pet Foods and methane as a source of energy for value addition in most of the modern plants.
7. There is a need to support pig rearing in order to progress sow productivity, growth rate of piglets and feed conversion productivity.
8. It is also necessary to enhance proper utilization of by-products of livestock slaughter for higher income of livestock owners. The environmental pollution and spread of livestock diseases has to be stopped.

Fisheries Sector:

Fisheries Sector of India is the third largest producer of fish and second largest producer of inland fish in the world. Fisheries Sector occupies an important place for socioeconomic development of country (Ramesh Singh, 2008). The policy for fishery development highlights inland fisheries, particularly aquaculture which has been contributory to increase production, enhance exports and reduce the poverty of fishermen. In India, fisheries and aquaculture are lively economic activities, and has been one of the fastest growing food production systems during the last three decades. Their connotation and contribution towards agricultural (4.6 per cent GDP) and national economies (1.3 per cent GDP), livelihood and nutritional security, employment generation (11 million people) and foreign exchange earnings (over Rs.8000 crores) have been huge though understated so far.

Allocations made for the expansion of fisheries sector through the Centrally Sponsored Schemes and Central Sector Schemes are utilized for implementation of both development and welfare oriented schemes through the respective states and UTs. Additionally, support is provided through other flagship programmes such as Rashtriya Krishi Vikas Yojana (RKVY) and the recently launched National Mission for Protein Supplements (NMPS).

Major challenges in fish sector are as under:

1. Lack of quality and healthy fish seeds and other critical inputs.
2. Lack of resource-specific fishing vessels and reliable resource and updated data.
3. Inadequate awareness about nutritional and economic benefits of fish.
4. Insufficient extension staff for fisheries and training for fishers and fisheries personnel.
5. Absence of standardization and branding of fish products.

Some preventive measures that can help to further support the fisheries sector are as under:

1. Schemes of cohesive approach for enhancing inland fish production and productivity with forward and backward linkages right from production chain and input requirements like quality fish seeds and fish feeds and establishment of required infrastructure for harvesting, hygienic handling, value addition and marketing of fish.
2. Existing Fish Farmers Development Authority (FFDAs) would be refurbished and cooperative sectors, SHGs and youths would be vigorously involved in concentrated aquaculture activities.
3. Massive adoption of culture-based capture fisheries and cage culture in reservoirs and larger water bodies are to be taken up.
4. Sustainable utilisation of marine fishery resources especially deep sea resources and enhancement of marine fish production through sea farming, mariculture, resource replenishment programme like creation of artificial reefs.

Employment generation: Animal rearing and Dairying may contribute a lot to generate the employment in rural areas throughout the year. Indian Agriculture is mainly dependent on monsoon and hence agriculture field faces certain bottlenecks to provide employment during such periods. Dairy farming, sheep and goat rearing, poultry production, pig farming rabbit rearing are the another sources of mix farming. It creates huge job opportunities for the farmers as well as land less labourers who can do this job themselves, or it may be possible to employ young and the old family persons as a side business. Many of the operations in Animal and Poultry Farming can be done by the rural women.

It is appraised that the fisheries sector has valuable contribution fir economic progress of country especially coastal areas. The relative dispersal of coastal small-scale fisheries adds to maintaining economically feasible rural communities and balancing the trend towards growing coastal urbanization.

Sheep rearing:

Other types of animal rearing is Sheep rearing. It can be reared as free range or under housing inside a shed. It is a very important component in dry land farming system. It can be started with less investments and farmers and landless labourers can generate more profit. India has seventh position in the world sheep population.

Most of the Indian sheep breeds are used for dual purpose such as for mutton and carpet wool. The important sheep breeds of the north-western arid and semi-arid regions are Chokla, Nali, Marwari, Magra, Jaisalmeri, Malpura and Sonadi. The Chokla and Nali breeds are found in Rajasthan. These are suitable for carpet-wool producing sheep breeds. The state of Rajasthan possessed highest sheep population as per record.

There are many advantages of sheep rearing such as:

- Well adopted to environment and poor management practices.
- The meat rate is increasing day by day.
- Sheep are appropriate for wool and meat.
- Average of 1-2 kids per sheep per delivery.
- Average meat recovery of 22-30 kg/goat.
- Penning leads to manurial value to land.

In order to fulfil growing demand of the domestic and international level for mutton and wool products, the domestic production of sheep has to be enhanced. The production enhancement can be accomplished only through improvement in productivity in the long-run. There is a huge importance of Sheep Farming in national fiscal development. Commercial sheep farming can play vital role for growth of a country. The goats have a great role in the national economic growth. By rearing sheep in small scale, the poor people can generate extra income. Sheep products have a huge demand in the international market. So there is an opportunity to earn foreign cash by exporting sheep products. That will directly increase national income.

Goat rearing is the mainstay of the economy of small and landless farmers in India. It is an assurance against crop catastrophe and provides alternate source of livelihood to the farmers all year round. Goats provide dependable source of income to 40% of the rural population who are below the poverty line.

There are technical constraints for securing goat industry in the country:

1. Non-availability of high-yielding breeding stock.
2. Low level of nutrition and managerial competence.
3. Lack of definition of the production objectives.
4. Inadequate attention to application of the modern techniques for improving the reproductive efficiency.
5. Limited use of outstanding exotic breeds for improvement.
6. Insufficient control of diseases and parasites due to non-availability of prophylactic vaccines against important contagious diseases.
7. Lack of knowledge on successful rearing of kids. Kid mortality is very high when weaning is practiced at a very young age.
8. Lack of knowledge on silvi-pastoral system.
9. Housing for goats in different eco-zones requires a very elaborate and systematic study.
10. Organized marketing is very limited. This has resulted in unscrupulous exploitation by the middle-man who is often seen moving with the goats along the migratory routes.

To summarize, the animal production system in India is principally part of a mixed crop-livestock farming system. It is important for the security and existence of huge numbers of poor community

of India. In such systems, livestock create income, provide employment, draught power and manure. This production system assumes special significance in the context of continued economic progress, growing income. It is documented that Indian livestock industry contributes a significant amount of world's livestock resources. Both the national economy as well as the socio-economic development of the country is supported by the livestock sector. The livestock sector is performing well in the manner of production, value addition and export of dairy, fishery, wool, poultry and other products.