



GOVERNMENT OF RAJASTHAN

**STATE
LIVESTOCK DEVELOPMENT POLICY**

**DEPARTMENT OF ANIMAL HUSBANDRY
JAIPUR**

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ABBREVIATIONS

AHD	Animal Husbandry Department
AI	Artificial Insemination
ASCAD	Assistance to State for Control of Animal Disease
ATMA	Agricultural Technology Management Agency
BQ	Black Quarter
CPR	Common Property Resources
CSS	Centrally Sponsored Schemes
DFZs	Disease Free Zones
ESWS	Economically and socially weaker sections
ET	Enterotoxaemia
FMD	Foot and Mouth Disease
GOI	Government of India
GOR	Government of Rajasthan
HS	Hemorrhagic Septicemia
ICAR	Indian Council of Agricultural Research
KVK	Krishi Vigyan Kendra (Farm Science Center)
LN2	Liquid Nitrogen
NIAM	National Institute of Agricultural Extension Management
MIS	Management Information System
NABARD	National Bank of Agriculture and Rural Development
NDRI	National Dairy Research Institution
NGO	Non-government Organization
NPCBB	National Project on Cattle and Buffalo Breeding
PCICDA Act	Prevention and Control of Infectious and Contagious Diseases of Animals Act, 2009
PPP	Public Private Partnership
PPR	Paste des petites ruminants
PVK	Pashu Vigyan Kendra (Animal Science Center)
R&D	Research and Development
RKVY	Rastriya Krishi Vikas Yojana
SEZ	Special Economic Zone
SPF	Special Pathogen Free
SPS	Sanitary and Phyto-Sanitary
SVO	Senior Veterinary Officers
VCI	Veterinary Council of India
VLW	Village Level Workers
VO	Veterinary Officers

1. Need & Scope of the Policy

Affirming the fact about the Livestock sector's importance in the State as an engine of social & economic growth, especially in the rural area, a fresh initiative in terms of policy framework is required for the following reasons:

- 1.1 The sector falls under the purview of the State, therefore its development is needed to be taken care of by the State itself with the assistance & direction of the GOI;
- 1.2 More than 80% rural families keep livestock in their households. Contribution of animal husbandry sector to the GDP of the State has been estimated to be around 9.16 %. About 35% of the income to small and marginal farmers comes from dairy and animal husbandry. In arid areas the contribution is as high as 50%. The sector has potential to create employment in rural areas with least investments as compared to other sectors. In the light of the potential, contribution and role of the sector in the State, a policy needs to be followed for desired growth of the livestock sector;
- 1.3 The policy is also required to cater future demands of the livestock products, particularly, milk, meat ,wool and eggs;
- 1.4 The policy is required to promote private livestock farms;
- 1.5 Planned growth of the sector can prove as a potent tool of sustainable economic & social development of rural households, as the livestock ownership is more equitably distributed than agriculture;
- 1.6 To meet the challenges of Globalization & to avail the opportunities available for the growth of the sector, a planned approach is required;
- 1.7 Policy required to cater to the needs of certain important sub-sectors, viz., small ruminants, horses, camels, poultry, fisheries etc.;
- 1.8 Due to different socio-economic, geographic and agro climatic conditions present in the State, specific approaches for growth of the sector might be required.
- 1.9 The State faces frequent droughts/ famine, which results in crop failure, because most of agriculture is rain fed. Dairy sector provides sustainable year-round income to large number of farmers and livestock sector is principal source for socio- economic and nutritional needs of rural masses.

1.10 The State is the second highest in milk production in the country. Gujrat is the fifth highest. Despite wide gap in production Gujrat is far ahead in dairy sector. Procurement in cooperative sector in Gujrat is 84 lac kgs. of milk per day as compared to procurement of 17 lac kgs per day in Rajasthan. The State has, therefore, immense potential of growth in the dairy sector for the benefit of its farmers.

