

CHAPTER 5.2

ANIMAL HUSBANDRY AND DAIRYING

5.2.1. The contribution of animal husbandry and dairying to total gross domestic product (GDP) was 5.9 per cent in 2000-2001 at current prices. The value of output of livestock and fisheries sectors was estimated to be Rs 1,70,205 crore during 2000-2001, which is 30.3 per cent of the total value of output of Rs 5,61,717 crore from the agricultural and allied sectors. The contribution of the milk group alone (Rs. 1,01,990 crore) was higher than wheat (Rs. 47,091 crore) and sugarcane (Rs. 27,647 crore). It is estimated (1993-94) that almost 18 million people are employed in the livestock sector in principal (9.8 million) or subsidiary (8.6 million) status. Women constitute about 70 per cent of the labour force in livestock farming. The overall growth rate in the livestock sector is steady (around 4.5 per cent) in spite of fact that investment in this sector is not substantial. As the ownership of livestock is more evenly distributed with landless laborers and marginal farmers, the progress in this sector will result in a more balanced development of the rural economy.

REVIEW OF NINTH PLAN

Cattle And Buffalo Development

5.2.2 The broad frame-work of the cattle and buffalo breeding policy being followed since the mid-sixties envisaged selective breeding of indigenous breeds in their breeding tracts and use of such improved breeds for upgrading of the

Achievements in Livestock Sector

India is currently the largest producer of milk (84.6 million tonnes during 2001-02) in the world.

India ranks 5th in Egg production (33.6 billion nos during 2001-02).

Rinderpest, a dreadful disease of ruminants has been eradicated from the country

nondescript stock. While the States accepted the framework, appropriate implementation through field level programmes could not be done. Lack of interest in promoting Breed Organisation/Societies and related farmers' bodies contributed to the gradual deterioration of indigenous breeds. Government intervention for breed improvement is not available to majority of owners of indigenous breeds of cattle. Eventually, the availability of good quality bulls needed for natural mating in breeding tracts became scarce, leading to further deterioration of indigenous breeds in these tracts. Production of quality indigenous bulls has been a long-neglected area and would require a major thrust in order to harvest the best male germplasm available in the country. The present production capacity of frozen semen doses is about 30 million against the estimated requirement of 65 million doses annually. Except for a few pockets in important breeding tracts and in sperm stations, indigenous bulls of unknown pedigree and with poor quality semen are generally used. Crossbreeding, which was to be taken up in a restricted manner and in areas of low producing cattle, has now spread indiscriminately all over the country. Continuous emphasis on cross breeding with exotic breeds even in the tracts of indigenous breeds led to the near-extinction of some of the known breeds. Further, the indiscriminate use of contaminated semen or infected bulls results in the spread of sexually transmitted diseases like Infectious Bovine Rhinotracheitis (IBR) at an alarming rate.

Milk Production

5.2.3 Milk production in India remained more or less stagnant from 1950 to 1970. Thereafter, it increased rapidly, reaching 84.6 million tonnes (mt) in 2001-02 (anticipated). But the Ninth Plan target of milk production (96.49 mt) was not achieved. The per capita availability of milk increased from 112 gm per day in 1973-74 to about 226 gm per day in

2001-02. However, it is still below the world average of 285 gm per day. Investment in the dairy sector in the Ninth Plan decreased significantly compared to the Eighth Plan. Out of 168 Milk Unions, 58 Milk Unions (34.5 per cent) were running in loss as of March 2000. So far, the Government policy in the dairy sector has been to give preference to the establishment of milk processing plants linking rural milk producers to urban consumers through a network of cooperatives. Restrictions on establishing new milk processing capacity under Milk and Milk Products Order (MMPO) has now been removed. No policy measures have been undertaken so far to give a fillip to the unorganised sector involved in the production of Indian dairy products (like ghee, paneer, chhena, khoa etc.), which have tremendous potential in the export market in Asian and African countries.

Egg Production

5.2.4 The Indian poultry industry has come a long way – from a backyard activity to an organised, scientific and vibrant industry. It is estimated that the egg production in the country is about 33.6 billion numbers (2001-02) against the Ninth Plan target of 35 billion numbers. The most notable growth among the livestock products has been recorded in eggs and poultry meat. Since 1970-71, their output has grown at 5.87 per cent per annum. The significant achievement in poultry development has come from the initiatives taken up by the private sector for commercial pure-line breeding. However, despite the huge investment made, mostly by the private sector, the poultry-processing sector is incurring losses.

The status of the poultry sector as to; whether it falls under agriculture or industry, is somewhat ambiguous and, therefore, it has remained deprived of various benefits available to these sectors. Poultry farming should be declared as an agricultural activity. The poultry production model in vogue (high input-high output using commercially developed strain of birds) has been primarily responsible for the rapid growth in production of eggs and broiler meat in the country, but it is successful mainly in large-scale units (more than 1,000 units of birds). Due to high

feed cost, non-availability of credit and marketing support, most of the small farmers have become contract farmers and are exploited by middlemen. Government intervention, by way of various support mechanisms, is now needed for the promotion of poultry in rural areas. Indigenous poultry breeds, including the improved strains that can survive with low quality raw feed and better resistance against diseases, can be reared under free range conditions by rural unemployed youth and women for some additional income and employment.

