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**IMPACT OF LIVESTOCK POLICIES AND
PROGRAMMES OF BANGLADESH
GOVERNMENT ON PRODUCTION**

en 77813



By

GOURANGA CH. CHANDA

A Dissertation

Submitted to the Institute of Bangladesh Studies, Rajshahi University in Partial
Fulfillment of the Requirements for the Degree of

Doctor of Philosophy

in

Agricultural Economics

**INSTITUTE OF BANGLADESH STUDIES
RAJSHAHI UNIVERSITY
RAJSHAHI, BANGLADESH**

May, 2005

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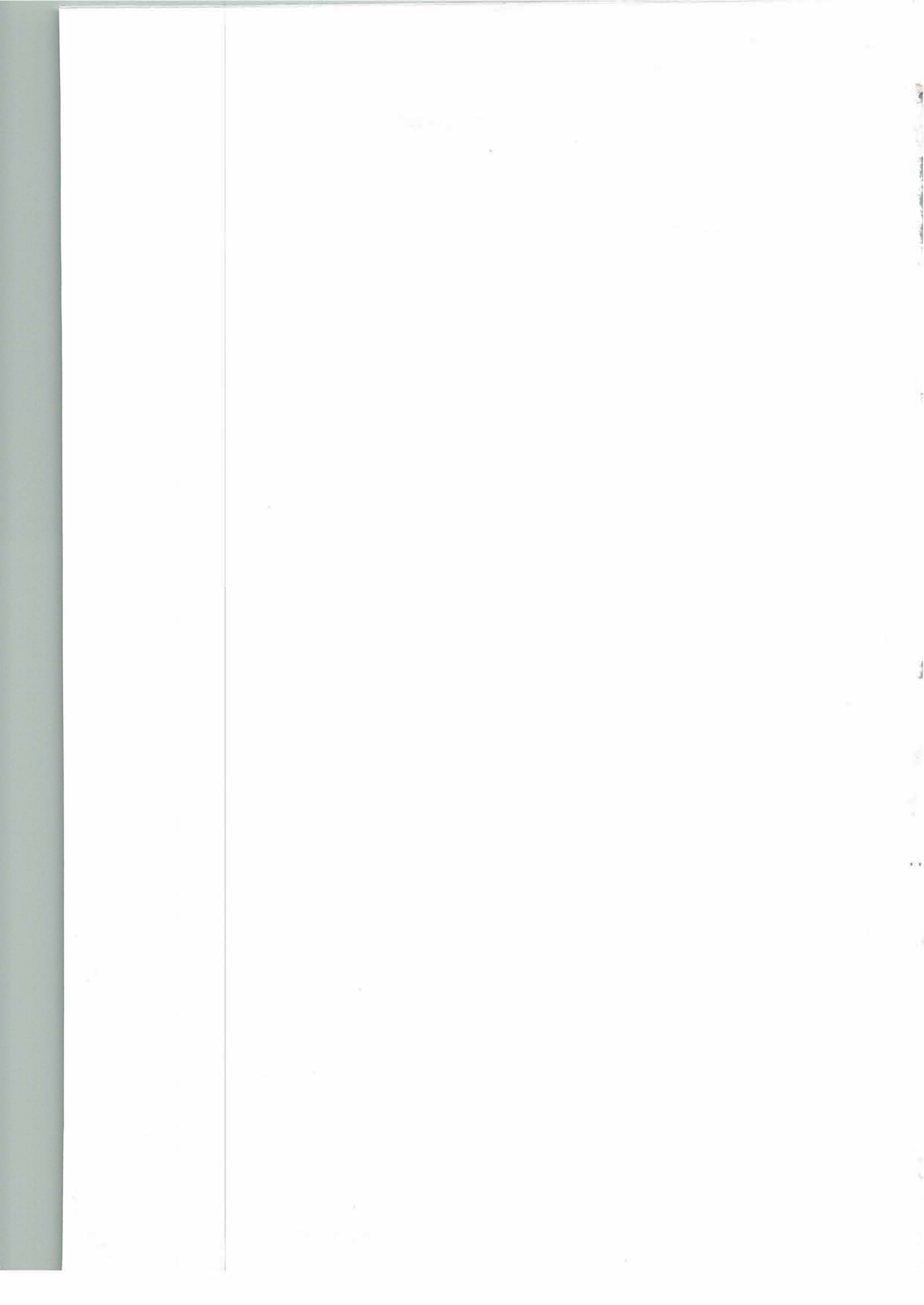
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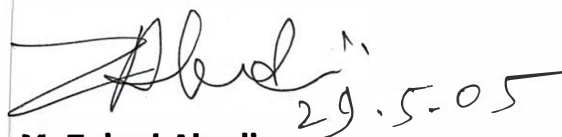
Dedicated to

The memory of my reverend father
-Late Girindra Ch. Chanda,
-Late paternal aunt Kushuma Kamini Dhar
(who being childless could never forget the affection of a child);
and
*the forefront of the lotus feet of my beloved mother Mrs. Priya
Bala Chanda whose virtuous blessing fulfills my life.*

CERTIFICATE

I have the pleasure to certify that the dissertation entitled, "Impact of Livestock Programmes and Policies of Bangladesh Government on Production" is the original work of Gouranga Ch. Chanda. So far as I know, no other person was associated in any stage of completion of this dissertation.

I went through the draft and final version of this dissertation very carefully and found it satisfactory for submission to the Institute of Bangladesh Studies, Rajshahi University, Bangladesh for the Degree of Doctor of Philosophy in Agricultural Economics.



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DECLARATION

I do hereby declare that I prepared the dissertation entitled "Impact of Livestock Programmes and Policies of the Government of Bangladesh". This is an original work done by me. No part of this work, in any form was submitted earlier to any other academic institute or university for any degree or diploma.



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Gouranga Ch. Chanda

GLOSSARY

ADB	:	Asian Development Bank.
ADP	:	Annual Development Programme.
AHARI	:	Animal Husbandry Research Institute.
AHRI	:	Animal Health Research Institute.
AI	:	Artificial Insemination.
ASA	:	Association for Social Advancement.
BADC	:	Bangladesh Agricultural Development Corporation.
BAHA	:	Bangladesh Animal Husbandry Association.
BMPCUL	:	Bangladesh Milk Producers' Co-operative Union Limited.
BARC	:	Bangladesh Agricultural Research Council.
BAU	:	Bangladesh Agricultural University.
BARD	:	Bangladesh Academy for Rural Development.
BBS	:	Bangladesh Bureau of Statistics.
BCRDV	:	Baby Chick Ranikhet Disease Vaccine.
BIDS	:	Bangladesh Institute for Developing Studies.
BIRD	:	Bankers Institute for Rural Development.
BKB	:	Bangladesh Krishi (Agricultural) Bank.
BLDC	:	Bangladesh Livestock Development Council.
BLRI	:	Bangladesh Livestock Research Institute.
BQ	:	Black Quarter Disease.
BRAC	:	Bangladesh Rural Advancement Committee.
BRDB	:	Bangladesh Rural Development Board.
BRI	:	Buffalo Research Institute.
BSVER	:	Bangladesh Society for Veterinary Education and Research.
CCBS	:	Central Cattle Breeding Station.
CGVC	:	Chittagong Government Veterinary College.

CIDA

CIRDAP

: Canadian International Development Agency.

: Center for Integrated Rural Development for Asia and the Pacific.

CRI

: Cattle Research Institute.

Crore

: Ten million.

DANIDA

: Danish International Development Agency.

DDB

: Dairy Development Board.

DLS

: Department of Livestock Services.

DOC

: Day Old Chick.

e.g

: For example.

Etc.

: et cetera.

FAO

: Food and Agricultural Organization.

FMD

: Foot and Mouth Disease.

FYP

: Five Years Plan.

GDP

: Gross Domestic Products.

GO

: Government organization.

GOB

: Government of Bangladesh.

GRI

: Goat Research Institute.

HS

: Hemorrhagic Septicemia Disease.

IBD

: Infectious Bursal Disease.

IBS

: Institute of Bangladesh Studies.

IFAD

: International Fund for Agricultural Development.

IFDP

: Integrated Farming Development Project.

i.e.

: that is.

Lac/Lakh

: One hundred thousand.

LRI

: Livestock Research Institute.

Ltd.

: Limited.

MMT/mmt

: Million metric tons.

MN/mn

: Million number.

MT/mt

: million tons.

MOFL

: Ministry of Fisheries and Livestock.

NGO

: Non-Government Organization.

ONBS

: Open Nucleus Breeding System.

PDB	: Poultry Development Board.
P S	: Parent Stock
p.	: page, pp.-pages.
PPR	: Peste des Petits Ruminants.
PRI	: Poultry Research Institute.
RDV	: Ranikhet Disease Vaccine.
SAARC	: South Asian Association for Regional Co-operation.
SAIC	: SAARC Agricultural Information Center.
SBC	: Sadharan Bima (General Insurance) Corporation.
SNA	: SNA'93- A new system of accounting introduced in 1999-2000 subdividing GDP into 15 sectors against 11 in the previous system (Base year 1995-96 instead of 1984-85).
SRI	: Sheep Research Institute.
Tk	: Taka (Bangladesh currency).
Tn	: total number.
ULDC	: Upazilla (Sub-district / Thana) Livestock Development Center.
US \$: United States Dollar.
VAT	: Value Added Tax.

ABSTRACT

The study on "Impact of Livestock Policies and Programmes of the Government of Bangladesh" was undertaken as an important issue of development in the recent years. Creation of self-employment for poverty alleviation has been considered as an important objective of government's "Poverty Reduction Strategy Plan". In an agro-based country like Bangladesh, where livestock and poultry husbandry occupies top priority, the undertaking of such research work no doubt carries significance.

To accomplish the study, written documents, published materials, handouts, books and booklets, pamphlets etc. were consulted; and formal and informal interviews with the related officials; and field survey were done. *It can be mentioned here that it was found tough to get statistics from authentic sources. It is also admitted to all that there is scarcity of real statistics of this sub-sector.* However, on the basis of the available data up till 1999 and in many a cases data up to 2003-04 were included to accomplish the study.

Bangladesh is one of the poorest country of the world (with per capita annual income of US\$ 389 in 2002-03 with a high population concentration (915 people per sq. km area)and inequitable distribution of wealth including agricultural holdings. Livestock plays an important role as well as is an integral part of

employment for 50 percent of country's labour force; a good portion of export earning in addition to other contribution. The Department of Livestock Services (DLS), under the Ministry of Fisheries and Livestock, MOFL is responsible for implementing livestock development projects and programmes. The department was running its programmes through its infrastructure and manpower since the late British regime. Until 1991-92, there was so specific livestock policy as such. Hence, the DLS formulated basic policies and programmes for augmenting its production. The main activities of DLS were preventive and curative treatment of animals and birds, artificial insemination, procurement, production and distribution of inputs like vaccines, medicines, fodder seed/cuttings, liquid and frozen semen, day-old chicks and ducklings etc; research, training and implementation of development projects under government annual development programme. The analysis of the growth trend of this sub-sector of agriculture shows a positive growth trend with the highest in 2003-2004 (4.4 percent). The sectoral growth rates at 1984-85 prices were 1.7 percent in 1975-76 and 7.7 percent in 1999-2000. However, this compound growth rates were different in different fiscal years. It was also as low as (-) 9.9 percent in 1983-84 and as high as almost 9.0 percent 1993-94. The sectoral share to GDP at 1984-85 prices varied from 2.7 percent to 3.6 percent during the last three decades. The contribution to GDP at current prices was increased from Tk.3040 million in 1975-76 to Tk. 75270 million in 1999-2000. This sub-sector contributed about 10 percent in early seventies which increased to nearly about 17 percent in 2004 to agricultural GDP. On the basis of 1984-85 constant prices, it contributed Tk.10590 million in 1975-76 that increased to Tk. 26630 million in 1999-2000. On the basis of 1995-96 prices, its contribution was Tk. 46510 million in 1989-90 and Tk.70010 million in 2003-04 showing the most prospective sub-sector in agriculture.

During measuring the programmes impact at macro-level, it showed a positive result in production of animal produces though the achievement could not satisfy the targets set in the FYPs. But it could show hopeful impact on employment generation and poverty reduction; the growth trend of private level farms, performance of public sector farms (specially poultry farm), production of inputs; government's subsidies and trade policy etc. During measuring the programmes' impact at selected micro level farms done through studying 120 randomly selected

private farms across the six divisions of the country were 94 poultry (02 broiler parents stock, 45 commercial broiler, 25 layers, 11 pullet chick rearing and 11 duck farms), 24 dairy farms, 01 goat, 01 sheep and, 06 were different types of mixed farms. Concerning the implications of government's policies and programmes, different types of relationships were analyzed statistically to evaluate the impact of livestock policies and programs. The impact of the parameters were found, to some extent, positive. Though farmers were facing a good number (22 different types) of problems and expected eight different types of helps, poultry farms were found to be most profitable. Though higher profit was earned in high investment, the percentage of higher profit was earned in low-scale farms. The dairy farmers were found to earn comparatively low profit but the value of the farms were increased highest number of folds due to increase in price of the animals and the farmland as well. Regarding the government's budget allocation, it has been found to allocate as low as 0.28 percent to as high as only 1.07 percent of total yearly budget. It has also been found that the allocated budget had not been properly spent due to weak management and complicated government system. Like the past, there are also 15 development projects being implemented during 2003-04. Among the factors responsible for low level of production, low genotype, scarcity and hence higher price of feed, higher disease incidence, absence of stable breeding policy, insufficient technical skill of the farmers, insufficient technical manpower and establishments, absence of proper marketing system, low budget allocation, lower credit facility, lack of insurance policy, insufficient extension activities, improper administrative management, complicated export import policy, lack of appropriate project planning were important. Some suggestive measures were stated to overcome those factors, which were responsible for low level of production. The measures were suggested in relation to the respective factors. In addition Poultry and Dairy Development Boards, establishment of Livestock Bank and intensive research activities were suggested to be undertaken by the government involving NGOs. Lastly, as a prospective sub-sector of Agriculture, this sub-sector was recommended to convert as a full-fledged **"Livestock Sector"**.

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Chapter 1

INTRODUCTION

1.1 The Backdrop

Bangladesh is one of the poorest countries of the world. Her per capita income was only U.S.\$ 389 in 2002-2003.¹ About 80 percent people live in rural areas of whom about 50 percent are land less and 25 percent are unemployed.² About 40 percent of the people share 15 percent of total income while only 5 percent of them shares 22 percent of the same. Top level 5 percent people own 30 percent of total cultivable land while bottom level 40 percent own only 3 percent of the same.³ The majority of the rural people remain unemployed for at least some months of the year. Between 1960 and 1984 the average farm size declined from 1.34 ha. to 0.91 ha. and the proportion of small farmer (under 1ha.) increased from about 52 percent in 1960 to 70 percent in 1984.⁴ If poverty criteria are extended to up to one acre's ownership, 90 percent of the rural population in some districts falls below the poverty line. The living standard scenery shows that out of the total 250 ml. milk and 120 grams meat requirement per head per day, only 33.95 ml. and 12.61 grams of those are consumed per head per day respectively. On the basis of daily requirement of 2200 Cal. energy per head per day, about 85.5% population are suffering from undernutrition. Bangladesh Bureau of Statistics estimates that 47 percent population is living below the absolute poverty and 27 percent are living below hard-core level of poverty on the basis of calorie consumption.⁵ The livestock development policies and programmes can make effective contribution towards meeting the need of protein requirement and poverty eradication (Annex-1).

¹ GOB, *Bangladesh Economic Review* (Dhaka : Ministry of Finance, 2004), p. 16.

² Quamrul Islam Siddique, "Employment Generation and Poverty Alleviation through Infrastructure Development Activities", M. Nurul Amin (ed.), *Government of Bangladesh in Poverty Alleviation* (Dhaka : BRDB, 1993), p. 144.

³ Gouranga Ch. Chanda, "Programmes and Activities of Department of Youth", M. Nurul Amin (ed.), *Government of Bangladesh in Poverty Alleviation* (Dhaka : BRDB, 1993), p. 155.

⁴ Quamrul Islam Siddique, *op.cit.*, p. 144.

⁵ Akmal Hossain, "Programme under Implementation by Ministry of Agriculture", M. Nurul Amin (ed.), *Government of Bangladesh in Poverty Alleviation* (Dhaka : BRDB, 1993), p. 118.

This study looks into some aspects of livestock development in connection with the policies and programmes of the Department of Livestock Services (DLS) under Ministry of Fisheries and Livestock (MOFL).

The country possesses livestock resources like cattle, buffalo, sheep, goat, fowl, duck, pigeon and guinea fowl etc., which are of indigenous types. The genetic potential of these indigenous livestock in this country is poor. Their productivity is low. As a result, they are unable to meet the demand for milk, meat, egg and draft power of the country. The cattle are the most important component of livestock. The role of cattle is mainly as the supplier of draft power for cultivation. Commercial dairy farming is almost absent in this country; because price of dairy products did not look more remunerative to the cultivators than raising of crops. Farmers used to keep cattle for both milk and draft use. The number of buffalo is very much less in comparison to cattle. There is a need for crossbreeding of indigenous cattle with exotic dairy breeds. The production potentiality of other species of livestock and poultry are also low. This study verifies the impact of government programmes and policies on the development of this sub-sector; identifies the problems and suggests the remedial measures.

1.2 Role of Agricultural Sector and Livestock Sub-sector in Bangladesh Economy

About 80 percent people of Bangladesh live in the rural areas and agriculture is the main source of their earning. Due to high skewing in land distribution, 95 percent of rural population find it difficult to ensure subsistence from their cultivable land. They must seek supplementary sources of income to ensure their livelihood through out the year. Agriculture sector continues to play a very important role in the economy of Bangladesh. It accounts for about one fifth of total GDP and nearly 60 percent of the total domestic employment.⁶ Agriculture accounted for 38 percent of GDP in 1989-90, which was the benchmark for the fourth plan. Out of this, crop sub-sector contributed 30 percent to GDP, forestry 2.5 percent, livestock 2.8 percent and fisheries 2.6 percent. At the end of the Fourth Plan, agriculture still accounted

⁶ GOB, *The Fifth Five Year Plan* (Dhaka : Ministry of Planning, 1997), pp. 259-263.

for about one third of the GDP. However, the sub-sectoral contributions to the GDP of 1994-95 underwent some marginal changes: forestry, fisheries and livestock, each contributed about 3 percent to GDP.

Livestock farming is the only agricultural source of income, which can ensure year-round profession for earning livelihood of the rural poor having minimum land. So, development of livestock farming is essential for overall sustainable rural employment throughout the year. This helps to produce milk, meat, eggs and other livestock products and by products to meet the energy requirements of our people, to supply the raw materials of livestock oriented industries as well as to earn exportable foreign currencies by increasing exports and reducing imports. The Directorate of Livestock Services (DLS) under the Ministry of Fisheries and Livestock has been launching multifarious services for promoting livestock production and health care. There were no specific policies on livestock development as such till 1991.⁷ The programmes were launched on the basis of five-year plans taking livestock development as sub-sector of agriculture sector. The policies of livestock development were undertaken since 1991.

Livestock plays a vital role in the national economy of the country. It plays great role as sources of food and nutrition, draft power, of pulling ploughs for cultivation and for drawing carts for rural transport as land communication; as manure to improve soil quality and fertility, as leather goods and warm clothing from wool hairs and feathers; as fuel from dung and droppings; as raw materials of industries like hides, skins for leather industries; blood and bones for animal feed and fertilizer industries: horns and bones for comb, button, handle and cottage industries; blood and lymph for glue industries; different body glands for producing medicine etc. and leather for shoe, leather bag and sports' industries etc.⁸

The small animals like goats, sheep rabbits etc. and poultry, like chicken, duck, pigeon etc. are used in research laboratories for experimentation of different drugs and medicines for treatment of men and animals.

⁷ GOB, *Development and Activities* (Dhaka : Department of Livestock Services, 1998), p. 2.

⁸ GOB, *Accomplished Report* (Dhaka : Ministry of Fisheries & Livestock, Department of Livestock Services, 1992), p. 1.

So, development of livestock sector is essential for the over all development of the country. The Planning Commission of the Government of Bangladesh reviewed the achievements of the livestock sub-sector (1994-95) and stated that the impact created by the programmes implemented was found substantial and encouraging.⁹ Modernization of diagnostic centres, Thana Livestock Development Centers, and qualitative improvement in vaccine production had considerably been increased the effectiveness of disease control services. Result in this area was found satisfactory in the reduction of cattle mortality rate to 10-15 percent from that of 15-20 percent during the initial period of Third FYP. Similarly the rate of poultry mortality had been reduced to 10-15 percent from the previous level of 30-40 in the same period.¹⁰

They also found that intensification of A.I. programme had resulted in the production of around 2 million crossbred cattle in the country. Around 12,000 crossbred cattle farms have been established. Each of these crossbred cattle produce around 7.0 liters of milk a day.¹¹ There are records that 35.0 liters of milk are produced per day from certain high breed cows. Likewise, capacity improvement in government poultry farm has ensured distribution of quality genetic materials, which attributed to the establishment of 50,000 poultry farms under the private sector.¹²

Consequently milk production had been increased to around 1.5 million mmt. in 1994-95 from 1.3 million mmt. in 1993-94. Similarly egg production had reached 2400.00 million number in 1994-95 from that of 2046.60 million in 1991-92.¹³

And in 2001-2002, the production increased to 1.75 mmt. and 3890.00 million number respectively, the milk production increased to 0.78 mmt in 2001-2002 from 0.46 million mmt. in 1991-1992.¹⁴

⁹ GOB, *Bangladesh Economic Review*, 1996, p. 123.

¹⁰ GOB, *Annual Report* (Dhaka : Department of Livestock Services, 1990).

¹¹ J. Alam, *Livestock Resources in Bangladesh, Present Status and Future Potentials* (Dhaka : University Press Ltd., 1996), p. 57.

¹² GOB, *Development and Activities*, 1998, p. 35.

¹³ GOB, *The Fifth Five Year Plan*, 1997, p. 253.

¹⁴ GOB, *Bangladesh Economic Review*, 2003, p. 62.

Production of important export items such as hides, skin had been increased to 25.00 million pieces in 1994-95 from 22.79 million pieces in 1993-94 contributing significant increase in foreign exchange earnings.¹⁵ The earning from export of hides and skin and their products has been increasing gradually. In the annual report of Export Promotion Bureau, it has been mentioned that Tk. 12,550 million was earned from this export in 1999-2000, which were about 4.36 percent of the total export of this country. This export earning could be made almost double than the present one if the crust leather (which is about 80 percent of the total leather export) could be converted into finished leather and leather goods as opined by Bangladesh Finished Leather Export Association and Bangladesh Hides and Skins Processing Association.

In addition, livestock had contributed to the creation of self-employment opportunities for a significant number of unemployed youth and women as vaccinators, chick rearers, duck rearers and small-scale dairy and poultry farmers. Since the problem that acted as constraints to livestock development, had been taken care of within the framework of strategic activities of Fourth FYP, it was expected that the desired rate of achievement would continue in respect of targets set out in the final year of the plan period. This study showed some achievements on veterinary service development of dairy farms, production of milk and eggs and creation of self-employment through different veterinary services. The Agriculture Division of the Planning Commission showed interest to know the production of crossbred cattle population in the adjoining areas of Central Cattle Breeding Station (CCBS), Savar in 1989 and suggested to undertake quick survey. The Economic and Marketing Research Division of Bangladesh Livestock Research Institute, Savar conducted a research work to find out the impact of artificial insemination in the adjoining five villages.

Survey study was performed and the statistics showed that on an average about 8.63 percent crossbred and 1.31percent pure breed cattle were found. Government of Bangladesh also puts due emphasis on enriching this sector and many programmes were already launched especially during the period of the first three Five Years' Plans (FYPs) up to 1990-91. During the Fourth FYP, government

¹⁵ GOB, *Annual Report*, 1995, p. 2.

took specific policies for livestock development and a good number of programmes were implemented during 1991-92 to 1995-96 to increase the livestock production.

The main objectives of livestock policy of 1992¹⁶: The main objectives are to increase people's participation and create new employment opportunities, and alleviate poverty of the rural poor through livestock development; to protect environmental degradation by scientific management of livestock and poultry; to increase the supply of milk, meat, hides and skins, eggs etc, through increase in productivity of animals and birds; to increase the supply of draft power of both cattle and buffalo through genetic improvement, better veterinary services, adequate feed supplies and harness improvement; and to increase foreign exchange earnings through export of quality hides and skins and reduce dependence on import of powdered milk.

1.3 Statement of the Problem

This study entitled "Impact of Livestock Policies and Programmes of the Bangladesh Government on Production" is a research work conducted in an area where much works were not done earlier. Here "Impact" is used to mean the consequences/ ultimate results of the endeavours taken or the eventual effects. Again, the effects are the existing livestock resource, milk, meat, eggs, hides and skin production and livestock farming for economic gain and poverty alleviation of the farmers. The growth of livestock related industries are also included.

Livestock : Animals domesticated for profitable use for both economic and nutritional purpose. Nutritional means getting meat, milk etc. for human consumption to meet the nutritional requirement. Livestock is also stated as domestic cows, horse, sheep, and pigs.¹⁷ In this experiment, cattle, buffalo, sheep, goat and poultry (fowl & duck) are included. Poultry the domestic birds that freely reproduce under human care and that contribute to the nutritional values as well as to the economy of the country. Only chicken and duck have been emphasized in this study.

¹⁶ GOB, *Livestock Development Policy* (Dhaka : Ministry of Fisheries & Livestock, Directorate of Livestock Services, 1992), p. 4.

¹⁷ S.K. Ahmed (ed.), *Joy Concise Dictionary* (Dhaka : Joy Books International, 1995), p. 594.

Policies mean the statements of aims and ideals in relation to livestock development i.e. what plan was taken for livestock development.

Programmes mean the specific plan of work what was done to attain the goal of the policies taken. In this work, it indicates the specific projects implemented to attain the goals of policies.

In order to fulfil the requirements of existing and increasing livestock production, the government undertook different policies to improve the quality of animal and bird through genetic upgrading, the provision of treatment and curative measurement, the supply of fodder through intensive use of available land, the livestock management through manpower training and skill development and maintaining the quality of draft animals; and by improving the marketing facilities. The policies also give emphasis on development of dairy cattle and establishment of dairy farms through subsidies and credit on easy terms. However, poor attention was given to the sub-sector until the recent past.

In spite of that, about 50,000 private poultry farms, 26,000 duck farms and 26,000 dairy farms were set up up to 1996 in the private sector. A DLS report states that the number of farms increased to 1,02,849 in 2003-2004. The same report shows that the number of private hatcheries were 100, Feed mill 27, Goat farms 25,890 and sheep farm 12,122 and the population of cattle were 22.53 million, buffalo 1.10 million, goat 17.69 million, sheep 2.20 million, poultry 162.44 million and duck 35.33 million. Consequently, there had been a 60 percent fall in the import of powdered milk. The production of milk and meat increased by an annual compound growth rate of 1.3 percent and 3.2 percent respectively. The growth rate of egg was 6.5 percent between 1990-91 and 1994-95.¹⁸ This growth rate has been continuing gradually. The contribution of this sub-sector was 2.89 percent in 2003 which was equivalent to Tk. 63,010 million as stated in Bangladesh Economic Review. Moreover, if the value of employment generation is taken into consideration the contribution of this sub-sector reaches higher. About 15.00 million manpower in full time and 30.10 million in part time are employed in this sub-sector (25 percent and

¹⁸ GOB, *The Fifth Five Year Plan*, 1997, p. 253.

50 percent of the population respectively). Livestock plays a vital role in rural poverty alleviation and expansion of industries and enterprises which can also be considered as the factors of their contribution to national economy. In respect of nutritional requirement of the people of our country, only 13.81 percent milk, 10.58 percent meat and 25.22 percent eggs were produced upto 1996 which increased to 14.99 percent, 13.68 percent and 34.76 percent respectively in 2001-2002.

The following tables (annual per capita availability of livestock products during 1994, 2002 and during 1979-81 to 1993-94) state the relative growth of livestock products for the last two decades.

Table 1.1
Production, Requirement and Deficits of Livestock Products (1994)

Products	Per capita Need	Per capita availability	Total need ²	Total Production	Total deficit (year) ³
Milk	250ml/day	32.06ml/day	10.859 mmt ⁴	1.392mmt (12.82%)	9.467mmt (87.18%)
Meat (all)	120 gm/day	12.51 gm day	4.691mmt (100%)	0.489mmt (10.42%)	4.202mmt (89.58%)
Eggs	2/week	.486/ week	9900.8mn ⁵ (100%)	2404.40mn (24.28%)	7496.4mn (75.72%)

Source : The Fifth Five Year Plan, 1997.

Note : 1. Population in 1994 = 119 million, 2. Total requirements for meat and eggs are calculated making a deduction of 10% and 20% respectively from total population, 3. The deficit in meat is calculated assuming all meat coming from livestock sources. Assuming 50% animal protein to be supplied by the fishery sub-sector, the net deficit in meat comes down to 79.15%, 4. mmt = million metric ton, 5. mn = million number.

The same parameters cited above are shown in the following table for the year 2002.

Table 1.2
Production, Requirement and Deficits of Livestock Products (2002)

Products	Per capita Need	Per capita availability	Total need ²	Total Production	Total deficit (year) ³
Milk	250ml/day	41 ml/day	11.87 Mmt ⁴	1.78 Mmt (14.99%)	10.09 Mmt (85.01%)
Meat (all)	120 gm/day	37 gm day	5.70 Mmt (100%)	0.78 Mmt (13.68%)	4.92 Mmt (86.32%)
Eggs	2/week	.67/ week	13520 Mn ⁵	4700.00Mn (34.76%)	8820.00Mn (65.24%)

Source : DLS, 2002 (as calculated from DLS data)

Note : 1. Population in 2002 = 130 million, 2. Total requirements for meat and eggs are calculated making a deduction of 10% and 20% respectively from total population, 3. The deficit in meat is calculated assuming all meat coming from livestock sources. Assuming 50% animal protein to be supplied by the fishery sector, 4. mmt = million metric ton, 5. mn = million number.

The above table shows deficits of the milk, meat, and eggs in relation to the per capita requirement. People are getting 32.06 ml (12.82 percent) of milk per head per day against the minimum requirement of 250ml. In the same way per capita daily availability of meat is only 12.51 gm (10.42 percent) against a requirement of 120 gms; and the pre capita weekly minimum requirement of 2 (two) eggs, people are getting 0.486 (24.28 percent) egg. It has been clearly stated that there is a shortage of production of 87.18 percent milk, 89.58 percent meat and 75.72 percent of eggs in this country. The milk availability per capita per day also decreased gradually because of the relative higher growth of population in relation to the growth of livestock products.

However, some of the problems of this sub-sector are inadequate supply of vaccines, medicine, equipment, feed, health care facilities, quality breed, parent stock, credit facilities and other inputs that are responsible for slow growth of livestock products. At this stage, it is necessary to know the major problems of this sub-sector that hinder its growth and development. What is the trend of its past growth rates? How can this sector's growth rate be improved in near future? What are measures needed to be undertaken for its development? In this relation, such other relevant queries are evolved. In short, this study aims at analyzing the past growth trends of livestock sub-sector, meaning the impact of government's policies and programmes on this sub-sector, identifying the present status of livestock production, obstacles towards augmentation of production; and at suggesting remedial measures.

1.4 Objectives of the Study

The main objective of the research project is to study the impact of the policies and programmes already launched since 1971 on livestock production. The research project examines and finds out what impact and therefrom changes took place during the post independence period. This also helps to show the differences between the status of livestock situation in 1971 and that of the present (2000).

This study wants to find out the effects of the programmes and policies for livestock development in terms of:

Fulfilling the protein requirements of the population of the country. This fulfilment of protein requirement can be measured though estimating the production of milk, meat and eggs. There is large shortage of milk, meat and eggs compared to the minimum requirement of the country.

Economic feasibility of the livestock development programmes. There is a budget in the ADP in each fiscal year. There are development projects to increase livestock production in various fields of livestock development e.g. poultry production, dairy production, beef production etc. and therefrom there is increase in production of milk, meat, eggs, hides and skins etc. In relation to the investment in this sector, determining the extent of production of the output can show a ratio of these two factors. Here the increase in income of the farmers as a result of utilizing the modern facilities of livestock development can show the changes occurred.

Determining the acceptance of modern facilities of livestock development among the general mass especially among the farmers. The modern facilities are breeding strategy and artificial insemination to develop the genotypic characteristics of livestock species; fodder cultivation, vaccination facilities, treatment facilities, credit facilities, research and training facilities for updating the knowledge about modern scientific management of livestock farming etc.

However, the Specific Objectives of the Study are

- a) To review the last three decades' livestock policies and programmes of Bangladesh Government.
- b) To measure the past growth trend of this sub-sector.
- c) To study the impact of the programmes at macro level.
- d) To study the impact of those at micro-level farms by observation and survey method.
- e) To review the financial allocation vis-a – vis achievement in livestock sub-sector.
- f) To identify the major obstacles towards its growth and development.
- g) To suggest measures for improvement of this sub sector.

The hypothesis drawn for this purpose is that there is a significant difference in average production trend of livestock and the production trend in the nineties.

1.5 Review of Literature

On this topic, the available literature in the country is very limited. However, some of the relevant literatures are reviewed here.

Rahman (1986) in a study on household distribution of draught animals found that with the increase in the proportion of land ownership per family, the number of draught animal increased. It also showed a reverse tendency in draught cattle ownership with the increase in years. He studied the cattle ownership of different landowner groups in 1972 and in 1981¹⁹ and showed that the average ownership decreased from 1.66 in 1972 to 1.31 in 1981. This is a very interesting study that showed the decline of per household ownership of Livestock. But the scope of the present study is wider and its aims are broader.

Alam (1995) in a study stated that in spite of a high density of livestock population; the country suffers from an acute shortage of livestock products like milk, meat, and eggs. The domestic production of milk, meat and eggs are only 12.82 percent, 10.42 percent and 24.28 percent respectively of minimum requirements.²⁰ The per capita availability of animal protein from domestic livestock source has declined from an average 2.03 gm. per day to 1.82 gm. per day over the 1977-87 period (GOB, 1990). The shortage of livestock products is attributed to prevalence of wide spread of livestock diseases, acute feed shortage, poor genetic quality of livestock species, and their low productivity. It does not deal with impact of the government's programmes on its production.

Bangladesh Livestock Research Institute (1995): A study conducted by Bangladesh Livestock Research Institute (BLRI) shows that there is an acute shortage of animal power for tillage operation. The extent of shortage appears to be

¹⁹ A. Rahman, "Differences in the Ownership of Other Material Elements of Production", *Peasants and Classics* (London: Zed Books Ltd., 1986), p. 124.

²⁰ J. Alam, *Livestock Resources in Bangladesh, Present Status and Future Potential*, 1995, p. 4.

7.3 percent in terms of number of draft cattle heads, but the proportion rises to 40.9 percent when the estimate is made on the basis of power unit.

The situation has been aggravated by a decline in power output of each work animal from 0.25 Hp in the seventies to 0.17 Hp in the eighties.²¹ The average body weight and power output of cattle in Bangladesh is currently very low compared to that of many other countries of the world. The scope of this study was very narrow. The new study covers wider aspects of livestock production.

ADB (1996): Asian Development Bank (1996) in a report states that the acute shortage of milk, meat and eggs in Bangladesh is attributed to poor genetic quality of livestock species with low productivity. The current milk production in the country is about 211 kg per cow per year against 4920 kg in Denmark and 5377 kg in USA. The average meat production of native cattle is about 50 kg per animal against 244kg in Denmark and 271kg in USA. A native hen lays 40 to 50 eggs a year against 250 to 300 eggs laid by a hen of exotic breed. However, production of meat per goat is very close to world average.²² But this study was not conducted to include all aspects of what the present study aims to achieve.

Department of Livestock Services (DLS, 1987): DLS states that the bones, horns and hooves from large and small ruminants have great economic value. Bangladesh produces about 5,115 tons of bones in a year from cattle and buffaloes (GOB, 1986). There are 20 bone-crushing factories in Bangladesh. The country earned Tk 19.0 million by exporting crushed and uncrushed bones in 1990-91.²³ This study brings new aspects for conducting livestock related research. The present study looks into the export earnings from livestock sub-sector as well.

Planning Commission (1994): The Economic Review Committee of the Planning Commission in a study in 1994 found that the livestock sub-sector could

²¹ GOB, *A Study on Five Adjoining Villages of Savar Dairy Farm* (Dhaka : BLRI, 1995), p. 6.

²² Asian Development Bank, *Main Report* (Manila: Third Livestock Development Project, 1996), v.1.

²³ GOB, *A Report* (Dhaka : Department of Livestock Services, Ministry of Fisheries and Livestock, 1992).

achieve a gradual increase in the growth rate of livestock. Due to high potential and government's efforts on livestock activities, the growth of this sub-sector had been 2.15 percent, 3.58 percent and 4.92 percent in the years 1990-91, 1991-92 and 1992-93 respectively while the attainment rate was 6.68 percent in the year 1993-94.

With the increase in the growth rate of livestock sub-sector the import of livestock products declined significantly. The records in import of milk and milk-products showed a declining trend. The amount spent in importing these products were U.S.\$ 63.00 million, 65.00 million 37.00 million and 21.00 million in 1991-92, 1992-93, 1993-94 and 1994-95 (July-Dec.) respectively.²⁴ This was due to increased production of milk in the country. This study also justifies the undertaking of the present study.

Bangladesh Livestock Research Institute (1991): The Agriculture Division of the Planning Commission showed interest to know the proportion of crossbred cattle population in the adjoining areas of Central Cattle Breeding Station (CCBS), Savar in 1989 and suggested to undertake a quick survey.²⁵ The Economics and Marketing Research division of Bangladesh Livestock Research Institute, Savar conducted a research work to find out the impact of artificial insemination in the adjoining five villages. The study was performed and the statistics showed that on an average about 8.63 percent crossbred and 1.31 percent pure breed cattle were found in those villages. By farm-size 8.62 percent crossbred and 1.13 percent pure breed cattle were found. This study also helps to look into a special aspect of the present study on the impact of government's programmes on production of livestock.

With a view to find out the possibilities of increasing income and labour employment through the introduction of poultry and dairy enterprises, **Sirohi et al.** (1982) conducted a survey of 72 farms in Union Territory of Delhi. By using linear programming technique and on the basis of data pertaining of sample of 72 farms, they observed that accompanied by liberal credit facilities and resource mobilization, the enterprises increased labour employment substantially, besides augmenting income of the marginal and small farms.

²⁴ GOB, *The Economic Review Committee Report* (Dhaka : Planning Commission, 1994).

²⁵ GOB, *Report of Agricultural Division* (Dhaka : Planning Commission, 1991).

Basically, the study was concentrated mostly on the productivity and income and employment aspects.²⁶ This study could hardly reflect on the impact of government policy for livestock development. The present study would reflect the impact of livestock policy of Bangladesh government on production and hence help to recommend future strategies to be taken for the development of this sub sector.

Shahjahan (1992): In a paper entitled "Livestock Development Strategies in Bangladesh" states that livestock played an important role in the economy of the country. Special emphasis should be given for its development. He stressed that the livestock sub-sector possessed a very prospective future in the economy of the country and the government should take proper strategy for its development. Indicating some strategies, the author stressed that, if given due emphasis, this sub-sector could show an increased share in GDP and play a great role in development process of the country as well.²⁷ The present study would help to identify areas to be knocked for livestock development through conducting the impact study.

Jabber, et. al (1993) in the study "The status and potential of Livestock within the context of Agricultural Development Policy in Bangladesh" states that though the potential of livestock in Bangladesh is limited, there could be a great scope for increasing the status and potential of the species. In a survey on milk production, they found the average daily production of 1.42 litres and 1.21 liters respectively for a non-draught and draught cow. However, the development of livestock sub-sector under agriculture sector could be done if agricultural development policy could be modified.²⁸ In the present study the livestock development strategies and policies would be analysed and examined and recommendations could be made on the basis of the practical need of this sub-sector.

²⁶ A.S. Sirohi *et al.*, "Role of Dairy and Poultry Enterprises for Increasing Income and Employment on Farms in the Union Territory of Delhi", *Indian Journal of Agricultural Economics*, Vol. XXXV, No. 4, 1982, p. 112.

²⁷ M. Shahjahan, "Livestock Development Study in Bangladesh", *Proceeding of the Workshop on Livestock Development in Bangladesh*, Held on 16th July, 1991, BLRI, Savar, Dhaka, 1992.

²⁸ M.A. Jabber and D.A.G. Green, "The Status and Potential of Livestock within the Context of Agricultural Development Policy in Bangladesh", *Department of Agricultural Economics*, The University College of Wales, Aberystwth, 1993.

Akteruzzaman (1993): analysed the economic impact of cattle distribution programme of Bangladesh Rural Advancement Committee (BRAC) for rural poverty alleviation. It was found that the rural dairy farming was found profitable with the estimated return of Tk.44.99 and Tk.25.67 per cow and per day respectively. The benefit cost ratio was 1.42 and the average cost of milk production was Tk.9.40 per litre. The average family income as well as the income from livestock farming due to the programme increased to a considerable extent.²⁹ This study showed the impact of cattle distribution programme of BRAC in selected areas. But the proposed study would help finding impact of livestock policies and strategies of the government for a period of last three decades. The scope of the proposed study is much higher than this study.

Alam et al. (1995) conducted an experiment on the economics of mini dairy farms using data collected from a total of 20 randomly selected farms. Among these, 10 were from Savar in Dhaka district and another 10 from Manikganj Sadar Thana . They found that average number of milch animals per farm were 2.55 crossbred cows and 0.65 local cows.³⁰ Rural farming pattern on dairy cows was done on two areas. A broader aspect of study is needed to evaluate the impact of livestock activities.

Rahman (1996) conducted a study to know the present status, constraints and prospect of private small dairy farms in Dhaka Metropolitan City areas. It was observed that 19 percent farmers have taken dairying as main business and 81 percent as side business. The lactating cows on an average were 36.38 percent and average milk production per day per cow was 7 liters. It was observed that each farm had been rearing on an average 72.70 percent crossbred cattle and 27.30 percent indigenous cattle. Most of the private small dairy (75 percent) farms were having semi-concrete houses for their animals. The average market price per kg of milk was TK. 24.00.³¹

²⁹ M. Akteruzzaman, "The Economic Impact of Cattle Distribution Programme for the Alleviation of Rural Poverty in Some Selected Areas of Bangladesh", *Final Report*, submitted to Winrock International Human Resource Development Programme, BARC, Farmgate, Dhaka, Bangladesh, 1993.

³⁰ Alam et al., "Economics of Mini Dairy Farms in Selected Area of Bangladesh", *Asian Australian J.Ani.Sci.*, 8(1) : 17-22, Cited from World Agricultural Economics and Rural Sociology Abstracts, 37(6) : 487.

³¹ M.M. Rahman, "A Study on the Present Status of Private Small Dairy Farms in Dhaka metropolitan City", M.Sc Thesis, Department of Dairy Science, BAU, Mymensingh.

Here different aspects of farm management, production and related economics were studied at micro level. No study on the impact of government policies and programmes was done in this experiment.

Islam and Oliuzzaman (1992) conducted a survey work in different unions of Trishal, Gauripur and Mymensingh Sadar Thana; and found that the average number of cattle were 3.03, 3.49 and 3.10 per family in Trishal, Gauripur and Sadar Thana respectively. For all the areas the number of the animals per family averaged 3.10 heads. The number of milking cows in Trishal, Gauripur and Sadar Thana were 0.59, 0.82 and 0.73 per family respectively.³² The average number of milk cows were 0.64 per family for all the study areas. This study only shows the farm size per household which did not study any impact of government policies and programmes.

