REPORT OF

THE WORKING GROUP

ON

ANIMAL HUSBANDRY & DAIRYING

12TH FIVE YEAR PLAN

(2012-17)

Submitted

To

Planning Commission
Government of India
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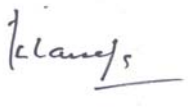
CONTENTS

PREFACE

Livestock have been an integral component of India's agricultural and rural economy since time immemorial, supplying energy for crop production in terms of draught power and organic manure, and in turn deriving their own energy requirements from crop byproducts and residues. The advances in bio-chemical and mechanical technologies, however, have weakened the synergy between livestock and crops. Livestock are now more valued as source of food and contribute over one-fourth to the agricultural gross domestic product and engage about 9% of the agricultural labour force. The livestock sector has been growing faster than crop sector; however, in recent years, the growth both in livestock production and productivity has decelerated considerably.

Livestock sector is expected to emerge as an engine of agricultural growth in the 12th plan and beyond in view of rapid growth in demand for animal food products. Achieving growth rate of 5-6%, however, would require addressing challenges of shortage of feed and fodder and frequent occurrence of some deadly diseases. The sector has remained under-invested; and neglected by the financial and extension institutions. Livestock markets are under-developed, which is a significant barrier to the commercialization of livestock production. Besides, the sector will also come under significant pressure of increasing globalization of agri-food markets.

This report presents performance of livestock sector and its contributing factors including development programs and policies pursued in the recent past; and suggest a roadmap for achieving the targeted rate of growth during the 12th plan ensuring its sustainability and inclusiveness. The suggested programs and policies are an outcome of the deliberations among members of the working group and the regional consultations with stakeholders in livestock development. I thank members of the working group and other participants for their valuable inputs. I hope the suggestions and strategies contained in this report will serve an important input for developing effective policies and implementable programs.



V K Taneja

Executive Summary and Major Recommendations

1. India's livestock sector is one of the largest in the world. It has 56.7% of world's buffaloes, 12.5% cattle, 20.4% small ruminants, 2.4% camel, 1.4% equine, 1.5% pigs and 3.1% poultry. In 2010-11, livestock generated outputs worth Rs 2075 billion (at 2004-05 prices) which comprised 4% of the GDP and 26% of the agricultural GDP. The total output worth was higher than the value of food grains.

2. Demand for animal food products is responsive to income changes, and is expected to increase in future. Between 1991-92 and 2008-09, India's per capita income grew at an annual rate of 4.8% and urban population at a rate of 2.5%.These trends are likely to continue. By the end of 12th Plan, demand for milk is expected to increase to 141 million tons and for meat, eggs and fish together to15.8 million tons. Global market for animal products is expanding fast, and is an opportunity for India to improve its participation in global market.

3. Livestock sector grew at an annual rate of 5.3% during 1980s, 3.9% during 1990s and 3.6% during 2000s. Despite deceleration, growth in livestock sector remained about 1.5 times larger than in the crop sector which implies its critical role in cushioning agricultural growth.

4. Distribution of livestock is more equitable compared to that of land. In 2003, marginal farm households (≤1.0h hectare of land) who comprised 48% of the rural households controlled more than half of country's cattle and buffalo, two-thirds of small ruminants (goat, sheep) and pigs as well as poultry as against their share of 24% in land. Livestock contributed 16% to the income of small farm households as against an average of 14% for all rural households.

5. The growth in livestock sector is demand-driven, inclusive and pro-poor. Incidence of rural poverty is less in states like Punjab, Haryana, Jammu &

Kashmir, Himachal Pradesh, Kerala, Gujarat, and Rajasthan where livestock accounts for a sizeable share of agricultural income as well as employment. The average yield of milk and meat in our animals is 20-60% lower than the global average[1]. Further, their production potential is not realized fully because of constraints related to feeding, breeding, health and management. Deficiency of feed and fodder accounts for half of the total loss, followed by the problems of breeding and reproduction (21%) and diseases (18%).Frequent outbreaks of diseases like FMD, BQ, PPR, Brucellosis, Swine fever and Avian Influenza etc. continue to reduce productivity and production. However, the available veterinary support in terms of infrastructure (for hospitals and diagnostic labs), technical manpower, is insufficient.

6. Livestock sector receives only about 12% of the total public expenditure on agriculture and allied sectors and about 4-5% of the total institutional credit flowing to agriculture and allied sectors. Only 6% of the animal heads (excluding poultry) are provided insurance cover. Livestock extension remains grossly neglected. Only about 5% of the farm households in India do access information on livestock. Organized slaughtering facilities are too inadequate.

7. Lack of access to organized markets and meager profits distract farmers from investing into improved technologies and quality inputs. Informal market intermediaries often exploit the producers.

8. Milk production increased from around 20 million tons in 1960s to 115 million tons in 2010-11. It grew at an annual rate of 4.4% during 1990s and 3.8% during 2000s. Although per capita availability of milk has increased from 128 g/day in 1980-81 to 267 g/day in 2010-11,it is far below the requirement of 280 g.

9. In an effort to increase milk production, the Government of India has been implementing the “National Project for Cattle and Buffalo Breeding (NPCBB)”

[1] FAOSTAT

since 2000 with focus on genetic upgradation of cattle and streamlining AI services and support system. The progress in the area of bull production and evaluation has been slow because of constraints of small herd size, lack of interest on the part of states, , little or no initiative to support/ form breed societies, and absence of effective extension network. Most government AI centers are still stationary due to deficiency of manpower and transport facility. Its component on propagation of indigenous milk breeds also did not make much mark. The “National Dairy Plan(NDP)”,a world Bank Funded project, due to start in early 2012 envisages increasing productivity of milch animals through provision of good quality semen, door step AI services and scientific feeding.

10. Small ruminants provide much needed livelihood support to the landless and weaker sections and hold considerable potential for commercialization. A stable sheep population in the last two decades produced around 40 million kg wool annually, of which only 4 million kg is of fine quality. Goat population grew faster than any other species of livestock and has been a major source of meat.

11. Shrinking and degrading pastures coupled with limitations of fodder, lack of sufficient veterinary care and apathy to assisted reproductive technologies have been the major constraints. The potential of raising Pashmina goats’ viz. Changthangi in Ladakh and Chegu in Himachal Pradesh remains under exploited. Interventions by the DAHD&F have hardly addressed any of the above issues.

12. Although, major concentration of pigs is in NE and eastern states, it is not able to meet the pork requirement of NE states. Predominantly non-descript pig populations there have poor productivity. High cost of concentrate feed, non-availability of swine fever vaccine and quality germplasm, lack of organized slaughter and market facilities have been the major constraints. A scheme on Piggery Development was started in XI plan with allocation of 150.0 crores. However, no expenditure has been made.

13. Indian poultry industry is well equipped and organized to achieve target growth rate of 11% for commercial broilers and 7% for layers although it failed to diversify in favor of duck, quail, turkey and emu production. Rural poultry sector however, needs financial, infrastructure and technological support to raise the present 2% growth rate to 3%. Need-based import of grandparent stock of reputed international brands may be continued with strict enforcement of bio-security measures.

14. Yaks are spread over J&K, Arunachal Pradesh and Himachal Pradesh while mithun are distributed in Arunachal Pradesh, Nagaland, Manipur and Mizoram. They provide meat, milk, wool, leather and transport. Major rearing constraints included fewer profits, poor productivity due to inbreeding because of lack of exotic germplasm, non-availability of feed, health services and lack of support services. Camel and equine population have shown a decline. The population of Mewari and Kutchhi camel as dromedaries and double humped camel-bactrians and all the six registered Indian breeds of equines need special attention as these may be threatened in numbers. There is a need to have a national equine breeding policy.

15. India has a broad spectrum of native breeds of cattle, buffalo, goats, sheep, swine, equine, camel and poultry with merits of adoptability to climate and nutrition, and resistance to diseases and stress. Populations of most of these breeds have alarmingly gone down due to comparative preferences for high producing exotic breeds. This calls for an immediate action for systematic conservation, genetic improvement and sustainable utilization of indigenous livestock breeds.

16. Although availability of feed resources has improved, the deficit of dry fodder, concentrates and green fodder currently is 10, 33 and 35%, respectively. Only 25% of forage seeds are available, that too of 15-20 years old varieties. The

schemes of Fodder and Feed development have not delivered the desired results. An “Accelerated Fodder Development Program (AFDP)’ with a budgetary outlay of Rs.300 crore has lately been initiated in the DAC although the DAHDF is the end user. The lack of convergence between the two departments has seriously affected the fodder development program. It is understood that the ICAR is also in the process of formulating a ‘Fodder Mission’. Such disjointed and lackadaisical efforts may not yield the desired results in enhancing the green fodder production in the country.

17. Sufficient facility / setup for disease diagnosis, reporting, epidemiology, surveillance and forecasting are not on board. Several diagnostic kits required for disease surveillance and monitoring are imported at a huge cost. The limited diagnostics available in the country are produced by few laboratories and are not of desired quality. Managing livestock diseases through prophylactic controls with strong laboratory diagnostic system is the only option. Appropriate measures to deal with imminent climate change are yet to become visible.

18. The dairy cooperative network in the country includes 254 cooperative milk processing units, 177 milk unions covering 346 districts and over 1, 33,000 village-level societies with a total membership of nearly 14 million farmers. Besides handling liquid milk, these plants manufacture value-added products. Testing of milk for safety and quality parameters at the collection centers is almost non-existent. Lack of proper anaerobic waste treatment and dairy by-product utilization are the other concerns. Due to quality concerns of milk, value addition and export potential has not been fully exploited.

19. Meat production from the recognized sources is estimated to be 3.96 MT and has increased at 4.1% annually during the last 5 years. Buffalo meat has grown at around 8% annually. Cattle and buffalo, sheep and goat, pigs, and poultry contribute 55.0%, 17.1%, 11.4% and 16.3%, respectively to total meat production. Inedible offal’s and animal wastes from the meat plant have large

potential to be used as valuable proteins/materials for export. There is also huge demand of Indian ethnic meat products in the international market. However, lack of international processing standards is the hindrance. Unfortunately, schemes on modernization of slaughterhouses and by-product utilization have not been effectively implemented.

20. Bulk of the investment for livestock development comes from the state governments. The central government contributes about 10% to the total investment. There is hardly any private sector investment in animal husbandry. The dairy sector, however, has attracted considerable private investment in processing, value addition and marketing. Flow of institutional credit, mainly the commercial banks is about 10%. More than 70% of the refinance disbursement by NABARD goes for dairy development. Investment linked tax incentives and attractive credit facility to private investors are missing.

21. Livestock insurance provided by the public sector insurance companies could cover only about 6% of the animal heads (excluding poultry). Cooperatives and agribusiness firms (in case of contract farming) should facilitate provision of insurance cover by providing premium on behalf of the farmers, which may be recovered in installments or lump sum from their sale proceeds. Innovative and acceptable insurance models may be designed to evolve a suitable scheme for various species/states.

22. The information on livestock population and production generated through the Quinquennial Livestock Census and Integrated Sample Survey is neither authentic nor timely mainly due to precarious shortage of staff. This adversely affects the quality of the estimates. The Census should compile breed-wise information so as to know the livestock diversity, breed status and should be conducted by the skilled persons having capability to recognize the animal characteristics. Data on the input use in the livestock sector should be collected systematically and cost of production estimates worked out.

23. Microbial contamination, antibiotic residues and adulteration in milk, meat and animal feed is rampant. Quality control for veterinary drugs and vaccines is almost non-existant. There is a need to establish food testing laboratories duly accredited by the Food Safety and Standards Authority of India (FSSAI) to check adulteration.

24. As in the developed countries, the responsibility to inspect meat and milk should rest with Veterinary Public Health specialists and not with medical professionals.

25. Livestock production activities are largely in the hands of women. The rapidly increasing demand for livestock products creates opportunities for their empowerment. Harnessing these, however, would require addressing constraints that women face. Appropriate policy and institutional arrangements such as establishment of “Women Livestock Producer Associations” would facilitate availing credit, insurance and other inputs and marketing services. Training women would reduce drudgery to women and improve animal productivity and enhance their economic returns.

26. Livestock extension services are almost absent. The extension format, methodology and set-up established for agriculture has failed to cater to the needs of the livestock sector. Consequently, only 5.1% of the farm households were able to access any information on animal husbandry against 40.4% for crop farming. The only centrally sponsored scheme on “Livestock extension and delivery services” with a budgetary outlay of Rs.15.00 crore remained non-operational.

27. Considering the existing orientation of livestock production systems and specialized requirements of livestock owners, it would be desirable to have a differentiated approach of providing extension and input services. This would call

for building up an exclusive cadre of livestock extension workers, establishment of KVKs exclusively for livestock activities and strengthening ATMA with AH experts. Public–Private-Partnership (PPP) in extension should be promoted for convergence and sharing of resources.

28. The veterinary and animal science services are a highly specialized area and need qualified technical manpower. Only 34,500 veterinarians are employed for field services against the requirement of 67,000. Similarly, against the requirement of 7500 veterinary scientists for teaching and research, only 3050 are available. Availability of Para-vets and other supporting staff is only 52,000 against the requirement of 2,59,000. Shortage of technical manpower for teaching, research and extension and for field services is affecting quality of manpower and services. Further, Veterinary infrastructure in general is poor, inadequate and need strengthening.

Major Recommendations

- For achieving targeted growth rate of 5 -6 % in milk production, provision should be made for production of required good quality semen from high genetic sources. To achieve that, the existing semen stations should be strengthened and upgraded to category 'A', and /or new semen stations established to ensure availability of minimum 150 million doses of quality semen to cover 40% breedable cows and buffaloes and 70% AI delivery at farmers' doorstep. Larger focus should on field progeny testing for quality bull production. Both NPCBB and NDP should be implemented in tandem.

- Profitability in sheep and goat would largely come from increased meat and to some extent wool/ hair production. The focus should be to adopt semi-intensive/ commercial production systems, application of assisted reproductive technologies and provision of improved quality feed and fodder and health care specially control of PPR. A community/ institutional

approach, establishing meat processing plant and developing adequate market linkages are suggested.

- A mission on Pig Production should be initiated in North-eastern region and other eastern states. Strengthening/establishment of pig breeding units, arranging feed inputs, quality germplasm, vaccines and diagnostics, processing plants and developing market linkages should be integral part of the Mission.
- For increasing growth rate from present 2% to 3% in rural poultry, a rural poultry mission project with focus on providing low input birds should be initiated. ICAR may participate and make available the low input birds.
- Conservation of AnGR should be a national responsibility and conservation activities implemented with 100 percent central assistance. Threatened breeds with unique characteristics should receive priority. There must be at least one farm for each breed in its native tract.
- The DAHDF should initiate a major 'Feed and Fodder Mission' for addressing the problem of shortages of quality fodder seed production, and nutritional enhancement of crop by-products with effective collaboration with DAC and ICAR. A comprehensive strategy for rejuvenation of natural grasslands/ pastures/ common property resources for enhancing their productivity is also required.
- The existing Immunization programs for FMD, PPR, Brucellosis and other important diseases should be the national commitment with 100% central funding. A comprehensive national network of diagnostic laboratories should be established. The vaccine and diagnostic production should be privatized with suitable incentives. Existing State Biological Vaccine production units should be phased out in a given time frame. Mobile veterinary services should be introduced and treatment provided at cost. A Veterinary Drug Control Authority should be put in place.
- Dairy plants should have inbuilt mechanism for anaerobic waste treatment and dairy by-product utilization. Government should defray a sizable portion of the capital costs. Some incentives in the form of tax holiday may

be given to milk by-product industry to attract private investment in this sector.

- Suitable incentives should be provided for setting up of rural abattoirs, establishment of new and modernization of existing slaughter houses, meat processing units, and high value by-product plants for ensuring quality meat production. Rearing of buffalo male calves for meat should receive priority.
- Well-equipped laboratories for testing adulterants, antibiotics residues, and food borne pathogens should be established to enhance safety and quality of animal feeds and foods.
- The share of animal husbandry in agricultural credit should be increased at least to 10% and interest rate on animal husbandry credit should be at par with crop loan. The facility of the Kisan credit cards should be extended to all livestock farmers. Livestock insurance coverage should be expanded to all types of production systems and species with appropriate incentive framework.
- Livestock economics, business management and market intelligence should be strengthened. The earlier recommendation of XI Plan for establishment of Institute for Livestock Information and Policy Studies is reiterated.
- A differentiated approach of providing extension and input services at the farmers' doorstep should be adopted. Dedicated KVKs exclusively for livestock should be established for training and demonstration. Para-vets should receive larger focus in respect of trainings and delivery of technologies. Public–Private-Partnership (PPP) in extension should be promoted for convergence and sharing of resources. Major program on livestock extension, delivery of services and women empowerment should be initiated in 12^{th} plan to enhance efficiency of production.
- The issue of shortage of manpower in veterinary and animal sciences should be addressed on priority and appropriate funds for strengthening of infrastructure for veterinary education and research must be made

available. Veterinary colleges/ veterinary universities should receive special grants to develop appropriate infrastructure to meet the manpower shortage in a given time frame.

- Establishment of Indian Council of Veterinary and Animal Science Education and Research (ICVAER) as proposed in 11th plan is reiterated. This would greatly help in better coordination and producing appropriate technologies for enhancing livestock productivity and achieving targeted growth rates.
- The ongoing Schemes and new initiatives should be placed under three mega schemes with wider freedom and flexibility for states to choose the components.
- A minimum of 35 – 40% of the allocation under the flagship scheme of RKVY must be earmarked for animal husbandry and dairy sector activities.
- A budgetary outlay of Rs.31,560 Crores is recommended for animal husbandry and dairy sector to achieve growth rate of 6%.

Terms of Reference (Specific)

1. To assess the extent achieved by the programs/schemes in meeting their objectives during XII Plan both in terms of physical and financial parameters, and the extent contributed by the states in furthering the process of development of Animal Husbandry & Dairying in terms of financial allocation and deployment of qualified technical manpower.
2. To examine the recommendations brought out by the Advisory Committee on Animal Husbandry & Dairying set up by Planning Commission and recommend measures for their implementation beginning XII Five Year Plan.
3. To rationalize the number of ongoing schemes of DAHDF and modify for improvement in such of those schemes which have a potential of increasing milk, egg and meat production in the country, and also recommend doing away with those schemes which have made no significant impact so far.
4. To examine the contours of NDP and recommend implementation of NDP with relevant restructured schemes of the Department of Animal Husbandry & Dairying.
5. To address the constraints faced by Animal Husbandry & Dairying in terms of inputs, technology, disease control, basic infrastructure and marketing.
6. To recommend measures to strengthen and ensure production of quality drugs, vaccine, feed and nutrition supplements both by the Government and private sector and work out a strategy to make these inputs easily available to a farmer.
7. To assess likely impact on Animal Husbandry & Dairying sector due to climate change, prepare a road map for AHD sector for the next decade and recommend measures to be adopted by farmer in order to counter any likely adverse effect due to the projected climate change.
8. To review the efficacy of the ongoing delivery mechanism in dissemination of technology and in providing relevant information to the farmer taking into cognizance presence of organizations like ICAR, SAU's, ATMA, KVK and other research organizations, and to recommend improved model of

extension by taking into consideration new methods like *Mahotsav* and use of IT.

9. To recommend measures for the development of piggery in the North-East and other potential areas in the country.
10. To review the ongoing scheme on Conservation of Threatened breed in the country and recommend measures to make the scheme more broad based and effective taking cognizance of the recommendations of the Workshop on Threatened breeds organized by Planning Commission.
11. To suggest strategies for development of small ruminants to benefit small and marginal and landless livestock farmers.

Chapter 1: Livestock in Indian Economy

1.1 India's livestock sector is one of the largest in the world. It has 56.7% of world's buffaloes, 12.5% cattle, 20.4% small ruminants, 2.4% camel, 1.4% equine, 1.5% pigs and 3.1% poultry. In 2010-11 livestock generated outputs worth Rs 2075 billion (at 2004-05 prices) which comprised 4% of the GDP and 26% of the agricultural GDP. The total output worth was higher than the value of food grains.

1.2 Animal husbandry is an integral component of Indian agriculture supporting livelihood of more than two-thirds of the rural population. Animals provide nutrient-rich food products, draught power, dung as organic manure and domestic fuel, hides & skin, and are a regular source of cash income for rural households. They are a natural capital, which can be easily reproduced to act as a living bank with offspring as interest, and an insurance against income shocks of crop failure and natural calamities.

1.3 Driven by the structural changes in agriculture and food consumption patterns, the utility of livestock has been undergoing a steady transformation. The non-food functions of livestock are becoming weaker. Importance of livestock as source of 'draught power' has declined considerably due to mechanization of agricultural operations and declining farm size. Use of dung manure is increasingly being replaced by chemical fertilizers. On the other hand, their importance as a source of quality food has increased. Sustained income and economic growth, a fast-growing urban population, burgeoning middle-income class, changing lifestyles, increasing proportion of women in workforce, improvements in transportation and storage practices and rise of supermarkets especially in cities and towns are fuelling rapid increases in consumption of animal food products. Between 1983 and 2004, the share of animal products in the total food expenditure increased from 21.8% to 25.0% in urban areas and from 16.1% to 21.4% in rural areas.

1.4 Despite significant increases in livestock production, per capita consumption of milk (69 kg) and meat (3.7 kg) in 2007 has been much lower against corresponding world averages of 85 and 40 kg[2].

1.5 Demand for animal food products is responsive to income changes, and is expected to increase in future. Between 1991-92 and 2008-09, India's per capita income grew at an annual rate of 4.8% and urban population at a rate of 2.5%.These trends are likely to continue. By the end of 12th Plan demand, for milk is expected to increase to 141 million tons and for meat, eggs and fish together to15.8 million tons. Global market for animal products is expanding fast, and is an opportunity for India to improve its participation in global market.

1.6 Livestock sector grew at an annual rate of 5.3% during 1980s, 3.9% during 1990s and 3.6% during 2000s. Despite deceleration, growth in livestock sector remained about 1.5 times larger than in the crop sector which implies its critical role in cushioning agricultural growth.

1.7 Distribution of livestock is more equitable than that of land. In 2003 marginal farm households (≤1.0h hectare of land) who comprised 48% of the rural households controlled more than half of country's cattle and buffalo and two-thirds of small animals and poultry as against 24% of land. Between 1991-92 and 2002-03 their share in land area increased by 9 percentage points and in different livestock species by 10-25 percentage points.