2. Vision:

The Policy envisages strengthening of the animal husbandry sector in order to enhance production, productivity, livelihood of the poor and self-reliance of underprivileged sections of the rural society through sustainable development of the sector. The vision encompasses:

- 2.1. Holistic growth of livestock sector in terms of production, product processing, marketing, quality & services, so that income and employment opportunities from livestock are enhanced with resultant food and nutritional security of the large masses;
- 2.2. The dairy sector aims to procure and market 50 lac kgs. of milk per day by the year 2020.
- 2.3. Conservation and improvement of the indigenous germ plasm of livestock and poultry in order to protect bio-diversity of the State and make their holdings sustainable;
- 2.4. Modernization of the sector through technological, institutional and policy interventions with due consideration to the social, cultural and traditional ethos;
- 2.5. Empowerment of ESWS families, especially women, by improving their household income through improved animal husbandry.

3. Objectives:

- 3.1 Economic & social development and gender equity.
- 3.2 To enhance animal protein availability to fulfill the nutritional requirement.
- 3.3 To ensure equitable, sustainable and balanced development of the sector.
- 3.4 To provide an enabling environment for the growth & development of the livestock sector by providing quality services and inputs.
- 3.5 To promote proper and efficient utilization of livestock, livestock draught power, livestock products & byproducts.

- 3.6 To conserve the bio-diversity through conservation & improvement of the indigenous Livestock.
- 3.7 To augment feed & fodder resources and capacity for manufacturing of balanced cattle feed, bye-pass protein feed and area specific mineral mixture.
- 3.8 To develop a proper system for control & eradication of major diseases for optimizing livestock production. Control of zoonotic diseases & pests will be accorded priority due to public health importance.
- 3.9 To strengthen education & research and remodel it to meet new challenges.
- 3.10 To provide logistic support to the farmers for protection of livestock during natural calamities. Support for migratory animals / Pastoralists shall be provided by developing a plan on long term basis.
- 3.11 Provision of Insurance and support for replacement of livestock and compensation of losses.
- 3.12 To develop organic livestock production system.
- 3.13 To enhance banking support to the sector.

4. Strengths of Animal Husbandry Sector in Rajasthan

Rajasthan is now the largest State of the country with geographical area of 3.42 lac sq. km. About 55% of the total area of the State is under Thar Desert. Animal husbandry comes to the rescue as a measure to alleviate effects of frequent droughts and has proved to be a saviour by providing sustainable year-round income to the farmers.

The sector provides:

- consistent growth rate of over 6% per annum,
- round the year employment opportunity with more than 50% of total house hold income in arid region as against national average of 22.5%,
- highly equitable distribution,
- an adaptive and technologically simple vocation.

Strengths of the sector in the State are:

- PPP in veterinary education-First State to have veterinary colleges and Para-vet institutions in private sector,
- Ranks 1st in the country to produce around 3000 Veterinarians and Para-vets per annum.
- Produces 10% milk, 35% wool and 10% meat of the country,

- Ranks 1st in wool production,
- Ranks 1st in sale of live meat animals (goat, sheep & buffalo) to the tune of about 40,000 heads per day,
- Ranks 1st in producing around 12% of its milk from goats,
- Ranks 1st in producing more than 93% of cow milk from indigenous cows,
- Ranks 2nd in total milk produced from indigenous cows,
- Ranks 2nd in per capita availability of milk ,
- Ranks 2nd in milk production in the country,
- Ranks 14th in egg production,
- Women empowering as livestock is predominantly managed by them,
- More than 80% rural households keep animals which continue to provide subsistence income during scarcity,
- Labor intensive vocation and therefore, a major source of Rural self employment.

5. Constraints:

a. Unorganized sector

- Holdings are very small.
- Predominantly owned by ESWS.
- Inadequate investment by State/ private sector.
- Inadequate extension activity.
- Animal Husbandry for livelihood.
- Unorganized markets

b. Inadequate availability of Good Germ Plasm

- Large number of non-descript bulls.
- Large number of low producing Cattle & Buffalo
- Large number of Infertile Animals.
- Low A. I. Coverage.
- Free grazing
- Inadequate door-step delivery of services.
- Low conception rate
- Trust on natural service.
- Long dry periods/ late maturity.

c. Health, Nutrition & Natural calamities

- Low veterinary health coverage
- Inadequate fodder & feed resources
- Natural Calamities- Frequent severe droughts

d. Inadequate infrastructure

- At present the cooperative sector has installed capacity of handling 15.5 lac kgs. per day of milk and 60 MT per day capacity of powder manufacturing. In order to realize the aim of procurement, processing and marketing of 50 lac kgs. of milk per day by the year 2020, adequate investment in infrastructure shall be required.
- The milk yield of cattle & buffalo is less in Rajasthan and Cattle feed is an important input in improving the yield. The present capacity of 600 MT per day of cattle feed in co-operative sector is far below the requirement which needs to be increased manifold to bridge the nutritional gap for achieving the higher levels of production of milk planned.

