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ORIGINAL ARTICLE

A COMPARATIVE STUDY BASED ON CRITICAL LITERATURE REVIEW OF LIVESTOCK RESEARCH AREAS, PRIORITIES AND CONSTRAINTS IN BANGLADESH AND INDIA

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Abstract:

The prospect of agricultural sector depends substantially on the improvement and application of new knowledge through research. Given the inadequate staff time, financial support and staff lines allocated to research, Agricultural researchers should be related with the priority researchable questions. Columnists have recommended part in which agricultural research wishes to improvement. Livestock plays a vital role in the economic development and life of farmers in developing countries like in India. The livestock sub-sector of Agriculture sector is an integral part of our society and giving priority to this sub-sector will enhance the inclusive growth process in the developing countries. Importance of the livestock sub-sector modernity and management of Agriculture sector are increasing day by day due to the rapid increase in the population in the developing countries. The dynamics of socio-economic structure and changing demographics scenario win through the significance of the livestock sub-sector in the developing countries specifically in South-east Asia. In the Asian region, livestock provides major additional contribution to agriculture through draft power, fuel, manure, and as fertilizer. Besides, animal products such as meat, milk and eggs provide the much required nutrition to rural population and are also a source of supplementary cash income. Globally, the livestock sector contributes 30% of the global agricultural output and uses about 80% of the land used for world agriculture (Word Bank, 2001). So, this study seeks to help the occupation improve its research program by identifying priority areas to investigate the research areas of livestock sub-sector in Bangladesh and India. The intention of this descriptive study was to determine the livestock research areas, identification and categorization of high priority research topics in livestock sub-sector, finally, the problems and challenges in livestock sub-sector of Bangladesh and India. Methodology and work plan followed in tow parts. Phase one incorporated an assessment of related literature and the use of a jury of research specialists to identify research areas in livestock sub-sector. In Phase two the categories, topics were prioritized and supplementary researchable issues and challenges are recognized. The result should incite dialogue and an on-going dialogue rather than present a single answer for all time. The findings and recommendation of this study will help the concerned sub-sector researchers of both the country. The vital policy implication through research will facilitate in the socio-economic improvement of this region.

KEYWORDS:

Livestock sub-sector, Socio-economic, Research areas, Priorities and Constraints.

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INTRODUCTION

Livestock sector plays a critical role in the welfare of India's and as well as Bangladesh rural population. Its contributes 9% of GDP and employs 8% of the labour force in India and Bangladesh livestock and sub sector contributes the GDP at 2.79% and which is 17.15 percent in Agricultural share. About 44 percent of the animal protein comes from livestock sources.

Actually livestock refers to the one or more domesticated animals raised in an agricultural setting to produce commodities such as food, fiber and labor. The term "livestock" as used in this article does not include poultry or farmed fish; however the inclusion of these, especially poultry,Dairy, within the meaning of "livestock" is common. Livestock generally are raised for subsistence or for profit. Raising animals (animal husbandry) is an important component of modern agriculture. It has been practiced in many cultures since the transition to farming from hunter-gather lifestyles. Animal Husbandry in India and Bangladesh is an integral and interwoven part of traditional agriculture and plays an important rule in the rural economy. It is closely related with the socio economic matrix of the society. The development of livestock sector has been significantly priority in India and Bangladesh in the last two or three decades. This sector is emerging growth leverage in India and Bangladesh economy. The livestock dung is used to enrich soil fertility and thus helps in increasing crops production. The sale of livestock and livestock products make a considerable cash income to rural people.Infact, next to agriculture, dairying has been proved to be major source of income and employment for the rural masses. According to all -India Debt and Investment survey 1981 about 73 percent of rural households reared livestock which is the subsidiary source of employment and income to small and marginal farmers, agricultural laborers and other weaker sections of the society. It should be noted that of the total population living in the rural areas Bangladesh and India ,nearly 50% of them are poor, the livestock sector demonstrated a beneficial impact on them by providing employment, income and consumption standard and thereby acting as potential tool in alleviating rural poverty. Moreover in Bangladesh 20% people directly and 50 % people partially depend on the livestock sector of their profession of livelihood. The share of livestock in India in terms of gross value of agricultural output(at1993-94 prices) has increased from 18.6 percent in 1971-72 to 35.5 % in 2001-02.Now a days livestock production is one of the important sources for livelihood of farmers in India. The increasing contribution of livestock, especially in the semi-arid and arid regions of India where crop husbandry has limited possibility and in poverty reduction is very well recognized. The production systems are still largely dominated by rural based, crop-livestock integrated, smallholder, mixed farming systems that are ecologically sustainable. In Bangladesh 30% of rural households own no land other than the homestead. The average farm size is 0.72ha and family size is seven. Livestock comprising cattle, buffalo, goats, sheep and poultry (including ducks) are an integral part of the farming system in Bangladesh. Regarding Bangladesh the sub-sector enjoyed a growth rate of 5.85 percent during the last fiscal year. Poverty reduction, gender equity and empowerment of women are amongst eight set targets of millennium development goals (MDG). To achieve the goals, Bangladesh government has identified livestock as one of the key player of Poverty Reduction Strategy. The government has set strategic targets for meeting protein demand, employment generation, up-scaling export earning and women's empowerment through the Livestock sub-sector. Finally livestock sector is important ingredient of the world economy, special concentration about India and Bangladesh economy. So here research is a very important aspect to develop the livestock and socio economic development for both the neighboring country. Livestock may be the main medium to generate employment and income to the rural households.