1.8 Livestock has been an important source of livelihood for small farmers. They contributed about 16% to their income, more so in states like Gujarat (24.4%), Haryana (24.2%), Punjab (20.2%) and Bihar (18.7%).

[2]FAOSTAT. www.fao.org[3]Birthal (2008). Livestock sector of India: An overview. Report submitted to the World Bank.

1.9 The agricultural sector engages about 57% of the total working population and about 73% of the rural labour force[3]. Livestock employed 8.8% of the agricultural work force albeit it varied widely from 3% in North-Eastern states to 40-48% in Punjab and Haryana. Animal husbandry promotes gender equity. More than three-fourth of the labour demand in livestock production is met by women. The share of women employment in livestock sector is around 90% in Punjab and Haryana where dairying is a prominent activity and animals are stall-fed.

1.10 The distribution patterns of income and employment show that small farm households hold more opportunities in livestock production. The growth in livestock sector is demand-driven, inclusive and pro-poor. Incidence of rural poverty is less in states like Punjab, Haryana, Jammu & Kashmir, Himachal Pradesh, Kerala, Gujarat, and Rajasthan where livestock accounts for a sizeable share of agricultural income as well as employment. Empirical evidence from India as well as from many other developing countries suggests that livestock development has been an important route for the poor households to escape poverty.

1.11 Nonetheless, there are number of socio-economic and environmental challenges that need to be overcome through appropriate policies, technologies and strategies in order to harness the pro-poor potential of livestock.

1.12 Improving productivity in a huge population of low-producing animals is one of the major challenges. The average annual milk yield of Indian cattle is 1172 kg which is only about 50% of the global average[4], and much less than in New Zealand (3343 kg), Australia (5600 kg), UK (7101 kg), US (9332 kg) and Israel (10214 kg). Likewise the meat yield of most species is 20-60% lower than the world average.

[3]Birthal (2008). Livestock sector of India: An overview. Report submitted to the World Bank.
[4] FAOSTAT

1.13 The growth in milk production decelerated from 4.4% during 1990s to 3.9% during 2000s. There remains a huge gap between the potential and the realized yields in Indian livestock. Only 27-75% of the dairy animal potential yield is realized in different regions of the country[5] because of constraints related to feeding, breeding, health and management. Output worth Rs 283 billion (at 2003 prices), which was equivalent to 25% of the value of milk produced in 2002, was lost due to these constraints. Feed and fodder scarcity is identified as the most limiting constraint accounting for half of the total loss, followed by problems in breeding and reproduction (21%) and in health (18%).

1.14 Crossbreeding of indigenous species with exotic stocks to enhance genetic potential of different species has been successful only to a limited extent .Limited AI services owing to deficiency in quality germ plasm, infrastructure and technical manpower coupled with poor conception rate following artificial insemination have been the major impediments. After more than three decades of crossbreeding, the crossbred population is only 16.6% in cattle, 21.5% in pigs and 5.2% in sheep.

1.15 Livestock derive major part of their energy requirement from agricultural byproducts and residues. Hardly 5% of the cropped area is utilized to grow fodder. India is deficit in dry fodder by 11%, green fodder by 35% and concentrates feed by 28%. The common grazing lands too have been deteriorating quantitatively and qualitatively.

1.16 Frequent outbreaks of diseases like FMD, BQ, PPR, Influenza etc. continue to affect livestock health and productivity. India has about 55000 veterinary institutions including poly clinics, hospitals, dispensaries and stockman

[5]Birthal, P.S., and A.K. Jha. 2005. Economic losses due to various constraints in dairy production in India. Indian Journal of Animal Sciences 75(12): 1470-1475.

centers. Veterinary and animal health services are largely in the public sector domain and remain poor.

1.17 India's huge population of ruminants remains a major source of greenhouse gases adding to global warming. Reducing greenhouse gases through mitigation and adaptation strategies will be a major challenge.

1.18 The sector will also come under significant adjustment pressure to the emerging market forces. Though globalization will create avenues for increased participation in international trade, stringent food safety and quality norms would be required.

1.19 Livestock sector did not receive the policy and financial attention it deserved. The sector received only about 12% of the total public expenditure on agriculture and allied sectors, which is disproportionately lesser than its contribution to agricultural GDP. The sector too has been neglected by the financial institutions. The share of livestock in the total agricultural credit has hardly ever exceeded 4% in the total (short-term, medium-term and long-term). The institutional mechanisms to protect animals against risk are not strong enough. Currently, only 6% of the animal heads (excluding poultry) are provided insurance cover. Livestock extension has remained grossly neglected in the past. Only about 5% of the farm households in India access information on livestock technology. These indicate an apathetic outreach of the financial and information delivery systems.

1.20 Access to markets is critical to speed up commercialization of livestock production. Lack of access to markets may act as a disincentive to farmers to adopt improved technologies and quality inputs. Except for poultry products and to some extent for milk, markets for livestock and livestock products are underdeveloped, irregular, uncertain and lack transparency. Further these are often dominated by informal market intermediaries who exploit the producers.

Likewise, slaughtering facilities are too inadequate. About half of the total meat production comes from un-registered, make-shift slaughter houses. Marketing and transaction costs of livestock products are high taking 15-20% of the sale price[6].

1.21 The extent to which the pro-poor potential of livestock can be harnessed would depend on how technology, institutions, policies and financial support address the constraints of the sector. The number-driven growth in livestock production may not sustain in the long run due to its increasing stress on the limited natural resources. The future growth has to come from improvements in technology and service delivery systems leading to accelerated productivity, processing and marketing.

[6]Birthal, P.S. 2008.Linking smallholder livestock producers to markets: Issues and approaches. Indian Journal of Agricultural Economics 63(1):19-37.

Chapter 2: Livestock Sector Performance

2.1 Contribution to GDP and growth

2.1.1 The share of agricultural sector in GDP declined from 34% in 1981-82 to 15% in 2010-11. The share of livestock in GDP also declined but not as steep as the share of agricultural sector. It remained between 5-6% until 2000-01 and then gradually declined to 3.9% in 2010-11. Nonetheless, the share of livestock in the agricultural GDP improved consistently from 15% in 1981-82 to 26% in 2010-11.

2.1.2 Livestock sector grew at an annual rate of 5.3% during 1980s, which was almost double the rate of growth in crop sector (Table 2.1). In subsequent decades, growth in livestock sector decelerated and reached 3.6% during 2000s. Despite this deceleration, growth in livestock sector remained about 1.5 times higher than the growth in crop sector, and this provided a cushion to overall agricultural growth.

2.1.3 There is, however, considerable regional variation in the contribution of livestock to agricultural income. Its share in the value of output of agriculture and allied activities is less than 20% in Assam, Goa, Karnataka, Kerala, Maharashtra, Orissa, Sikkim, Tripura, West Bengal, Daman & Diu and Lakshadweep; between 20-25% in Arunachal Pradesh, Gujarat, Manipur and Dadra and Nagarhaveli; 25-30% in Himachal, Madhya Pradesh, Mizoram, Rajasthan, Tamil Nadu, Uttar Pradesh, Puducherry, Jharkhand and Uttarakhand; and more than 30% in Andhra Pradesh, Bihar, Haryana, Jammu & Kashmir, Meghalaya, Nagaland, Punjab, Andaman and Nicobar Islands, Chhattisgarh, Chandigarh and Delhi.

2.1.4 Milk is the main output of livestock sector accounting for 66.7% of the total value of output of livestock. Meat and egg share 17.5% and 3.6% of the value of livestock output. The share of wool and hairs is negligible (0.2%). The share of

dung, which is used as domestic fuel and farm yard manure, in the total value of livestock sector output, is about 9%.

2.1.5 The relative importance of milk, meat and eggs across states is determined by the food preferences. In most states in northern and western regions dairying dominates the livestock economy. Its share in total livestock income is more than 75% in these regions. In northeastern states (except Assam and Sikkim) it is the meat and eggs that comprise bulk of the livestock income. The contribution of meat and eggs to the livestock income is also substantial in southern states of Andhra Pradesh, Tamilnadu and Karnataka.

2.2 Livestock Population

2.2.1 India has huge population of different species of livestock . In 2007 there were 199 million cattle, 105 million buffaloes, 72 million sheep, 141 million goats, 11 million pigs and 649 million poultry birds.

2.2.2 The cattle population after reaching a peak of 204.6 million in 1992 declined until 2003, but again showed an increasing trend in 2007. The decline in cattle number was largely confined to the male cattle – an important source of draught power in Indian agriculture. Their number declined from 101 million in 1992 to around 83 million in 2007. This was due to declining size of land holding and increasing mechanization of agricultural operations. The population of adult female cattle, on the other hand, kept on increasing-- their share in total cattle population increased from 30% in 1982 to 37% in 2003. Except in Punjab, Haryana, Uttar Pradesh, Rajasthan, Gujarat and Andhra Pradesh, cattle outnumber buffaloes. Within the cattle population there was marked shift in favour of crossbreds, whose share in the total cattle population increased from 4.6% in 1982 to 16.6% in 2007. Further, among adult females the share of crossbreds increased substantially from 8% in 1982 to 36% in 2007. The

southern states of Andhra Pradesh, Kerala, Karnataka and Tamil Nadu account for one-third of the total crossbred cattle in the country.

Table 2.1 Trend in livestock population (million)

	1982	**1992**	**1997**	**2003**	**2007**
Total cattle	192.45	204.58	198.88	185.18	199.08
Crossbred (%)	8.88 (4.61)	15.22 (7.44)	20.01 (10.06)	24.69 (13.33)	33.06 (16.61)
Adult female cattle	59.21	64.36	64.43	64.51	72.95
Cross bred (%)	4.82 (8.14)	10.56 (16.40)	14.75 (22.89)	19.74 (30.60)	26.22 (35.94)
Total buffalo	69.78	84.21	89.92	97.92	105.34
Adult female buffalo	32.5	43.81	46.77	50.97	54.47
Sheep	48.76	50.78	57.49	61.47	71.56
Crossbred (%)	1.52 (3.11)	2.41 (4.75)	3.1 (5.39)	5.73 (9.32)	3.73 (5.21)
Goat	95.25	115.28	122.72	124.36	140.54
Pig	10.07	12.79	13.29	13.52	11.13
Crossbred (%)	0.81 (8.04)	1.85 (14.46)	2.25 (16.93)	2.18 (16.12)	2.39 (21.47)
Horses and ponies	0.9	0.82	0.83	0.75	0.61
Donkeys	1.02	0.97	0.88	0.65	0.44
Mules	0.13	0.19	0.22	0.18	0.14
Camels	1.08	1.03	0.91	0.63	0.52
Yaks	0.13	0.06	0.06	0.06	0.08
Poultry	207.74	30.7.07	347.61	489.01	648.88
Domestic dogs			13.09	16.72	19.09

Source: Livestock census

2.2.3 Population of buffalo increased steadily during the last 25 years. The share of adult female buffaloes in the total buffalo population increased from 46% in 1982 to 52% in 1992 and remained unchanged thereafter. In fact, females account for more than 81% of the total buffalo population. Buffaloes are now reared in almost all the states. Buffaloes outnumber cattle in Uttar Pradesh, Andhra Pradesh, Rajasthan, Gujarat, Punjab and Haryana which account for two-third of country's total buffaloes as against 30% of the total cattle.

Interestingly, crossbred comprise over half of the total cattle in the buffalo dominated states, Punjab and Haryana.

2.2.4 The number of goat and sheep increased continuously. Between 2003 and 2007, the number of goats increased by 13% and of sheep by 16%. In sheep the crossbred comprised 5.2% in 2007. In fact, the number of crossbred sheep declined from 5.73 million in 2003 to 3.73 million in 2007. More than 75% of the sheep are found in Andhra Pradesh, Rajasthan, Karnataka and Tamilnadu. However in these states (except Tamilnadu) crossbred sheep comprise less than 1% of the total sheep.

2.2.5. India had about 11 million pigs in 2007, 2.4 million less than in 2003. During this period the proportion of crossbred population increased from 21.5% in 2007 to 16% in 1997. Eastern and northeastern states account for over 70% of the total pigs in the country.

2.2.6. The population of camel, donkey, horses, ponies and mules has been declining continuously. The population of domestic dogs, valued as companion animal, has been rising continuously.

2.2.7. The poultry population increased from 208 million in 1982 to 489 million in 2003 and further to 649 million in 2007. Chickens account for 99 percent of the total poultry population. Robust growth in the poultry population was triggered by increasing market demand, health support and substantial private investment. Andhra Pradesh, Tamilnadu, Maharashtra and West Bengal are the leading poultry states.

2.3 Production and Productivity

2.3.1 Milk

2.3.1.1 Milk production in India has increased tremendously during the last four decades, from around 20 million tons in the 1960s to 32 million tons in 1980-81 and further to 116 million tons in 2010-11 (Table 2.2). It grew at an annual rate of 4.4% during 1990s, which however decelerated to 3.8% during 2000s. Nonetheless, the per capita availability of milk more than doubled during this period, from 128 g/day in 1980-81 to 267 g/day in 2010-11. The significant growth in milk production during 1980s and 1990s was due to Operation Flood which emphasized introduction of improved breeding technology and germ plasm, along with development of dairy cooperatives and horizontal integration of milk markets.

Table 2.2 Production of important livestock products in India

	Milk (million tons)	Meat* (million tons)	Eggs (billion numbers)	Wool (million kg)
1991-92	55.7	3.6	21.983	41.6
2000-01	80.6	4.0	36.632	48.4
2001-02	84.4	4.0	38.729	49.5
2002-03	86.2	4.1	39.823	50.5
2003-04	88.1	4.1	40.403	48.5
2004-05	92.5	4.2	45.201	44.6
2005-06	97.1	4.2	46.235	44.9
2006-07	100.9	4.3	50.663	45.1
2007-08	104.8	4.3	53.581	44.0
2008-09	108.6	4.4	55.395	42.9
2009-10	112.5	4.4	59.844	43.2
2010-11	116.2	4.5	61.454	43.3
% annual growth				
1991-92 to 1999-2000	4.39	1.01	4.18	2.51
2000-01 to 2010-11	3.80	1.11	5.60	-1.60

* from registered slaughterhouses only.

2.3.1.2 Buffaloes, cows and goats contributed 53.4%, 43.2% and 3.5% to the total milk output in 2009-10, respectively (Table 2.3). Since 1991-92 while the share of buffaloes in the total milk production has remained almost unchanged,

there has been a significant rise in the share of crossbred cows from 14.2% in 1991-92 to 22.9% in 2009-10. Despite this transformation, growth in milk production of all the species decelerated. It decelerated from 11.3% during 1990s to 7.7% during 2000s in case of crossbred cows, from 2.5% to 2.2% in case of indigenous cows and 6.2% to 3.6% in case of buffaloes.

2.3.1.3 However in states like Andhra Pradesh, Bihar, Gujarat, Madhya Pradesh and Orissa, milk production increased faster and at an accelerated rate during 2000s while in major milk producing states like Haryana, Kerala, Karnataka, Maharshtra, Rajasthan and Tamilnadu it decelerated considerably .

Table 2.3 Production and yield of dairy animals in India

	Production (million tons)			**Yield (kg/in-milk animal/day)**		
	Indigenous cow	**Crossbred cow**	**Buffalo**	**Indigenous cow**	**Crossbred cow**	**Buffalo**
1992-93	16.75	7.60	31.0	1.65	5.57	3.46
2000-01	18.83	14.13	43.4	1.92	6.44	4.05
2009-10	22.47	25.36	59.2	2.14	6.87	4.57
		% annual growth				
1992-93 to 1999-2000	2.50	11.33	6.23	2.99	2.90	2.70
2000-01 to 2009-10	2.15	7.72	3.56	1.72	0.58	1.41

2.3.1.4 Milk yield of all the species increased at an annual rate of 2.7% to 3.0% during 1990s, which however came under stress during 2000s. This calls for technological breakthrough in animal breeding, health and nutrition as the number-driven growth is unlikely to sustain in the long run.

2.3.1.5 There is considerable regional variation in milk yield of different species. The average milk yield of dairy animals is less than 1.5 kg/day in most eastern and northeastern states, while it is close to or more than 5.0 kg/day in Punjab,

Haryana and Delhi. Punjab has the highest average milk yield of a crossbred cow (10.54kg/day) and buffalo (8.51kg/day).

2.3.2. Meat and eggs

2.3.2.1 Meat production from registered slaughter houses increased from 3.6 million tons in 1992-93 to 4.5 million tons in 2010-11 at an annual rate of around 1%. During 2000-01 to 2009-10, the meat yield of cattle, sheep, goat, and poultry grew at an annual rate of 1.5-2.0% and of pig 0.8%, while meat yield of buffalo remained almost constant. Poultry, small ruminants, pigs and cattle and buffalo contributed about 16, 17, 11 and 55% to the total meat output. Andhra Pradesh, Maharashtra and Tamilnadu contribute about half of the total poultry meat. Uttar Pradesh produces about one-third of the buffalo meat, followed by Maharashtra and Andhra Pradesh. Andhra Pradesh, West Bengal, Maharashtra, Bihar, Orissa and Rajasthan are important states for small ruminant meat. About 70% of the pork is produced in the eastern and northeastern states.

2.3.2.2 Carcass weight of most species is low: 90 kg for cattle, 110 kg for buffalo, 13 kg for sheep, 10 kg for goat, 35 kg for pig and 1.3 kg for poultry. However there is considerable regional variation in meat yields.

2.3.2.3 The number of eggs produced almost trebled between 1992-93 and 2010-11 from 22 billion to 62 billion. Per capita egg availability almost doubled from 26 eggs to 51 eggs in 2010-11. Andhra Pradesh and Tamilnadu with a share of 32% and 18% in the total eggs produced respectively are the leading states. Haryana, Punjab, West Bengal, Maharashtra and Karnataka each contribute 5-6% to the total egg output. Egg production grew at an accelerated rate from 4.2% a year during 1990s to 5.6% a year afterwards primarily because of rapid growth in Tamilnadu, Haryana, Gujarat, Bihar and Orissa. In many states including Andhra Pradesh and Maharashtra growth in egg production decelerated.

2.3.2.4 There has been a significant technological transformation in the poultry sector. Between 1992-93 and 2009-10, the share of improved layers in the total layers increased from 45% to 70% and in egg production from 64% in 1992-93 to about 85%. During this period, average yield of desi layers increased from 108 to 117 and of improved layers from 237 to 273 eggs per year. The adoption of improved layers is lower in eastern, northeastern and western states.

2.3.3 Wool

2.3.3.1 Wool production in the country, after reaching a peak of 51 million kg in 2002-03, declined to 43 million kg in 2010-11. It increased at an annual rate of about 2.5% during 1990sand declined at a rate of about 1.6% a year thereafter. Rajasthan with a share of about 30% in the total wool output is the leading state, followed by Karnataka and Jammu & Kashmir (17% each) and Andhra Pradesh (11%). It may be noted that the decline in wool production is largely because of significant decline in Rajasthan—from 19 million kg in 1992-93 to 13 million kg in 2009-10.

Chapter 3: Cattle and buffalo

3.1 Present status and trends

3.1.1 There are 199 million cattle and 105 million buffaloes (2007 livestock census). Crossbreds formed 16.6% of total cattle of which one-third are in Andhra Pradesh, Kerala, Karnataka and Tamil Nadu. Female cattle has gone up from 59 million in 1982 to 73 million in 2007.

3.1.2 Two-third of the buffaloes is concentrated in Andhra Pradesh, Rajasthan, Gujarat, Punjab and Haryana. Adult female buffalo numbers have gone up from 33 million in 1982 to 54 million in 2007.

3.1.3 Buffaloes and cows contributed 53.4% and 43.2% to total milk output in 2009-10. While buffaloes contribution remained unchanged, share of crossbred cows increased from 14.2% in 1991-92 to 22.9% in 2009-10.

3.1.4 Average daily milk yield in 2009-10 was 6.87 kg in crossbred cows 2.14 kg in indigenous cows and 4.57 kgin buffaloes. Punjab has the highest average milk yield of crossbred cows (10.54 kg/day) and buffaloes (8.51 kg/day).

3.1.5 There are 49 semen stations producing 54 million doses of buffalo and cow bull semen (indigenous, exotic- HF and Jersey, and crossbreds bulls).Only around 20% of these bulls come from organized breeding programs and the remaining are selected on the basis of dams yield. Information on the progeny tested bulls and their performance is hardly published.

3.1.6 There are 84,000 AI centers, (65,000 with government, 14,000 with cooperatives and 5,000 with NGOs and private companies) carrying out about 50 million inseminations annually. At present only 25% of the breedable bovine females are covered under AI.

3.2 On-going programs and their analysis

3.2.1 Government of India initiated National Project on Cattle and Buffalo Breeding (NPCBB) in 2000 for two phases of five years each with an allocation of Rs. 402 crore for Phase–I and Rs. 914.87 crore for Phase-II. Under this scheme, 100% grants-in-aid is given to State Implementing Agencies for streamlining storage and supply of liquid nitrogen, conversion of stationery government AI centers into mobile centers, promotion of private mobile AI service for doorstep delivery, strengthening semen stations and bull production and their evaluation for use in semen stations and natural service etc.

3.2.2 The NCBBP has significantly contributed to strengthening of semen stations and AI delivery. Progress in bull production has been very slow mainly because of lack of appropriate initiatives by the states.. Most government AI centers remained stationary despite availability of portable AI equipments and cryocontainers mainly due to deficiency of manpower and transport facility. AI activities at Government centers mostly get secondary importance. Creation of 'Breeders Societies' is not supported by the States.

3.2.3 Production of high genetic merit cattle and buffalo bulls through progeny testing is critical to enhancing productivity. Unfortunately, Progeny testing programs for evaluation of bulls for buffaloes, crossbred cattle and indigenous breeds have not been effective because of constraints of technical manpower, small herd size, and lack of interest on the part of states in undertaking bull production programs, little or no initiative to support / form breed societies, and absence of effective extension network.

3.3 Strategies and programs for 12th plan

3.3.1 Milk yield of various types of dairy animals increased at an annual rate of 2.7% to 3.0% during 1990s but decelerated considerably during 2000s. This calls for a technological breakthrough in animal breeding and production to sustain a growth rate of 4% in milk production. Technologies of sexed semen, embryo transfer, and ovum pick up should be integrated in breed improvement program. In view of climate changing scenario, improvement of indigenous breeds that have potential to contribute and be part of future production system should be identified, evaluated and improvement programs for them initiated/ strengthened on priority. Some of the indigenous cattle breeds with potential are Gir, Red Sindhi, Sahiwal, Kankrej, Rathi etc.