6. Guiding principles of the Policy:

- 6.1 **Pro-poor, pro-women and pro-youth face:** Rajasthan livestock policy has a pro-poor, pro-women and pro-youth focus for attaining enhanced growth to generate more house hold income, increased production and induction of new technologies to meet future demands of livestock products.
- 6.2 **New employment opportunities:** The policy shall generate new employment opportunities both in public and private sector. There shall be substantial increase in self-employment amongst rural youth by making the sector more remunerative. The policy aims at strengthening of Animal Husbandry related formal, non-formal and vocational education programmes to educate rural youth including women.
- 6.3 **Establishing effective linkages:** The Government shall develop a working mechanism to establish effective linkages among experts, scientists, State departmental authorities, industries, NGOs, Cooperatives,

farmers, livestock owners, farmwomen, unemployed rural youth, banks, insurance etc.

6.4 **Use of innovative mechanisms:** For effective implementation of this policy, the Government shall utilize the following innovative mechanisms:

- i. New Veterinary University shall be helpful in developing the sector through:
 - Setting up of Research organization for further research in problem areas;
 - Setting up of Extension organization to expand and coordinate extension activities in the State;
- ii. KVKs and Pashu Vigyan Kendra to be opened under The Veterinary University for identification of area specific problems and refer to the research organization for providing solutions.
- iii. Expertise available within the State to facilitate faster growth of the sector.

6.5 **Research & Development:** R & D programmes in various specialized subjects/ topics will be encouraged through veterinary university, other Governmental and Non Governmental organizations. Effort will be made to find out appropriate solutions for emerging problems relating to diseases, breed improvement, management, extension and marketing.

6.6 **Mobilization of additional Resources:** Ongoing programmes of GOI and State Government will be sourced to fund the schemes / activities to be undertaken in pursuance of various thrust areas of the policy. NABARD, co-operatives and other financial institutions will also be approached for providing funds for the new activities and schemes.

6.7 **Restructuring and revising ongoing programmes:** The Government shall review ongoing programmes, in order to restructure them in accordance with the objectives of this policy.

6.8 **Impact assessment:**

The Government shall form a task force for regular assessment of implementation of this policy to periodically suggest the GOR for taking appropriate steps to achieve the envisaged targets and objectives. The

Government shall get the impact evaluation for selected programmes as may be required.

6.9 Formation of breed wise societies of breeders for focused development in the home tracts.

6.10 To synchronize all activities/ components of the livestock sector in Mission mode to enhance investment in the sector through innovative approaches.

7. THRUST AREAS OF THE POLICY

Following thrust areas have been identified:

7.1 Capacity building through:

a. Programmes:

- i. New programmes for increasing livestock production shall be formulated to ensure increased income, balanced family diets and employment generation in rural and peri-urban areas.
- ii. Programmes shall be formulated to enhance contribution of livestock sector to reduce poverty and benefit women and underprivileged sections. With technical, material and knowledge support, the poor shall be empowered to bring about positive changes in their livelihood.

b. Infrastructure Development:

- i. The Government shall strengthen the existing infrastructure of Veterinary institutions, laboratories, B.P lab, diagnostic centers, education & training, animal and poultry farms etc...

c. Services:

- i. The Government shall re-organize delivery system of input services like treatment facilities, AI centers, diagnostic laboratories, mobile services, camps etc...
- ii. Promote and support participatory bodies such as Self Help Groups, Producers Cooperatives, Breeding associations, Village Committees, Voluntary organizations etc., with emphasis on women participation through whom extension support, knowledge, technologies, skills including inputs can be made accessible.