OBJECTIVES:

The study undertaken the following objectives.
To examine the livestock research areas in Bangladesh and India.
To identify and categorize high priority research topics in livestock sub-sector in Bangladesh and India.
To examine the problems and challenges in livestock sub-sector in Bangladesh and India.

METHODOLOGY:

This study is mainly based on the secondary data collected from the various sources like Published report of Govt. of India, Govt.of Tripura, Govt. of Bangladesh, Web Articles, Journals and research report etc. Comparative study for this research have been done through the assessment of existing research report, articles related to the research area of both the country, identification and categorization of high priority research topics in livestock sub-sector in Bangladesh and India and finally examination of the existing problems and challenges in livestock sub-sector in Bangladesh and India.

Motivation and Practical Utility of the Study: The main rational of the study is to ascertain the livestock research areas, existing problems and challenges in livestock sub-sector in Bangladesh and India so that collaborative efforts can be develop to improve the livestock condition in both the country and research related co-operation, co-ordination can be initiated. Research related resources, consultancy can be exchanged and India can take strategic advantage on that.

Literature Review in Bangladesh:- Livestock is an essential constituent of agricultural economy of Bangladesh performing diverse functions such as requirements of food, nutrition, income, savings, foreign currency earning (by exporting hides & skin, bone and other products), draft power, manure, fuel, transport, social and cultural functions. Bangladesh Economic Review 2009 shows the maximum growth rate of livestock sub-sector in GDP at steady prices (base year 1995-96) in the years 2004-05, 7.23% and 2005-06, 6.15% compared to 0.15% crops and vegetables and 3.91% fisheries. A lower rate of growth in subsequent years 2006 – 07, 5.49% and 2007-08, 2.44 % was observed which might be due to the incidence of Avian Influenza causing a serious loss of poultry birds. The current contribution of livestock sub-sector to overall GDP is about 2.73% which is 17.15% of agricultural GDP. The export earning from leather and leather goods is 4.31% of the total export, 20% of the population is directly and 50% is partly dependent on this sector. Livestock population in Bangladesh in 2007-08 was cattle 23 million, buffalo 1.3 million, goats 21.6 million, sheep 2.8 million, chicken 212.5 million and ducks 39.8 million. The per capita number of cattle was o.16, goats 0.15, sheep 0.01, chicken 1.47 and ducks 0.27. Although an upward trend in the production of meat, milk and egg from 2001—2008 is evident, the per capita availability of meat was 20gm/day, milk- 51ml/day and 40 eggs/year in the year (2007-08, DLS). Total production in the years 2002-2008 was milk 1.82- 2.65 million ton at a growth rate of (145.6%), meat 0.91 – 1.04 million ton at a growth rate of (114.3%), and eggs—4770- 5653 million numbers at a growth rate of (118.5%). Demand and supply gap is more evidenced. As per FAO estimates there is a deficit of 80% in milk, 82% in meat and 63% in eggs.