3.3.2 Current production of 50 million semen doses need to be increased to around 150 million to cover atleast 50% of the breedable population by end of 12^{th} plan. In order to meet the additional needs of semen production, two mega semen stations should be established. The existing semen stations of “A” and “B” category should be further strengthened and the rest upgraded to “A or “B” level to meet requirement of semen for AI. Import of good quality semen is necessary to add new exotic blood of HF and Jersey breeds.

3.3.3 Door step delivery of AI services is critical to achieving 40-50% conception rate. Creation of appropriately trained manpower and provision of mobility/incentives are necessary. Large breeding companies should be encouraged and given the responsibility of delivering AI services. Requirement of AI workers should be worked out and these trained at recognized institutes and put in place.

3.3.4 A number of agencies are currently involved in delivery of AI with large variation in efficiency and cost. The whole issue of door step delivery of services and AI should be examined and a cost effective and efficient AI delivery system adopted.

3.3.5 A world bank funded project "National Dairy Plan" at a total cost of Rs. 1760 crores (Rs.1584.00 crore IDA Credit and Rs.176 core GOI share) has been approved for implementation during 12th plan. The project envisages increasing the productivity of milch animals through better organized scientific breeding, strengthening existing semen stations/ starting new stations for producing high quality disease free semen doses, setting up a pilot model for viable doorstep AI delivery services through a professional service provider and increase delivery of semen from present 50 million (of which only 20 million are presently doorstep delivery) to over 90 million (with the bulk comprising doorstep delivery).

3.3.6 The NDP also envisages providing technical support for balanced feeding of milch animals to produce milk commensurate with their genetic potential, to reduce methane emission and strengthening village based procurement system. Project is well conceived and has a strong monitoring mechanism.

3.3.7 Both NCBBP and National Dairy plan have similar objectives, focus, and approach. The NDP has an outlay of Rs1760 crore for 12th Plan. The allocation for NCBBP for the 12th Plan has yet to be finalized. Both agencies should sit together and work out an action plan for the next 15 years for enhancing bovine productivity, producing quality semen, ensuring 75% coverage through AI with delivery at farmers door step, laying down an effective field recording system, mechanism for production and evaluation of bulls-exotic, crossbreds, indigenous cattle breeds and buffaloes with effective monitoring mechanism.

Chapter 4: Sheep and Goat

4.1 Present status and trends

4.1.1 The small ruminants provide livelihood support to the poor underprivileged landless, and marginal farm households. The goat and sheep production systems are mainly subsistence-oriented but in view of the rising demand for meat, there is a great scope for their commercialization. Nonetheless, these animals have been grossly neglected in development programs and their potential for enhancing livestock growth remains untapped.

4.1.2 India ranks 3rd in sheep population, next to China and Australia and is placed at the 7th position among the top 10 countries of the world in terms of mutton and wool production. Development of sheep has been at crossroads. The population of sheep has stagnated except a marginal increase between 2003 and 2007. The wool production has declined to around 40 million kg, of which fine wooll is only 10%. The trade policy of permitting import of wool under OGL has affected domestic traditional market. A clear cut policy direction is needed on priority as to whether the focus should continue to raise sheep for wool production or the focus should shift towards mutton production. With as many as 42 descript breeds, Indian sheep wealth is valued at Rs.3600 crores and development of this species needs focused attention during 12th plan period and beyond.

4.1.3 Various programs like Intensive Sheep Development Projects (ISDP) were implemented in the past. A large Central (Australian) Sheep Breeding Farm at Hissar, Haryana was also established to produce exotic fine wool rams to be distributed to the seven large State Sheep Breeding Farms which in turn were mandated to produce crossbred rams to be distributed to the farmers for improving wool production and quality of their sheep. Department of Sheep and Wool and Department of Sheep Husbandry were also established in Rajasthan

and J&K, respectively for focused development of this sector. With the change in sheep breeding policy and restricting crossbreeding with exotic fine wool breeds only to the northern temperate region, the demand for exotic fine wool/ crossbred rams declined. A similar situation occurred in the large state sheep breeding farms. The schemes developed earlier therefore, do not have much relevance in the current scenario. The sheep breeding farm at Hissar has more or less become non-functional and several committees have recommended for its closure / relocation.

4.1.4 There are breeds of sheep in India like Garole in Sunderban area of West Bengal which is though small in size with adult body weight of around 15 kg produces in excess of 50% twins and triplets. The crossing of Garole with medium/ large size sheep breeds has led to production of in excess of 150% of lambs per 100 ewes compared to 80% in the larger breeds. If such lambs are properly raised and fattened, they can yield profitable mutton production

4.1.5 Goat is one of main species for meat in India. It has all the characteristics required for efficient meat production viz. high prolificacy, more than one breeding season in a year, higher milk production and capacity to bear twins and triplets. Goat meat is preferred and fetches higher prices in national and international markets. In spite of the prejudice against goat rearing due to environmental issues, the population of this species has grown at a faster rate than any other species of livestock.

4.1.6 The potential of raising Pashmina goats viz. Changthangi in Ladakh (J&K) and Chegu in higher altitudes in Himachal Pradesh for production of pashmina fibre has remained underexploited.

4.1.7 The traditional transhumance system of rearing of sheep and goats with established migratory routes are becoming economically unviable and slowly waning due to several reasons. The major limiting factors in improving sheep and

goat production are lack of pastures and fodder shrubs and trees in the area where the sheep and goat abound, especially in the states of Rajasthan and the whole of the northern hill region. All efforts for improving high altitude pastures through arial re-seeding with perennial temperate grasses and legumes have not been very successful. The higher stocking rates, excessive grazing pressure, change in plant composition of grazing areas and reduced biomass availability have rendered migratory system of rearing difficult to sustain. Excessive parasitic load in migratory flock, higher energy spent while covering greater distance during migration along with other factors lead to body weight loss resulting into poor remunerative price realization by migratory sheppard community.

4.2 Ongoing schemes and their analysis

4.2.1 A centrally sponsored scheme “Integrated development of small ruminants and rabbits’ has been under implementation with a budgetary outlay of Rs. 190 crores. However, the financial progress of the scheme has been dismal with only Rs. 11 crores spent during the first four years of the plan, which is just 5% of the approved outlay. It would be worthwhile to examine as to why this important scheme was not implemented in right earnestness as envisaged.

4.2.2 It is clear that very little efforts have been made by the Animal Husbandry departments both at state and central level for development and growth of small ruminants. The absence of effective centrally sponsored / central sector schemes has hampered the growth of this sector and also failed in providing much needed assistance and livelihood opportunities to the vulnerable section of the community. The vast potential of developing goat sector, which exists in some of the regions like Bundelkhand, parts of Rajasthan and Himachal Pradesh needs to be harnessed. A focused approach with higher investment, community approach, establishing meat processing plant and developing adequate market linkages is to be made.

4.3 Strategies and Programs for 12th Plan

4.3.1 A two-pronged approach for development of small ruminant sector is essentially called for during the 12th plan period. Since this is the only sector, which provides direct livelihood and income generating opportunities to landless and marginal farmers and the other vulnerable sections of the society, formulation of appropriate schemes for inclusive development of this sector is essential. The second component includes harnessing of the untapped potential in processing and value addition of mutton.

4.3.2 As stated earlier, a clear-cut policy direction is needed as to whether sheep production should focus on wool or mutton. Considering the past experience in improving apparel wool production, it would be worthwhile to consider the strategy of raising sheep for fine wool production confining only to the northern temperate region.

4.3.3 The improvement of mutton production could be focused in other regions of the country. Appropriate breeding policy, delivery of input services, assured supply of quality rams, establishment of hygienic and modern slaughter facilities, creation of efficient market linkages and transport logistics are some of the issues which are to be addressed in a holistic manner. Considering the fact that the migratory system of rearing of small ruminants is on the decline and traditional communities involved in this occupation have diversified away from this occupation, it would be prudent to slowly promote rearing of small ruminants on stall feeding and at the same time focusing on providing the necessary support systems to farmers who continue to depend on rearing of these animals for their subsistence.

4.3.4 Due to disease problem of PPR in small ruminants, considerable economic loss occurs both at the individual farmer level as well as at the sectoral level. Inadequate availability of vaccine, lack of proper delivery mechanism and

awareness among the farmers are some of the factors hampering the effective tackling this important disease. Concerted efforts and proper approach is essential for eradication of this economically important disease.

4.3.5 The major emphasis in improving goat production should be on meat (chevon) production through ensuring larger number of kids born per doe per year, improving their survival and body weight gains both in pre-weaning and post-weaning periods till they reach the market weight of around 25 kg at nine months of age when they may be disposed off for slaughter. If such kids are sold at festive occasion such as Eid, they can fetch in excess of Rs. 5000 per animal.

4.3.6 There is a large scope for export of meat to Gulf and South East Asian countries. The export potential needs to be tapped fully. The participation of the private sector for harnessing this potential is essential.

4.3.7 Community mobilization, training & capacity building of all the stake holders, effective institutional mechanism and efficient & innovative market linkages are some of the key issues to be addressed in a holistic manner for promoting the small ruminant sector during 12th plan period. Sheep & goat farmers' organizations, Self Help groups and Producer Companies could be promoted with adequate support for furthering the prospects of growth of the sector.

4.3.8 Improved fecundity through incorporation of appropriate genes, enhancement of twinning percentage, higher feed conversion efficiency, achieving higher body weight at marketable age, breeding strategies for fine wool production, improved vaccines are some of the important research issues, which have much relevance for achieving higher growth rate of small ruminants.

4.3.9 Formulating a comprehensive and holistic scheme and its effective implementation during the 12th plan period is called for. The scheme so

formulated needs to include all important components suggested in para 4.3.7 Implementation of this scheme is recommended in RKVY mode, which provides enough freedom and flexibility to the states. However, it should be ensured that the states where a large section of the community is dependent on goats and sheep and the sector holds promise for development, should invariably implement the scheme with a focused approach.

Chapter 5: Pigs

5.1 Present status and trends

5.1.1 India has 13.84 million pigs and the North Eastern Region (NER) has the highest concentration. In spite of sizeable population, the local pigs are not able to meet the pork demand of North-Eastern states. The region, therefore, imports large number of pigs from other major pig producing states including Andhra Pradesh, Uttar Pradesh, Bihar and West Bengal to meet the pork demand.

5.1.2 Bulk of the pigs reared by the farmers in the NER and other states are non-descript having low productivity. The issue of poor growth and productivity is aggravated as pigs compete with poultry and human beings for feed ingredients. Feeding pigs as per recommended schedule is increasingly being costlier.

5.1.3 The issue of non-availability of swine fever vaccine in required quantity as well loss of potency of the vaccine has been a major concern for pig farmers across the country. Emergence of Swine Flu has underlined the need to adhere to the required bio-security measures. Pig farming has therefore to be planned in such a manner that enforcement of such measures become easier and efficient.

5.1.4 The way pigs are slaughtered is deterrent to pork consumption for many communities. Establishment of slaughter houses on scientific lines and other infrastructure for value chain management should receive priority. Although pork products like ham, sausages are highly valued, a lot of research in value chain management is necessary. Farmers are desirous of having access to organic pork production for better price and quality.

5.2 Ongoing schemes and their analysis

5.2.1 A scheme on Piggery Development was started in 11th plan with allocation of 150 crores. The funds have remained unutilized till now.

5.3 Strategies and Programs for 12th Plan

5.3.1 The importance of piggery sector in poverty alleviation has been highlighted time and again including its role in enhancing inclusiveness of agricultural growth. **It is to be clearly understood that piggery for the tribal and socially weaker sections of the society is like the dairy or poultry for others in the country and hence a thrust to pig production and value addition is required.**

5.3.2 In order to meet the demand for improved germplasm and breeding animals, there is a need for establishing large pig breeding farms in the NE region for their multiplication. Artificial Insemination (AI) technology should be integrated in breed improvement program. Maize, fiber crops, oil cakes and bran (wheat/rice) are important components of pig feed. Programs to support maize production and fiber crops should be strengthened in the region.

5.3.3 Protection of pigs from Swine Fever in particular is a must. Although this issue has been voiced in a number of *fora*, both at regional and national level, a permanent solution to the vaccine availability is yet to be found. A regional Classical Swine Fever Vaccine production Centre preferably at a central place like Guwahati, Assam is suggested. It is gathered that College of Veterinary Science, Assam Agricultural University has already developed and field-tested a cell culture Classical Swine Fever Vaccine.

5.3.4 The other states of importance from Piggery point of view are Uttar Pradesh, West Bengal, Bihar, Jharkhand, Kerala and Tamil Nadu. Two large breeding farms in each of these states are suggested for multiplication of quality germplasm.

5.3.5 There is a need to undertake research on developing organic pork production processes together with the crop scientists in North Eastern Region. The National Research Centre on Pigs should undertake research on organic pork production as well as on artificial insemination in pigs in a collaborative network mode.

5.3.6 In view of the pig production potential in NER and eastern states, a mission on Pig Production with focus on strengthening large pig breeding farms and other infrastructure, incentives for producing feed input materials, improved package of practices, vaccines and diagnostics, pork processing plants and linking of pig producers to markets should be initiated.

Chapter 6: Poultry

6.1 Present status and trends

6.1.1 India has emerged on the world poultry map as the 3rd largest egg (56 billion eggs) and 5th largest poultry meat (2.6 million tons) producer. Total chicken population has registered an annual growth of 7.3% in the last decade. While farm chicken grew at the rate of 12.4%, *desi* chicken showed much lower growth rate of about 2%. Other poultry species showed reduction of 2.3 % per annum between 2003 and 2007.

6.1.2 Organized sector accounts for nearly 70% of the total poultry output in the country. The progress of the broiler industry is well dominated in the southern states which contribute 60-70% to the total poultry output. The annual growth in egg production approximated 6% per year. Similarly, in chicken meat production, an average growth rate of about 10% was observed. The current strength of layers and broilers in India is estimated to be 230 million and 2300 million, respectively. Poultry processing has also gone up to 20% of total broiler production the rest are still marketed as live birds in wet markets. However, only about 6% of eggs produced in the country are converted into processed egg products, mainly for export. The annual per capita availability has increased from 7 eggs in 1961 to 52 eggs in 2010; and poultry meat from o.16 kg to 2.96 kg. However, the present availability level is far below the ICMR recommendations of 180 eggs and 11 kg meat per capita per annum. The statistics given below underline the need for giving great impetus for increasing egg and meat production to meet the need of growing human population.

6.1.3 The potential of poultry sector in employment generation and enhancing rural incomes is well-recognized. Over 5 million people are directly or indirectly engaged in poultry sector, apart from numerous small poultry keepers in rural and tribal areas of the country. Superior germplasm of chicken have been

developed by both public and private sectors which met the requirement of Indian poultry industry. Faced with the challenges of ever growing feed cost, efforts have also been made to identify, evaluate and efficiently utilize the newer feed stuffs in poultry rations in order to resolve growing competition for the same feed resources. Value-added products utilizing poultry eggs, meat, and culled birds for human consumption have been developed. In organized sector the germplasm used is greatly improved for production as well as for efficiency of production. Presently, a broiler achieves a body weight of ~2 kgs in less than 40 days with a feed conversion ratio of 1.8 to 1.9 and a layer produces > 325 eggs in 52 weeks of production with an average egg weight of 54-58 g and FCR of less than 2.0 kg/dozen of eggs.

6.1.4 Regional imbalance in poultry production, processing and demand for processed products continue to exist in the rural areas. Alternative poultry species have not found acceptability because of their poor production efficiency. Disorganized state of marketing of poultry products, except in case of vertically integrated units and contract farming continues to be a major concern.

6.1.5 There is inadequate infrastructure for processing, cold-chain and strict quality assurance of poultry products in domestic market. Credit facilities for small/medium poultry entrepreneurs are inadequate. Other constraints include occurrence of emerging and re-emerging poultry diseases and lack of adequate linkages between R&D institutions and private sector to get feedback and transfer of proven technology.

6.1.6 International trade in poultry meat and table eggs accounts for about 10% and 2.5% of their global annual output, respectively. India has also been exporting table eggs, hatching eggs and frozen chicken etc. mainly to Gulf, SAARC and SEA countries as well as dehydrated and frozen egg products

mainly to Japan and some European countries but its export of poultry products in terms of volume constitutes about 0.6% of global trade.

6.2 Ongoing programs and their analysis

6.2.1 In addition to central sector schemes, a number of centrally sponsored schemes (CSS) have been in existence in the previous plans. These schemes have substantially contributed to the growth of poultry sector especially rural poultry. Under CSS on Poultry Development with components viz. Assistance to State Poultry Farms, Rural Backyard Poultry Development and Poultry Estates, 218 state poultry farms have been benefitted covering most states. It is felt that some state poultry farms which were left out need to be further strengthened. Grants were provided to the State Govts for promoting smallholder poultry rearing in rural/tribal areas of the country with refinance from NABARD. This scheme has benefitted a large number of poor families in enhancing their income and nutritional security. Under development of Poultry Estates, two estates were decided to be established on pilot basis in low commercial activity states / region viz. Bihar, Chhattisgarh, Jharkhand, Gujarat, MP, Orissa, Uttarakhand, some districts of UP, and West Bengal, Vidharbha region of Maharashtra and north-eastern states. Two estates (viz. Sikkim and Orissa) have already received the grants. It is recommended to extend this scheme in 12th plan with a view to promote commercial poultry production in deficit states to minimize the existing regional imbalances.

6.2.2 Central Poultry Development Organizations have been promoting development of poultry through providing quality chicks for identified low-input technology poultry stocks; diversifying poultry rearing towards duck, turkey & emu, quail and guinea fowl; training of trainers, farmers, women beneficiaries, poultry organizations, NGOs, banks, cooperatives and foreign trainees etc. and regular testing of various stocks available in the country to assess their performance.

6.2.3 Poultry Venture Capital Fund scheme has yielded good result and needs to be continued with thrust on wider publicity and awareness creation among target groups as well as the implementing agencies to derive maximum benefits to diverse stakeholders.

6.2.4 In addition, support to rural poultry is also being made available under Swaranjayanti Gram SwarojgarYojana (SGSY) with particular emphasis on group formation of women and the weaker sections. Under Poultry Seed Project being executed by ICAR**,** rural chicken germplasm is being further improved, multiplied and distributed to various agencies.

6.3 Strategies and programs for 12th Plan

6.3.1 The 12th plan may target an average growth rate of 7% in commercial layer; 11% per annum in commercial broiler and 3% in rural poultry. Both rural and commercial sectors need to be supported to meet the ever-growing domestic demand of poultry products and promote export trade.

6.3.2 Augmentation and modernization of infrastructure and establishment of hi-tech laboratories in the area of disease diagnostics & forecasting, feed/food microbiology, feed and poultry processing and quality as per International Standards are essential to face the R&D challenges emanating from rising demands, imbalances in production-consumption systems and growing globalization, etc.

6.3.3 Need-based import of grandparent stock of reputed international brands may be continued with strict enforcement of bio-security measures. Conservation, improvement and utilization of native (indigenous) breeds and newly developed low input chicken are taken up for promoting small scale poultry production in rural and tribal areas. The diversified poultry species may be

promoted in some pockets of the country to overcome the monocultured poultry dominated by chicken keeping in view the emerging poultry diseases. One of the Central institutes may be given the task of maintaining the avian biodiversity activities with SAU's as collaborators.

6.3.4 Zoning of country especially for avian influenza free zones in accordance with OIE guidelines (as has been done in China, Brazil, Thailand etc.) should be attempted so as to promote export.

6.3.5 A mechanism for efficient marketing network particularly for small and medium poultry farmers as well as quality assurance of poultry products along the value-chain with adequate refrigerated transport/cold storage facilities at terminal markets should be further strengthened. Nationwide assessment of bio- and phyto-contaminants to address safety concern in poultry products should be undertaken.

6.3.6 Poultry farming being a component of agriculture, which is a state subject, needs to be categorized either a industrial or agricultural activity by the state governments so that the concerned stakeholders may reap the benefits accordingly. Other measures for enhancing poultry production include increasing access to micro finance to the smallholders on the lines of crop loans or Kisan Credit Card; removing poultry from the negative list for purpose for extending financial support; increased level of investment in the poultry infrastructure such as cold chain, storage, semi-automatic processing, and providing incentives in the form of subsidy to the poultry exporters. Demand of poultry corporate for making available damaged foodgrains from FCI at reduced rates may be considered and exim policy for trade in soybean cake and maize (major feed ingredients) must be rationalized keeping in view the domestic demand of poultry sector. Custom (common) poultry dressing units should be set up in major broiler producing areas to meet the growing demand of freshly dressed/chilled chicken in view of their preference over frozen chicken in our country.

6.3.7 The DAHD&F may consider initiating a rural poultry mission with focus on multiplying low input birds and diversified poultry species viz. duck, quails, turkey, emu etc. and their distribution along with package of practices for efficient and economic management. The ongoing central sector and central sponsored schemes on poultry should be dovetailed to this mission. Poultry Venture Capital Fund scheme should also be part of the mission. ICAR may participate in the mission and make available the low input birds for rural poultry production.

6.3.8 There is a need for introduction of vocational poultry diploma courses (poultry polytechnics) in SAUs/State Veterinary Universities (SVUs) for matriculates/10+2 students to meet the shortage of middle-level technicians in private sector.

Chapter 7: Yak, Mithun, Rabbits, Camel and Equines

7.1 Yak is a unique bovine species of economic importance in high hill and snow bound areas of Indian Himalayas. This versatile bovid is a major source of livelihood for the highlanders living in difficult terrains. The range of products and services provided by yak include; meat, milk, wool and leather, draught power and soil nutrients besides serving as financial asset and security. The animal therefore needs not only to be conserved but also improved in terms of production and productivity so as to encourage creating Yak centric livelihood opportunities for the youths. Provisioning of feed blocks and stock piling of essential medicines and vaccine for 3-4 months together with training of local population in Yak health service delivery would greatly help improving performance. High land pastures need to be identified, developed and protected with adequate fencing.

7.2 Mithun, a unique free-range domesticated bovine species, is one of the extremely rich animal biodiversity of North East India. This valuable ungulate probably originated more than 8000 years ago and is believed to be the domesticated form of wild gaur. The tribal people of the region highly value Mithun not only as a pride object of social sacrifice but also for their use in barter trade.