Meat Production

5.2.5 In India, meat production is largely a by-product system of livestock production utilising spent animals at the end of their productive life. Meat production was estimated at 4.6 mt in 1998. Projects sanctioned during the Seventh and Eighth Plans for improvement/modernisation of abattoirs and carcass utilisation centres for fallen animals are still to be completed.

Goat Development

5.2.6 Despite the least attention from the planners, goat population in India has increased at the fastest rate among all major livestock species during last two decades. However, instead of increasing the goat population, emphasis should be laid on productivity per animal, organised marketing and prevention of emergence of new diseases like Peste des petits ruminants (PPR) which has led to higher mortality and abortion in goats. The goat improvement programme is to be given a push through extending credit to the poor landless farmers.

Sheep Production

5.2.7 During the last four decades, there has not been much increase in the sheep population. Production of wool has increased from 43.3 million kg in 1996-97 to 49.0 million kg (anticipated) in 2001-02. The Ninth Plan target of wool production (54.0 million kg) was not achieved. The fine wool production in the country is around 4 million kg against the demand of around 35 to 40 million kg. Indian wool is primarily

used for the production of carpet, drugget, wall hangings etc. To enhance the quality and quantity of carpet wool, shepherds need incentives like credit, health coverage, breed improvement programmes and timely disposal of wool and surplus animals at a reasonable price.

Pig Development

5.2.8 Pig husbandry is the most important activity in the animal husbandry sector in the northeastern region inhabited by tribal people. The region also has a substantial pig population, which constitutes around 25 per cent of the country's pig population. The bulk of the population is, however, of the indigenous type whose growth and productivity is very low. The major difficulty in pig development is the acute shortage of breeding males.

Animal Health

5.2.9 Since the Second Plan, efforts have been made to control diseases namely, Rinderpest, Foot and Mouth Disease, Haemorrhagic Septicemia, Black Quarter and Anthrax. Although Rinderpest has been eradicated from the country, the prevalence of the other diseases continues to be one of the major problems in the animal production programme. Some of the emerging diseases like PPR, Bluetongue, Sheep Pox and Goat Pox, Classical Swine Fever, Contagious Bovine Pleuropneumonia, New Castle Disease (Ranikhet Disease) are causing substantial economic losses. The programme for creation of disease-free zones was sanctioned in the Ninth Plan but was not implemented. The Department of Animal Husbandry and Dairying is also not well equipped with the necessary infrastructure and qualified technical manpower to execute the programmes and perform its mandatory duties and responsibilities like disease diagnosis and accreditation as per the international standards, development of an effective surveillance and monitoring system for diseases, mass immunisation against the most prevalent diseases etc. Dovetailing the Animal Research Institutes of the Indian Council of Agricultural Research (ICAR) with the Department would not

only improve its efficiency but also provide it with an effective delivery machinery to carry out its regulatory and certification authority functions, including the conservation of endangered breeds of livestock. The suggestion for the establishment of an Indian Council for Veterinary and Fisheries (ICVFR) by carving out the animal science and fishery institutes from ICAR has not yet materialised.

Animal Statistics

5.2.10 The Livestock Census Scheme suffers from quantitative as well as qualitative problems. The present arrangements for conducting the Livestock Census in the States and Union Territories are not satisfactory in relation to timely collection of data and reporting. The Integrated Sample Survey Scheme for estimation of production of major livestock products also needs improvement.

Conservation

5.2.11 The last few decades have witnessed serious erosion, and even extinction, of some indigenous animal breeds in the country. Many existing breeds are facing varying degrees of threat, endangerment and are heading towards eventual decimation. In all States, crossbreeding of cattle is now occupying a dominant position in the production programme and, in this process, the native cattle breeds, which are well adapted, have suffered wilful neglect resulting in their progressive elimination from the production system. India is bestowed with rich domestic animal biodiversity, having 30 breeds of cattle, 12 breeds of buffalo, 20 breeds of goats, 40 breeds of sheep, eight breeds of camel, six breeds of horses, three breeds of pig and 18 of poultry. Besides, there are other species like equine, mithun, yak, turkey, ducks, etc. Indigenous breeds/types are rich in variability and are endowed with many positive traits like superior disease resistance, better tolerance to high heat and humidity and other characteristics suitable to particular agro-climatic environments. It has also been noted that indigenous breeds are more efficient in feed conversion particularly the crop residues and naturally available low quality roughages. Indigenous breeds at risk are:

Cattle	: Red Sindhi, Sahiwal, Tharparkar, Punganur and Vechur.
Buffaloes	: Nili-Ravi, Bhadawari and Toda.
Sheep	: Nilgiri, Muzaffarnagri, Malpura, Chokla, Jaisalmeri, Munjal, Changthangi, Tibetan, Bonpala from Sikkim and Garrole sheep
Goat	: Beetal, Jamunapari, Chegu, Changthangi, Surti and Jakhrana.
Camel	: Bacterian, Jaisalmeri and Sindhi.
Yak	
Mithun	
Poultry	: All the 18 indigenous breeds of poultry are facing extinction. The three important breeds are Aseel, Kadaknath and Naked Neck,

It has been globally recognised that conservation and improvement of native animal genetic resources are essential for sustainable development in agriculture and animal husbandry. The conservation and improvement programme should be decentralised and each State/adjoining States where a breed exists should take necessary steps with the active involvement of institutions, Gaushalas, Non-government Organisations (NGOs) and Breed Societies. The efforts should, however, be effectively coordinated centrally.

