GOVERNMENT OF MEGHALAYA
DIRECTORATE OF ANIMAL HUSBANDRY & VETERINARY::SHILLONG

No.MVD/DEV-24/CSS/2018/12 **Dated Shillong the 31st January 2018**

From: Dr B.Rijal
Director AH & Veterinary
Meghalaya,Shillong

To: The Commissioner & Secretary to the Government of Meghalaya
Animal Husbandry & Veterinary Department.

Sub: **Meghalaya Bovine Breeding Policy 2018- approval reg.**

Sir,

In inviting to the subject mentioned above, and in pursuant to the direction of the Government of India relating with framing of separate breeding policy for Bovine etc, the Technical Committee under the Chairmanship of Dr D.Das,Former Dean, Faculty of Veterinary Science(AAU),Assam etc, has prepared the **Bovine Breeding Policy 2018** for the State after exhaustive study, survey, consultation and discussion with all stake holders.

In the above connection, I have the honour to submit herewith the draft ***Meghalaya Bovine Breeding Policy 2018*** which will require examination and approval by the Government of India.

Enclosed: soft & hard copy

Yours faithfully

(Dr B.Rijal)
Director AH & Veterinary
Meghalaya,Shillong

Memo No.MVD/DEV-24/CSS/2018/12(A) **Dated Shillong the 31st January 2018**

Copy to:

1. P.A to Dr S.S.Honnappagol, Animal Husbandry Commissioner, Ministry of Agriculture & Farmer's Welfare, Department of A.H,Dairying & Fisheries, Krishi Bhavan, New Delhi [email: ahc-dadf@nic.in].
2. Dr B.Tyagi, Assistant Commissioner, Ministry of Agriculture & Farmer's Welfare, Department of A.H,Dairying & Fisheries, Krishi Bhavan, New Delhi. Advance copy is provided for favour of kind information and necessary action[email: bhusantyagi@yahoo.com].
3. Dr D.Das, Chairman-Technical Committee,Meghalaya Bovine Breeding Policy,Guwahati[email: drdasd@rediffmail.com]
4. All Member of Technical Committee.

Director AH & Veterinary
Meghalaya,Shillong

MEGHALAYA BOVINE BREEDING POLICY 2018

Department of Animal Husbandry and Veterinary
Meghalaya

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MEGHALAYA BOVINE BREEDING POLICY 2018

Prepared by the Technical Committee constituted by the Govt. of Meghalaya

Department of Animal Husbandry and Veterinary

Shillong, Meghalaya

Under the Chairmanship of

Prof. (Dr.) Dharmeswar Das

Ex- Director (Actg) and Jt. Director

Indian Veterinary Research Institute, Izatnagar-243122, U.P.

Former Dean, Faculty of Veterinary Science, Assam Agricultural University

Ex-Director, Deptt. of Animal Resources Development, Government of Tripura

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MEGHALAYA BOVINE BREEDING POLICY 2018

Expert Committee constituted by Government of Meghalaya

1. Prof. Dr. Dharmeswar Das -Chairman
   Former Dean-cum-Joint Director (Academic)
   ICAR-Indian Veterinary Research Institute Deemed University,
   Former Dean, Faculty of Veterinary Science, A.A.U, Khanapara,
   Former Director, Deptt. of Animal Resources Development, Tripura.
   Now Chairman, ICAR-NRCM, Nagaland
   Member, Research Advisory Committee, ICAR-IVRI DU.

2. Director of A.H & Veterinary Department, -Member
   Meghalaya, Shillong

3. Joint Director (AHP) -Member
   A.H & Veterinary Department, Meghalaya, Shillong

4. Joint Director (Admn) -Member
   A.H & Veterinary Department, Meghalaya, Shillong

5. Deputy Director (Admn) -Member
   A.H & Veterinary Department, Meghalaya, Shillong

6. Deputy Director (Planning) - Member Convener
   A.H & Veterinary Department, Meghalaya, Shillong

CERTIFICATE

The Govt. of Meghalaya, Shillong constituted a Technical Committee (Annexure – I and II) under the Chairmanship of Dr. Dharmeswar Das, the then Dean-cum-Joint Director (Academic) IVRI-Izatnagar, Bareilly, U.P. and former Dean, Faculty of Veterinary Science, Assam Agricultural University with the following members to formulate the Livestock and Poultry breeding policy for the State of Meghalaya :

1.	Dr. Dharmeswar Das Dean-cum-Joint Director (Academic) IVRI-Izatnagar, Bareilly, U.P.	-	Chairman
2.	Director of A.H & Veterinary Department, Meghalaya, Shillong	-	Member
3.	Joint Director (AHP) A.H & Veterinary Department, Meghalaya, Shillong	-	Member
4.	Joint Director (Admn) A.H & Veterinary Department, Meghalaya, Shillong	-	Member
5.	Deputy Director (Admn) A.H & Veterinary Department, Meghalaya, Shillong	-	Member
6.	Deputy Director (Planning) A.H & Veterinary Department, Meghalaya, Shillong	-	Member Convener

The Expert Committee accordingly framed the Bovine (Cattle and Buffalo) Breeding Policy, 2018 for the state of Meghalaya and submitted the same to the Govt. of Meghalaya through the Director of the A.H. & Veterinary Department for acceptance and implementation. The breeding policy being a dynamic and continuous process for improvement of productivity of livestock to make the state self-sufficient in food of animal origin the Govt. of Meghalaya desired to update the policy for Bovine breeding and formulate the same looking into the changing scenario and production demand of the state. The committee after thorough review, deliberation and consultation with all concerned framed the present Bovine breeding policy 2018 for the state of Meghalaya as enclosed.

Dr. B.Rijal
Director, A.H & Vety. Deptt., Member

Dr.K.Kharmihpen
Joint Director (AHP), Member

Dr.B.K.Mawthoh
Joint Director (Administration), Member

Dr(Mrs)G.Kynwir
Deputy Director (Administration), Member

Dr.C.Shilla
Deputy Director (Planning),
Member-Convener

Dr D.Das
Chairman-Technical Committee

PREFACE

Meghalaya, a north eastern state of India with its congenial topographical and geo-climatic characteristics and rich domesticated animal biodiversity and varied bio-resources has immense economic potentials for animal husbandry activities and livestock farming along with dairy, poultry, meat and allied agro based industry. In Meghalaya, there is big demand for animal products and these products are the major source of proteins of higher biological value. The state has also the export potential for these products after meeting the domestic requirements. However, the gross output of animal products like milk and its various products is disproportionate to the available population of cattle and buffaloes due to the low genetic potential of the indigenous animals so far productivity is concerned. Disorganized breeding, inadequate feed and fodder supply, incidence of diseases, lack of efficient and scientific management of the resources and lack of application of newer and advanced technologies for augmentation of productivity and production, inadequate adoption of processing technologies, and unorganized marketing are some of the important factors relating to lower production and supply of animal products. A Livestock breeding policy was formulated in 2012 with the mission and target to increase productivity of livestock and conservation of indigenous animal genetic resources besides provision of sustainable livelihood to the rural mass and economic upliftment of farming families as a whole to derive maximum benefit out of the proposed policies.

The Government of Meghalaya, Department of Animal Husbandry and Veterinary constituted a Technical Committee under the Chairmanship of the undersigned vide Order No. VET(SCH)206/2000/222 Dated Shillong, the 15th April, 2008 and continued further vide Notification No. VET(SCH)206/2000/277 Dated Shillong, the 6th November 2008 in order to formulate the Livestock Breeding policy encompassing all the important livestock species and poultry for the State of Meghalaya. The Committee accordingly framed the Livestock and Poultry Breeding Policies 2012 and submitted the same to the Govt. of Meghalaya through the Director of the A.H. & Veterinary Department on 31st October, 2012 for implementation.

The breeding policies being a dynamic and continuous process for improvement of productivity of livestock to make the state self-sufficient in food of animal origin, the Govt. of

Meghalaya desired to update the policies for Bovine breeding and formulate the same looking into the changing scenario and production demand of the state. The committee after thorough review in its several meetings and deliberation and consultation with all concerned in different occasion framed the present **Bovine Breeding Policy,2018** for the state of Meghalaya. The required updated information and data were also provided by the concerned officers of the Directorate, and field veterinary officers. The Director and all senior level officers of the Directorate and other establishments of the state contributed immensely in framing the policy and preparation of the document. Contributions and assistance received from all are duly acknowledged with thanks.

The final draft of the present policy document was prepared and discussed in the Technical committee meeting at the office of the Director, A.H. and Veterinary Department, Meghalaya, Shillong. After incorporation of all aspects, the final policy document is submitted for consideration of the Government of Meghalaya for approval and implementation.