7.2 Doubling the livestock production by 2020: Overall direction of the policy is to enhance livestock production at the rate of at least 6 % per

annum, which shall provide socio-economic benefits to all farmers having animal component in their farming systems. This policy shall particularly benefit more than 70% of those ESWs families, which draw major part of household income from livestock, poultry and fishery. Following initiatives will be taken:

- a. Risk reduction in livestock production by offering technology options for enhanced production and income.
- b. Develop a cadre of trained Para-vets as village level workers, who can assist and further train livestock producers in adoption of new technologies, advanced husbandry practices, identification of diseases, their causes of spread and preventive measures to enable them to shed superstitions and participate in disease control and other government programs so that production of milk and meat is enhanced as targeted.
- c. Launch a special drive to drastically reduce cases of anoestrus, infertility, repeat breeding and other reproductive problems in cattle and buffaloes as it is estimated that at least 50% of breedable cows and buffaloes have a break in regularity of their reproductive cycle, leading to delayed resumption or loss of production of milk on account of these.
- d. Have a realistic picture of factors responsible for reproductive problems through area specific surveys. Suggested measures shall be applied accordingly to ensure rapid restoration of reproduction.



7.3 Area and Species specific development programmes:

7.3.1 Area specific approaches:

Initiate programme for development of various models of livestock production systems, improved feeding practices through managerial interventions for effective utilization of feed & fodder, integrate traditional & modern approaches and technologies for each district for better sustainability and higher income generation.

7.3.2 Species specific approaches:

Encouraging specialized breeders amongst the progressive farmers for commercial breeding. Species wise programmes shall be formulated and implemented.

7.4 Ecological sustainability:

To conserve the ecology and environment it is essential to conserve the native breeds and flora and fauna. It is also essential to support technologies to control pollution and have healthy and hygienic livestock production with focus on promotion of organic livestock production.

Create awareness among the livestock producers about the impact of livestock on environment.

7.5 Quality services and inputs:

7.5.1 Stimulating and supporting organizations: Commercial poultry sector with initial support from the government is fast growing under the private sector. The Government shall formulate programmes for policy support to catalyze further growth. The policy shall encourage agro-processors and poultry farmers to expand production/ processing facilities through incentives

7.5.2 Industrialization:

Promote agro-industries in the field of livestock products through development of livestock farms and product based industries and processing units and also establishment of Agriculture Export Zone (s) and Special Agriculture Zone (s) for production of quality livestock products and their export and marketing.

7.5.3 Livestock product marketing:

i Ensuring access to market through institutional arrangement and encouraging processing and marketing of livestock products through cooperatives and private sector.

- ii developing local markets for live animals especially sheep and goat with facilities such as shelter, drinking water, veterinary facilities, sanitation and security arrangements.
- iii creation of commodity oriented production clusters and registration of existing small scale value addition enterprises to regularize the markets.



- iv strengthening market information system and enhance information flow to livestock producers to enable them to understand the market demand, supply and prices.

7.5.4 Credit delivery and de-risking:

- i Improve livestock producers' access to financial services including institutional credit and insurance to enhance their capacity to invest in livestock and cope up with unforeseen calamities.
- ii Influence lending institutions to correct lending bias against livestock by de-linking livestock credit from collateral requirements.
- iii Influence lending institutions to enhance coverage so as to reach to unserved backward regions on low transaction costs, where credit requirements among livestock farmers are high.
- iv Influence lending institutions to provide short-term loans for livestock production as in the case of crop production by enhanced representation of the Department in institutionalized forums aiming at augmenting credit delivery.
- v Promote livestock insurance schemes to protect the livestock producers against risks of natural calamities and diseases.

- vi Encourage evolution of community-based risk-coping mechanisms with public, private sector and livestock producers as share holders.

7.5.5 Re-Engineering of Delivery system

- i. Paradigm shift from a hospital to service center
- ii. Strengthening the department progressively to build its core competence areas and slowly outsource delivery of services, both veterinary care and artificial insemination.
- iii. Decentralization of Training and Extension and reach up to block/village level.
- iv. Modernization of management information system.
- v. Promote animal based contract farming.

7.6 Proper and efficient utilization of livestock and products:

7.6.1 Technological innovations:

- i Encourage use of animal power in agriculture by providing farmers with low cost animal-drawn machines and equipments.
- ii Promote technology packages for organic farming developed locally by farmers and organizations.
- iii Enhance capability of the poor producers through technical & technological information and skills to improve their competitiveness vis-à-vis large commercial producers, and finally to improve their scale of production so as to enable them to increase household income.