The major constraints affecting the livestock productivity were identified as: absence of appropriate breed for different livestock species including poultry; shortage of quality feeds and fodder; absence of appropriate technology for improving the feed efficiency of feed stuffs; inadequate veterinary coverage and technologies for disease diagnosis, treatment and control; poor/lack of epidemiological information about major livestock and poultry diseases; shortage of quality vaccines for various infectious diseases; poor/lack of strategic disease control programs including absence of disease monitoring and information system; poor/lack of appropriate quality control, bio-security and bio-safety issues; absence of quarantine system in the ports; absence of livestock live market regulations; poor/lack of preservation techniques for livestock products and bi-products; absence of systemic marketing net work for live livestock and their products and value addition. To achieve the projected demands for milk, meat and eggs appropriate research plans will have to be implemented to get 1.3- 1.5 times increase in the production in the years 2015 and 2020 from the base line year 2008 and in the years 2020 and 2030 an increase of 1.5 – 1.8 times. In the light of the discussions research program areas have been identified under the headings as: animal genetics, breeding, conservation and improvement; nutrition, feed biotechnology and housing; feeds and fodder; epidemiology/surveillance of livestock diseases; characterization of etiologic agents of livestock diseases by conventional and biotechnological approach; diagnosis and diagnostics; therapy, prevention and control of livestock diseases; biologics and vaccine biotechnology, ICT for livestock health and production; safety, quality improvement and control; livestock biodiversity and conservation; socio-economic and management; processing, preservation and marketing of livestock products, bi-products and value added products; waste management and pollution control; and climate change. A number of research programs under commodity and non-commodity areas with ranks as high, medium and low depending on magnitude of the problem and extent of severity were identified. The sample research programs were shown under the respective headings.

Since its inception BARC developed a few Strategic Research Plans. It is necessary to review and analyze the action plans and achievements which may guide to formulate future research plan. Research Plans (194- 89) and 1995 were reviewed. In the previous plans food production was defined only cereal grains mainly emphasized on rice production later on crop diversification was meant in addition to rice other crops such as oil seeds and pulses and other agricultural crops but animal agriculture was not considered. Strategic Plan for National Agricultural Research System to the 2010 and beyond (1995) set the following objectives production and productivity by:

a. Genetic upgrading of local stocks;
b. Provision of efficient disease control system; and
c. Provision of effective feed and feeding system.

Increase the supply of animal products- meat, milk, eggs, hides and skin for domestic consumption and

export. Maximize the utilization of by-products, residual and waste materials of other wise little worth by converting them into milk, meat and other useful products by ruminant animals. Explore new animals and birds, which are now little known or underutilized for possible source of food and other useful products and make efforts for their farm scale production. Supplement draft power requirement with improved nutrition, management and better veterinary coverage for a short term scenario.

Generate technologies for storage, preservation and processing of livestock products to improve quality standards determined by consumer preference and products competition in the market place. Strengthen the commercial base of the livestock industry by implementing appropriate policies on trade and tariff regime, import regulations, local subsidies, and credit to attract private investment. Undertake innovative research to increase reproductive efficiency of livestock, develop diagnostic reagents like monoclonal antibodies, and increase nutrient utilization by ruminants. Strengthen research, education and extension linkage. To ensure local and national food security Bangladesh Climate Change Strategy and Action Plan -2008 emphasized farming system comprising cropping, livestock and fisheries, and formulated the following strategic action relevant to the development of livestock sub sector.

a) Promote small, medium and large scale dairy and poultry farming on commercial basis through providing technical, financial, infrastructure and marketing support.
b) Strengthen livestock R & D for development of quality breeds including genetic stock development.
c) Establishment of forage bank in drought hit areas to mitigate livestock feed shortage.
d) Protection of livestock and poultry from disasters particularly cyclone and flood.
e) Development of stress tolerant livestock and poultry strains to cope with climate change.
f) Provision of adequate livestock health care services for disease control including supply of adequate medicine and vaccine.
g) Development and protection of family/private farm poultry production, goat raising and beef fattening. Dissemination of scientific knowledge about animal husbandry among community.
h) Institutional capacity building of the Department of Livestock Services (DLS) with adequate budgetary provision and logistics.

The draft SFYP (2011- 2015) recommends the following objectives to provide the enabling environment, opening up opportunities, reducing risks and vulnerability for harnessing the full potential of livestock sub-sector to accelerate economic growth for reduction of rural poverty in which the private sector will remain the main actor, while the public sector will play a facilitating and supportive role.

LITERATURE REVIEW IN INDIA:

The scenarios for livestock production are usually extremely fine. Demand for, and production of, livestock and livestock products in less developed countries (LDCs) is predictable to double over the subsequently 20 years (Delgado et al., 1999). Livestock production has been increasing faster than any other agricultural sub-sector, and it is predicted that by 2020 livestock will account for more than half of total global agricultural output in financial terms. (This process has been termed the 'livestock revolution'.) Thus, any discussion about agricultural growth and poverty needs to take account of trends and prospects in the livestock sector. The livestock revolution presents both opportunities and threats to resource-poor livestock-keepers in LDCs. The increased demand for livestock products could represent sustained, and perhaps increased, revenues for them. On the other hand, they could face increased competition from larger, more commercially oriented livestock production units. One dimension of the livestock revolution has been the industrialization of livestock production, with production changing from being the traditional local multi-purpose activity to an increasingly market-oriented and vertically-integrated business (Delgado et al., 1999; Steinfeld, 2002).