It is expected that implementation of the new Bovine (Cattle and Buffalo) breeding policy 2018 would lead the state of Meghalaya to become not only self sufficient in production of food of animal origin and other animal byproducts for domestic consumption but also for export of these products to boost the economy of the farming community and development of the livestock industry in the state. The policy would also contribute towards increase in growth of GDP and development of the State.

Dr. Dharmeswar Das

Dated, January, 2018. **Chairman, Technical Committee**

ACKNOWLEDGEMENT

The Technical Committee profusely thank and extend its gratefulness to the Government of Meghalaya in general and the Commissioner and Secretary, Animal Husbandry and Veterinary Department in particular for assigning the responsibility to frame the Bovine (Cattle and Buffalo) Breeding Policy, 2018 for the state of Meghalaya. I on behalf of the committee and my personal behalf thank Mr.P.Sampath Kumar,I.A.S, Commissioner & Secretary for his constant support and cooperation in this endeavor to bring out the policy. The keen interest taken by the former Principal Secretary Mr.P.Naik,I.A.S and his support in initiating formulation of a Livestock Breeding policy for Meghalaya which was shaped in 2012 is also duly acknowledged.

I sincerely thank Dr. B.Rijal, Director, Department of Animal Husbandry and Veterinary, Govt. of Meghalaya and also a member of the committee for his valuable inputs, support and cooperation without which it would not have been possible to carry out this huge task for the state and finally producing this policy document.

I place it on record my sincere thanks to all other members of the Committee namely Dr.K.Kharmihpen,Joint Director (AHP), Dr.B.K.Mawthoh, Joint Director (Administration), Dr(Mrs)G.Kynwir,Deputy Director (Administration), and Dr.C.Shilla, Deputy Director (Planning) and Member-Convener for their untiring help who had deliberated on the drafts prepared from time to time in various meetings/discussions. The contributions made by Dr. K.B.Sahkhar, Deputy Director(AHP) of the Department and his association with the committee all the time in providing the inputs and completing the job are thankfully acknowledged. The help and assistance of all other field functionaries and officers of the Department of Animal Husbandry and Veterinary of the state Government including Shri S.Kurbah, Joint Director(Stat) was immense to prepare the policy based on the present status and future need of the state.

The committee wishes to thank former Directors Dr. D. Khonglah , Dr. L. Lyngwa, Dr J.S.Jyrwa and Dr(Mrs)W.Papang for their contributions and support since initiation of the process of developing and framing of the policy. The cooperation and assistance received from Dr. E. Bareh, Ex-Joint Director (Planning) was immensely helpful in the endeavor which is thankfully acknowledged.

The committee acknowledges with thanks all the officers and staff of the Department of Animal Husbandry and Veterinary, Meghalaya and special invitees for the their help received in compilation of data and information to a great extent in preparing the policy document.

Dr. Dharmeswar Das

Dated, January, 2018 Chairman, Technical Committee

MEGHALAYA BOVINE BREEDING POLICY, 2018

EXECUTIVE SUMMARY

In Meghalaya, out of the total livestock population of 19.95lakhs, bovine population is 9.32 lakhs comprising of 9.06 lakhs cattle and 0.25 lakhs buffaloes (Livestock census Report, 2012). The milk production in 2016-17 was 84,195 tonnes out of which 57.92 percent have been produced by crossbred cattle. The per capita availability of milk in Meghalaya is 77.00g per person per day only which is far below the national average and the Indian Council of Medical Research recommended requirement of 300g per day per person. It is expected that the demand for milk and milk product will be higher on account of changing food habits and increased purchasing power of the people. The gross output of milk production is disproportionate to the available population of bovines (Cattle and Buffalo) due to their low genetic potentiality, disorganized breeding, inadequate feed and fodder supply, incidence of diseases, lack of efficient and scientific management of the resources, lack of application of newer advanced technologies for augmentation of production, processing technologies, marketing etc.

In order to produce the required quantities of milk, proportionate increase in the number of milch cattle and buffaloes are to be made besides enhancement of their genetic potentiality for increased productivity in terms of quantity and quality. Various studies conducted on livestock breed improvement in Meghalaya and in neighboring states reported that the cattle currently available in the state are the result of haphazard breeding within and between various breeds within the species. Although cattle breeds such as Jersey, Holstein Friesian, Brown Swiss etc. have been introduced in the state their breeding programmes are devoid of any sound strategies and targeted direction. In order to address the issue of development of suitable and improved cattle and buffalo breeds and various cross breeds adaptable to the production systems of the state, framing of appropriate Bovine Breeding Policy is required for implementation aiming at augmenting genetic merit of the existing livestock population to provide economic sustainability of cattle and buffalo husbandry thereby increasing contribution to GDP growth of the state.

Bovine Breeding Policy:

The native cattle population of Meghalaya consists of indigenous non-descript animals and productivity of these cattle are negligible when compared to the exotic and Indian cattle breeds. The average milk yield of indigenous cattle of the State in a lactation length of about 180 - 260 days is found to be only 327 ml per day. Therefore the productivity enhancement of cattle for milk is envisaged by improving the genetic potential of the animals, improving the overall management system, identifying the field problems in the sector and taking corrective measures and by expanding the processing and marketing facilities for milk and milk products throughout the State.

Cross breeding of indigenous/nondescript cattle using bulls of improved Indian and exotic breed is recommended as a major strategy to increase in productivity of milk in cattle herds of elite, large commercial and Government farms and in field where resources to maintain the crossbreds are gradually being made available. Policy is also formulated for adoption of zone/location specific strategies like selective breeding/grading up/crossbreeding of indigenous cattle using Indian breeds like Red Sindhi and Sahiwal and exotic breeds viz, Jersey and Holstein Friesian, prioritized on the basis of climatic conditions, feed and fodder availability, livestock management practices, marketing facilities for livestock produce etc. Level of exotic breed inheritance in crossbreds has been recommended as 50 percent although it may go up in systematic manner in elite and field herds based on the production system followed with required inputs of feed, fodder and management practices. Grading up of nondescript cattle using semen from Indian breeds of cattle has also been recommended in the policy. Nucleus herds and lines of Indian cattle breeds of choice viz, Red Sindhi and Sahiwal and exotic and crossbreds of Jersey and HF will be maintained in Government cattle breeding farms and in progressive private farms.

Selective breeding for conservation and improvement of indigenous cattle of Meghalaya for their good quality type, milk quality characteristics, draught power and disease resistance recommended. Adoption of large scale Artificial insemination all over the state recommended using frozen semen from proven bulls of different exotic and Indian breeds by developing semen stations in the state. Frozen semen of Indian and exotic breeds may be procured from outstanding proven bulls form Grade A semen stations for breeding from within and/or outside the country. MOET (Multiple ovulation and Embryo Transfer) technology will be one area of special focus along with Open Nucleus Breeding (ONBS) in the state to modernize the cattle development programmes for maximum output. Emphasis has been given for data and information recording

systems using modern technologies in farms and field for selection of good quality animals for future breeding, monitoring and evaluation of the progress of the programmes besides traceability of the animals.

Grading up of the indigenous/nondescript buffaloes of Meghalaya recommended using Murrah bulls using Artificial insemination technique besides developing pure herds of Murrah breed in the state.

Conclusion:

The Bovine (Cattle and Buffalo) Breeding Policy 2018 formulated for the state of Meghalaya once implemented will raise productivity of bovine populations and contribute towards sustainable animal husbandry practice of the farmers and raise income generation and assured livelihood of the people including farmers, youths and women of the state. Besides recommending Bovine breeding policy along with strategies for their genetic improvement, some important recommendations have also been made for development of work plans as per need for fruitful implementation of the policy. Implementation of the policy would improve the livestock production system with better adaptability of the genetically improved animals under changing climatic condition and management needs. It is also expected that once implemented the policy will gradually minimize the gap between production and demand of milk and other products in the state and ultimately lead the state towards self-sufficiency. The progammes developed as per the policy recommendations will be supported by appropriate production system ensuring optimum and economic feeding and management of the animals, adequate health care and disease control, adequate post-harvest processing and value addition for the products and assured and organized market for sustainable livelihood generation and economic upliftment through livestock farming. The policy once implemented will raise production and contribute towards sustainable animal husbandry practices, enhance rural livelihood, industrialize the dairy sectors thereby enhancing Gross Domestic Product (GDP) growth of the state of Meghalaya.