Khan (1996) in a study to know the existing status of private dairy farms in four districts found that the average distribution of occupation as agriculture was 36 percent, as business 41 percent, as service holder 15 percent and others 8 percent. Among the respondents 55 percent farmers had bamboo/ wooden tin shed houses, 37 percent tin-roofed cemented house, 6 percent farmers had thatched houses and only 4 percent had concrete building.³³ In this study the involvement of people of different occupation, types of housing systems and related animal husbandry practices were analysed. No study on impact of government programme was done. The scope of the study was also very limited.

Rahman (1992) studied potentialities and constraints to dairy development at Bhabakhali area of Mymensingh, Bangladesh. It revealed that small farmers were generally interested to rear high yielding cows. The study identified some crucial problems like high feed cost, low yield for indigenous breeds and lack of livestock credit and insurance.

³² M.N. Islam and M. Oliuzzaman, "A Study on the Existing Distribution Pattern Rearing Practice and Some Economic Productive and Reproductive Dairy Characters of Indigenous Cows in Some Selected Areas of Mymensingh District", *Annual Report*, BAURES, 7(A), 1992.

³³ M.S. Khan, "Study on Status of Private Dairy Farms among Different District in Bangladesh", M.Sc Thesis, Department of Dairy Science, BAU, Mymensingh.

Despite of some limitations the study showed that there were potentials particularly for the small and marginal farmers to get income for adopting "mini-dairy" farming or "family dairy farming" as a supplementary enterprises.³⁴ This study also did not find the role of the programmes of DLS.

Shahjahan *et al.* (1994) showed the production capacity and economic efficiency of dairy farming in the study on "Crossbred Dairy Development in Dhaka Metropolitan City". They studied on a total of 2973 farms of which 2685 (90.30 percent) were small holders having 1-4 cows, 236 (7.94 percent) were medium holders having 5-10 cows and 52 (1.75 percent) were big holders having 11-50 milch cows.³⁵ This is a study at micro-level where the impact of government innovation and intervention was not reflected.

Sarker (1995) conducted a study to determine the probability of dairy enterprises in two areas of Pabna and Sirajgonj district. He identified some crucial problems such as scarcity of feed, milk marketing problems and lack of technical knowledge. The farmers/entrepreneurs opined for breed improvement, availability of balance ration, proper marketing, availability of loan, proper management and training, proper breeding facilities, availability of medicine and veterinary services and increasing awareness for the improvement of this sub sector. He also offered a number of suggestions for solution, which included subsidized supply of concentrate feed, development of milk marketing facilities and extension of artificial insemination services as important ones.³⁶ This study, however, emerges to have an impact study of the programmes of DLS from broader aspect as it was done to find out the scope of dairy farming in a small area.

³⁴ S.M. Rahman, "Dairy Development in Bangladesh" *Proceeding of 4th National Conference of Bangladesh*, Animal Husbandry Association held on December, 1992.

³⁵ Shahjahan *et al.*, "Contribution of Crossbred Dairy Development in Dhaka Metropolitan City in Attaining Milk Self Sufficiency, Proceedings of the Workshop on the Role of Agriculture in Improving City Environment and Self-Employment Generation", 22 June 1994, BARC, Dhaka, Bangladesh, Krishibid Institution, Bangladesh, Dhaka City Chapter, pp. 67-74.

³⁶ M.A. Sarker, "Economic Analysis of Dairy Cattle Enterprise and Its Pattern of Contribution to Farm Income in a Selected Area in Bangladesh", M.Sc Thesis, Department of Agricultural Economics, BAU, Mymensingh, Bangladesh.

Halim (1992) in a study identified some problems of raising cows in the rural areas of Bangladesh. He found that scarcity of feeds and fodder, insufficient veterinary care and services, inadequate grazing land, non-availability of good quality bull, distance of insemination centres, lack of institutional credit, inadequate training facilities and low price of milk were the main problems of the farmers.³⁷ He did not study the role of DLS to address the problems of the farmers.

Rahman et al. (1995) carried out an assessment on the productive status of Zebu cows in the Tangail milk shed area. The reproductive state of the local cows in a cooperative owned by farmers in 4 villages (Tangail milk shed area) was evaluated. About 900 cows were included in the study. The calving to conception interval was averaged 12.57 ± 0.44 months.³⁸ This study assessed the reproductive status of Zebu cattle in a micro-level study, which does not relate with the impact of government policy and programmes on production.

Sayed et al. (1994) conducted a study to compare the cost of raising native and crossbred dairy cows and returns received from them. For this purpose, 144 cows from 132 households from 24 villages were randomly selected. Of these, 96 were native cows and 48 were crossbred cows. The study revealed that among the structure of cost components, labour cost occupied the major share in the total costs of milk production per litre. The total cost of raising native and crossbred cows were TK. 14,155.00 and 19,854.00 per anum respectively. Return from native cows was TK.0.52 and from crossbred cows was TK. 3.40 per litre of milk. The cost benefit ratio of milk per litre was higher in crossbred (1:1.33) than native ones (1:1.04) showing the profitability of dairying with crossbred cows which seemed to be viable in commercial enterprises in Bangladesh.³⁹

³⁷ M.A. Halim, "A Comparative Economic Analysis of Local and Crossbred Dairy Cows in a Selected Area of Dhaka District", M.Sc Department of Agricultural Economics, Bangladesh Agricultural University, Mymensingh.

³⁸ Rahman *et al.* "Assessment on Reproductive Status of Zebu Heifers and Cows in Tangail Milk Shed Area", *Bangladesh Veterinary Journal*/Vol. 29, No. 1-4, Dhaka, 1995. pp. 17-24.

³⁹ Sayed, *et al.*, "Economics of Milk Production in Dhaka District : A Case for Savar Thana", *Asian Australian J. Ani. Sci.*, 7(1), Seoul, 1994, pp. 49-55.

This study has given emphasis to find out the viability of dairy farming with crossbred cows. It could not reflect the impact of government policy for increasing livestock production through her on-going programmes.

Hossain (1998) in a study to know the present management condition and prospects of the existing private dairy farms of Rangpur Sadar Thana. He found that the lactating cows of the farms on an average was 45.19 percent and the construction of cow-shed were straw made thatched house 48 percent, tin shed 26 percent, full concrete building 4 percent and half building (tin roofed concrete) 22 percent respectively. Milking system was manual and number of milking was twice a day. About 54 percent farm-owners stated that their farms were profitable.⁴⁰ This study was also concentrated in one area. A study across the whole country to know the impact of government policies and programmes should also be done.

Ukill and Paul (1992) conducted a study on problems and prospects of broiler industry in Chittagong region. They found the non-availability of birds/chicks, prevention and control of disease, lack of balance feed, housing and fluctuation of marketing price were the basic problems of broiler poultry farming. They showed that 80 percent profit was earned within a year by broiler farming.⁴¹ This study only showed the prospects and problems of broiler industry in Chittagong region. No reflection of the activities of DLS has been identified in this study.

Karim (2000) conducted a study on "An economic analysis of broiler enterprise under contract farming system in the area of Bangladesh".

In this study, attempts have been made to analyse the performance of broiler farms in terms of profitability and sustainability under contract growing prevailing located at Bajitpur Upazilla of Kishorgonj district. Cost and return were calculated to find out the profitability of broiler production. Total cost per bird per batch was estimated at Tk. 78.43 for small farms, Tk. 78.51 for medium farms, Tk. 78.32 for

⁴⁰ Z.M.A. Hossain, "Study on Present Management Condition of Private Dairy Farm in Rangpur Sadar Thana", M.Sc Thesis, Department of Dairy Science, BAU, Mymensingh, 1998.

⁴¹ M.A. Ukill and D.C. Paul, "Problems and Prospects of Broiler Industry in Chittagong Region", Forth National Conference of Bangladesh Animal Husbandry Association, Dhaka, 1992.

large farms and Tk. 78.31 for all broiler farms. It was found that the variable costs accounted for the major part of the total costs, the average gross return per bird per batch stood at Tk. 89.21, Tk. 89.40, Tk. 90.71 and Tk. 89.87 for small, medium, large and all broiler farms respectively. The net return per bird for small, medium, large and all broiler farms were Tk. 10.80, Tk. 10.85, Tk. 12.40 and Tk. 11.75 respectively.⁴² This study could not show any role and impact of the programmes of DLS.

Ahmed (1984) studied the characteristics of different crossbred cows of Savar Dairy Farm from July, 1982 to June, 1983.⁴³ He found that the age at puberty and first calving, the milk production, the length of calving interval and lactation periods, the daily weight gain, the mortality and disease rates were higher for crossbred cows than those for local ones. In this study, some problems of dairy rearing in intensive system of farming were identified; but the impact of DLS policies and programmes on these issues was not studied.

Shahjahan *et al.* (1994) conducted a study on "contribution of crossbred dairy development in Dhaka metropolitan city". The objective of the study was to undertake census of crossbred animals in Dhaka metropolitan area, to know its production capacity and economic efficiency of small holders, availability of crossbred animals, their management and feeding practice, extension of veterinary service from the Directorate of Livestock Services and other constraints faced by the farmers. The study showed that 93.4% farmers were small holders having 1.4 milch cows, 5.4% were medium holders having 11-50 and above milch cows. The production record of crossbred cows varies from 5-25 liters per day depending on feeding and management practices.⁴⁴ The selling rate of fresh milk varied from Tk. 18-25 per litre. It was noticed that about 75.2 percent of farmers used artificial

⁴² F. Karim, "An Economic Analysis of Broiler Enterprise under Contract Farming System in an Area of Bangladesh", M.Sc Thesis, submitted to the Department of Co-operation and Marketing, BAU, Mymensingh, 2000.

⁴³ Z. Ahmed, "Breeding Policy : Its Past, Present and Future Strategy", Central Cattle Breeding Station (CCBS), Savar, Dhaka, 1984.

⁴⁴ Shahjahan, *et al.*, "Contribution of Crossbred Dairy Development in Dhaka Metropolitan City", Proceedings of the Workshop on the Role of Agriculture in Improving City Environment and Self-employment Generation, 22 June, 1994, BARC, Dhaka, Bangladesh, Krishibid Institution, Bangladesh, Dhaka City Chapter, pp. 67-74.

insemination (AI). The study also identified some constraints of rearing crossbred cows and made a set of suggestions to overcome the constraints and for dairy development in the study area.

Rahman and Rahman (1991) conducted a study on economic analysis of dairy enterprise in four selected villages of Mymensingh district in Bangladesh. They observed that small farmers were generally the owners of high yielding cows or buffaloes in all the study areas. The findings showed that farmers in Bhabakhali, Mymensingh town and Birampur areas gained substantially by keeping milch animals. Feed cost was higher in the urban and milk pocket areas than in the rural and semi-urban areas. In buffalo area (Ahmed Bari) feed cost was highest. The gross returns per animal were positive for all types of cows. Net returns were also positive and higher for the high yielding cows and buffaloes.⁴⁵ The study identified some crucial problems such as high feed cost, low yield for indigenous breed, lack of livestock credit and insurance for dairy development.

1.6 Justification

The importance of livestock in fulfilling the protein requirement and food production, earning foreign currencies, as well as in poverty alleviation is well known. Its contribution to the GDP is also countable. To uplift the status of livestock, the DLS has been trying its best since British regime. Programmes for breeding and improvement of animal health and disease control, animal nutrition, improvement of training and education, for credit and research etc. were launched during the last three decades.

Though the budgetary allocation for livestock development, and therefrom the ADP could not bring the due amount as per the requirement, still the DLS could not utilize it to its satisfactory level.

A number of development projects are being implemented each year. Though there was no policy of livestock development as such up till 1991, still the

⁴⁵ M.M. Rahman and M.H. Rahman, "An Economic Analysis of Dairy Enterprise in 4 Villages of Mymensingh District in Bangladesh", Research Report Submitted to the Bureau of Socio-economics Research and Training, 1991.

development programmes and projects were launched every year and the government tried to develop this sub-sector.⁴⁶ A number of such other studies in relation to profitability, breeding efficiency, feeding and nutritional efficacy of different type of animal and poultry rations, prevention of diseases, treatment and disease control measures, herd health management, processing, production and marketing of different livestock products and by-products including hides and skins, fodder production and preservation, feed analysis, storage, milling, transportation and distribution; different farming and production systems etc. were done for livestock development. But, now-a-days there is an emergent feeling for impact study of government programmes to evaluate their effectiveness. Since 1991, i.e. at the initial stage of the fourth FYP, Government undertook some specific strategies and policies to develop this sub-sector.⁴⁷ But the impact of these policies and programmes were not studied earlier by any researcher.

As no study on the impact of livestock policies and programmes on its production has yet been done to know the effectiveness of the policies and programmes of livestock development especially those taken after independence, an impact study has been felt essential to evaluate the performance of government programmes. It is also expected that the findings and the remedial measures which are recommended in this study to overcome the constraints to the development of livestock sub-sector would be useful to the DLS, under the Ministry of Fisheries and Livestock (MOFL); to the teachers and students of the faculty of agriculture; to the planners, policy makers and to the researchers.

1.7 Scope and Limitations

The study is conducted to see the impact of livestock policies and programmes on livestock development in the post liberation period. The main emphasis of the study is to evaluate the impact of the government policies and programmes on the development of this sub-sector.

⁴⁶ GOB, *Annual Report*, 1990.

⁴⁷ GOB, *Livestock Development Policy* (Dhaka : Department of Livestock Service, 1991), p. 3.

The study reviews the policies and programmes of the DLS under the MOFL. The impact of the programmes at macro-level is studied here. The contributions of livestock sub-sector to GDP, import and export of livestock products and by products are included in this study. The study looks into the impact of the programmes at micro level farms also. The major problems of livestock development and suggestions to overcome those are also stated in this study.

The present production status of meat, milk, eggs, hides skins livestock products and in some cases livestock by-products is analysed here. The growth trend of livestock sub-sector in the post-liberation period is analysed and examined in this study for forecasting the future prospects.

However, like any other study, this study also has some limitations. Only 120 farmers were randomly selected from across the country to conduct this study. Larger samples could not be taken due to time, budget and resource constraints. The growth trend of the last three decades was analysed very briefly for keeping place for other chapters.

1.8 Methodology

For any type of investigation, the investigator or researcher has to follow appropriate guideline i.e. the method, which somehow differs, from one investigation to another.⁴⁸ This method is set in such a way that it must satisfy the objective of the investigation/research project.⁴⁹ However, in any type of investigation, emphasis is given on the use of documentary analysis for collecting information from secondary sources.⁵⁰ For Secondary data this study uses documentary analysis method and for primary data it uses survey method.

⁴⁸ William Geddie, *Chamber's Twentieth Century Dictionary* (London : W & R Chambers Ltd., 1965), p. 669.

⁴⁹ Lawrence Urdong (ed.), *The Random House Dictionary of the English Language* (New York : Foundation House, 1968), p. 811.

⁵⁰ Julius Gould and William L. Kolb, *A Dictionary of the Social Sciences* (London : 1961), p. 425.

The unpublished official documents, manuscripts, dissertations, reports etc. are the main sources of secondary data. Moreover, micro-level field survey is the source of the first hand primary data. Direct observation and informal discussions with the concerned persons and the farmers supplement this primary data. Annual reports of DLS, manuals, records, statements, accounts, magazines, journals and periodicals, Planning Commission's reports, statistical reports, books articles etc. are also used as sources of secondary data. About 120 livestock farms are selected purposively from the six administrative divisions of Bangladesh for collecting primary data through survey method. Out of 120 farms, 45 are located in Dhaka division, 35 are in Chittagong division, 10 farms are from each division of Rajshahi, Khulna, Sylhet and Barisal. Limited time, costs and resources compelled the researcher to study only 120 sample from a large population. The data were collected during 1999. Chapter-5 gives further details of selection of samples and administration of a questionnaire for collection of primary data.

1.9 Statistical Analysis

To make the experiment a success and thereby to draw the results, statistical analysis of data is to be completed. In the light of the objective and the hypothesis, the data are classified, computerized and tabulated. Determination of central tendency by using mean, median and mode is necessary. Percentage of any parameter is used wherever necessary. Correlation, regression, test of significance, etc are found out to conclude on the relation lying between the variables and the parameters. The computer facilities were utilized as per convenience. Concrete conclusions are drawn from the statistical analysis.

1.10 Chapter Plan

- I. Introduction : This chapter states the Problem, Objectives, Methodology, etc.
- II. The second chapter gives A Review of Livestock Policies and Programmes of Bangladesh Government since 1973 (during the last three decades).
- III. The third chapter states An Analysis of Impact on the Growth Trend of Livestock Sub-sector during 1971-2000.

- IV. The fourth chapter measures the Programmes' Impact at Macro Level.
- V. The fifth chapter examines the Programmes' Impact on Selected Micro Level Farms.
- VI. The sixth chapter identifies the Factors Responsible for Low Level Performance.
- VII. The seventh chapter suggests the Remedial Measures for Promotion of Livestock Sub-sector.
- VIII. The last chapter eight states Summary, Recommendations and Conclusions.

1.11 Conclusion

From this study the impact of livestock development programmes is visible. The over all impact e.g., people's acceptance of modern scientific methods of livestock rearing, creation of awareness among people, change in production of livestock products, economic analysis etc. are found out from the study. The major problems and the remedial measures are also identified through this study. So, It is useful for the growth of livestock sub sector.

Chapter 2

A REVIEW OF LIVESTOCK POLICIES AND PROGRAMMES OF BANGLADESH GOVERNMENT

As livestock plays an important role in raising agricultural GDP as well as in the economy of Bangladesh, this sub-sector should have specific policies and strategy for its development. There were some specific programmes for the development of this sub-sector, but there were no policies as such until the initiation of the Fourth Five Years' Plan (1990-1995). However, the past programmes on livestock sub-sector are reviewed below.

2.1 The First Five Years' Plan Period (1973-78)

In the First Five Years' Plan, the development of livestock was centred round to two major objectives and those were improvement in the quality of draft power and increase in the supply of animal protein by greater production of milk, milk products, meat and eggs.

During the last 3 years of the commencement of the first FYP, the livestock population declined due to the cyclone and the diseases. This has partly been replenished by natural growth. Most estimates show that livestock output in Bangladesh has progressively declined since 1964-65.¹ Not only that the draft power in the country had failed to keep up with demand but the per capita availability of meat, milk products and eggs had also gone down.

There was no specialized commercial livestock industry in Bangladesh. Practically all livestock were reared and maintained on small farms by way of mixed farming. The local breeds were small in size and poor in milk and meat production. Since there was a heavy pressure of population on land, there was competition between man and animal on a given area of land for food and feed. The area for production of green fodder and roughage has gone down considerably. Livestock

¹ GOB, *The First Five Years Plan (1973-78)*, 1973, p. 125.

feed, on commercial basis, had not developed in the country. As a consequence, both the quantity and quality of livestock had gradually gone down. The poultry birds were mostly scavengers and small in size. They were susceptible to epidemics against which there was hardly any effective control. Cattle population were also like-wise prone to epidemics. There was hardly any effective research work on upgrading the local breeds of both poultry and cattle. The government breeding programme was inadequate and to a great extent, ineffective. The main constraints to the commercial poultry production were absence of locally adaptable improved breeds and lack of measures to control epidemics. However, to implement the programmes to achieve the objectives, the budget allocation of TK. 477.74 million was made in the first FYP.

Draft Power: Land preparation was traditionally done by bullocks pulling indigenous wooden ploughs. The main sources of this draft power are cattle. Increased irrigation under high yielding variety (HYV) during the first FYP, might necessitate more draft-power unless large-scale mechanization was contemplated.

Animal Protein²: As stated in the FYP that the protein intake in Bangladesh was very low. Pulses and fish were the major sources of protein. The average intake of pulses and fish protein was 28 grams per capita per day against the standard requirement of 63.5gms. The per capita milk and meat consumption per day were 17gms. and 4gms respectively. The per capita annual consumption of eggs was only 4.

Beef and Goat: Beef was usually obtained from disabled, ailing and very old cattle and goats, which provided the main supply of better quality meat. There was no specialized beef cattle industry in the country. Meat from poultry and goat constitute only about 25 percent of total meat production. Therefore, substantial increase in the total meat supply could not be expected from these sources. Beef production can be increased by increasing the number of cattle and improving their body weight by better feeding.

² Ibid., p. 126.

Poultry: In the poultry sector, duck rearing on commercial scale would be emphasized during the plan period. The topography and water resources in Bangladesh provided favourable conditions for a much larger duck population.

The prospect for rearing chicken was also brighter during the First FYP. Back yard poultry would be relatively more promising than the commercial poultry farms. Supply of chickens could be increased by introduction of exotic breed in the rural areas and adopting disease control measures. During the plan period, chicken would be distributed to the farmers from different poultry farms, for rearing and marketing either directly or through an organized cooperative marketing society. Distribution of chicks of exotic breed would help increase both egg and meat production from the level of 40-50 eggs and 1-3 lbs. of meat per bird to 200-250 eggs and 3-4 lbs. of meat per bird respectively.

Disease Control and Feed³ : The major diseases which affected cattle and buffaloes were rinderpest, anthrax, foot and mouth disease and tuberculosis, etc. In order to provide effective disease control, veterinary services at village level would be organized for preventive purposes. Village quacks would be trained for vaccination and inoculation. Thana veterinary hospitals would be modernized. Production of viral and bacterial vaccines would be stepped up and a diseases investigation laboratory would be established.

Cooperative Dairy Complex: Special programme would be drawn up to increase the supply of milk in the country. A co-operative dairy complex was planned with four plants in rural areas of Pabna, Faridpur, Tangail and Manikganj and a pasteurization and packaging unit in Dhaka City. That would offer a year-round remunerative milk market outlet to small, poor mixed-farm units. It would be integrated with veterinary services and artificial insemination units, which would be producing dual-purpose animals rather than pure draught animal.

³ Ibid., p. 127.

2.2 The Two Years' Plan (TYP) Period (1978-80)

It was found that during 1973-78 emphasis was on providing services for conservation through provision of veterinary manpower, hospitals, dispensaries, vaccines and medicines.⁴ Limited facilities for genetic improvement of large animals and birds had been also provided through special programmes for artificial insemination, cockerel exchange and distribution of hatching eggs and chicks. But due to under utilization even of the available resources the programmes could not make any significant impact.

In a review of the performance of first FYP, it was felt that provision of balanced feed and improved practices along with improved breeding were urgently needed to improve the situation. At the same time, due attention was supposed to be given to ensuring better utilization of institutional and other facilities to ensure the participation of the mass and private entrepreneurs.

Management deficiencies in the public sector greatly had hampered the development process and optimum utilization of available facilities in this sector. Due attention should, therefore, be given to ensuring better utilization of available facilities in this sector. Due attention should, therefore, be given to ensuring better utilization of the existing institutional and other facilities, participation of the masses as well as private entrepreneurs.

2.3 The Second Five Years' Plan Period (1980-85)

It was thought in the second FYP that substantial improvement in livestock resource could be achieved through breeding of improved varieties, provision of adequate quantities of feed and fodder through intensified conservation programme and better management practices.⁵ The objectives of the second FYP were to increase draft power through introduction of large number of improved cattle; to increase production of milk, meat, eggs etc. with a view to increase protein of livestock origin; and to provide adequate veterinary coverage and modern feed. In

⁴ Ibid., p. 154.

⁵ Food and Agricultural Organization (FAO), "Statistics on Livestock Population", *Asian Livestock*, Bangkok, 1995, p. 18.

an analysis, it was found that about 11.4 million cattle and buffaloes (including 3.4 million cows) were in use in 1979-80 for tillage operation and carting. Power realized from these animals was inadequate compared with the need for proper tillage and post-harvest operation. During peak season, shortage of draft power has affected cropping patterns. Draft power would be improved through prevention of mortality and morbidity, breeding of improved animals, supply of adequate feed and fodder, use of improved extension and management practices and introduction of an improved harnessing system.

Disease Control Programme: Mortality of animals and birds due to various factors including diseases caused substantial annual loss⁶, in case of animals' mortality the loss is about 10 percent and in case of birds, it is about 33 percent. It was felt that well organized and efficient preventive and curative system was essential. Vaccination was the most effective means of preventing fatal diseases. The infrastructure, so far created, was inadequate for the need; but even the available facilities had not been fully utilized. In 1979-80, only 45 million doses of vaccines against a requirement of 550 million does had been produced within the country; but for lack of transportation facilities, those could not be fully utilized.⁷

It was expected that during the plan period, availability of vaccines would be increased to about 300 million doses by 1984-85, of which about 280 million doses would be locally produced. The plan provided for establishment of hospitals in all districts' headquarters and dispensaries at all thana headquarters. Drug production could be raised from 10 million doses in 1979-80 to 50 million doses by 1984-85.

There were about 800 veterinarians in the Department of Livestock Services (earlier Directorate of Livestock Services), of whom about 100 was in supervisory position. As per the plan, some of them would be placed at the district level for supervision and monitoring the disease control programmes. For management of preventive and curative activities, about 300 veterinarians attached to hospitals and

⁶ C.H. David, *et al.*, *Proceedings of the Fourth Seminar on Livestock Production*, Bangladesh Agricultural University, Mymensingh, 1983.

⁷ GOB, *The Bangladesh Census of Agriculture and Livestock : 1983-84* (Dhaka : Bangladesh Bureau of Statistics, 1984), p. 225.

dispensaries would be utilized for training of farmers on poultry vaccination and in-service training of Veterinary Field Assistants. In addition, about 400 Thana Livestock Officers would be used for preventive and curative work. Since the capacity of public sector personnel is limited, that would be supplemented by private sector agents and local bodies.

Large Animals: Research result indicated that production potential and draft power of local cattle could be improved through the use of improved exotic blood. Breeding through artificial insemination and direct method had been in practice since 1958 and some improved cattle were then available in the country. There were over 600 improved bulls placed at remote localities for natural direct breeding. It was proposed to import 250 Haryana bulls. In addition about 500 large animal bulls would be produced in the breeding farms for distribution during that period.

The number of artificial insemination done in 1979-80 was 0.20 million. All the district head quarters and 84 thanas (upazilla) were provided with adequate facility for artificial insemination. Semen production would increase from 0.20 million doses in 1979-80 to 0.50 million doses in 1984-85.⁸

Small Animals: Breeding of small animals like goats and sheep could remain confined to research level to evolve improved meat animals through fattening. The excellent quality of Black Bengal Goats would have to be maintained while crossing this animal with exotic breed was tried. Artificial insemination would initially be introduced on a small-scale in case of goats for studies and research during the plan period.

Poultry: The poultry population in the country was 63.00 million in 1979-80. The birds produced through crossing the local birds with exotic breed were introduced since the mid-forties. During the plan period, 104 million cockerels would be raised on government farms. Incubators and brooders required for the purpose would be manufactured locally. Sale of hatchable eggs would be controlled to increase production of chicks.

⁸ A.A. Hossain, "Review of the Livestock Sub-sector in Bangladesh", *Bangladesh Agriculture Sector Review*, Conference Volume 11, Dhaka, 1987, p. 19.

It was observed that there was acute malnutrition among animals and birds resulting in loss of animal protein. Agricultural by products were the primary sources of livestock feed. But straw from dwarf varieties of rice and wheat were inferior in quality due to silica content and they need to be processed into better feed for cattle.

Experiments conducted at the Dairy and Cattle Improvement Farm at Savar and field trials conducted, so far, had indicated that there were some improved varieties of fodder, which could economically compete with other crops. Area under such fodder could be gradually increased through extension. Increase in production of leguminous crops would provide additional fodder and would also serve to enrich soil.⁹ Spare land, marginal land, embankment sides etc. could be used for fodder production. Manufacture of feed could be undertaken in the public sector on a pilot project basis. The private sector would be encouraged with credit and other facilities to set up feed mills to produce balanced feed mixture.

Extension and Management: Generally livestock is reared in mixed farming along with crop production in the rural areas which contribute about 90 percent of the total livestock production. Out of 6.85 million agricultural holdings, 5.83 million reared animals while almost all farmers reared some birds. There were only 0.6 million exclusive livestock holdings. The productivity of birds and animals raised by these farms was low as the farmers lack knowledge of scientific management.¹⁰ So the second FYP envisaged extending modern management practices to the farmers by training them in elementary husbandry techniques.

Education and Training: Bangladesh Agricultural University (BAU), would continue to impart graduate and post graduate education on animal sciences. While technical education was not adequate, there was acute shortage of field level technical personnel. At that period only one livestock training institute was imparting technical training. During the plan period, 4 training institutes were proposed to be established and facilities would be provided for training of 400 persons per year. To

⁹ Bangladesh Livestock Research Institute, *Project Reports 1985-91* (Dhaka : City Art Press, 1992), p. 19.

¹⁰ BMPCUL, *Bangladesh Milk Producers' Co-operative Union Limited* (Dhaka : A Publication of BMPCUL (Milk Vita), 1990), p. 16.

meet the shortage of lower level technical personnel, about 3,000 progressive farmers and rural youths would be trained in simple work like vaccinating the birds and livestock management.

Research: Bangladesh Agricultural University (BAU), Bangladesh Agricultural Research Council (BARC) and various research sections of the Directorate of Livestock Services conducted various research works on different aspects of livestock problems. These institutions would be reorganized and better equipped to take up further works on breeding, nutrition, poultry husbandry, livestock economics and other important problems.¹¹ During the second FYP some policy issues were supposed to be firmed in addition to the programmes and activities mentioned above. The animal act in force was mentioned as outdated; which was supposed to be modified to suit the need of that period. Availability of credit and other inputs for small farmers and for entrepreneurs were supposed to be ensured for livestock production and their marketing. Organizational arrangements were also proposed for various input production and supplies.

2.4 The Third Five Years' Plan Period (1985-90)

During the formulation of Third FYP, the miserable condition of the livestock sector was reflected. Production of milk increased at the rates well below the population's growth rate. Annual rates of growth of this item were 1.78 percent and 1.80 percent during the first and second FYP, respectively.

In an overview during the formulation of the Third FYP; it was mentioned that the reasons for decline in growth rate of milk were generally due to poor genotype of local breeds, non-availability of adequate feeds and green fodder and high cost of fodder. The main policies and programmes pursued for livestock development during first and second FYPs, were reduction of mortality in animals and poultry, infrastructure development of breeds and biological products and increased output. Sectoral programmes had suffered due to lack of institutional capability as reflected

¹¹ J. Alam, *et al.*, *A Socio-economic Evaluation of the Artificial Insemination Programme in Bangladesh* (Dhaka : Bangladesh Livestock Research Institute, Savar, 1992), p. 49.

in the under utilization of resources. Mortality of livestock could not be reduced as envisaged due to shortage of biological product and lack of adequate research finding, and technological support. For all these, output had increased slowly.

The main objectives of livestock sub-sector for the Third Plan were: to increase the supply of draft power of both cattle and buffalo through better veterinary services and feed and harness improvements; to increase production of milk, meat, hide and skin, eggs etc. particularly of milk through encouragement of dairy farming as a separate husbandry; and to create new employment opportunities for the women and the landless in cattle, goat and poultry birds rearing. To attain the above objectives, some strategies were supposed to be pursued and those were improvement of draft power, production of milk and supply of milk products and employment generation.

Improvement of Draft Power: During third FYP, the shortage of draft power was about one-third of the total requirement. That was not due to overall shortage of cattle but due to poor health, skewed ownership pattern, etc. As cropping intensity would rise due to expansion of irrigation, the demand for draft power would increase for reaching the food target. Because of the shortage of grazing field and feed, the third plan's programmes would first focus on controlling diseases including parasitic infestations and improvement of feed supply in the short run and genetic improvement in the long run. The plan would, at the same time, look for increasing the access of the small and marginal farmers to this important resource of the farming system. The skewed distribution could be improved if such access could be ensured through the credit mechanism: but as that may entail the risk of leakage of resource both before and after provision of credit, possibility of developing draft-power husbandry for hiring purpose was supposed to be explored at the community level.¹² Besides improvement of animal health with supply of feed and veterinary services, the harness yoke and plough needed also to be improved.

Improvement of Milk and Dairy Products' Supply: It has been found that per capita output of these products had declined continuously over the first and the

¹² BARCM, USAID/Chechchi & Consulting Inc., *Current Status of Poultry Production and Marketing System in Bangladesh* (Dhaka : Unique Printer, 1993), p. 8.

second plan period. There was only one dairy cattle for 28 people in the country producing only 0.02kg of milk per capita per day. The stock was poor both in number and yield and the yield had suffered particularly because of use of cows for draft purpose. The past efforts to set up dairy farms had no significant effect on the animal husbandry as was shown by the fact that most of the cooperative dairy farms were running serious shortage of milk supply. The Third Plan, therefore, emphasized development of dairy cattle at farmers' level around the existing cooperatives, starting with the land-less population as distinct from dual-purpose animal husbandry.

Employment Generation: Animal husbandry was a labour intensive farming activity. Therefore, given the primary objective the Third Plan for creation of productive employment opportunities, development of husbandry would significantly contribute to this goal. Besides that, livestock would contribute directly to employment in tillage and dairy farming could absorb quite a large number of the labour force. A second area which was being developed with success and promised further development in future was goat (also sheep) rearing because of high demand for meat and skin. It has also been stated that goat and poultry rearing could be coupled with fish culture in ponds and haors with higher return.

Programmes for Third Plan¹³: The Third Plan envisaged to improve in feed supply, veterinary services and the stock of livestock. These are discussed below.

Feeds and Fodder: Malnutrition and the consequent susceptibility of livestock to diseases are the main cause for reduced draft power and low yield of dairy products. Improvement of fodder supply could be easily brought about because of limitation of land. Hence, fodder cultivation along with crop production or in between the crops would be encouraged among the farmers. To augment private fodder supply, programme for cultivation of HYV grass like napier, para, guinea, pangula, maize, ipilipil, etc. would be taken up in khas/fallow (govt. owned) lands, road sides and canal sides. Seeds and seedlings of the fodder plants could be made available to farmers through the district and thana seed multiplication centres. Enrichment of straw with urea from digestive point of view would be explored as a possibility for use as cattle feed.

¹³ GOB, *The Third Five Years Plan*, 1985, p. 42.

Disease Control: It has been found that mortality and health hazards due to various parasitic infestations were a serious threat to livestock development. Each year about 10 percent of the animals and about 30 percent of the birds died due to various diseases. As a result, a large part of national efforts for improving also went wastes. A major thrust of the Third Plan in the livestock sector was given on disease control and prevention. That was consisted of two prong efforts, namely, prevention and treatment, but the focus would be mainly on the former. The plan was supposed to bring 50 percent livestock population under disease prevention and 300.00 million doses of vaccines would be produced and utilized. To ensure proper potency, various preventive medical products, produced at central vaccine laboratory at Mohakhali, Dhaka would be distributed to 20 old district headquarters having chilled room facilities. From these, the vaccine ampules would be taken to all new districts and 465 thanas' head quarters, which would be equipped with, appropriate storage facility for the vaccines.

Genetic Improvement: The genetic potential of indigenous stock was supposed to be improved through upgrading programmes for artificial insemination (A.I.) and natural services. For natural services, breeding bulls would be supplied to the remote and inaccessible areas. Maintenance of breeding bulls would be the responsibility of thana and union parishads. For strengthening the breeding programme, artificial insemination coverage would be expanded by establishing 15 additional district A.I. centres over the existing 20 and 67 sub-centres in addition to the existing 300 in the thanas. Moreover, programmes would be intensified for the development of cattle in the milk shed areas.

Manpower Development and Research: Since the livestock sector was spread far and wide, effectiveness of the breeding and disease control programmes was found to depend on the extension services. Therefore, during the Third FYP period, programmes related to development of skilled manpower would need to be strengthened. Each year about 440 officers and 1000 field level staff would be provided with in-service and pre-service training respectively. Similarly, 18000 farmers were supposed to be provided with training relating to improved husbandry practices. The specific research activities of BLRI would include development of

suitable breed for livestock and poultry, identification and development of water plant suitable for cattle feed, development of suitable feed formulae for cattle and poultry and information about epidemiological and immunological aspects of important fatal diseases.

Credit Programme: It has already been mentioned that the cattle heads in Bangladesh are numerous, still a large section of small farms did not have draft cattle. During the Third Plan, they would therefore, need access to credit for purchase of cattle. In addition, the landless and the marginal farmers would need credit support for setting up poultry and dairy farms. These loans were supposed to be channeled through Bangladesh Krishi Bank (Bangladesh Agricultural Bank or BKB) and nationalized Commercial Banks, Grameen Bank and Bangladesh Rural Development Board (BRDB). In a review of the third FYP, it has been observed that major policies and programmes for livestock development over the previous plan periods encompassed reduction of mortality in animals and poultry, infrastructure development for improvement of breeds and biological products and increased output. The Third Five Years' Plan aimed at increasing the supply of draft power and animal proteins particularly milk along with increased employment for women and the landless. The strategies emphasized expansion of disease control, improvements in feed supply, genetic upgrading and similar other measures.¹⁴

During the Third FYP period, production of milk, meat and eggs increased at the annual growth rates of 1.77, 2.38 and 6.34 percent respectively. The reasons for slow growth of milk production were genetically poor constitution of local breed, non-availability of feeds and green fodder, deterioration in quality and quantity of straw, etc. Import of powdered milk and high cost of feeds also affected the local production. Average growth rate of meat production had been lower as mortality of animals and birds could not be reduced as envisaged in the plan and due to lack of adequate programmes including fattening programmes and absence of research resulted on poor quick yielding economically viable species. Production of eggs was also affected by mortality and worm infestation, high cost of balanced feed, non-availability of breed stock and poor gainful participation of farmers.

¹⁴ Ibid., p. 41.

In an overview of Third FYP, it has been opined that despite those shortcomings, considerable progress was achieved in employment and income generation activities, expansion of physical infrastructure facilities along with the introduction of a new concept of service-delivery and input-production promotion methods. During the Third Plan period along with the predominant traditional modes of production, some distinct stratification of the sub-sectors had emerged. The trend had been most pronounced in poultry, where intensive and semi-intensive production forms were becoming popular with significant income employment generation. With cattle, such stratification had been centred locally, with dairy enterprises being established in the vicinity of urban centres and in selected high potential rural areas. During the formulation of Fourth FYP it was stated that despite these successes, livestock development needs in the past in general had usually been underestimated, inappropriately targeted and poorly implemented.

2.5 The Fourth Five Years' Plan Period (1990-95)

The Fourth FYP objectives for the sub-sector were based on a realistic assessment of the situation prevailed in terms of problem and potentials and were supported by adequate policies and programmes within the available constraints of financial resources and the time frame. The Fourth Plan programmes and policies were designed to take into account the emerging diversity of the sub-sector. The major objectives of the Fourth Five Years Plan were to increase supply of livestock products through increase in productivity, to expand the employment opportunities, both full time as well as in the form of supplementary activity for poverty alleviation and to increase supply of draught power to support the planned crop production activities. The value added of the livestock sub-sector had been projected to grow at the annual rate of 4.6 percent during the Fourth Plan in order to achieve the integrated objectives of the plan.

In view of the serious constraint of draught power shortages and declining per capita availability of various livestock products, improvement in the quality and quantity of draught animals and increases in the supply of animal proteins formed the major objectives of development programmes during the Fourth Plan. Livestock

production would be viewed as a crop production activity with adequate cash and income generating potentials.

Obviously a wide range of development activities would be needed to be undertaken to improve the situation and increase productivity, and they encompassed all areas of livestock management: research, extension, training, feed supply, veterinary care, animal husbandry linkages with other sub-sectors, input services and others. However, under the existing constraints and lack of institutional capability, efforts would be concentrated during the Fourth Plan on high priority areas with potentials of quick and significant payoffs. Efforts would be directed for the integration of all areas of livestock development into a consistent set of policy measures and programmes on the basis of identification of such priority areas. Programmes of cattle breeding, fodder supply and animals health would be considered as priority areas where development activities would focus.

The poultry sector would be identified as the one holding the best promise for increasing the supply of animal meat and protein most rapidly in the short run along with improving the equity of access to animal protein among the poor. The cost of poultry production was lower and much less lumpy than that of cattle farming and that placed small-scale poultry production within the reach of the poor households.

During the Fourth Plan period, two broad aspects of policies were supposed to be emphasized: ensuring supply of draught power of adequate quality and increased supply of livestock products. Within the purview, the strategies and policies in the livestock sector during the Fourth Five Years' Plan focused on the areas like increased livestock husbandry with genetic upgrading and avoiding genetic erosion; improved animal health with provision of prophylactic and routine farmers administered treatment for infectious diseases and parasitic infestations of livestock: adequate emphasis of non-ruminants which subsist on a more concentrate intake with advantages of better feed conversions and fewer locational constraints on production; special emphasis on poultry husbandry as a value added activity capable of operating in small units with significant labour absorption and poverty alleviation potentials. In this respect, adequate focus would be placed on medicine, feed marketing and other problems along with the development of dairy cattle at farmers

level for increased fodder supply of milk and dairy products; generation of employment opportunities in the rural areas through dairy farming, cattle and poultry rearing and further development of animal husbandry practices for distressed women and unemployed youth. Adequate policy supports were given by providing proper marketing facilities, price incentives, organization and extension systems, education and manpower training in relevant activities, appropriate technology transfer and information system; and by realization of export potentials; proper review of and incorporating necessary changes in the import policy for livestock products; and by strengthening of the organizational and institutional framework for the livestock sub-sector for undertaking effective research, manpower training and developmental activities.

In order to strengthen the sub-sectoral and institutional framework to undertake well conceived and justified programmes, appropriate reorganization, manpower training and effective research coordination would be undertaken during the Fourth Plan. Proper investigation of the livestock production at the village level small farms, field investigation of livestock population was needed to identify the problems and to undertake actions for their solutions.

Programmes and policies would be implemented for increasing research capabilities and infrastructure on livestock with relevance and focus on improving productivity within the broad framework of short and long-term aspects of livestock development. In this respect, emphasis would be placed on diseases prevention, parasitic control, on farm fodder supply improvement, calf mortality reduction, cattle fertility improvement as well as development of breeds adaptable to the climate with appropriate balance between local and improved breeds.

Adequate breeding policy and practices were supposed to be designed on the basis of scientific cattle breeding practice in order to use it as a tool for efficient feed conversion into milk, meat and draught power through appropriate breed selection. Expansion of breeding bull and heifer production farm and programmes would be undertaken through creation of regional centres and expansion of contract growers system.

Programmes and policies would be implemented for improvement of fodder resource based on adequate feed and fodder production. Considering the high pressure on land for food grain production, Bangladesh Agriculture was not likely to permit extensive expansion of acreage for pastureland or large-scale diversion of cropland from food grains to fodder production. Therefore, efforts would be made to increase production of forage and green fodder to supplement straw through utilizing waste lands for growing productive and nutritious varieties of feed crops e.g. maize, sorghum etc. as well as selective inter cropping with food etc. cash crops, improvement in roughage production management practices and farmers training programme for efficient production, presentation and utilization of fodder and feeds.

In order to strengthen the animal and veterinary care system, along with the extension of expert field staff, emphasis was placed on routine farmer administered treatment system including knowledge of sound animal husbandry, proper feeding and sanitation, timely recognition of disease symptoms and routine drugs and medicines necessary for immunization and other purposes. In this respect priority was given to regular anthelmintic doses particularly against internal parasites and creation of adequate storage, transport and distribution facilities.