There is a real danger that large-scale intensive producers could undermine the viability of small-scale livestock production, thereby exacerbating rural poverty (Steinfeld, 2002). Whether or not this happens will depend on two factors. One is government policies, and how supportive they are of small scale production. The other is the extent to which small-scale producers are able to increase the efficiency of their operations and the productivity of their animals. This in turn will depend partly on the efficacy of research and extension systems in supporting them. In India the value of livestock output grew by 6 percent per annum in real terms between 1985 and 1992 (World Bank, 1999). The dairy and poultry industries contributed the major share of this growth. In 1990, livestock accounted for about 32 % of the total value of agricultural output. The increasing demand for livestock products is driven by sustained economic growth and rising incomes. In addition, the income elasticity of demand for livestock products is high, estimated at around unity for certain wealth groups in rural areas (Mehta et al., 2003).

Extension services in India are characterized by five biases that result in them tending to neglect poor rural livestock-keepers, (Matthewman and Ashley, 1996). First, many organizations follow a top-down 'transfer of technology' approach: they rely heavily on interactions with 'progressive' farmers, and assume that others will learn from the experiences of these farmers and will subsequently adopt the technology in question.

Second, most extension organizations focus on large ruminants "almost to the complete exclusion of other species" (ibid). Third, they also tend to focus primarily on intensive systems; and particularly on milk production, to the neglect of other roles of livestock. Fourth, services are usually concentrated in higher potential areas. The state Departments of Animal Husbandry tend to have higher densities of veterinary institutions and activity in areas where production is highest. Similarly, dairy cooperatives use business criteria to determine their areas of operation, which results in less well developed areas being explicitly excluded from involvement in their activities. Fifth, livestock extension is generally provided by men for men, despite the key roles that women play, particularly in goat-keeping and backyard poultry. An international review of donor-supported livestock projects concluded that they have generally failed to benefit the poor (LID, 1999). As poor people generally consume only a very limited quantity of livestock projects, they need to be reached through improvements to production rather than via lower prices for livestock products. This in turn means that donor support should particularly target the types of animals that the poor keep. In principle, the voice of poor livestock-keepers in policy discussions can be greatly strengthened through formation of producer groups and networks, and through lobbying by development NGOs and donors. There is also a need for better articulation of poor producers' needs from service agencies, and reform of research and extension agencies to make them more client-led and poverty-focused. In their programmes and projects development agencies should give higher priority to supporting pro-poor livestock enterprises, such as goat-keeping and poultry-keeping.

Thrust areas of Bangladesh Livestock sub-sector:

Having analyzed the livestock production and research status, and the problems faced by the farmers the following research areas have been suggested.

1: Epidemiology/Surveillance of Livestock Diseases
Epidemiology and surveillance of major important diseases of ruminants.
Epidemiology and surveillance of major important diseases of poultry.
Epidemiology and surveillance of zoonotic diseases.

2: Characterization of Etiologic Agents of Livestock Diseases by Conventional and Biotechnological Approach.
Characterization of the etiological agents of economically important diseases of ruminants.
Characterization of the etiological agents of economically important diseases of poultry.
Characterization of the etiological agents of zoonotic diseases.

3: Diagnosis and Diagnostics
Development of diagnosis systems and diagnostics.
Development or adoption of molecular biotechnological techniques for diagnosis of different diseases.
Development or adoption of serological techniques for diagnosis of different diseases.
Development of new cost-effective and rapid diagnosis systems and diagnostics against different diseases.
Cell culture techniques for diagnosis of viral diseases and vaccine production

4: Therapy, Prevention and Control of Livestock Diseases
Development of new treatment system.
Development of herbal drugs and treatment.
Development of drugs and other therapeutics.
Development of appropriate herd health management system.
Studying host immune responses against pathogens.
Studying the biology of animal reproduction and disorders of reproduction, and adoption of biotechnological tools for assisted reproduction.
Evaluation of hazardous toxic compounds for their harmful effects on animal health and development of measures for mitigation.
Development of zoo-sanitary and bio-security for farm animals and poultry.
Development of prevention, control and eradication measures for different livestock diseases.