MEGHALAYA BOVINE BREEDING POLICY, 2018

Chapter – 1

INTRODUCTION

Increase in productivity of the livestock and production as a whole are the primary concern for sustainable animal husbandry development in the state of Meghalaya. Depending upon the capability and resources available with the farmers they practice livestock farming using different production systems. Farmers' economic returns largely depend upon the quality of livestock they raise under any given production system. The tribal population of the State is traditionally dependent on livestock for livelihood where there is no taboo in consumption of animal products and food habits of the people is mostly non-vegetarian in nature. Although Meghalaya is rich in domesticated animal biodiversity indicating immense potentiality of livestock development but due to lack of suitable and dynamic breeding policy as per need of the time the growth is slow particularly in dairy sector. Hence, appropriate breeding strategies need to be followed for production of genetically superior offspring with higher productivity.

In Meghalaya, out of the total livestock population of 19.95lakhs, bovine population is 9.32 lakhs comprising of 9.06 lakhs cattle and 0.25 lakhs buffaloes (Livestock census Report, 2012). The milk production in 2015-16 was 83,924 tonnes out of which 59.07 percent has been produced by crossbred cattle. The per capita availability of milk in Meghalaya is 77g per person per day only. The gross output of milk production is disproportionate to the available population of livestock due to low genetic potential and productivity of the indigenous cattle and buffaloes, disorganized breeding programmes, inadequate feed and fodder supply, incidence of diseases, lack of efficient and scientific management of the resources, lack of application of newer advanced technologies for augmentation of productivity and production, processing technologies, marketing etc.

In order to produce the required quantities of milk, proportionate increase in the number of milch cattle are to be made besides enhancement of their genetic potentiality to produce more in terms of quantity and quality. Various studies conducted on livestock breed improvement in Meghalaya and in neighboring states reported that the cattle currently available in the state are the result of haphazard breeding within and between various breeds. Although cattle breeds such as Jersey, Holstein Friesian, Brown Swiss etc. were introduced in the state their breeding programmes are devoid of a targeted direction in the state of Meghalaya. In order to address the

issue of development of suitable cattle and buffalo breeds/cross breeds adapted to the farming and production systems of the state, framing of appropriate breeding policies are required for implementation aiming at improving genetic merits of the existing bovine (cattle and buffalo)population of the state to provide economic sustainability of the farmers' through cattle husbandry.

1.1: Jurisdiction: The policy formulated shall be called the "**Meghalaya Bovine Breeding Policy, 2018"** which shall become effective from the date of its notification made by the Government of Meghalaya and will be followed all over the state.

1.2: Definitions:

- **Breed:**A breed is a specific group of domestic animals having homogeneous appearance (phenotype) and behavior, and/or other characteristics that distinguish it from other organisms of the same species. Breeds are formed through genetic isolation and either natural adaptation to the environment or selective breeding, or a combination of both.
- **Animal Breeding:** Animal Breeding means mating of animals and production of offspring.Animal breeding addresses the evaluation of the genetic value (Estimated Breeding value, EBV) of animals, their selection with superior EBV in growth rate, egg, meat, milk, or wool production, or with other desirable traits and planned mating of the selected animals for improved productivity and adaptability.
- **Extensive Production system:** Farming system which is, considered as low input-low output system. This is a traditional system where mostly the indigenous animals are reared without providing any significant inputs in the form of feed or improved management requirements thereby depending only on naturally available resources like grazing in forest areas, grazing reserve etc.
- **Intensive Production system:** Farming system which is also considered as the high input high out production system where modern and improved technologies are adopted. With the result the out-put i.e. production and productivity is also high.
- **Semi-intensive Production system:** Farming system which is considered as a medium input medium output system depending upon the adoption of improved technologies for feeding, management, breeding etc.

1.3: PROFILE OF MEGHALAYA STATE

Meghalaya literally means "*Abode of Clouds*". It describes the phenomenon of bringing torrents of rain to this Hill State of North Eastern Region of India. The State is located in the North-Eastern part of India lying between the latitude of 25˚ 47″ and 26˚ 10″North, 89˚ 45″ East and 92˚ 47″ East longitude. The State is bounded on the North and East by Assam and on the South and West by Bangladesh. Physio-geographically, the State is divided into three hills sections - (a) Western Meghalaya or Garo Hills, (b) Central Meghalaya or Khasi Hills and (c) Eastern Meghalaya or Jaintia Hills. The total area of the State is about 22,429 sqkm. The topographical and geo-climatic characteristics endow the State with immense economic potentials particularly hydro-power generation, tourism, horticulture, forest based industry and vast animal resources.There are seven districts in Meghalaya. The number of villages in each district are East Khasi Hills – 998, West Khasi Hills – 1093, Ri-Bhoi District – 579, Jaintia Hills – 498, East Garo Hills – 1058, West Garo Hills – 1577 and South Garo Hills – 731.

1.3.1: Human Population:

The total human population of the State is about 29.67 lakhs as per 2011 census report, out of which 23.71 lakhs live in rural areas of the State with agrarian and animal husbandry activities to earn their livelihood. Meghalaya is inhabited by mainly three tribes: the Khasis, the Jaintias and the Garos. The overall literacy rate in Meghalaya is 74.43 percent.

The human population distributions in seven different districts of the State are depicted in Table – 1.

TABLE – 1: HUMAN POPULATION CENSUS, 2011

Sl No	District	Male	Female	TOTAL	Urban Population	Rural Population
1	East Khasi Hills	410749	415173	825922	366481	459441
2	RiBhoi	132531	126309	258840	25253	233587
3	West Khasi Hills	193715	189746	383461	43105	340356
4	Jaintia Hills	196285	198839	395124	28430	366694
5	East Garo Hills	161223	156694	317917	44192	273725
6	West Garo Hills	324159	319132	643291	74858	568433
7	South Garo Hills	73170	69164	142334	13131	129203
	STATE (overall)	**1491832**	**1475057**	**2966889**	**595450**	**2371439**

Source: *Directorate of Economics and Statistics*, Meghalaya 2014

The Estimated population Density in the State of Meghalaya has gradually increased from 132 per sqkm in 2011 with the annual increase as 136 per sq.km in 2012, 139 in 2013, 142 in 2014, 146 in 2015, 149 in 2016 and 153sqkm in 2017.

TABLE – 2: PROFILE OF THE STATE OF MEGHALAYA

Item	East Khasi Hills	West Khasi Hills	Ri-Bhoi	Jaintia Hills	East Garo Hills	West Garo Hills	South Garo Hills
Area (Sq. km)	2,748	5,247	2448	3,819	2603	3,677	1,887
Nos. of Sub-Divisions	1	2	Nil	2	1	2	Nil
Number of Blocks	8	6	3	5	5	8	4
Number of villages (inhabited 2011)	923	1093	579	498	1058	1,577	731
Towns	13	2	2	1	2	1	1
Police Station 2009-10	12	4	3	5	4	7	3
Police Outpost 2009-10	9	6	10	3	5	6	1
Total population (2011 census)	825922	383461	258840	395124	317917	643291	142334

Source: *Statistical Handbook of Meghalaya, 2014, Directorate of Economics & Statistics, Govt. of Meghalaya.*

1.3.2: AGROCLIMATIC ZONES:

As per the prevailing climatic conditions, the State of Meghalaya has been divided in to five agro-climatic zones as shown in Table – 3.

TABLE – 3: AGROCLIMATIC ZONES OF MEGHALAYA

Zones	Agro-climatic features	Dominant Geographical Units
I	Humid and warm with an average rainfall between 1270-2032 mm.	Hills and rolling and undulating pediment.
II	Humid and hypothermic moderately cold in winter and warm in summer rainfall varying between 2800-4000 mm.	Upper and middle plateau.
III	Humid and moderately warm summer and severe winter rainfall between 2800-6000 mm.	Upper and middle plateau.
IV	Humid and warm high rainfall ranging from 4000-10,000 mm.	Severely dissected and undulating low hills gentle to steep slope and rolling pediment.
V	Humid and hot, rainfall varying from 2800-4000 mm.	Rolling and undulating pediment and valley land having depression.

1.3.3: CULTIVABLE LAND.

The total cultivable land including net area sown in the state is shown in Table – 4.