Due to the existence of great potentials for goat and sheep development in the country, plans and programmes were implemented for appropriate selection and breeding for improvement of herds, reduction in kid mortality through improved veterinary care and training especially to women on feeding, rearing etc. Necessary research on diseases and other aspects, measures to address seasonal shortage of feeds, credit programmes for goat production with a view to discourage selling and slaughtering of young goats were undertaken.

In the past, poultry egg production expanded rapidly and policies during the Fourth Plan emphasized on further acceleration of such trends in order to make poultry as the major domestic source of animal protein. For this, emphasis was given on expansion of poultry sector in rural areas. Poor and women groups were encouraged to undertake poultry rearing as a smallscale economic activity. Rather than increases under the scavenging system, poultry production was stressed in the backyard or in intensive system with required supports of quality cross bred chicks,

cockerels and pullets, quality feed supply, health care and veterinary services, proper management practices, marketing facilities, and timely credit facility supported by training facilities and advisory services. In order to improve the output and products of the tannery industries, attentions was given to improve the quality of raw materials and processing technology through improved slaughtering, flaying and curing procedures and providing incentive through marketing, quality grading and price policy for hides and skins.

Unlike developed countries, cattle and buffaloes were primarily used for draught power and secondarily for production of animal protein in Bangladesh. There existed serious shortage of animal draught power, in the country, which was likely to be further aggravated in future with increased cropping intensity. Under the prevailing conditions, the chances of increasing the number of cattle and buffalo in order to overcome the draught power shortage were relatively small. Therefore, the policies emphasized to improve draught power potential through better health and strength of draught cattle and buffaloes as well as through introduction of efficient farming practices and appropriate mechanization. The measures would include development of better and efficient ploughs and other animals-drawn farm implements, local manufacture and promotion of their uses along with selective mechanization with emphasis on multiple-uses of such equipments. Adequate credit and other facilities especially in draught power shortage areas would supplement these programmes.

With a view to providing adequate policy supports, a review of the import policy with respect to the livestock would be undertaken. The objective would be to formulate and execute a realistic import policy within the overall livestock development policy consistent with national objective. For the proper development of the dairy sector, a sound milk policy supported by adequate cattle breeding policy would be evolved. In order to increase the quality and digestibility of beef, which was the principal source of meat in the country, beef fattening programmes would be initiated with urea-treated straw, molasses and oilcakes. Obligatory fattening of animals before slaughtering may be introduced by phases to increase the dressed meat weight per animal as well as to improve quality.

The Fourth Plan considered the livestock sector as important as the crop sector. Therefore, the provision of adequate policy supports, effective delivery system, required infrastructure for collection, processing, storage and marketing network of livestock products were made.

On the basis of the strategies and policies during the Fourth FYP, the major programmes like feed and Fodder Development, Animal Health and Disease Control, Animal Breed and Breed Multiplication, Marketing, Credit, Extension, Training and Education Research, were undertaken. Feed and Fodder Development would receive special attention during the plan period. Because of their involvement in fodder production, the Ministries of Agriculture, Forestry and Environment was supposed to be actively involved in programme planning and implementation. In the area of feed supply, specifically supply of fishmeal, the cooperation of the development of fisheries would be important.

In support of chicken production, a maize production campaign for grain would be undertaken. Preparation of balanced feed in the smallscale commercial sector would be encouraged. However, for reasons of market stability a critical public sector feed production capacity would be established. In order to increase the availability of feed protein, supplementary pilot programmes for the collection of slaughter wastes and the processing into bone and blood meal would be undertaken. To ensure quality of feed, feed analytical laboratories would be installed in central locations of the most important poultry production areas.

Fodder development programmes would be pursued intensively in "intensive milk production areas" and on a more extensive scale in the remaining part of the country. The programme would consist of fodder cultivation, as well as activities for the improved utilization of existing feed resources including by products. Emphasis would be on introducing appropriate legumes into the crop rotations. In the "intensive milk production areas" there was scope for the production of maize for green fodder and fodder grasses such as Napier (*Pennisetum purpureum*) and para (*Brachiaria mutica*). The planting of fodder trees would be continued with the assistance of the Ministry of Forestry and Environment and others. Planting of Ipil-Ipil would be extended, but other trees would also be introduced in selected areas of the

Chittagong Hill Tracts and Sylhet. Programmes of over-sowing with appropriate grasses and legumes would be undertaken. The main effort of the programme would be directed towards fodder production in farmers field as past experience has shown that the potential to increase fodder production from public land was relatively limited due to issues of organization and access. For the production of seeds and seedlings, three additional fodder development farms would be established in addition to the involvement of contract farmers and the modalities of such programmes would be tested in the early stages of the plan period. Programmes for the improved utilization of existing feed resources would comprise production of the molasses block, and propagation of the use of urea treated straw. Fodder development would be supported by a comprehensive research programme, addressing both issues of fodder cultivation and animal nutrition.

The supply of concentrate feed for poultry from governmental mills would reach 23 thousand mmt by the end of the Fourth Plan. In addition, supply from private sector sources was expected to be 70 thousand mmt. To facilitate increased availability, the government would continue the present restrictions on the export of feed ingredients like wheat bran, rice polish and oilcake and, at the same time, would allow duty free import of maize, fish meal, minerals and feed additives.

The comprehensive programme during the Fourth Plan would consist of the components like disease prevention and treatment; and vaccine and medicine production and distribution. The programme would strengthen disease diagnostic services, diagnosis through the expansion of the established disease diagnostic network, providing the scope for more targeted prevention and treatment. The programme would include conduction of regular surveys from which the progress made in the improvement of the animal health situation could be measured.

Programmes of treatment and prevention would include an expanded mobile service through increases in the number of government field personnel as well as trained cattle and poultry workers. During the Fourth FYP, greater emphasis would be placed on reduction of morbidity through control of parasitic diseases. The access to treatment facilities would be further increased through the establishment of 290 Upazilla Livestock Development Centres (ULDC).

The programme of Vaccine and Medicine production and distribution included measures to increase the production capacity of vaccines in the public sector and to further strengthen the distribution system in the upazilla level. Production of Marek's disease vaccine would be taken up on large scale. The research programme for the development of Foot and Mouth disease vaccine would be strengthened and research would also continue for Goat Pox vaccine. Production of medicines would remain with the private sector and programmes to encourage increased production and distribution would include the setting of appropriate prices.

Programmes of Animal Breeding and Breed Multiplication would be directed to upgrade cows in the "intensive livestock development areas" to 50 percent exotic blood and in the remaining areas to 25 percent. In remote areas, the programme will be implemented through placing of breeding bulls, and in all other areas through artificial Insemination (A.I.). The breeding herd would be expanded and upgraded and to increase the outreach capacity of the service, the number of A.I. stations would be increased. Embryo-transfer technology would be introduced on a limited, experimental basis. Frozen semen was proposed to be used extensively in artificial insemination. In this respect, adequate programmes were supposed to be implemented to increase efficiency and coverage. Multiplication of crossbred heifers and breeding bulls would be on government farms and, at the same time, supply possibilities from contract farmers would also be tested. The buffalo herd would be upgraded through crossbreeding with Murrah and Nili buffaloes. As artificial insemination worked less well with buffaloes, emphasis would be on the placing of bulls in villages and the distribution of crossbred heifers.

Programmes for breeding of goats would be through selective breeding of the "Black Bengal Goat" and the placement of good quality bucks with villages. The supply of bucks would be increased and for this purpose additional breeding farms would be established. For sheep, cross breeding programme was proposed to be undertaken and the physical infrastructure would be expanded including establishment of more farms in the public sector.

Programmes on fowl breeding would continue with the development of improved scavenging birds. In addition, programmes would be directed to maintain commercial layer and broiler strains. Also, feasibility of rearing those birds in small

systems had been proven in Bangladesh. For birds of the scavenging variety, government farms would continue to maintain breeding stock and to produce day old chicks, cockerels and pullets. Emphasis would be on the targeted distribution of day old chicks to support the build up of small and medium sized multiplication flocks in the small-scale private sector. Hatcheries were proposed to be established in strategic places through out the country and the required supply of hatching eggs would be produced by contract farmers. For commercial breeds multiplication farms would continue to remain in the large-scale private sector. However, government would maintain a critical flock size to ensure regularity of supply and to test appropriate breeds. Programmes of Duck Breeding would continue with the crossbreeding of deshi duck with Khaki Campbell. The output of improved breed ducklings would be substantially increased. To this end two more hatcheries would be established and reading facilities would be expanded. For multiplication, government would also maintain breeding stock and through the targeted distribution of ducklings would work towards establishment of small-scale multiplication flocks in private sector.

With the exception of a limited network of public sector organized milk marketing facilities, all marketing activities were with the private sector. Analysis of regional price data suggested, however, that the system was less than fully competitive and production was in many instances constrained by the resulting low production prices. That had important equity implications, as a significant part of the producers belonging to the very poor segments of the population. To remedy the situation, marketing programmes would be implemented for milk, eggs and poultry meat, where market inefficiencies were most pronounced. Programmes would consist of price information services, as well as purchasing programmes that would guarantee fair producer prices.

Non-availability of sufficient funds continued to be a major impediment to the participation of lower income groups in livestock activities. While various credit sources had been created during the previous few years, there was an obvious need to widen the scope of these programmes. To that end, a programme for the distribution of improved breed heifers to members of the low-income groups would be implemented.

The livestock extension service was severely hampered by staff-shortages at the upazilla level. Because of these constraints, extension work in the past had to be confined to a few selective activities. However, in order to increase livestock productivity improved production technologies had to be spread through far reaching changes in the structure of the service. These changes would result in reorientation and rationalization of the various classes of field assistants positioned at the upazilla level and service delivery would be expanded through an increase of departmental staff to the union level. Self employed cattle and poultry workers would implement the system. In addition, a network of contact farmers would be trained to assist in the delivery of extension measures messages at village level. Because of the increasing importance of the sub-sector for employment and income generation, an expanded manpower development programme would be implemented.

Adaptive research on breeding, feeding, disease control etc. would be taken up in Bangladesh Livestock Research Institute (BLRI) and results thus obtained would be disseminated to the farmers. Linkages between production, research, training and extension would be established. Efforts would be made for development of suitable breed/breeds for livestock and poultry. In addition, survey on potentialities of local varieties of cattle and poultry would be done.

A massive programme for plantation of Ipil-IPil and other fodder plants would be taken up in 460 upazillas. Fodder crops would also be cultivated on embankments, roadside, khas and fallow land, which would help, improve the environmental balance. Indiscriminate throwing of dead animals in rivers, canals and open fields causing spread of diseases and environmental pollution would be checked through proper legislation.

Livestock provided about 98 percent of the available draught power requirement for crop production and other agricultural operations as well as, it contributed substantially to rural transportation activities, production of cow dung, (which was estimated to be 85 million tons annually) also substantially contributed to meet the demand for rural fuel and manure for crop production. Besides, the sector was closely linked to a chain of industries based on livestock and poultry, such as, milk power, butter, cheese, ghee, broiler, bone meal, hides and skin, shoes, leather

products etc. which also generated wide-range of employment opportunities for both skilled and unskilled workers. Integrated farming of poultry and fish was increasingly becoming popular. In the livestock sub-sector, the NGO activities might concentrate on target group formation, training, extension, credit disbursement, supervision and recovery and conducting socio-economic studies on the impact of those.

It had been stated that one of the major thrusts of the public sector programmes would be to support the private sector activities in the livestock sub-sector. For the purpose, adequate material and financial support, training and required services in terms of breed, feed, technology, credit etc. would be arranged along with organization of groups for undertaking various livestock activities especially by the poor and disadvantage groups including women.

Emphasis of the programmes in the livestock sub-sector would be on creating additional incomes in rural areas. Employment would be increased in the area of both service delivery and production. The scope of the most of the interventions to be propagated, would, in most instances lead to additional full time employment and income generation especially for women.

2.6 The Fifth Five Years' Plan Period (1997-2002)¹⁵

After the two years holiday period (1995-97) when the livestock development activities continued following the traditional feature, a five years plan was formulated for the next period. The Fifth FYP was undertaken with a view to maximize the growth of this sub-sector. Government took the policy to achieve the goal with minimum effort in research, extension, training and support services from public sector. But the strategy was to achieve maximum growth realizing the importance of this sub-sector's contribution to GDP and the development of livestock sub sector would be set to a considerable extent. It was also stated that positive indication had already been developed by the private individuals, groups and NGOs regarding the development of the sub-sector. Though earlier little attention was given to this sub-sector, at the beginning of the plan period private sector responded nicely. It has been stated in the Fifth FYP that about 50,000 private poultry farms, 26,000 duck

¹⁵ GOB, *The Fifth Five Year Plan*, 1997, p. 253.

farms and 26,000 dairy farms had been established in the private sector. As a result, there had been a 60 percent fall in the import of milk powder.

The production of milk and meat increased by the annual compound growth rates of 1.3 percent and 3.2 percent respectively. The growth rate of egg was, however, satisfactory which was 6.5 percent during 1990-91 to 1994-95. But there were wide gaps between the potentials and the realized yields of milk, meat and eggs. Therefore, there are ample potentials for increasing production of milk, meat and eggs in the country. The main problems of this sector are inadequate supply of vaccine, medicine, equipment, feed, health care facilities, quality breed, parent stock, credit facilities and inadequacy of other inputs.

The main objectives of the livestock sub-sector as stated in the plan were the entrepreneurs' groups for creating new employment opportunities for small farmers, landless labourers and women and other target groups; to generate income for the poor; to increase the supply of milk, meat, birds, eggs, hides and skins etc. to undertake adaptive research on breeding, feeding, disease control for cattle, Bengal goat, poultry birds by BLRI and to transfer appropriate technologies to the users; to improve the quality of draft power of both cattle and buffaloes through genetic improvement, better veterinary services, adequate feed supply and improved management; to increase foreign exchange earnings through the export of quality hides and skin and reduce dependence on import of powder milk; to involve private sector, local Government Institutions and NGOs in livestock industry for credit distribution, production of cattle and poultry feed, milk processing, input supply, marketing and to improve distribution network for these products in collaboration with Livestock Department and Livestock Research Institute; to privatize input supply and to provide fiscal support, if needed, for sustainable development of the sub-sector.

In order to achieve the above objectives of the Fifth Plan, the following strategies would be adopted. Improvement of the quality of animals, birds through genetic upgrading, preservation of native breeds and selection of exotic breed; wider provision for treatment of infectious diseases and parasitic infections and large scale production of vaccine at home; increased fodder supply through intensive use of available land; improvement of livestock management through manpower training

and skill development; improvement of the quality of draft animals and expansion of the single animal ploughing system; giving emphasis on development of dairy cattle and encourage establishment of mini dairy farms through support services; encourage goat production through supply of inputs; giving special emphasis on poultry husbandry for increased supply of meat and eggs; credit for livestock and poultry farming on easy terms in the private sector; improvement of marketing facilities for realization of competitive prices by the farmers and discouraging import of powder milk and other livestock products.

Strengthening of the organizational and institutional framework of the Bangladesh Livestock Research Institute for undertaking research on livestock production and expanding the data base on socio-economic aspects of livestock development was also emphasized in the plan. Training of the target groups like landless, destitute women, unemployed youth, landless poor farmers on livestock management, inputs production, product processing and marketing for poverty alleviation and income generation was taken as a strategy for the development of the sub sector. Pricing of vaccines for cost recovery and commercialization of Veterinary Vaccine Productions under the Department of Livestock Services would be strengthened.

Major Programmes During The Fifth FYP¹⁶

Feed and Fodder Development: Feed mill would be established in the private sector at important places of the country. The government would provide support services in the form of credit and technologies. Fodder production would be encouraged through crop diversification, intercrossing and plantation of fodder trees with timber trees.

Animal Health and Disease Control: The programme consists of diagnosis, prevention and treatment, vaccine and medicine production and distribution. Qualitative and quantitative improvement would be made in disease control. Facilities would be expanded and number of veterinary surgeons would be increased to 350 during the plan period. About 10,000 youths would be trained as veterinary health workers.

¹⁶ Ibid., p. 254.

Animal Breeding and Breeder Multiplication: Programmes would be directed towards multiplication of breeding of cattle, buffalo, goat, sheep, fowl and duck.

Marketing: Marketing of livestock products and by-products in our country is not properly organized. Livestock market places are under developed and unhygienic. As marketing network of livestock products and by-products is not properly maintained, the producers are being deprived of their benefits. During the Fifth plan, programmes would be taken up for improving marketing channels to ensure equitable distribution of benefits at different stages of production process.

Research: Adaptive research on breeding, feeding, disease control etc. would be undertaken by BLRI and appropriate technologies would be transferred to the users. Research result on fodder production, processing and preservation and vaccine production already tested and certified would be released shortly for on going programmes. These areas would receive priority. Particular emphasis would be given on different aspects of poultry production. Locally suitable poultry and cattle breed would be developed. Attempts for poultry parent stock development would be made. Technology transfer through collaboration with international research centres and advanced research institutions abroad would be promoted.

Role of NGOs: NGOs would perform major role in group formation, training, extension services, credit disbursement, supervision and recovery and conducting socio-economic studies related to development projects. Government NGO cooperation would be more extensive for development of this sector.

Private Sector: One of the major and most important thrusts of the public sector programme would be to support the private sector for the development of livestock sub-sector. Towards this end, adequate technical, material and financial support, training on breeding, feed production, marketing, credit management, adoption of new technologies, disease control etc. would be given to the private sector. Some 23 technology packages have been developed and being implemented

on experimental basis since 1996-97. About 10,000 entrepreneurs would be trained up in different trades in next five years. Major trainees would be poultry farmers, egg collectors, chick rearers, feed producers, feed sellers, dairy farmers, goat rearers etc. Integrated approach of developing livestock and fisheries would be encouraged. Fiscal supports in importing quality breeds, feeds, feed-ingredients, equipment and medicine would be continued and further expanded, if necessary. Some productive units of the government sector would be transferred to private sector to increase efficiency and reduction of government subsidy form this sector. Increase in milk, meat and egg production would be achieved mainly through quality improvement of local cow by cross breeding with deep frozen semen through artificial insemination and improvement of poultry through introduction of high breed commercial birds for eggs and meat production. The number of poultry population is expected to increase significantly during the plan period.

Extension Training and Education: In order to increase livestock productivity improved production technologies would be spread all over the country. Training of farmers, farm owners, NGOs for all kinds of related activities of this sector would be given through extension services and formal and informal education. Number of veterinary colleges and Veterinary Training Institutes would be increased from 2 and 3 to 6 and 21 respectively. Those would be located in 6 divisions and 21 former greater districts.

Input Production: Input production under Livestock Department like production of vaccine, semen, day-old-chicks, ducklings and eggs through different projects included in plan would increase significantly. Vaccine production would increase from 350 million doses in 1996-97 to 400 million doses in 2001-2002; semen production from 1.8 million doses to 4.5 million doses, day-old-chick production from 4 million to 6 million, duckling production from 0.5 million to 1.00 million and egg production from 2815 million to 4730 million during the plan period. Limited input production in the public sector would be gradually transferred to the

private sector. Meanwhile, existing input supply programmes in the public sector would be run on full cost recovery basis.

Employment Creation and Poverty Alleviation: Programmes undertaken during the Fifth Plan will create positive impact on self and wage employment in livestock farming, chick rearing, feed selling, goat rearing and other income generating activities under different package programmes of Livestock Department. Credit programmes of various NGOs are supporting women's involvement in livestock production around the homestead using surplus labour and agricultural by-products. The government encourages these programmes. The total number of man-days involved in livestock development activities is likely to increase from 12.50 million in 1996-97 to 16.00 million in 2001-2002. The beneficiaries like poultry workers would increase from 22,600 to 45000; chick rearers from 8,000 to 12,000; key rearers from 5,00,000 to 14,00,000; feed sellers from 1,000 to 3,000; egg collectors from 2,600 to 6,5 00; and mini hatcheries from 200 to 1,000.

2.7 Conclusion

A review of livestock plans and programmes undertaken during the different plan periods exhibits that a lot of activities were planned to execute but a large portion of those remained unattained the due mainly to inefficient administration, lack of commitments of the different governments and other problems. It took more than two decades to formulate a national livestock policy for the country. Still we should not be pessimistic rather we should look forward with hopes and aspirations.

Chapter 3

AN ANALYSIS OF THE IMPACT ON GROWTH TREND OF LIVESTOCK SUB-SECTOR

3.1 Growth Trend of Livestock Sub-Sector in Value Added Terms (1975-2000)

The contribution of agriculture to GDP was about 38 percent during seventies. Nevertheless this contribution decreases gradually as it was 25.51 percent in 1990 and 17.68 percent in 2003-04. Still the importance of this sector in country's economy is great. Yet the growth of this sector is not satisfactory. The growth rate in 1992-93 was 1.35 percent, which was 1.93 percent in 1994-95. Afterward it became 2.03 percent in 1995-96 with the highest of 6.92 percent in 1999-2000.¹

The growth of cereal crops also follows the same trend as of Agriculture as a whole. The GDP growth rates for cereal production show a negative trend of -1.66 percent and -3.42 percent for 1993-94 and 1994-95 respectively with the highest of 8.1 percent in 1999-2000 following a sudden fall to -2.4 percent in 2001-02. The sectoral growth trend of Livestock Sub-sector in relation to other sub-sectors of agriculture is shown in the Table 3.1 and figure 3.1 (area chart).

On the basis of the base year 1995-96 the contribution of Agriculture to the country's GDP was 22.20 percent in 1993-94 with a gradual fall to 18.22 percent in 2002-03 and 17.68 percent in 2003-04. But Livestock plays an important role in both supplying proteins to human diet, subsidiary income, draft power, as well as employment generation of the country's major labour force. The growth trend of this sub-sector shows a gradual increase with a slight fall in mid nineties. Since 1964-65, the growth trend of Livestock sub-sector has progressively declined as described in First FYP (1973-78). But from the mid seventies it starts rising. However, the Sectoral growth rate of GDP is also shown in the Table 3.1.

¹ GOB, *Bangladesh Economic Review*, 2000, pp. 202-205.

Figure 3.1
Sectoral Growth Rate of GDP (at Constant 1984-85 Prices)

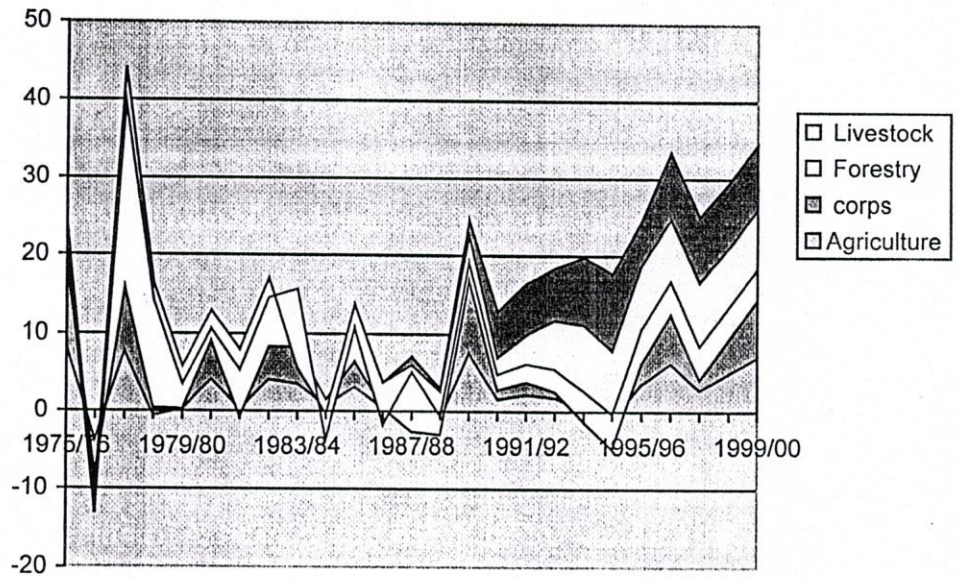


Table 3.1 Sectoral Growth Rate of GDP (at Constant 1984-85 Prices) (Percentage)²

Sector	1975 /76	1976 /77	1977 /78	1978 /79	1979 /80	1980 /81	1981 /82	1982 /83	1983 /84	1984 /85	1985 /86	1986 /87	1987 /88	1988 /89	1989 /90	1990 /91	1991 /92	1992 /93	1993 /94	1994 /95	1995 /96	1996 /97	1997 /98	1998 /99	1999 /00
GDP sectors	5.7	2.7	7.1	4.8	0.8	3.4	1.2	4.9	5.4	3.0	4.3	4.2	2.9	2.5	6.6	3.4	4.2	4.5	4.2	4.4	5.3	5.9	5.7	5.2	6.0
Agriculture	8.4	-3.7	7.8	-0.7	0.2	4.2	0.2	4.2	3.6	0.7	3.3	0.4	-0.8	-1.1	7.7	1.6	2.2	1.8	0.3	-1	3.7	6.4	2.9	5.1	7.2
a. Crops	10.6	-4.5	8.0	1.1	0.1	4.9	-1.0	4.2	4.8	0.8	3.4	0.0	-1.8	-1.9	9.2	1.2	1.7	0.8	-1.6	-3.8	2.8	6.2	1.4	4.4	7.2
b. Forestry	3.2	-5.0	23.9	13.8	3.3	1.5	6.2	6.1	7.2	-5.2	4.2	-2.1	7.8	2.3	2.3	2.1	2.4	3.0	4.0	4.5	4.3	4.2	4.3	4.0	4.0
c. Livestock	1.7	1.6	4.5	2.2	2.3	2.3	2.6	2.5	-9.9	3.3	2.9	5.5	0.9	3.3	3.4	2.2	3.6	6.2	8.5	8.3	8.0	8.0	8.0	7.6	7.7
d. Fisheries	-0.3	0	1.3	-26.5	1.4	0.4	5.7	5.3	1.8	2.5	1.6	2.2	1.1	0.4	2.1	5.8	6.5	6.6	8.7	9.7	5.9	8.6	8.6	8.4	8.4

Source : GOB, *Bangladesh Economic Review*, Dhaka : Ministry of Finance, Finance Division and Bangladesh Bureau of Statistics, 2003.

² GOB, *Economic Review of Bangladesh* (Dhaka : Ministry of Finance, 1996), p. 14.

However, the growth rate of this sub-sector was 1.7 percent in 1975-76, and rose to the highest of 8.5 percent in 1993-94 (base year 1984-85). As a matter of fact, the growth of livestock sub-sector is higher than other sub-sector of agriculture sector. Since 2002-03, this sub-sector shows higher growth rates than other sub-sectors of Agriculture. The share of livestock to country's GDP at current prices is also shown in the Table 3.2 (from 1987-88 to 1992-93).

Table 3.2
Gross Domestic Product and Share of the Livestock Sub-sector at Current Prices (Million Tk)³

Sector	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93
All sectors	597136	659598	737571	834392	906502	947896
Agriculture	231623	245392	271790	300596	312438	288842
Share of livestock to total GDP (%)	3.0	3.2	3.4	3.2	3.1	3.1
Share of livestock to agricultural GDP (%)	7.7	8.7	9.3	8.8	8.9	10.9

Source : *Bangladesh Economic Review*, Dhaka, 1997.

Though the contribution of crops sub-sector decreases, the contribution from fisheries and Livestock Sub-sectors have increased gradually. The contribution of this sub-sector to agricultural GDP increased up to 17.00% during 2003-04 as illustrated in the *Bangladesh Economic Review*, 2004.

³ GOB, *Bangladesh Economic Review*, 1997, p. 11.

Table 3.3

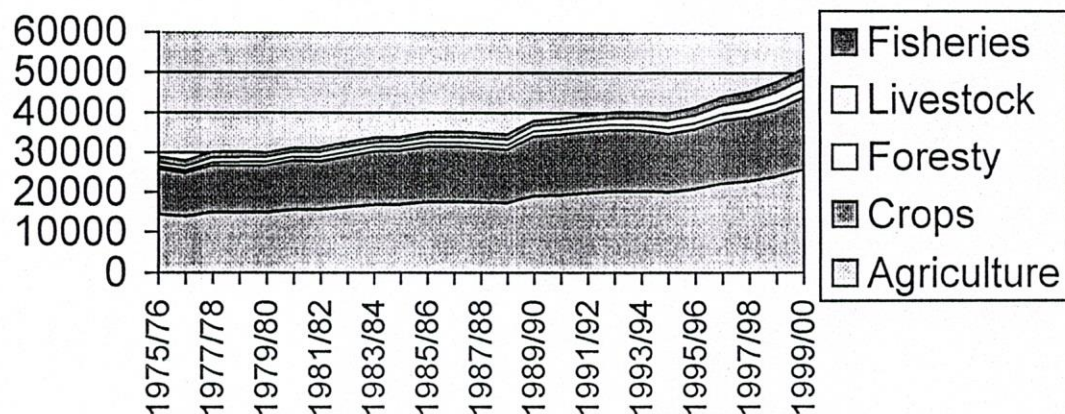
Table 3.4 Sectoral Share of GDP (percent) at Constant Prices (1984-85)⁴ Prices in Tk. ,0000000

Sector	1975 /76	1976 /77	1977 /78	1978 /79	1979 /80	1980 /81	1981 /82	1982 /83	1983 /84	1984 /85	1985 /86	1986 /87	1987 /88	1988 /89	1989 /90	1990 /91	1991 /92	1992 /93	1993 /94	1994 /95	1995 /96	1996 /97	1997 /98	1998 /99	1999 /00
Agriculture	49.3	46.3	46.6	44.2	43.9	44.2	43.8	43.5	42.7	41.8	41.3	39.9	38.4	37.1	38.3	37.6	36.9	35.9	34.6	32.8	32.2	32.4	31.6	31.6	31.9
a. Crops	38.5	35.8	36.1	34.8	34.6	35.1	34.3	34.1	33.9	33.2	32.9	31.6	30.1	28.8	30.3	29.7	28.9	27.9	26.4	24.3	23.6	23.8	22.8	22.6	22.9
b. Forestry	2.5	2.3	2.7	2.9	2.7	2.7	2.9	2.9	2.9	2.7	2.7	2.5	2.7	2.6	2.5	2.5	2.5	2.4	2.4	2.5	2.4	2.3	2.3	2.3	2.3
c. Livestock	3.6	3.6	3.5	3.4	3.5	3.4	3.5	3.4	2.9	2.9	2.8	2.9	2.8	2.9	2.8	2.7	2.7	2.8	2.9	2.9	3.0	3.1	3.2	3.3	3.3
d. Fisheries	4.7	4.6	4.3	3.1	3.1	3.0	3.1	3.1	3.0	3.0	2.9	2.9	2.8	2.8	2.7	2.7	2.8	2.8	2.9	3.1	3.1	3.2	3.3	3.4	3.4

Source : GOB, *Bangladesh Economic Review*, Dhaka : Ministry of Finance, Finance Division and Bangladesh Bureau of Statistics, 2003.

⁴ GOB, *Bangladesh Economic Review* (Dhaka : Ministry of Finance, 2003); GOB, *Bangladesh Bureau of Statistics* (Dhaka : Ministry of Planning, 2003).

Figure 3.2
Gross Domestic Products (GDP) at constant (1984-85) Price



The share of Livestock Sub-sector to total GDP and Agricultural GDP; sectoral share at different constant prices as well as current prices are also shown in the tables (Tables 3.3, 3.4, 3.5 and 3.6). The figures found are positive towards growth trend.

Figure 3.3
Sectoral Share of GDP (percent) at constant prices (1984-85)

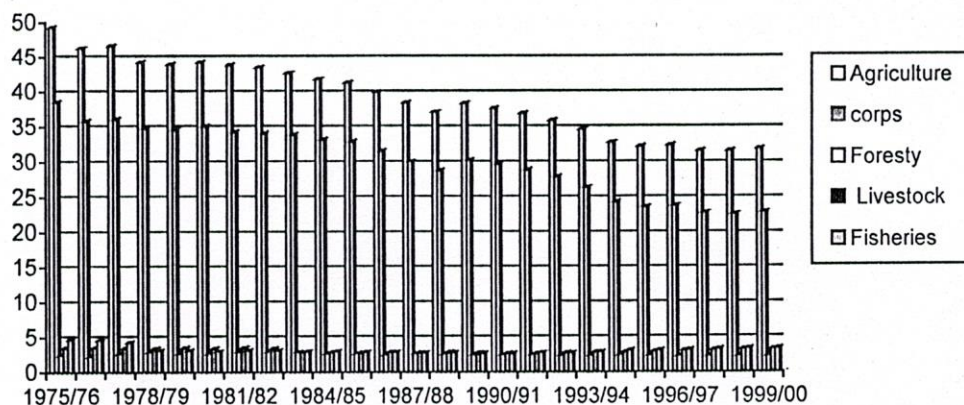
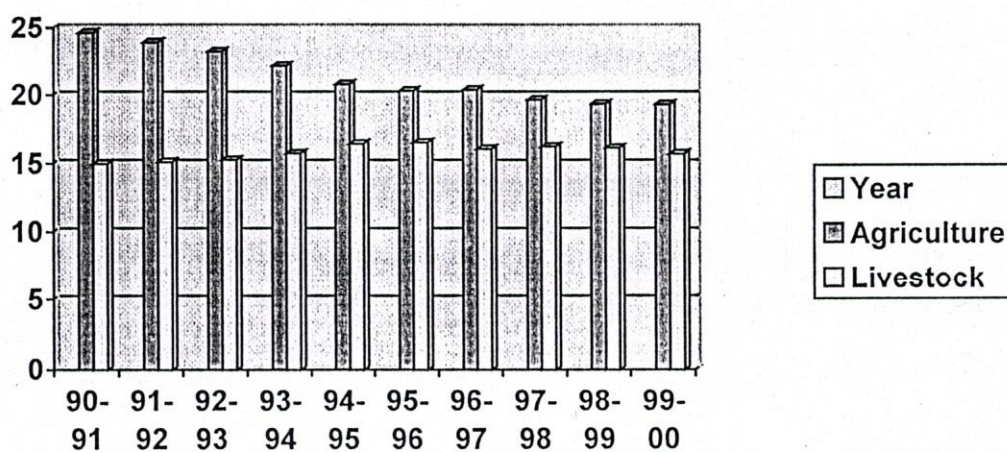


Table 3.4
Sectoral Share of Livestock in Relation to Agriculture in Percentage (Price Index for 1995-96)⁵

Sector/Sub-sector	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00
Agriculture	24.66	23.96	23.28	22.20	20.81	20.32	20.39	19.67	19.35	19.32
Livestock	14.98	15.12	15.27	15.75	16.45	16.53	16.06	16.22	16.13	15.71

Source : Bangladesh Bureau of Statistics, Statistical Yearbook of Bangladesh, 2001.

Figure 3.4
Sectoral Share Of Livestock In Relation To Agriculture in percentage (Price Index for 1995-96)⁶



⁵ GOB, *Statistical Yearbook of Bangladesh*, Dhaka, 2003.

⁶ *Ibid.*, 2001.

Table 3.5
Growth of Agriculture and Agricultural Sub-sector and Fisheries Sector (Base Year 1995-96) in Relation to GDP
(in percentage)⁷

Sector/ Sub-sector	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03	2003-04 (Provisional)
GDP (Total)	4.5	7.08	4.93	4.62	5.34	5.23	4.87	5.94	5.27	4.42	5.26	5.52
1. Agriculture	1.4	-0.7	-1.9	2.0	5.6	1.6	3.2	6.9	5.5	-0.6	3.29	2.41
Crops	1.0	1.7	-3.4	1.7	6.4	1.1	3.1	8.1	6.2	-2.4	2.88	1.67
Livestock	2.4	2.4	2.5	2.5	2.6	2.6	2.7	2.7	2.8	4.7	4.51	4.48
Forestry	3.0	2.8	2.8	3.5	4.0	4.5	5.2	5.9	4.9	4.9	4.43	4.48
2. Fisheries	8.5	7.9	6.8	7.4	7.6	9.0	10.0	8.9	-4.5	2.2	2.3	3.65

Source : *Bangladesh Economic Review*, 1999-2004.

Table 3.6
Contribution of Different Sub-Sectors to Agriculture (Base Year 1995-96) (in percentage)⁸

Sector / Subsector	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03	2003-04 Provisioned
Agriculture	23.28	22.20	20.81	20.32	20.39	19.67	19.35	19.45	19.51	18.58	18.22	17.68
Crops	17.17	16.7	15.43	15.03	15.21	14.59	14.33	14.59	14.70	13.75	13.43	12.9K
	(76.09)	(75.31)	(74.17)	(73.96)	(74.57)	(74.15)	(74.06)	(74.87)	(75.37)	(74.00)	(73.69)	(73.16)
Livestock	3.56	3.49	3.42	3.36	3.27	3.19	3.12	3.02	2.95	2.96	2.93	2.90
	(15.27)	(15.75)	(16.45)	(16.53)	(16.06)	(16.22)	(16.13)	(15.50)	(15.10)	(15.9)	(16.09)	(16.42)
Forestry	2.01	1.98	1.95	1.93	1.91	1.89	1.90	1.88	1.87	1.88	1.86	1.84
	(8.64)	(8.94)	(9.38)	(9.15)	(9.37)	(9.63)	(9.18)	(9.63)	(9.53)	(10.1)	(10.2)2	(10.42)
Fisheries	4.93	5.10	5.21	5.34	5.48	5.67	5.93	6.09	5.51	5.40	5.25	5.15

Source : *Bangladesh Economic Review*, 2000-2004.

Note : Figures in the bracket show the shares of the sub-sectors in total agri-GDP.

⁷ GOB, *Bangladesh Economic Review*, Dhaka, 1999-2004.

⁸ Ibid., 2000-2004.

3.2 Growth Trend of Livestock Population

There is an inevitable impact on the growth of livestock and poultry population. It is a continuous process of the birth of new population and there are sacrifices of different species by human population every day, on the contrary as well. For appropriate planning to increase the growth rate of livestock and poultry, DLS had also estimated the livestock population to couple up with the demand for the additional human population (up to 2009-2010). Still Agricultural census concomitted with the population estimation done by DLS forecasted the production of the livestock population of the country.

It has been also found that there is a gradual growth of each species of livestock and poultry population other than some pauses due to some natural disasters, epidemics, cyclones and political revolution. It could be mentioned here that there is a big drop in livestock and poultry population during liberation movement in 1971. At the same time, in the long devastating floods of 1988 and 1997, the population of all species of livestock and poultry drops down.

It is also likely that some epidemics like Anthrax, Foot and Mouth Disease, Ranikhet (Newcastle), Gumboro disease may affect the growth of livestock and poultry population. In this case poultry population is highly affected. It has been found to have gradual increase in poultry population except during 1964-1971, 1988 and 1998. However, this sub-sector's growth rate during the 1970's was estimated at around 5.0 percent, which was higher than the other sub-sectors of agriculture sector as a whole. The growth rate has averaged at 3.0 percent during the 1980.⁹ But no negative tendency is found. The livestock population could be seen in million as shown in the First, Second, Third, Fourth and Fifth FYPs in the Table 3.7.

⁹ GOB, *Statistical Yearbook of Bangladesh*, 1996, p. 125.

Table 3.7
Livestock Population in Bangladesh (in million)¹⁰

Species	First FYP, 1973-78	Second FYP, 1980-85	Third FYP 1985-90	Fourth FYP, 1990-95
Cattle	18.00	21.80	23.22	21.50
Buffalo	3.80	Included with cattle	included with cattle	0.57
Goat &	8.00	13.00	10.72	14.23
Sheep	included with goat	Included with goat	included with goat	included with goat
Fowl	7.95	85.00	84.25	61.09
Duck	3.45	Included with fowl	included with fowl	12.62

Source : FYPs, GOB.

However the livestock population in 1960 were 18.96 million cattle, 0.45 million buffalo, 5.67 million goat, 0.48 million sheep, 20.10 million Poultry (both fowl and duck) .On the analysis of the annual growth of different species of animals and poultry, it has been found that the growth rate of cattle, buffalo, goat, sheep, chicken and duck, are 0.60, 2.70, 7.00, 4.00, 5.70, and .60 percent respectively during 1977-1984.¹¹ But these figures show a reduction in 1989, most probably due to devastating flood of 1988. However, the livestock population in the recent past (from 1989-90 to 1993-94 and 1995-96 to 1997-98) are shown in the Tables 3.8 and 3.9.

Table 3.8
Estimated Livestock Population (1989-90 to 1993-94)¹²

Species	Livestock population (million)					% increase 1990-94	Annual growth rate (%) 1990-94
	1989-90	1990-91	1991-92	1992-93	1993-94		
Cattle	22.47	22.65	22.83	23.02	23.20	3.24	0.80
Buffalo	0.69	0.71	0.73	0.75	0.78	13.43	3.00
Goat	21.70	23.48	25.41	27.49	29.75	37.06	7.89
Sheep	0.87	0.91	0.95	0.99	1.04	19.72	4.41
Chicken	89.86	95.88	102.31	109.16	116.48	29.62	6.49
Duck	13.10	13.20	13.29	13.38	2.47	2.83	0.69

Source : DLS, 1996.

¹⁰ Ibid., 1997.

¹¹ GOB, *A Report of Planning Section* (Dhaka : Ministry of Fisheries & Livestock Services, 1988).

¹² GOB, "Department of Livestock Services", an unpublished report, Dhaka, 1996.

Table 3.9
Livestock Population in Bangladesh (1989-90 to 2001-02)¹³

Year	Livestock Population (Million)					
	Cattle	Buffalo	Goat	Sheep	Poultry	Duck
1989-90	22.47	0.69	21.70	0.87	89.86	13.10
1990-91	22.65	0.70	23.38	0.91	95.88	13.20
1991-92	22.83	0.73	25.41	0.95	102.31	13.29
1992-93	23.02	0.75	27.49	0.99	113.38	13.38
1993-94	23.20	0.78	29.74	1.04	116.48	13.47
1994-95	23.38	0.80	32.19	1.09	124.28	13.57
1995-96	23.40	0.82	35.50	1.11	138.20	13.00
2001-02	23.50	0.91	39.18	1.25	175.13	13.70

Source : Ahmed, 1996; Reza, 1999 and DLS, 2001-02.

During this period from 1989-90 to 2001-02, the gradual growth is found in case of all species without any pause even in the long devastating flood in 1998. It has also been found that during the period from 1989-90 to 2001-02 the population also shows positive correlation about the growth of each species of livestock and poultry, though the rate of growth of all the species vary significantly as discussed earlier. The growth rate of goat was found the highest during 1977-1984, which was 7.00 percent followed by chicken (fowl) which was 5.70 percent as stated by DLS.

The lowest growth rate was found in duck during 1989-94 which was 0.69 percent followed by cattle (0.80 percent).¹⁴ On the other hand, the growth rate was found the highest of chicken (6.7 percent). The estimated population which was calculated during 1997 for the period covering 1997-2010 has been shown in the Table 3.10. This estimation has been done in accordance with the estimated human population.

¹³ R. Ahmed, "Present Status of Commercial Poultry Production in Bangladesh", A paper presented at a seminar in Dhaka, 1996; A. Reza, *Livestock Extension Activities in Bangladesh*, M. Akhtaruzzaman, M.S. Hoque and M.M. Rahman (ed.), Proceeding 6th National Conference and Seminar, Bangladesh Animal Husbandry Association, (Dhaka, 1999); GOB, *Divisional Livestock Exhibition, Dhaka* (Bengali Version) (Dhaka : Department of Livestock Services, 2002-03).

¹⁴ GOB, *Development and Activities*, 1988, p. 82.