5.2.12 Given the severity of the resource constraint, all the Central sector and Centrally sponsored schemes were subjected to zero-based budgeting during the Ninth Plan. The objective was to retain only those schemes that are demonstrably efficient and essential. The schemes that are similar in nature would be converged to eliminate duplication and resource flow would be linked to performance. Out of 41 schemes, 23

schemes were weeded out, one scheme was transferred and six schemes were merged.

TENTH PLAN FOCUS AND STRATEGY

5.2.13 Animal husbandry and dairying will receive high priority in the efforts for generating wealth and employment, increasing the availability of animal protein in the food basket and for generating exportable surpluses. The overall focus will be on four broad pillars viz. (i) removing policy distortions that is hindering the natural growth of livestock production; (ii) building participatory institutions of collective action for small-scale farmers that allow them to get vertically integrated with livestock processors and input suppliers; (iii) creating an environment in which farmers will increase investment in ways that will improve productivity in the livestock sector; and (iv) promoting effective regulatory institutions to deal with the threat of environmental and health crises stemming from livestock. The Tenth Plan target for milk production is set at 108.4 mt envisaging an annual growth rate of 6.0 per cent. Egg and wool production targets are set at 43.4 billion numbers and 63.7 million kg respectively. The allocation for animal husbandry, dairying and fishery is Rs. 2500 crore during the Tenth plan. The scheme-wise break-up of the Tenth Plan outlay given in the Appendix.

A transition from subsistent livestock farming to sustainable and viable livestock and poultry farming

Technology support is imperative not only for enhancement of productivity but also reduction of per unit cost

Transfer Of Technology

5.2.14 Use of technological and marketing interventions in the production, processing and distribution of livestock products will be the central theme of any future programme for livestock development. The generation and dissemination of appropriate technologies in the field of animal production as also health care to enhance production and productivity levels will be given greater attention. Integration of Animal Research Institutes with the Department of Animal Husbandry and Dairying is essential to facilitate transfer of technology as well as to undertake sanitary and

Table 5.2.1
Average Annual Growth rate of Milk and Egg Production 1950-51 to 2000-01

Year	Milk (%)	Eggs (%)
1950-51 to 1960-61	1.64	4.63
1960-61 to 1973-74	1.15	7.91
1973-74 to 1980-81	4.51	3.79
1980-81 to 1990-91	5.68	7.80
1990-91 To 2000-01	4.21	4.46

phyto-sanitary measures. This would provide an effective delivery machinery to the Department enabling it to work primarily as a regulatory body in the liberalised era.

Human Resource Development And Extension

5.2.15 Sustainable rapid growth and development in this sector can only be ensured if the livestock owners, service providers, veterinarians and planners become knowledge based and acquire the ability to absorb, assimilate and adopt developments in the veterinary sciences and related technologies. Efforts will be made to improve the skills and competence of all stakeholders by involving village schools, veterinary colleges and universities in collaboration with the ICAR and its institutions including Krishi Vigyan Kendras (KVK), State Agricultural Universities and their field stations. Steps will be taken to ensure that veterinary education is regulated as per the guidelines of the Veterinary Council of India. Introduction of animal science education (rearing of poultry, cattle, sheep, goat and pig) in the school curriculum will be one of the focus areas during the Tenth Plan. Training of para-veterinarians, Artificial Insemination (AI) technicians, laboratory technicians on a regular basis will be given priority. Similarly livestock extension, which is primarily based on providing services and goods, will be treated differently from crop-related extension activities that are primarily based on transfer of knowledge. Livestock extension will be driven by technology transfer. As women play an important role in animal husbandry activities, deployment of women extension workers will be encouraged and they will work as links between farmers, the animal husbandry department and workers of NGOs.

Integration Of Programmes

5.2.16 Besides the Ministry of Agriculture, schemes relating to animal husbandry and dairying are being implemented by other ministries viz. Ministry of Rural Development, Ministry of Non-conventional Energy Sources etc. Many schemes operated by these ministries have similar and overlapping objectives and target the same population. Generic components like extension, training, and infrastructure get repeated in most of

THRUST AREA

Conservation of native livestock to maintain diversity of breeds

Immunization Programme against important animal diseases and creation of disease free zones

Enhancement of feed/fodder production and improvement of common property resources.

Creation of National Animal Health and Production Information System.

such schemes and are not complementary. Efforts will be made to consolidate and bring in convergence in these areas.

Livestock Services

5.2.17 Most of the livestock services like artificial insemination/natural service, vaccination, deworming etc. are time-sensitive, which Government institutions, at times, are not able to deliver due to financial as well as bureaucratic constraints. This necessitates the providing for efficient and effective decentralised services in tune with demands emanating from users. Efforts will be made to provide such services at the farmer's door, linked with cost recovery for economic viability. Availability of credit in time and technology support are the two important services needed for livestock development in the rural areas.