TABLE – 4: LAND USE STATISTICS IN MEGHALAYA (inHectares)

Particular	**2008-09**	**2009-10**	**2010-11**	**2011-12**
Reporting area for land utilization statistics	2227100	2228914	2234283	2240837
1. Forest	948133	946318	946116	946089
2. Not available for cultivation	225921	230525	236447	239194
3. Other uncultivated land excluding Fallow Land	553444	555840	554532	555104
4. Fallow Land	215453	213292	213309	215273
5. Net Area Sown	284149	282939	283879	285177
6. Area Sown more than once	53245	53477	53974	54040
Total cropped area	337394	336416	337853	339217

Source:*Directorate of Economics &Statistics, Govt. of Meghalaya.*

1.3.4: METROLOGICAL DATA OF THE STATE:

The average annual rainfall in the State is 12,000 mm and relative humidity varies from 42 to 93 percent. The temperature varies from 4^0 to 29^0 Celsius in different seasons of the year. Some records, however, in different altitudes of the State are shown in the Table–5 and Table–6.

TABLE – 5: RAINFALL RECORDS IN SELECTED VILLAGES

District/Centres	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
East Khasi Hills (a) Mawsynram	14026	10072	8082	13302	10722	8952	11069	8927	12327
(b) Cherapunjee	NA	NA	NA	12647	11415	9000	13472	8732	13350
West Khasi Hills Nongstoin	4036	3097	2366	4778	NA	3507	3316	2982	NA
JaintiaHillsJowai	5374	3042	2898	5379	3094	3025	3404	2964	4254
East Garo Hills Williamnagar	3837	3612	2098	3899	3317	3252	3183	NA	3109
West Garo Hills Tura	4107	4652	2528	4265	3632	3355	3278	4003	3580
South Garo Hills Baghmara	1811	2347	1405	2589	2392	1532	1161	2147	1841

Source: *Directorate of Economics and Statistics*, Meghalaya 2014

TABLE – 6: MAXIMUM & MINIMUM TEMPERATURE IN SOME CENTRES, 2011.

(In Decree Celsius)

Month	2011 records									
	Nongstoin		Jowai		Tura		Nongpoh		Baghmara	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
January	12.8	7.8	14.81	11.49	26.0	8.0	12.60	16.56	33.0	14.0
February	16.3	10.9	16.65	13.77	33.0	15.0	15.34	20.06	29.0	20.0
March	20.1	15.1	21.65	16.56	33.0	18.0	18.19	23.30	32.0	24.0
April	23.4	17.6	18.49	18.06	34.0	16.0	20.66	24.53	36.0	25.0
May	24.3	17.6	22.0	19.77	34.0	18.0	22.75	25.29	35.0	24.0
June	25.9	19.1	23.17	21.10	32.0	20.0	24.43	26.38	34.0	21.0
July	25.7	18.5	22.14	20.61	34.0	16.0	24.59	26.37	34.0	25.0
August	25.8	18.7	23.51	21.12	34.0	19.0	24.24	26.10	36.0	25.0
September	25.1	17.7	23.77	21.41	34.0	19.0	23.88	25.71	37.0	26.0
October	23.4	16.1	23.63	19.77	34.0	17.0	22.17	24.60	36.0	28.0
November	17.8	12.7	20.32	17.37	32.0	15.0	16.77	19.83	32.0	22.0
December	15.0	9.0	18.11	14.99	29.0	8.0	14.22	17.43	30.0	16.0

Source: *Directorate of Economics and Statistics*, Meghalaya 2014

1.3.5: FOREST AREA

Besides the available grazing grounds, the cattle of Meghalaya largely dependent on either fodders and tree leaves available in the forests in Meghalaya, area of which is reported to be 963.03 ('000) hectares during the year 2009-10. Forest area has been classified into Reserved, Protected, National Park and Un-classed Forests covering an area of 71.54, 1.24, 39.95 and 850.30 thousand hectares respectively. (Source: *Principal Chief Conservator of Forest, Meghalaya* and published in Statistical Handbook Meghalaya, 2014). Area under forest cover from 1994-95 to 2009-10 is shown in Table – 7. Although the areas under forests in Meghalaya has been dwindling over the period of last two decades but still it has been providing the fodder requirements for cattle and buffaloes for milk production in a profitable venture minimizing the cost of production by lesser use of costly compounded feeds.

TABLE – 7: AREA UNDER FOREST COVER ('000 hectares)
IN MEGHALAYA STATE

YEAR	Reserved forest	Protected forest	National Park	Un-classed	Total
2000-01	71.27	1.24	26.75	850.30	949.56
2001-02	71.27	1.24	26.75	850.30	949.56
2002-03	71.27	1.24	26.75	850.30	949.56
2003-04	71.27	1.24	26.75	850.30	963.03
2004-05	71.54	1.24	39.95	850.30	963.03
2005-06	71.54	1.24	39.95	850.30	963.03
2006-07	71.54	1.24	39.95	850.30	963.03
2007-08	71.54	1.24	39.95	850.30	963.03
2008-09	71.54	1.24	39.95	850.30	963.03
2009-10	71.54	1.24	39.95	850.30	963.03

Source: *Principal Chief Conservator of Forest*, Meghalaya

1.3.6: ROAD CONNECTIVITY:

Road connectivity is an important prerequisite for animal husbandry development as because it facilitates provision of inputs and access to marketing of the milk and its products which are perishable in nature. The availability of roads maintained by the PWD in Meghalaya in 2009-10 is as follows: Surfaced 5,581 km and Subsurface 2,986 km. The Road Density is 38.20/100 sq. km.

1.3.7: POWER SUPPLY POSITION:

Besides road connectivity from rural areas to the milk processing plants/units for production of various categories of processed milk and products, power supply is another basic requirement of any developing state like Meghalaya. Generation and distribution of electricity in urban as well as rural areas greatly influence the implementation of animal husbandry developmental projects. The position of annual power generation in Meghalaya over the last two plan periods are shown in the Table–8.

TABLE – 8: GENERATION OF ELECTRICITY IN MEGHALYA

Year	Generation (MKWH)
2000 – 01	657.86
2001 – 02	675.59
2002 – 03	526.97
2003 – 04	526.97
2004 – 05	637.65
2005 – 06	514.44
2006 – 07	389.09
2007 – 08	633.06
2008 - 09	554.13
2009 – 10	536.15
2010 – 11	509.17
2011 - 12	518.50
2012 - 13	705.93
2013-14	868.56

(Net) Source: *Meghalaya State Electricity Board*.

Consumption of electric power by different sectors in the State is shown below in Table–9.

TABLE – 9: CONSUMPTION OF ELECTRICITY (MKWH) BY DIFFERENT CLASS OF CONSUMERS IN MEGHALAYA

Sl.no.	Projects	2009-2010	2010-2011	2011-2012	2012-2013
1	Domestic	227.37	270.81	316.77	333.64
2	Commercial	52.24	62.42	75.55	74.78
3	Industrial	468.63	484.01	519.93	483.04
13	Grand Total (inside and outside)	978.85	1104.54	1181.64	1204.36
14	Per Capita Consumption (KWH)	387.44	326.65	362.64	351.02

Source: Additional Chief Engineer (Commercial)Meghalaya Energy Corporation Ltd, Shillong.

Chapter – 2

LIVESTOCK POPULATION AND PRODUCTION SYSTEM IN MEGHALAYA

Livestock production system in Meghalaya is primarily based on mixed farming with agricultural and horticultural activities using the crop residues and forests grazing. Almost all the livestock species are available in the state including cattle and both Stall Feeding and Free Range Systems are followed by the farmers. Rural and hill farmers follows grazing of their animals with provision of some amount of concentrate feed i.e., grains, agricultural crop residues and agro-by-products depending on the resource availability of the individual farmer. In Government and commercial farms, concentrated feed and improved fodders are used for feeding of the animals.

In Meghalaya, every household has one or the other livestock in combination. Source of water is mostly ground water reserve in the hills to sustain livestock rearing. About 32.32 percent households keep cattle for milk and other products. However, the priority of animals reared and preferred varies according to districts/zones depending upon the resources available in a particular region. The different farming systems followed by majority of the farmer are extensive farming system or semi-intensive farming system.

2.1: LIVESTOCK SCENARIO OF MEGHALAYA:

The Livestock Census reports of 2007 and 2012, and livestock population growth rate in the State are shown in various Tables at sl. No. 10and 11 series respectively.