TABLE 3.10
Year Wise Livestock Population (Estimated by DLS in ,000)¹⁵

ITEMS	98-99	99-2000	2000-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10
	2	3	4	5	6	7	8	9	10	11	12	13
1. a) Cattle. Growth @0.8%	14144	24532	24532	24728	24926	25125	25326	25529	25733	25939	26146	26355
b) Adult female @ 32%	7726	7850	7850	7913	7979	8040	8104	8169	8235	8300	8367	8434
c) Milk cow @ 49% adult female	3786	384.7	384.7	387.7	3908	3940	3971	4003	4035	4067	4100	4132
2. a) Buffalo growth @ 3.2%	910	939	969	1000	1032	1065	1099	1134	1170	1208	1247	1287
b) Adult female @ 23%	209	216	223	230	237	245	253	261	399	278	287	296
c) Milk buffalo @ 33% female adult	69	71	73	76	78	81	83	86	89	92	95	98
3. Goat growth @ 3.5%	36934	38226	39564	40949	42382	43866	45401	46990	48635	50337	52099	53922
4. Sheep growth @3.5%	1229	1265	4306	1343	1383	1424	1467	1511	1556	1603	1651	1701
5. Fowl growth @ 6.7%	174046	185707	198150	211426	225591	240706	256833	274040	292402	311993	33297	355301
6. Duck growth @ 1.5%	14400	14616	14916	15058	15284	15513	15746	15982	16222	16465	16712	16963

Source : Department of Livestock Services 1997, Dhaka.

¹⁵ Government of Bangladesh. Department of Livestock Services, Development and Activities, Dhaka.

3.3 Impact on Milk, Meat and Egg Production¹⁶

The chief nutritional products from livestock and poultry are milk, meat and egg. The livestock population (including poultry) are good enough in comparison to other countries of the world. But their average productions are comparatively much lower in relation to the livestock of other countries (Annex 2). Still the growth rate is increasing gradually.

But the rates of growth of these produces cannot cope up with the growth of population of the country. Nevertheless, there are controversies about the requirement of milk, meat and eggs. The requirement of milk meat and eggs are 250 ml per head per day, 120 gm per head per day and 3.90 eggs per head per week. At the same time, the requirement of eggs has been mentioned as 2 (two) per head per week. In the same way, unlike the requirement of eggs, there is little variation in the requirement of milk and meat as mentioned in different nutritional and departmental statements of DLS and other organizations. However the target of livestock products as mentioned in First FYP is presented in the Table 3.11.

It could be mentioned here that the per capita availability of milk, meat and eggs were 45.0ml, 9.0gms and 0.08 eggs per week during 1971-72. But during the planning, taking bench mark of 1979-80 for Second FYP, the production increases, and the target fixed with an annual average growth rate of 2.16 percent, 1.69 percent and 6.9 percent respectively during 1980-1985. However the table shows the production in 1969-70, and in 1977-78 showing the rate of increase in production.

Table 3.11
Physical Target in Livestock Products over First FYP¹⁷

Products	Production in base year 1969-70	Production in reporting year 1977-78	Percent increase in production
Milk and Milk Products	627,000 tons (20.4.Ibs)	1005,000 tons (26.4 Ibs)	60
Meat	127,000 tons (4.1 Ibs.)	210,000 tons (4.5 Ibs.)	65
Eggs	353.00 million (5.1)	520.00 million (6.1)	48

(Figures in parenthesis show per capita availability of Livestock Products per annum)

Source : Department of Livestock services, Mohakhali, Dhaka

¹⁶ Asian Development Bank, *Main Report* (Dhaka : Third Livestock Development Project, 1996), p. 28.

¹⁷ GOB, *Development and Activities*, 1998, p. 39.

Likewise the production target of Second FYP has been stated in the tabular form (Table 3.12).

Table 3.12
Production Targets of Second FYP¹⁸

Items	Bench-mark 1979/80.	Target in 1984/85.	Increase over benchmark (percentage)
i) Milk (million metric tons)	1.036(32.55)	1.25690(35.20)	2.16
ii) Meat (million metric tons)	0.33035(10.55)	0.38614(10.79)	1.69
iii) Eggs(million metric tons)	0.04730(1.48)	0.05058(1.41)	6.9

(Figures in the parentheses indicate production in grams per head per day)

Source : The First, Second, Two years' Plan (1978-80) & Third FYPs, Ministry of Planning, Dhaka.

During the period of Second FYP, miserable condition is reflected in milk, meat and egg production. The production of milk increased at rates well below the population growth rate. The annual growth rate of these products together was 1.78 percent and 1.80 percent during First and Second FYP respectively. However, the production figures of milk meat and eggs during 1972-1985 are shown in the Table 3.13.

Table 3.13
Production of Milk, Meat and Eggs¹⁹

Item	First FYP			Second FYP		
	1972/73	1977/78	Average growth rate	1979/80	1984/85	Average growth rate
1. Milk (million tons)	0.70365	0.75287	1.40	0.77190	0.82500	1.38
2. Meat (million tons)	0.15900	0.12960	2.55	0.18862	0.21500	2.69
3. Eggs (million No.) million tons)	660.00	896.00	6.30	1007.00	1350.00	6.04
	0.02649	0.03596	6.30	0.04043	0.05419	6.04

Source : The First FYP, Ministry of Planning, Dhaka, 1980.

The achievement during the Third FYP period is shown in Table 3.14.

¹⁸ GOB, *The First, Second and Third FYPs*, Dhaka, 1973, 1980 and 1985.

¹⁹ GOB, *The First FYP* (Dhaka : Ministry of Planning, 1980), p. 125.

Table 3.14
Targets and Achievements During the Third Five-Year Plan²⁰

Item	Unit	1984-85 Revised Bench mark	1989-90 Revised Target	Achievement
Milk	Mmt	1.218	1.39	1.326
Meat	Mmt	0.3888	0.480	0.435
Eggs	million no.	1450.00	2200.00	1910.00

Source : Third & Fourth FYPs, Ministry of Planning, Dhaka.

In 1994-95, the milk production estimated by DLS was 1.60 million tons out of which 90 percent was from cows and 10 percent from buffalo. In a statement of the Ministry of Fisheries and Livestock, it has been stated that, Bangladesh has drastically reduced its dependency on milk import from abroad over the last few years. According to the ministry, the country used to import milk powder worthing Tk. 4500.00 million. The total cost of milk to be imported would not exceed Tk. 1500.00 million. It was also added that the achievement in this sector was possible due to the several incentive and innovative programmes of the government. The detail statistics could be seen in the impact on export (foreign currency earning and saving, Chapter 4). "Besides the sector has created a lot of employment opportunity, Many educated youth have engaged themselves in self-employment project in this sector"-the ministry added. The ministry acknowledged that the availability of bank loan was the main factor that helped the growth of the sector. Other than reducing import dependency of milk, the country has also successfully increased production of meat through the cow-fattening programme. Finally the ministry also acknowledged that most of the bank, specially the Bangladesh Krishi Bank (BKB), were distributing loan facility to the cow-fattening and milking programmes initiated by the entrepreneurs.⁸⁹ The achievement up to 1993-94 covering the whole of the Third FYP and most of the Fourth Plan period has been shown in the Table 3.15. This table represents production and annual growth rates during 1987-1994. The highest growth rate was found in egg production.

²⁰ GOB, *The Third & Fourth FYPs* (Dhaka : Ministry of Planning, 1980 & 1985).

⁸⁹ GOB, "A Statement of the Ministry of Fisheries & Livestock", *The Daily Observer*, Dhaka, May 25, 1998.

Table 3.15
Production and Annual Growth Rates of Milk, Meat and Eggs During 1987-88 to 1993-94.²¹

Product	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94	Annual growth rate (%)	
								1987-88/ 1993-94	1990-91/ 1993-94
Milk (mmt)	1293859	1300769	1313949	1338298	1352508	1370123	1392373	1.26	1.32
Meat (mmt)	413898	423504	435099	447395	460438	4743 01	489030	2.80	2.97
Eggs TN	1754313	1843426	1941236	2046530	2158272	2276946	2404401	5.26	5.37

Source : Government of Bangladesh, Ministry of Fisheries & Livestock.

However, the annual growth rates for milk and meat during the period from 1987-88 up till 1993-94 was not satisfactory as shown in the Table 18. The growth rate for egg production for that period was, to a certain extent, satisfactory that was 5.26 percent on an average. The growth rates for all these product continued almost the same trend for 1990-91 to 1993-94. However, the requirement of livestock and livestock products during 1990-1995 was as shown in the Table 3.16.

Table 3.16
Requirement and Production of Livestock & Livestock Products During Fourth Plan (1990-91 to 1994-95)²²

Year	Population (million)	Milk (million metric ton, mmt)		Meat (million metric ton, mmt)		Egg (million number)	
		Requirement	Production	Requirement	Production	Requirement	Production
	1	2	3	4	5	6	7
1991	108	9.86	1.34 (13.59%)	4.26	0.45 (10.56%)	8,985.60	2046.60 (22.78%)
1995	121	11.04	1.41 (2.77%)	4.77	0.51 (10.69%)	10,067.20	2539.00 (25.22)%

Source : The Fifth FYP, 1997 and BBS.

The production of milk and meat increased by an annual compound growth rate of 1.3 percent and 3.2 percent respectively. The growth rate of egg was, however, satisfactory which was 6.5 percent between 1990-91 and 1994-95. But there were wide gap between the potentials and the realized yield of milk, meat and eggs. Therefore, there are ample potentials for increasing production of milk, meat and eggs in the country. The main problems of this sector are : inadequate supply of vaccine, medicine, equipment, health care facilities, quality breed, parent stock, and other inputs. However, the share of livestock sub sector is about 3.0 percent to total

²¹ Asian Development Bank, *Main Report*, 1996, p. 18.

²² GOB, *The First FYP*, 1997, p. 128, *Statistical Yearbook of Bangladesh 2003*.

GDP and 17.0 percent to Agricultural GDP. The growth rate of livestock sub sector is gradually increasing and is the highest amongst the sub sectors and Fisheries sector which is about 4.48 percent; against 1.67 and 3.6 percent respectively for crops and Fisheries respectively during 2001-02. This sub sector shows the highest among all the sub sectors of Agriculture and Fisheries, which was 4.51 during 2002 -03. The contribution has been being increasing gradually. The rate of growth of livestock population, though not so rapid as a whole in relation to the growth of poultry population, has been also gradually increasing. The rate of growth of milk, meat and egg has owned an increasing trend gradually as well.

3.4 Production of Inputs by DLS

Livestock production depends on factors like feeding, breeding, housing, health care, management etc. There is much input that should be made available to the farmers for enhancing production as well. Among them vaccine and vaccination, artificial insemination, young stock distribution, treatment etc. are important. DLS fixes year wise target for each of the tasks. The department also gathers information accordingly. However, the input supply targets and achievement of some important tasks are shown in tabular forms (Table 3.17).

3.4.1 Vaccine production for Livestock

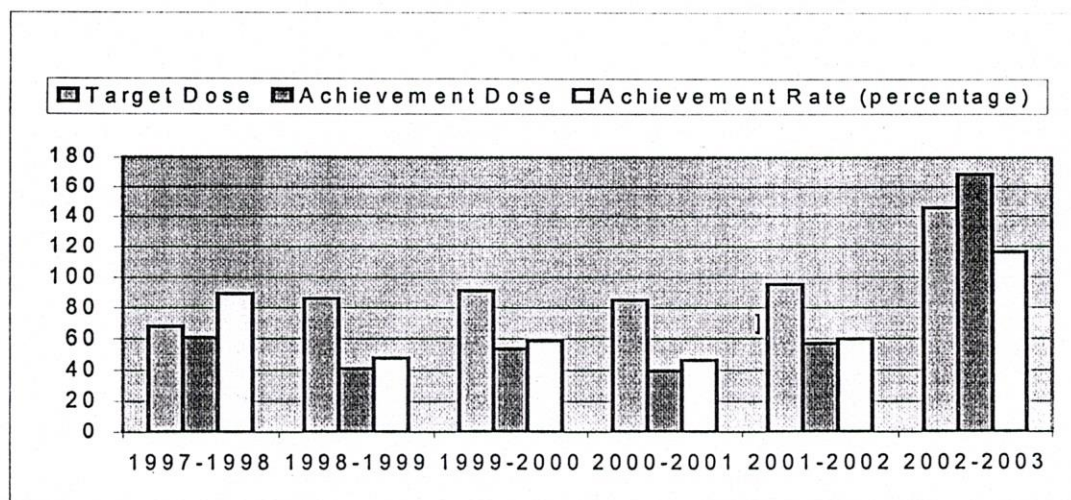
Table 3.17
Vaccine production for Livestock (doses in ,00000)²³

Year	Target	Achievement	
	Dose	Dose	Rate (percentage)
1997-1998	68.13	60.79	89.20
1998-1999	86.10	40.95	47.60
1999-2000	91.10	53.32	58.50
2000-2001	85.06	39.35	46.30
2001-2002	95.06	56.82	59.80
2002-2003	145.35	168.55	115.97

Source : Department of Livestock Service, 2003

²³ GOB, *Role of Department of Livestock Services in National Economic Development* (Dhaka : Department of Livestock Services, 2003).

Figure 3.5
Vaccine Production for Livestock



The figure and table are showing vaccine production for livestock indicated that target was fulfilled only during 2002-2003, which was 115.97 percent. The achievement of target was below 50 percent during 1998-1999 and 2000-2001. The main reasons behind this achievement were shortage of modern facilities, skilled manpower, complicated government formalities etc.

3.4.2 Vaccine Production for Poultry

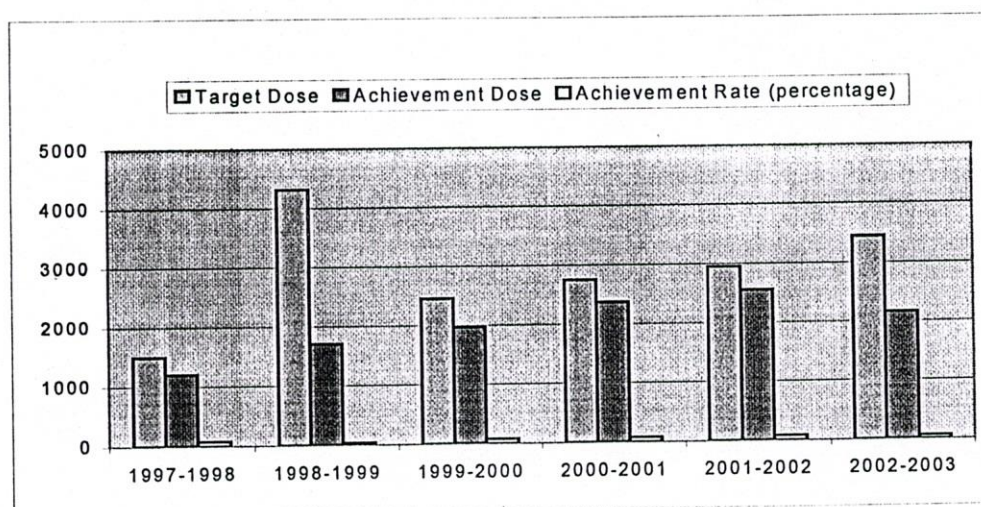
Table 3.18
Vaccine Production for poultry (Figures in ,00000)²⁴

Year	Target Dose	Achievement	
	Dose	Dose	Rate (percentage)
1997-1998	1490	1195	80.20
1998-1999	4315	1697	39.30
1999-2000	2445	1963	80.30
2000-2001	2745	2360	86.00
2001-2002	2950	2534	85.90
2002-2003	3450	2145.74	62.19

Source : Government of Bangladesh, Department of Livestock Service, 2003

²⁴ Ibid.

Figure 3.6
Vaccine Production for poultry



The target for higher vaccine production (431.50 million) was due to face the consequences of devastating flood in 1988; but the achievement was very poor (39.30 percent). The targets were not fulfilled in the years mentioned. The achievement was about 80 percent or above other than in 1998-99 and 2002-2003. Insufficient technical manpower, want of modern instruments and machineries, complicated government facilities; sometimes poor funding are main reasons for this low achievement.

3.4.3 Poultry Vaccination

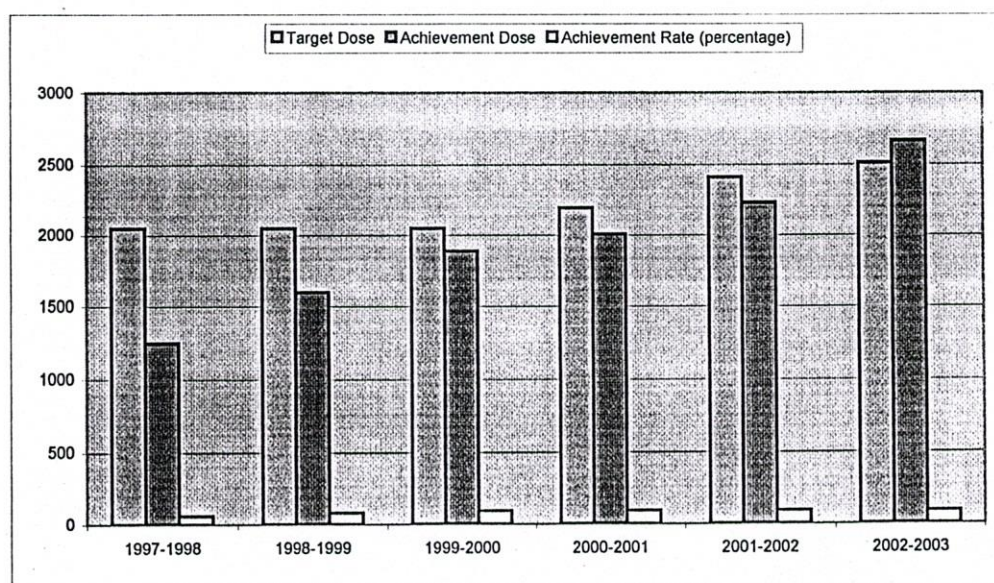
Table 3.19
Poultry Vaccination (Figures in ,00000)²⁵

Year	Target	Achievement	
	Dose	Dose	Rate (percentage)
1997-1998	2050.00	1247.00	60.80
1998-1999	2050.00	1596.30	77.90
1999-2000	2050.00	1882.30	91.80
2000-2001	2190.00	2004.70	91.50
2001-2002	2409.00	2225.10	92.40
2002-2003	2510.75	2664.47	90.19

Source : Department of Livestock Service, 2003.

²⁵ Ibid.

Figure 3.7
Poultry Vaccination



Though target for vaccination in each year was set, rate of achievement was gradually increasing. In 1997-98 the achievement was 60.80 percent with the highest achievement in 2001-2002 which was 92.40 percent

3.4.4 Cattle Vaccination

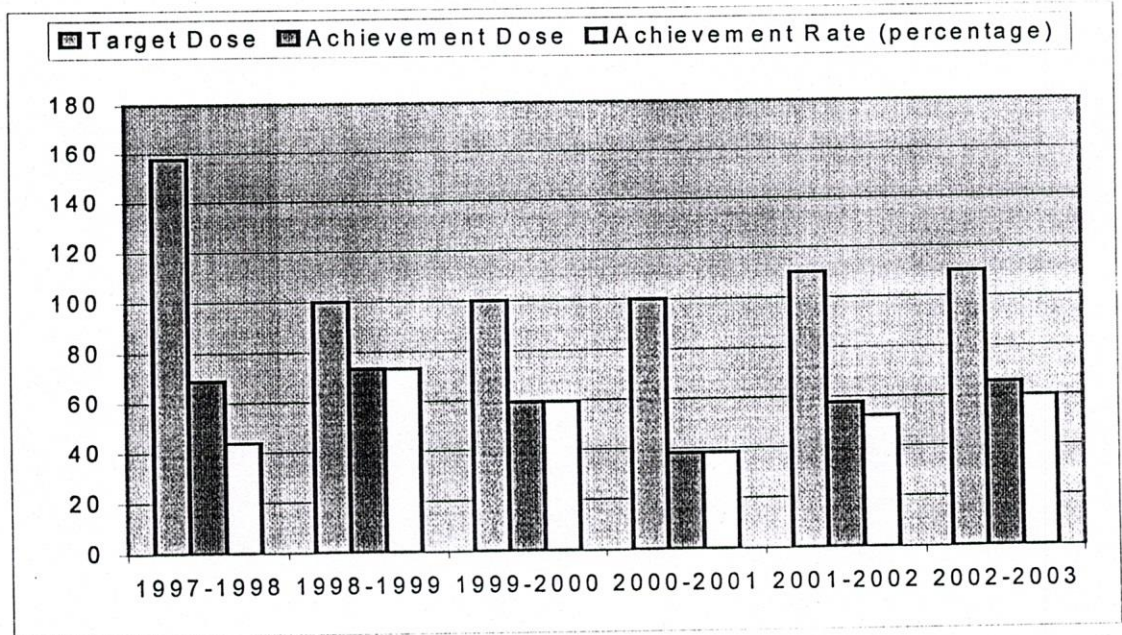
Table 3.20
Cattle Vaccination (Figures in ,00000)²⁶

Year	Target	Achievement	
	Dose	Dose	Rate (percentage)
1997-1998	157.55	68.93	43.80
1998-1999	100.00	73.41	73.40
1999-2000	100.00	59.34	59.30
2000-2001	100.00	38.11	38.10
2001-2002	110.00	57.46	52.20
2002-2003	110.00	65.64	59.67

Source : Department of Livestock Service, 2003

²⁶ Ibid.

Figure 3.8
Cattle Vaccination



The production of vaccine for cattle and hence target for vaccination are comparatively lower than that of poultry. Still the achievement of cattle vaccination was also lower. It was as low as 38.10 percent in 2000-01 against a yearly target of 10.00 million. Lack of awareness among the farmers and insufficient number of Field Assistants were main causes for low achievement.

3.4.5 Livestock Treatment

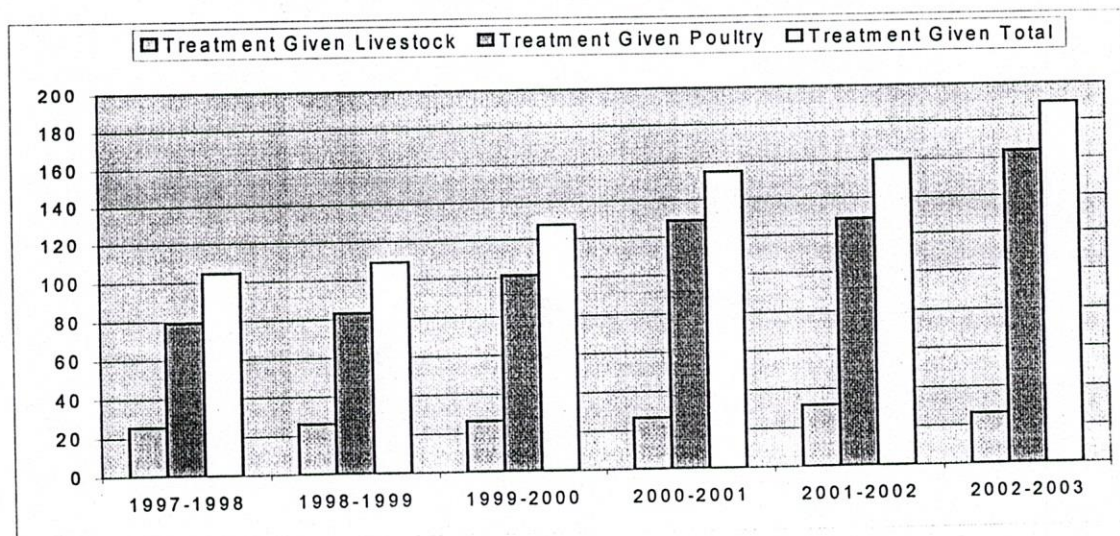
Table 3.21
Livestock Treatment (Figures in ,00000)²⁷

Year	Treatment Given		Total
	Livestock	Poultry	
1997-1998	25.31	79.04	104.35
1998-1999	25.92	82.87	108.79
1999-2000	26.05	101.13	127.18
2000-2001	26.41	128.48	154.89
2001-2002	31.65	128.24	159.89
2002-2003	25.97	163.77	189.74

Source : Department of Livestock Service, 2003.

²⁷ Ibid.

Figure 3.9
Livestock Treatment (Figures in ,00000)



The treatment of livestock and poultry were given at the Veterinary Clinics at Thana level and the farms both at rural, periurban and urban areas. Livestock species were given individual treatment and poultry species were treated both on individual basis as well as flock wise. This service is required as per the extent of outbreak of diseases.

3.4.6 Production of Semen

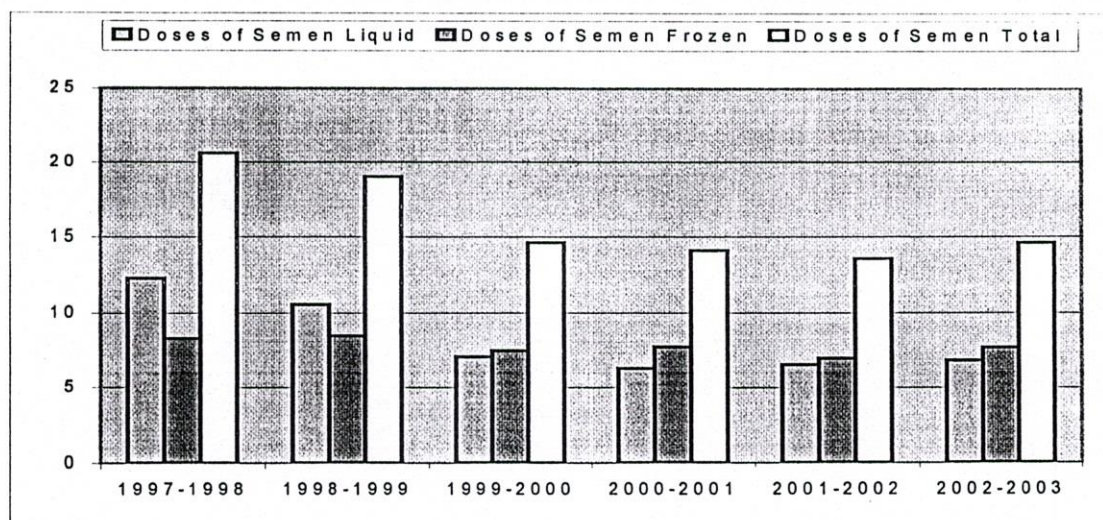
Table 3.22
Production of Semen (Doses in, 00000)²⁸

Year	Doses of Semen		
	Liquid	Frozen	Total
1997-1998	12.28	8.31	20.59
1998-1999	10.55	8.46	19.01
1999-2000	7.08	7.51	14.59
2000-2001	6.32	7.77	14.09
2001-2002	6.57	7.00	13.57
2002-2003	6.85	7.72	14.57

Source : Department of Livestock Service, 2003.

²⁸ Ibid.

Figure 3.10
Production of Semen (Doses in, 00000)



The Semen was produced in Central Cattle Breeding Station and Dairy Farm at Savar, Dhaka. In accordance with the existing breeding policy, those were being produced. The highest production was 2.059 million doses in total (both liquid and frozen) in 1997-98 and the lowest was in 2001-2002, which was 1.357 million doses. No target was fixed. It was produced on the basis of the number of the quality bulls keeping consistency with the breeding policy.

3.4.7 Number of Cows Inseminated

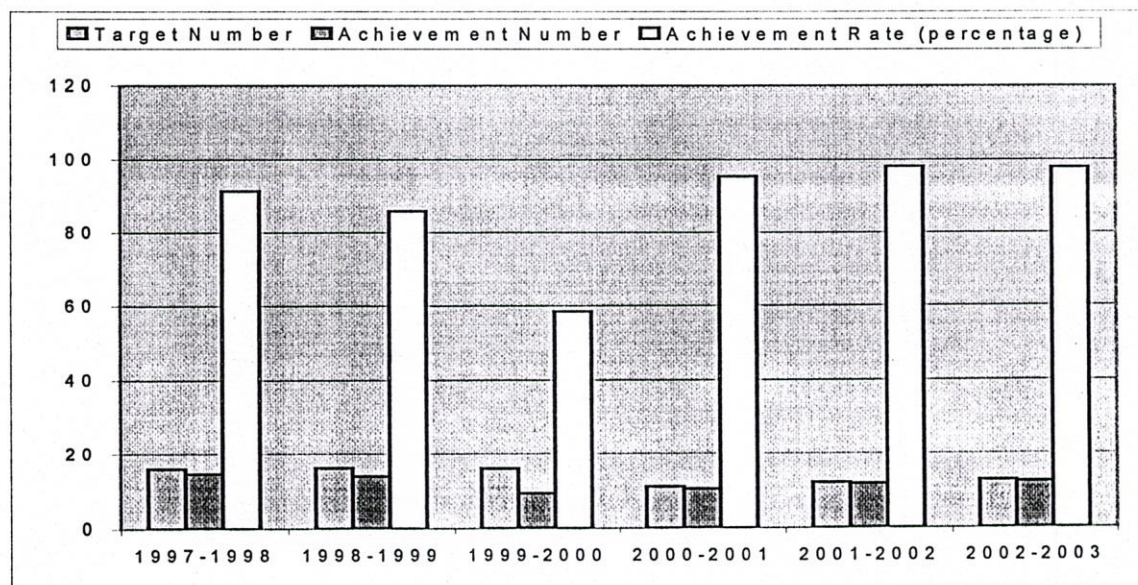
Table 3.23
Number of Cows Inseminated (Artificial Insemination) (Figures in ,00000)²⁹

Year	Target	Achievement	
	Number	Number	Rate (percentage)
1997-1998	16.00	14.62	91.40
1998-1999	16.15	13.89	86.00
1999-2000	16.00	9.34	58.40
2000-2001	11.05	10.54	95.40
2001-2002	12.00	11.77	98.10
2002-2003	12.55	12.28	97.83

Source : Department of Livestock Service, 2003

²⁹ Ibid.

Figure 3.11
Number of Cows Inseminated (Artificial Insemination) (Figures in, 00000)



The Achievement of this Artificial Insemination (AI) Programme was mainly depended upon the number of doses of semen produced at and distributed by the A.I. Section of the Central Cattle Breeding Station (CCBS). The availability of the cows in estrous at the District A.I. centre and A.I. points at rural level were also very important factors. The achievement was as low as 58.40 percent in 1999-2000.

3.4.8 Day Old Chick Production (Govt. Farm)

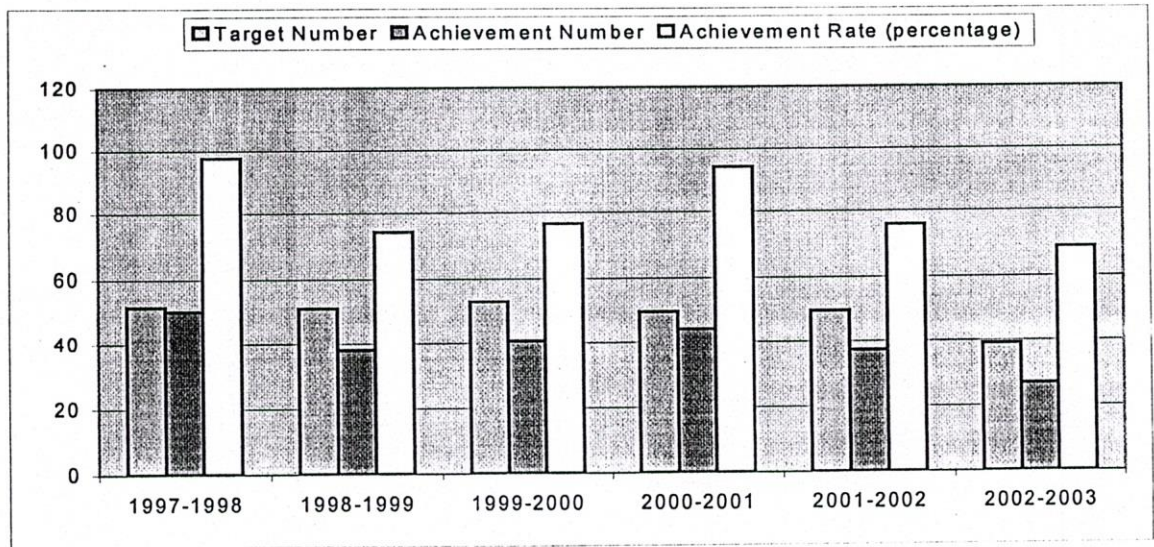
Table 3.24
Day Old Chick Production (Govt. Farm) (Figures in, 00000)³⁰

Year	Target Number	Achievement	
	Number	Number	Rate (percentage)
1997-1998	51.50	50.20	97.50
1998-1999	51.00	37.84	74.20
1999-2000	53.00	40.52	76.50
2000-2001	49.50	44.02	94.00
2001-2002	49.50	37.10	75.70
2002-2003	39.00	26.84	68.80

Source : Department of Livestock Service, 2003

³⁰ Ibid.

Figure 3.12
Day Old Chick Production (Govt. Farm) (Figures in ,00000)



The day old chick production at the government was farms were satisfactory except in some specific years, like 2002-2003. But production could be made higher with the availability of modern high capacity incubators, at the same time the size of the government farms should be extended.

3.4.9 Duckling Production at Government Farm

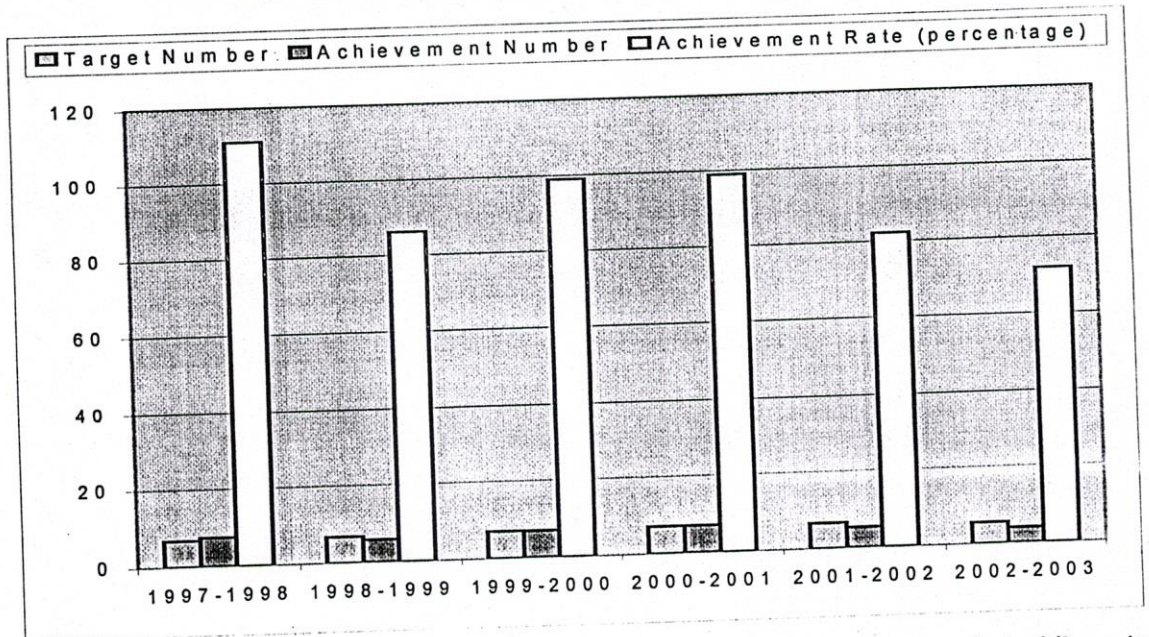
Table 3.25
Duckling Production at Government Farm (Figures in, 00000)³¹

Year	Target	Achievement	
	Number	Number	Rate (percentage)
1997-1998	6.75	7.52	111
1998-1999	6.75	5.82	86
1999-2000	7.00	6.90	99
2000-2001	7.00	6.98	99
2001-2002	6.50	5.32	82
2002-2003	5.50	3.95	71.75

Source : Department of Livestock Service, 2003.

³¹ Ibid.

Figure 3.13
Duckling Production at Govt. Farm (Figures in, 00000)



The only duck-breeding farm is at Narayanganj, which produced ducklings to a limited extent. The target was fixed accordingly and the achievement varies from as low as 71.75 percent in 2002-03 up to as high as 111 percent in 1997-98.

3.4.10 Day old Chick and Duckling Distribution

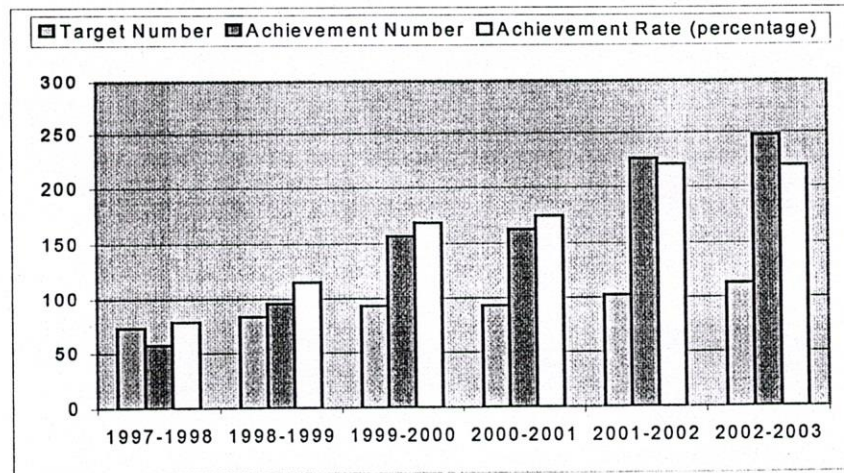
Table 3.26
Day old Chick and Duckling Distribution (Figures in, 00000)³²

Year	Target	Achievement	
	Number	Number	Rate (percentage)
1997-1998	73.33	57.86	78.90
1998-1999	83.50	95.83	114.80
1999-2000	93.13	156.62	168.20
2000-2001	93.13	162.25	174.20
2001-2002	102.49	225.81	220.30
2002-2003	112.97	247.51	219.09

Source : Department of Livestock Service, 2003.

³² Ibid.

Figure 3.14
Day old Chick and Duckling Distribution (Figures in, 00000)



The distribution programme of day old chicks (DOC) and Ducklings were satisfactory due to satisfactory level of hatching and at the same time, the demand from the farmers were comparatively higher since the price was cheap. That was also a reason for this achievement.

3.4.11 Egg Production in Government Farms

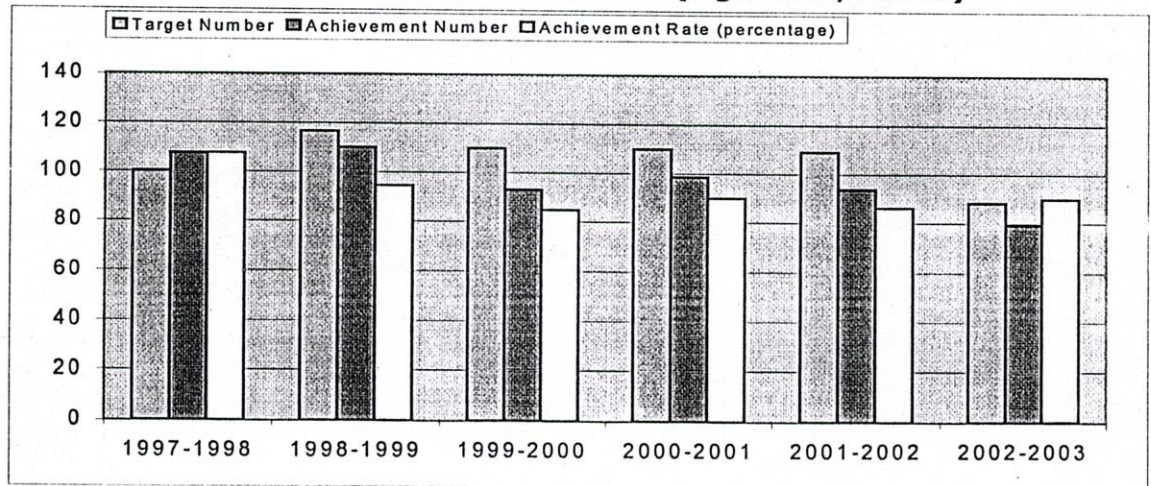
Table 3.27
Egg Production in Govt. Farms (Figures in, 00000)³³

Year	Target	Achievement	
	Number	Number	Rate (percentage)
1997-1998	100.00	107.48	107.50
1998-1999	116.47	109.85	94.30
1999-2000	109.80	92.84	84.60
2000-2001	109.80	98.59	89.80
2001-2002	108.90	93.70	86.00
2002-2003	88.20	79.19	89.78

Source : Department of Livestock Service, 2003.

³³ Ibid.

Figure 3.15
Egg Production in Govt. Farms (Figures in, 00000)



The achievement in relation to the target fixed was satisfactory as those were above 80 percent and sometimes very close to the target. If the capacity of the farmers could be extended, more could be achieved. Complicated Government procedure of procurement of fund, rules of release of fund, insufficient fund, machineries etc are also factors for low level of achievement.

3.5 Other Impacts

In addition to the production of livestock products and byproducts including hides and skins; supply of inputs like vaccines, day old chicks, day old ducklings, medicine, semen (liquid and frozen), and hatching eggs were important achievements of DLS. Extension service on A.I., chick and duckling distribution, cockrel exchange programmes (for rural poultry development), particularly livestock development activities through skill training and related services; micro credit programme for the poor were important tasks of DLS as well. Undertaking of projects like Breed Upgradation through Progeny Testing, Cattle Breeding and Modernization of Dairy Farms, Farmers' Development of Five Districts Adjacent to the Coastal Area, Poverty reduction through Backyard Subsistence Level Farming, Extension of A.I. and Introduction of Embryo Transfer Technology, setting up of New Livestock Development Centre, improvement and Infrastructural Development of Dairy and Poultry farms, Upazilla/ Thana (Sub-District) Livestock Development Centre, Project for Vaccine Production, National Livestock Enterprise Development

project, establishment of four Veterinary Colleges, establishment of Veterinary Hospitals at District Headquarters, establishment of Duck Breeding and Hatchery Project, strengthening of Livestock information Service and Participatory Livestock Development project are also the activities of DLS for improvement of Livestock. In an approximate calculation of the department, it produces 8,000 mmt (cow) dung, 5,000 mmt bones, hairs, feathers, horn, hooves, glands, offals, and a considerable amount of inedible guts etc. (generally used in pisciculture as manure). These are also used as the input of many industries for production of many products like poultry feed, sports materials, glue, medicine, combs, handles of different weapons for daily household works etc. Though there is no commercial wool industry in Bangladesh, Wool has been used to produce blankets etc. in some specific parts of the country. In addition to the use of cow dung and poultry wastage/ droppings as organic manure, mainly cow dung has been used as fuel for daily cooking in the rural families and it contributes about 25 percent of the total rural household fuel in Bangladesh. A lot of lab animals like rats; mouse, rabbits etc. have been being used in the research laboratories. The equines are still used mainly for carrying goods in addition to rural transport.

3.6 Conclusion

Livestock shows a trend of continuous positive growth in value added term (in both constant and current price basis). The input supplies e.g. vaccine production and vaccination, semen production and A.I., day old chick and duckling production and distribution, clinical service for treatment of livestock and poultry etc. represent a continuous positive growth trend. The growth rate of milk, meat and egg production though the rate of growth could not satisfy the target, set as per the programmes taken as well as to coup up with population; private livestock and poultry farms, different private enterprises like establishment of hatcheries, feed mills, poultry farms, duck farms, dairy farms and sheep farms showed positive trend. Obviously with the positive growth of livestock population and products and by products like cow-dung, bone meal, leather (raw, wet-blue, crust and finished) and leather goods, draft power etc. also showed positive trend showing it as a prospective sub-sector of this country.