5: Biologics and Vaccine Biotechnology
Development of vaccines and biologics against important diseases of ruminants and poultry using conventional and molecular biotechnological approaches.
Development of thermostable vaccines.

6: Information Communication Technology(ICT) for Livestock Health and Production
Establishment of databank for bacterial, viral, fungal, parasitic, mycoplasmal and other diseases prevalent in livestock and poultry in Bangladesh.
Establishment of databank for livestock production with feeding information.

7: Animal Genetics, Breeding, Conservation and Improvement
Characterize, conserve and improve different productive type of indigenous livestock and poultry through improved scientific means.
Studies on immunogenetic status of livestock and poultry in Bangladesh.
Develop assorted beef and dairy breeds suited to the local environmental conditions.
Develop disease resistant HYV of livestock and poultry.
Genetic evaluation of indigenous and cross bred livestock and poultry for productivity in specific agro-ecological conditions.
Develop livestock and poultry varieties or line for harsh/inclement environment like cyclone, salt, flood and draught.

8: Nutrition, Feed biotechnology and Housing
Commercial herbal feed additives for ruminants.
Commercial manufactured feed from agro based and other wastes.
Commercial beef meat production.
Protected protein concentrates for ruminants.
Feed information and feeding standard for growing and beef animal and milking
Cows.
Commercial probiotic or direct fed microbes (DFM) and prebiots for beef meat and milk production .
Beef starter and finisher feeds.
Commercial milk replacer and calf starters.
Develop feeding standards for different species of livestock and poultry at different Production stages.
Feed toxicity determination and evaluation of their residual effects.
Commercial prebiotic and probiotic development for calves, growing, lactating and beef cattle and buffalo.
Herbal feed premixes for calves, growing, lactating and beef cattle and buffalo.
Enzyme feed premixes for cattle and buffalo .
Development of manufactured feed compositions using potential and public health friendly agro-industrial wastes and by-products .
Searching plants and their extracts to combat invidious position of antibiotic and chemical feed additive use for milk and meat production .
Modeling beef productions matching with available feed resources.
Feed preservation and processing and quality management system development
Development of regional feed information and large animal feeding systems
Development of nutritional therapy for calf and lactating animal disorders
Nutritional management of livestock and poultry for productivity and environmental issues.
Develop techniques for improving utilization of agro-industrial by-products as high quality livestock feed such as straw, bagasse, meat offals, leather trimmings and shavings, pineapple, citrus fruits wastes etc.
Develop appropriate technology for the utilization of NCFR such as algae, duck weed, water hyacinth, silk worm pupae, tree leaves herbs and shrubs.
Mapping of nutrient status in feeds and livestock species Upazilla wise.
Studies on nutrition- reproduction interaction at different reproductive stages of livestock and poultry.
Develop appropriate and effective housing for sheep, goat and poultry.

9: FEEDS AND FODDER-

Established forage germplasm bank of both exotic and native types .
Increased green grass availability at farm level.
Tissue culture technique for forage crop seed production and distribution.

Establishment of private fodder nurseries.
Increased availability of forage crop seeds/cuttings to farmers of different regions and seasons
Introduction of multipurpose forage crop into cropping system
Development of salt, draught and flood tolerant forage crops
Genetic manipulation of forage crop for higher nutritive value and/or biomass yield
Biotechnological and mechanical manipulation of forage preservation systems
Characterize, conserve and improve HYV fodder species suited to Bangladesh environment.
Develop suitable fodder/forage crops in the forest lands, tree plantations, fruit plantations, sugar cane areas, haors, baors, roadsides and bund areas.
Develop region specific feeding system for different productive functions of different species incorporating available feeds and fodder in the area.
Fodder germplasm conservation, improvement and forage production technology.
Develop data base on the chemical composition and nutritive value of feeds and fodder species at different seasons of the year under different cropping and production system.
Develop cropping system incorporating appropriate fodder species in the existing cropping pattern.

10: SAFETY, QUALITY IMPROVEMENT AND CONTROL

Livestock products, value added products and bi-products
Feeds, fodder and forages
Vaccines, biologics, drugs and diagnostics
Livestock seed materials (male, semen, embryo, chicks, etc.)

11: LIVESTOCK BIODIVERSITY AND CONSERVATION

Characterization and conservation of indigenous species.
Conservation of endangered species.
Zoo-animals.

12: SOCIO-ECONOMIC AND MANAGEMENT

Develop models for livestock production system commensurate with the existing topography and farming system.
Economic studies on the losses accrued due to the incidence of recurrent and emerging diseases in livestock.
Identify economically viable livestock health and production technology for large and small farm entrepreneurs.
Economic studies of feeds and fodder production including price policy.