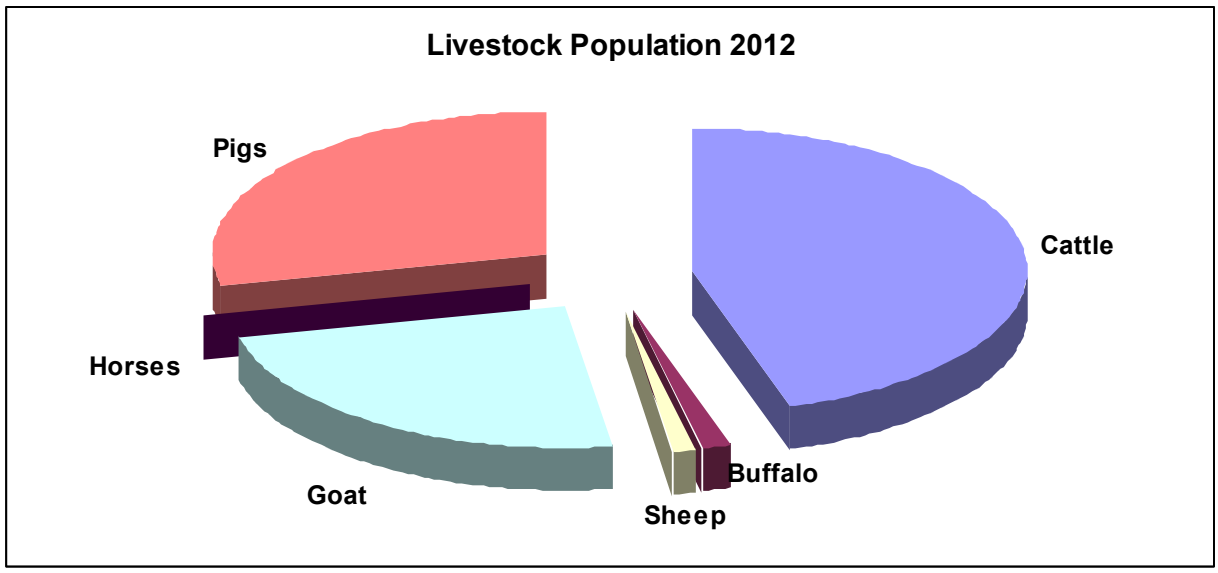
TABLE – 10(a): POPULATION OF LIVESTOCK IN MEGHALAYA
(LIVESTOCK CENSUS 2007)(Species-wise)

Sl No	District	Cattle	Buffalo	Horse & Pony	Sheep	Goat	Pig	Poultry
1	East Khasi Hills	73274	413	48	8957	56632	119357	**629036**
2	RiBhoi	83121	3289	24	116	13835	42470	**344451**
3	West Khasi Hills	115709	2787	889	3516	61786	85710	**498237**
4	Jaintia Hills	147497	2224	33	42	27005	70208	**374839**
5	East Garo Hills	158034	1415	-	1260	43652	55537	**599743**
6	West Garo Hills	263343	11133	864	7149	138468	128346	**629036**
7	South Garo Hills	46265	1366	-	1	24105	22729	**171316**
	State Total	**887243**	**22627**	1858	21041	365483	**524357**	**3092875**

Source: *Directorate of Animal Husbandry & Veterinary, Govt. of Meghalaya*

TABLE – 10(b): CATTLE AND BUFFALO POPULATION IN MEGHALAYA (LIVESTOCK CENSUS 2012)

Sl. No.	Name of District	Cattle		Total Cattle	Buffalo	Total Bovine
		Cross bred	Indigenous			
1.	East Khasi Hills	12807	69410	82217	1756	83973
2.	RiBhoi	9295	27614	36909	5043	41952
3	West Khasi Hills	498	95150	95648	5849	101497
4	South West Khasi Hills	331	25652	25983	202	26185
5	East Jaintia Hills	622	62981	63603	927	64530
6	West Jaintia Hills	663	33610	34273	1692	35965
7	North Garo Hills	196	66400	66596	8	66604
8	East Garo Hills	241	76379	76620	18	76638
9	West Garo Hills	1631	239283	240914	4233	245147
10.	South West Garo Hills	134	113390	113524	5164	118688
11	South Garo Hills	40	69426	69466	2	69468
	Meghalaya	26458	879295	905753	24894	930647



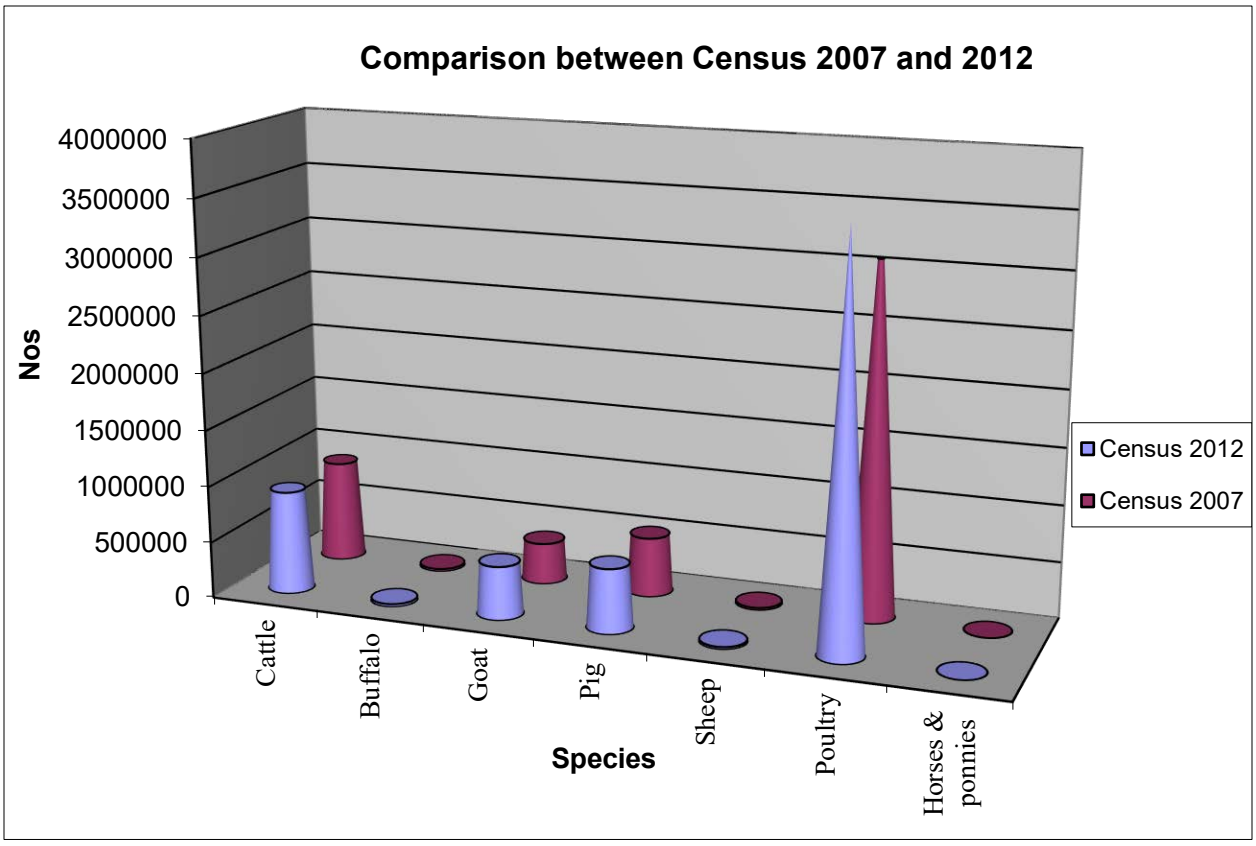


TABLE – 11(a) POPULATION GROWTH PATTERN (%) OF CATTLE AND BUFFALO FROM 1982 TO 2012.

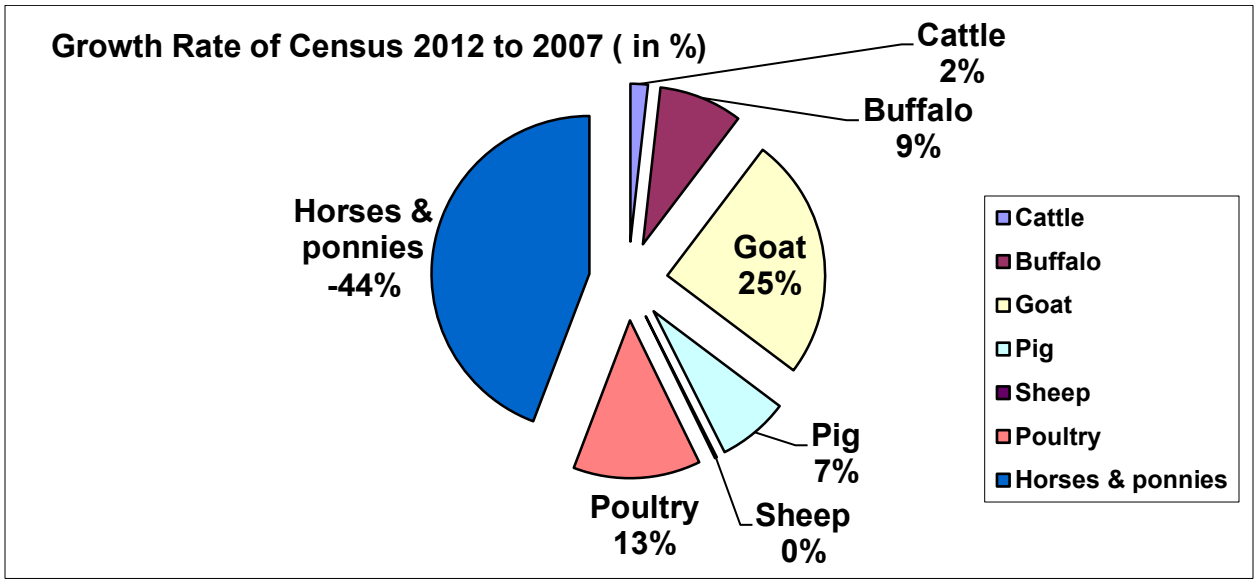
(Population in '000)