7.3 Though primarily used for meat purposes, Mithun has great potential for quality meat, milk and leather production and there is a great scope to promote this animal as an organic meat and milk producer. Being a meat animal, the growth rate of mithun is the prime concern of farmers. With adequate feeding, the growth rate varies from 400 to 600 g/day. Due to denudation of free range along with the biotic and abiotic stresses, there is urgent need of scientific intervention for proper management as well as conservation of this beautiful hill animal through implementing an effective conservation and improvement program.

7.4 Angora rabbit rearing is an important backyard activity mostly limited to the hilly region of Himachal Pradesh and Uttarakhand. Angora wool / hair is presently utilized by the handloom industry for manufacture of angora wool-blended yarns and apparels like shawls, mufflers, caps, gloves, socks, stoles, etc. wool/ hair (between Rs. 500 – Rs. 1,100 per kg). Major areas which need intervention of the government to support this venture are pricing policy and setting up of angora wool processing unit with requisite technology / machineries. The stock of German Angora rabbit available is very old and has high levels of inbreeding. Fresh stocks of Angora Rabbits should be imported.

7.5 Camel population between 2003 and 2007 showed a decline of 18.2% which mainly was due to increased mechanization, continued shrinkage in grazing resources and increase in command area both under canal and tube well irrigation. The population of Mewari and Kutchhi camels as dromedaries and double humped camel-bactrians need special attention as these may be threatened in numbers. The therapeutic value of milk and unique camel immunology for better human health could be considered point of merit necessitating undertaking the conservation and improvement program for camel.

7.6 Horses of all the six registered Indian breeds namely Marwari, Kathiawari, Manipuri, Zanskari, Spiti and Bhutia have declined continuously during the last five decades due to their indiscriminate breeding, decreased demand and utilization in general. There is a need to have a national Equine Breeding Policy to conserve all the breeds along with registration of well known pedigreed equines, precious stallions and mares and maintenance of stud books. There should also be a strict policy for vaccination and quarantine of all the imported animals as some diseases of low risk may get entry in our country. Parentage testing is essential as registration of newly born foals also need DNA based parentage testing throughout the world. A Nationally recognized Parentage testing lab should be set up.

Chapter 8: Conservation of Animal Genetic Resources

8.1 Present status and trends

8.1.1 The farm animal genetic resources in India are represented by a broad spectrum of native breeds of cattle, buffaloes, goat, sheep, swine, equines, camel and poultry. Presently, there are 135 registered breeds of livestock and poultry in India which includes 34 breeds of cattle, 12 of buffalo, 39 of sheep, 21 of goats, 6 of horse and ponies, 8 of camel and 15 of chicken, besides populations/breeds of other species like pigs, mules, donkeys, yaks, mithuns, ducks, quails etc. The large diversity of domesticated livestock and poultry breeds was as a result of adaptational selection within specific ecological niche to meet the local needs.

8.1.2 Focus of Intensive livestock development programs in promoting the universal use of very few improved breeds are increasingly resulting in reduction in population of many of the indigenous breeds. Further, such an approach may lead to reduced and loss of genetic variability within a species. Loss of variability may lead to adverse effects for fitness and adaptive change in animal populations.

8.1.3 Several factors viz. lack of structured/ organized breeding activity in native tract, absence of breeding societies, non registration of animals of a particular breed etc. have contributed to intermixing of breeds resulting in their dilution. Some of the important genes related to adaptation may even have been lost. Many of the indigenous breeds have the potential to be economically sustainable even in the changing environment following intense selection programs. Indigenous breeds' hold considerable advantages in terms of their adaptation characteristics, production potential under low inputs and harsh environment, valuable genetic makeup, and providing opportunity of employment and income to rural poor. However, these breeds are in danger of disappearing, pushed out

by modern production techniques and out-competed by exotic breeds and their crossbreds. Social changes have also greatly influenced AnGR especially small ruminants because present generation is not keen to continue their ancestral occupation of rearing livestock in migratory system of grazing. This calls for an immediate action for systematic conservation, genetic improvement and sustainable utilization of indigenous livestock breeds

8.2 Ongoing schemes and their analysis

8.2.1 *In situ* conservation is one of the best ways of preserving/conserving a breed, and if the sample size is fairly large, sufficient genetic diversity within the breed/population can be maintained. *Insitu* models of conservation have been developed by NBAGR by providing technical inputs and incentives to the farmers/breeders in the breeding tract of respective farm animal breeds.

8.2.2 A National Animal Gene Bank has been established at NBAGR which has about 80,000 cryopreserved semen doses representing of 27 breeds of seven species. Animal Genomic Resource Bank has collection of genomic DNA from 130 breeds/populations of livestock and poultry. It also has buffalo mammary gland EST library.

8.2.3 The conservation programs are difficult to be implemented at farmer's level. There is no regular system of monitoring of the breeds at risk. Insufficient manpower and infrastructure also hinder implementation of programs. Almost all the conservation programs on AnGR are funded and implemented by government agencies and participation of farmers and private sector is negligible. Absence of breeders' organization barring few, make the implementation of conservation program more difficult and not sustainable.

8.2.4 A centrally sponsored scheme on Conservation of Threatened Breeds of small ruminants, yak, mithun, rabbits, pigs, pack animals and equines continued

in the 11th plan with an allocation of Rs.45.00 crores. Expenditure in the scheme has been negligible.

8.3 Strategies and Programs for 12th Plan

8.3.1 Considering the importance of conservation of AnGR, which is now a multidimensional activity encompassing not only preservation and maintenance of existing breeds but also their improvement and proper management needs a focussed approach. The final goal should be sustainable utilization, restoration and genetic enhancement of native breeds for present and future use.

8.3.2 Conservation of threatened breeds does not appear to be a priority for the States who are more concerned with enhancement of production and productivity of livestock. Conservation of AnGR should therefore be a national responsibility and the scheme on conservation should be implemented with 100 percent central assistance.

8.3.3 Considering the poor reliability of breed census carried out in the present form, it would be desirable to take carry out a separate livestock breed census with involvement of State Animal Husbandry Departments and Veterinary Colleges where skilled manpower exists for proper identification of breed specimens.

8.3.4 A legal framework for implementation of breeding policies and performance recording in the field and legislation for protection of Animal Breeds and Animal Keeper's rights in line with Protection of Plant Variety and Farmers Right Act should be put in place. All the existing livestock farms with state/central govt. should be declared as in-situ conservation centers of indigenous breeds. There must be at least one farm for each breed in its native tract. Wherever need be, new farms may be established/supported.

8.3.5 A mega scheme on Conservation of AnGR should be taken up by enlarging the scope of ongoing central sponsored scheme. The revised scheme should have the following components - sample survey, establishment/ strengthening of nucleus farms, characterization and documentation of lesser known breeds/populations, formation of breed societies/associations, value addition through identification and exploitation of breed specific unique products, propagating pharmaceutical / nutritional properties of animal products, and their commercialization for enhancing utility of local breeds, and strengthening of National Gene Bank. Guidelines/models and practices for establishing breed society, breeders association for conservation and improvement of breed should be developed. The criteria of animal breeds for conservation and development should be well defined. The breed conservation units will act as demonstration and training centres for capacity building and bringing awareness on breed conservation amongst farmers, students and field functionaries.

8.3.6 There should be a Central Steering committee for proper monitoring and coordination among project implementation agencies (SAHD, SLDB, SAUs, Veterinary Universities, Vet/Animal Sci. Colleges, Research Institutes, NGOs) for conservation of AnGR.

Chapter 9: Feed and Fodder Development

9.1 Present status and trends

9.1.1 Though feed and fodder is one of the most important contributing factors for the growth of livestock sector, development of this sector has not received the required level of focus in the past. It is estimated that the 60-70% of total cost in livestock production is due to feed and fodder. Any attempt towards enhancing feed availability and economizing the feed cost would result in increased margin of profits to livestock owners.

9.1.2 Over the last two decades (1985-86 to 2005-06) availability of various types of feed has increased. Even though availability of feed resources vary from area to area, but during this period, the country as a whole recorded 52% (240.7 to 365.8 Mt), 76.0% (19.6 to 34.5 Mt) and 1.8% (124.3 to 126.6 Mt) increase in crop residues, concentrates and green forages respectively. In spite of this, there is a gap in the availability vs. requirement. As per estimates, the deficit of dry fodder, concentrates and green fodder currently is 10, 33 and 35 percent respectively, which by 2020 is likely to be 11%, 35% and 45%. Availability of crop residues and concentrates is linked with the food crop production and since the overall food crop production in the country has shown an increasing trend, the crop residue and concentrate feed ingredients availability has also shown a commensurate increase. However, the crop diversification, which is seen in the recent years with commercial crops replacing the traditional cereal crops especially the coarse cereals, is likely to have an impact on the availability of crop residues. What is more concerning is the stagnation in the availability of green fodder and its increasing deficit over the years.

9.1.3 Forage crops are usually area, region and season specific. These are generally cultivated on degraded and marginal lands with minimum input, in terms of fertilizers, water and operational energy. In case of forages, regional and

seasonal deficiencies are more important than the national deficiencies, as it is not economical to transport the forages over long distances. It is estimated that out of 55 micro-regions of the country, only 12 regions have surplus fodder, while the remaining 43 have deficiencies of one or other kind of feeding material. For achieving the targeted milk production of 160 million tones by 2020 from the current level of 111 million tones, the requirement of feed in 2020 would be of 494 mt dry fodders, 825 mt green fodders and 54 mt concentrates.

9.1.4 Fodder seed production at different stages, its availability, market linkages, and seed replacement rate are few of the issues of concern. There is a substantial gap between the requirement and availability of quality seeds. According to an estimate, only 25% of forage seeds are available, that too of 15-20 years old varieties. Seeds of better and newer varieties are not available to the farmers for cultivation. Production and early replacement of quality seeds of newer varieties need to be optimized.

9.1.5 Over the years, considerable technological advancement has taken place in the feed and fodders focusing on enhancement of nutritional quality and productivity enhancement. The by-pass nutrient technology has been taken up by private feed manufactures as well as NDDB & dairy federations and benefits of this technology have percolated at the ground level. The Area Specific Mineral mixture technology has helped to a considerable extent in overcoming the problem of infertility at field level. Benefits of these technologies need to be fully exploited.

9.1.6 The key driving forces for feed and fodder development in the coming years would be on productivity enhancement, shift to semi-intensive/ commercial production systems and convergence with other flagship schemes of the government like MNREGA, RKVY, Watershed program etc. The countervailing forces that may restrict the development are non-availability of sufficient quantity of quality fodder seeds and lack of appropriate extension services

9.2 Ongoing programs and their analysis

9.2.1 For addressing the feed and fodder development during the 11th Plan, DAHDF has been implementing one Centrally Sponsored and one Central Sector Scheme with a budgetary outlay of Rs. 141.40 and 80.00 crores, respectively.

9.2.2 The Centrally sponsored scheme of Fodder and Feed development with its sub components was expected to address the problem of feed and fodder shortage. However, considering the performance of the scheme during the 11th Plan period, it appears that the scheme has not been able to deliver the desired results. The Centrally-sponsored 'Fodder Development Scheme' with four sub components which was initiated during 2005-06 focusing on four independent and not interlinked components has since then undergone considerable changes both in its focus and components. Considering the expenditure of Rs. 91.09 crores up to October 2011 against the outlay of Rs. 141.40 crores, the financial progress (64.36%) has not been very satisfactory. Some of sub component of the Fodder and Feed development scheme like Fodder Mini Kit Scheme are quite popular among the farmers. However, the insufficient quantity of kits, time of supply and supply of seeds not preferred by farmers has over the years hampered the progress of the scheme to a great extent. The desired impact of Central Mini-kit Testing Programme on Fodder Crops being implemented by DAHD was not seen in most of the States. Fodder Mini Kit Scheme needs to be comprehensively relooked into if the desired impact is to be achieved.

9.2.3 Under the Central sector scheme of Central Fodder Development Organization, the AH department has large infrastructure available in its seven regional stations and one unit of Central fodder seed production farm located in different agro-climatic regions of the country. During the 11th Plan period, against the budgetary outlay of Rs. 80.00 crores, an expenditure of Rs. 103.94 crores (129.90%) has been incurred upto October 2011. These units have served a

limited purpose and outcomes have not been commensurate with the investments made.

9.2.4 Both the above two schemes needs a comprehensive relook and redesigning during the 12th plan period for ensuring that issues of feed and fodder which is a critical component for further growth of livestock sector are addressed in a holistic manner.

9.3 Strategies and Programs for 12th Plan

9.3.1 Adequate availability of livestock feed and fodder both quantitatively as well as qualitatively is going to be one of the key inputs in the growth of livestock sector during 12th plan period and beyond. With greater focus being given towards productivity enhancement in the recent years, it becomes all the more essential for ensuring the availability of quality feed and fodder to sustain higher productivity of animals.

9.3.2 The expansion of area under cultivated green fodder crops in the coming years would essentially be demand driven and based on benefit – cost factor as demonstrated in Punjab. Establishment of commercial dairy farms with high productive cattle and buffaloes has created a higher demand for green fodder which consequently has resulted in dairy farmers taking up large scale cultivation of fodder maize crop either on their own land or on leased land. Conservation of fodder maize provides nutritious feed during the lean period and helps to cut down cost of feeding expensive concentrate feed. Future focus for enhancing green fodder production and its conservation has to be area-based approach where demand could be created.

9.3.3 It is paradoxical that DAC, which is implementing the 'Accelerated Fodder Development Programme (AFDP)' with a budgetary outlay of Rs.300 crores during FY 2011-12, has not effectively consulted DAHD while formulation of the

scheme. Further, it is understood that ICAR is also in the process of formulating a 'fodder mission program'. Such disjointed and lackadaisical efforts may not yield the desired results in enhancing the green fodder production in the country.

9.3.4 As per Action Plan of the National Dairy Plan, fodder production activity would be mostly through demonstration at farmer's field. This would facilitate the much needed capacity building and awareness to the farmers. DAHDF needs to capitalize on this and promote area expansion program for enhanced green fodder production through cluster approach where NDP is implemented.

9.3.5 The existing problems in the fodder seed production chain of Breeder seed – foundation – certified – truthfully labeled, need to be addressed in right earnestness. Considering the fact that comparatively less importance is being given to fodder seed production by National Seed Corporation and other private certified seed companies also, some out of the box solutions like establishing Producer Companies, market linkage with private sector agencies etc. are called for. Involving ICAR institutions, SAUs, State agencies, Private sector along with farmers' participation in a holistic manner could help in addressing this issue in proper perspective.

9.3.6 Though area under natural grasslands/ pastures/ common property resources are on decline, in some of the regions especially under arid ecosystem are of considerable importance for livestock rearers. Excessive stocking pressure and degeneration of the original pasture grasses has led in to decline biomass productivity from these resources. A comprehensive strategy for rejuvenation of these important resources is required

9.3.7 Considering the fact that livestock production systems in India predominantly sustain on feeding of crop residues; the scenario which may not undergo drastic change in the near future, it is important to focus on augmenting for its adequate quantitative and qualitative availability. Further, for sustaining

high productivity in dairy animals and for commercial poultry production, availability of nutritiously rich compounded feed at reasonable cost would be a critical aspect.

9.3.8 The manufacturing of compounded cattle feed is by and large with the private sector agencies (both organized and unorganized) and dairy federations. The usage of compounded cattle feed has not witnessed the desired level of growth over the years. The shift of focus towards rearing animals with higher production potentials and the mushrooming of commercial dairy farms is likely to enhance production and consumption of nutritionally balanced compounded feed. The Ration Balancing Programme envisaged in the NDP would certainly facilitate the dairy farmers in providing a nutritionally balanced feed, which is cost effective to their animals by using feed ingredients available with them and also inclusion of compounded cattle feed.

9.3.9 Efforts need to be focused on augmenting the existing feed resources by tapping non-conventional feed resources. Promotion of fodder cactus in arid ecosystem especially in states of Rajasthan and Gujrat may be taken up during 12^{th} Plan period. The use of by-pass nutrients, promotion of area specific mineral mixtures, fodder enrichment and densification could be some of the focused areas for enhancing the productivity and thereby furthering the growth of the sector.

9.3.10 A 'National program on livestock feed and fodder' be formulated and implemented in a Mission Mode. The scheme so developed has not only to address the issue of green fodder seed production but also encompass other aspects like area expansion of green fodder, fodder conservation, fodder densification, establishment of fodder banks, and nutritional enhancement of crop residues, capacity building, and extension. The ongoing centrally sponsored and central sector schemes on 'Feed and Fodder Development' should be with this mission project.

9.3.11 The existing central sector scheme of ‘Central Fodder Development Organization’ may be subsumed with the recommended project and infrastructure and facilities at the central and seven regional stations may be beneficially utilized exclusively for fodder seed production.

Chapter 10: Animal Health

10.1 Present status and trends

10.1.1 Several measurable steps have been taken to improve animal health but these need further strengthening in view of existing, emerging and trans-boundary diseases and enhanced susceptibility of hosts to various diseases in the wake of global warming. Outbreaks of Avian Influenza are being continuously reported in different areas of the country and strict biosecurity norms need to be formulated and implemented in the absence of any vaccine.

10.1.2 There are a total of 8,732 veterinary hospitals/ polyclinics and 18,830 veterinary dispensaries in the country providing services for the large livestock population. Not only is their number grossly inadequate compared to the requirement, these also have poor infrastructure in terms of dilapidated buildings, lack of equipments, etc. The polyclinics, wherever established, lack the adequate infrastructure for surgical interventions and diagnostic imaging. There is acute shortage of manpower to manage these institutions and provide required services.

10.1.3 Diagnostic facilities at field level in terms of good clinical laboratories, equipments, quick and quality diagnostics and the human resource having expertise in these areas are practically non-existent. Several diagnostic kits required for national surveillance and monitoring are imported at a huge cost. The limited diagnostics available in the country are produced by few laboratories and are not of same uniform quality and not available readily.

10.1.4 Surveillance and monitoring of livestock diseases is a major component of policy decisions. The present disease reporting is neither timely nor complete. Due to this delay, many times animal disease out-breaks assume serious proportions before control and containment steps can be initiated, causing

avoidable social and economic costs to livestock owners and the country's economy. Severe under-reporting of diseases at the ground level is a great dampener to the creation and adoption of adequate strategies and control programs. An authentic epidemiological data for realistic assessment of the prevalence and emergence of these diseases in different agro-climatic zones is essential not only for identification and prioritization of the most important diseases but also their prevention and control by making judicious use of available resources. Recording the incidence of diseases is essential for estimating the economic loss, conducting risk analysis and also for obtaining disease free status of the country.

10.1.5 National Disease Control Program involves the vaccination of all susceptible livestock against major infectious diseases. The vaccine and diagnostic production in the country needs a relook. Except for FMD vaccine, production of most other vaccines is with the state biological units. The biological production centers available in the Govt. sector (both state and central) are old, obsolete, do not comply with the GMP requirements, and are not having contemporary technologies and infrastructure to meet the requirements. The availability of qualified man power to run these institutions are also not available. This situation needs to be addressed urgently now.

10.2 Ongoing programs and their analysis

10.2.1 Various projects under the Livestock Health and Disease Control (LH & DC) and Central Schemes have made tangible impact suggesting that these programs must continue in the 12th plan albeit in more aggressive and comprehensive manner. The programs were being implemented on 75:25 / 90:10 sharing basis between the centre and the states. It is strongly recommended that 100% central assistance should be provided for all the Programs/Schemes in the 12^{th} plan.

10.2.2 Assistance is provided to State Governments for control of economically important diseases of livestock and poultry by way of immunization, strengthening of existing State Veterinary Biological Production Units and State Disease Diagnostic Laboratories, holding workshops/seminars and in-service training to Veterinarians and Para-veterinarians. Implementation of the scheme has basically served the purpose and also helped in reducing the incidence of economically important diseases. However, it requires certain modifications/ changes by enlarging the scope of the components.

10.2.3 Foot and Mouth Disease Control Program (FMD-CP) has been implemented in 221 districts in Phase I with 100% central funding towards cost of vaccine, maintenance of cold chain and other logistic support to undertake vaccination. The program has lead to reduced incidence of disease and hence, it should be extended to whole country in the 12th Plan.

10.2.4 The Department has initiated NCP-PPR with the ultimate objective to eradicate this disease from the country in a time-bound manner on the lines of Rinderpest eradication. The program involves vaccinating all susceptible goats & sheep and their three subsequent generations. This program should be continued and extended to areas left out in the previous plan.

10.2.5 Similarly, National Control Program on Brucellosis initiated in 2010 which envisages mass screening of cattle & buffaloes to ascertain exact incidence of the disease and vaccination of all female calves using S-19 vaccine should be continued. The vaccine production also needs to be enhanced to fulfill the targets and incorporation of DIVA tests will be an added asset towards control of brucellosis.

10.2.6 A beginning could be made during 12th plan to ensure that production of vaccines and other veterinary biologicals is fully privatized and only biologicals which are not commercially viable should remain with the Govt. institutes.

Alternately, the state Governments may be funded not for production of vaccines but for purchasing it from private sector which will indirectly help the private sector to come up with large units for long term commitments. However, there should be a strong government regulatory mechanism for ensuring the desired standards of production and quality of vaccines. Mandatory arrangements for cold storage and refrigerated transportation of vaccines should be an in-built part of supply arrangements. Thermal stickers on vaccine containers would assist in verifying cold-chain.

10.3 Strategies and Programs for 12th Plan

10.3.1 Managing livestock diseases through prophylactic controls with strong laboratory diagnostic system is essential to enhance productivity and reduce losses due to diseases. The ongoing schemes should be further strengthened. The following actions are suggested:

i. The existing scheme 'Livestock Health and Disease Control' should continue with additional components of strengthening and establishing disease diagnostic laboratories throughout the country.

ii. A large component of Mobile Veterinary Clinics should be supported for doorstep delivery of veterinary services with a provision of at least one mobiles clinical van in each of the 6350 blocks in the country.

iii. There is a need to establish a dedicated Centre for Disease Surveillance and Epidemiology for important animal diseases including trans-boundary animal diseases at the central level. The surveillance system must be statistically valid and ongoing.

iv. For meeting the Minimum Standard of Veterinary Education Regulations, the existing Govt. Veterinary colleges should be provided one time catch-up grant for development of the infrastructure

v. Animal quarantine and certification services should be further strengthened by establishing both sea, air and land quarantine stations. The quarantine stations should have the required technical, scientific, and

supporting staff to deliver this responsibility. Linkages with veterinary universities and colleges for providing the services to manage the quarantine stations should also be explored. The possibility of involving private sector for providing these services should also be examined.

vi. The whole sector of vaccine production should be privatized and a strong government regulatory mechanism for ensuring the desired standards of production and quality of vaccines, drugs and biological put in place. A separate Veterinary Drug Control Authority which was recommended in 11th plan for establishment is still awaited.

vii. An integrated, national laboratory diagnostic network with defined capabilities along with dedicated funding to ensure ongoing sustainability and a national integrated surveillance system must be established and made operational. Linkages of field diagnostic laboratories with academic and research institutions would further add competence to diagnostic network.