Livestock Breeding Strategy

5.2.18 A national livestock breeding strategy needs to be evolved to meet the requirements of milk, meat, egg and other livestock products. Major thrust will be given to genetic upgradation of indigenous/native cattle and buffaloes using proven semen and high quality pedigreed bulls and by expanding the artificial insemination and natural service network to provide quality semen and other services at the farmer's level. Improved bulls for natural breeding will be made available to private breeders, Gaushalas, NGOs and panchayats in remote and hilly areas. The programme of providing exotic males for improvement of sheep in the northern temperate region and pigs in the

RECENT INITIATIVES

- Withdrawal of Milk & Milk Products Order MMPO)
- Introduction of National Project on Cattle & Buffalo improvement Programme
- Database & Information Network
- Creation of disease free zone (proposed)
- Conservation of threatened livestock breeds (Proposed)
- Feed & Fodder production enhancement (Proposed)
- Dairy/Poultry venture capital fund (proposed)
- Clean Milk Production (proposed)

northeastern region will continue in the Tenth Plan. Financial and technological support would be needed to promote breeding programmes.

Conservation Of Breeds

5.2.19 Conservation of threatened breeds of livestock and improvement of breeds used for draught animals and packs would be one of the major goals of the Tenth Plan. It will be the national priority to maintain diversity of breeds and preserve those showing decline in numbers or facing extinction. The improvement programme of indigenous breeds possessing desirable characteristics like disease resistance, heat tolerance, efficient utilisation of low quality feed etc. will be taken up. This is essential even for a sustainable crossbreeding programme. Steps will be taken to coordinate all the activities related to the efficient utilisation of draught animal power and animal by-products. Similarly efforts will be made to conserve indigenous birds and propagation of other birds like quail, guinea fowl and duck in those parts of the country where they are popular.

Milk Production

5.2.20 The bacteriological quality of raw milk at the time of milking in India is comparable with that in the advanced dairying nations. Subsequently, however, the quality deteriorates due to improper handling of milk and lack of availability of infrastructure like all-weather roads, cooling facilities, potable water, regular electric supply and sewage disposal. A holistic approach will be taken to address the issue of clean milk production, which is imperative for marketing and promoting export of dairy products. Steps will also be taken for

development of unorganised milk sector that controls a significant portion of the liquid milk and sweetmeat market.

Fodder Development

5.2.21 The importance of feed and fodder in livestock production hardly needs to be emphasised. Three major sources of fodder supply are crop residual, cultivated fodder and fodder from common property resources like forests, permanent pastures and grazing land. A significant portion of crop residue, particularly paddy and wheat straw, is being wasted. Emphasis will be given on enrichment of straw/stover, preparation of hay/silage to overcome fodder scarcities during the lean season, conversion of fodder into feed block to facilitate transport of fodder from surplus areas, establishment of fodder banks and promotion of chaff cutters. The productivity as well as carrying capacity of public and forestland are decreasing due to improper management of common property resources and lack of coordination between the different agencies involved. For sustainable and economic livestock production, this problem will be addressed through scientific utilisation of traditional pastures and integration with the Watershed Development Programme, especially for silvi-pastoral development. For enhancement of grass production, measures will be taken to bring larger areas under joint forest management and treatment of wastelands and areas under problem soils. As the scope for increasing areas under cultivated fodder production is limited, efforts will be made to increase productivity through promotion of intensive fodder production technologies, quality fodder seed production by specialised agencies and use of wasteland for tree and bush based fodder production.

Animal Feed

5.2.22 Oil cakes, maize and cereal by-products are important ingredients of animal feeds. Coarse grains and cottonseed are traditionally used as cattle feed. Measures will be taken to fill up the deficit in the requirement of feeds in quantitative and qualitative terms. At present, a very small portion of grains produced in the country is utilised for livestock and poultry feeding. Rain-fed and arid zones present enormous prospects for production of feed grains. Steps will be taken to develop specifications for many agro by-products like mango seed kernel, mahowa cake, neem cake, soya pulp, whey powder etc. so that these could be utilised for feeding livestock. Quality control of animal feed will be given importance in the Tenth Plan.

Animal Health

5.2.23 Enhanced and sustainable productivity through improved animal health will be one of the major strategies during the Tenth Plan. After the successful eradication of Rinderpest disease, the major thrust will now be to adopt a National Immunisation Programme against the most prevalent animal diseases. Animal disease diagnosis and accreditation as per the international standards, development of an effective surveillance and monitoring system for animal diseases, animal quarantine, certification and enforcement will be the major functions of the Department of Animal Husbandry and Dairying and necessary schemes will be evolved during the Tenth Plan. Further, measures will be taken to ensure that firms producing veterinary biologicals like vaccine, diagnostic kits etc. are following Good Manufacturing Practices (GMP) and meeting Good Laboratory Practices (GLP) requirements.

Poultry Production

5.2.24 The present system of production of commercial hybrid broilers and layers has become highly successful. To give a boost to export of poultry products, measures will be undertaken for the development of infrastructure like cold storage, pressured air cargo capacity and reference laboratory for certification of health and products. Programmes will be formulated to improve

indigenous birds and promotion of backyard poultry farming which could help employment generation as well as economic empowerment of poor women in rural areas. There is tremendous scope for exporting poultry products produced from birds fed on organically produced feed.

Carcass Utilisation

5.2.25 Projects sanctioned during the Seventh and Eighth Plans for improvement/modernisation of abattoirs and carcass utilisation centres will be completed. Emphasis will be given on establishing/improving carcass utilisation centres for naturally fallen animals in rural areas.