Category	1982	1988	1992	1997	2003	2007	2012
Cattle	549.8	586.2	637.4	755.52	767.02	887.24	905.75
Buffalo	28.9	27.8	33.7	17.4	18.00	22.63	24.89
Growth Pattern		(+) 6.62 % in Cattle and (-) 3.81% in Buffalo	(+) 8.73 % in Cattle and (+) 0.21% in Buffalo	(+) 18.53 % in Cattle and (-) 48.37% in Buffalo	(+) 1.52 % in Cattle and (+) 3.45% in Buffalo	(+)15.67 % in cattle and (+) 25.70 % in buffalo	(+) 2.09% in Cattle and (+) 9.99% in buffalo

The population growth rate of cattle and buffalo in the State is presented in Table -11(a) and 11 (b). The cattle population growth is positive over the years from 1982 till 2012. However, the buffalo populations had dwindling growth rate from 1982 to 2003, after which a positive trend of growth rate observed from 2003 till 2012.

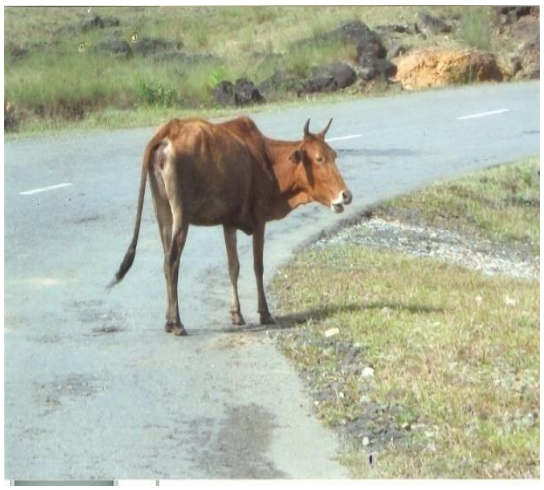
TABLE – 11(b): CATTLE AND BUFFALO POPULATIONS (2012 CENSUS) AND GROWTH RATE AS COMPARED TO 2007 CENSUS

Sl No	Species	Population (Numbers)			Total	Growth Rate (%)
1	Cattle	Crossbred	Male	5602	26458	-1.45
			Female	20856		
		Indigenous	Male	355705	879295	2.2
			Female	523590		
2	Buffalo	Indigenous	Male	16363	24894	10.02
			Female	8531		



2.2: TYPE OF CATTLE REARED IN MEGHALAYA:

2.2.1: Indigenous cattle of Meghalaya: The native cattle population in Meghalaya is mostly indigenous and non-descript which are of small body size and their production potentiality is very low in comparison to the Indian improved breeds and exotic breeds of cattle. But these local cattle are hardy and adapted to local harsh conditions of feeding and management and are found to be resistant to many tropical diseases. Because of indiscriminate breeding in past some crossbreds of indigenous cattle with exotic Jersey, Holstein Friesian, Brown Swiss and some Indian breeds like Sahiwal, Red Sindhi, Hariana etc. are also available. The population of buffaloes is very meagre, but is showing an upward trend in recent years in some selected districts due to its utilization as draught animal and acceptability as a meat and milch animal.



Local indigenous/nondescript cattle available in Meghalaya

Jersey cow

Holstein Friesian

2.2.2: Indian/Exotic cattle and crosses with indigenous in Meghalaya:

Red Sindhi(Indian breed): Red Sindhi is a milch breed of cattle, native tract spreads in North India. Coat colour is red with shades varying from dark red to light, strips of white, the Umbilicus is large and hanging. Milk yield ranges from 1250 to 1800 kg per lactation. Bullocks despite lethargic and slow can be used for road and field work.

Sahiwal (Indian breed): Sahiwal is a milch breed of cattle, native tract is inPunjab, Haryana, UP and Delhi. Animals of this breed possess loose skin, stunt horns, pale red or reddish Dun. Lactation milk yield ranges from 1400-2500 Kg with butter fat of 4.0 to 4.5 percent.

Jersey (Exotic breed): The native tract of this milch breed is in Europe and America. The animals are reddish-brown in colour and without any hump. The lactation milk yield ranges from 5000-8000 Kg in a lactation of about 300 days.

Holstein Friesian (Exotic breed): HF is a milch breed and its native tract is in Netherland. The animals do not possess hump. Body coat colour is white with black patches. The lactation milk yield ranges from 8000 to 14000 litres.

Jersey X Local (Crossbred): These are crosses of exotic Jersey breed (Sire) and Local, i.e. indigenous/nondescript cows of Meghalaya. Milk yield of these crossbred cows ranges from 1500 to 3000 litres in a lactation.

Holstein Friesian X Local (Crossbred): These are the crosses of Holstein Friesian breed (Sire) and indigenous/nondescript cows of Meghalaya with different levels of exotic Holstein Friesian inheritance. Milk yield of these cows ranges from 2,000 to 3,500 litres in lactation.

There are five major cattle and buffalo farms in the state of Meghalaya as follows:

Sl. No.	Name of farm	Location and district	Breed/CB maintained
1	Cattle Fram-Indo-Danish project	Upper Shillong, East Khasi Hills	HF cross
2	Regional Crossbred Cattle Breeding farm,	Kyrdemkulai, Ribhoi district	HF, and Jersey cross, Sahiwal
3	Cattle Breeding farm	Rongkhon, West Garo hills	HF, and Jersey cross
4	Cattle Breeding farm	Saitsama, West Jaintia	HF cross
5	Buffalo farm	Songsak, East Garo hills	Murrah Buffalo

These farms provide the basic infrastructure facilities for raising of the selected bulls and cows of different breeds in the state.

Chapter – 3

STATE DEPARTMENT OF ANIMAL HUSBANDRY AND VETERINARY OF MEGHALAYA

3.1: Mandate of the Department:

The broad mandate of the Department is to provide nutritional security of the human population through augmentation of animal production. Dairy sector provides milk and its various products to meet the animal protein requirements of large population of the state. Present availability/production of milk is far below the national average and needs to be increased with emphasis on maintaining nutritional levels of growing children and nursing mothers. Maintenance of bio-diversity, environment and energy conservation is another emerging area and livestock sector requires a balance between animal and man to maintain the ecological biosphere and to enable economic exploitation of the resources without causing irreversible damage to the environment. Uplift-ment of women, employment generation, rural transformation and poverty alleviation through dairy activities is one of the priority areas. Rural women in this tribal state play an important role in livestock management and participate actively in areas of feeding, breeding, maintaining and health care of animals. Livestock production is an integral part of integrated farming system with crop farming and horticulture and contributes substantially to poverty alleviation and creates employment opportunities. Livestock sector including dairy husbandry has great potential to bring about socio economic change and improving the living standards of the people in the state.

3.2: Objectives of the Department:

Towards fulfilling the mandates, the main focuses of activities are:

- Developing suitable and appropriate infrastructure for increasing animal productivity and production.
- Preservation and protection of livestock through preventive and curative health care.
- Carry out appropriate breeding programme for preservation and propagation of indigenous breeds and development of superior germplasm.

3.3: Approach and Thrust areas of the Department:

In consonance with the overall strategy, the major thrust of activities are concentrated on scientific management and up gradation of genetic resources, control of animal diseases, increasing the availability of nutritious feeds and fodder upon which most of the livestock thrives, development of processing and marketing facilities and enhancement of production and profitability of livestock enterprises.