Chapter 11: Dairy Processing, Value Addition and Marketing

11.1 Present status and trends

11.1.1 The overall sustenance of the dairy industry necessitates a comprehensive approach in milk production, processing and marketing through increased productivity coupled with decreased cost of production, effective collection of the marketable surplus and efficient processing and marketing aimed at delivering safe and quality milk and milk products to the consumers. The government policies and programmes in respect of dairying are thus very crucial especially when the entire trade and economic process is becoming more and more competitive at the global level in this post liberalization area of WTO regime.

11.1.2 While milk production has grown at about 3.5% annually in the recent past, milk consumption has been growing at about 5% per annum. Value-added products, though growing, still have a relatively small share in the total dairy market. Cooperative and private sectors share nearly half-and-half of the marketable milk surplus. However, the cooperatives market liquid milk more than milk products unlike the private processors who produce more of dairy products.

11.1.3 The dairy cooperative network in the country includes 177 milk unions covering 346 districts and over 1, 33,000 village-level societies with a total membership of nearly 14 million farmers. Fifteen major State Cooperative Federations have some 173 dairy plants (of total 254 cooperative processing units) with a handling capacity of about 270 lakh liters of milk per day. Besides liquid milk, these plants manufacture value-added products such as paneer, dahi, dairy whitener, cheese, ice cream, infant food, khoa, peda, misti-doi, sweet curd, milk-cake, kalakand, lassi, shrikhand, gulabjamun mix, rasagolla, condensed milk, burfi, buttermilk, chhach, sweets and UHT milk, besides ghee, milk powder

and flavoured milk. The private-sector plants manufacture mainly dairy whitener, cheese, milk-food, condensed milk, UHT milk, and Dahi.

11.1.4 The recently promulgated Food Safety & Standard Regulations 2011 mandates that milk should be handled hygienically and kept cold (4^{o}C) all along the farm-to-plant route. This implies that adequate cooling facilities (equipment as well as power supply) will have to be made available if the rules are to be complied with. Further, the above-said government regulations also require that all individual milk producers (except those who are members of a dairy cooperative) be registered with the local authority. This scheme is expected to help ensure milk quality and safety, provided that it is implemented in such a way that it would promote milk production rather than hindering it.

11.1.5 Milk procurement price is either on fat basis or on fat-and-SNF (solids-not-fat) basis. Testing facilities are in place at some cooperative societies, a larger number remain yet to be provided with the same. Testing of milk for safety and quality parameters at the collection centres is almost non-existent. Quality of the milk procured is an important element in the chain, and calls for quality testing at the local level itself. Quality control is possible only through well-equipped laboratories and trained technical manpower. A mechanism for continuous monitoring of quality of milk and milk products will allow generation of data which can guide us on the kind of inputs & improvements required from region to region.

11.1.6 The volume of dairy exports to the world trade (2008-09) was approx. 70,800 tons only. Other than ghee, several traditional Indian dairy products seem to have a considerable potential for export which can be realized only through the mechanized and hygienic production, as well as by the application of latest packaging techniques to ensure the quality and safety of the products. According to ‘International Market Analysis Research & Consulting Group’ sales

of dairy products in the country is expected to go up from the present rupees 2.6 lakh crores to rupees 5.1 lakh crores in 2016.

11.2 Ongoing Programs and their analysis

11.2.1 A total of six schemes with a financial outlay of Rs. 580 crore were implemented during the 11th Plan. Considering the growth of milk sector, the financial allocation of Rs.580 crore appears to be very meager.

11.2.2 Centrally-sponsored Scheme of 'Integrated Dairy Development' which was launched in 1993-94 was subsequently modified as 'Intensive Dairy Development Programme' in March 2005. Since inception 90 projects have been supported, of which 40 have been completed. The investment has by and large gone to non-viable areas without conducting any study to explore the potential for dairy activities. With the current orientation of the scheme limiting its implementation only to non- operation flood and hilly areas, it is anticipated that the scheme may not yield desired returns on investment made and further may not contribute significantly either to growth of the dairy sector or improve the livelihood of resource poor farmers. Relevance and continuation of this scheme should be examined in light of the National Dairy Plan which is expected to be launched in the near future.

11.2.3 The Central scheme of 'Assistance to Cooperatives' with a funding pattern of 50:50 sharing basis between Centre and State is in operation since 1999-2000 with the objective of re-vitalizing sick dairy cooperative unions at district level and cooperative federations at state level. Since its inception, 37 rehabilitation proposals of milk unions in 12 states have been supported with an outlay of Rs.271 crores of which the Central share is Rs.135.69 crores. Since inception of the scheme, a release of Rs. 106.17 crores has been made up to December 2010. The issue of continued support to sick district milk unions at the cost of government funds is of considerable concern. A large number of milk unions/

state milk federations continue to have accumulated losses for various reasons and supporting these sick units on a continuous basis needs a comprehensive relook. It is recommended that the 'Assistance to Cooperatives' scheme should be discontinued.

11.2.4 The scheme 'Venture Capital Fund for Dairy and Poultry Sector' was initiated in 2004. During 11th Plan, after separating the poultry component the scheme was implemented as 'Dairy Venture Capital Fund' with a financial outlay of Rs.250 crore. The scheme has the primary objective of providing financial assistance for organised development of dairy sector and is being implemented by NABARD. The scheme has again been modified based on inputs of an independent evaluation agency, banks and beneficiaries and is being implemented as Dairy Entrepreneur Development Scheme (DEDS) since 1st September 2010. Removal of restrictions of limiting only to non – OF areas and providing back end subsidy instead of loan component in the new scheme appears to be steps initiated in the right direction. 18184 dairy units have been established up to August 2010 and a disbursal of Rs.174.39 crore made by NABARD. Implementation of DEDS needs to be carefully monitored and its impact evaluated periodically.

11.2.5 Under scheme on strengthening infrastructure for quality & clean milk production farmers are trained for good hygienic practices; provide with bulk milk coolers and new laboratories are set up to ensure good quality milk production. About 5.74 lakh farmer members have been trained, 1835 bulk milk coolers (BMCs) installed and 1253 labs upgraded and strengthened.

11.3 Strategies and programs for the 12th plan

11.3.1 The concept of modernization of dairy sector needs to be redefined. Instead of looking up to the western world for benchmarks, we could set up our own yardsticks in terms of operational efficiency, green manufacturing practices,

reduced carbon footprints, lower wastages, novel processes and waste utilization technologies. However, considerable R&D efforts will be needed to develop these and, therefore, adequate budgetary provisions are required to implement these.

11.3.2 The Government may consider making anaerobic waste treatment obligatory for dairy plants handling more than say, one lakh litres of milk per day. This will ensure environmental benefits and also provide significant quantity of energy for dairy operations. In fact, we can think in terms of commissioning an organization on the lines of Carbon Trust of UK which oversees the energy issues of the food processing industry.

11.3.3 Dairy by-product utilization is another field which requires due attention not only because of economic loss but these pose problem of environmental pollution. Among the dairy by-products whey is one of the important by product. Currently, only few dairy plants are having facilities and technology for whey utilization at large scale. Some incentives in the form of tax holiday may be given to by-product industry to attract private investment in this sector.

11.3.4 National Dairy Plan will be implemented in almost all districts and the quantum of money/funds will be allocated based on the current situation (high potential or low potential) of dairying in the district. Through this plan government is considering to enhance milk production (through breeding & feeding interventions) in major milk producing areas, strengthen and expand infrastructure for the production, processing and marketing of milk products through existing routes or developing new institutional structures. The plan also aims at bringing 65 % surplus milk produced under the ambit of organized sector as against the present 30%. It is proposed to develop new business models to bring the unorganized sector into the organized sector by utilizing existing legal provisions like Company`s Act (producer companies), Societies Act (producer associations), etc. New milk-sheds based on innovative business models should

be established. The idea is to allocate resources into small but potential geographical areas which are presently not focused on dairying.

11.3.5 In view of this mega project, the continuation of central sponsored schemes in the area of dairy development should be re-examined and those schemes with different objectives should be continued and remaining dropped.

Chapter 12: Meat and Abattoirs

12.1 Present Status and Trends

12.1.1 India has enormous potential to be the world's number one producer of meat but has not been able to harness it. Meat production from the recognized sources is estimated to be 3.96 MT (DAHD, 2010). However, meat production which is quoted as 6.3 MT at various forums has increased at the rate of 4.1% annually during the last 5 years. Cattle and buffalo, sheep and goat, pigs, poultry contribute 55.0%, 17.1%, 11.4% and 16.3%, respectively to total meat production.

12.1.2 There are 30 export-oriented modern abattoirs and 77 meat processing plants registered with Agricultural and Processed Food Products Export Development Authority exporting raw meet (chilled and frozen) to about 56 countries. India exported 5,45,731 tonnes bovine and 52,251 tonnes sheep and goat meat (2009-10), which amounted to Rs. 5436.1 crores and Rs 737.27 crores, respectively. The export of sheep and goat casings and processed meat (put together) has been hanging around Rs.100 crores during the last ten years. It is mainly the buffalo meat that has been increasing at the rate of 8% per annum during the last five years.

12.1.3 Constraints in the meat sector include poor infrastructure of slaughter houses both registered (3894) and un-registered (25754), lack of cold chains, proper meat inspection system and poor utilization of by-products.

12.2 Ongoing Schemes and their analysis

12.2.1 A total of five schemes were in operation during the 11th plan. These were: Establishment/Modernization of rural slaughter houses including mobile slaughter plants (Rs. 240 crores), Utilization of fallen animals (Rs. 75 crores),

Salvaging and rearing of male buffalo calves (Rs. 300 crores), Food safety and traceability (Rs. 50 crores) and Setting up of Retail Poultry Dressing Units (Rs. 1662.2 crores). Except under Poultry dressing units, where 629 crores was spent, no expenditure was incurred in any other scheme.

12.2.2 The department of Food Processing Industries (MFPI) could start 10 slaughter houses out of the 50 sanctioned. At present, only 3 have been completed and the remaining 7 are in different stages of execution. Little progress was achieved under scheme on “Modernization of existing municipal slaughter houses”, each at a cost of Rs. 15 crores.

12.2.3 The major constraints in implementing schemes in meat and abattoirs sector were overlapping functions of various agencies (Central Ministries / Departments – AHD&F, Food Processing Industries, Environment & Forest) which led to procedural delays and poor coordination. These stood in the way of modernization of the meat industry.

12.3 Strategies and programs for 12th Plan

12.3.1 Since slaughter is a state subject, the actual processing of meat for exports as well as for domestic demand follow the laws of the individual states, which are at variance with each other. The new regulations notified in May, 2011 under Food Safety and Standards Act call for complete modernization of the industry to produce quality and safe meat. There is a need to improve awareness among the stake holders on Food Safety and quality aspects of meat for effective implementation of the newly proposed Food Safety Rules.

12.3.2 The existing slaughter houses - large, medium and small which cater to consumer’s demand in the metropolitan towns, sub-urban and rural areas need to be upgraded and modernized to ensure quality meat production. This should receive top priority.

12.3.3 Most of the butchers working in meat sector are not adapted to newer meat processing techniques and quality standards. And there is no cadre of qualified Veterinarians/technicians for meat inspection. In most of the States, the Veterinarians are given additional responsibility of meat inspection. Therefore, there is an urgent need to train butchers and meat inspectors.

12.3.4 Inedible offal's and animal wastes from the meat plant can be rendered for the preparation of economically useful products. Much larger potential exists for processing animal tissues for valuable proteins/materials which have global market and most of them are imported to India. One hundred rendering units and two high-value by-product processing units under PPP mode should be established. There is also huge demand of Indian ethnic meat products in the international market. Suitable incentives should be provided for setting up of further processed meat units, rendering and high value by-product plants in PPP mode.

12.3.5 There is a need to upgrade/ modernize/ strengthen livestock markets by building up infrastructural facilities on the pattern of Agriculture Produce Marketing Centres. This shall help in marketing of meat animals, and meat and meat products.

12.3.6 National Meat & Poultry Processing Board was constituted under MFPI to promote processing of meat & meat products by clubbing meat and poultry. The scope of the board may be broadened to cover all meat related issues right from the primary production to the consumers. In continuation, State Meat Development Boards may be established to address the meat issues.

12.3.7 All schemes in the meat sector in existence should be continued in the 12^{th} plan. Other schemes proposed are critical to ensure production of quality meat and meat products and save environment from pollution.

Chapter 13. Investment, Credit and Insurance

13.1 Present status and trends

13.1.1 Animal husbandry and dairying is a state subject, and bulk of the investment for their development comes from the state governments. The central government contributes about 10% to the total investment through central and centrally-sponsored schemes as to supplement state governments' resources. In absolute terms, total outlay for animal husbandry and dairying increased over the plan periods. However, as per cent of the total plan outlay the share of animal husbandry and dairy development declined from 1.1% during first FYP to 0.4% during VI FYP and further to 0.3% in the subsequent FYPs. As proportion of the total outlay for the agricultural sector, the share of livestock fell from 11.2% in II FYP to 3.6 % in IX FYP but increased to 9.3% during XI FYP. The share of livestock in the planned investment has never been commensurate with its contribution to GDP or AgGDP.

Table 13.1 Planned and Actual Expenditure on Animal Husbandry and Dairy Development during various Five-Year Plan periods (Rs. Crores at current prices)

Plan	Animal Husbandry		Dairy Development		Total		% AH&D to total agriculture outlay	% AH&D to total outlay
	Planned	Actual	Planned	Actual	Planned	Actual		
First (1950-55)	14.2	8.2	7.8	7.8	22	16	6.2	1.1
Second (1955-60)	38.5	21.4	17.4	12.1	55.9	33.5	11.2	1.2
Third (1960-65)	54.4	43.4	36.1	33.6	90.5	77	8.3	1.1
Fourth (1967-72)	94.1	75.5	139	78.8	233.1	154.3	10	1.5
Fifth (1975-80)	NA	178.4	NA	NA	437.5	232.5	9	1.1
Sixth (1980-85)	60.5	39.1	336.1	298.3	396.6	337.4	7	0.4
Seventh (1985-90)	165.2	102.4	302.8	374.4	467.9	476.8	4.4	0.3

Eighth (1992-97)	400	305.4	900	818.1	1300	1123.5	5.8	0.3
Ninth (1997-2002)	1076.1	445.8	469.5	146.9	1545.6	592.7	3.6	0.3
Tenth (2002-07)	1384.0	1419.4	361.0	285.8	1745.0	1705.2	11.87	0.12
Eleventh (2007-12)	4323.0	1101.3**	580.0	262.4**	4903.0	1363.7**	9.23	
Source: GoI (20011) Planning Commission, Government of India ** Up to Dec 2009								

13.1.2 Since IV FYP the emphasis had been on dairy development to support the the Operation Flood Programme. With the end of Opertaion Flood program, the allocation to dairy development slowed down, reaching to about 30% in the XI FYP. Animal health and veterinary services now receive about 30% of the total funds. In XI Plan, the centrally sponsored schemes -Animal Health and Disease Control and National Project for Livestock Development accounted for a major share of the outlay for animal husbandry. Small ruminants, piggery, feed and fodder development, research, education and training did not receive adequate financial support.

13.1.3 There has been a large gap between planned and actual expenditure in case of Animal Husbandry in most plan periods, except during Xth FYP.

13.1.4 There is hardly any private sector investment in animal husbandry except some support to Gaushalas and Gosadans. The diary sector, however, has attracted considerable private investment in processing, value addition and marketing. The dairy development is no longer a monopoly of the NDDB as privately owned dairy plants account for close to half of the total milk processed in the country. Diary processing was not a priority for lending by institutional credit agencies. In 2009, dairy processing was included in the list of priority sector lending activities.

13.1.5 Credit: Financial institutions provide credit for various livestock as ‘term credit’ for introduction of animals, construction of animal sheds, purchase of equipments etc.). The credit is also provided for activities like establishment of

milk collection centres, bulk milk coolers, livestock product processing units, cold chain, storage and marketing infrastructure, vehicles for transporting livestock products, retail outlets for sale of livestock products etc. and feed and fodder development activities are also eligible for financing.

13.1.6 Flow of institutional credit to livestock sector has not been in commensurate with its share in AgGDP. The average share of the sector in total term loan advanced to the agricultural sector was about 10% during 2005-06 to 2009-10 (Table 13.2). After 2005-06 there has been very slow growth in credit flow to the sector. Its share in the total agricultural credit (short-term and long-term) has hardly ever exceeded 5%. 4.5.9.8 About 80% of the credit to animal husbandry and dairying is provided by the commercial banks. The Regional rural banks (RRBs) that are mandated to cater to the credit needs of the socially and economically weaker sections have a very small share.

Table 13.2 Ground level credit flow to animal husbandry (Rs crores)

S.No	Purpose/year	2002-03	2006-07	2007-08	2008-09	2009-10
1.	Crop loans	63,141	138,455	181,393	210,395	276,656
2.	Investment credit/term loans for agriculture and allied activities	17,555	90,945	73,265	91,513	107,858
3.	Total loans (1+2)	80,696	229,400	254,658	301,908	384,514
4.	Animal husbandry out of term loans	2,637	8,045	9033	11203	10,260
5.	AH term loans as% of total term loans	15.02	8.85	12.33	12.24	9.51

13.1.7 NABARD - the apex bank for financing agriculture and rural development, provides refinance for different activities, and also co-finances projects with commercial banks and RRBs. More than 70% of the refinance disbursement goes for dairy development. The share for poultry, small ruminants and piggery has declined sharply from 50% in the early 1990s to 32% in the late 1990s and further to less than 22% in triennium ending 2005-06.

13.1.8 Insurance: Livestock insurance is provided by the public sector insurance companies. The sum insured is the market value of the animal. The basic annual premium rate is 4% of the sum insured. Long term policies are also issued on discounted premium. The animals purchased under the government's poverty alleviation programs (scheme animals) are insured at the concessional premium rate of 2.25%. Poultry insurance provides indemnity to birds which include layers, broilers and hatchery birds (breeding stock) which are exotic and improved, and is applicable to poultry farms with a specified minimum number of birds.

13.1.9 The progress of livestock insurance schemes has not been encouraging. Only about 6% of the animal head (excluding poultry) are covered with insurance.

13.1.10 The private institutions have also entered into livestock insurance market. BASIX, a livelihood promotion institution working in several arid and backward districts spread over seven states, collaborates with Royal Sundaram to provide livestock insurance to poor livestock keepers.

13.2 Ongoing schemes and their analysis

13.2.1 A Venture Capital Fund to promote entrepreneurship in dairying and poultry was started in 2005 and continued in the XIth Plan also. Its progress has been satisfactory. Around Rs 200 crores have been sanctioned during 2005-2010. Since inception of the scheme 18184 dairy units have been sanctioned with Interest Free Loan assistance of Rs 174.39 crores up to 31st August, 2010 by NABARD. The scheme was modified and renamed as 'Dairy Entrepreneurship Development Scheme' (DEDS) from 1st September, 2010. The changes or modifications included, (i) change in the mode of central assistance from Interest Free Loan to back-ended Capital Subsidy. (ii) removal of the restriction on establishment of dairy units in Operation Flood (OF) areas, (iii) extension of

assistance to indigenous descript milch cows like Sahiwal, Red Sindhi, Gir, Rathi etc. and graded buffaloes up to 10 numbers, (iv) assistance for rearing of heifers up to 20 which was not available earlier, (v) assistance for vermi -composting, and (vi) assistance for dairy marketing outlet/parlor.

13.2.2 The Centrally Sponsored Scheme on "Poultry Development" has various components viz., assistance to State Poultry Farms for strengthening infrastructure, farmers training, setting up of demonstration units, etc.; the 'Rural Backyard Poultry Development' component is envisaged to cover beneficiaries from poor families to enable them to gain supplementary income and nutritional support. The progress in disbursement is not available. In a pilot project for establishing 'Poultry Estates', entrepreneurship skills are to be improved initially through establishment of two estates by the state governments. These estates are meant primarily for educated, unemployed youth and small farmers for establishing individual layer/broiler units with interest free loan. As the work on establishing poultry estates is not completed, no proposal has been received from banks for setting up of poultry units by the identified beneficiaries.

13.2.3 Since 2011-12, the 'Poultry Venture Capital Fund' scheme is in progress for implementation in Capital Subsidy mode through NABARD. The scheme has recently been introduced.

Table 13.3 Progress of credit linked Schemes of DAHDF through NABARD (Rs. Lakh)

S. No.	Name of Scheme	Outlay In XI plan	Units achieved	Amount released
1	Establishment/ modernization of rural slaughter houses	4850	1	10.2
2	Integrated Development of small ruminants and rabbits	19000	304 Promotional	101 64
3	Scheme for piggery development	15000	239 Promotional	122 27.4
4	Poultry Estates & Rural backyard poultry units	15000	nil	nil
5	Salvage and rearing of male buffalo calves	12162	nil	nil

6	Utilization of fallen animals	7500	nil	nil
7	Dairy Entrepreneurship Development Scheme	10840	6335	2821
8	Poultry venture capital fund	12500	nil	nil

13.2.4 Rahstriya Krishi Vikas Yojana (RKVY) was introduced during XI FYP to support agricultural development with an outlay of Rs 25,000 crores. Although, animal husbandry and dairying are eligible to receive assistance under this scheme, allocation of funds to these activities has been quite poor- only 10-15% of the total outlay in different years. The RKVY is implemented by the Department of Agriculture without much involvement of the Department of Animal Husbandry and Dairying.

13.2.5 Rural Infrastructure Development Fund (RIDF) should provide cost effective loan support to State Governments to develop infrastructure in rural areas including veterinary hospitals / dispensaries (new and renovation), dairy rehabilitation programme, dairy processing plants, pig breeding farms, vaccine production centres, livestock knowledge centres, semen bank, poultry hatchery and strengthening of cattle breeding farm. So far Rs744.88 crore has been sanctioned forming 0.61% of total sanctions and 0.29% of value of output of livestock sector.