7.6.2 Ensuring quality of livestock products:

Need based promotion of quality livestock products for balanced growth of livestock.

7.6.3 Promoting small animal farming:

The sustainable food and nutrition security shall give higher priority to small animals and poultry in food security programmes. The sheep, goat, pigs and backyard poultry are a viable option for improving rural incomes and reducing poverty.



7.7 Conservation of Biodiversity and Productivity enhancement:

7.7.1 Cattle and buffalo genetic improvement will be done taking into consideration the farmers needs, market and agro climate and simultaneously conserving the livestock, poultry and fishery biodiversity. Following are the important aspects:

- i Genetic improvement of important indigenous livestock breeds shall be through selective breeding as per State Breeding Policy;
- ii Low producing Indigenous livestock breed populations shall be improved by upgrading with superior indigenous germplasm.
- iii Conservation and improvement of indigenous Cattle and Buffalo:
 - for this purpose, nucleus herds of Rathi, Tharparkar, Kankrej, Gir, and Nagauri cattle breeds with superior quality bulls and bull mothers shall be established to form germplasm pool of high productivity cattle, and continued efforts shall be undertaken on scientific lines for upgrading their germplasm;
 - Increasing bovine productivity to enhance domestic production to meet the rapidly growing demand of milk, For this purpose following bovine specific key areas are identified:
 - Strategies and programmes for production of quality semen adopting internationally accepted standards and protocols.

- Strategies and programmes for expanding door-steps AI delivery services to substantially increase the coverage of adult breedable female bovines by adopting standard operating procedures.
- Strategies and programmes for collecting data on breeding activities in a timely manner and putting in place an information system for monitoring and tractability in the context of breeding.



- The Government shall also endeavor to launch progeny testing programmes for producing proven cattle and buffalo bulls;
- Expansion and strengthening of the infrastructure for artificial insemination shall be undertaken to improve its efficiency and effectiveness using frozen semen technology for upgrading indigenous cattle and buffaloes of the State;
- Natural Service with quality bulls of indigenous breeds in remote areas shall be promoted.
- Programme shall be formulated for castration of low productive and non-descript males.

7.7.2 **Conservation and improvement of indigenous Sheep and Goat:**

- i. Identify pockets and flocks of better germplasm sheep and goats of indigenous breeds and then launch a programmes of purchasing of breedable males and distributing them to low performance flocks to upgrade indigenous germplasm;
- ii. Coordinate with existing and future research stations and schemes operating in the State;

- iii. Strengthen existing farms and opening of new farms for upgrading various breeds of sheep and goat;
- iv. Utilize and conserve the sheep and goat genetic resources and effect breed improvement through selective breeding as per State Sheep and Goat breeding policy.

7.7.3 Conservation and improvement of indigenous poultry:

Launch programmes for strengthening backyard poultry by introducing fast growing strains of improved Poultry breeds, to improve nutritional and economic security of under privileged families.

7.7.4 Conservation and improvement of indigenous breeds of camels, horses and donkeys:

Promote introduction of new technologies regarding management, health and production of camel, horses and donkeys.



7.7.5 Conservation and improvement of indigenous fishery:

- i. Promote new technologies regarding management and production of inland fishery;
- ii. collaborate with public sector agencies, NGOs and private organization;
- iii. Promote education, training and research on fisheries.

7.7.6 The Government shall formulate programmes for strengthening Goshalas to:

- i. function as centers for cattle improvement and hubs for show casing of advanced husbandry practices;

- ii. provide home to destitute animals;
- iii. develop as a centre for milk production;
- iv. promote production of 'Go Mutra' Based Insecticides and organic manure (natural manure and vermicompost);
- v. ensuring up gradation of stock through selective breeding;
- vi. ensuring hygienic disposal of dung and urine by promoting drainage system, dung/compost pits and Bio Gas plants;
- vii. ensuring sustainable fodder production through silvi pasture development. Fodder tree plantation and green fodder crop cultivation as per availability of water for irrigation.