Chapter 4

MEASURING THE PROGRAMMES' IMPACT AT MACRO LEVEL

Programmes and Policies of livestock sub-sector have some positive impact at macro level. Programmes' impact on employment generation and poverty alleviation is very much evident in Bangladesh. Almost all the families of the country rear livestock at subsistence level. About 85 percent poultry are being reared in the backyard system. Likewise a very negligible number of higher animals are reared in the farming level and rural farming is the main source of milk and meat. And the poor are the main rearer of the livestock (including poultry). A good impact is found on foreign currency earning and saving. Likewise impact on NGO and private sectors and other miscellaneous fields are also briefly discussed here.

4.1 Livestock Sub-sector's Contribution to GDP and Agricultural GDP Over the Years (in terms of percentage) During 1975-2000

Among the different Sub-sectors, Livestock contributes to a considerable portion to GDP and Agricultural GDP though during eighties it was somewhat lower in comparison to other Sub-sectors. Presently, its contribution is considerable showing higher performance (4.4) in 2003-04. However, the following Table 30 shows it elaborately (year wise).

The livestock sub-sector shows a trend of positive growth to the country's GDP (and agricultural GDP as well). The figures on the basis of constant 1984-85 prices represent it as a prospective sub-sector when compared with other sub-sectors of agriculture though fisheries has shown a higher contribution to agricultural GDP.

The contribution of agricultural GDP shown in the Table 4.1 (at constant 1984-85 prices) and in the graph. In addition, the contribution of agriculture sector and it's sub-sector (including livestock) at current prices has also been shown in the Table 4.2.

Table 4.1 Gross Domestic Products (GDP) at Constant (1984-85) Price (In Tk., 0,000,000)¹

Sector	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86
All sectors	29382	30167	32301	33852	34130	35288	35722	37470	29503	40693	42459
Rate of growth (%)	5.7	2.7	7.1	4.8	0.8	3.4	1.2	4.9	5.4	3.0	4.3
Agri-culture	14493	13963	15057	14957	14981	15607	15631	16293	16881	16997	17555
a) Crops	11320	10808	11671	11789	11813	12397	12267	12778	13392	13503	13960
b) Forestry	729	692	858	976	944	957	1017	1079	1157	1095	1141
c) Livestock	1059	1077	1125	1151	1177	1205	1236	1266	1141	1178	1213
d) Fisheries	1385	1386	1403	1432	1047	1051	1111	1170	1191	1221	1241

Sector	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00
All sectors	44234	45513	46661	49753	51444	53619	56023	58384	60979	64244	68021	71867	75612	80171
Rate of growth (%)	4.2	2.9	2.5	6.6	3.4	4.2	4.5	4.2	4.4	5.3	5.9	5.7	5.2	6.0
Agri-culture	17625	17490	17304	19035	19342	19766	20123	20192	19982	20713	22046	22696	23853	25566
a) Crops	13960	13712	13451	15083	15257	15510	15639	15385	14807	15217	16157	16383	17102	18340
b) Forestry	1117	1204	1231	1259	1285	1315	1354	1408	1471	1534	1598	1667	1733	1803
c) Livestock	1280	1292	1335	1380	1410	1461	1552	1684	1824	1971	2128	2298	2473	2663
d) Fisheries	12.53	12.78	1301	1313	1390	1480	1578	1715	1880	1991	2163	2349	2545	2760

Source : *Bangladesh Economic Review*, Ministry of Finance, Finance Division, 2003 and Bangladesh Bureau of Statistics

¹ GOB, *Bangladesh Economic Review*, Dhaka : Ministry of Finance, 2003; GOB, *Bangladesh Bureau of Statistics*, Dhaka : Ministry of Planning, 2003.

Figure 4.1 : Gross Domestic Products (GDP) at constant (1984-85) Price

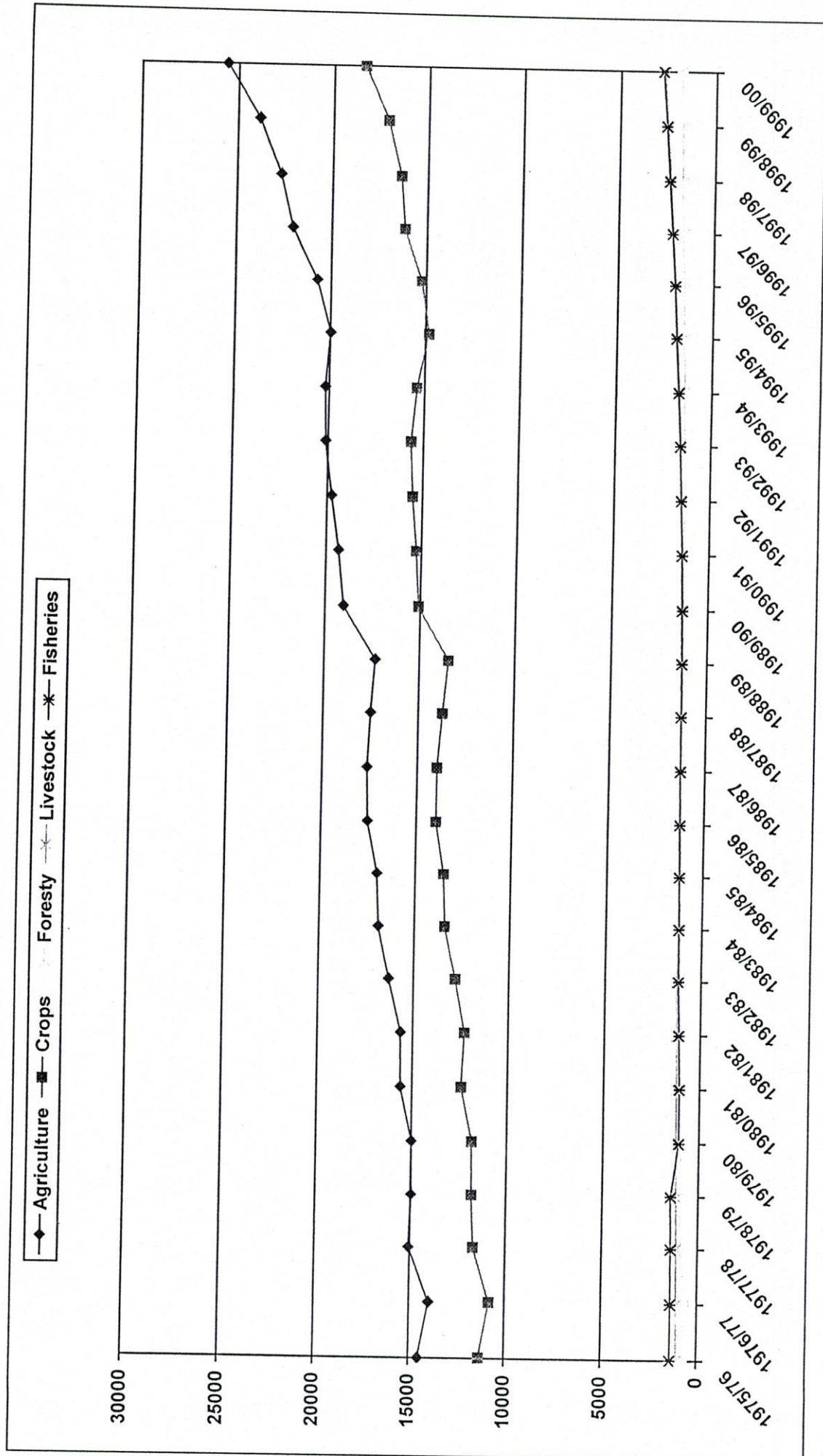


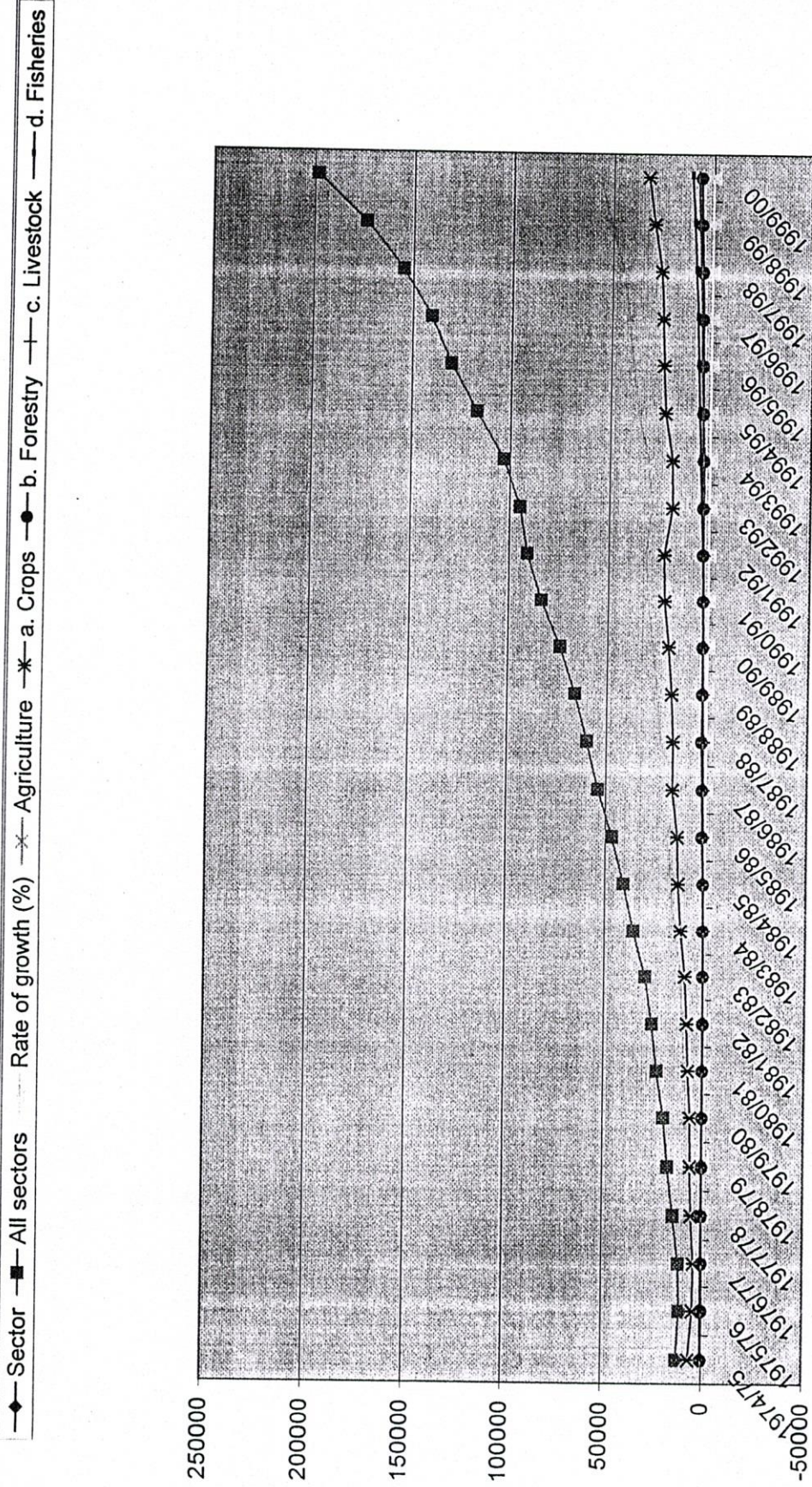
Table 4.2 Gross Domestic Products (GDP) at Current Price (In Tk., 0,000,000)²

Sector	1974 /75	1975 /76	1976 /77	1977 /78	1978 /79	1979 /80	1980 /81	1981 /82	1982 /83	1983 /84	1984 /85	1985 /86	1986 /87	1987 /88	1988 /89	1989 /90	1990 /91	1991 /92	1992 /93	1993 /94	1994 /95	1995 /96	1996 /97	1997 /98	1998 /99	1999 /00
All sectors	12437	11032	11600	14519	17405	19605	23142	25902	29419	35519	40693	46623	53920	59714	65960	73757	83439	90650	94807	103036	117026	130160	140305	154833	173762	198299
Rate of growth (%)	64.2	-11.3	5.1	25.2	19.9	12.6	18.0	11.9	13.6	20.7	14.6	14.6	15.7	10.7	10.5	11.8	13.0	8.6	4.6	8.6	13.6	11.2	7.8	10.4	12.2	9.2
Agriculture	7370	5495	5327	6893	7795	8082	9480	10455	11758	14827	16997	18838	12976	23162	24539	27179	30024	31244	28884	30589	36137	38999	41163	44356	50812	56431
a. Crops	6446	4490	4215	5481	6177	6313	7650	8508	9507	12001	13503	13949	16765	16765	17647	19421	21782	22245	18466	18765	22514	23520	24325	25356	29028	32179
b. Forestry	212	192	194	373	436	446	537	601	780	1090	1095	1898	2054	2537	2419	2653	2864	3101	3244	3374	3894	4306	4553	5010	5688	6114
c. Livestock	304	318	330	449	594	726	694	693	777	805	1178	1540	1622	1787	2127	2530	2656	2811	3161	3609	4038	4686	5135	5772	6761	7527
d. Fisheries	408	495	588	590	588	597	599	653	694	931	1221	1451	1802	2073	2347	2575	2757	3087	4013	4841	5691	6487	7150	8218	9335	10611

Source : *Bangladesh Economic Review*, Ministry of Finance, Finance Division and Bangladesh Bureau of Statistics, 2003.

² GOB, *Bangladesh Economic Review*, Dhaka : Ministry of Finance, 2003; GOB, *Bangladesh Bureau of Statistics*, Dhaka : Ministry of Planning, 2003.

Figure 4.2 : Gross Domestic Products (GDP) at Current Price



It can be mentioned here that the calculation of GDP both at current and constant 1995-96 prices are much higher than those shown in the above two tables based on old (traditional) system (estimation on the basis of 11 sectors) of GDP calculation. Because, the new system of accounting (SNA' 1993) which introduced in 1999-2000 by subdividing GDP in to 15 sectors against 11 in the previous system (the base year in the new system was 1996). But the contribution and trend of livestock sub-sector to agricultural GDP and agricultural GDP over the last three decades were proportionately the same.

4.2 Growth of farms and Impact on Employment Generation and Poverty Alleviation

Unlike crops farming, livestock and poultry farming provide year round employment of the farmers. In a country like Bangladesh where 78 percent people live in rural areas with low per capita income in agro-based economy, and 57 percent families are either land less or with marginal land -ownership with less than 50 decimals of cultivable land, livestock and poultry farming is one of the most important profession from which the farmers can get full time self-employment opportunity. The development and gradual increase in establishment of livestock and poultry farms indicates the positive impact in this sub-sector and women play an important part in imparting major portion of labour in backyard farming. It has been reported that 20 percent of the total labour force get full time self-employment and 50 percent part time employment. These employments are entangled with the livestock and poultry farms being established from small scale and large-scale scattering all over country in the private sector. The number of farms increased in the recent years and it shows a promising prospect of development. It has been mentioned earlier that there are about 50,000 poultry (fowl) farms, 26000 duck farms and 26000 dairy farms have been set up in the country in the private sector up to 1997. But this figure rises up gradually. It has been reported that there are about 1,32,520 poultry farms, 51,518 duck farms and 56,421 dairy farms which have been established by 2002-03. In addition, there are also 27,752 goat farms and 13,114 sheep farms which have been set-up by 2002-03. The gradual development up to 2003 was remarkable and that is shown in the Table 4.3. The Fifth Five Years Plan reveals that the contribution of Livestock Sub-sector in employment generation

is 39 percent (7 percent from Poultry and 32 percent from livestock) and from overall financial viewpoint, the contribution is 16 percent. The plan also states that about 78 percent labour requirement of this sector is contributed by family members and 22 percent from outside.

Table 4.3
Private Level Livestock & Poultry Farms (in number)³

Type of farm	Up to 1995-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03
Dairy Farm	23,924	2,6581	29,649	30,480	31,028	32,614	47,319	56,421
Goat Farm	9,228	15,249	20,833	22,217	23,051	24,940	25,890	27,752
SheepFarms	4,186	6,666	10,289	10,462	10,987	11,112	12,122	13,114
Duck Farms	21,225	25,343	30,760	32,417	33,805	35,374	43,601	51,518
Poultry farms	47,638	53,644	60,670	70,430	81,075	91,430	1,02,849	1,32,520

Source : "Development & Activities", Department of Livestock Services and BBS.

The rate of growth of these farms shows ray of hope to many households and poor families. These farms provide employment and generate income for many people.

4.3 Impact on Production and Availability of Vaccines

Vaccines are one of the most important input as well as a factor for livestock production, which has a tremendous effect on the farms. The gradual improvement regarding quantitative production and availability of services to the farmers attributes to ensuring protection against infectious diseases of the livestock and poultry stock of the farmers. The vaccines for cattle are GTV (Goat Tissue Vaccine) or TCV (Tissue Culture Vaccine), FMD (Food and Mouth Disease) Vaccine, H.S (Hemorrhagic Septicemia) Vaccine, BQ (Black Quarter) Vaccine, PPR (Peste Des Petits Ruminants) and Anthrax vaccine are produced. FMD vaccine production is not sufficient. At the same time BQ, PPR and Anthrax vaccines are also not up to the requirement.

³ GOB, *Development and Activities*, 1998, pp. 33-35; GOB, *Role of Department of Livestock Services in National Economic Development* (Dhaka : Department of Livestock Services, 2003); GOB, *Planning Commission Draft Report* (Dhaka : Ministry of Planning, 2002).

For poultry, RDV (Ranikhet disease vaccine or New Castle disease vaccine), BCRDV (Baby chick Ranikhet disease vaccine), Fowl Pox vaccine, Duck Plague vaccine, Fowl Cholera vaccine, Mareck's vaccine, Gumboro vaccine, Infectious Bronchitis, Infectious Coryza are used against different contagious as well as infectious diseases. Other than RDV, BCRDV, Duck Plague and Fowl Pox, all other vaccines are imported from overseas countries.

In the First FYP it has been mentioned that vaccine production was inadequate during the earlier period. During the Second and Third FYP periods, the targets were to produce 300 million doses in each plan period. In the Fourth FYP, it has been marked that 220 million doses were supposed to produce during 1990-1995. In the Fifth FYP, it has been mentioned that an increased number of doses would be produced during the plan period and the target was fixed to 350 million doses.

To implement the policies, at the same time, with the present technological strength, inability of DIS, to produce all vaccines in appropriate quantities, the Government decided to import vaccines both by public and private sectors. Among the private organizations, Rhone-Poulenc, Renata, Novartis, Cedar/ Lohman Animal Health, Intervet etc. are engaged in importation since early eighties.

4.4 Impact at Farmers' Level⁴

Livestock programmes are made available at the rural areas. The facilities are easier to avail both for the farmers as well as for the executing bodies. Integrated Farming Development Project of Bangladesh Agricultural University, Mymensingh and the DLS implemented the livestock development activities at Kanthal and Bailor of Trishal Thana under Mymensingh during 1996-97. A total of 802 animals and 11590 birds were given treatment; 2144 cattle and 38, 338 birds were vaccinated, 350 cows were provided with Artificial Insemination; 51260kg urea treated straw and 500kg urea molasses blocks were produced for cattle feeding, 16 growers of broilers, 02 farmers of layers 15 beef fattening, 03 commercial goat rearing, 102 dairy

⁴ Bangladesh Agricultural University Integrated Farming Development Project in Bangladesh, *Second Annual Report 1996-97*, Report of the Rotary Club of Mymensingh with Assistance of USAID, Australia, Myn., 1997.

farmers were established with due motivation followed by technical support. Other survey programmes also show the positive growth of livestock and poultry at farmers' levels.

4.5 Performance of the Public Sector Farms

DLS has its farms of dairy, buffalo, sheep, and poultry (layer & breeding, broiler and duck). The main objective of these farms is to extend the exotic and improved blood to the livestock and poultry farmers. Presently DLS has been operating ten (10) poultry, six (6) dairy, four (4) goat, two (2) duck, one (1) buffalo one (1) sheep, one (1) pig and one (1) Gayal farms scattering all over the country.

The sheep farm of Sonagazi, Feni, were transferred to Bangladesh Livestock Research Institute. BLRI;

As a case study, the performance of the Pahartali Zonal Poultry farm has been studied. The case study is presented below.

A case study on "Activities and Performance of Zonal Poultry Farm, Pahartali, Chittagong under the Department of Livestock Services"

To augment the poultry production as a profitable profession among the farmers, Zonal Poultry Farm, Pahartali, Chittagong was established in 1957 along with other six farms elsewhere in the country. From the very beginning of the farm, White Leg Horn (WLH), Rhode Island Red (RIR), Black Minorca, Australorp and New Hampshire were reared in the farm. Within four years of the establishment of the farm, it was transferred under Bangladesh Agricultural Development Corporation. In the post liberation period the farm was again transferred under the Department of Livestock Services in 1973. This farm starts activities keeping consistency with the national programmes. Different projects in the names of Back Yard Poultry Project, Poultry Improvement Plan project, Project of Poultry Extension by IFAD were undertaken. All these projects were approved for the overall development of poultry farming specially in the rural areas. Presently only fayoumi breed of Egypt is being reared which is very much adaptable in rural condition.

With a view to improve the socio-economic and nutritional development of the rural mass, important programmes were being carried out. To create self-employment opportunities of the land and asset less distressed women IGVD (Income Generation for the Vulnerable Group Development) and SLDP (Small Scale Livestock Development Programme) have been under taken. The farm plays a vital role in supplying the chicks in these programmes. The main objectives of these programmes were as follows:

a) Cross-breeding of the rural indigenous chicken: As the indigenous chickens possess the lower genotype and hence, very low productivity, the crossbreeding programme would help to improve the genetic quality and, therefrom, the production performance. This programme distribute cockerels of the improved breeds among the rural farmers.

b) Distribution of eggs and chicks of improved breeds: To encourage the rearing of improved breeds by the rural farmers, fertile eggs and chicks were distributed among the farmers.

c) Training on poultry farming: To encourage and motivate the rural farmers to rear improved variety of chicken, the first and foremost consideration was the technical know-how of the farmers about rearing of the exotic breeds. The farm rendered training programmes to provide the farmers with technical skill on poultry farming.

d) Extension and Motivation: Encouraging and motivating the rural farmers on poultry farming was also a major task of the farm. To disseminate information on the availability of the exotic poultry breeds and their production characteristics, extension activities were also done by the farm.

e) Feed supply: There was a provision of selling balanced feed among the farmers to ease the rearing of the improve birds.

4.5.1 Assets of the farm and related information

a) Year of establishment-1957.

b) Total land-5.55 acres.

- c) Establishment (Building & other capitals).
- (i) Laying house-12, area-39980 sq. ft.
 - (ii) Hatchery-02, area-3440sq.ft
 - (iii) Feedstore-01, area-400sq.ft.Capacity (500mt)
 - (iv) Office Building-01, area-150sq.ft.
 - (v) Generator room-01, area-150 sq. ft.
 - (vi) Electricity transformer-01.Area-150sq.ft.
 - (vii) Incubators:
 - a) Victoria-Setter-2, Capacity 51840eggs.
 - b) Peter sim-setter-2, Capacity 67200 eggs.
 - (viii) Feed mixing machine capacity 1.5 mt per hour.
 - (ix) Office quarter-02, (4Units)
 - (x) Employees quarter-02 (8Units).

4.5.2 Man Power

There are a good number of technical persons starting from Deputy Director as the In-Charge of the farm down to the sweepers. A total of 31-man power is the number of working staff in the farm from both regular revenue and development budget. Of them 4 (four) are officers and 27 are employees. Presently 2 (two) officers and 25 (twenty five) employees are working.

4.5.3 Present Poultry Stock

Presently there are about 25000(twenty five thousand) birds of different ages in the farm. Of them 700 are cocks, 8000 laying birds, 400 cockerel, 2000 pullets and 13900 chicks.

4.5.4 Performance of the Farm

So far possible, data on the target and achievement of the farm collected are shown below (Table 4.4).

Table 4.4
Year wise Target & Achievement on Chick Production and Distribution⁵

Year	Chick Production		Chick distribution, In lakh (,00000)				
	Target	Achievement	Govt. Farms	BRAC	Proshika	Farms	Extension
1989-90	4.0	4.95	3.15	-	-	1.80	-
90-91	6.0	3.93	2.94	.71	-	89	.39
91-92	6.0	4.24	2.1	.56	-	1.59	-
92-93	6.0	3.95	2.1	.55	-	1.3	-
93-94	6.0	8.8	2.9	3.4	-	1.5	-
94-95	8.0	9.7	1.3	5.6	-	2.8	.005
95-96	9.0	8.7	1.8	5.0	-	1.9	-
96-97	11.0	14.4	2.0	7.6	-	4.5	-
97-98	11.0	14.4	2.6	9.7	-	2.1	-
98-99	11.5	9.7	3.3	3.4	1.0	2.0	-
99-2000 (As of August 99.)	11.5	.7.4	.3.8	.34	.02	.007	

Source : Government Zonal Poultry Farm, Pahartali, Chittagong.

The types of input distributed among the farmers as extension work are also shown in the above table.

The year wise target of the Zonal Poultry Farm was set to achieve a fixed target of egg production as shown in the Table 4.5.

⁵ GOB, "Pahartali Zonal Poultry Farm", An Unpublished Annual Report (Projected), Chittagong, 1999.

Table 4.5
Year Wise Target and Achievement on Poultry and Egg Production⁶

Year	Stock		Egg Production	
	Target	Achievement	Target	Achievement
1989-90	3500	3341	640000	541774
90-91	4000	3415	720000	655283
91-92	4000	2121	720000	353298
92-93	5000	3558	900000	464306
93-94	5000	4414	900000	761873
94-95	5000	4523	900000	728090
95-96	6000	4448	1080000	705539
96-97	6500	5128	1080000	881821
97-98	6500	5228	1080000	881820
98-99	6500	5170	1170000	949547
99-2000 As of August 99.	6500	6472	1170000	32224

Source : Government Zonal Poultry Farm, Pahartali, Chittagong.

The year wise target for poultry production was almost satisfactory but the egg production was not up to the mark as expected. The following table shows year wise chick production and distribution directly to the farmers as well as to the NGOs as extension works (Table 4.6). Under the administrative jurisdiction of the farm there are about five Government farms at Sylhet, Sitakundu, Noakhali, Rangamati and Comilla. These farms get supply of the birds from this zonal farm. Government poultry farm Sitakundu also gets supply of feed from this farm.

Poultry Feed : Like practices done else where in the country, this farm also uses wheat bran, rice polish, oil cake, fish meal, pulse barn, soybean meal, oyster shell, common salt, protein concentrate, fish oil etc. On the basis of the availability of the ingredients, Feed formulae are done. Presently blended food is also used in the feed mixture. Averages of 400 to 600 kgs of feed are used every day in the farm.

⁶ Ibid.

Table 4.6
Year Wise Distribution of Poultry in Extension Work⁷

Year	Cocks	Hens	Cockerels	Pullet	Chicks
1992-93	286	1107	846	1175	5721
1993-94	110	131	302	249	9243
1994-95	71	64	109	29	2249
1995-96	69	96	39	435	11198
1996-97	106	77	10	149	3848
1997-98	84	58	8	182	3319
1998-99	242	184	157	2688	5303
1999-2000 (As of August 99.)	20	52	39	383	484

Source : Government Zonal Poultry Farm, Pahartali, Chittagong.

This farm is one of the important farms of the Department of Livestock Services. Presently this farm has been suffering from want of adequate budget for recurring expenditure, renovation of the building of the farm and residence, repair of the vehicles etc. By solving the problems, it could be facilitated to take further role in developing the poultry farming among the rural farmers, help solving the unemployment problem of the literate, semiliterate and dropout youths. This will help both in poverty alleviation as well as in increasing protein supplement for human nutrition. In addition to Fayoumi, other strains could also be reared in this farm.

4.5.5 Impact on Export

Leather is one of the most vital product originates from livestock origin. A good effect is found on the earning of foreign currency through exporting leather, leather goods, horn, hooves, foot wears, leather bags and purse, animal casein, hand gloves etc and reducing import of powder milk.

⁷ Ibid.

Bangladesh has to import sizeable quantities of milk powder every year to meet the storage of fresh milk. Data relating to this yearly import, both in quantity and value is shown in the Table 4.7.

Table 4.7
Import of Milk Powder⁸

Year	Quantity (Metric ton, mt)	Price (Million Tk.)	Remarks
1997-78	2130	110.30	
1978-79	3413	220.00	
1979-80	3994	290.20	
1980-81	5832	280.50	Price Per mt was reduced
1981-82	8430	560.33	
1982-83	2347	740.89	Price Per mt was reduced
1983-84	31367	930.47	Price Per mt was reduced
1984-85	46402	1500.52	
1985-86	54821	1820.01	
1986-87	59640	2060.68	
1987-88	56000	2120.00	
1988-89	70000	32.00	
1989-90	65000	4000.00	Price Per mt was higher
1990-91	60000	4300.00	
1991-92	55000	4500.00	Price was increased
1992-93	45000	3500.00	
1993-94	35000	3000.00	
1994-95	25000	2500.00	
1995-96	21000	2000.00	
1996-97	14000	2260.00	
1997-98	13000	2050.00	
1998-99	15000	2700.00	
1999-2000	15000	3020.00	
2000-01	16000	3350.00	
2001-02	19000	3100.00	Price was reduced
2002-03	20000	3000.00	
2003-04	191000	3200.00	

Source : Reports of BBS, Bangladesh Bank, Ministry of Finance, Export Promotion Bureau, Ministry of Commerce and *Annual Report of Milk Vita*, Bangladesh Milk Producers Cooperative Union Ltd., Dhaka, 2004.

⁸ GOB, *Statistical Yearbook of Bangladesh*, 2004; GOB, *A Report of Bangladesh Bank* (Dhaka : Ministry of Finance, 2004); GOB, *A Report of Export Promotion Bureau* (Dhaka : Ministry of Commerce, 2004); Bangladesh Milk Producers Cooperative Union Ltd. (BMPCUL), *Annual Report of Milk Vita*, Dhaka, 2004.

It is remarkable that the import was gradually reduced from 1990-91 to 1997-98. It might have happened due to Government policy which was undertaken by encouraging the farmers in the form of providing them with grants and subsidies etc. This might be due to the government policy and programmes for augmentation of dairy production.

In exporting leather and leather products a good share is found to contribute in country's total export. The export value of leather and leather products in relation to that of other exports during 1987 - 1992 are shown in the Table 4.8.

Table 4.8
Export Value of Leather and Leather Products in Relation to that of Other Exports (Million Taka)⁹

Sector	1987-88	1988-89	1989-90	1990-91	1991-92
All sector	41161	42686	51415	60271	74218
Agriculture	22853	23046	27089	24892	27301
Leather and leather products	4588	4534	5969	4440	4981
Share of livestock sub-sector to total export(%)	11.1	10.6	11.6	7.4	6.7
Share of livestock sub- sector to agricultural export(%)	20.1	19.7	22.0	17.8	18.2

Source : Bangladesh Bureau of Statistics, 1993.

It has been found that these products have a considerable share in country's total export. Though the figures show a gradual decline during 1987 – 1992, recently the rate increases. But in total export of agricultural products and commodities, the share of this sub-sector varies in different years. The growth of export and share of leather during 1997-2004 have been shown in the Table 4.9.

⁹ GOB, *Statistical Yearbook of Bangladesh*, 1993.

Table 4.9 Growth of Export and Share of Leather (in million US\$)¹⁰

Commodities	Total export						Percent of total exports						Growth rate							
	1997 /98	1998 /99	1999 /00	2000 /01	2001 /02	2002 /03	2003 /04	1997 /98	1998 /99	1999 /00	2000 /01	2001 /02	2002 /03	1997 /98	1998 /99	1999 /00	2000 /01	2001 /02	2002 /03	2003 /04
Total	5172.00	5324	4124.69	66467.30	5986.09	6548.44	5420.93	100	100	100	100	100	100	16.83	2.94	8.41	12.43	-7.44	9.39	14.86
Leather	190.26	168.24	143.91	253.93	207.33	192.23	147.16	3.68	3.26	3.49	3.93	-3.46	2.89	-2.67	-11.57	-16.03	30.19	-18.35	-7.77	-7.80

Source : *Bangladesh Economic Review, 2000-2004*

¹⁰ GOB, *Bangladesh Economic Review, 2000-2004*.

Leather contributes about 3.0 percent of total export of Bangladesh. The earning from exporting leather is also considerable though it shows a declining growth rate. In 2000-2001, the growth rate jumps up to 30.19 percent but following a sudden fall it went down to - 18.35 percent in 2001-2002 with subsequent fall in total export earning. In the same year about 17.35 million sq. meters leather were exported. Presently leather occupies the fifth place of priority among the export items of Bangladesh. The exported leather are 80 percent crust and 20 percent finished. If all the leather could be made finished, the export earning could be made double than the present. Bangladesh Finished Leather Export Association opines that if all the leather are converted to leather products, the earning could be made three fold higher than the present export value. It can also be mentioned here that the percentages of the primary commodities exported (which are predominately agricultural-frozen food, tea, vegetables, raw jute and others) are in between 6 and 8 percent during 1997-2004.

4.6 Participation of the NGOs¹¹

The government has given special emphasis on the role of NGOs and private sector in livestock development. This importance has been laid down in the Fourth FYP.

The Fourth FYP reiterates the macro economic policy thrust of attracting private investment in livestock production and supporting services. As NGO activities give emphasis on target group formation, training, extension, credit disbursement, supervision and recovery and conducting socio-economic studies relating to development project, the Fourth FYP recommends for the inclusion of the NGOs in livestock activities.

As a result, three of the leading NGOs: Bangladesh Rural Advancement Committee (BRAC), Association for Social Advancement (ASA) and Proshika were selected for undertaking rural poverty alleviation projects relating to livestock activities. It also stressed on the public sector projects, which have similar components. Moreover, it placed much weight on the need for the livestock sector to create additional income in the rural areas both in service delivery and in production.

¹¹ Asian Development Bank, *Main Report*, 1996, p. 28.

It has made a very encouraging impact on developing linkages with private sectors and the NGOs the successful GOB/IFAD/DANIDA Small Holder Livestock Project (SLDP) has been implemented as a joint venture by the DLS and the three leading NGOs. The success of this project leads to expand gradually for credit; farmers' training and technology and other services for the landless and the very poor marginal farmers.

On output pricing, the Government has a very limited influence on domestic livestock prices as most of the commodities are freely traded in the open market. Developments in government trade policy have seen a reduction in the nominal import tariff rates, a reduction in tariff dispersion and removal of many quantitative restrictions and a wider acceptance of pre-shipment inspection. However, meat with an operational tariff (OT) of 30 percent is heavily protected, while eggs have both a 45 percent OT and are subject to quantitative restrictions.

Similarly, imported milk products carry an OT of 45 percent. Quantitative restrictions are in place for vaccines and animal remedies. Other production inputs have modest (7.5-15 percent) OT and free entry. Most animal feeds (maize, soybean cake, etc) have a zero OT and free entry. Equipment for use in food processing and feed compounding has OTs between 7.5 and 15 percent but imports of packaging material attract a 60 percent OT. Capital goods, fertilizer and other agricultural inputs are in general exempted from 15 percent value added tax (VAT).

However, despite the expressed policy of attracting private investment to the sector, there are in place many laws, regulations and statutory controls which significantly influence commercial decision making in the livestock industry, mostly in negative ways. The Animal Slaughter and Meat control Act (1957) prohibits the sale of meat on three days in each week and makes it illegal to sell or serve meat in any catering establishment on those days. The Act also prohibits the slaughter at any time of female cattle below three years of age, male cattle below seven years of age if the animal is used or capable of being used for draught or breeding purposes, cows below ten years of age if they are capable of bearing offspring or producing milk, female goats under two years old and male goats under one year old and male goats under one year old. Such restrictive legislation has the impact on reducing the

volume of meat marketed and hence the opportunities remain open to farmers. It raises the consumer meat price as traders raise their margins to cover their fixed costs and/or make illegal payments to circumvent the law. Similarly, the Animal Disease Act (1993), the Dhaka Municipal Corporation Ordinance (1983) and the Veterinary Drug Policy have similar restrictive sections. All require reexamination in the light of the Government's expressed intent to encourage more private sector investment in livestock production and services.

4.7 Impact on Miscellaneous Fields

The livestock sub-sector contributes to agricultural production and other important fields in various ways. This sub-sector provides 80 percent nutrition for public health in conjunction with fisheries; nevertheless there is acute shortage of milk, meat and eggs.

In this agro-based country, mechanized cultivation could not provide the farmer with sufficient contribution. Power driven cultivation provides only 5.0 percent of total power requirement in this country. Remaining 95 percent power in cultivation are accomplished by livestock. Rural transportation through pulling bullock cart originates mainly from cattle; though buffaloes are also used in this purpose. In this transportation system, livestock contributes about 50 percent. There is a gigantic need of fuel for cooking of foods for this vast population, About 20 percent of this need is fulfilled from dung produced by livestock. As a source of manure to provide the soil with required humus essential for crops production, dung is of grater importance. About 80.0 million metric tons of dung are produced yearly. Livestock Poultry contributes about 10 percent of the total need of fertilizer in the form of compost. This compost is also used as a good source of nutrition for crop plants.

4.7.1 Subsidies on Livestock Inputs¹²

Subsidies on livestock inputs have influence on the facilities of services provided for the livestock farmers. A preliminary assessment of direct subsidies provided by the government shows a significant transfer of public resources. There

¹² Ibid.

are concerns that the pricing policies adopted by DLS, are limiting the development of competitive markets for the supply of live animals and birds, hatching eggs, milk and animal by-products and artificial breeding (AI) services. Private companies and the NGOs have shown themselves technically capable of producing improved livestock and poultry and similarly, there is a small private industry developing for imported and domestically produced semen.

Vaccine production is the main activity of the biological production and disease investigation division of DLS. Although several government-produced vaccines are completely protected from competition and all vaccines are often either free or supplied below their cost of production, farmers complain about their non-availability in the field. International drug companies with experience in vaccine production have been reluctant to compete with the government's service. Privatization of the vaccine laboratory was a conditionality of the Second Livestock Project and this issue is yet to be resolved.

Despite the significant value of annual subsidies (Table 4.10) they are insufficient to reach all livestock farmers. Farmers at the first participatory Planning Workshop were outspoken on the issue and claim that many of the benefits are received by the politically influential rural elites. Farmers also complain that "rent seeking" by government staff where supposedly free goods were to be offered were supplied at a price. Setting aside these subjective concerns, an ADB report argues that discontinuation of subsidies would encourage a greater level of private sector investment in the supply of inputs and services, and ensure that the majority of farmers would be able to purchase them in a timely, adequate and competitively coastal way. Presently annual subsidies include, the distribution of free or subsidized breeding animals, poultry, hatching eggs and semen; free or subsidized animal health drugs and vaccines, services, veterinary treatment and diagnostic services, and below market prices for milk, chickens and other livestock products produced from DLS farms. Under a separate budget allocation there has been a direct cash subsidy of TK.5, 000 per animal for those people holding five or more dairy cows. Total cash disbursed to date for dairy cows has been Tk. 15 million (US\$35.00 million). The main annual subsidies are shown in the Table 4.10.

Table 4.10
Cost of the Main Subsidies Provided by the DLS for 1995-96 in Tk. and US\$ (in million)¹³

Particulars of Items	Tk	US\$
(A) Dairy cattle and dairy Products		
a) 211 Crossbred heifers distributed @ 50% subsidy		
b) Fodder-38,400 kg @ Tk. 1 per kg	5.27	0.13
c) Milk-subsidy @ Tk. 5/ liter for 738,649 liter	0.04	0.01
d) Ghee – subsidy @ Tk. 50/kg for 6,574 kg	3.69	0.09
	0.33	0.08
Sub- total =	9.33	0.31
(B) Semen Production		
a) Frozen semen subsidy @ Tk. 45/dosex441, 768	19.88	0.47
b) Fresh semen subsidy @ Tk. 15/dosex 878,623	13.18	0.31
	33.06	0.88
Sub-total =	33.06	0.88
(C) Poultry and duck Production		
a) Day old chicks subsidy @ Tk.6x3,625,000	21.75	0.52
b) Day old ducklings subsidy @ Tk.6x500,000	3.00	0.07
c) Fertile eggs subsidy @ Tk. 3.25x1,800,000	0.580	0.14
	33.06	0.88
Sub-total =	33.06	0.88
(D) Vaccines and Medicines		
a) Vaccines @ av. subsidy cost Tk.0.25x400m	110.48	2.63
b) Medicines	75.00	1.78
	185.48	4.41
Sub –total =	185.48	4.41
Grand-total for 1995-96	258.00	US\$.6.33

Source : Asian Development Bank, Third Livestock Development Project, 1996.

The annually recurrent subsidies of US\$6.33 million (1995-96) are assessed by the DLS at the difference between the open market prices and the DLS's supply prices. Supply of vaccines and medicines account for 69 percent of the total subsidy while dairy cattle production, semen production and poultry/duck production account for 5 percent, 14 percent, and 12 percent respectively. However, assessed subsidies

¹³ Ibid.

do not reflect the actual cost of production or supply from the DLS. In most subsidy categories these costs appear to be greater than open market prices and therefore they contain an additional implicit subsidy element.

In general, concession rates of duty such as those shown above for dairy and feed processing equipment are available only to licensed industrial users. Exemptions from **VAT** are provided to all primary unprocessed livestock and fisheries products.

4.7.2 Trade Policy, Prices, Comparative Advantage and Protection¹⁴

Government intervenes directly in trade in animal products and sectoral inputs through the imposition of both tariff and non-tariff barriers. The main instruments are shown in the Table 4.11.

Table 4.11
Tariff and Other Trade Interventions¹⁵

Description	Operational tariff	Access
Parent stock ; day old chicks	Nil	Restricted
Meat of bovines, fowls	30	Unrestricted
Whole milk powder	45	Tariff value; otherwise unrestricted
Eggs in shell	45	Partial restriction
Wheat, bulk	7.5	Unrestricted
Maize, bulk	Nil	Unrestricted
Meat/fish meal	Nil	Unrestricted
Soybean cake	Nil	Unrestricted
Veterinary vaccines	Nil	Restricted ; Drug Admin approval required
Dairy equipment	7.5	Unrestricted
Feed process equipment	7.5	Unrestricted

Source : ADB, Main Report of DLS, 1996.

¹⁴ Ibid.

¹⁵ Ibid.

However, with the simultaneous increase in awareness about the importance of livestock farming of both government and private levels, positive impact has been found at macro-economy level. Livestock has played an important role in employment generation and poverty alleviation, foreign currency earning and saving and in other miscellaneous field including government trade policy involving NGOs and private sectors to uplift the livestock production.

4.8 Impact of Globalisation

With the background on the tremendous scope of the livestock sub-sector in alleviating poverty and malnutrition in Bangladesh, the role of DLS is very critical, challenging and important. In order to meet the demands, it is important to analyse the future trends of production in relation to free market economy. As Bangladesh has to import many of the feed ingredients, veterinary drugs, vaccines etc. both government and NGOs should be more economic and strategic in regulating livestock production, processing, marketing and other related activities in harmony of globalisation. Production in the countries of South and South-East-Asia will definitely come in direct competition in the market.