13.2.6 Apart from Schemes for Dairy and Poultry development, some schemes for small ruminants & rabbits, piggery, rearing of male buffalo calves and rural slaughter houses were also sanctioned but these have been largely non-starters. Most of the schemes are conceptualized and approved only after Sept. 2009 by which time half of the plan period was over and subsequently some time went in preparation of guidelines and sensitization of bankers. In view of this, the progress in most of the schemes was not satisfactory.

13.2.7 The Government of India introduced a Centrally Sponsored Livestock Insurance scheme on pilot basis in 2005-06 and 2006-07 in 100 selected districts of the country. The scheme continued during 2007-08 also. A full-fledged

scheme on 'Livestock Insurance' was approved in 2008 for another 100 districts on regular basis. The scheme now covers 300 districts. The scheme restricts insurance cover to high yielding cows and buffaloes (yielding at least 1500 litres of milk per lactation) and is implemented in all the States through the State Livestock Development Boards, or through the State Directorate of Animal Husbandry. Fifty percent of the premium is borne by the farmers and the remaining 50% and the administrative charges by the Government of India. The subsidy is restricted to two animals per beneficiary, and for a maximum period of three years. The farmers are encouraged to buy a three-year policy which is likely to be more economical and useful for getting the real benefit of insurance on occurrence of natural calamities like flood, drought, etc. However, if a livestock owner prefers to have an insurance policy for less than three years period for valid reasons, the subsidy is still available, with the restriction that no subsidy would be available for further extension of the policy. During 2008/09 to 2010/11, the number of animals insured increased from 3.96 lakhs to 8.16 lakhs, but given the fact that there are over 94 million dairy animals in the country; the achievement of the scheme is just like a small drop in the ocean. Further, the beneficiaries of the scheme are largely concentrated in southern states, Gujarat, Haryana and Madhya Pradesh. The coverage in other states is very low. Besides the Centrally Sponsored Insurance Scheme for the dairy animas, a few state governments have also launched schemes to ensure protection of the livestock assets. This includes Avikavach of Rajasthan for the benefit of sheep flock owners and similarly AP sheep federation has introduced sheep insurance scheme. The Central Wool Development Board had also proposed implementation of sheep insurance scheme under the Social Security Scheme during 11th Plan (2007-12), with the objective to provide insurance in case of accident including fire, lightening, storm, tempest, flood, inundation, earthquake, famine and diseases contracted.

13.2.8 There are several reasons for the low coverage of livestock insurance outside the commercial poultry sector, such as lack of awareness among

potential beneficiaries, affordability, delivery channels, problems in settlement of claims etc. Further, the heavy claim ratio (above 80%) in case of livestock makes the cost of transaction and service very high for the insurance industry and also acts as deterrent factor in extending the coverage of the schemes.

13.3 Strategies and Programs for 12th Plan

13.3.1 In order to harness the pro-poor potential of livestock there is a need for enhancing public investment in the livestock sector and priorities for utilization may be decided depending upon the opportunities and challenges across different programs and states.

13.3.2 Clear-cut planning of the Centrally Sponsored and Central Schemes with specific monitoring mechanism should be put in place for fund utilization, time frame and quality of assets created. The specific schemes and programs are conceptualized and implemented within 18 months of initial approval. This would help in increasing fund utilization. The estimated requirement of public investment from DAHDF towards capital subsidy under various schemes referred in chapter 3 is Rs 4000 crores for the 12th five year plan.

13.3.3 New institutional mechanisms need to be put in place so that the schemes and programs can be awarded for implementation in the competitive mode, rather than sole emphasis of State AHDs as the implementing agency. This would encourage public-private partnership and could also attract much needed private capital investment for its development. Taking the business entities, NGOs, etc. as partners for delivery of the Govt. Schemes could be considered as an option.

13.3.4 Investment linked tax incentives may help private investors to invest in livestock production and processing activities.

13.3.5 The estimated term loan requirement for the sector is around Rs 78285 crore for the 12th plan period and over and above this the working capital requirement may be around 25 % of term loan.

13.3.6 Presently, there is no target for animal husbandry loans, banks depend on walking in business and efforts of the customers. Also there is no systematic budgeting and follow-up review by banks specifically in animal husbandry activities. Hence, minimum sectoral targets in priority sector and rural lending should be specified. For instance, RBI should consider making it mandatory for banks to allocate some component, say 3-4%, to livestock sector in total direct agricultural priority sector lending benchmark of 13.5%. It will shift focus of banks to this activity.

13.3.7 Credit to animal husbandry should be treated at par with crop loan as animals generate a continuous stream of output. The facility of the Kisan credit cards should be extended to the livestock farmers.

13.3.8 There is no co-ordination between various departments and also with the banks to have an integrated approach. While the departments are forwarding the applications for implementation of the scheme, they normally withdraw themselves from the recovery scene. This results in banks left alone for recovery which reduces their enthusiasm for fresh finance under the scheme

13.3.9 For improving the access of smallholders to institutional credit, formation of Joint Liability groups, tie-up with Dairy Department/Dairy Co-operatives/ Milk Plants/ Milk federations etc. are important.

13.3.10 National Livestock Insurance Scheme should not be limited to bovines only and be extended to the small ruminants and piggery. The insurance for the small ruminants and backyard poultry should be in welfare mode as in case of

community health programmes. Periodic meetings of stake holders are essential to review the scheme and its implementation.

13.3.11 The line departments have to be given active role and incentives for livestock insurance. The para-vets, veterinary doctors, stockmen, in the field can serve as micro-insurance agents with the right incentive structure. This would provide support to the Insurance companies that do not have the agent network in the rural areas and hence have not been able to make widespread penetration in the livestock insurance.

13.3.12 Polyutherene tags may be used for all insured animals and the cost of which may be shared by the government and Insurance Company as it successfully helps in tracking the animal and reducing the moral hazard of the insured/farmer.

13.3.14 The service tax on rural livestock insurance may be exempted or reduced and private sector should be incentivized.

13.3.15 Cooperatives and agribusiness firms (in case of contract farming) should facilitate provision of insurance cover by providing premium on behalf of the farmers which may be recovered in installments or lump sum from their sale proceeds.

13.3.16 A study on insurance models of various states/institutions may be designed to evolve a suitable scheme for various species/states.

Chapter 14: Livestock Economics and Statistics

14.1 Present status and trends

14.1.1 Availability of reliable and in-time statistics is crucial to livestock development planning but there is acute scarcity of such information on many aspects of livestock sector. Nonetheless, a need for reliable statistics is now recognized for two main reasons. First, as the economy grows and incomes rise, the relative importance of livestock food - milk, meat, poultry and their processed products - in the average Indian diet is going to grow further. From the point of view of its contribution to the national income, the share of the sector has also increased over time and hence, precise and reliable estimates of livestock sector become vital. Secondly, for meeting the challenges of globalization it is imperative to have comprehensive and reliable knowledge of the ground realities on all aspects of our livestock production system.

14.1.2 The first Livestock Census was conducted during 1919-20 and since then it is being conducted quinquennially by all States/UTs. So far 18 such Censuses have been conducted, and the latest one is 18th in the series with 15/10/2007 as reference date. The Census which is conducted as a 100% Centrally Sponsored scheme , is the only source providing number of all species and equipments and machinery. Since the last two Censuses, the efficacy of the DAHD in reducing the time gap between the conduct of census and availability of its data has improved.

14.2 Ongoing schemes and their analysis

14.2.1 Unlike crop sector where a number of schemes and surveys for collecting the information are made, there are only two schemes for compiling information on animal husbandry and dairying. These are the (i) Quinquennial Livestock Census and (ii) Integrated Sample Survey. In addition, the National Sample

Survey Organization also conducts a decennial survey on Land and Livestock Holdings.

14.2.2 Integrated Sample Survey (ISS) generates information on production and yield of major livestock products like milk, eggs, meat and wool on annual basis. Under the scheme, central assistance to the tune of 50% & 100 % of the expenditure on salary of entitled posts is provided to the States and UTs respectively. The production estimates are finalized by the Technical Committee of Direction for improvement of Animal Husbandry Statistics, under the chairmanship of DG, Central Statistics Office in its annual meeting.

14.2.3 However, not all the states carry out the Survey regularly and not all of them carry it out in any given year. The States, which do carry out the Survey, supply their 'Survey estimates' to the Ministry of Agriculture at the centre. However the states, which do not carry out the Survey, supply to the centre what is called 'official estimate.' In 1979-80, a committee called Technical Committee of Direction for Improvement of Animal Husbandry and Dairy Statistics was appointed by the central government for scrutinizing and reconciling two sets of estimates supplied by the states; and finally approving state- wise and all- India milk production estimates for official release.

14.2.4 The accuracy of the data generated by the ISS is debatable. A sub-committee set up to make an in-depth examination of the estimates found that the survey design is not strictly followed in operation, actual weighment of milk yield is not done as often as required and non-response rate is quite high. In view of the questionable reliability of the ‘official estimates' and infirmity associated with the 'Survey estimates' , it is not surprising that the Technical Committee takes about a year or two to finalise and put the official seal on the state wise and all India milk production estimates.

14.2.5 Besides the milk production estimates, the meat, egg and wool production estimates are based on studies on yield-rates from very few states. For the

states where yield rate studies have not been carried out, the yield estimates of neighboring states are applied to arrive at production estimates. A committee was constituted under the Chairmanship of Animal Husbandry Commissioner for the revision of the methodology/schedule for data collection under ISS scheme. The recommendations of the committee were finalized during the second meeting of the committee held on 2nd June 2011, and its recommendations would be implemented from the next year.

14.2.6 One of the major constraints faced in smooth conduct of the ISS is the precarious shortage of staff. Out of the 1334 entitled posts, only 717 posts (54 % of entitled strength) are filled up by the States/UTs. In many States/ UTs, the supervisory level posts of Joint Director/ Deputy Director at State head quarter are not filled up. This adversely affects the reliability of the estimates, and also delays the finalization of estimates or frequent revisions. For better implementation of the scheme, the vacant posts need to be filled. The reasons for not creating/ filling up the vacant posts, as intimated by the State Animal Husbandry Departments, is the non availability of 50% matching share of funds.

14.3 Strategies and programs for 12th plan

14.3.1 The Livestock Census should be made mandatory, and efforts made to conduct it simultaneously throughout the country. Publicity for Livestock Census should be given due importance with specified funds allocated for the same in the scheme itself. The Census should compile breed-wise information so as to know the livestock diversity in the country. The Census should be conducted by persons trained extensively in identification of breed characteristics by involving breeders and concerned scientists/technical persons. The Census should aim its conduct through computer-intensive technology only. Data on Livestock Census should be scanned the moment it is collected and validated by immediate supervisor. For this, infrastructure and software required for verification, validation, howler checking, work file creation, tabulation and publication should

be kept ready well in advance and before the scanning of data in order to make faster publication of results.

14.3.2 Further the data should be readily available to the researchers and policy makers. Presently, the ISS reports are available only with the respective State AHDs, and Centre publishes just the state level figures not the district-level or seasonal estimates.

14.3.3 To strengthen collection process and increase accountability in the collection of livestock data, an office of livestock statistics should be created at each district having all infrastructure of converting the collected data into computer friendly media. At the state level there should be sufficient staff of data collectors, supervisors and field officers headed by Assistant Director (Livestock Statistics) having sufficient expertise in livestock statistics collection.

14.3.4 The aims of ISS Scheme should be broadened to cover all statistical activities related with livestock sector. The present schedule of Integrated Sample Survey Scheme should be revised by involving subject specific and/or other institutes of repute. Deficiency in information on broilers production and meat production from unorganized sector in the schedule should be removed.

14.3.5 Unlike the crop sector, there is no systematic collection of data on the input use in the livestock sector and cost of production estimates. In this context, either the scope of the ISS Scheme should be broadened to cover all statistics related with livestock sector. It is suggested that various veterinary/Agriculture universities should be involved on the lines of cost of cultivation for providing such information in different states/regions. The regional estimates on cost of production and input use (feed, fodder, labour, etc) may be generated once in two years and unit record data for the same be made available (at a price) in public domain as is done by the NSSO for its surveys. A separate wing dealing

with livestock statistics and economics may be established to plan data collection on various aspects of livestock production and health.

14.3.6 The NDDB compiles useful information on the milk procurement, prices, value addition and other aspects of milk production and processing collected from the vast network of dairy cooperative structure in the country. However, the public access to this data base is not there. NDDB may provide this information in public domain.

14.3.7 A National Institute for Livestock Information and Policy Studies as proposed in the XI FYP may be established. The Institute should be an autonomous body and provide the required technical inputs and guideline on Animal Husbandry Statistics and Economic studies.

Chapter 15: Adulteration in milk and meat and animal feed

15.1 Present status and trends

15.1.1 Tropical climate, unorganized milk production, laxity in quality control, a lopsided demand and supply position coupled with evolution of recalcitrant pathogens are major hurdles in development pace of the dairy industry. The situation is further being deteriorated by incessant reports of adulterated milk and milk products. With globalization of the raw material supply, food adulteration is an increasing threat. The recent Chinese melamine crisis which led to human death drew the attention of the whole community. Adulterants in milk are used to increase the volume of a raw material or the level of its major constituents, preserve its physico-chemical structures or as bacterial inhibitors. Most commonly used chemicals in synthetic milk are urea, neutralizers and detergents etc.

15.1.2 The problem of quality assurance with particular reference to microbial contamination ails Indian dairy sector starting with milk producing animals, which can deliver heavy load of bacteria to fresh milk due to infections. Even though there are different reasons for developing and developed economies to combat infection and food contamination, everyone agrees that such undesirable microbes are a threat to human health and must be contained or eliminated. World wide there are huge efforts being directed towards the discovery of conventional and non conventional ways to combat food infections.

15.1.3 The adulteration of inferior with superior quality meat is a common practice for financial gain. Further, carelessness and lack of proper hygienic conditions are common maladies affecting meat trade and industry in India. Meat species adulteration concerns consumers in terms of economic loss, food allergies, religious observance, and food safety. The conventionally available methods for detecting adulteration in meat depend on protein expression pattern

and suffer from the disadvantage that after cooking the proteins get heat denatured which leads to alteration of results and also show cross species reactivity. There is need for a method that would give unambiguous conclusion, work with cooked samples and also help in solving vetro-legal problems particularly related to Prevention of Cow Slaughter Act. Mixing of non-declared protein, addition of flour, starch, fibre, and plant proteins, mixing of non-meat ingredients in meat products such as blood proteins, edible offal etc. are the most frequent adulterations used in meat products. Hence, it is necessary to have a wide array of analytical methods available to ascertain adulteration or authenticity of particular food commodities, and to develop novel methods.

15.1.4 Adulteration/Contamination of feed ingredients at times is done intentionally and also occurs due to improper storage in compounded feed/feed ingredients especially during warm and humid climate and needs to be controlled to maintain quality of feed. Whole grains can be adulterated with sub standard/cut grains stones, sand, iron fillings and shriveled/insect-eaten grains. Urea and or ammonium salts may be mixed in oilseed cakes to increase the protein contents. Various oil seed cakes and brans may contain fibrous material such as saw dust, husk and hulls. Generally adulterants used in feed ingredients include excess moisture to increase weight which lead to fungus infestations and low shelf life.

15.1.5 The occurrence and detection of antibiotic residues in milk continue to be a concern for dairy industry, consumer and the Government with emerging issues of development of resistance to multiple antibiotics. Presence of antibiotic residues is also linked to cause allergic reactions in human beings even if they are present at very low level (1 ppb), carcinogenicity and spread of bacterial resistance to antibiotics. Further, such residues are detrimental to the dairy industry in formulation of value added products where bacterial starter cultures are required. The Food and Drug Administration, USA, has recently identified approximately 80 drugs which are likely residues in animal-derived human food.

In India, many of these antibiotics are being used in an "extra label" fashion and furthermore, due to the malpractices new generation antibiotics recommended for human use are also being used in animal for disease control, for which no safe levels have been recommended in milk and are leading to development of antibiotic resistance.

15.1.5 There is need for preparation of inventory database of adulterants, pathogens and residues in milk, meat and animal feed which shall help to evolve suitable protocols and develop mitigation strategies for production of quality assured and residue free food of animal origin.

15.1.6 There is a major concern over the adulteration and substandard quality veterinary drugs. There are no facilities available for veterinarians or even Govt procurement agencies to check the quality standards of veterinary drugs and potency of vaccines available in the market.

15.2 Ongoing Schemes and Their Analysis

15.2.1 Food Safety & Standards Act (FSSA) 2006 has been implemented from 5th August 2011. With the coming into effect of FSSA, the Prevention of Food Adulteration Act, 1954, and all acts and rules on milk and meat adulteration and quality stand repealed. As per FSSA, no article of food shall contain pesticides, veterinary drugs and antibiotic residues and microbiological counts in excess of such tolerance limits as may be specified by regulations. As per as FSSA 2006, Food Safety and Standards Authority of India (FSSAI) will notify accredited food laboratories and research institutions for analysis and will establish or recognize, referral food laboratories.

15.2.2 Animal Husbandry Departments should have state-of-the-art infrastructure in the area of food safety, quality control assurance and research for foods of animal origin and animal feed for offering service to dairy farmers,

food processors, consumers, etc. Establishment of testing and authentication by a standard facility like as proposed will also enhance the export potential of food items from the region.

15.2.3 The Drug and Cosmetics Act regulates manufacture, sale and distribution of drugs and is primarily the concern of the State authorities. An expert committee on a Comprehensive Examination of Drug Regulatory Issues, including the Problem of Spurious Drugs (2003) has reported that majority of the States are not either adequately staffed or technically equipped to monitor the quality of drugs in their States. There is a strong need to strengthen the organizations with competent and trained manpower and adequate budgets. States should set-up well-equipped testing laboratory to enable them to test all categories of drugs in shortest possible time.

15.3 Strategies and Programs for 12th plan

15.3.1 Taken together, detection of adulterants and pathogens in the milk, meat and their products is critical for ensuring quality both for domestic consumption, exports and calls for development of effective sensing technologies at competitive international level.

15.3.2 Establishment of five accredited Central/ Regional referral laboratories and twenty five State Quality Control laboratories, with uniform method of analysis, adequate technical personnel to manage quality assurance goals and measures for sanitary and phyto-sanitary monitoring is recommended. Each laboratory should have facilities for analysis of adulterants and quality control of milk, meat, and animal feed; pesticide, antibiotic and heavy metal residues analysis. These units should be placed under one roof so as to allow use of common equipments etc. Providing analytical services supported with mobile vans will be of great help for routine screening of samples. Funds should be

provided for developing the infrastructure, man power for research and development, and other recurring and non-recurring contingencies.

15.3.3 There should be Regional Veterinary Drug Testing Laboratories approved by the Drugs Control Administration to carry out testing and analysis of veterinary drugs for their quality and vaccines for their potency.

15.3.4 ICAR should collaborate with research institutes/state universities for development of rapid, cost-effective and easy to use tests/kits for detecting adulterants; antibiotics residues; food borne pathogens in food of animal origin, animal feed quality, which can be used at field level and at milk procurement centers. Initially diagnostic kits can be imported for use and later on these produced indigenously.

15.3.5 Incentives to milk producers for quality milk production, in terms of hygiene, somatic cell count, drug residues, microbial load and chemical contaminants should be provided. Such a move shall encourage farmer to undertake legitimate steps for increasing the quality of milk following recommended feed and medicines etc. Various reputed milk processing companies with their efficient quality control labs, incentives and extension activities has significantly improved the quality of procured milk.

15.3.6 National and State regulatory bodies should be established to ensure the quality of milk and meat.

15.3.7 In all developed countries, it is the responsibility of qualified veterinarians to inspect meat and milk as they are well versed with animals and food safety issues originating from animal food whereas in India this issue comes in jurisdiction of medical professionals. The duty of inspection of food of animal origin should come under the preview of veterinarians as it shall also be helpful in vetero-legal cases for expert opinion.

Chapter 16: Women and Livestock

16.1 Present status and trends

16.1.1 The economic policies of both the central and state governments though have helped enhance and sustain agricultural growth but have not been able to address adequately the deeply entrenched economic and social inequalities including gender inequalities in the Indian rural society. The reformist policies of liberalization, privatization and globalization of the recent years have negatively impacted women and added to the problems women already face in a deeply patriarchal, social milieu with structured gender inequality along economic, social and cultural dimensions.

16.1.2 Women are the custodian of household food security. They are often the producers of agricultural products and translate these products into food and nutrition security of their households. When women have income sources they spend most of it on the education and nutrition of their children. Fueled by a growing population, rising income and rapid urbanization, the demand for livestock products is rising. And with increasing globalization of agri-food markets, livestock producers are now exposed to global competition. This has transformed the national and global market pull into an engine for generating sectoral and national competitive advantage, and create conditions which compel and enable sectoral decision-makers to creatively utilize the opportunities offered by the new economic environment to establish competitive advantage not only at the farm-level but also at industry levels, making India a leading player in global livestock product market through sustained and all-round improvements in quality and efficiency. Gainfully participation of women in the process of growth and modernization of the livestock sector would necessitate promoting gender sensitive institutional, legal and technological change that promotes productivity, excellence and competitive advantage.

16.1.3 In India livestock production is largely in the hands of women. In fact animal husbandry is becoming feminized. The share of women in the total agricultural workforce increased from 70.5% in 1993-94 to 76.6% in 2004-05. This proportion is as high as more than 90% in states like Punjab and Haryana where animal husbandry is more commercialized and engages more than 40% of the total agricultural work force. Most of the animal farming activities such as fodder collection, feeding, watering, and health care, management, milking and household-level processing, value addition and marketing are performed by women

16.1.4 Livestock are important for their livelihood culture and they have limited alternative opportunities for employment. However, women have little resources to improve animal productivity, to manage risk and buy good quality animals which could respond to inputs for productivity enhancement. At the same time, poverty reduction requires paradigm shifts through which the under-privileged should be enabled to earn better and gradually grow out of subsistence system through application of appropriate technology, skills, market linkages, information and service delivery systems

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16.1.5 Despite their considerable involvement and contribution, significant gender inequalities also exist in access to technologies, credit, information, inputs and services probably because of inequities in ownership of productive assets including land and livestock. The rapidly increasing demand for livestock products creates opportunities for empowerment of women. Harnessing these however would require addressing constraints that women face along the value chain through appropriate policies and institutional arrangements.