13: Processing, preservation and marketing of livestock products, bi Products and value added products

Develop appropriate marketing system for live livestock and their products and bi-products.
Develop suitable processing, preservation technologies for livestock products and bi-products.
Studies on the efficacy of value added livestock products.

14: Waste management and Pollution Control

Develop appropriate environment friendly livestock waste management system
Develop bio-gas production technology and generation of electricity.
Develop suitable bio-fertilizer mixture using livestock and poultry manure appropriate for different crops.
Develop ways and means to alleviate methane emission and control the atmospheric pollution.

15: Climate change

· Climate change due to the accumulation of gasses such as carbon dioxide, methane, CFC, marsh, and other gasses in the atmosphere definitely affects the man and his well being. Out of the gasses methane mainly arises out of the anaerobic fermentation of carbohydrate fractions in the rumen and paddy fields. Methane gas contributes about 18% of the global warming effect where animal agriculture contributes to a

small degree. Large ruminants produce major portion of methane in the rumen when the animals are fed on low quality roughages. A feeding strategy supplementing the low quality roughage diet by high quality feed nutrients can improve the efficiency of roughage utilization and can reduce methane production per unit of feed up to 50% (Leng. 1982).

Thrust areas of India Livestock sub-sector:

The following research areas are on focused in Indian Livestock sub-sector:

1. Livestock policy development: To support governments and other stakeholders in the development of holistic livestock policies
2. Livestock Service Delivery: To facilitate establishment of need based livestock service delivery systems for the smallholder livestock farmers
3. Veterinary and Animal Husbandry Education: To Review and reorientation of veterinary and AH education to effectively equip veterinary and para-veterinary professional to shoulder emerging responsibilities
4. Livestock Environment Interactions: To better understand Livestock Environment Livelihood interactions to facilitate policy adv for sustainable use of natural resources
5. Knowledge Networking & Research Partnerships: To knit together the rich knowledge base that exists through effective linkages and communication platforms
6. HID: Support HID of stakeholders in the livestock sector to play their role effectively. It is a cross cutting thrust
7. Livestock Products Marketing: Support small holder livestock producers in improving their income through better market access and potentially.

Commodity wise Research Priority in Bangladesh Livestock sub-sector:

Inadequate and disproportionate food production and its supply and distribution are the major contributors of chronic energy deficiency, protein-energy mal- nutrition, macro and micro nutrient deficiency of different age and productive function groups of the people of the country. Balanced food production and distribution according to the nutrient need of the people is a great challenge for the vision document 2030 and beyond which should be addressed through well designed integrated food production research programs. Essentially the research plan and vision 2030 and above is an attempt to significantly improve the nutritional status of the people and to alleviate the poverty, and thereby, contribute to the improvement in the quality of life and socio-economic development.

A need for stepping up research support to achieve the national requirement for food of animal origin should be earmarked in the SFYP. The use of genetically programmed bacteria, yeast and tissue cells are promising avenues for producing safe, more potent and less costly vaccines the potentiality of which was felt seriously due to the recent incidence of avian influenza, swine influenza, causing death to livestock and human being. Potential non-conventional feed resources may be profitably used in formulating complete rations for livestock and poultry based on their availability, quality and utility in individual animal species. There is a need to prepare a detailed inventory for non- conventional feed resources in different regions of the country. More studies on the incriminating agents limiting the utilization of nutrients and methods for removing them are required. There is also a need for concerted effort to apply available knowledge to large scale farm testing.

Commodity–wise the following research programs are identified in Bangladesh
Large Ruminants (Cattle and Buffalo) Problem specification
Animal Genetics, Breeding, Conservation and Improvement of Animal Genetic Resources (AnGR)
Nutrition, feed biotechnology, Feeds and Fodder and Housing
Establishment of Fodder Research and training Centre
Epidemiology and Surveillance of Diseases
Characterization of etiologic agents of diseases by conventional and biotechnological approach
Diagnosis and Diagnostics
Therapy, Prevention and Control
Biologics and vaccine biotechnology
Health Management
Establishment of Foot and Mouth Disease Research Institute/Centre

Small Ruminants (Goat and Sheep)
Establishment of Goat and Sheep Research Institute/Centre
Genetics, Breeding, Conservation and Improvement

Feeding, nutrition and housing of goat and sheep
Poultry
Establishment of Poultry Research Institute/Centre
Conservation of Poultry Genetic Resources and Breed development
Poultry Feeding, Nutrition and Housing
Common to livestock health and production
Livestock Products and By-products
Safety, Quality Improvement and Control
Waste management and pollution control
Technology Transfer
Farming Systems Research
Hill Research: Establishment of Hill Research Centre