4.9 Conclusion

Livestock and poultry provide a good opportunity for the increase of agricultural GDP. Its impact at macro-economy of the country is considerable; nevertheless the livestock development policy was formulated for rapid growth to coup up with the subsequent need of the increased population of the country. As about 47 percent of the people of this country are landless and marginal farmers; and, at the same time, there prevails and equitable income distribution in Bangladesh. That sub-sector provided an ample source of employment for those low-income group poverty affected people. About 20 percent of the country's labour force got full-time employment and 50 percent of that section of people was engaged in part time employment. With a considerable growth of private farms, especially at the late nineties favoured that opportunity. Due to good impact of

government programme and policy, production of different types of inputs, dairy and poultry produces, co-ordination with NGOs, government emphasis to introduce subsidies to various inputs, exemption of VAT, soft terms for importing machineries, concentrate, vaccines, medicines etc. were achieved. Much foreign currency was earned and saved. Internal production both at private and public level farms were augmented which benefited the farms and increased the domestic contribution to this sub-sector as well.

Chapter 5

EXAMINATION OF THE PROGRAMMES' IMPACT ON SELECTED MICRO-LEVEL FARMS

To find out the programmes' impact at farmers' level, a survey work was done covering the whole country. A questionnaire (Annex 3) was prepared in such a way that it met the objectives of the study.

5.1 Preparation of Questionnaire

To find out the impact of livestock policies and programmes at grass root level, a survey work involving the farmers was performed. To collect information relevant to the study, a questionnaire was prepared in such a way that it covered all the objectives of the study reflecting the impact of the policies and programmes of livestock development of Bangladesh Government (Annex 3).

Pre-testing the Questionnaire: Before finalizing the draft questionnaire, it was pre- tested through field survey. Formal and informal discussions with the officials of DLS were also held. Some questions were simplified and some were modified as well. Some new questions were also added. Afterwards, it was found that the farmers could reply it properly and clearly.

5.2 Selection of Study Area

One hundred and twenty farmers were interviewed to get a clear picture and reliable information from across the country. The respondents (120) were selected randomly (purposive) from all the six divisions of Bangladesh.

5.3 Selection of Farms

All types of farms were covered irrespective of type, size, and species. But the farmers who were farming at least for five years were selected. On the other hand, farmers having not less than 05 dairy cows, 50 layer birds, 50 duck, 500 parent stock, 15 goats, 05 dairy buffaloes, 15 sheep for single species / type farming were selected.

For mixed farming, minimum number of animals and birds were the same as stated. The farmers might have other professions as well in addition to livestock farming.

5.4 Location of the Farms

The farms were selected randomly from urban, semi-urban and rural areas. Precautions were taken to cover all these three types of areas in all the six divisions of Bangladesh.

5.5 Conducting the Survey

The survey workers were given a thorough orientation about the study describing background, objectives and procedure of the study. As the questionnaire of the study was prepared in Bengali, the survey works did not have to face much confusion about it. Still thorough discussion and trial with farms at Rajshahi and adjoining areas were done before going to the respective study areas.

5.6 Period of Study

As the study area was bigger and at the same time, it was expected that the study would be accomplished within a year to avoid price fluctuation, it was completed in the year 1999 accordingly.

5.7 Analysis of Data

In analysing data, with a view to draw inference reflecting the impact of livestock policies and programmes at micro-level both tabular and other statistical techniques were followed. The analytical part is stated below.

5.7.1 Basic Socio-Economic and Professional Information

A total of 120 farms were covered in the survey work. Out of this total, 45 were from Dhaka Division, 35 from Chittagong Division and 10 farmers from each division of Sylhet, Rajshahi, Khulna, and Barisal were interrogated. The farmers were then categorized on the basis of the locations of their farms. It was found that 35 farms were located in the urban areas, 69 at semi-urban area and 16 at rural areas.

The educational qualifications of the farmers were as high as from Master's degree down to school dropout and illiterate. The number of Master's degree holders were 05 Bachelor's (including one B.Sc. engineer) 20, higher secondary/Intermediate 35, Secondary 25, school dropout 24 and illiterate (who put thumb-press instead of putting signature) were 11.

Regarding the age of the farmers, it has been found that the farmers of the age of 60 years and above were 09; 50 years and above but below 60 years of age were 12; 40 years to below 50 years were 12; 30 years to below 40 years were 50; 20 years to below 30 years were 36 and the number of farmers below 20 years was only 01.

Regarding the gender type there were 91 male farmers and 29 were female. Among the females there were 05 widow and divorced.

Regarding the distance of the farms from the farmers dwelling, it was found that 30 farms were totally away from their dwellings, 21 were within the homestead and 69 were attached to the homestead of the farmers.

It is to be noticed that a good number of farmers had some other non-farm professions as well. The number of farmers with such non-farm professions were 46. The farmers with agriculture specially crop husbandry as additional profession were 32, wage employment 21 and farmers exclusively with only livestock farming were 21.

On the basis of the personal profession, 20 farmers were from the families with business and 22 were from wage-employment; 32 were from agricultural (crop husbandry) plus backyard livestock; and 40 were from poultry husbandry; and 6 were exclusively with livestock and poultry and /or pisciculture farms.

The main sources of motivation to livestock farming were of seven different categories. The categories were the existence of higher demand for livestock products, prestigious profession as it produces valuable nutritious food items, sources of year round profession, subsidiary income to support agriculture, yields quick return, highly profitable enterprise and paternal profession.

Regarding acquaintance with livestock policies only one farmer (of master's level) could reply to a considerable extent and others could not do. However, 112 farmers replied through stating different aspects of the policies and programmes, and nine different types of responses were given while 8 replied "no". The types of responses were artificial insemination, vaccination, fodder cultivation, veterinary clinical service, credit facility through bank loan, farmers training, registration of farms incentive to successful farmers and subsidies, etc.

5.7.2 Farming Information

There were 94 poultry farms of which 02 were broiler parent stock farms, 45 broiler (commercial broiler), 25 layer, 11 pullet chick rearing farms and 11 duck farms. The remaining farms are 18 dairy, 01 goat, 01 sheep and 06 are of mixed types.

It is to be noted that the farmers reared broiler birds in a single shed and the batches were reared with a gap between 15 to 30 days in between and hence 4 to 5 batches were reared yearly. The chick rearers rear their chicks for about 100 to 125 days with a gap of 15 to 20 days in between and so 2.5 to 3 batches were reared yearly. The pisciculture was carried out with carps and the fishes were sold twice a year. However, the farming information are shown in the pie chart (Fig. 5.1) and in the Tables 5.1, 5.2, 5.3 and 5.4.

Figure 5.1
Number of Different Types of Farms

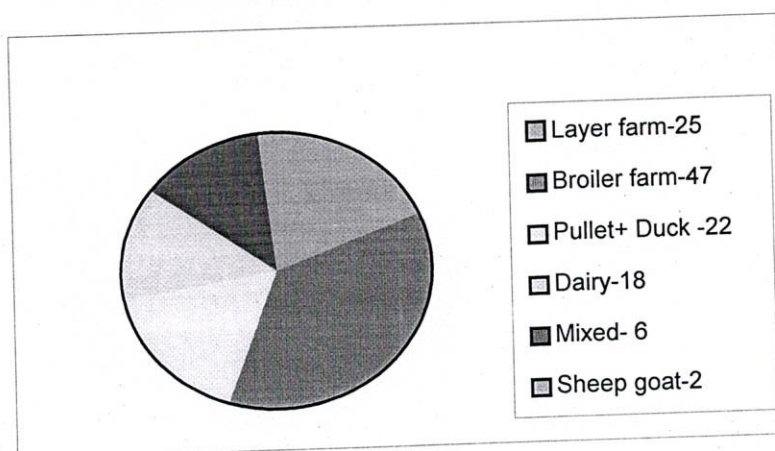


Table 5.1 Establishment of Poultry Farms

Present Information as of 1999																	
Type	No. of farms	No. of birds	Strain	Total Investment Tk.	Average Monthly income Tk	Mean Tk	Type	No. of farms	No. of birds	% increase pre annum	Strain	Present Value of the farms Tk	Annual percent increase	Average Monthly income Tk	% increase	Mean (Income Tk)	% increase
Breed P.S	02	1000 & 2000	Kasilia Hub chix	8,00,000 & 11,00,000	5,000 & 8,000	6,500	Parent stock	02	5000 & 20000	100& 80	Kasilia hub-chix	20,00,000 & 55,00,000	50 to 100	18,000 & 55,000	360 to 687.50	36,500	561.54
Layer	25	50-1500	Hisex	10,000 to 3,50,000	500 to 3,000	2100	Layer	25	500 to 4000	200 to 53.33	Hisex	11,00,000 to 16,00,000	110.00 to 91.43	3000 to 11,000	600 to 366.67	8,900	423.81
Broiler	45	100-1000	Sarbro, Hub chix & Arberacre	20,000 to 3,00,000	1500 to 7000	5,700	Broiler	45	250 to 5000	50 to 100	Sarbro & Hub-chix	9,00,000 to 22,00,000	900 to 146.67	2200 to 20,000	146.67 to 285.71	17,000	289.24
Pullet	11	200-1000	Fayoumi	20,000 to 2,50,000	1000 to 4000	2,200	Pullet rearing	11	300 to 4000	30 to 80	Fayoumi	1,00,000 to 4,00,000	100 to 32	2500 to 8000	250 to 200	5,900	268.18
Duck	11	50-200	Khaki Campbell cross	15,000 to 1,00,000	600 to 1800	1270	Duck	11	100 to 500	40 to 50	Khaki Campbell cross	60,000 to 2,50,000	80 to 50	2000 to 4000	333.33 to 222.22	3,200	251.97

Source : Field Survey, 1999.

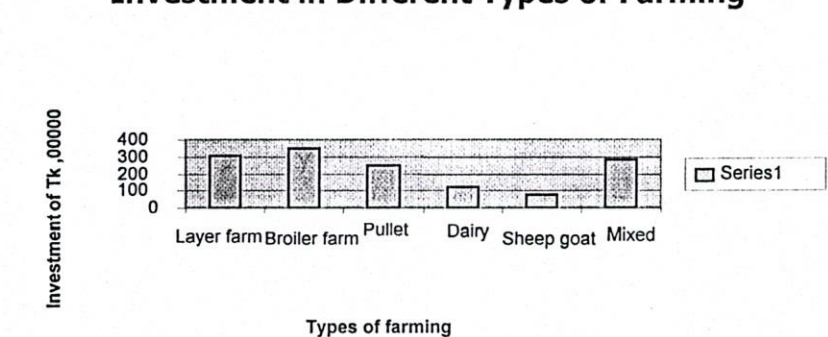
Note : (i) Though the data were collected having the initial information of 1994-95, but the farms started functioning at different extents in different times; even the farm(s) did not start functioning full swing at a time during starting. The present value of the farm showed higher value due to a sudden increase of number and specially price of animals and land. Especially the value of land rises many folds than the initial period; (ii) Here the investment includes all the prices of the animals/ birds during functioning the farms. The farms started at different times starting from late eighties onward. Many of the farms were situated at the remote places; and the land value was very much low during that period which increased to even 20 times more than that in initial period. The price of the animals also rises many folds; (iii) The income meant the net income which showed the net value after deducting all the production and marketing expenditures- both recurrent cost and depreciation value.

Regarding the two broiler parent stock farms, one started with 1000 and the other started with 2000 parent stock in early nineties. The commercial broiler farms started with minimum 100 birds up to 1000 birds per batch. The layer farms started with from 50 up to 1500 birds. The pullet chick rearers started with from 200 to 1000 birds. The duck farming started with as low as 50 birds up to 200 ducks. The dairy farming started with from only 01 to 15 dairy cows in the early nineties. The goat farms started with 15 does and the sheep farm with 13 ewes.

The mixed farms were dairy plus layer, goat plus layer, layer plus duck, broiler plus pisciculture, dairy plus broiler and goat plus broiler. The mixed farms were found to start with 05 dairy cows plus 50 layers birds, with 10 goats plus 100 laying birds, with 100 layers plus 30 ducks ; with 100 broiler per batch plus a pisciculture of carps in a 50 decimal pond with 03 dairy cows and 100 broiler per batch and with 06 goats plus 100 broiler per batch.

However the information about the establishments including farm size, investment income etc. shown in tabular forms.

Figure 5.2
Investment in Different Types of Farming



About 94 poultry (including duck) farms were investigated across the country. All the farms were initiated during 1994-95 and final data were collected in 1999. The initial and final information regarding the number of birds, strains, total investment during starting and total value as of 1999, average monthly income etc. are shown in the Table 5.1.

During initiation, the farms started with as low as 50 Hisex layer or 50 khaki cross ducks with investment of Tk. 10,000/- having the lowest monthly income of Tk. 500/=. The highest no of birds were 2000 broiler parent stock breeding farm

with corresponding monthly income of Tk.8000/- which is found to be the highest monthly income. In this case the highest investment was found worthing Tk. 11 (eleven) lac in 1994. In the final information of 1999, a good scenario was observed.

The highest no of birds was found in the same category of farms i.e., the breeding farm with the same strain. The number of birds was 20,000 with an average monthly income of Tk. 55000/ and the value of the establishment rises to 55 lacs. The lowest monthly income was with duck farm worthing Tk. 2000/. The table also shows the mean income of the farm. Among the five categories of farms, the maximum no of farms covered were commercial broiler farms and that was 45. Only broiler parent stock farms were studied and that was the minimum no of farms among the poultry farms.

Regarding dairy farms, it has been found that out of 18 dairy farms of five categories 9 dairy farms were started with 1 to 2 dairy cows during 1994-95 which were raised to 5 to 22 in 1999. All the farms were with crossbred with various level of exotic blood. The only farm studied possessed 15 dairy cows during 1994-95 and 45 dairy cows during surveying year in 1999. The average monthly income with a single crossbred cow was Tk. 600/and the maximum was Tk. 10,000/ of the single type of farm with 15 dairy cows during 1994-95. The initial investment was as low as Tk. 19,000/- for the farm with one dairy cow and as high as Tk. 2,20,000/- of the single type of farm with 15 dairy during 1994-95. Here as the highest no of dairy cows was 55 in 1999 and the highest amount of monthly income was found with maximum number of cows at the initial stage but the same could not necessarily have maximum number of cows in 1999 and vice versa. The costs of the establishment were from Tk. 1,25,000/- to Tk. 10,80,000/- It is to be noted that the initial investment and the final value of the farms were not found to be proportionately figured due to variation of prices of the animals from place to place etc. It could also be mentioned here that the number of dairy farms established in 1988-89 declined proportionately in comparison to earlier years but which again started rising since 1991. This might be due to introduction of incentives with the simultaneous formulation of livestock policy.¹

¹ R.K. Talukdar, *Recent Changes in the Non-crop Agricultural Activities in Bangladesh* M.A. Sattar Mandal (ed.), *Changing Rural Economy of Bangladesh* (Dhaka : Moushumi Printers, 2000), p. 78.

Table 5.2 Establishment of Dairy Farms

No. of Farms	Initial information during 1994-95					Information as of 1999									
	No. of dairy cows	Type/Breed	Total Invest (Tk.)	Average Monthly income Tk.	Mean Income Tk	No. of farms	No. of dairy cows	Annul % increase	Type/Breed	Present value of farms	Annul % increase	Average Monthly income Tk.	% increase	Mean Income Tk.	% increase
10	01-02	Cross	19000 to 300000	600-1000	950	10	05-22	500-1200	Cross	100000 to 400000	105.26 to 26.67	4000 to 11000	666.67 to 1100.00	8800	926.31
04	03-05	Cross	30000 to 110000	2000-4000	3200	04	05-21	167-620	Cross	110000 to 400000	73.33 to 72.72	4000 to 11000	200.00 to 275.00	7500	234.37
03	06-10	Cross	120000 to 200000	4500 to 8000	6800	03	08-55	133-610	Cross	150000 to 480000	25.00 to 48.00	7500 to 24000	166.67 to 300.00	16800	247.06
01	15	Cross	220000	10000	10000	01	45	300	Cross	900000	81.82	20000	200.00	20000	200.00

Source : Field Survey at Selected Micro level Farms, 1999.

Note : i) Though the data were collected having the initial information of 1994-95, but the farms were started to function in different extents in different times. The present value of the farm showed higher value due to a sudden increase of price of animals and land. The value of land rises 20 times than the initial period; ii) Here the investment includes all the prices of the animals/ birds during starting the farms. The farms started at different times starting from late eighties. The farms are situated at the remote places; the land value was very much low during that period which increase to even 20 times than the purchasing period. The price of the animals also rises many folds; iii) The income meant the net income which contributes the farmers after meeting up all the production and marketing expenses.

There were six different categories of mixed farming with a single type from each category as shown in the Table 5.3. The animals and birds were pure breed (Black Bengal), crossbred, and strain (in case of layer poultry). The minimum and maximum initial investment were Tk.22, 000/- (in case of layer poultry plus duck farm and broiler plus pisciculture) and Tk. 55,000/- (for dairy plus layer farm) respectively during 1994-95 which changed to final values of Tk. 2,10,000 (for goat plus broiler farm) and Tk. 6,00,000/- (for dairy plus layer farm) respectively in 1999. The average minimum monthly income was Tk.1200/- for goat plus layer farm and maximum for dairy plus layer farm which was Tk. 3,000/- respectively during 1994-95 and those changed to Tk. 2,000/- for goat plus broiler farm and Tk.8000/- for dairy plus layer farm respectively in 1999.

Only one each of goat and sheep farms was studied. The initial information during 1994-95 and final data as of 1999 are shown in table no 22. The initial number of animals for goat and sheep farms were 15 and 13 with an initial investment of Tk.45,000/- and 27,000/- respectively during 1994-95. The final no of goats and sheep were 100 and 24 respectively. The value of the farms and the average monthly income were Tk.4, 00,000/- and Tk.56, 000/- and Tk.1800/-and Tk.1000/ respectively during 1994-95. The average monthly income changed to Tk. 12,000 and Tk.1400 respectively in 1999.

The income of the farmers were found to increase gradually during late eighties; but rate of increase of income was found slow.² Many researcher also recommend for soft bank loan to augment livestock production with simultaneous increase in profit of the farmers.³

² Asian Development Bank, *Main Report*, Vols. I-II, 1996, pp. 16 & 19; M. Asaduzzaman, *Economic Development and Poverty Alleviation in Bangladesh*, M.A. Sattar Mandal (ed.), *Changing Rural Economy of Bangladesh*, 2000, pp. 42-45; GOB, *The Second FYP*, 1980, pp. 154-155.

³ J. Alam, *Livestock Resources in Bangladesh*, 1996, p. 108; A. Hossain, "A Review of the Livestock Sub-sector in Bangladesh", *Bangladesh Agriculture Sector Review*, Vol. II, UNDP, Dhaka, 1989.

Table 5.3 Establishment of Mixed Farming

Type	Initial Information during 1994 - 1995				Information as of 1999												
	No. of farms	No. of animals/ birds etc.	Breeds/ varieties/ Strains	Initial Investment Tk.	Average Monthly Tk.	Mean Income Tk.	Type	No. of farms	No. of animals birds etc.	Annual % increase	Breeds/ varieties/ Strains	Present value of the farm Tk.	Annual % increase	Average Monthly Tk.	% increase	Mean Income Tk.	% increase
Dairy plus Layer	01	50 layer & 05 dairy cows	Cross bred, Hisex	55000	3000	3000	Dairy plus Layer	01	200 layer & 15 dairy cows	80 & 60	Cross bred Hisex	6,00,000	218.18	8,000	266.67	8,000	266.67
Goat plus Layer	01	10 goats & 100 layer	Black Bengal, Hisex	50000	1200	1200	Goat plus Layer	01	15 Goats & 200 layer	30 & 40	Black Bengal, Hisex	2,80,000	112.00	2800	233.33	2800	233.33
Dairy plus Broiler	01	3 dairy cows & 100 broiler	Cross bred, Starbro	35000	2500	2500	Dairy plus Broiler	01	10 dairy cows & 200 broiler	66.67 & 40	Cross bred, Hub chix	3,70,000	211.43	4,000	160.00	4,000	160.00
Layer plus Duck	01	100 layers & 30 ducks	Hisex khaki cross	22000	1800	1800	Layer plus Duck	01	400 layer & 100 ducks	80 & 66.67	Hisex, khaki cross	2,50,000	227.27	4,000	222.22	4,000	222.22
Broiler plus pisciculture	01	100 broiler plus pisciculture (50 decimal pond)	Hub chix plus carp	22000	2500	2500	Broiler plus pisciculture	01	200 broilers plus (50 decimal pond)	40 as broiler	Hub chix, carp	2,70,000	245.45	5,000	200.00	5,000	200.00
Goat plus broiler	01	6 goats & 100 broiler	Black Bengal, Hibro	30000	1800	1800	Goat plus broiler	01	15 Goat & 200 broilers	50 & 40	Black Bengal hub chix	2,10,000	140.00	2,000	111.11	2,000	111.11

Source : Field Survey at Selected Micro level Farms, 1999.

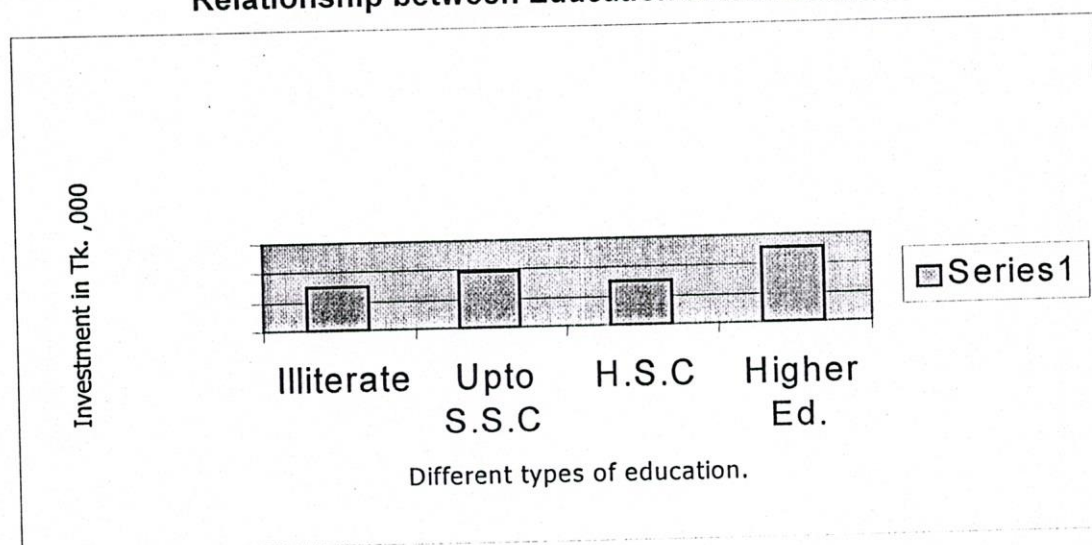
Note : i) Though the data were collected having the initial information of 1994-95, but the farms were started to function in different extents in different times. The present value of the farm showed higher value due to a sudden increase of price of animals and land. The value of land rises 20 times than the initial period; ii) Here the investment includes all the prices of the animals/ birds during starting the farms. The farms started at different times starting from late eighties. The farms are situated at the remote places; the land value was very much low during that period, which increase to even 20 times than the purchasing period. The price of the animals also rises many folds; iii) The income meant the net income, which contributes the farmers after meeting up all the production and marketing expenses.

Livestock Development policy also recommends to provide the farmers with bank loan with soft terms and conditions.⁴

5.8 Relationship between Education and Investment

It has been found that out of 120 farmers 11 are illiterate and 24 are school dropouts. There are about 25 farmers who are bachelors and masters degree holder.

Figure 5.3
Relationship between Education and Investment



Regarding the relationship between education and investment in farming it has been found that there is no significant difference between level of education and degree of investment (Figure 5.3) (Annex 5).

But numerically it is observed that on an average educated farmers invest relatively more than the farmers with lower education or illiteracy. Most of the farms are owned by school dropout and S.S.C passed farmers. Variance is lowest in case of the farmers having H.S.C level education or more. It means that the rate or higher investment is found among the farmers with higher education.

⁴ GOB, *Livestock Development Policy*, 1992.

5.9 Association of Profit with Bank Loan

From the survey work, it has been found that there is no significant difference in profit percentages between the farms established with loan and without loan at 5 percent level of significance (Annex 8). But the variance is too much high in case of farms with bank loan. This is due to high investment in the large-scale farms having a higher amount of profit. This means that higher investment gives higher amount of profit; but when this profit is calculated in terms of percentage, this shows a lower figure in comparison to the farms with comparatively lower investment. In most cases, the large-scale farms have bank loans and from the data, it has been found that there is no significant difference in profit percentages in relation to bank loan. But a comparative study among the same type of farming shows a higher profit percentage of the farms with bank loan.

Table 5.4 Establishment of Goat and Sheep Farming

Type	Initial information during 1994-95					Final information as of 1999											
	No. of farms	No. of animals	Breed	Total Investment	Average monthly income Tk.	Mean Income Tk.	Type	No. of farms	No. of animals	Annual percent increase	Breed	Present value Tk	Annual percent increase	Average income Tk	Annual percent increase	Mean Income Tk.	Annual percent increase
Goat	1	15 does	Black Bengal	45,000	1800	1800	Goat	01	100 does	66.67	Black Bengal	4,00,000	888.89	12000	666.67	12000	666.67
Sheep	1	13 sheep	Indigenous	27,000	1000	1000	Sheep	01	24 sheep	184	Indigenous	56,000	207.74	1400	140	1400	140

Source : Field Survey at Selected Micro level Farms, 1999.

Note : i) Though the data were collected having the initial information of 1994-95, but the farms were started to function in different extents in different times. The present value of the farm showed higher value due to a sudden increase of price of animals and land. The value of land rises 20 times than the initial period; ii) Here the investment includes all the prices of the animals/ birds during starting the farms. The farms started at different times starting from late eighties. The farms are situated at the remote places; the land value was very much low during that period, which increase to even 20 times than the purchasing period. The price of the animals also rises many folds; iii) The income meant the net income, which contributes the farmers after meeting up all the production and marketing expenses.

5.10 Association of Types of Farming and Profit Percentage

It has been found from the raw data that there was a significant difference among the farms both from the viewpoints of type of farms and scale of farming even within the same type of farms. On the other hand, only one each of goat and sheep farms were studied.

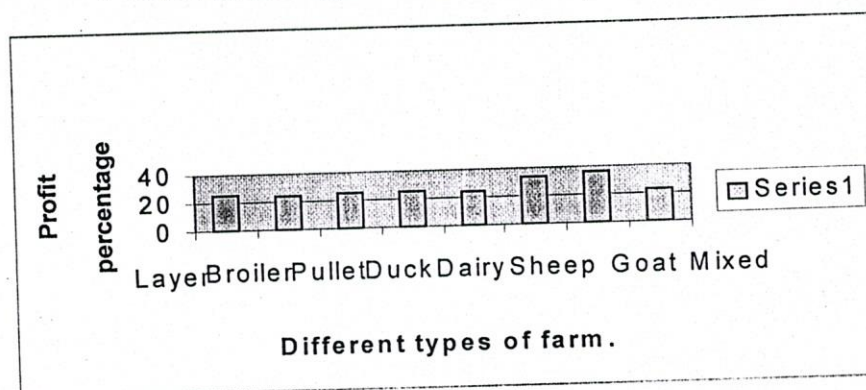
However, it is evident from the information that the profit is higher in case of goat farming. As only one farm each of sheep and goat were studied, it is hard to draw inference about the profitability, though numerically profit is higher in case of goat farming (Table 5.4).

In case of other farms, a statistically insignificant value at 5 % level significance is found regarding the profitability (Annex 6). The variance is found highest in case of layer and parent stock farm. The amount of profit is found to be the highest in case of parent stock farm, but compared to investment, the profit percent is seen lower. As the variance is highest in case of layer farming (including parent stock farms), the profitability might be the highest.

In case of broiler and dairy farming, the profitability is more or less same and the variance is also more or less same. But the number of broiler farms studied is the highest. This might be due to rapid return in comparison to other types of farming.

In case of chick (pullet) rearing and duck farming, the average profit is almost same. The variance is lowest in case of duck farming. This indicates that the profit of duck farming is more or less stable in comparison to other farming. One important thing should be mentioned here that duck farms studied were at haor and low-lying areas where the feed cost of the farms were more or less zero.

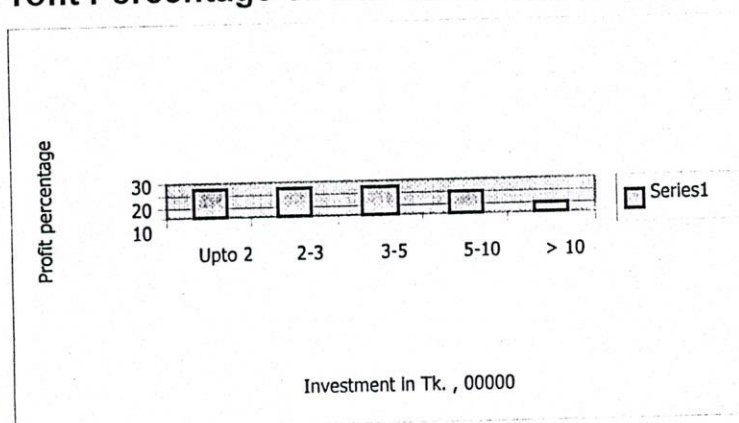
Figure 5.4
Profit Percentage in Different Types of Farms



5.11 Relationship Between Investment and Profit

To find out the relationship between investment in livestock farming and profit generated from farming, statistical analysis was made based on the data of the survey investigation. It shows a significant difference of profit percent depending on the degree of investment. When investment is too much high i.e. more than Taka 10 (ten) lac, the percent profit decreases; though the total profit remains higher. The profit percentage in relation to the investment is shown in the graph (Figure 5.5). This means that more the investment, the higher the total profit. It is also evident that, with the increase of investment, though economically it does not permit to increase investment due to lower percentage of return/ profit, the figure of profit is higher. On the contrary, with low investment, though the profit percent shows a higher figure, the total profit is not up to satisfactory level for sustainable farming (Annex 7).

Figure 5.5
Profit Percentage on the Basis of Investment



5.12 Relationship between Education and Types of Farming

The relationship between level of education and types of farming are shown in a tabular presentation in the Table 5.5.

The pie chart (Figure 5.6) also shows the relationship of literacy level and total farming as well as types of farming separately.

Figure 5.6
Total Farming on the Basis of Education

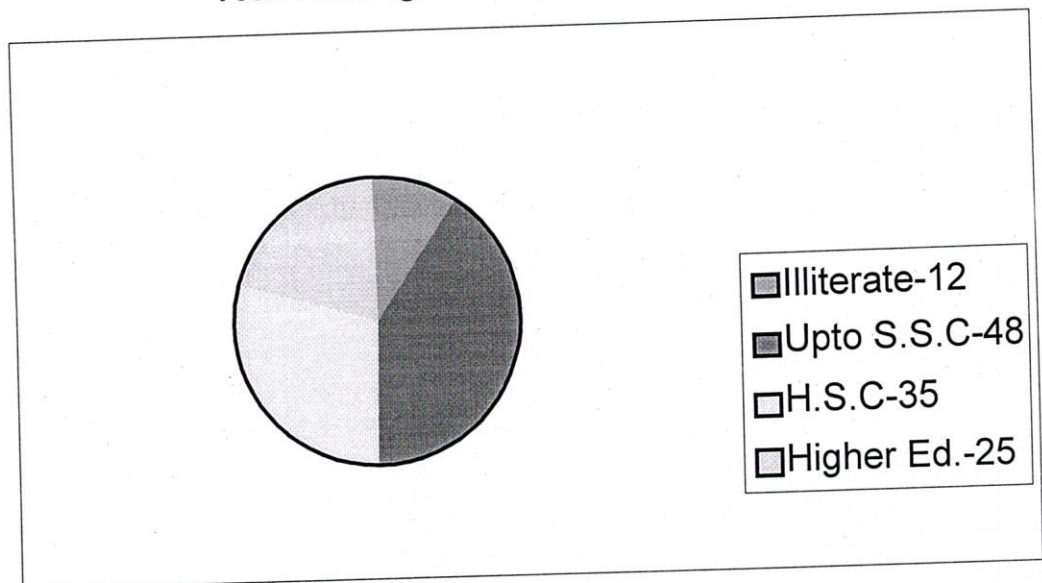


Table 5.5 Education Vs Types of Farms

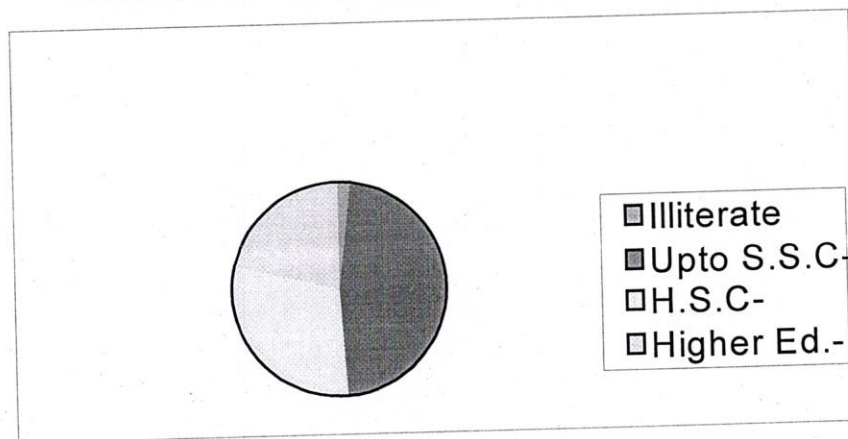
Education	Types of farm										Total	
	Poultry	% (n=120)	Dairy	Percent (n=120)	Mix	Percent (n=120)	Sheep	Percent (n=120)	Goat	% (n=120)	Number	%
Illiterate	2	18.18 (1.67)	1	9.09 (0.83)	6	54.54 (5.00)	1	9.09 (0.83)	1	9.09 (0.83)	11	100
Upto-S.S.C	44	89.79 (36.67)	5	10.20 (4.17)	0	0	0		0		49	100
H.S.C	28	80.00 (23.33)	7	20.00 (5.83)	0	0	0		0		35	100
B.Sc/BA -Masters	20	80.00 (16.67)	5	20.00 (4.17)	0	0	0		0		25	100
Total	94	78.33	18	15.00	6	5.00	1	.83	1	.83	120	100

Source : Field Survey, 1999.

Figure in the parenthesis of the table shows the percentages of the total sample (120) engaged in mixed farming. The majority farming numbering 44 (36.66 percent) was done by upto S.S.C level farmers and the farming was done in poultry.

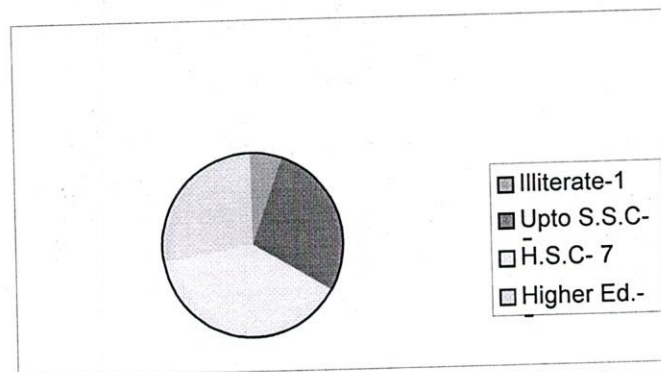
About 94 people were engaged in poultry farming of whom 18.18 percent were illiterate. The other farmers were 44 from up to S.S.C level, 28 H.S.C and 20 from highly educated (Bachelor to Masters level) group (Annex – 9).

Figure 5.7
Number of Poultry Farming on the Basis of Education



Out of total 18 dairy farmers, the highest number was found from H.S.C level. The higher number were from up to S.S.C and highly educated level and the number was 5 each. From illiterate group only one farmer was recorded.

Figure 5.8
Number of Dairy Farm on the Basis of Education



The mixed farming, sheep farming and goat farming were done by only illiterate group and the number were 6, 1 and 1 corresponding to 54.54, 9.09 and 9.09 percent respectively.

5.13 Relationship of Education with Adoption of Artificial Insemination

Out of total 18 dairy farmers, only 9 farmers adopted A.I. technique to serve their dairy farming.

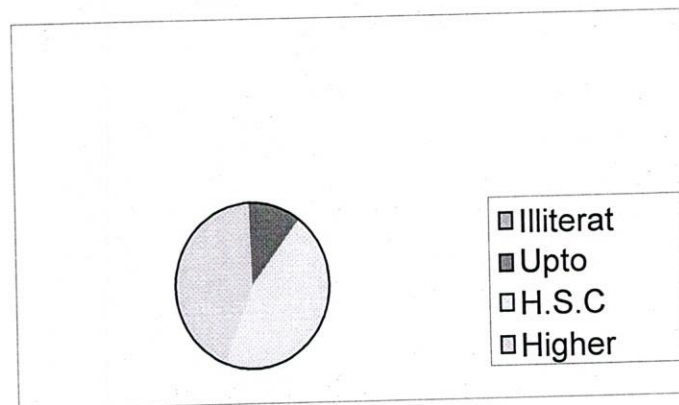
Table 5.6
Education VS Adoption of AI Technique

Education	Total number	A.I technique	Percentage
Illiterate	11	0	0.00
Upto S.S.C	49	1	2.04
H.S.C	35	4	11.43
B.SC/BA-Master's	25	4	16.00
Total	120	09	07.50

Source : Field Survey (1999)

Out of 5 dairy farms owned by highly literate farmers, 4 farmers used A.I. The relationship is shown in the table 5.6. The pie chart (Figure 5.9) also shows the relationship of education with adoption of artificial insemination.

Figure 5.9
Relationship of Level of Education & Adoption of Artificial Insemination



5.14 Relationship Between Education and Bank Loan

Out of total 120 farmers of whom 21 farmers could take bank loan of different amount and maximum of them were served by Bangladesh Krishi Bank. Out of this, the higher number was found from up to S.S.C level farmers who were 11 (out of 49 farmers). The lowest number was from illiterate group, who were 2 (out

of 11). The pie chart (Figure 5.10) and Table 5.7 shows the data showing corresponding percentages of different categories of farmers.

Figure 5.10
Education vs Bank Loan

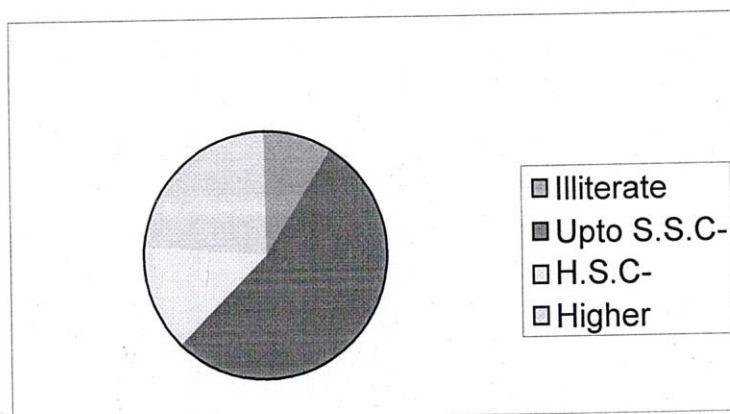


Table 5.7
Education VS Bank loan

Education	Total Number	Bank loan	Percentage
Illiterate	11	2	18.18
Upto S.S.C	49	11	22.45
H.S.C	35	3	8.57
Bachelor/Master	25	5	20.00
Total	120	21	17.50

Source : Field Survey 1999

5.15 Relationship of Education with Knowledge About Livestock Policy

A hard fact is found about the knowledge about livestock policy of the government of the farmers. Only one out of 120 farmers could express about government policy about livestock development. The farmer is from higher education level.

5.16 Problems Faced by the Farmers

There were about 22 different types of problems which the farmers had faced. Those are shown in Table 5.8. In total 120 farmers gave the total of 898 responses because of multiple answers. The problem of high price of feed scored the highest (110) followed by insufficient technical services, low price of the produces, insufficient vaccines, insufficient scientific and technical skill, want of soft credit/bank loan, improper quality of vaccine, insufficient input supply (like baby chicks, heights, ducklings, bulls) etc. The responses were as low as 5 against want of green fodder and pasture land. The other problems stated by the farmers, though comparatively lower in number of response are also considered important.

These problems are also mentioned in different FYPs and also found in some related research reports.⁵

Table 5.8
Problems Faced by the Farmers

Sl. No	Type of Problems	Number of responses	Percent (n=120)
01	Want of soft credit /bank loan	90	75.00
02	Low price of the produces	96	80.00
03	High feed price	110	91.67
04	Insufficient technical service	102	85.00
05	Insufficient scientific technical skill	91	75.83
06	Insufficient supply of Vaccines	93	77.50
07	Improper quality of Vaccine	75	62.50
08	Insufficient input like day old chicks, heifers, bulls, ducklings, etc.	65	54.16
09	A.I. facilities at remote areas	07	05.83
10	High price of medicine & vaccine	64	53.33
11	Illegal /Black marking/ Import of day old chicks/ eggs etc.	12	10.00
12	Less govt. control over import	07	05.83
13	Low quality of inputs	06	05.00
14	Transportation & communication problem	06	05.00
15	Epidemics out break	12	10.00
16	Skilled labour is not available	22	18.33
17	Lack of cold storage & cooperative system	07	05.83
18	No mobile veterinary service	07	05.83
19	Natural calamities	07	05.83
20	No specific govt. livestock policy	07	05.83
21	No Insurance system	07	05.83
22	Want of green fodder and pasture land	05	4.17

Source : Field Survey 1999

⁵ GOB, *The Fifth FYP*, 1997, p. 259.

5.17 Expectations of the Farmers from the Government

There were 8 different categories of expectations of the farmers from the government, and those are shown in the Table 5.9. On the whole 710 responses were given by 120 farmers from across the country. The highest response was for ensuring prevention of the diseases through vaccination.

The farmers expressed their apprehension about the survivability of their livestock and poultry from the diseases and epidemics and hence they sought vaccination services from DLS free of cost. The responses scored the highest and those were 115. This was followed by seeking mobile veterinary services, soft bank loan (without interest or with very low interest), and marketing of the produces. The farmers wanted assurance for stable market with lower fluctuation of price of milk, meat and eggs through out the year so that they could avoid the loss incurred from the farming. The responses are shown in Table 5.9.

Table 5.9
Expectations from the Governments

Sl. No.	Expectation from Government	No. of responses (N=120)	Percent
01	Supply/availability of feed at reasonable lower price	102	85.00
02	Bank loan without interest /or with very low interest	110	91.67
03	Mobile veterinary service	110	91.67
04	Vaccination (free of cost) service	115	95.83
05	Skill training	79	65.83
06	Input supply at minimum price (animals, birds, medicine etc.	89	74.17
07	Easy insurance policy	53	44.17
08	Assurance of market	52	43.33

Source : Field survey, 1999

The other responses were also found to be very much important and those were also directly related to sustainable farming.

5.18 Conclusion

Some impacts of the programmes and policies of the government taken as livestock development strategy, are visible at micro-level. The survey work done to evaluate the programmes impact at micro-level farms revealed so many positive features. Farmers could avail the service of DLS, to a considerable extent, for their economic as well as social benefit. The growth of farm establishment, per capita annual income, size of the farms, introduction of modern breeds/varieties/strains of animals and birds (poultry), increase of investment in farming, availing bank loan, involvement with NGOs, acquaintance with new technologies and husbandry practices were the new achievements of DLS. The farmers also stated their problems. They also suggested remedial measures for solving the problems.