7.8 Augmentation of feed and fodder resources:

7.8.1 The Government shall create an institutional arrangement to undertake the following functions:

- i. Creating a database on various feed and fodder resources, feeding practices and consumption patterns in various agro-climatic zones/areas, to be updated every two years. This also needs to be linked through input and output profiles of various animal products as cost-benefit studies;
- ii. Step to be taken to effectively monitor the production and sale of quality cattle feed, area specific production of Mineral Mixture as per Mineral Mapping, Calf Starter and Bye-pass Protein feed.
- iii. Inter-agency coordination in fodder production, fodder seed production, conservation, transport and sponsoring research in these directions;
- iv. Establishment of fodder banks in private sector, for which appropriate programmes shall be formulated to generate feasible storage technologies for each type of roughage and to facilitate banking with the farmers themselves;
- v. Identifying potential areas outside the State, from where fodder can be purchased and transported to the deficient areas of the State, through surveys well in advance of the lean period/drought;
- vi. Creation of regulated feed markets for input marketing and processing and value addition facilities in PPP mode.

7.8.2 The Government shall constitute State level Standing Committee for Fodder Development and District level Fodder Management

Committees for ensuring fodder availability. These committees shall:

- i formulate and reorient existing programmes to ensure fodder and pasture grass seed availability;
- ii increase availability of fodder by facilitating cultivation of fodder crops and fodder trees and regeneration of grazing lands as well as CPR through implementation of new programmes to be formulated for this purpose;

7.8.3 i. The National Commission on Cattle has also recommended that in the State of Rajasthan, the emphasis should shift from crops to animal husbandry as a major livelihood option;

- ii. For this purpose, the Government shall launch new schemes for motivating and facilitating incorporation of animal husbandry component in the farming practices of those farmers, who are currently pursuing only crop farming for the purpose of making it more sustainable;
- iii Intensified efforts shall be undertaken so that the wasteland are converted into grazing lands by planting grasses and fodder trees with the help of Gram Panchayats. Similarly, vast area of non-forest & forests land shall be utilized for developing good grazing lands;
- iv the Government shall make appropriate efforts to utilize land availability with public sector organizations, Goshalas, NGOs etc. for fodder production and pasture development.

7.8.4 Dovetailing of fodder production and pasture development programmes with other programmes related to animal husbandry, agriculture, forest and rural development.

7.8.5 Research & Development efforts:

- i facilities shall be upgraded for Feed and Fodder Analysis, so that quality of marketed feed and fodder can be tested and ensured;
- ii efforts shall be intensified to utilize latest technologies so that crop residues and non-conventional feed and fodder resources can be utilized for feeding animals if converted into energetic feed and oil-meals into proteins, which are usable by animals;
- iii fodder banking technologies shall also be developed and transferred;

- iv the Department of Animal Husbandry and Dairying, Agriculture & Forest shall have a special R&D fund to encourage institutions (both in public and private sector) to undertake result-oriented and time-bound projects in these areas;
- v Widespread demonstration of fodder enrichment technologies to the stake holders.

7.9 System approach for disease control:

- i. In the light of PCICDA Act, access to quality animal health services is crucial to protect livestock against diseases. Animal health services in the State are in the public domain and are underutilized and under developed. There is a need to improve infrastructure and the delivery system through prioritization of animal diseases based on their damage potential, probability of occurrence and importance to the poor, and initiate disease management programs accordingly.
- ii. Initiate research to enhance scientific base of disease control and eradication, zoonotic disease control, food safety, quality control mechanisms and Indian systems of medicine as per need.
- iii. Develop SEZs, DFZs, SPF zones and adopt SPS measures to augment export potential of livestock products.
- iv. Introduce and strengthen disease surveillance, monitoring and reporting system at all levels and enforce preventive and control measures for the diseases relevant for animals kept by poor livestock keepers by promoting mobility of veterinarians and auxiliary staff for effective delivery of services and extension activities.
- v. Increase production and ensure availability of low-cost vaccines, multiple disease vaccines and biologicals of quality standards and using effective cold chain system for vaccines and biologicals from production line to farmer's door.
- vi. The Government shall endeavor to initiate and continue research on the following aspects, which require a real time and area specific recommendations:
 - trace mineral mapping in soil, water, plant, ration and animals in all districts of the State;