Socio-economics of livestock and poultry production and global market policy
Livestock and Poultry Marketing Improvement
Socio-economic impact analysis of livestock development programs
Livestock production and climate change

Research priorities and future programmes in Indian Livestock sub-sector:
Bio-informatics, genetic evaluation, biological markers and production of quality male germplasm
Development of latest diagnostics and vaccines for augmenting animal health
Crop-livestock integrated farming systems
Feed resource utilisation and improvement
Improved reproductive efficiency
Socio-economic analysis, policy issues and developing alternative technologies
Collaborative research in India:
The Indian Council of Agricultural Research (lCAR) cau coutribute in strengthening livestock improvement
programmes in the following areas.
Buffalo development
Supply of superior germplasm and breeding strategies for improvement in livestock
Gennplasm processing and semen freezing technology
Reproductive biotechnology (ET, IVM and IVF)
Rural livestock management and productivity
Co-operative movement for smallholder farmers
Semi-iuteusive poultry production including backyard poultry development
Nutrient requirements and germplasm evaluation
Straw enrichment and urea-molasses blocks
Resource management
Human resource development including degree programmes and specialized vocational training
Research opportunities in India:
One of the purposes of this meeting is to identify research opportunities for improving the productivity and sustainability of Asian production systems. The following is a tentative list of topics under three different themes that may be considered for discussion.
Systems analysis
Characterise major production systems and their pathways of development
Model and quantify energy flows between crop and animal subsystems
Model effects of technology interventions on subsystem relations and overall system evolution
Identify recommendation domains for various technologies
Feed and natural resources
Integration of forages in cropping systems
Synchronization offered supply with demand by animals throughout the year
Development of feed packages using local resources
Strategic utilisation of feeds.
Nutrient cycling involving manure as well as legumes in production systems.
Other livestock-environment interactions for resource conservation.

Socio-economics and policy
Forces driving intensification and conunercialisation

Macro-economic and sector policies affecting investment and commercialisation of livestock sector
Bio-energetic, economics and sustainability implications of various feed production and utilization systems
Structure and efficiency of input and output markets
Gender roles in livestock management and food security
Potential loss in output due to constraints

Problems and Constraints of Bangladesh Livestock sub-sector:

Having reviewed the available reports, publications and interactions with different stakeholders the following problems/constraints have been identified for the lowest productivity of all the livestock species in comparison to that of the developed and neighboring countries.

1. Breeds.
a) Lack of appropriate/suitable breed of different livestock species and breeding materials.
b) Infertility, long calving interval and late age at maturity.
c) Lack of conservation of potential genetic resources .

2. Feeds.
a) Shortage of feeds and fodder in respect of both quality and quantity.
b) Shortage of lands for fodder cultivation .
c) High feed price .
d) Shortage of high quality fodder germplasm.
e) Lack of appropriate processing and conservation technology for feeds and fodder.

3. Livestock Diseases .
a) Poor/lack of epidemiological information about major livestock and poultry diseases.
b) Limited veterinary services, including poor disease diagnostic facilities.
c) Poor/Lack of strategic disease control programs including disease information system .
d) Serious shortage or lack of manpower in veterinary or disease research in BLRI, currently this is a major obstacle to control disease problem in livestock production.

4. Livestock Health Management
a) Absence of animal quarantine services in the reports.
b) Lack of appropriate herd health management system.
c) Lack of appropriate bio-security system.
d) Improper implementation of waste management system.
e) Disease control Act, Quarantine Act, Fisheries and Livestock Feed Act are still not implemented.
f) Lack of Slaughter Act
g) Lack of wet market regulations

5. Vaccine
a) Lack of quality vaccines against major livestock and poultry diseases
b) Lack of thermo stable vaccines.
c) Lack of vaccine research in BLRI / LRI

6. Quality control
a) Lack of quality control measures for vaccines, drugs, biologics, breeding materials, etc.
b) Lack of quality control measures for livestock products and bi-products.
c) Lack of preservation techniques for livestock products and bi-products

7. Marketing management techniques.
a) Lack of systemic marketing net work for live livestock and their products.
b) Lack of quality value added products in the market .
c) Lack of adequate infrastructure to the expansion of trade and investment in the sector.