Chapter 6

FACTORS RESPONSIBLE FOR LOW LEVEL OF PRODUCTION

There are a number of factors that are responsible for low level of production of livestock. A number of authors, researchers, investigators, observers, consultants and workers interested in livestock activities opine that various factors are responsible for low level production of livestock in Bangladesh. Factors like low producing animals and birds; want of available feed ingredients and high price of the ingredients; high infestation of various infectious diseases, insufficient veterinary services; want of facilities of artificial insemination for improvement of genotype of animals at grass root level; lack of marketing facilities, and inadequate financing for livestock and poultry rearing were found. Other than these, lack of sufficient financial allocation (budget), lack of insurance facilities to ensure the farmers to get rid of the sufferings from financial loss due to uncertain death of livestock and poultry; and insufficient training facilities to develop skill regarding modern technology of livestock and poultry rearing were also important factors.¹ Alam points out that there are some other factors that affect the livestock production. He adds that management of the total livestock development programmes are not in a proper chain. An effective mechanism for providing the farmers with improved livestock feed, vaccination, medication, management skill is still lacking for which both intensive and backyard livestock production could not reach up to the satisfactory level. He also adds that poor allocation in this sub-sector is attributed to its least development.²

¹ Asian Development Bank, *Main Report*, 1996, p. 11; Bankers Institute for Rural Development, *A Techno Economic Feasibility Study of Integrated Regional Dairy Project in Bangladesh, Pakistan and SriLanka* (India : Army Printing Press, 1996), p. 112; J. Alam, *Livestock Resources in Bangladesh*, 1995, pp. 41-73; M.A. Jabbar & D.A.G Green, *The Status and Potential of Livestock within the context of Agricultural Development Policy in Bangladesh* (Aberstwyth : The University College of Wales, 1993), pp. 30-39; GOB, *Development and Activities*, 1998, p. 12.

² J. Alam, "The Status of Livestock Sector in Bangladesh : Implication for Research", A Key-note Paper presented at the Inaugural session of the Workshop on Livestock Research in Bangladesh held on February 2, 1992 at BLRI, Savar, Dhaka.

Bangladesh Veterinary Society states that, in addition to improved breed, feed, vaccine, medicine and training, there are lacking in regulatory, advisory, extension linkage, research and involving non-public sector in livestock development. In addition it states that the people of the country are not aware of the importance of livestock rearing in their everyday life and also of its role in the country's economy. Lack of coordination among the GOs and NGOs in performing livestock development activities to improve the economic condition of the rural poor also hinder its growth and improvement.³

Bangladesh Livestock Research Institute argues that lack of improved breed, quality feed, fixed breeding policy, training facility for skill development of the farmers, lack of marketing facility, disease prevention and treatment facilities, A.I facilities are the major constraints to livestock development. High cost of feed, less loan facility, lack of awareness among farmers about the importance of livestock raising etc. also directly affect livestock development. BLRI stresses on research facility in the way that lack of research facility in the livestock sector hinder its development. Higher education of the manpower is also necessary for better performance in research programmes.⁴

The Rotary Foundation of Rotary International states that low genotype of the livestock, lack of disease prevention and treatment facilities, lesser facility for A.I at the grass root level, lack of good quality feed, high price of feed ingredients, lack of training facilities for skill development of the farmers, insufficient facilities for bank loans, and micro credits for the poor and land less or marginal farmers, want of extension work for diffusion of modern technologies to the farmers, improper and insufficient facilities for distribution of inputs are the major factors that cause hindrance in livestock development.⁵ Government of Bangladesh in its Fourth FYP states that the major constraint to livestock development is the acute shortage of feeds and fodder. The shortage has been intensified over the past decades mainly

³ M.M. Amin, "Veterinary Services in Bangladesh for the Next Decades", Paper presented at the 6th BSVER Animal Conference held on 4-5 March 1999 at Bangladesh Agricultural University, Mymensingh.

⁴ Bangladesh Livestock Research Institute, *About BLRI* (Dhaka : A Brochure, BLRI, 1992).

⁵ Bangladesh Agricultural University, *Second Annual Report*, 1997.

due to conversion of traditional grazing lands into cereal crop land, introduction of high yielding variety (HYV) with short stemmed paddy resulting reduction in quality of straw and increasing use of straw as domestic fuel and housing material. The other constraints are high incidence of diseases, low productivity of "local breeds of animals" with low per capita production of milk, meat and eggs; and low-graded livestock management system. There was very few intensive commercial production. Small number of livestock was kept by majority of rural households. Livestock was needed to be treated as a primary activity of its own for the supply of livestock products rather than as supportive activity for crop production or as a subsidiary activity for improving family income. It was also stated that there had been very little research effort locally to develop and introduce appropriate technology for improving livestock production. Adequate support services, including input and technical advisory service were also lacking due to lack of sufficient man power and facilities to meet the requirements of the country.⁶ Following the Fourth FYP, major programmes were undertaken in the fifth FYP. The programmes were undertaken to reduce the constraints regarding feed and fodder supply, disease prevention and medication, breeding, extension, training and education both for veterinarians and production specialists and for farmers; and production of inputs like vaccines, baby chicks, ducklings, eggs, etc.⁷ In the Third FYP, livestock sub-sector was reflected as a sick sector showing the very low annual growth rate of livestock products indicating low quality of livestock population.⁸ During the First FYP (1973 - 1978) and TYP (1978 - 1980), the major factors for low level of production were low quality livestock, less grazing land due to heavy pressure of population, less feed and fodder, less facilities for disease prevention and treatment; lack of breeding programmes and inadequate A.I ; and research work. Management deficiency was also identified as a major constraint to livestock development.⁹ In the First FYP some other constraints were also identified¹⁰ Negligence to the livestock sub-sector and

⁶ GOB, *The Fourth FYP*, 1990, pp. X, 3-4.

⁷ GOB, *The Fifth FYP*, 1997, pp. 261-264.

⁸ GOB, *The Third FYP*, 1985, p. 189.

⁹ GOB, *The Second FYP*, 1980, pp. 154-155.

¹⁰ GOB, *The First FYP*, 1973, p. 125.

insufficient supply of feeds and fodder during the last 30 years were identified as the major factors for low level of production of livestock.¹¹

Government of Bangladesh in its "Livestock Development Policy" analysed and identified the factors for low level of production. The factors are genotype of livestock, insufficient feeds and fodder supply, lack of sufficient facility for disease prevention and treatment, lack of appropriate education and training both for veterinary officers and farmers, lack of appropriate research facility, lack of facilities for capital investment and credit management and insurance; necessity for establishment of livestock bank, improper marketing system, necessity for organizational development etc. The sub sector can be developed by proper implementation of the "Livestock Development, Policy" and monitoring the implementation of the activities of DLS.¹²

Asian Development Bank, in review of the Third Livestock Development Project, identified some constraints to livestock development. The major factors identified by the Bank responsible for low level of production were lower genotypes, high cost and insufficient supply of feeds and fodder, lesser facility for disease prevention and medication; and A.I., low banking facility for soft loan, lesser marketing facility, complicated administrative and management system and hence insufficient management of DLS, less extension and research facility etc.¹³ In addition to these factors, Bankers Institute of Rural Development, India adds that the trade policy of the government is difficult one. In this policy government was suggested to stop export of concentrate and molasses until and unless the internal demand was met up.¹⁴ Though the density of livestock population is comparatively higher than many countries, the total production is very low. The density of cattle and buffalo per ha of arable land in 1989 were in India: 1.65, Pakistan: 1.59, Sri Lanka: 2.99, Indonesia: 0.87, Malaysia:

¹¹ Bangladesh Agricultural Research Council, *Livestock Development Policy and Strategy*, M. A. Jabbar (ed.) (New York : Abco Press, 1995), p. 33.

¹² GOB, *Livestock Development Policy* (Bengali Version), 1992.

¹³ Asian Development Bank, *Main Report*, Vols. I and VI, 1996, p. 14.

¹⁴ Bankers Institute of Rural Development, *A Techno-Economic Feasibility Study of Integrated Regional Dairy Project in Bangladesh, Pakistan and Sri Lanka*, 1996, p. 112.

0.86, Thailand: 0.55 and Bangladesh: 2.6.¹⁵ Having such a comparatively higher population of Livestock (as well as Poultry), due to some factors this population could not couple up with the existing demand of the country.

The major factors responsible for low level of production, including those which also were revealed from different investigations, are stated below:

6.1 Genotype of Livestock and Poultry Species

There is no established breeds of livestock and poultry other than Bengal goat and Red Chittagong cattle in Bangladesh. The per capita production of our livestock and poultry species are very low in comparison to that of developed countries. Even when compared to the per capita production of the livestock and poultry species of the neighbouring countries like India, an awful scenario is observed. The main livestock species in Bangladesh is cattle and among the poultry species is chicken. The other species of food animals and birds reared in this country are buffalo, goat, sheep, duck and pigeon. Among these, goat and duck occupied the second positions respectively.

There is no specific established cattle breed in Bangladesh as said. It is also hard to get Red Chittagong in pure form. The per capita production of the non-descript cattle of this country is very poor (below one litter per head per day). Sometimes it has also been found to fail nourishment of the calves by the lactating dams. The quality of the only breed - Red Chittagong has been also deteriorated out due to lack of initiative for its conservation. Buffaloes of Bangladesh are also non-descript (or crosses of indigenous with Surti, Murrah, Nili-Ravi) with considerable per capita production.¹⁶ But its population is found to be very low. The population growth rate is also very poor and slow; and sometimes statistics showed negative growth of this species. The highest population is found to occupy by the goat among the ruminant animals, and its the rate of growth is also good. The breed is also famous for its high prolificacy, and high quality flesh and skin. But the mature weight

¹⁵ M. Asaduzzaman, *Economic Development and Poverty Alleviation in Bangladesh*. 2000, p. 42.

¹⁶ Bangladesh Agricultural University, Department of Animal Breeding & Genetics, "Identification of Best Genotype of Buffalo for Dairy Purpose in Bangladesh and to Improve Their Productivity", *Final Report*, (Mymensingh : Islam Printer, 2000), pp. 3-13.

is comparatively low in relation to many exotic breeds. The sheep are very poor both in genotype-phenotype and number. The quality of wool is very low and adult weight is also very poor.

The chicken occupies the highest position in number; but the quality is poor in terms of growth rate, adult weights, and rate of egg and meat production. These chickens produce 40 to 60 eggs per annum. The non-descript indigenous chicken reared in backyard system contributes to more than 80 percent of total production of the country. The duck are also non-descript with low per capita production and the production is 80 to 90 eggs per annum. The same picture is also found in case of pigeon. The other species like goose, guinea fowl, quail are very negligible in number in this country. Breeding programmes of DLS are mainly for cattle improvements have been going in a very changing way. HYV of poultry strains both for layer and broiler have been being imported from overseas countries. But still the situation could not coup up with the present need.

6.2 Feed

Feed is a very important component of livestock and poultry production. Acute shortage of both roughage and concentrates intensifies the nutritional status of our livestock leading to very low production. Cereals and pulses could not be made available due to higher competition for food of human. Livestock (mainly cattle and buffalos) of the country depend on rice straw as a main source of roughage. And indigenous insects, worms and post harvest residues provide feed for major poultry population (more than 80 percent) reared at backyard farming under scavenging system in the rural areas. With the increase in human population in the country, continuous pressure on cereal production squeezes the grazing lands depriving the ruminants from consuming succulent roughage. On the other hand, due to the same reason, pressure to more production of cereal crops, short stemmed high yielding varieties reduces the straw production. Moreover, increased use of straw as domestic fuel and for housing material has worsen the condition. Government programmes on fodder cultivation and feed milling could not meet the existing need of the country. On the other hand, gradual distortion of the nutritional condition of the country's livestock may have a great influence on production of animal products that supports the human

nutrition of the country. It could be mentioned here that due to high price of feed (and medicine as well) a decreased tendency of the growth of micro-level dairy farms was observed at Chittagong area.¹⁷

6.3 Diseases

Diseases are the most detrimental impediments of livestock production in Bangladesh. This country has to face significant losses every year due to higher infestations of different contagious and infectious diseases. Due to persistence of sub tropical climate along with poor nutritional status, there prevails high incidence of diseases. Frequent outbreak of different diseases and many a times in the forms of epidemics result in higher economic loss due to higher mortality of different livestock and poultry specie. Among the diseases, the common diseases are foot and mouth disease (FMD), hemorrhagic septicemia (HS), brucellosis, black quarter (BQ), anthrax, goat pox, Peste des Petits Ruminants (PPR), contagious ecthyma, gid disease etc. of ruminants; and new castle disease (ND)/ ranikhet disease, fowl and duck cholera, gumboro disease/ infectious bursal disease (IBD), colibacillosis, salmonellosis, fowl pox, chronic respiratory disease (mycoplasmosis), infectious bronchitis, coryza, fowl typhoid, lymphoid leukosis, duck plague, coccidiosis, duck viral hepatitis of poultry are very common. DLS continues to implement vaccination programmes year-round through out the country against many of the diseases. Some vaccines are produced in the country with sufficient and insufficient doses; and some are imported.

Due to insufficient number of vaccinators and sometimes-poor quality of vaccines could not keep the livestock free from infestations. There is no in-depth study on the loss of livestock due to various diseases in the country. Data generated by DLS shows that the loss of livestock due to various diseases was of about Tk. 14,000 million per year in mid eighties. Nakamura shows the loss of at least Tk. 20,700 million per year at 25 percent mortality from diseases and parasitic infestations.¹⁸

¹⁷ Yousuf Chowdhury, "Problems of Dairy Farming", *The Daily Purbokone*, Ltd. Chittagong, 24 April 2000; Dr. Rafiq Ahmed, Asstt. Programme Officer, Agro-based Technology Development Project, Ministry of Agriculture, Chittagong : An Informal Discussion.

¹⁸ R.M Nakamura, "A Livestock and Poultry Disease Control Programmes for Bangladesh", *Consultancy Report for ARP-II*, Chechchi, USAID, BARC, Dhaka, 1990, p. 31.

6.4 Lack of Existence of Proper Established Breeding Policy

No proper and stable breeding policy has yet been formulated for conservation of the locally available good germ-plasm like Red Chittagong, Sarail Chicken, Naked neck, Sarail Dog, Giribaz pigeon, Shirazi pigeon, Jalali pigeon, and Bengal Goat. Red Chittagong (averaging 2 liters per head per day with an average production of 550 litres per lactation) could produce better than the local non-descript population average. Among the Bengal Goat, Black Bengal, White Bengal and Grey Bengal, Fawn Bengal are commonly found; and a good number of mixed coloured Bengal Goat are also available throughout the country. The Sarail and Naked neck Chicken also have some good and, at the same time, specific characteristics regarding their unique phenotypic, behavioral as well as production characteristics. But, to conserve these local germ-plasm of these species of animals and birds through selective breeding as well as husbandry practices, no specific policy has yet been undertaken. To improve the genotype of the most important species of Bangladesh - the cattle, the breeding strategy underwent many changes. During the late British regime starting the beginning of early forties, Hariyana breed was selected to cross the indigenous cattle. After the independence of Pakistan, Sindhi and Shahiwal were used to breed the non-descript cattle of the country till the liberation of Bangladesh. In the mid seventies, Holstein-Friesian and Jersey were the breeds by which government started upgrading of the indigenous cattle. Later Jersey has been expelled and Shahiwal again been introduced in the breeding strategy with a view to improve the most economically important traits.¹⁹ These types of metamorphosis have affected genotype improvement of the cattle population of the country. Breeding for improvement of next important species, the buffalo has not yet been done.

The only buffalo farm was established at Bagerhat but with no much initiative for breeding and improvement of this species. For improvement of the important small ruminant - goat, selective breeding programme through establishing goat improvement stations by DLS has been being run; but the number of stations and

¹⁹ GOB, *First National Workshop on Animal Breeding*, Dhaka, 1998.

activities are not sufficient. For improvement of domestic fowl, different breeds like Rhode Island Red (RIR), White Leg Horn (WLH), Australorp, Lohman New Hemp Shire etc. were introduced. At the latest, to accelerate rural scavenging production, Fayoumi has been introduced though government took different projects for augmenting poultry production, but with no decision for permanent breeding policy. Government should settle down to adopt stable policy for improvement of poultry population from the view point of both backyard poultry development and commercial chicken production in terms of egg and broiler.

6.5 Insufficient Education and Technological Skill of the Farmers

Majority of the farmers of the country live in rural areas and most of them are illiterate. They don't have primary education to possess the capability to go through written papers or documents; even they can't take proper idea from a leaflet, which is also a means of extending scientific information. The farmers when undergo any type of training, they cannot keep information in writing and ultimately they forget almost everything. Other than those done practically, the remaining information are missed. Due to lack of education, the farmers are also lacking technological skill and this is why they cannot adopt modern technologies for improvement of their livestock.

6.6 Lack of Sufficient Technical Manpower²⁰

Insufficient number of technical manpower is an important constraint to the improvement of this sub sector. A total of 8462 including the supporting staff are working in the DLS. But of this, only 1450 are the technical graduates serving both in technical, administrative and technological services. A committee - Enam committee headed by Mr. Enamul Hoque was deputed to evaluate DLS structure and activities and the committee deducted 36 manpower with a declination of total number to 8426. The distribution of the manpower is consolidated in the Table 6.1. It shows that there are only 1450 class I technical manpower in DLS.

²⁰ GOB, *Development and Activities*, 1998.

Table 6.1
Manpower Distribution of DLS²¹

No.	Posts	Created posts by Enam committee	Further created by Enam committee	Total
1(a)	Class I (Technical)	1327	123	1450
(b)	Leave/deputation/training/reserve posts	-	96	96
2.	Class II	7	1	8
3.	Class III	3938	674	4612
4.	Class IV	1685	611	2296
Total		6957	1505	8462
Abolished by Enam committee		36	-	-
		6921	1505	8426

Source : DLS, Dhaka

To run the diversified activities of DLS, a good number of technical manpower of different levels with different capacities are urgently needed by the department. On the other hand, infrastructural facilities are also needed to be increased for successful implementation of the policies and programmes as envisaged in the Livestock Development Policy. Presently institutional arrangement is not satisfactory to face the need of the country. As of 2002, in total there are 8426 posts, with 7854 manpower who are working in the department. The headquarter of the department is at the capital city, Dhaka. The position of other establishments across the country has been shown in the Table 6.2.

²¹ Ibid., p. 29.

Table 6.2
Establishment under the Department of Livestock Services²²

Sl. No.	Establishments	Number
1	Divisional livestock office	05
2	District Livestock office	64
3	District Veterinary office	63
4	Upizilla Livestock Office	460
5	Upizilla Veterinary Hospital	462
6	Thana Livestock office (Metropolitan)	09
7	Central Cattle Breeding and Dairy Farm	01
8	District Artificial Insemination Center	22
9	Artificial Insemination Sub-centre	433
10	Artificial Insemination Point	623
11	Dairy and Cattle Department Farm	06
12	Buffalo Breeding and Department Farm	01
13	Goat Department Farm	05
14	Pig Farm	01
15	Central Poultry Farm	01
16	Zonal Poultry Farm	02
17	Poultry and Duck Farm (Egg Production)	10
18	Day old Chick and duckling rearing Farm	20
19	Central Duck Breeding Farm	01
20	Zonal Duck Breeding Farm	03
21	Central Veterinary Hospital	01
22	Central Medicine Store	01
23	Zoo	02
24	Livestock Research Institute	01
25	Livestock Research Laboratory	01
26	Central Disease Investigation Laboratory	01
27	Regional Disease Investigation Laboratory	07
28	Animal Nutrition Laboratory	01
29	Central Artificial Insemination Laboratory	01
30	Officers' Training Institute (OTI)	01
31	Veterinary Training Institute	02
32	Livestock Training Institute	02
33	Veterinary College	04
34	Animal Feed Mill	01

Source : The Role of the Department of Livestock Services in Economic Development, DLS, Dhaka, 2002.

²² GOB, *The Role of the Department of Livestock Services in Economic Development (Bengali Version)*, 2002.

Bangladesh Livestock Research Institution under the same ministry as like as DLS has been conducting research for improvement of Livestock production and disease control.

6.7 Lack of Sufficient Budget Allocation²³

The contribution of livestock sub-sector has been shown as Tk. 63,010 million (at constant price of 1995-96) in an economic review, which is about 2.89 percent of total GDP. In another information of the Planning Commission, the value of the livestock products has been shown as Tk. 87,000/- million equivalent to 4.0 percent of GDP. In addition, if the values of fuel in daily household activities, wages of women employment in livestock rearing and the values of draft power are added to GDP, this figure might rise up to Tk. 300,000 million.

But the allocation for livestock development during Fifth Plan Period (1997-2002) was only Tk. 5435.60 million, which was about 0.28 percent of the total budget. The allocation for 1998-99, for example, was only Tk. 1413.20 million against the total national budget of Tk. 295370.00 million, which was equivalent to only 0.48 percent of total budget. For 2002-2003, the allocation was Tk. 1081 million. The production of meat, milk and eggs were 0.83 million mmt, 1.82 million litre and 4780 million number respectively. Considering the present trend of growth, these productions, could be increased to 0.94 million mmt, 1.95 million litre and 6020 million number respectively in 2005-2006 if a budget of Tk. 1440 million is allocated for this sub-sector.

6.8 Lack of Proper Marketing System of Livestock Produces of the Farmers²⁴

Marketing of different species of livestock and their products is unorganized. A number of intermediate traders are involved in transferring commodities from the farmers to the consumers. This raises marketing cost and margin. Moreover, there is considerable fluctuation of commodity prices by season and region reflecting on the

²³ Ibid.

²⁴ Asian Development Bank, *Main Report*, 1996, p. 16.

inefficiency of marketing system. Besides, market places are underdeveloped and unhygienic. Communication network is inadequate for easy transfer of commodities to the market. There is very little provision for processing and preservation of livestock products around market places. No cold storage facilities have yet been developed in relation to livestock and poultry production marketing channel. As a result, the producers do not get fair price of their produce. Even there is no system of cooperative by which sustainable/stable market could be established as elsewhere in the developing countries to ensure the selling price of the farmers. Marketing of live animals including poultry birds and their products needs improvement. For this purpose, all such markets should be brought under regulation by phase. No special transportation system has yet been developed for carrying livestock products to the market.

6.9 Inadequate Financial Facilities for the Farmers and the Entrepreneurs

Public allocation is the main source of financing development programmes in Bangladesh. It has been discussed earlier that, the livestock sub-sector never received due attention of the policy makers in regards to the allocations of development budget. The share of the livestock sub-sector to total allocation were 0.76%, 0.98% and 1.43% during the 2nd, 3rd, and 4th five year plan periods. It has also been stated that those were virtually insignificant in relation to the gigantic task that this sub-sector would require to perform. In fact this sub-sector received the lowest share of resource allocation compared to that of other important sub-sectors' of the economy. This was due to lack of proper realization of this sub-sectors contribution in the national economy.

Livestock has been making significant contributions in four main areas of the national economy viz. supply of human nutrition, supply of draught power and generation of foreign exchange and creation of self-employment. Wide ranges of development activities are needed to be undertaken to improve the performance in those areas. That will call for heavy investment in the livestock sub-sector. At least, three percent of the total development outlay of the country should be allocated to livestock development.

The main concern for livestock development is helping the farmers and entrepreneurs through providing with sufficient financial assistance with soft terms and conditions; and DLS itself should take credit programmes from its own budgetary allocation. Because it has been found that the farmers and entrepreneurs have to face a great trouble to have bank loans. A recent study shows that little amount of money are available for this purpose.²⁵ Not more than one percent of rural households received institutional credit for livestock development. The average size of loan was very small to buy one cattle. The utilization of loan for the purpose for which it was taken was poor. The repayment rate for such loan was also poor. Low return of credit and sudden death of animals were the main reasons for non-repayment of loans.

6.10 Livestock Insurance Policy

Livestock insurance can play a vital role in repayment of loan of the farmers. Since 1981, arrangements made through the Shadharan Bima (General Insurance) Corporation for cattle insurance, but its coverage is still very little. Most of the farmers are not aware of the necessity of such insurance; those who know entered into the agreement for cattle insurance. But majority of the farmers were left out of this programme.

6.11 Lack of Extension of Technical Training and Information to the Farmers

The farmers are not up-dated with the modern and up-to-date information. About 85 percent of country's poultry output accounts from village level production and women are the common rearers of these birds. The ownership of backyard poultry is almost entirely in the hands of women often those who are economically disadvantaged. These rural women rear small flocks of predominately local indigenous birds. The main feeds are household waste, homestead pickings and rope residues. With the absence of concentrate feed and animal health inputs the productivity of local fowls is low and losses due to diseases are high. If these high range of poultry production could be equipped with scientific technical know-how,

²⁵ Abul Hossain, "A Review of the Livestock Sub-Sector in Bangladesh", *Agriculture Sector Review*, UNDP, Dhaka, 1997, Compendium Vol. II.

the total poultry out put of the country could be increased many folds. Thana level offices are not given projects/programmes to train with local farmers to equip the with technical train. As the farmers are also not aware of the modern information regarding livestock and poultry development, extension work is needed to be strengthened down to the grass-root level.

6.12 Miscellaneous Factors

There are a number of other factors that are also directly related to the factors responsible for low level production and those are stated below in brief.

6.12.1 Shortage of Draught Power²⁶

There exists serious shortage of animal draught power in the country, which is likely to be further aggravated in future with increased cropping intensity. Under the prevailing conditions the chances of increasing the number of cattle and buffalo in order to overcome the draught power shortages are relatively small. In addition it has been found that lactating animals have been being used as draught animals. Therefore, policies should be emphasized to improve draught power potential through introduction of efficient farming practices and appropriate mechanization. The measures would include development of more efficient plough and other animal drawn farm implements, local manufacture and promotion of their use along with selective mechanization with emphasis on multiple uses of such equipments. Moreover, efforts should be made of expand and intensify the system of single animal ploughing in different parts of the country.

6.12.2 Lack of Appropriate Farming System and Related Factors

In a study of identification of problems affecting the livestock and poultry production and transfer of technology to improve their production at farming system, it was found that landlessness is one of the reasons of not keeping livestock systemically at backyard system.²⁷ Livestock was an adjunct to the cropping system

²⁶ M.A Jabbar & D.A.G Green, *The Status And Potential of Livestock Within the Context of Agricultural Development Policy in Bangladesh*, 1993; J. Alam, *Livestock Resources in Bangladesh*, 1995, pp. 41-73.

²⁷ GOB, *Progress Report* (Dhaka : Bangladesh Livestock Research Institute, 1991), p. 103.

and 80 percent of the framers of Aragon village, Savar kept livestock and mixed herd as a part of farming. It was also found that the pattern of ownership of cattle revealed a direct relationship with the land ownership. The other problems found were lower per capita milk yield, lack of hybrid variety of cattle and poultry. Lack of practice of artificial insemination due to fear of calf-death and maternal mortality, religious taboo against artificial insemination, lack of requisite member of draught cattle for which milk animals were used for draught purpose, lack of sufficient feed both roughages and concentrate, seasonal availability of green grass, no practice of growing modern variety of fodder like napier, para etc and vaccination. Only one percent of the animals were vaccinated regularly.²⁸

6.12.3 Inequitable Distribution of Livestock²⁹

Inequitable distribution of livestock had also been found to be reported. Though the number of cattle is not insufficient in the country, still in some places there are shortage of cattle, especially draught cattle was found shortage. In a study of "identification of problems affecting the livestock and poultry production and transfer of technology" to improve their production in farming system it was reported to exist a substantial shortage of draught power in Aragon village of Savar, Dhaka which was about 25 percent and that increased with the increase of land size. It was also stated that 4 percent farmer reported about their shortage of draught power during peak season. This inequitable distribution of livestock also affect on backyard milk production through utilizing and inclusion of lactating cows in agricultural work as draught animal during peak season.

6.12.4 Small Size of Farm Holding

A very important constraint of livestock development in the country is the majority of small size of farm holdings. Especially in dairying, it becomes almost tough to rear dairy cattle even if the farmer wants to go along for milk. Because small farm holdings don't permit the farmer to spare land for growing fodder. As the prices of crops is high with the simultaneous comparatively low price of milk and milk

²⁸ Ibid., pp. 101-110.

²⁹ J. Alam, *Livestock Resources in Bangladesh*, 1995, pp. 41-73.

products and low per capita production, in addition, cultivation of fodder is almost impossible for the small holders.³⁰

6.12.5 Management of Livestock Services³¹

The DLS could not strengthen livestock development activities in collaboration with NGOs that supported self-employment activities of smallholder farmers and provided an integrated package of assistance. Credit facilities was not made available to the private sector for establishment of livestock enterprise, processing and marketing facilities; and animal feed mills. Private sector investment in the production of animal health remedies was not encouraged. Supply of medicines and anthelmintics free of charges was continued though that supply helped the small farmers to a limited extent. The production of vaccines continued under the direct control of the DLS. The vaccine production also was supposed to be from the private sector. Due to lack of efficient management, despite the considerable investment in training and research over the two decades, the public sector livestock agencies had been unable to cope with the small farmers needs. The projects implementation performance had been poor and it had reflected the generic problem of staff motivation and efficiency inherent in the public sector. To fill that gap in livestock development, NGOs and farmer-managed co-operatives and associations had progressively built up their own technical resources and initiated production enterprise. Development around the basic grass roots of these organizations those initiatives had successfully reached several hundred thousand of the poorest of the poor in the rural areas.

6.12.6 Low Per Capita Production Under Backyard Management³²

Though the indigenous livestock species yield is much less (as mentioned earlier), it has been found that milk yield had suffered (23 percent) in backyard farming system particularly because of the use of 89 percent cows for draught purposes. In a field research it has been reported that there was only one dairy cattle per eleven people in Aragon village and daily average production was only

³⁰ Asian Development Bank, *Main Report*, 1996, pp. 9-22.

³¹ Ibid.

³² GOB, *Progress Report*, 1991, pp. 99-110.

one liter. It has also been observed from the same type of field survey that the rate of egg production was also very low and that was 43 eggs per hen per year. It was also found that the rate of egg production of the indigenous was fowls was also increased with the increase of the land size and landownership of the farmers.

6.12.7 Government Intervention in Exporting Hides and Skins³³

It is well known that hides and skins are valuable export items of Bangladesh. It has been found that due to Government intervention to enhance more export earning from this sector, government banned export of raw hides and skins including wet blue product. Even crust leather was supposed to be banned since 1997 causing a significant reduction in the number of small tanneries. On the other hand, about 6,66,000 cattle and 5,66,000 goats are sacrificed each day totalling 2.0 million and 1.7 million hides and skins respectively for a three days period during Eid Festival. The tanners confirmed that, during that period take-off, flaying and preservation damage occurred to hides and skins to a greater extent.

6.12.8 Lack of Appropriate Project Planning³⁴

It has been found that maximum development projects planned for improvement of livestock are not sustained as permanent programme of DLS. This is either due to improper planning in relation to the practical need of the country or due to lack of foresight in realizing the need of the programme. Expert opinion is to undertake appropriate projects for sustainable livestock development.

6.12.9 Uncontrolled Egg Markets³⁵

The number of eggs brought to Bangladesh is uncountable. Because these eggs crossed Indian border by the black markets. The big size bamboo cases (khacha) contain thousands of eggs (from India) are crossed round the border

³³ Asian Development Bank, *Main Report*, 1996, p. 33.

³⁴ Jorgen Hensen, "Livestock Development Issues in Bangladesh", A Seminar held at Chittagong Government Veterinary College on 27 Sept., 2001.

³⁵ M.M.B. Zaman Sentu, "The Various Programmes for Resisting the in-coming of Foreign Eggs", *Poultry and Dairy Barta*, Khundkar Manir Ahmed (ed.) (Dhaka: 1995), p. 3.

through out the year. Karwan Bazar of the metropolitan Dhaka city is one of the biggest wholesale market of these eggs. The officials of poultry association, Bangladesh found these eggs of and when they visit to research in this market area. These eggs occupied the egg market of a greater extent. The main reason of black market of eggs was due to facilitating the black marketers by the Bangladesh Rifles (Bangladesh force engaged in border security) as they were arrested.

6.13 Conclusion

A number of factors are responsible for low level of production of livestock and poultry in Bangladesh. Different government agencies, non government agencies from both local and national levels investigated the causes for low level of production and a good number of reasons were identified by DLS, BLRI, BAU, CGVC, Rotary International, ADB, CIDA, DANIDA, BRAC and such other organizations; and a number of national and international consultants and researchers found a good number of problems.

Among those, the most important ones are poor genotype, scarcity and high price of feeds and fodder, disease outbreak, want of established breeding policy, insufficient education and technical skill of the farmers, insufficient number of technical manpower and veterinary and extension services, lack of sufficient budget allocation and inadequate financial assistance for farmers and entrepreneurs, lack of proper marketing system, lack of insurance policy, insufficient extension works for livestock development, shortage of draft power, small farm holding, in consistent export-import policy of the government, inappropriate project planning etc. are important factors.

Chapter 7

REMEDIAL MEASURES FOR PROMOTION OF LIVESTOCK SUB-SECTOR

To overcome the existing barriers that affect the growth of livestock sub-sector with simultaneous low performance, government formulated the livestock development policy. This policy of Bangladesh Government suggests for augmenting livestock production through improvement of livestock and poultry; production of livestock and poultry feed, prevention and treatment of livestock and poultry; facilitating education, training and research; investment of capital and credit supply; ensuring marketing and institutional development. With a view to increase production of milk, meat, egg, draft power; and to take necessary measures for creation of more self-employment facilities and increased income in rural areas. The Government took many efforts. Through establishing cordial relation with the NGOs, a large number of commercial dairy farms were established in urban and semi urban areas; and backyard farming at upazilla and rural areas was encouraged through providing the farmers with financial and technical assistance. Following the same strategy poultry production was also increased to meet the enhanced need for eggs and poultry meat. To ensure adequate production of feed, which the most researches consider as the most important barrier in livestock development, appropriate strategy for fodder production was undertaken. Emphasis was given on utilization of unconventional feeds and industrial by products; and proper utilization of land for integrated agricultural and fodder production by using scientific technology. Through establishing animal feed mills, Government support for private initiatives and controlling export-import policy for animal feed, the demand for those could be met up. For well equipping the Upazilla Livestock Development Center, the infrastructural facilities should be provided for prevention and control of diseases. Artificial insemination training for both field workers and unemployment youths should also be provided. Arrangements should be made for supplying drugs free of cost and proper veterinary service including mobile veterinary clinic. Appropriate education, training and research works for the improvement of livestock status

should be encouraged. Investment of capital and credit supply should be encouraged for better performance in livestock sub-sector. Establishment of a Livestock Bank and introduction of Livestock Insurance Policy may help the improvement of performance in this sub-sector. To ensure proper price of the produces, marketing channel should be established. The present structure of DLS should be changed and expanded and Bangladesh Livestock Development Council (BLDC) should be formed to monitor the development activities according to Livestock Development Policy.¹

Stein and Mack put importance on the balance between private and public sectors' efforts for livestock development. They opine that extended public services proved to be increasingly inefficient and costly to run, and, therefore, private sector should be encouraged to take the responsibilities. They also emphasize that the macro-economic and sectoral policies are needed to be analysed as to their relevance to livestock production as they affected relative boundary of production factors and adequacy in view of likely future development.² To overcome the factors responsible for low level of production, the government undertakes the programmes accordingly. Government emphasizes livestock development for improvement of draft power, animal protein intake for improving health care and disease control, etc. Hence cooperative dairy complex and other programmes were undertaken accordingly.³ In the Second FYP, to improve livestock production, disease control and prevention, and for the improvement of genotype of cattle by A.I.; many activities including cockerel exchange programmes, animal feed mill and fodder extension, farmers training for introducing elementary husbandry techniques, staff training for professional development of field level technical personnel and research programmes were undertaken. Credit programmes were also undertaken to augment farm establishments at the grass-root level.⁴ The programmes undertaken during third plan period were establishment of mills for feeds, disease control, genetic improvement through A.I. and natural services for cattle and selective breeding for goat; training and credit facilities through Bangladesh Krishi Bank, other commercial

¹ GOB, *Livestock Development Policy*, 1992.

² F. Stein and S. Mack, "Livestock Development Strategies", *World Animal Review*, Vols. 3-4, FAO, 00100 Rome, Italy, 1995, pp 19-21.

³ GOB, *The First FYP*, 1973, pp. 125-128

⁴ GOB, *The Second FYP*, 1980, pp. 155-157.

banks and Bangladesh Rural Development Board (BRDB).⁵ Major programmes undertaken during the fourth plan period were poultry feed production (especially meat-meal, tankage, blood and bone meal production), cattle feed production, animals health and disease control, disease diagnosis, treatment, prevention, vaccine and medicine production and distribution (cattle, buffalo, goat, sheep, fowl and duck breeding), marketing, credit, extension, training, and education, etc. Government efforts for environmental improvement, income generation and creation of employment facilities were supposed to be implemented through intersectional linkages involving the NGOs and other private sectors.⁶

Many programmes were undertaken to overcome the factors responsible for low level of production.⁷ Raha suggests for undertaking programmes for conservation and improvement of local improved breeds of milch cows such as Pabna local and Red Chittagong to establish commercial farms of cattle (for beef and milk) and goat and to intensify research programmes for intervening areas for augmenting production. He also mentions that the Government's introduction of incentives for strengthening initiatives of the entrepreneurs in dairy farming, reducing dependence on imported powdered milk and also creation of employment opportunities by providing financial assistance to them. He also suggests for continuation of current programmes (disease control, genetic improvements etc) and strengthening of research.⁸ In addition, he highlights the programmes on genetic improvement and A.I. extension programmes down to the village level; veterinary services, extension services, marketing development, poultry, sheep, and goat development programmes.⁹ Comparing the farming system, marketing and role of the Government of Thailand, Sahab Uddin sought the initiatives from the government for controlling eggs and chicken markets through fixing minimum price of the products; export and import policies of poultry feed, medicines, vaccines, equipments and others in consultation with the farmers/

⁵ GOB, *The Third FYP*, 1985, pp. 190-191.

⁶ GOB, *The Fourth FYP*, 1990, pp. X.4.8 - X.4.13.

⁷ GOB, *The Fifth FYP*, 1997, pp. 254-258.

⁸ S.K Raha, "Development of Livestock Sector : Issues and Evidences", M.A. Sattar Mandal (ed.), *Changing Rural Economy of Bangladesh*, 2000, pp. 54-65.

⁹ M.S. Mian, "Livestock Development : A Tool for Poverty Alleviation", *The Bangladesh Observer*, Dhaka 14, Nov., 1996.

farmers' association; the efficacy and potency of the medicines and vaccines and quality of the feeds imported and produced within the country. He also suggests for improving the poultry industry through management practices for which proper training of the framers are necessary.¹⁰

Alam suggests to undertake some steps for overcoming the impediments relating to livestock development in Bangladesh. These include in genetic development, disease prevalence, feed production, skill development of the farmers regarding husbandry practices, products and by products technology including hides and skin flaying and processing; financing for intensive farming, establishment of research institution, to increase sectoral budget, to ensure the supply of equipment and machineries, to facilitate marketing, to extend supports for education and training for skill development of the livestock personnel.¹¹

Hensen stresses on careful formulation of development projects relating to sustainable development of livestock focusing the present farming system and status of the farmers. After completion of the recommended period specified for the respective governments projects, no or little continuation is carried out. As a result, the achieved success could not bring long lasting fruitful effect to the farmers.¹²

Fattah puts importance on destitute women, landless labourers and unemployed youths who could be successfully engaged in rearing livestock and poultry as a means of earning and hence livestock farming could play a great role in poverty alleviation in Bangladesh. As women constitute half of the total population and at the same time youth age-group also constitute a considerable part of population of the country, they could successfully be engaged in livestock rearing. Livestock production could be augmented with simultaneous efforts for year-round employment creation and poverty alleviation.¹³ Islam suggests to upgrade the

¹⁰ Md. Sahab Uddin, "Management of Poultry Industry in Thailand and Bangladesh : A Comparative Statement", A.B.M. Habibul Huq (ed.), *Khamar* (Dhaka, 2002), pp. 26-27.

¹¹ J. Alam, "The Status of Livestock Sector in Bangladesh : Implications for Research", Feb., 1992, BLRI, Dhaka.

¹² Jorgen W. Hensen, "Livestock Development Issues", on 19 sep., 2001.

¹³ K.A. Fattah, "Livestock Role in Rural Employment Generation and Poverty Alleviation", *The Guardian*, June, 1997.

indigenous cattle of Bangladesh through breeding, increasing feed production and intensive veterinary service, provision of sufficient government budget; providing lowest rate of electricity used in farming activities and facilities for land to easy livestock production.¹⁴

On the basis of analysing the opinions and findings of the experts and specialists, and the farmers some remedial measures for promotion of livestock sub-sector are suggested below.

7.1 Development of Breeds and Strain

It has been discussed earlier that there is no established breeds/varieties/strains of livestock and poultry for which per capita production of the animals and birds are very low in Bangladesh even though when compared to many low producing countries. Among different species of animal and birds, development of breeds of cattle and strains for fowl (chicken) are very important. Of the two species, demand for chicken could have been met by easy import of parent stock from the neighbouring countries. But it could not be economically feasible to meet the continuous increasing demand for beef and milk through continuous uninterrupted import. Government will have to take an intensive research for development of cattle breed/varieties. Present breeding policy should also be continued strictly following the accepted strategy. For improvement of the genotype of the buffaloes specific breeding policy should be implemented.

Open Nucleus Breeding System (ONBS) for improvement of Bengal Goat should be continued. Even introduction of heavy goat breeds for out breeding Bengal goat could be through analysing relative merits and demerits. Improvement of the genotype of sheep should also be considered. Development of strains for both layer and broiler type chicken should be given emphasis avoiding the strategy for importing of parent stock for indefinite period of time.¹⁵ Likewise strain development

¹⁴ N. Islam, *Dairy Farm* (Chittagong : Ahla Printers, 1999), pp. 9-11.

¹⁵ Mr. Alef Hossain, *Poultry Consultant*, Dhaka, 2003 [An informal discussion].

for duck, pigeon and other species of poultry should also be given due emphasis though expert opinion (from some poultry scientists) was not to take steps for production grand parent stock or parent stock with the involvement of huge amount of money preferring import of parent stock from abroad.¹⁶ Intensive research projects should be taken to develop and improve these species of domestic animals and birds.

7.2 Production of Feed

Many specialists of livestock and poultry opine that there is serious scarcity of animal feed prevailing in this country. Taking this factor as an important one, Government will have to undertake policies and strategies for ensuring availability of animal feeds—both roughage and concentrate. These are alternatives regarding the availability of concentrates whether it could be produced locally in the country. Government will have to ascertain the actual storage of concentrates by analysing the actual need and the actual domestic production. Government could provide subsidy to the farmers to produce both leguminous and non-leguminous crops. Again, Government could take strict import-export policy on concentrate ingredients. For the production of conventional fodder, wasteland should be brought under intensive cultivation. All public lands and places like roadsides, rail tracks, embankments may be utilized by the nearby farmers under the care and supervision of DLS. To achieve the best result, proper planning should be made and be implemented by the grass root level officers of DLS.

7.3 Control of Disease

One of the most important measures for livestock development is control of different types of diseases with special emphasis on infectious (contagious) diseases. The livestock and poultry production of Bangladesh is highly vulnerable to various types of diseases due to its tropical type of climate along with relatively high density of livestock and poultry population. As discussed earlier various types of

¹⁶ Dr. Q.M.E Haque, Director General, BLRI Dhaka and Mr. Md. Rafiqul Haque, Poultry Consultant, Dhaka September 2003 [An informal discussion].

bacterial, viral and parasitic infestations are manifested and that causes great loss to our country every year. The diseases, specially which are specific to cattle appear frequently in endemic and occasionally in epidemic form.¹⁷ Due to high incidence of different types of livestock and poultry diseases; a great loss occurs, the burden of which is carried by the farmers. This loss showed a figure of Tk. 14000 million per year in mid eighties which was found to be Tk. 20,700 million in 1990.¹⁸ However, present disease control programmes should be strengthened by the upazillas to strengthen the vaccination programmes for preventive measures. Employment of more veterinarians at the Thana/Upazilla levels is necessary. At least 4 (four) Veterinary Field Assistants should be appointed at each Thana or upazilla.