- Mastitis is a major cause of production loss in dairying. There is a need to start continuing research programmes for identification of etiological agents, their sensitivity to antimicrobials and development of appropriate preventive and curative strategies;
- there is a need to start continuing research programmes for monitoring and surveillance of animal diseases across the State through application of advanced diagnostic methods and drawing endemic charts for each disease.
- development of suitable technologies for Management of Production diseases;
- identification of occurrence of Zoonotic diseases and develop suitable diagnostic methods;
- studies on Parasites in different agro climatic zones of the State in order to recommend suitable deworming schedule for each species of domesticated animal;
- study of physiological and behavioural pattern of livestock under environmental stress;
- use of Radioisotope technology for identification of health problems and diagnosis of diseases of livestock;
- veterinary forensic science research in order to curb crimes against wild animals as well as to utilise this area in protection of indigenous germ plasm by detecting cases of falsification of meat;
- In-vitro rumen digestion and manipulation studies for analysing nutritive value of indigenous feed and fodder resources.

7.10 Human resource development, research and extension:

7.10.1 Human Resource Development

University of Veterinary and Animal Sciences and other educational institutions will help to develop appropriate human resource, particularly in the field of livestock business management, animal technology and engineering, bio-security, animal biotechnology etc. The Government shall endeavor to develop human resource at the following levels:

a. Informal education:

- i Training of livestock owners, particularly farm women, youth and input suppliers;

- ii Training of entrepreneurs for developing livestock, poultry and fishery based enterprises;
- iii Continuing Veterinary Education and Orientation Training Programmes for veterinarians and Para-vets;
- iv Training of field veterinarians and Para-vets on various aspects of veterinary and animal sciences.

b. Formal education:

- i Two year Animal Husbandry Diploma programmes as vocational course;
- ii To regulate Para veterinary education and practice, the State shall endeavor to enact Para veterinary council Act.
- iii Basic veterinary courses, i.e., B.V.Sc. & A.H.
- iv Specialization in various disciplines leading to Masters degree;
- v Super Specialization in various disciplines leading to Doctoral degree;
- vi Post Doctoral Diplomas in various disciplines;
- vii Initiate new need based and job oriented degree and diploma programmes utilizing the existing facilities of higher education.
- viii Specialized formal education programmes in diversified fields, particularly, poultry, fishery, beekeeping, food technology etc.

7.10.2 Research:

- i Strengthen livestock research and its linkages with extension system to improve livestock producers' knowledge and access to new developments. Dissemination of technologies is central to sustain growth in livestock production. The State has enormous plant and animal biodiversity that can be gainfully utilized for livestock development through research.
- ii Increase investment in animal science research which is grossly under funded at present with special reference to cataloging traditional germplasm of Rajasthan.
- iii Prioritize livestock research in terms of species, regions and programs.
- iv Promote need-based participatory research taking into consideration the concerns of various stakeholders including producers (productivity-enhancement and cost-effectiveness), consumers (tastes and preferences) and industry (shelf-life and processing attributes).

- v Encourage multi-disciplinary research and collaboration among research institutions within and outside the State.
- vi R&D on biological products to be primarily entrusted to the University of Veterinary & Animal Sciences.

7.10.3 Extension:

- i Improve the process of dissemination of new technologies to the users through public extension system, social organizations and mass media.
- ii Strengthening linkages with farmers in coordination with existing training institutions and Universities.
- iii The Government shall endeavor setting up of Pashu Vigyan Kendras on the lines of KVK to disseminate modern technological packages and appropriate rearing practices for livestock. For this purpose existing farm and research station facilities shall be utilized as infrastructure and human resource.
- iv Promote new modes of dissemination including distance education involving different agencies, like, research institutes, extension department, social organizations, input dealers, service providers, NGOs and livestock producers.

7.11 Disaster management:

The Government shall establish effective emergency response mechanism for disaster management in animals including drought, flood, fire, diseases etc. by providing logistic support to the farmers for production of livestock during natural calamities viz.:

- i. Support for migratory animals / pastoralists shall be provided by developing a long term programmes.
- ii. Provision of insurance support.

The Government shall support to develop animal Husbandry based models and R&D for drought proofing and sustainable income.

7.12 Legislative support:

The Government shall render requisite legislative support for proper implementation of this policy, wherever required.