Marketing

5.2.26 The development of a marketing network and remunerative price support to the producers are great incentives for higher animal productivity and these will be encouraged for all types of livestock products. Even the advanced countries are giving direct and indirect price support to livestock farmers. Priority attention should also be given to improve processing, marketing and transport facilities for livestock products and value addition thereon. External markets are an extremely important source of demand and these will be tapped much more aggressively. In order to encourage exports, licensing control for processing of livestock products/by-products will be repealed and restrictions on the export of livestock and its products will be removed. The immediate focus will be on export of animal and poultry products to Asian and African countries. The minimum requirements for sustainable export are creation of disease-free zones, organic farming and potable water. These will be made available in selected areas having large marketable surplus. India has a large number of animal markets where livestock are traded but these are not developed on scientific lines. Market facilities are generally inadequate and, if available, are poorly maintained. Development of organised markets with adequate facilities will, therefore, be taken up. The concept of organic farming can also be extended to animal products. Indian animals are reared in village pastureland and they are not generally treated with hormones, feed-antibiotics, or other drugs, so their products are healthy,

wholesome and natural in every sense of the word. In rural India, cow dung and biomass are primarily used as manure. Initiative for export of 'Grassfed' animal products will be taken. Necessary infrastructure for certification procedures related to organic animal farming will be promoted.

Quality And Safety Of Livestock Products

5.2.27 Quality and safety of livestock products depend upon a quality and safety assurance system for which legislation for setting up standards, corresponding to Codex standards, is obligatory. These do not exist nor is there any method for reviewing and rationalising the quality and safety guidelines. Efforts will also be made for harmonisation of infrastructure facilities for testing food quality and safety with international standards.

Database

5.2.28 Currently, there is absence of a lot of data like those relating to breed-wise milk production of cattle and buffalo, egg production from commercial farms and households, cost of production of milk, egg and wool, availability of livestock resources etc. A National Animal Health and Production Information System will be established with the active involvement of research Institutions, Government departments, panchayati raj institutions (PRIs), urban local bodies (ULBs), private industries, cooperatives and NGOs. This will work as the national database.

Animal Welfare

5.2.29 Animal welfare is also related directly with the productivity of animals. The well-being of animals is affected during management under the intensive production system, in the animal market, during handling and transportation, rearing of buffalo male calves in urban areas etc. There is a great deal of wastage, as well as animal suffering due to ill-designed agri-implements, carts and implements attached to animals. Efforts will be made to strengthen the institutions working on a livestock care system so that they can ensure and promote animal care and well-being. Research and technology development will be taken up for enhancing efficiency and reducing drudgery of

animals by improving the design of carts, yokes, implements and toolbars used in agriculture. A good example is the buffalo-drawn bogey fitted with rubber tyre and bearings.

Development Of Location Specific Animals

5.2.30 Camel will continue to be important in desert areas for quite some time. Effective support for providing nutrition and health cover is needed for its improvement. The Department of Animal Husbandry will continue its programme for improvement of better studs both for horses and donkeys used for transport in hilly areas. Horse riding is now becoming an integral part of amusement parks and this will be encouraged as a niche industry. To encourage the breeding of horses, mules and asses, technological and financial support will be extended to entrepreneurs. Animals indigenous to specific agro-climate regions like Yak and Mithun will be developed.

Capital Formation

5.2.31 Public sector lending in the livestock sector is low and inadequate credit support leads to poor capital formation. As the organised financial sector is unwilling to finance livestock programmes that are not in their interest, especially after the initiation of financial sector reforms, the livestock farmers are mainly dependent on the financial intermediaries and they end up bearing a higher interest rate than would be available otherwise. Attempts would be made to create a favourable economic environment for increasing capital formation and private investment. Financial institutions would actively participate in livestock credit programmes through standardised ready-made bankable projects with back-ended subsidy. Creation of a venture capital fund is needed to assist the private entrepreneur in establishing units that could provide services and goods at the district/block level.

THE PATH AHEAD

5.2.32 The programmes that will be emphasised during the Tenth Plan are:

1. The major thrust will be on genetic upgradation of indigenous/native cattle and

- buffaloes using proven semen and high quality pedigreed bulls and by expanding artificial insemination and natural service network to provide services at the farmer's level. Production of progeny-tested bulls in collaboration with military dairy farms, government/institution farms and gaushalas will be taken up.
2. Conservation of livestock should be the national priority to maintain diversity of breeds and preserve those showing decline in numbers or facing extinction.
 3. After the successful eradication of Rinderpest disease, the focus would now be to adopt a national immunisation programme to control prevalent animal diseases. Efforts will be made for the creation of disease-free zones.
 4. Development of fodder through cultivation of fodder crops and fodder trees, regeneration of grazing lands and proper management of common property resources.
 5. Improvements of small ruminants (sheep and goat) and pack animals (equine and camel) should be taken up in the regions where such animals are predominant.
 6. Building infrastructure for animal husbandry extension network. Panchayats, cooperatives and NGOs should play a leading role in generating a dedicated band of service providers at the farmer's doorstep in their respective areas
 7. Strengthening infrastructure and programmes for quality and clean milk production and processing for value addition.
 8. Programmes would be implemented to improve indigenous birds and promotion of backyard poultry in rural areas.
 9. An information network would be created based on animal production and health with the active involvement of Research Institutions, Government departments, private industries, cooperative, and NGOs.
 10. Strengthening of veterinary colleges as per the norms of Veterinary Council of India. Strengthening of Department of Animal Husbandry and Dairying is also crucial if it has to work as a regulatory and monitoring authority.
 11. A regular interaction between the Department of Animal Husbandry and Dairying and research institutes like the Indian Veterinary Research Institute, National Dairy Research Institute, Institutes on cattle, buffalo, sheep, goat, equine and camel.