7.4 Implementation of Intensive Livestock Extension Programme

The farmers of the country are not acquainted with modern method of rearing due to prevailing high rate of illiteracy, but still modern scientific methods of livestock rearing should be extensively introduced. The farmers should be provided with modern and latest information on livestock husbandry. In this regard, farmers should be given knowledge regarding housing, breeding, feeding, fodder cultivation; production, collection, storage and utilization of unconventional feeds; use of waste land and places for fodder production, scientific method of processing different feeds; nutritional needs and fulfilment of nutrients of different species of animals and birds of various ages and types; disease prevention and treatment; production system; processing, storage and marketing of livestock products; sources of credits and better utilization of credits; availing facilities of livestock insurance to cover the risk of loss of animal wealth, different ways of creation of self-employment opportunities from livestock related enterprises etc. All these information should be made available at the doorstep of the grass root level farmers and these could be possible by intensive and at the same time extensive extension works. To accomplish

¹⁷ K.M. Kamaruddin and K.K. Pandit, "Pattern of Foot and Mouth Disease Virus Infections in Cattle of Bangladesh", *Bangladesh Veterinarian*, Vol. 5(2), Mymensingh, 1998, p. 22.

¹⁸ A.F.M.R Hassan, "Foot and Mouth Disease in Bangladesh", *Third World Country Training Programme on Foot and Mouth Disease Control*, Bangkok, Thailand, 1985; R.M. Nakamura, "A Livestock & Poultry Disease Control Programme for Bangladesh", *Consultancy Report for ARP- II, Chechchi/ USAID/ BARC*, Dhaka, 1990.

this very important task, there should be at least one Animal Husbandry Extension Officer (AHEO) at the Thana / upazilla level. The Government should take this factor as an important one by giving topmost priority.

7.5 Creation of Dairy and Poultry Boards

Creation of Dairy Development Board (DDB) and Poultry Development Board (PDB) would help channelize dairy and poultry production, processing, preservation and marketing the milk, meat, eggs and related products. The boards in collaboration with the Government (DLS), Co-operatives and, if needed, with NGOs would decide on micro-economic policies on farming; livestock production, processing, marketing and pricing policies. Thus the manipulation of exchange rates; and controlling costs and returns of livestock produces through wages and interest rates, fiscal and monetary policies, consumer subsidies, tariffs, quota and export subsidies related to the import and export of raw and finished products like hides and skins (for earning foreign currency), animal feeds, vaccines, medicines, etc. would enhance the growth of this sub-sector. These would also help to maintain balance between private and public ownership of livestock related enterprises and services. The boards would also control the sectoral policies needed to be analysed as to their relevance to livestock production.

7.6 Improvement of Skill of the Livestock Workers

Livestock workers are engaged at different levels of the DLS starting from grass root level field assistants and equivalent workers upto the officers working at policy determination levels should be equipped with update knowledge of livestock development. These workers should have enough knowledge and skill about modern information and technology regarding feeding, breeding, management, disease prevention, treatment (both medicine and surgery), processing, technology, preservation/storage, extension, credit management, employment creation, training etc. The workers, employees, officers, surgeons, technologists, researchers, planners and executives should undergo training and education at their appropriate levels. Both in country and foreign training should be provided as and when needed. These training programmes would help to equip the manpower with appropriate knowledge to perform their duties smoothly which in turn will contribute to augment livestock production.

7.7 Establishment of Livestock Bank

Livestock production could be accelerated through the establishment of a Livestock Bank. Through this initiative, the farmers and entrepreneurs would get bank loan for establishment of livestock and poultry farms and related industries. This bank would provide both micro-credit at backyard levels and loans for intensive farming with soft terms and conditions keeping relation with Government banking policies. The bank would also provide services for export-import of livestock feeds, equipment and machineries, vaccines, medicines, frozen semen, raw and finished products etc. It would also contribute to employment- creation and poverty alleviation through livestock and poultry farming, processing, preservation/storage and marketing of livestock products.

7.8 Livestock Insurance

It is of greater importance to avail the insurance policy for livestock and poultry to cover the risk of loss of the animals and birds affected by diseases and other calamities. Livestock insurance has yet not been practiced by the farmers in the country as the farmers and even the elite entrepreneurs of the country are not aware about the great loss that might be incurred due to the loss of their animals and birds. Even in case of the farmers and entrepreneurs who are aware of the loss of the animals and birds, they are not very much acquainted with their insurances. Since 1981, Sadharan Bima (General Insurance) Corporation (SBC) introduced this policy. Animals bought with loans from Bangladesh Krishi (Agricultural) Bank should come under SBC's insurance policy.

7.9 Expansion of Research

As research plays a great role in development and improvement, this is equally true in case of livestock development. In a country like Bangladesh where the status of development of livestock and poultry are far behind, there prevails a great scope of research in all related fields like feeding, breeding, management, disease control, processing, marketing etc. So, livestock development would require continuous support from the extension of modern research. Realizing the fact, the Government established BLRI (Bangladesh Livestock Research Institute) in 1984

where research programmes on animal health, animal production, poultry production and socio-economic aspects of livestock development have been being conducted. To expand research activities the Government should separate research programmes establishing Animal Health Research Institute (AHRI), Cattle Research Institute (CRI), Buffalo Research Institute (BRI), Goat Research Institute (GRI) Sheep Research Institute (SRI) and Poultry Research Institute (PRI). Livestock Research Institute at Mohakhali could be intensified through introducing different health research programmes in conjugation with central and field disease diagnosis laboratories. Goat Breeding farms could conduct research on various aspects of goat development in Bangladesh.

7.10 Development of Marketing System of Livestock and Livestock Products

The marketing problems are commonly faced by the farmers and the entrepreneurs in the country. The producers had been being faced problems of both purchasing and selling of livestock inputs and outputs respectively. This is due to defective marketing channel prevailing in the country. This marketing system should be developed to augment livestock production. If the producers remain assured about the selling of their produces at a reasonable rate, the production would remain in continuous positive growth. In many countries marketing co-operative had been established to perform this task. But in Bangladeshi producers had to depend on a good number of middlemen like small traders, traveling traders (farias), distribution traders (paikers), broakers (dalals and aratdars). A good share of selling price was being taken by them. And many of times, the producers had to face loss due to the influence and activities of these middlemen. The backyard farmers who contribute more than 85 percent of total production of the country, sell their products (milk, meat, eggs and live animals and birds) at home or at village markets at a comparatively lower rates. These produces reach the major consumption centres and the ultimate consumers through the intermediaries. The wholesalers, traders and retailers earn profit in course of transfer of produces to the ultimate consumers. An effective marketing system corresponds to high farm gate price and low marketing cost and margin.

Bangladesh Government took initiative to establish a milk producers co-operative and established "Bangladesh Milk Producers Co-operative Union Ltd" (BAMPCUL), which had been taken the responsibility of marketing the milk produced at a large number of milk pocket areas in Bangladesh. This could successfully ensure proper price of the milk in the respective places. Like wise, co-operatives for marketing eggs, chickens, live birds and even other animals could be established with a view to enhance livestock production as a whole

7.11 Budget Allocation

It has been discussed earlier that livestock sub-sector was not given proper attention and hence due care through providing with reasonable public sector allocation for its development. Since the partition of India in 1947, this sub-sector has been marked by utter negligence as it received much less attention of the policy makers than it really desired. It has been stated that this sector received 0.76 percent allocation in Second FYP which was increased to 1.43 percent in Fourth FYP. It could be noticed that this sector experienced a relatively high growth rate during Third FYP period. It's share to GDP was also high (6.5 percent) in the terminal year of that FYP. However, it received the lowest share of resources in the Fifth FYP compared to other sectors of the economy. To organize and implement the gigantic task of livestock development policy, it should get due share of the public sector allocation for overall development. Financing for the improvement of the status of commercial farming the allocation for skill development, education and training, extension of veterinary and production oriented services, credit etc. should also get due attention.

7.12 Inclusion of NGOs in Development

The NGOs have been playing vital role in development activities. A good number of NGOs had been carrying out a large number of livestock development activities in their poverty alleviation programmes. As livestock provides year round employment opportunities, the majority members of the NGOs rear livestock both at semi intensive and intensive farming. In relation to these farming activities, a good number of NGO members had been engaged themselves in processing and marketing of their produces on a co-operative basis. Other than this, the NGOs had been

undertaking efforts to introduce new technologies in livestock development. So, Government should include NGOs in planning and implementation of the programmes.

7.13 Management of Livestock Services

It has been found that there is a great deviation in the management of livestock development activities. In Bangladesh, DLS, is the key body to implement livestock development programmes. The farmers generally raise livestock at small subsistence levels to meet the need of milk, meat, eggs and draft power. They generally consider livestock rearing as a subsidiary profession and hence are less concern about the profitability from farming. They rear animals and birds from their existing facilities of space and feeds. Crop residues from their won agriculture, grazing the animals on fellow lands and road sides; and allowing scavenging the birds in and around the home-stead are the facilities provided to their livestock and poultry. In recent years, DLS has improved its activities through diffusing artificial insemination, fodder development, vaccination, dispensary facilities and to a limited extent, extension activities.

The number of veterinarians are still not sufficient. There are about 663 veterinarians at different levels. Currently, there is one veterinarian for about 1,67,927 livestock heads and 1,18,136 poultry.¹⁹ Training for skill development of the farmers and acquainting them with modern technologies and information are still not in proper execution in a regular basis at the grass-root level. Providing the farmers with input services in feeding, breeding, vaccination, medication, management skill are still lacking.²⁰

7.14 Government Special Policies

Government policy in addition to appropriate budget allocation for livestock sub-sector, has to take necessary steps to ease import of machineries and equipment for dairy and poultry production and processing, to assure quality control, pricing policy both of inputs (feeds, drugs, vaccines etc) and outputs (milk, meat,

¹⁹ GOB, *Development and Activities*, 1998, p. 30.

²⁰ J. Alam, *Livestock Resources in Bangladesh* (Dhaka : University Publication Ltd., 1995), p. 72.

eggs, hides & skins etc) keeping coordination with the proposed Dairy and Poultry Boards, cooperatives and NGOs.

In a nutshell, a coordinated efforts should be undertaken to improve livestock production with a view to increase people's income, more animal protein intake to overcome malnutrition problem, to reduce dependence on import of livestock products and to alleviate poverty of the poor mass as well.

7.15 Conclusion

The views of the farmers and the experts suggest to improve livestock services to augment this prospective sector. The important suggestions are formulating and implementing proper breeding policy for improving genotypic status of all farm animals and birds; enhancing production of feeds and fodder through introduction of extension of and motivation for fodder cultivation, providing subsidy to the farmers, disease control programme, creation of dairy and poultry Boards, skill development programme for both livestock workers and farmers; facilitating soft credit with easy terms and conditions preferably through establishing Livestock Bank; introduction of insurance policy as a safety measure to meet the loss of livestock due to disease outbreak and other incidences; enhancing of research activities, establishment of marketing system, allocation of proper budget, inclusion of NGOs in implementing field programmes.

Chapter 8

SUMMERY, RECOMMENDATIONS AND CONCLUSIONS

8.1 Summery

Bangladesh is one of the poorest countries of the world with per capita annual income of US\$ 389 (in 2002-2003) and a high population density (of more than 900 people per square kilometer area) and inequitable distribution of wealth including agricultural holdings. Agriculture plays an important role in Bangladesh economy with a considerable contribution to the country's economy (which was about 33 percent in early seventies with a continuous decline to about 20 percent at the beginning of the twenty first century). Livestock plays an important role as well as is an integral part of Bangladesh agriculture having a continuous positive growth trend (4.4 percent in 2003-2004) with some exceptions in some specific years in the last three decades (i.e. since independence in 1971). In a country like Bangladesh where considerable GDP originates from agriculture (crops & vegetables, livestock, forestry as well as fishery) majority of the people (more than 70 percent) hold small land ownership below 1.5 acres per household. Livestock (which, in this study also includes poultry) plays an important role in the earning of people's livelihood (though in many a cases contributes subsidiary income engaging women force). This sub-sector contributes more than eighty percent of draft power for crops and vegetables; supplies proteinous food (milk, meat and eggs) as nutrition; provides manure (dung, droppings and others) for crop production and a good portion (about 25 percent) of fuel; provides full time employment for 20 percent and part time employment for 50 percent of country's labour force; earns (through exporting crust & finished leather, bones etc) and saves foreign currency (through lowering import of powder milk and other dairy products) of the country in addition to other contributions. The Department of Livestock Services, (DLS) under the Ministry of Fisheries and Livestock (MOFL) is responsible for implementing livestock development projects and programmes. The department was running its programmes through its infrastructure and manpower since late British regime. Until 1991-92, there was so specific

livestock policy as such. Then, the DLS formulated basic policies and programmes for augmenting its production. To evaluate the impact of the livestock policies and programmes, this study was undertaken. The dissertation contains eight chapters. The first chapter states the introduction, describing the backdrop, objectives, chapter outlines, methodology, justifications etc. The second chapter briefly reviews the programmes of DLS in different five years' plans and their achievements. In all the plans emphasis was put on augmenting production of animal products (milk, meat and egg), draft power, and getting related benefits from domesticated animals and birds through better health care and management practices. In the First FYP (1973-78) the main thrust was on increasing animal production and draft power through better health care services and setting the cooperatives. The TYP, (1978-80) seeks for livestock conservation through health services and genetic up gradation. The Second FYP (1980-87) had the main programmes including genetic up-gradation, ensuring health services through extension, education, training and research. The Third FYP (1985-90) seeks for increasing and improvement of draft power, animal food production, employment generation; through better health services, producing feeds and fodder, genetic improvement, credit programme, manpower development and research. During formulation of Fourth FYP (1990-95), Livestock Development Policy was formulated, which mainly included increasing animal products (milk, meat, eggs, hides and skin), draft power, foreign currency earning, poverty reduction through employment generation and other related development activities. During 1995-97 two years' holidays, the activities were the same as were in the fourth plan. In the fifth plan (1997-2002), the programmes were for feeds and fodder production, health services breeding and up gradation, research, involvement of NGOs, encouraging private sectors, strengthening extension, training and education; input production and employment creating and poverty alleviation. However, all over the plan periods targets were set, programmes were implemented but the achievements were not very satisfactory other than some prospective advancements in poultry sector during nineties.

By analysing the growth trend of this sub sector of agriculture in the third chapter, it showed a positive growth trend with the highest in 2003-2004 (4.4 percent). The sectoral growth at 1984-85 prices was 1.7 percent in 1975-76, but it

was 7.7 percent in 1999-2000. However, these growth rates were different in different fiscal years. It was also as low as -9.9 percent in 1983-84 and as high as almost 9.0 percent in 1993-94. The sectoral share to GDP at 1984-85 prices varied from 2.7 percent to 3.6 percent during the last three decades. The contribution to GDP at current prices was increased from Tk.3040 million in 1975-76 to Tk. 75270 million in 1999-2000. This sub sector contributed about 10 percent in early seventies which increased to near about 17 percent in 2004 to agricultural GDP. On the basis of 1984-85 constant prices, it contributed Tk.10590 million in 1975-76 which increased to Tk.26630 million in 1999-2000. On the basis of 1995-96 prices, its contribution was Tk. 46510 million in 1989-90 and Tk.70010 million in 2003-04 showing the most prospective sub-sector in agriculture.

During measuring the programmes impact at macro-level in the fourth chapter, it showed a positive result in production of animal product; though the achievement could not satisfy the target set in the FYs. But it could show hopeful impact on employment generation and poverty reduction, the growth trend of private level farms, performance of public sector farms (specially poultry farms), production of inputs; government's subsidies and trade policy etc.

In the fifth chapter, programmes' impact at selected micro level farms was shown through studying 120 randomly selected private farms across the six divisions of the country; of which 94 were poultry (02 broiler parents stock, 45 commercial broiler, 25 layers, 11 pullet chick rearing and 11 duck farms), 24 dairy farms, 01 goat, 01 sheep and 06 were different types of mixed farms. Concerning the implications of government's policies and programmes, different types of relationships were analysed statistically to evaluate the impact of livestock policies and programmes. The impacts of the parameters were found, to some extent, positive. Though farmers were facing a good number (22 different types) of problems and expected eight different types of helps, poultry farms were found to be the most profitable. Though higher profit was earned in farms with higher amount of investment, the percentage of higher profit was also found in farms with smaller farm sizes. The dairy farmers were found to earn comparatively low profit but the value of the farms were increased due to increase in price of the animals and the farmland as well.

Among the factors which were found to be responsible for low level of production as discussed in the sixth chapter, low genotype, scarcity and hence higher price of feed, higher disease incidence, absence of stable breeding policy, insufficient technical skill of the farmers, insufficient technical manpower and establishments, absence of proper marketing system, low budget allocation, lower credit facility, lack of insurance policy, insufficient extension activities, improper administrative management, complicated export-import policy, lack of appropriate project planning were important ones.

In the seventh chapter, suggestive measures were stated to overcome those problems, which were responsible for low level of production. The measures were suggested in relation to the respective problems. In addition the suggestions were given for establishment of Bangladesh Livestock Development Council (BLDC), Poultry and Dairy Development Boards, Livestock Bank, and for conducting intensive research activities. By involving the NGOs, the government should undertake massive activities across the country for the development of Livestock sub-sector.

8.2 Recommendations

As the present study covered the impact of livestock policies and programmes on production as a whole, this study could not show the impact of rearing deferent species individually. The prospect and scope of livestock development should be studied in the light of development strategy of the Government.

The scope of export of livestock by products like hides and skin should be extended further. It has also been seen that the quality of hides and skins of Bangladesh is much better than that in many other countries of the world including India and Pakistan. But their quality should be improved further.

Area wise intervention for the prospects of farming of different species should be explored. There prevails various facilities for establishing various types of farms on the basis of the available resources and market demands. Those opportunity should be utilized.

Better administrative set up for smooth operations of different programmes is necessary. As soon as possible, this should be ensured.

As feed is one of the most important impediments for livestock development, its local production should be increased. Side by side its import should be encouraged, if there is any deficit..

As breed is one of the important factors for livestock development, a persistent breeding policy formulation and implementation is necessary and intervention could be made in the light of past experiences of DLS.

To increase production of livestock feeds; fodder and concentrate, the farmers should be motivated and convinced to producing those ingredients. To achieve this, extension programme should be strengthened down to the grass-root levels. Village level clubs and other organizations should be involved. Technology dissemination about cultivation, production, processing and storage of the feed ingredients should be performed through extension and import policy.

Arrangement should be made to get the farmers trained on scientific rearing of livestock, preservation of livestock feed (both concentrate and silage) and main feeding principles.

Import of processing plants should be kept free of all Government taxes or it should be as low as possible.

The VAT on all the raw materials required in processing livestock products should be kept as low as possible.

To ascertain easy bank loan with soft terms and conditions, a separate "Livestock Bank " should be established.

8.3 Conclusion

Livestock sub-sector is very important from the view point of subsidiary income generation for the farmers, producing nutritious and valuable foods,

supplying the source of draft energy, considerable portion of fuel, raw materials for a good number of industries, laboratories and research animals, raw materials for many drugs. Bangladesh possesses a very good environment for raising different species of livestock and poultry. There prevails a scope of providing self-employment facilities for the rural poor through livestock and poultry farming and hence to alleviate poverty. This sub-sector can also help the country to earn a good amount of foreign currency through developing intensive farming and exporting hides and skins. The Government should take necessary steps to reorganize the DLS in an effective manner, involve the NGOs in livestock development projects, establish Dairy and Poultry Development Boards, broaden research and training activities, increase budget allocation for this sub-sector. The importance of this sub-sector in the national economy will remain in future also. The performance of the economy depends, to some extent, on the performance of this sub-sector.

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APPENDICES

Livestock Development Policy, 1992

Ministry of Fisheries and Livestock

Livestock Development Policy of GOB 1992

Livestock has been playing an important role in national economy of Bangladesh. Livestock contributes about 6.5 percent of the Gross Domestic Products (GDP). The cattle and buffalo of the country impart about 98.0 percent of draft power for ploughing in agriculture. If the manure and fuel from dung of the cattle and buffalo used in ploughing, rural transportation and harvesting crops are taken into account, the contribution from livestock will reach to about 15.0 percent of the GDP. According to the Agricultural Census of 1983-84, the number of livestock population in the country was 21.4 million cattle, 0.56 million buffalo, 13.5 million goat, 0.66 million sheep, 73.7 million fowl and 12.6 million duck. The animal proteins e.g. milk; meat and eggs are essential for physical growth and mental development of human being. About 25.0 percent of the country's total requirement of the animal protein comes from livestock. The hides and skins of cattle, buffalo, goat and sheep are valuable export items. The export of hides and skins in 1990-91 quantifying about 107.60 million square feet contributed 7.82 percent of the total export income of the country. In rural areas, a great part of the population, especially the landless poor and marginal farmers, unemployed youth, distressed women earn their livelihood and poultry rearing.

2. Through having a great contribution in the national economy, livestock sub-sector was not given due importance in the past. In the Third Five Years Plan period, only 1.0 percent budget was allocated for this sub-sector. Through there was upward intensity of the production due to the population bloom, the per day consumption of animal protein came down to 1.8 gm from 2.0 gm. Want of sufficient feed and lack of infrastructural facility, institutional weakness, lack of skilled manpower, appropriate research work and technological support are the main constraints of livestock development. The primary cause of non-advancement of livestock sub-sector is the lack of proper efforts and steps to eradicate the barriers. It is essential to formulate livestock development policy through planning, proper development strategy diversified programmes.

3. Objectives of Livestock Development Policy

3.1 To earn self sufficiency in production of milk, meat and egg with a view to increase the supply of protein rich feed within a very limited periods of time.

3.2 To heal alleviation of poverty through motivating the landless, small and marginal farmers, unemployed youths and distressed woman to adopt projects on livestock and poultry farming for additional employment and increased income.

3.3 To augment the supply of animal power for ploughing and harvesting of crops necessary in agriculture and rural transportation.

3.4 To reduce the import of milk and milk products through increasing domestic production.

3.5 To ensure the proper utilization of modern and improved technology for the development of veterinary services, animal feed production, change the genotype of livestock and poultry for overall livestock development.

3.6 To ensure the proper utilization of hides and skins and other inedible parts of animal body as well as the by products and to create the facilities for the development export oriented industries based on these by products.

3.7 To encourage private sector in establishing modern large scale farms with a view to export livestock products like chicken, broiler, chevon etc.

3.8 To encourage setting up of bio-gas plants in rural areas to protect environmental pollution and conservation of forest.

3.9 To ensure the optimum price of the products to the farmers through improvement of marketing facilities.

3.10 To build up a proper institutional structure and develop skilled manpower for improving livestock development.

3.11 To ensure higher yield and proper utilization of land to improve integrated agriculture livestock and fisheries through appropriate technology.

3.12 To undertake practical oriented research projects on the basis of the present socio-economic condition of the community to solve the existing problems, which act as the barriers for livestock Development and ensure eradication of all the barriers through implementing extension work.

4. Field of Application

This policy includes all the institutions, departments, corporations of persons either at government or private levels dealing with production and marketing related of livestock (cattle, buffalo, sheep, goat etc.) and poultry within the territory of Bangladesh. This also includes the production and marketing of milk, milk products and such other goods originated from livestock and poultry.

5. The Implementation Programme of the Livestock Development Policy

To increase the production of milk, meat, egg and other commodities in a coordinated way the planned development policy will be undertaken:

- 5.1 Improvement of livestock and poultry
- 5.2 Production of livestock and poultry feed
- 5.3 Prevention and treatment of livestock and poultry
- 5.4 Education training and research
- 5.5 Investment of capital and credit management.
- 5.6 Marketing management
- 5.7 Institutional development.

5.1 Improvement of Livestock and Poultry

The main objective of livestock development policy will be (a) to augment milk production and to encourage the establishment of dairy industries for processing and storage of milk and milk products, (b) to take appropriate steps for increasing meat production in order to ease availability of meat at local levels, (c) to expand programmes on production of draft power to meet the need for ploughing and rural transportation and (d) to take necessary measurement for creation of more self-employment facilities and increased income in rural areas.

5.1.1 Milk Production

5.1.1.1 Establishment of commercial dairy farms in urban and semi-urban areas; and backyard dairy farming in upazilla and rural areas will be encouraged. The financial and technical assistance for increasing milk production at non-government level will be rendered gradually. Proper training and required credit will be provided to the innovative rural farmers willing to undertake small-scale dairy farming thru establishing cordial relation between Government and non-government institutions.

5.1.1.2 Initiatives for establishing of large scale dairy farms will be undertaken as a joint venture with foreign entrepreneurs thru multinational companies.

5.1.1.3 Dairy farming will be treated as an important sector for which milk production and industries on milk processing will be given proper emphasis.

5.1.1.4 Steps for increasing milk production will be given priority thru improving genotype of the livestock, supplying balanced feed and expanding veterinary facilities identifying the milk shed areas.

5.1.1.5 Import of powdered milk will be reduced in relation to the gradual increase of domestic milk production. Proper steps will be taken to fix more Tax/VAT on imported milk.

5.1.1.6 To discourage the import of power milk, selling of sweets from milk for a particular day will be stopped.

5.1.1.7 The crossing of the selected cows from milk pocket areas and from one hundred upazillas with bulls of pure Friesian or cross of Friesian with Shahiwal will be strengthened. In the same way, local buffaloes will be crossed with bull of Nili, Ravi or Murrah.

5.1.1.8 The poor and landless farmers will be encouraged to produce more milk thru development and distribution dairy goats at lower cost.

5.1.2 Poultry Development

There is a bright future development in contrast to all situation and investing small capital by the poor and landless people under present socio-economic condition. It has been possible to identify small scale poultry farming as profitable and so, the primary objectives of livestock development policy will be to embolden the people to set up small and medium scale poultry farms. In this riverine Bangladesh, as there are a number of rivers, haors, cannel, rivulet, ponds and lakes, programmes on duck and integrated poultry cum fish culture will be undertaken. The participation of the NGOs in implementing the programmes of poultry farms by the rural poor will be enhanced.

Egg Production

5.1.2.1 The programmes for expansion of Government poultry farms will be assumed. New poultry farms will be established simultaneously in districts where there are no poultry farms and steps will be taken accordingly.

5.1.2.2 The rural people will be enthused to high yielding exotic breeds of poultry. For this, provision for distributing day -old and growing chicks among the farmers will be augmented. Programme for setting up modern small poultry units at backyard system at the urban areas will be undertaken.

5.1.2.3 Establishment of large scale poultry farms with high yielding layer stain will be enthused at private levels.

5.1.2.4 The poultry and fish farmers will be encourage to continue integrated poultry cum pisciculture. In the same way, the present chick and ducking distribution, feed supply and vaccination will be expanded thru establishing duck breeding farms in the low lying areas.

5.2 Feed Production

It is essential to ensure the production and supply of animal feed both green forage and concentration for livestock development. In order to meet the demand of food for the country's vast population almost all the arable lands are being used and hence, it is very tough to get land

for pasturing and animal feed production. On the basis of this reality, steps and measures will be taken to make available of feed supply under this policy.

Emphasis will be given to utilize unconventional ingredients, by products from agriculture and industries, and proper utilization of land for integrated agricultural and fodder production using scientific technology will be implemented.

5.2.1 Fodder Production

5.2.1.1 Land scattering all over the country as fellow land will be clearly identified and these land will be conserved through proper management. If necessary, these lands will be transferred to social or cooperative organization or grouped based ownership to ensure proper management.

5.2.1.2 Arrangement will be made to cultivate fodder like napier, para, stylo, centrosoma etc. and trees like ipil-ipil, kanchan etc. whose leaves nutritious, on both the sides of highways, railways, roads, barrage, dams under the management of local NGO, social and cultural organization and cooperative organization. To accomplish this seeds, cutting and plants will be supplied free of cost from Government farms.

5.2.1.3 Transplantation of multipurpose trees (fruit, timber, fuel ect.) and fast growing trees (jackfruit, coconut, mango etc.) in and around homestead, office areas and other institutional campus will be encouraged.

5.2.1.4 Cultivation of maize with simultaneously cultivation of agricultural crops as intercropping will be arranged. Special extension work on cultivation of winter crops like cowpea, maize, oat, berseem will be undertaken intensively

5.2.1.5 With the coordination with Forest Dept. programmes for cultivation of leguminous corps will be implemented.

5.2.1.6 Arrangement for implementing fodder cultivation programme of napier, para, maize, cowpea, oat, berseem etc. on the ridges of the agricultural plots will be made. The employees of the different farms of the Dept. of the Agricultural Extension under the Ministry of Agriculture will be involved for cultivation of napier type fodder as livestock feed.

5.2.1.7 Steps for supplying seedling, cutting, and seed of different fodder will be distributed free of cost among the farmers.

5.2.1.8 Special programmes on fodder cultivation at greater Chittagong, Hill Tracts and coastal areas will be started.

5.2.2 Extension Works will be Strengthen to Popularize the Cultivation of Fodder

5.2.3 Production of Concentrate

5.2.3.1 Establishment of animal feed mills under private initiatives will be enthused.

5.2.3.2 Government support against private initiatives for production of animal feed will be provided. Necessary steps to provided credits with easy terms and conditions will be taken in conversation with Bangladesh Bank.

5.2.3.3 Export of concentration like what barn, rice barn, pulse barn, oil cake, and molasses etc., which are used, as animal feed will be prohibited.

5.2.3.4 In order to arrest the environment pollution by slaughtering the animals where, legal arrangements will be made to slaughter animals through establishing abattoirs in a planned way with the simultaneous processing of inedible parts of the slaughtered bodies to make animal feeds.

5.2.3.5 Initiative will be taken to import oil seeds instead of importing edible oil to meet the demand of oil cake. Action will be taken in this regard through discussing with the Ministries of Agriculture and Commerce.

5.2.3.6 To meet the demand of animal feed, initiatives will be taken to process the unconventional feeds like outer covering of different fruits, molasses, sugarcane tips etc. and use them as animal feed.

5.3 Veterinary Treatment and Prevention of Diseases of Livestock and Poultry

The depth of incidences of different types of diseases has been considered as, a barrier of livestock development in Bangladesh. It is essential to control diseases to earn the higher yield of meat, milk and egg from livestock and poultry. Special emphasis will be given for prevention of diseases with the simultaneously expansion of veterinary facilities under the livestock development policy. All the remaining upazillas of the country will be equipped with infrastructural facilities as integrated extension centre for prevention and treatment of diseases, artificial insemination, fodder production and training. Steps for appointing a mobile veterinarian in each upazilla in addition to the present manpower will be added to ensure the veterinary services at the doorsteps of all the farmers. Required number of additional field assistants will be also recruited to appoint as an additional field assistant at union level. Two honorary livestock contract workers who will be self-employed by skill development will be trained and appointed in each ward.

Arrangement will be made to stop the supply of veterinary drugs free of cost and initiative to set up pharmaceutical industries by private ownership will be encouraged to ease the availability of veterinary drugs will be supplied to the farmers free of cost. All efforts will be given to appoint the trained vaccinators for vaccinating livestock and poultry arrange availability of vaccines and increase skill to produce all required vaccines. As per international rules, there is a

need of one veterinarian for every ten thousand livestock heads to ensure proper veterinary care. It is not possible to appoint such a huge number of veterinarians by the Government. Contiguous private initiatives, in addition to public arrangement, in livestock development and veterinary services will be encouraged. In this regard, loan arrangement will be provided in simple terms and conditions. Special programmes e.g. to increase milk production, arrangement for certain of self-employment facilities through livestock development, prevention of diseases, etc. will be formulated to implement livestock development policy. In this regard, graduates in Veterinary Science and Animal Husbandry will be involved providing with optimum loan in simple terms and conditions to facilitate self-employment projects.

5.4 Appropriate Education, Training and Research in Livestock

The needs of proper education, training and research for livestock development are inevitable in the country. Steps will be taken to increase the scope of education under the livestock development policy. Training of the employees and farmers will be made appropriate and stronger. Research activities will be extended and intensified in order to create and apply of appropriate technology for uplifting the quality and development breeds of livestock and poultry.

5.4.1 Education

5.4.1.1 At the preliminary stages, arrangements for the fundamental education in Animal Husbandry and Veterinary Science will be provided.

5.4.1.2 Action will be taken to integrate the present two different degrees in Animal Husbandry and Veterinary Science for providing a combined degree through discussion with the Ministries of Agriculture, Fisheries and Livestock; and Bangladesh Agricultural University.

5.4.1.3 Measures to expand the Animal Husbandry and Veterinary Education for the general mass will be taken and broadcasting will be made in radio television and newspapers.

5.4.1.4 To create public awareness about the usefulness of the unconventional animal feed for producing milk and meat; nutritional value of these animal production, the economic importance of rearing livestock and poultry; and different diseases and their prevention, extension work will be expanded.

5.4.2 Training

5.4.2.1 The syllabus curricula of officer Training Institute and Veterinary/livestock Training Institutes will be changed as per the modern technological development, practical and feasibility in rural areas.

5.4.2.2 To make the manpower, already engaged in livestock development activities more skill in performing their services both at office and in extension work, in service training will be strengthened.

5.4.2.3 To make the backyard livestock development activities (vaccination, primary treatment, dowering, rearing of yielding breeds of livestock and poultry, fodder cultivation etc.) fruitful \ ward wise livestock workers will be developed, through special training.

5.4.2.4 Measures for providing special training for the innovative farmers and unemployed youths in each upazilla for rearing high yielding livestock and poultry and monitoring services will be continued.

5.4.3 Research

5.4.3.1 Intensive research work will be carried out on the most important issues which will be identified on priority basis for livestock development.

5.4.3.2 Tremendous research work for augmenting the productivity of local Black Bengal goat and use of local unconventional feed ingredients to use, as livestock feed will be undertaken.

5.4.3.3 With a view to ease and intensify the transfer of technologies from research laboratories for field application, research extension connections will be strengthened.

5.4.3.4 Due emphasis will be given to the necessary of proper coordination, continuous supervision and monitoring of different research and development programmes.

5.5 Investment of Capital and Credit Management

On the basis of the present socio-economic condition of the country, the development programmes of livestock and poultry, development is primarily rural oriented. Naturally due to lack of proper institutional, capital and credit facilities, the livestock development programmes are being interfered. So, the necessary for monetary investment is readily felt. The institutional credit support is essential for augmenting the income and creation of self-employment facilities of, especially of the landless, small and marginal farmers. The following measures will be taken to introduce the appropriate capital investment for livestock development.

5.5.1 To establish livestock and poultry farms under backyard system, easy credit programme and distribution system will be introduced. This credit programme will be implemented with other livestock development programme in coordination with a reputed NGO or a crated organization.

5.5.2 The capital investment and credit management for establishing livestock and poultry farms at non-government level will be implemented with the help of Industrial Finance Corporation or commercial banks.

5.5.3 In context to the rural poverty, only the livestock and poultry stock of the landless and marginal farmers will be treated as mortgage in case of the poor farmers; and moveable and immovable property in case of middle class farmers.

5.5.4 The technical parameters for repayment of loans by the landless, marginal, small and middle class farmers will be made in such a way that they will be able to start repayment after the starting of production the farm.

5.5.5 Arrangement for loans on simple terms and conditions will be made available for livestock, poultry and pisciculture farming. The conditions and amount of loans will be determined by the joint efforts of Finance Division and Bangladesh Bank.

5.6 Insurance Policy

5.6.1 All innovative farmers will be encouraged to undertake insurance policy for their livestock and poultry.

5.6.2 In case of farming at rural areas under new institutional loans, the insurance policy should be made easier to repay the instalments.

5.7 Establishment of Livestock Bank

5.7.1 In the light of the experience of Thailand, a livestock Bank will be establish. To implement this objective, initially four banks will be established in four divisions.

5.7.2 Bank will distribute loan in kinds. The conditions of distributing loans in kinds will be decided by the bank concurrence of Government.

5.7.3 Banking for establishing goat farms (Goat bang) will be somewhat different from that of livestock Bank. Each distressed family will be provided with 1 to 2 she – goat with condition that the loanee will return two 8 - month doe kids within first 2 years. By this way the loanee will earn the ownership of the goat and the two female kids will be given other two poor families.

5.8 Marketing System

As production is directly related to marketing, to create a proper and appropriate marketing system for milk, milk products, meat and eggs, import and export of ingredients

related to production and produced goats will be controlled; and initiatives of private sectors will be encouraged.

5.9 Institutional Development

5.9.1 Organization Development of the Department of Livestock Services

On the basis of the role of the Department of livestock Services and prospective contribution in the future in the national economy, the present structure of the DLS will be changed and expanded conveniently.

5.9.2 Bangladesh Livestock Development Council

To make this Government initiative success, the Honourable Minister of the Ministry of Fisheries and Livestock will act as the ex-officio Head of this council, Government can any number in this council who, government thinks, are able to contribute in livestock development.

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Annex-2

Beef and veal production in Bangladesh compared to other countries of the world (Kg/animal).

Country	1979-81	1988	1989	1990
World	198	211	211	212
Asia	115	123	124	123
Bangladesh	50	60	61	62
China	75	105	107	109
India	80	80	80	80
Indonesia	182	216	235	240
Japan	337	390	691	694
Jordan	90	90	90	90
Korea DP RP	150	150	150	150
Korea REP	194	164	219	220
Pakistan	123	152	158	158
Philippines	146	139	161	165
Thailand	200	200	200	200
U.K	260	281	284	284
Denmark	224	244	250	247
USA	271	287	293	297
New Zealand	163	181	174	178
Australia	176	196	206	232

Source : Compiled from FAO production yearbook, 1990.

SURVEY QUESTIONNAIRE
IMPACT OF LIVESTOCK POLICIES AND PROGRAMMES ON LIVESTOCK DEVELOPMENT
Post graduate Research Project

Institute of Bangladesh Studies, University of Rajshahi

Farmers /Entrepreneurs having farming activities on livestock and poultry for not less than five years will fill-up the questionnaire. The farmers should put tick(s) (✓) in the appropriate box (es) as and when needed.

1. Name of the framer/ entrepreneur:

Father's Name:

Address:

Village:

Union:

District:

P.O:

Thana:

Educational Qualification:

Age:

Main Profession:

Name of the Farm:

Address of the Farm:

Village:

Union:

District:

Thana:

2. Family Information:

(a) Family members: Male: Female: Total:

(b) Other details

Name of the members	Age	Qualification	Main Profession		Additional Profession	
			Livestock farm	Agri	Busines	service

3. Information of starting Livestock Farming:

(a) Parental profession of the farmer / farm owner:

(b) How the Farm become motivated to start livestock farming:

(c) Whether the farmer is aware about the livestock policies, strategies and programmes of the Government:

Yes:

No:

If Yes, what he knows about the livestock Development programmes and policies:

(i) (ii)

(ii) (iv)

(v) (vi)

(d). Whether the farmer uses Artificial Insemination for his livestock.

Yes

No

if yes, the starting year

(e). Why he takes Artificial Insemination.

(f). What are the feed ingredients the farmer uses in his farm:

(i). In case of Ruminants.....

(ii). In case of Poultry.....

(g). Whether the farmer uses unconventional feed: Yes No

If yes, what are those;

Urea Urea molasses block Bone meal Meat meal

Tankage Fishmeal Oyster shell meal Ipil-ipil

Seed cakes from indigenous trees Cultivated fodder Others.....

(e). Employment Position; Full time:

Parttime:

(f). Yearly Net Income of the farmer.

Source	Quantity	Net Income (in 00,000 Tk.)					
Milk (Liters)							
Egg (Number)							
Meat Broiler (Kg)							
Meat Beef (Kg)							
Meat Other (Kg)							
Others							

(g). In Bank loan is taken:

Amount (Tk.)	Date	Percent of total Investment

5. Present obstacles that are prevailing the farmers thinks/ faces:

- (i) (ii)
- (iii) (iv)
- (v) (vi)

6. The facilities to be proved by the Govt. as the farmer seeks:

- (i) (ii)
- (iii) (iv)

7. The recommendation the farmer likes to keep for livestock developing:

.....

 Name of the farmer/ farm owner with signature
 Date:

Annex-4

Goat meat production in Bangladesh compared to other countries of the world (Kg/goat)

1979-81	1988	1989	1990	Country
11	11	12	12	World
11	11	12	12	Asia
10	10	10	10	Bangladesh
10	10	10	10	India
10	14	15	15	Pakistan
25	25	25	25	Oman
14	14	14	14	Qatar
13	15	15	14	Saudi Arabia
17	17	20	22	Syria
16	16	16	16	UAE

Source : Complied from FAO production yearbook, 1990.

Annex-5

Anova: Single Factor - Education Vs Investment.

Groups	Count	Sum	Average	Variance
Column1	12	3700	308.3333	42133.33
Column2	48	18723.5	390.0729	195586.1
Column3	35	10499	299.9714	34729.5
Column4	25	12884	515.36	1103462

ANOVA:

Source of Variation	SS	df	MS	F	P-value	F crit
Between G	748366.5	3	249555.5	0.775373	0.510039	2.68281
Within' Gro	37319916	116	321723.4			
Total	38068283	119				

Annex-6

Anova: Single Factor - Types of Farming & Profit.

Groups	Count	Sum	Average	Variance
Column1	17	413.75	24.33824	19.145119
Column2	45	1102.05	24.49	18.69848
Column3	27	697.47	25.83222	24.495223
Column4	11	276.09	25.09909	2.942969
Column5	11	272.58	24.78	6.66498
Column6	1	33.6	33.6	#DIV/0!
Column7	1	36	36	#DIV/0!
Column8	7	156.81	22.83	38.80283

ANOVA:

Source of Variation	SS	df	MS	F	P-value	F crit
Between G	256.7886	7	37.9698	2.030055	.057327	2.092381
Within' Gro	2094.829	112	18.70383			
Total	2360.617	119				

Annex-7

Anova: Single Factor -- Investment Vs Profit Percent.

Groups	Count	Sum	Average	Variance
Column1	45	1074.17	24.98	48.39032
Column2	28	700.98	25.04	10.87081
Column3	25	627.83	25.11	8.896139
Column4	20	433.16	21.66	13.98189
Column5	4	41.95	10.49	2.520625

ANOVA:

Source of Variation	SS	df	MS	F	P-value	F crit
Between G	942.3502	4	235.5875	9.632466	9.385-07	2.45057
Within' Gro	28112.632	115	24.45766			
Total	3754.981	119				

Annex-8

Anova: Single Factor -- Bank Loan vs Profit Percent.

Groups	Count	Sum	Average	Variance
Column1	102	2677.9	26.25392	34.50944
Column2	18	499.76	27.76444	164.6645

ANOVA:

Source of Variation	SS	df	MS	F	P-value	F crit
Between G	34.90969	1	34.909669	0.655451	0.4198	3.921485
Within' Gro	6284.751	118	53.2606			
Total	6319.661	119				

Annex-9

Anova: Single Factor -- Education Vs Types of farms.

Summary

Groups	Count	Sum	Average	Variance
Column 1	24	7372	307.17	79769.19
Column 2	2	1608	80.40	8089.92
Column 3	6	1036	115.11	23470.86
Column 4	11	2720	247.27	10341.82
Column 5	44	15531	352.98	125117.1
Column 6	23	6515	283.26	40221.84

ANOVA:

Source of Variation	SS	df	MS	F	P-value	F crit
Between G	563025.5	5	112605.1	1.434565	0.217762	2.299231
Within' Gro	839882	107	78494.22			
Total	8961907	112				

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