The Department of Animal Husbandry and Veterinary came into existence as an independent department in the year 1971-72 and since then the Department is serving the people in various production oriented, poverty alleviation and employment generation programmes through livestock development. The Department played a very crucial role in ameliorating the plight of the poor farming communities and provides livelihood security. Capacity building of the farmers and entrepreneurs through training and extension is an important activity of the Department besides assisting and guiding the farming community to generate more returns. The department plays a pivotal role in transfer of technology from laboratory to field making the farmers aware of the same so that their household economy is boosted.

Considering the above, the state plan documents are prepared for some of the major programmes namely (1) Livestock development, (2) Animal Health coverage, (3) Education and Training, (4) Dairy development, and (5) Poultry development. Livestock and Poultry development broadly covers cattle, buffalo, sheep, goat, pig and poultry including feeds and fodder resources. The basic aim of the development process is to produce or evolve type of highly productive animals adapted to the conditions and environment of the state which can be maintained economically under prevailing and upgraded systems of management with suitable inputs. Livestock rearing in the State of Meghalaya is an age-old practice and is extremely popular. Almost every family maintains these animals for fulfilling the protein requirements of their own family through consumption of the products like milk and other animal products and also for economic gain. The state of Meghalaya represents a mixed terrain of hills and valleys with a congenial climate for livestock farming which has tremendous scope to contribute towards higher GDP growth of the state through this sector.

3.4: Establishment set up of the Department of Animal Husbandry & Veterinary:

The following are the positions of technical man power in the Dept. of AH &Veterinary.

TABLE – 12(i): Number of Veterinary Officers with Pay Scale

Scale Range	Standard Pay Scale	Over All Total
VETERINARY DOCTORS		
Director A.H. & Veterinary	31300-46760/-	1
Joint Director,Registrar State Vety Council	26700-42100/-	3+1=4
Deputy Director A.H. & Veterinary	23300-39270/-	5
Principal VFA Training Institute	23300-39270/-	1
District A,H. & Veterinary Officer	23300-39270/-	11
Assistant Directors (Disease Investigation)	20700-36650/-	1
Assistant Director (Disease Surveillance)	20700-36650/-	1
Assistant Director (Livestock Census)	20700-36650/-	1
Assistant Director (Rinderpest Eradication)	20700-36650/-	1
Assistant Director (Veterinary Information)	20700-36650/-	1
Assistant Director (Fodder Development)	20700-36650/-	2
Assistant Director (Piggery Development)	20700-36650/-	1
Assistant Director (Poultry Development)	20700-36650/-	1
Assistant Director (Project ICDP)	20700-36650/-	2
Assistant Director,IDP (Veterinary)	20700-36650/-	1
Assistant Director,IDP (Agronomy)	20700-36650/-	1
Assistant Director (Feed Analytical)	20700-36650/-	1
Sub-Divisional A.H. & Veterinary Officer	20700-36650/-	4
Assistant Director (Sr. Instructor)	20700-36650/-	2
Senior Manager	20700-36650/-	3
Senior A.H. & Vety. Officer	18300-35100/-	42
Fodder Supervisor	17000-33690/-	1
A.H. & Veterinary Officer	17000-33690/-	164
Posted in Other Service (BATC)	18300-35100/-	1
Posted in Other Service	17000-33690/-	3
Total :		**255**

TABLE – 12(ii): Number of other Officers according to Designation & Pay Scale

Designation/Posts	Standard Pay Scale	Over All
DAIRY		
Joint Director (Dairy)	26700-42100/-	1
Deputy Director (Dairy)	23300-39270/-	1
Dairy Development Officer	20700-36650/-	1
Assistant Dairy Development Officer	18300-35100/-	3
Procurement & Distribution Officer	18300-35100/-	1
Plant Manager	17000-33690/-	6
Rural Dairy Extension Officer	17000-33690/-	2
Dairy Extension Officer	17000-33690/-	1
Milk Tester	17000-33690/-	3
Total : DAIRY		**19**
ENGINEERING	**-**	
Executive Engineer (CEW)	23300-39270/-	3
Assistant Engineer	17000-33690/-	2
Total : ENGINEERING		**5**
STATISTICS	**-**	
Joint Director (Statistics)	26700-42100/-	1
Deputy Director (Statistics)	23300-39270/-	1
Research Officer	18300-35100/-	1
Statistical Officer	17000-33690/-	3
Total : STATISTICS		**6**
OTHERS	**-**	
Financial Accounts Officer	17000-33690/-	1
Audit Officer	16300-31860/-	1
Registrar	16300-31860/-	1
Total : OTHERS		**3**
Grand Total :		**33**

TABLE – 12(iii): Number of Field Staff /Ministerial according to Designation & Pay Scale

Designation	Standard Pay Scale	Over All
ENGINEERING	-	
Junior Engineer I	14100-27510/-	4
Junior Engineer II	10600-20720/-	3
Sectional Assistant (6) and Tracer (3)	8300-16270/-	9
Total : Engineering		16
STATISTICS	-	
Inspector Statistics(2),Statistical Asstt.(7)	14700-28760/-	9
Data Entry Operator	9900-19370/-	2
Enumerators	9200-18020/-	10
Total : Statistics		**21**
ASSTT. MANAGER /LAB. ASSTT./SVFA / VFA		
Asstt. Managers, Asstt. Farm Managers	9900-19370/-	5+4=9
Demonstrator (5), L/S Demonstrator (1)	8300-16270/-	6
Hatchery Man, Laboratory Assistant (4)	8300-16270/-	7
Lab. Technician, Manager	14100-27510/-	2
Poultry Assistant (7) and Stockman (56)	8300-16270/-	63
Supervisor VFA	13100-25570/-	4
S.V.F.A.	9900-19370/-	41
Semen Courier	7700-15020/-	2
Senior Sexer, Sexer	13100-25570/-	2
Technical Assistant	11300-22000/-	3
Veterinary Fields Assistant	8300-16270/-	329
Total :Asstt. Mng/LA/SVFA / VFA		**467**

TABLE – 12(iv): Overall Strength of A.H. & Veterinary Department during 2015-16

Total Nos. of Non-Gazette Employee	1,492
Total Nos. of Gazette Employee (posts in the Department)	284
Total Nos. of Gazette Employee (posts in other Services)	4
Grand Total	**1,780**

3.5: INFRASTRUCTURE FACILITIES OF A.H. AND VETERINARY IN THE STATE

District wise infrastructure, farm and other facilities available with the Department of A. H &Veterinary, Meghalaya as in March 2016 are as mentioned below in Table – 13.

TABLE – 13: INFRASTRUCTURE, FARM AND OTHER FACILITIES (MARCH 2016)

Sl No.	Items	East Khasi Hills	RiBhoi	West Khasi Hills	South West K.H	West Jaintia Hills	East Jaintia Hills	East Garo Hills	West Garo Hills	South Garo Hills	North Garo Hills	South West G.H.	State
1	ICDP	1	-	-		-	-	-	1	-	-	-	**2***
2	SMC (with AI)	7	11	1	-	1	-	6	8	-	-	-	**34***
	SMC (without AI facilities)	1	8	2	-	-		-	11	2			**24**
3	Key Village Centre & AI)	-	-	-	-	-	-	3	3	-	-	-	**6***
	KVC (without AI)	-	-	-	-	8	-	-	2	-	-	-	**10**
4	Vety Aid centre (A.I.)	5	2	2	-	4	-	1	8	1	-	-	**23***
5	Check Post	-	1	1	-	1	-	1	-	-	-	-	**4**
6	Cattle Farm.	1	2	-	-	1	-	-	1	-	-	-	**6**
7	Buffalo Farm.	-	-	-	-	-	-	1	-	-	-	-	**1**
8	Poultry Farm.	2	3	2	-	1	-	1	3	1	-	-	**13**
9	Pig Farm.	4	2	3	-	1	-	1	3	1	-	-	**15**
10	Sheep & Goat Farm.	-	-	1	-	1	-	-	-	-			**2**
11	Fodder Dem. Farm.	1	-	-	-	1	-	-	1	-	-	-	**3**
12	Fodder &Seed Farm.	-	1	-	-	-	-	-	1	-	-	-	**2**
13	Feed Mill.	-	1	-	-	-	-	-	1	-	-	-	**2**
14	Rabbit Farm.	1	-	-	-	-	-	-	-	-	-	-	**1**
15	Vocational Training Centre.	-	1	1	-	-	-	-	1	-	-	-	**3**
16	Hatcheries	1	2	1	-	1	-	1	1	-	-	-	**7**
17	State DD Laboratories	1	-	-	-	-	-	-	-	-	-	-	**1**
18	District DD Labs.	-	1	1	-	1	-	1	1	1	-	-	**6**
	Dairy												
19	Dairy Plant.	1	-	-	-	1	-	-	1	-	-	-	**3**
20	Chilling Centre.	-	-	1	-	1	-	-	-	-	1	-	**3**
21	Cream,Ghee Making Centre.	-	-	-	-	-	-	-	1	-	-	-	**1**