FISHERIES

5.2.33 The fisheries sector is one of the important sectors in the socio-economic development of the country. More than six million fishermen and fish farmers, a majority of whom live in 3937 coastal villages, besides fishermen hamlets along major river basins and reservoirs in the country, depend on fisheries and aquaculture for their livelihood. The sector has also been one of the major contributors to foreign exchange earnings through exports. India is the third largest fish producer in the world and second in inland fish production. The fisheries sector contributes Rs. 19,555 crores to national income which is 1.4 % of the total GDP.

The country is endowed with an Exclusive Economic Zone (EEZ) extending to 20.2 lakh sq. kms. with a continental shelf area of about 5.2 lakh sq. kms. having about 8118 kms. coastal length with some of the richest fishing grounds in the world. The estimated potential for fish production from inland water bodies is about 4.5 million tonnes(mt). The main inland fishery resources include about 1.20 million hectares (m ha.) of brackish water area, about 23.81 lakh ha. of fresh water ponds & tanks, about 7.98 lakh ha. lakes and about 20.31 lakh ha. of reservoirs, besides about 1,91,000 kms of rivers and canals.

REVIEW OF THE NINTH PLAN

5.2.34 During the last five decades, fish production has increased with an annual growth rate of 4.1 percent. Fish production touched 5.67 mt in 1999-2000 and is estimated to be about 5.66 mt in

2000-01. It is likely to reach a level of 6.12 mt by the end of the Ninth Plan, which is much below the target of 7.04 mt. This is because of slow progress in the fish production to the extent of 1.44 percent per annum [marine : (-) 1.32 percent and inland :4.87 percent] during the first four years of the Ninth Plan. At present, resource-wise (reservoirs/ rivers/ ponds/ tanks etc.) data on fish production and productivity are not available in the country. In the absence of any major initiative for strengthening of infrastructure, fish seed production remained almost static (16,000 million fry per annum) during the first four years of the Ninth Plan.

5.2.35 Inland Fish Production: The share of inland fishery sector in fish production, which was 29 percent in 1950-51 (0.22 mt), has increased to about 50 percent in 1999-2000 (2.84 mt). In spite of this, the present level of fish production in the country is about 67 percent of the estimated potential of 8.4 mt. There is enormous scope both for augmentation of production potential as well as enhancement of productivity in the inland fishery sector. The 429 Fish Farmers Development Agencies (FFDAs) have covered about 5.67 lakh ha. (inclusive of 1.70 lakh ha. in Ninth Plan) of the total water area under scientific fish culture and trained 6.51 lakh fish farmers (1.11 lakh in Ninth Plan). But the average productivity from waters covered under this programme remained almost static at about 2.2 tonnes/ha./year during the Ninth Plan period. States like Andhra Pradesh, Punjab and West Bengal have shown better response and faster development. The highest productivity of about 5 tonnes/ha/annum from FFDA ponds/tanks has been achieved in Punjab. About 6240 ha. was brought under brackish water aquaculture activities during the Ninth Plan through 39 Brackish Water Fish Farmers Development Agencies (BFDAs). The performance of the programme has also been affected due to litigation.

5.2.36 Marine Fish Production: Marine capture fisheries play a vital role in India's economy. The sector provides employment and income to nearly two million people. Marine fish production level has risen from 0.53 mt in 1950-51 to 2.81 mt in 2000-01 with a growth rate of 3.43 per cent. Most of the major commercially exploited stocks are showing signs of over exploitation. Problems of juvenile

finfish mortality and bycatch discards increased with the intensification of shrimp trawling. Plateauing of catches and over-fishing at several centers and inter sectoral conflicts in the coastal belts have highlighted the need for caution. Proper management of coastal fishery resources with suitable enforcement mechanisms like uniform ban on fishing during monsoon which is considered the breeding season for majority of commercial species, regulation on craft and gears etc. are the priority issues in the sector to allow for its rational exploitation. The development of the deep-sea fishery industry is of concern to the entire marine fishery sector because it would have considerable impact on the management of near-shore fisheries, shore-based infrastructure utilization and post-harvest activities both for the domestic market and exports. With the growing demand for sea food, it becomes imperative that the current level of marine fish production from the exploited zone to be sustained by closely monitoring the landing and the fishing effort and by strictly implementing the scientific management measures.

5.2.37 Infrastructure: The existing fishing harbours and infrastructures need to be modernized to meet minimum international standards necessary for fish quality assurance. Under the Fisheries Extension & Training Programme 28 training centers and 15 awareness centers have been established for the benefit of fishermen and fish farmers during the Ninth Plan. Research projects in the area of aquaculture and marine biotechnology are supported to strengthen the gap in the areas of fish health and disease diagnostics, transgenic aspects, cell and tissue culture, intensive prawn culture, carp-culture, feed and seed production, bio-active compounds and development of culture technology in non-conventional species etc. by the Department of Bio-technology during the Ninth Plan.