16.2 Strategies and Programs for 12th Plan

16.2.1 Major approach and effort should be to enhance women's access to livestock assets as to enable them to avail benefits of various livestock

development programmes and policies. This may include evolving women self-help groups or women livestock producers' association for availing credit for securing livestock and inputs; insurance to manage risk, and inputs and services to improving animal productivity. Procedural requirements to avail policy benefits may be relaxed for women livestock keepers e.g. doing away with collateral requirement in accessing credit; and targets of women participation may be fixed for the implementing agencies. Women may also be provided additional incentives in terms of subsidies on interest rates and insurance premium.

16.2.2 Special programmes should be initiated for developing women entrepreneurship along the livestock value chain including production, processing and marketing as to enable them to face the emerging challenges in production and marketing. Besides, women being closely associated with animal husbandry have a better understanding and knowledge of animal behavior in respect of reproduction, feeding, symptomatic changes in animal health and response to external factors. It is suggested to enhance women's skill in various aspects of animal breeding, health, feed and nutrition, management and marketing. It is also imperative to develop women's entrepreneurship in rearing of quality calves and heifers, progeny testing and make appropriate provisions for marketing of the calves and heifers. Livestock focused institutions and industries such dairy cooperatives and agribusiness and marketing firms should be encouraged to have more of registered women members or suppliers of dairy products. The production systems are highly internalized based mainly on farm and family resources. To boost animal productivity and income of the women there is a need for appropriation of technologies that reduce drudgery to women and improve animal health and nutrition. Improve women's access to services through appropriate training programs/ extension programmes as to enhance their capacity in clean livestock production and livestock management to improve resilience of livestock to climate change. Social entrepreneurship approach needs to be adopted and accredited at village level especially for ecologically fragile areas. Developing common property resources needs more of social

engineering than technical expertise. Based on the assessment of needs of empowering women in ecological fragile environment, there is need for improvement of animals that would ‘niche well’ with the ecologically fragile regions. Besides, there is also a need to correct gender bias in veterinary education, research and service delivery systems as to enhance the effectiveness of women-oriented livestock development programs.

Chapter 17: Livestock Extension

17.1 Present Status and trends

17.1.1 Extension of knowledge, technology and service to the grass root level is of paramount importance for the growth of the sector. However, compared to crop sector, extension services for livestock have so far been a non-starter severely hampering its growth. The sector is still considered as subsidiary to crop sector and the extension format and methodology developed for crop production are considered to take care of the livestock extension needs. This is not true. Both, Central and State Governments have kept extension as a low priority as hardly 1 % of the total budget for the sector is allocated for extension activities.

17.1.2 An NSSO survey revealed that only 5.1% of the farmer households in India were able to access any information on animal husbandry as against 40.4% on crop farming.

17.1.3 In the recent past, however, the livestock sector in India has emerged as an important source of agricultural growth and rural development. The changing production systems, increased role of women and technological advances in breeding, feeding, management and health warrant distinct extension approaches and set-up.

17.1.4 The approach has to be door step delivery of services including AI, immunization, health coverage, credit and market procedures. Emphasis should also be on wider dissemination of information through intensive contact and electronic media.

17.2 Ongoing Programs and Their Analysis

17.2.1 Only one centrally sponsored scheme on “Livestock extension and delivery services” with a budgetary outlay of Rs.15.00 crore was proposed by DAHDF during the 11th Plan period. No expenditure however, has been incurred. This clearly shows the neglect of the livestock extension.

17.3 Strategies and programs for 12th plan

17.3.1 It is essential to accord utmost priority to develop appropriate livestock extension system to fully exploit its potential for agricultural growth and rural development.

17.3.2 A differentiated approach of providing extension and input services would be necessary to address to the various technical, advisory and financial needs of different livestock production systems and species. This would call for building up an exclusive cadre of extension workers with appropriate skills and knowledge.

17.3.3 Special KVKs with emphasis on various livestock activities should be established, albeit in limited districts in each state. These efforts should be complemented with support from para-vets, NGOs and other development organizations. KVKs distinctly created for livestock should support education of farmers and up gradation of skills of the paravets and field guides.

17.3.4 Presently the major activities of ATMA are confined to improving crop production. There is a need to strengthen ATMA with AH experts to coordinate various extension and training activities; the private AI and other workers could be effectively utilized for providing extension services.

17.3.5 The DAHD&F should have special “Extension Cell” with matching official machinery in the states for formulation and implementation of programs.

17.3.6 The shortage of technical manpower for work in the filed should be addressed appropriately.

17.3.7 Public–Private-Partnership (PPP) in extension has to be encouraged. The potential private extension service providers could be identified and made partners in PPP mode for effective management of services.

17.3.8 A major program on livestock extension, delivery of services and women empowerment should be initiated in 12th plan to enhance efficiency of production.

Chapter 18: Human Resource and training needs

18.1 Present status and trends

18.1.1 The veterinary and animal science services is a highly specialized area that involves management and health care of the livestock and poultry, prevention of the diseases, disease diagnosis, meat and food inspection, including milk and milk products, quarantine, animal welfare, feed formulation and testing, dissemination of technologies besides administration and management. Globalization and implementation of world trade agreements (WTA) has increased the scope for export of livestock and hygienically produced livestock products manifolds. Movement of livestock and livestock products across the borders also introduces the risk of trans-boundary infections. Zoonotic diseases and public health issues associated with livestock and livestock products are other concerns. The role of the veterinarian has become multifaceted as a clinician, researcher, and an advisor.

18.1.2 There were 9527 veterinary hospitals/polyclinics, 20,897 veterinary dispensaries, 24482 veterinary aid centres and 67,048 artificial insemination centres offering quality veterinary services to millions of farmers and livestock owners. The human resource requirement and availability in respect of veterinary and animal science to meet research, academic and development need is given below. Against the requirement of 67,000 veterinarians, only 34,500 are available. Similarly, against the requirement of 7500 veterinary and animal science specialists for teaching and research, only 3050 are available. Similarly, availability of para-vets and other supporting staff is only 52,000 against the requirement of 2, 59,000. Shortage of manpower is a major concern. Further, veterinary infrastructure in general is poor, inadequate and need strengthening.

Table 18.1 Human resource (Veterinary & Animal Science) requirement vs availability

Category	Required	Availability	Difference
Field Veterinary institutions, meat and food, drug, inspection, etc.	67,000	34,500	32,500
Teaching and Research	7,500	3,050	4,450
Para-Veterinary (Vet. Pharma., AI Lab.)	2,59,000	52,000	2,07,000

Generated using information and norms from VCI; NCA (1976)

18.1.3 There are 53 veterinary colleges offering undergraduate veterinary education. Many of these colleges are also involved in post-graduation (PG) education. The current status of manpower in veterinary institutions is far from adequate in the context of offering quality veterinary education. Most of the colleges are operating at 50% of the approved strength. In order to support the increased need, it is essential to strengthen the faculty position in existing colleges to produce the required manpower to manage both UG and PG teaching and research responsibilities. The current available strength in the veterinary colleges/institutes including deemed universities offering undergraduate and postgraduate programs is around 3050.

18.1.4 It is essential that deficit in required manpower is addressed in the next 10-15 years, considering that around 1650 veterinary graduates pass out every year, by doubling intake capacity through strengthening existing infrastructure and laboratory facilities should receive priority. Around 20 new veterinary colleges in private sector in next 5 years should be opened with a capacity of 60 students. Twenty institutions among existing ones should be selected as centres of excellence for post-graduate teaching and research and funded for strengthening diagnostic labs, contract faculty and infrastructure.

18.1.5 Veterinary Council of India regulates the Minimum Standards of Veterinary Education at National level. The Postgraduate Veterinary and Animal Science Education is with the Indian Council of Agricultural Research (ICAR). As a part of

the ICAR system, growth of the veterinary/dairy sector education has not been up to the desirable level. Initial experiment with the creation of Veterinary and Animal Science University at Chennai proved to be a successful model. Today, eleven Veterinary Universities in different states have been established and are working successfully. Thus, for further quantum jump in the veterinary education, veterinary colleges/ veterinary universities should receive large funds and special grants to address the issue of shortage of manpower.

18.1.6 Veterinary curriculum is too heavy with theory and little practical training. Students need to be exposed maximally to hands on training and problem based learning. Creation of instructional herds with sufficient number of animals should be mandatory for any Govt. or private college imparting degrees in veterinary Science and Animal Husbandry. Requirements of the feed industry, pharmaceuticals, food processing plants, semen stations, wild life and zoo animals, public health issues, herd health management and reproduction, environment and global warming should be addressed adequately.

18.1.7 Re-training of the veterinarian to brace for the recent developments is paramount. A vet should attend mandatory refresher courses every 5 years during his career.

18.1.8 Para-vet staff is involved in delivery of vaccination, artificial inseminations, and other minor veterinary practices. More Veterinary Polytechnics should be established for awarding two year diploma in each state.

18.1.9 A large project on Developing Human Resource in Veterinary & Animal Sciences which should involve strengthening infrastructure, laboratory facilities, establishing new veterinary colleges, and Veterinary Polytechnics supported with contract manpower should be developed to address the issue of shortage of Vets and Para-vets in a given time frame. As the budget requirement is going to

be very high, both DAHD&F and ICAR should reflect the required funds in their plan budget.

Chapter 19: Restructuring of Schemes and budgetary requirements

19.1 Growth of animal husbandry and dairy sectors during the 12th Plan period, to a considerable extent, would depend on the contours of Central Sector and Centrally Sponsored schemes formulated by DAHDF and their implementation at the state level. For achieving targeted 6 % annual growth rate, it is imperative to address the issues of inclusiveness, environment and export in totality.

19.2 The following aspects were considered while suggesting structure and format of the schemes:

i. Scheme components: funding pattern, financial allocation, expenditure and performance,
ii. State specific requirements that emerged during regional consultations,
iii. Changing scenario of animal husbandry and dairy sectors and
iv. Recommendations of Bhasin Committee (2010) constituted by the Planning Commission.

19.3 The 11th Plan had a total of 29 schemes (21 in Animal Husbandry, 6 in Dairy, 1 under the special package for suicide prone districts, and 1 Externally Aided Project).

19.4 The overall performance of most of schemes has not been to the desired levels. Problems lied with funding pattern, poor flexibility etc. Most of these schemes were stand alone with meager financial outlay. Their implementation across all the States resulted in dilution of the focus.

19.5 The States have their own specific needs and problems but are not able to address them comprehensively due to inadequate financial resources of their own. They have to essentially look forward to the Central assistance. In the present dispensation of the CS and CSS schemes, the States submit the proposals in all the schemes irrespective of their relevance. It would be beneficial

to harness the regional strengths using a regionally differentiated approach for exploiting the potential. Major requirements that emerged are:

i. Improving manpower and infrastructure
ii. Wider and effective immunization for important economic diseases
iii. Focused Pig production in North Eastern and Eastern states
iv. Enhanced green fodder production
v. Adding value to livestock by-products
vi. Strengthening animal husbandry extension network and service delivery at farmers' door step.

19.6 Allocation of funds to DAHDF as a proportion of the overall allocation to agricultural sector has been meager over the last several plan periods in spite of rising contributions of the livestock sector. This is a paradoxical situation wherein the growing sector is not being fully supported. One of the arguments put forth is that the DAHDF and State AH Departments do not have sufficient absorption capacity. This should not dither higher fund allocation to livestock sector. Instead, the states should be supported for strengthening infrastructure and man power for better performance and utilization of funds. The Working Group strongly recommends for substantial enhancement in the financial allocation to DAHDF during the 12th Plan period proportionate to its contribution to agricultural GDP.

19.7 Considering the above points the following recommendations are made for restructuring and reorienting the schemes.

i. All the ongoing schemes recommended for continuation should be classified under three mega schemes; a) Animal production b) Livestock Health, and c) Dairy development.
ii. 'National Dairy Plan' (NDP) should be implemented as a National Project and its activities effectively dovetailed as complementary and supplementary to NPCBB.
iii. The Accelerated Fodder Development Program (AFDP) presently being implemented by the DAC may be enlarged into 'Feed and Fodder Mission

Program' (FFMP) with inclusion of additional components of nutritional enhancement of crop residues, conservation etc. and the whole program implemented by DAHDF in collaboration with DAC and ICAR.

iv. For supporting the state specific needs, it is recommended that a set of time bound schemes may be developed in consultation with the States and implemented through RKVY.

19.8 Considering the lack of performance and further relevance, the following three schemes should be dropped:

i. CS scheme of Central Sheep Breeding Farm
ii. CS scheme of Assistance to dairy cooperatives
iii. CS scheme of Delhi Milk Scheme

19.9 A strong concurrent monitoring and evaluation mechanism may be inbuilt in all the schemes to be implemented in the ensuing plan period. An independent impact evaluation by third party should also be carried out.

19.10 The proposed financial outlay for the above schemes for 12th Plan period is Rs.31,560 crores. The detailed activities of the three schemes are given below.

Recommended budgetary outlay for 12th Plan period

Sector/Schemes	Budgetary outlay (Rs. in crores)
Mega Scheme	
(a) Animal Production	
Cattle and buffalo Breeding	8500.00
Mission on pigs	700.00
Small ruminants, rabbits and broiler buffalo calves	400.00
Poultry development including venture capital fund	600.00
Establishment and modernization of slaughter houses	300.00
Conservation of threatened livestock breeds	200.00
Fodder & feed development	2000.00
Livestock Insurance, census and sample survey	900.00
Livestock extension and delivery of services and women empowerment	200.00
Total	**13800.00**
(b) Livestock health	
Disease Control – Immunization for important diseases, disease surveillance, diagnostic laboratories, veterinary infrastructure, drug control authority, mobile veterinary clinics, traceability & food safety	7000.00
Strengthening infrastructure - Veterinary Education	4000.00
Total	**11000.00**

(c) Dairy Development	
Dairy Development activities (including for Clean Milk Production)	2500.00
National Dairy Plan (NEW)	1760.00
Dairy Venture Capital Fund	2500.00
Total	**6760.00**
Grand Total	**31560.00**

Annexure-I

BY SPEED POST

F.No.Q.12043/1/2010-Agri.
Government of India
Planning Commission
(Agriculture Division)

Yojana Bhavan, Sansad Marg,
New Delhi the 8th March, 2011

OFFICE MEMORANDUM

Subject:- Constitution of the Working Group on Animal Husbandry & Dairying for the Twelfth Five Year Plan (2012-17)-regarding.

It has been decided with the approval of the competent authority to constitute a Working Group as cited above, in the context of formulation of Twelfth Five Year Plan (2012-17) with the following Composition and Terms of References.

Composition

1	Dr. V. K. Taneja , Vice-Chancellor, Guru Angad Dev Veterinary & Animal Science University, GADVASU, Ludhiana-141004(PUNJAB) (M)09914234347;(O)0161-2553320, 2553360;(R)0161-;(FAX)0161-2553340,E-mail: vijay_taneja@hotmail.com, vcgadvasu@gmail.com	**Chairman**
2	Dr. K.M.L. Pathak , DDG (Animal Science), Indian Council of Agriculture Research, Krishi Bhavan, New Delhi-110001(NEW DELHI) (M)9582898988;(O)011-23381119;(R)011-25843814;(FAX)011-23097001,E-mail: pathakklm@yahoo.co.in; ddgas.icar@nic.in	Member
3	Dr. K. M. Bujarbaruah , Vice-Chancellor, Assam Agriculture University, , Jorhat-(ASSAM) (M)09435050050;(O)0376-2340013;(R)0376-2340350, 2310245;(FAX)0376-2340001,E-mail: kmbujarbaruah@rediffmail.com	Member
4	Dr. A. K. Shrivastava , Director, National Dairy Research Institute, , Karnal-132001(HARYANA) (M)094665926610;(O)0184-2252800;(R)0184-2271612;(FAX)0184-2250042,E-mail: dir@ndri.res.in	Member
5	Dr. Dalip K Das, Chief Executive Officer, Paschim Banga Go-Sampad Bikash Sanstha (PBGSBS), 618, 55B, Mirza Ghalib Street, 5th Floor, Kolkata-700016(WEST BENGAL) (M);(O)-;(R)-;(FAX)-,E-mail:	Member
6	Dr. M. C. Sharma , Director, Indian Veterinary Research Institute, , Izatnagar-(Uttar Pradesh) (M);(O)-;(R)-;(FAX)-,E-mail:	Member
7	Dr. B. K. Joshi , Director, National Bureau of Animal Genetic	Member

	Resources, Makrampur Campus, GT Road, Baldi Bye Pass, Karnal-132001(HARYANA) (M)09354115339;(O)0184-2267918;(R)0184-2267518;(FAX)0184-2267654,E-mail: director@nbagr.ernet.in; directornbagr@gmail.com	
8	Dr. K. S. Ramchandra , Expert (Animal Husbandry), National Rain Fed Authority, NARS Complex, Pusa, NEW DELHI-110012(NEW DELHI) (M)9810477171;(O)011-25842961;(R)011-26175897;(FAX)011-25842837,E-mail: koodliramu@yahoo.co.in	Member
9	Director General, Remount Veterinary Services in India, QMG's Branch, Integrated HQ of Mo D (Army), West Block-III, RK Puram, New Delhi-110066(New Delhi) (M)09868860083;(O)011-26103832;(R)011-;(FAX)011-26173113,E-mail: dgrvsihq@yahoo.in	Member
10	Mr. Ravishankar , Sr. Executive, National Dairy Development Board, (NDDB), Anand-388001(GUJARAT) (M)09898008708;(O)02692-;(R)02692-;(FAX)02692-260157,E-mail:	Member
11	Dr. M. M. Roy , Director, Central Arid Zone Research Institute, (CAZRI), Jodhpur-(Rajasthan) (M);(O)0291-2786584;(R)0291-;(FAX)0291-2788706,E-mail:	Member
12	Mr. R. S. Sodhi , MD, Gujarat Cooperative Milk Marketing Federation (GCMMF), , Anand-388001(Gujarat) (M);(O)02692-241623;(R)02692-;(FAX)02692-,E-mail:	Member
13	Dr. K. S. Dangi , Director General (Animal Husbndry), Directorate of Animal Husbandry, Haryana, SCO 80-81/17C, Chandigarh-160017(HARYANA) (M)09876644619;(O)0172-2574662;(R)0172-2576619;(FAX)0172-0,E-mail: dg.ahd@hry.nic.in, dangikrishan@yahoo.co.in	Member
14	Dr. Palanimuthu Thangaraju , Former VC, TANUVAS, 5/14, VOC Street,, Officer's Colony Extension, Mogappair (East), Chennai-600050(TAMIL NADU) (M)09444011997;(O)044-;(R)044-26546997;(FAX)044-,E-mail: ptrajuagb@yahoo.com	Member (Non-Official)
15	Dr. R.C. Chandramohan , Chairman, Hutson Agro Product Ltd, 5-A, Vijayaraghava Road, T. Nagar, Chennai-600017(TAMIL NADU) (M)09840932299;(O)044-28150014;(R)044-;(FAX)044-28152508,E-mail: rgc@hatsun.com	Member (Non-Official)
16	Ms. Anuradha Desai, Chairperson, Venkteshwara Hatcheries, Corporate Office, Venkateshwara House, Sno. 114/A2, Pune Sinhagad Road, Vithalwadi, Pune-411030(Maharashtra) (M)24251530;(O)020-24251531;(R)020-;(FAX)020-24251077,E-mail: response@venkys.com	Member (Non-Official)
17	Dr. S. K. Ranjhan , Director, Hind Agro Industries Ltd., A-1,Okhla Industrial Area Phase-I, New Delhi-110020(Delhi) (M)9811091457;(O)011-26372786;(R)011-;(FAX)011-0,E-mail: sk_ranjhan19@yahoo.in, info@hind.in	Member (Non-Official)

18	Dr. P. R. Patil , Head (Animal Husbandry), Gokul Milk Union, , Kolhapur-416003(Maharashtra) (M)09422427030;(O)0231-2653333, 2655330;(R)0231-2653647;(FAX)0231-2657419,E-mail: drprp@hotmail.com, vet@gokulmilk.coop	Member
19	Mr. Nandalal Uppadhyay , Chairman, Sitajakhola Dugdha Utpadak Samiti, Jagiroad, Morigaon-782410(Assam) (M)0943164697;(O)-;(R)-;(FAX)-,E-mail:	Member (Non-Official)
20	Dr. S. C. Suneja , Former Director, NPRE, DAHDF, C-307, Kendriya Vihar, , Gurgaon-122002(HARYANA) (M)9899113123;(O)0124-;(R)0124-2396003;(FAX)0124-0,E-mail: sunejasc@yahoo.com	Member (Non-Official)
21	Dr. V. V. Sadamate, Adviser (Agri), Planning Commission, Yojana Bhavan, New Delhi-110001(NEW DELHI) (M);(O)011-;(R)011-;(FAX)011-,E-mail:	Member
22	Dr. A. S. Nanda , Animal Husbandry Commissioner, Department of Animal Husbandry & Dairying, Krishi Bhavan, New Delhi-110001(NEW DELHI) (M)9999600703;(O)011-23384146;(R)011-;(FAX)011-23382192,E-mail: asinghnanda@gmail.com	Member
23	Dr. P.S.Birthal, , ACRISAT, , Patancheru-502324 (ANDHRA PRADESH), (M) 09000052052; (O)040-30713071;(R)040-;FAX-040-30713074; Email:psbirthal@yahoo.com	Member
24	Dr. K. R.Rao, Former CGM, NABARD, 402, Sri Krishna Balaji Aptd., Gudimalkapur Road, Mehdipatnam, Hyderabad-500067 (ANDHRA PRADESH), (M) 09573638000; (O)040-23518000;(R)040-23518000;FAX-040-; Email:krao50@gmail.com	Member (Non-official)
25	Dr. N. G.Hegde, Sr. Consultant, BAIF Development Research Foundation, Dr. Mani Bhai Desai Nagar, Warje, Pune-411058 (MAHARASHTRA), (M) 09890181848; (O)020-25231661, 25237663;(R)020-;FAX-020-25231662; Email:nghegde@baif.org.in	Member (Non-official)
26	Dr. Shyam Zawar, Vice President (Cattle R&D), J. K. Trust Gram Vikas Yojana, JK Gram, Thane-400606 (MAHARASHTRA), (M) 09821066911; (O)022-40368621;(R)022-25857378;FAX-022-0; Email:shyam.zawar@raymond.in	Member (Non-official)
27	Dr. KalyanChakravarty, Director, Global Dairy Health Ltd., No2, Aurangzeb Lane,, New Delhi-110011 (Delhi), (M) 9810418007; (O)011-43173400;(R)011-;FAX-011-43173419; Email:kalyan@globaldairyhealth.com	Member (Non-official)
28	Mr.Rajbir Singh Rana,Joint Secretary (Livestock Health),Department of Animal Husbandry & Dairying,Krishi Bhavan,New Delhi-110001-(NEW DELHI),(M)9868704728;(Phone-O)011-23384509;(Phone-R)011-;(FAX)011-0;E-mail:rs.rana9@nic.in	Member-Secretary

2. Terms of Reference (Specific)

2.1 To assess the extent achieved by the programmes/ schemes in meeting their objectives during XII Plan both in terms of physical and financial parameters, and the extent contributed by the states in furthering the process of development of Animal Husbandry & Dairying in terms of financial allocation and deployment of qualified technical manpower.