Problems in Livestock in India: In livestock sector plays a vital role in the Indian economy. But livestock and income generation through livestock in India is a biggest task. But now the point of view is very clear, there are several problems issues related to the livestock farming. In a case of milk production, rural milk producer faced several problems.

1.The major problems faced by the farmers include small herd strengths, small land Holdings.
2.Small land holdings, shortages of green and dry fodder,feed concentrate is the root cause of poor performance of livestock stock sector in specifically genetic milk production of cross bred animals their not getting proper nutrition.
3. Low productivity of animals.
4. Non availability of timely inputs for breeding, feeding and health care of animals.
5.Lack of suitable education,training for skill development for new viable and sustainable technology, inadequate finances, poor rural infrastructure facilities and lack of proper marketing support for their produce.
6.Another important constraint for livestock sector in India lack of marketing infrastructural facilities of livestock products in rural villagers.
7.Lack of specific state policy on animal breeding and strategies for livestock development in the state plan with proper perspective.
8.Technology intervention on Artificial insemination has not been fully put into gear in all the areas of the State.
9.Lack of perception of the farmers to the research focus on Livestock sector and poor linkage between the veterinary research and planning. This has created a avoid in the research focus and planning.
10.Due to lack of proper extension system there is also poor perception of the farmers towards livestock industry as a viable alternative to other occupation.
11.Lack of access to urban markets for remunerative prices of livestock and livestock products are one of the major constraints affecting the development of livestock farming in plain and hilly areas.
12.Payment of prices of milk by the society is reported to be less than market prices and irregular in payment which caused great concern to the members of the society.

Challenges and Opportunities of livestock in India: India has the major share of global livestock population comprising of 185.5 million cattle, 97 million buffaloes, 62 million sheep, 120 million goats, 14 million pigs and 425 million poultry as per the Live Animal Database of FAO 2004. Another statistics put us on the top of the world as far as livestock population is concerned.

Livestock sector serves as the exclusive source of animal protein. It provides employment to over 300 million of rural people and contributes enormous amount of draught power and biomass that enriches the agricultural field of our country. The importance of livestock in the economy is thus enormous and cannot be underestimated. Main oppourtunities like major markets of Indian livestock sectors are for Indian buffalo meat is Malaysia and Egypt. Sheep and goat meat mainly goes to UAE, Iran and Jordan. India also exports small quantity of processed meat and that goes to the market like Thailand, Yemen, and Japan whereas for poultry products market is mainly in Saudi Arabia, Oman, Kuwait and Qatar. It can be pointed out here that our meat is sold largely as fresh and frozen and not much as value added processed products. Also market is concentrated mainly in Middle East and south East Asian countries. Developed western world do not buy meat from India although potential is very large. Indian meat has an advantage of the fact that it is low fat and low cholesterol, which is a fear with most of the red meat. This is because livestock in India are reared on green pastures and agricultural crop residues. As is done in developed world, meat cum bone meal, blood meal and carcass meal are not fed to cattle and buffaloes here. Also hormones, antibodies and antibiotics are not generally used for promoting growth and fattening of livestock. This sector therefore, has great opportunities.

The major challenges of Indian livestock sector are as follows:
1.Expanding demand, supply and trade.
2.Food-Feed –Energy competition.
3.Livestock diseases.
4.Livestock and the environment.
5.Quality, safety and social standards.
6.Drivers of the trends.
7.In the case of trade in livestock such as milk production, India is a very minor player in the world market. India was a primarily dependent country till early seventies. Most of the demand –supply gaps of liquid milk requirements for urban consumers were met by importing anhydrous milk fat/butter and dry milk powder.
8.The main challenges of livestock in Indian producers to facing huge competition in world market when they sale in livestock products.
9. New challenges of Globalization and trade Liberalization-perspectives 2010.
10.A dynamic livestock sector needs to build on scenarios of system evolution and alternative development

pathways.
11.New sustainability and socio-cultural issues to address example: water and energy use by the livestock sector, shift to dietary preferences etc.
12.Need to be able assess trade offs different levels and to identify what is desirable and feasible.
13.Proper distribution of payment is not done till date, equally is not given to the livestock producers- it's a big challenges to the livestock research.
14.Proper and adequate facility is not available for the livestock researcher during a research time.

CONCLUSION:

Research Program areas identified in this document are not rigid but may be expanded as deemed necessary. These need to be implemented very carefully. Necessary fund allocation and timely release of the fund will help success of the research results. It is hoped that successful implementation of the research programs will help to achieve the animal food production set in the vision document 2030 and improve the nutritional standard of the population, improve the income of the farmers, increase employment opportunities and reduce poverty status of the country.

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