TENTH PLAN FOCUS AND STRATEGIES

5.2.38. Development of Fisheries: The major thrust during the Tenth Plan will be on integrated development of riverine fisheries, habitat restoration and fisheries development of upland waters, development of reservoir fisheries, management of coastal fisheries, deep-sea fisheries with equity

participation, vertical and horizontal development of aquaculture productivity, infrastructure development and improved post-harvest management, policy intervention including monitoring, control and surveillance. The Tenth Plan has proposed a fish production target of 8.19 mt envisaging a growth rate of 5.44 percent per annum (marine 2.5 percent and inland 8.0 percent).

5.2.39. Development of Aquaculture: In the recent years, there has been a spurt in the growth of aquaculture in the country. The inland fisheries sector has registered an impressive growth rate of 6.55 percent per annum in the 1990s. However, in spite of the vast resources of culturable water bodies as well as availability of proven technology for aquaculture, the levels of production and productivity are not adequate and there is a large gap between the potential and actual yields. Therefore, increase in productivity and production of fish/shrimps from freshwater and brackish water areas under ongoing programmes would continue during the Tenth Plan. The present production level of about 2.2 tonnes/ha./year from fish farming will be raised considerably by adopting existing advance technology. Programmes will be devised to develop fisheries in fallow derelict water bodies, waterlogged areas, saline waters, lakes, beels, etc. for enhancing fish production. Aquaculture activities will also be taken up for development of cold-water fisheries in the hill areas of the ecologically fragile zone. On the basis of experience of pilot projects taken up for fisheries development in reservoirs during the terminal year of the Ninth Plan, programme to enhance fish production will be formulated on a large scale during the Tenth Plan. An integrated approach to marine and inland fisheries, designed to rational exploitation and to promote sustainable aquaculture practices, will be adopted. Bio-technological applications in the field of genetics and breeding, hormonal application, immunology and disease control will receive particular attention for increased aquaculture production.

5.2.40. Seed and Feed Development : Seed and feed are critical inputs required for the development of fisheries and aquaculture for enhancing production and productivity. Research and development (R&D) programmes will be taken up for production of quality fish/shrimp seed and feed.

Box 4.1.12

Enhancing Productivity and Production from Inland Waters.

Technical and financial support for enhancing production and productivity.

R & D programmes for Enhancing Production of quality Fish/ Shrimp Seed and Feed.

Diversification of Activities for Development of Fisheries and Aquaculture.

Improving post harvest management by processing, value addition, setting up of cold chains and packaging.

Creation of health and sanitary check facilities to ensure quality of products as per international standards.

Integrated Approach for Sustainable Development of Fisheries and aquaculture.

The present level of fish seed production of 16,000 million fry will be raised to 25,000 million fry by the end of the Tenth Plan at an 8 percent growth rate per annum. Diseases-free and diseases-resistant fish/shrimp seed will be ensured with strict quarantine measures. Besides, adequate infrastructure will be required for increasing production and productivity of other commercially important fishes/prawn such as freshwater prawn, catfish, sea bass, grey mullet, grouper, snapper, chanos, etc. for diversifying fishing activities during the Tenth Plan. The Research Institutes under the ICAR like Central Institute of Fisheries Education (CIFE), Mumbai, Central Marine Fisheries Research Institute (CMFRI), Kochi, and Central Institute of Fresh Water Aquaculture (CIFA), Bhubaneswar, have developed technology for pearl culture, which needs to be taken up on a commercial basis through concerted efforts for further development during the ensuing Plan period.

5.2.41. Training of Fisherwomen: Traditionally, women have played an important role in the fishery sector, and they have a much larger role to play in the emerging scenario of fisheries and aquaculture

development. One of the important ways to improve the status of fisher-women in a community is to train them to improve their participation in their own development. Programmes for human resource development with emphasis on training and skill development in post-harvest/processing and marketing activities particularly for fisherwomen besides other income generating revenues will be taken up. Emphasis will be laid on the development of marketing infrastructure and techniques of preservation/ storage and transportation with a view to reducing post-harvest losses and ensuring a better return to the grower.

5.2.42. **Strengthening of Database:**

Notwithstanding the existing efforts made by several agencies, the fisheries database is poor and needs considerable strengthening. In the inland sector, the priorities are standardization of methodologies for estimation of catch from the diverse aquatic resources and establishing mechanisms for regular collection and dissemination of data by States and Union Territories. In the marine sector, the existing methodologies need revision and also subsequent re-orientation of the Departments of Fisheries on collection and estimation of methodologies. To strengthen the efforts in this direction, the use of remote sensing and Geographical Information System (GIS) in estimation of resource size and productivity also needs to be integrated in the existing programmes of fisheries catch statistics.

5.2.43. **Overexploitation of Coastal Resources:**

A major emphasis will be placed on positive and purposeful checks on over exploitation of resources in the near shore areas through appropriate regulations on the number of fishing vessels, their operational areas, ban on monsoon fishing/close season, mesh size, use of the right type of fishing gear and other such restrictions to prevent un-economic and oversize fishing.