2.2 To examine the recommendations brought out by the Advisory Committee on Animal Husbandry & Dairying set up by Planning Commission and recommend measures for their implementation beginning XIIth Five Year Plan.

2.3 To rationalize the number of ongoing schemes of DAHDF and modify for improvement in such of those schemes which have a potential of increasing milk, egg and meat production in the country, and also recommend doing away with those schemes which have made no significant impact so far.

2.4 To examine the contours of NDP and recommend implementation of NDP with relevant restructured schemes of the Department of Animal Husbandry & Dairying.

2.5 To address the constraints faced by Animal Husbandry & Dairying in terms of inputs, technology, disease control, basic infrastructure and marketing.

2.6 To recommend measures to strengthen and ensure production of quality drugs, vaccine, feed and nutrition supplements both by the Government and private sector and work out a strategy to make these inputs easily available to a farmer.

2.7 To assess likely impact on Animal Husbandry & Dairying sector due to climate change, prepare a road map for AHD sector for the next decade and recommend measures to be adopted by farmer in order to counter any likely adverse effect due to the projected climate change.

2.8 To review the efficacy of the ongoing delivery mechanism in dissemination of technology and in providing relevant information to the farmer taking into cognizance presence of organizations like ICAR, SAU's, ATMA, KVK and other research organizations, and to recommend improved model of extension by taking into consideration new methods like *Mahotsav* and use of IT.

2.9 To recommend measures for the development of piggery in the North-East and other potential areas in the country.

2.10 To review the ongoing scheme on Conservation of Threatened breed in the country and recommend measures to make the scheme more broad based and effective taking cognizance of the recommendations of the Workshop on Threatened breeds organized by Planning Commission.

2.11 To suggest strategies for development of small ruminants to benefit small and marginal and landless livestock farmers.

3. Terms of Reference (General)

3.1 The Chairman of the Working Group may co-opt any other official/ Non-official expert/representative of any organization as a member (s) required.

3.2 The Working Group may also examine and addressed any other issues which are important but not specifically spelt out in the TOR's. The Working Group may devise its own producers for conducting its business/meetings/ Field Visits constitution of Sub-Groups etc.

3.3 The expenditure of the members on TA/DA in connection with the meeting of the Working Group or any work incidental to the functions of the Working Group/ Sub-Groups will be borne by the parent Department/Ministry/Organization for official members and by the Planning Commission for Non-official members as per entitlement of Class-I Officer of Government of India.

3.4 The Working Group will submit its draft report to the Planning Commission by June, 2011 and final one in September, 2011.

3.5 Dr. Chandra Shekhar Sahukar, Dy. Adviser (AH), Planning Commission, Room No. 320, Yojana Bhavan, New Delhi-110001 Phone(O)011-23096731, FAX:011-23096779,23096764, E-mail: wgahd12plan@email.com will be the nodal officer of this group and any further query/correspondence in this regards made with him.

UNDER SECRETARY TO THE GOVERNMENT OF INDIA

Annexure-II

BY SPEED POST/e-MAIL

F.No.Q.12043/1/2010-Agri.
Government of India
Planning Commission
(Agriculture Division)

Yojana Bhavan, Sansad Marg,
New Delhi the 23rd May, 2011

OFFICE MEMORANDUM

Subject:- Constitution of the Working Group on Animal Husbandry & Dairying for the Twelfth Five Year Plan (2012-17)-Constitution of Sub-Groups-regarding.

In Continuation of OM of even Numbers dated 8th March, 2011, 8th April, 2011 and 15th April, 2011, It has been decided with the approval of the competent authority to constitute 12 Sub-Groups of WG on Animal Husbandry and Dairying as cited above, in the context of formulation of Twelfth Five Year Plan (2012-17) with the following Composition and Terms of References.

1. Sub-Group on National Dairy Plan

1	Dr.A. S.Nanda,Animal Husbandry Commissioner,Department of Animal Husbandry & Dairying,Krishi Bhavan,New Delhi-110001-(NEW DELHI),(M)9999600703;(Phone-O)011-23384146;(Phone-R)011-;(FAX)011- 23382192;E-mail:asinghnanda@gmail.com	**Convener**
2	Dr.K.S.Dangi,Director General,,,Chandigarh-Haryana),(M);(Phone-O)-;(Phone- R)-;(FAX)-;E-mail:dg.ahd@hry.nic.in, dangikrishan@yahoo.co.in	Member
3	Dr.K. S.Ramchandra,Expert (Animal Husbandry),National Rain Fed Authority,NARS Complex, Pusa,NEW DELHI-110012-(NEW DELHI),(M)9810477171;(Phone-O)011-25842961;(Phone-R)011-26175897;(FAX)011-25842837;E-mail:koodliramu@yahoo.co.in	Member
4	Dr.AvtarSingh,Pr. Scientist,Dairy Cattle Breeding Division,NDRI,Karnal-132001- HARYANA), (M)09416988988; (Phone-O)0184-2259103; (Phone-R)0184- 2258132; (FAX)0184-2250042;E- mail:avtar54@gmail.com	Member
5	Mr.Ravishankar,Sr. Executive,National Dairy Development Board,(NDDB),Anand-388001-(GUJARAT),(M)09898008708; (Phone-O)02692-;(Phone-R)02692-;(FAX)02692-260157; E-mail:rs@nddb.coop	Member
6	N. Ramachandran Unnithan, Former, MD (KLDB), D1-Krishna Nagar, Ulloor, , Thiruvananthapuram-695004(Kerala), Mobile:09447454845 Phone-O: 0471-;Phone-R:0471-2553960; FAX:0471-: E-mail:unnithan_nr@yahoo.com, neehuraj@asianetindia.com	Member (Non official)

TOR: (i) To examine the contours of NDP and recommend implementation of NDP with relevant restructured schemes of the Department of Animal Husbandry & Dairying.
(ii) To critically examine the performance of National Project for Cattle and Buffalo Breeding especially the scarcity of quality bulls and evolve integrated program for production of highly pedigreed and progeny tested breeding bulls including sexed semen.

2. Sub-Group on Rationalization of existing and development of new schemes in Animal Husbandry and Dairying.

1	Dr.V. K.Taneja,Vice-Chancellor,Guru Angad Dev Veterinary & Animal Science University,GADVASU, Ludhiana-141004-(PUNJAB),(M)09914234347; (Phone-O)0161-2553320, 2553360; (Phone-R)0161-;(FAX)0161-2553340; Email:vijay_taneja@hotmail.com, vcgadvasu@gmail.com	**Convener**
2	Dr.A. S.Nanda,Animal Husbandry Commissioner,Department of Animal Husbandry & Dairying,Krishi Bhavan,New Delhi-110001-(NEW DELHI),(M)9999600703; (Phone-O)011-23384146;(Phone-R)011-;(FAX)011-23382192;E-mail:asinghnanda@gmail.com	Member
3	Mr.Rajbir SinghRana,Joint Secretary (Livestock Health),Department of Animal Husbandry & Dairying, Krishi Bhavan,New Delhi-110001-(NEW DELHI),(M)9868704728;(Phone-O)011-23384509;(Phone-R)011-;(FAX)011-0; Email:rs.rana9@nic.in	Member
4	Dr.K. S.Ramchandra,Expert (Animal Husbandry),National Rain Fed Authority, NARS Complex, Pusa,NEW DELHI-110012-(NEW DELHI),(M)9810477171;(Phone-O)011-25842961;(Phone-R)011- 26175897;(FAX)011-25842837;E-mail:koodliramu@yahoo.co.in	Member
5	Dr. A.B.Negi, Joint Commissioner (LH),Department of Animal Husbandry,Dairying & Fisheries, Ministry of Agriculture ,Govt. of India, New Delhi –110001. Ph: 011-23384190; 09818002564 (M)	Member
6	Dr.P.S.Birthal,,ACRISAT,,Patancheru-502324-(ANDHRA PRADESH),(M)09000052052;(Phone-O)040-30713071;(Phone-R)040- ;(FAX) 040-	Member

	30713074; E-mail:psbirthal@yahoo.com	

TOR : (i) To assess the extent achieved by the programs/ schemes in meeting their objectives during XI Plan both in terms of physical and financial parameters, and the extent contributed by the states in furthering the process of development of Animal Husbandry & Dairying in terms of financial allocation and development of qualified technical manpower.
(ii) To rationalize the number of ongoing schemes of DAHDF and modify for improvement in such of those schemes which have a potential of increasing milk, egg and meat production in the country, and also recommend doing away with those schemes which have made no significant impact so far.
(iii) To assess the role of private institution in the delivery of veterinary and animal husbandry services.
(iv) To examine the recommendations brought out by the Advisory Committee on Animal Husbandry & Dairying set up by Planning Commission and recommend measures for their implementation beginning XIIth Five Year Plan.

3. Sub Group on Animal Husbandry Extension

1	Dr.N. G.Hegde,Sr. Consultant,BAIF Development Research Foundation,Dr. Mani Bhai Desai Nagar, Warje,Pune-411058- (MAHARASHTRA), (M)09890181848;(Phone-O)020-25231661, 25237663;(Phone-R)020-;(FAX)020-25231662;E-mail:nghegde@baif.org.in	**Convener**
2	Dr.O.S.Parmar,Retd. Director Extension,Guru & Dev Veterinary & Animal Science University, 09814330319; E-mail: osparmar319b@yahoo.co.in	Member **(nonofficial)**
3	Dr. (Mrs.)JancyGupta,,NDRI,,Karnal--(),(M);(Phone-O)-;(Phone-R)-;(FAX)-;E-mail:	Member
4	Dr.K.S.Risim,Director,Extension Education, SKU&T,Jammu; Ph: 0191-2262028; 09419210023 (M); 0191-2262029 (Fax)	Member**(nonofficial)**
5	Dr.P.R.Patil,Head,Animal Husbandry,Gokul Milk Union,Kolhapur--(),(M)09422427030; (Phone-O)0231-2653333, 2655330;(Phone-R)0231-2653647;(FAX)0231-0;E-mail:drprp@hotmail.com, vet@gokulmilk.coop	Member **(nonofficial)**
6	Mr.V. PadmakumarVarijaksha Panicker,Senior Programme Manager,International Livestock Research Institute,CG Centres' Block B, National Agricultural Science Centre, Dev Prakash Shastri Marg,New Delhi- 110012-(),(M);(Phone-O) 011-25609844;(Phone-R)011-;(FAX)011-;E-mail:	Member

7	Dr.A. J. Kachhiapatel, Director, Directorate of Animal Husbandry, B-Block, Krishi Bhavan, Sector-10A, Gandhinagar-(GUJARAT), Mobile:09978405251 Phone-O: 079-23256190;Phone-R:079-23256141; FAX:079-23256142: E-mail:dir-anml@gujarat.gov.in, dr_kachhia@yahoo.com	Member
8	Mr.G. S. Sandhu, Financial Commissioner, Animal Husbandry, Government of Punjab, Secretariat, Chandigarh-(PUNJAB),Mobile:09815616523 Phone-O:0172-2740190;Phone-R:0172-546753;FAX:0172-0:E-mail:fcahpunjab@gmail.com, gssandhu@gmail.com	Member
9	Dr. Rajendra Singh, Professor, Animal Science, Krishi Vigyan Kendra, Rohtak-(HARYANA), Mobile:09416495904 Phone-O: 01262-;Phone-R:01262-; FAX:01262-274431: E-mail:	Non official

TOR : (i) To address the constraints faced by Animal Husbandry & Dairying in terms of inputs, technology, basic infrastructure and work out strategies to make these available to farmers.

(ii) To review the efficacy of the ongoing delivery mechanism in dissemination of technology and in providing relevant information to the farmer taking into cognizance presence of organizations like ICAR, SAU's, ATMA, KVK and other research organizations, and to recommend improved model of extension by taking into consideration new methods like Mahotsav and use of IT.

4. Sub-Group on Animal Health and Climate Change

1	Dr.M.C.Sharma,Director,Indian Veterinary Research Institute,,Izatnagar--(Uttar Pradesh), (M)09837118752; (Phone-O)-;(Phone-R)-;(FAX)-;Email: directorivri@gmail.com	**Convener**
2	The Director General, Remount Veterinary Services in India, QMG's Branch, Integrated HQ of MoD (Army), West Block-II, R.K. Puram, New Delhi – 110 066 Ph. 011-26103832, FAX 011-26173113, e-mail:dgrvsinq	Member
3	Dr. S.C. Suneja, Former Director, NPRE, C-307, Kendriya Vihar, Sector – 56, Gurgaon – 122 011 (Haryana) Ph. 01242396003, Mobile:09899113123, e-mail: sunejasc@yahoo.com	Member
4	Dr. P.K. Shukla, Joint Commissioner (P), Department	Member

	of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture, Government of India, Krishi Bhawan, NEW DELHI – 110 114 Ph. 011-23386035 (O) Mobile: 09897303876, e-mail jcpoul@nic.in pksmathura@yahoo.co.in	
5	Dr. S. Prathabhan, Professor of Medicine & Director, Clinic, Madras Veterinary College, TANUVAS, Chennai – 600 007 (TAMIL NADU) Ph.No.044-25550360 (F) 09381013014 (M) E.mail:drpratha@yahoo.co.uk	Member **(nonofficial)**
6	Dr. V.P. Singh, Joint Director (Academic), Indian Veterinary Research Institute Izatnagar-243122, U.P.Ph.0581 -2302179 (Telefax) Mobile: 09412738300 E-mail:jda@ivri.res.in	Member

TOR : (i) To recommend measures to strengthen and ensure production of quality drugs, vaccine, feed and nutrition supplements both by the Government and private sector.
(ii) To examine the present status of disease control programs and suggest strategies for control/eradication using concept of zoning.
(iii) To suggest measures for installing bio-security and quality assurance system for laboratories and animal quarantine.
(iv) To assess likely impact on Animal Husbandry & Dairying sector due to climate change, prepare a road map for the next decade and recommend measures to be adopted by farmers to counter any likely adverse effect due to the projected climate change.

5. Sub-Group on Human Resource, Technology and Training needs

1	Dr.PalanimuthuThangaraju,Former VC, TANUVAS,5/14, VOC Street,,Officer's Colony Extension, Mogappair (East),Chennai-600050-(TAMILNADU),(M)09444011997; (Phone-O)044-;(Phone-R)044-26546997;(FAX)044-;Email: ptrajuagb@yahoo.com	**Convener (nonofficial)**
2	Dr.M.V.Reddy,Director of Animal Husbandry, Hyderabad, Andhra Pradesh- Phone (o) 040 23391335,Mobile No:o9989998049.E mail: dirahd@yahoo.com	Member **(nonofficial)**
3	Dr.A.Samad,Director of instruction & research,Faculty of Veterinary Sci, MAFSU,Seminary Hills,Nagpur-440006; Phone(o) 0712 2511282, MobileNo:09969371999, E Mail: vetsamad@yahoo.com	Member **(nonofficial)**
4	Dr.J.V.Solanki,Dean,College of Veterinary and	Member

	Animal Husbandry Anand Agricultural Universty, Anand-388001 Phone (o): 02692 261486n Mobil No: 09998009970 E Mail: jvsolanki@aau.in	**(nonofficial)**
5	Dr. Sushil Prabhakar, Prof. & Head, Deptt. of Teaching Veterinary Clinical Complex, Guru Angad Dev Veterinary & Animal Scs. University,Ludhiana Ph: 0161-2414007, 2406367 (O), 0161-4622976 (R), 08146296100 (M), 0161-2400822 (fax); E-mail: sp1962@yahoo.com	Member **(nonofficial)**
6	Dr.John Kirubaharan,Professor of Vet.Microbilogy, Madras Veterinary College,Vepery,Chennai-600007, Phone(o) o44 25381506-o9,Mobile: 09 840278491; E Mail: jjohnk@gmail.com	Member **(nonofficial)**

TOR : To examine the requirement of human resource, technologies and training needs to support livestock sector.

6. Sub-Group on Small ruminants, pigs, yak, mithun and camel

1	1 Dr.K. M.Bujarbaruah,Vice-Chancellor,Assam Agriculture University,,Jorhat-- (ASSAM),(M) 09435050050; (Phone-O)0376-2340013;(Phone-R)0376-2340350, 2310245;(FAX) 0376-2340001;E-mail:kmbujarbaruah@rediffmail.com	**Convener (non-official)**
2	Dr.K.K.Baruah,Director,NRC Yak,Dirang,Dirang-790101-(ARUNACHAL PRADESH),(M); (Phone-O)03780-242259, 200075;(Phone-R)03780-242205;(FAX)03780-242273; E- mail:yak.dicrector @mailcity.com, yakdirector@gmail.com	Member **(non-official)**
3	Dr.C.Rajkhowa,Director,NRC Mithun,Jharnapani, Medziphema-797106- (NAGALAND), (M);(Phone-O)03862-247341;(Phone-R)03862-247340;(FAX) 03862-247341;E-mail:rajkhowac@ gmail.com, nrcmithun@lycos.com	Member
4	Dr.C.Prasad,ADG (ANP),ICAR,Krishi Bhavan,New Delhi-110001-(Delhi),(M)9582898977; (Phone-O)011-23388808;(Phone-R)011- 25831152; (FAX)011-;E-mail:mala_pras@yahoo.com, cadaba_prasad@yahoo.co.in	Member
5	Dr.A.Batobayal,JC,DAHD&F,Krishi Bhavan,New Delhi-110001-(Delhi),(M);(Phone-O) 011-23389620;(Phone-R)011-;(FAX)011-0;Email: jclp@nic.in	Member

6	Dr.A.Das,Director,NRC Pig,Rani,Guwahati-781131-(ASSAM),(M);(Phone-O)0361-2847195;(Phone-R)0361-;(FAX)0361-2847195;Email:anubrata_das@rediffmail.com	Member

TOR : (i) To recommend measures for development of piggery, yak and mithun in the North-East and other potential areas in the country.
(ii) To suggest strategies for development of small ruminants to benefit small and marginal and landless livestock farmers.
(iii) To identify areas/zones with potential for organic animal husbandry and to suggest / approach and programs for organic farming.

7. Sub-group on Poultry

1	Dr Harpal Singh, (Industry representative)Email: drharpals@yahoo.com Mailing Address: Dr Harpal singh, Street No. 13 H.No. 233, Satya Sai Enclave Military Farm Road , Old Bowenpally, Secunderabad 500 009, Andhra Pradesh Mobile: 919849212265	**Convener (Non-official)**
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3	Dr R Chatterjee , Director PDP, Hyderabad (Acting) Email: mcchat@rediffmail.com Mobile : 09652052462	Member
4	Dr R P Singh, Director, CARI, Email: singhreps02 @rediffmail.com, Mobile : 09411881280	Member
5	Dr. G. S. Brah, Director, Animal Biotechnology, Guru Angad Dev Veterinary & Animal Scs. University, Ludhiana. Ph: 0161-2561931 (R) 098725-94571(M); E-mail: gsbrah@yahoo.co.in	Member **(Non-official)**

TOR: To suggest strategies for development of poultry both commercial and rural.

8. Sub-Group on Conservation of Animal Genetic Resources

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6	Mr.P.K.Vij,Principal Scientist,National Bureau of Animal Genetic Resources,,Karnal-132001-(),(M)09416086999;(Phone-O)-;(Phone-R)-;(FAX)-;E-mail:	Member

TOR : To review the ongoing scheme on Conservation of Threatened breed in the country and recommend measures to make the scheme more broad based and effective taking cognizance of the recommendations of the Workshop on Threatened breeds organized by Planning Commission.

9. Sub-group on Finance, Credit input, and Insurance

1	Dr.K. R.Rao,Former CGM, NABARD,402, Sri Krishna Balaji Aptd.,Gudimalkapur Road, Mehdipatnam,Hyderabad-500067-(ANDHRA PRADESH),(M)09573638000;(Phone-O)040-23518000;(Phone-R)040- 23518000; (FAX)040-;E-mail:krao50@gmail.com	**Convener (non-official)**
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7	Dr.SmitaSirohi,Principal Scientist,National Dairy Research Institute,,Karnal-132001-(HARYANA),(M);(Phone-O)-;(Phone-R)-;(FAX)-;E-mail:	Member

TOR : (i) To suggest ways and means for augmenting resource generation and fund flow to development of this sector.
(ii) To assess the present role of different financial institutions like NABARD, NCDC, Public Sector and Cooperative banks etc. in this sector and suggest modes for their direct involvement.
(iii) To review the ongoing program of livestock insurance of Government of India and States and suggest measures for making it more effective and increase its average.

10. Sub-group on Processing, Value Addition and Marketing of Milk and Milk products.

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TOR : (i) To suggest measures for technological development for value addition of milk and milk products and modernization of dairy sector.
(ii) To suggest structuring of unorganized milk sector into formal dairy sector to get benefits of R&D and modern management technology.
(iii) To suggest measures for attracting increased private sector investment in the dairy sector.
(iv) To suggest measures required for improving quality and food safety standards and assess requirement of human resource development.

11.Sub-Group Production, Processing, Abattoirs and marketing of meat

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TOR : (i) To critically examine the constraints affecting development of organized meat sector,

(ii) To suggest schemes for modernization of meat industry, establishment of modern abattoirs and promoting meat export.

(iv) To suggest structural development of meat sector with forward and backward linkages and introduction of newer management technologies for enhancing meat production.

12. Sub-Group on Feed & fodder

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TOR : (i) To assess requirement of feed and fodder against availability and suggest programs for optimization of feed resources.
(ii) To suggest programs for production of quality seeds with respect to cultivated fodder varieties as well as grasses.
(iii) To suggest means for improving availability of fodder through conservation programs and to propagate conservation packages.
(iv) To suggest means for development and management of pastures and grasslands through involvement of communities.

Sub-Group – Drafting Committee

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