5.2.44. **Exclusive Economic Zone:** Exploitation of offshore resources in the EEZ will be considered in terms of both the resource available and the infrastructure. Along with the absolute right on the EEZ, India has also acquired the responsibility to conserve, develop and optimally exploit the marine living resources within this area. Efforts will be made

to exploit fishery resources in the EEZ on a priority basis. Satellite-assisted Vessel Monitoring System (VMS) will be helpful in the EEZ for both Indian and foreign fishing vessels. This would ensure the safety of fishers and vessels, and also provide emergency help whenever required. This would also help in the collection of fishery-related technical data as well as determining the number of fishing vessels required in a particular area for exploiting the available fishery resources.

Formulation and introduction of a new deep sea fishing policy consistent with the national interest to exploit fishery resources in the EEZ should be given top priority. The present gap in the potential and current exploitation has several repercussions, the more important of which is leaving the EEZ opening to other neighbouring countries like Nepal, Bhutan etc. and owners of foreign fishing vessels which may take advantage of the situation. Besides, even land locked neighbouring countries like Bhutan, Nepal etc. may stake their claim legally unless we put our efforts together on under-exploited marine resources in the Indian EEZ.

Efforts are also needed to maintain World Trade Organisation (WTO) catch levels by rational exploitation of our resources and to counter measures taken by neighbouring countries like Pakistan in collaboration with USA which is resulting in the over-exploitation of resources in the adjoining areas and there by curtailing our rights in these areas. Besides it should also be ensured that suitable measures are taken to exploit resources beyond the EEZ so that we put our due stake in the international waters alongwith other countries.

5.2.45. **Investment:** Increasing public/private investment is needed for strengthening infrastructure for diversifying fisheries and aquaculture activities enhancing fish production and productivity. Enhanced public investment is also required in research programmes, strengthening infrastructures for training, post-harvest, marketing etc. Setting up of minor fishing harbours and creation of common facilities for maintenance and usage of dredgers by the Government should be given priority for improvement of infrastructure facilities in the marine fishery sector. Product

development by value addition of low quality fish and development of products like chitosane out of wastes like prawn shells, products out of fish bladder etc. need to be encouraged. Private sector investment in fisheries will also be encouraged particularly in seed and feed production, adopting existing technologies for higher production, human resource development, post-harvest management and marketing. For sustainable development of coastal areas, establishment of agro-aqua farms along coastal regions, linking ecological security with livelihood security would be encouraged by States/NGOs. Such farms involve concurrent attention to culture and capture fishery and forestry and agro-forestry programmes. Besides, conservation of fisheries resources, these farms would also be used for demonstrations of diversifying activities of different techniques to be used for fishing operations. Emphasis would be given for technological upgradation of the traditional fishing sector with improved motorised crafts and gears for the development of coastal fisheries and for the introduction of new generation of fishing vessels, for development of off-shore fishing with modern communication equipments to ensure safety of fishermen while out at sea etc. Proper credit and technological support for standard bankable projects and ventures by small fishermen groups in the inland sector and setting up of cooperative marketing network in marine sector should be ensured through institutional finance from the National Bank for Agriculture and Rural Development (NABARD) and National Cooperative Development Corporation (NCDC).

New Initiatives

5.2.46. The new initiatives for development of fisheries during the Tenth Plan would be to increase production and productivity from deep seas, inland capture fishery resources like rivers, canals etc. and from culture sources like reservoirs, beels, ox-bow lakes, measures for replenishment of fishery resources through mariculture etc. Besides, development of infrastructural facilities for better post-harvest management, technology for sustainable aquaculture, setting up of cold storage and marketing network through viable fishermen cooperatives etc., are also proposed to be taken up to ensure better livelihood for fishers and

enhance export promotion for economic development of the country.

The Path Ahead

5.2.47 The main thrust for fisheries development during the Tenth Plan would be to utilise the full potential of inland fishery resources as well as deep seas to increase per capita consumption to a substantial level from the present level of 9 kg. per head per annum. Special emphasis will be given on :

- Increasing the depth of fishing harbours especially for small fishermen using dredgers and the upgradation of hygienic conditions there.
- Strengthening of data base and information networking in the fisheries sector for standardisation of methodologies and estimation of catch from diverse aquatic resources.
- Aquaculture and development of capture fisheries of inland water resources.
- Measures will be taken to increase fish production from the deep sea marine sector.
- Infrastructure development, post harvest management for marketing by setting up of model fish markets and establishment of cold chain through viable fishermen cooperatives.
- Popularisation of pearls developed by CIFA, CMFRI etc. and value added products developed by the Central Institute of Fisheries Technology (CIFT), Kochi and Integrated Fisheries Project (IFP), Kochi made out of low value fish with suitable credit/subsidy support.
- Welfare measures for fishers will be strengthened to ensure their safety at sea etc. and also to involve more women in fisheries sector.
- Research & technology needs in fisheries institutes to be upgraded to meet the growing demands.

- Formulation of a comprehensive deep sea fishing policy and passing of the Aquaculture Authority Bill in Parliament to be expedited for rational exploitation of deep sea fishery resources and sustainable aquaculture development.
- Strategy for an effective enforcement mechanism is needed to prevent poaching in the EEZ and thereby safeguard our resources.
- Suitable mariculture programmes need to be undertaken for commercially important fin/shell fish species for replenishment of resources in our seas.
- Setting up of disease control laboratories and quality certification centres to ensure international standards for fishery products.
- Technologically improved fishing boats with proper communication network etc. to be introduced for the benefit of small fishermen.