TABLE –14: NUMBER OF VETERINARY INSTITUTIONS(DISTRICT WISE)

Sl No	Name of District.	Particulars				
		Vety. Hospi Tals	Vety. Dispen saries	Vety. Aid Centres	Mobile Vety. Dispensary	Vigilance Unit
1	**2**	**3**	**4**	**5**	**6**	**7**
1	East Khasi Hills	1	22	11	2	1
2	Ri-Bhoi	-	15	2	1	-
3	West Khasi Hills	1	10	8	2	-
4	South West Khasi Hills		5	-	1	1
5	West Jaintia Hills	1	15	8	2	1
6	East Jaintia Hills	-	5	4	1	1
7	East Garo Hills	-	8	1	1	-
8	North Garo Hills	-	4	7	1	1
9	West Garo Hills	1	17	2	3	1
10	South West Garo Hills	-	6	1	-	1
11	South Garo Hills	-	7	5	1	-
	State	**4**	**114**	**49**	**15**	**7**

3.6: COOPERATIVES AND UNIONS:

As per Statistical Hand Book (2014), there are 103 Dairy Co-operative Societies, 42 Piggery/Poultry Co-operative Societies and 4843 Self Help Groups (SHG)intheState.

(Source: http://megselfhelp.gov.in/table-2.htm).

3.7: MARKETING OF ANIMAL PRODUCTS

The state Government fixes the prices of various animal products from time to time the latest being notified vide Government notification letter No.MVD/Acctt/G-12/2013-14/ 37, Dated Shillong, the 27th Nov' 2014.

Chapter- 4

BOVINE DEVELOPMENT AND HEALTH COVER PROGRAMMES OF A. H & VETERINARY DEPARTMENT

There are different programmes with schemes/projects funded by the state as well as central government and North Eastern Council are in operation in order to fulfil the mandate and objectives of the Department which are presented below:

4.1: ANIMAL HEALTH SERVICES:

Aims and objectives: *To render healthcare to all livestock and poultry in the State besides vaccination and castration of the animals. To set up dispensaries in rural areas, equipped with modern facilities for treatment of animals, etc. and to conduct regular testing and analysis of samples by setting up Disease Diagnostic Laboratory / Clinical laboratories at District headquarters.*

Animal Disease Scenario in Meghalaya:

Although viral diseases are most common in the state in different species of livestock and poultry, the following tables (Table – 15) shows the outbreaks of various animal diseases in the State from time to time.

TABLE –15: INCIDENCE OF SPECIFIC DISEASES IN MEGHALAYA DURING THE PERIOD FROM APRIL 2016 TO MARCH 2017.

Sl No.	DISEASE/SPECIES	Out-Break	Attack	Death	Mortality Rate
1	Foot & mouth Diseases (FMD)				
	(a) Bovine	17	2145	2	0
	(b) Swine	0	9	0	0
	(c) Caprine	0	138	0	0
2	Swine Fever	0	687	0	0
3	Canine Distemper	0	72	0	0
4	Ranikhet Disease	0	672	0	0
	Fowl Pox	0	2485	0	0
	Infectious Bursal Disease	0	738	0	0
	Goat Pox	2	24	0	0
1	Anthrax- Bovine	2	17	17	
2	Haemorrhagic Septicaemia		168		
3	Black Quarter		134		

At present the Department has 4(four) Veterinary Hospitals, 114 (hundred fourteen) Veterinary Dispensaries, 15 (fifteen) Mobile Dispensaries, 7(seven) Vigilance Units and 49 (forty nine) Veterinary Aid Centres. There is 1 (one) State Disease Diagnostic Laboratory at Shillong, East Khasi Hills District and 6 (six) District Disease Diagnostic Laboratories in other Districts (West Khasi Hills, Jaintia Hills, RiBhoi, West Garo Hills, East Garo Hills and South Garo Hills) to cater to the need of the State.

The State requires about 170 numbers of Dispensaries, of which 114 numbers have been established. During 2010-11, 7 numbers of new dispensaries have been approved and sanctioned under NABARD loan scheme. Already 51 veterinary dispensaries have been equipped with A.I facilities for cattle breeding.

The State of Meghalaya has also been declared as "Total freedom from Rinderpest infection status" along with other States of the country. However, the State Department is still continuing the programme in conducting 'Village Searches' and Sero-surveillance by adopting Annual Work Plan as directed by NPRE, Govt. of India.

4.2: BOVINE (CATTLE AND BUFFALO) DEVELOPMENT PROGRAMME:

Aims and objectives:*To enhance milk production by upgrading local stock through cross breeding, adopting improved breeding practices by means of artificial insemination.*

There are 2(two) ICDP centres (Shillong and Tura) and 76(seventy six) Stockman Centres in the State. During the year 2010-11, 28,480 numbers of AI were performed. Frozen Semen for A.I is being used for the purpose. There are 2(two) numbers of Liquid Nitrogen (LN_2) Plants located at Shillong and Tura. The Department is extending support to Dairy Farmers who maintain crossbred heifers/cows in the State by providing 25% feed subsidy and also encouraging dairy farmers and Educated Un-employed Youth with 50% subsidy for distribution of crossbred cows. Under CSS – NPCBB scheme, strengthening of Frozen Semen Bank at ICDP, Upper-Shillong, establishment of Bull Mother Farm at Saitsama (Jaintia Hills) and Rongkhon (West Garo Hills), distribution of Breeding bulls for NS to areas where AI could not be covered, Training of existing AI workers and Private AI workers are being carried out.

The animal stock positions in thecattle and buffalo farms are presented in Table –16.

TABLE – 16: STOCK POSITION OF CATTLE AND BUFFALO FARMS(2015-16)

Sl. No.	Name of the Farm	PARTICULARS OF STOCK MAINTAINED (Nos.)									
			Milch Cows			Young Bull	Heifers	Calves Reared		Calves produced during the year	Milk Production in '000' Litres
		Total Stock	In Milk	Dry	Total Milch Cows			Male	Female		
1	Indo Danish Project, Upper Shillong.	79	32	13	45		2	3	24	40	49.60
	Indo Danish Project, Upper Shillong. (RKVY)	70	33	17	50		-	8	12	16	44.90
2	Regional Cross Bred Cattle Breeding Farm, Kyrdemkulai.	25	5	6	11		6	1	7	11	19.04
	-do- Under RKVY	42	11	8	19		16	2	5	14	31.92
3	Livestock Farm, Rongkhon.	40	11	7	18		20	-	2	2	14.82
4	Cattle Farm, Saitsama	29	9	8	17		4	4	4	7	5.16
	Total Cattle: -	**285**	**92**	**59**	**151**		**48**	**18**	**54**	**90**	**165.44**
5	Buffalo Farm, Songsak	25	5	2	7	-	3	6	6	1	3.70

N.B. Stock position as on February 2017

There is no recognized breed of buffalo in Meghalaya. The indigenous buffaloes of the State are either nondescript or swamp type as in the case of neighbouring State of Assam. These are hardy and suitable for agricultural works in wetlands, paddy fields etc. They are also a source of milk. No much scientific study has so far been made on the performance and milk quality traits and characterization of these animals in terms of body conformation and other traits have been made in the State. However, performance of swamp buffaloes of neighbouring State of Assam is as follows (Table – 17).

TABLE – 17: PERFORMANCE OF INDIGENOUS/SWAMP BUFFALOES

Traits	Average value
Age at 1st calving (m)	59.03 ± 0.42
First lactation milk yield (kg)	509.63 ± 4.20
First lactation length (d)	282.87 ± 78
1st lactation peak yield (kg)	4.09 ± 0.04
Days to attain 1st peak yield (d)	58.28 ± 0.93
Persistency of 1st lactation	0.88 ± 0.01
Lactation milk yield (kg)	505.95 ± 3.14
Lactation length (d)	283.43 ± 1.44
Peak yield (kg)	4.08 ± 0.03
Days to attain peak yield (d)	57.89 ± 0.68
Dry period (d)	224.58 ± 2.17
Service period (d)	181.75 ± 2.39
Gestation period (d)	325.85 ± 0.42
Inter-calving period (d)	507.80 ± 2.39
Birth weight (kg)	32.06 ± 0.10
Specific gravity of milk	1.0296 ± 0.0002
Fat % in milk	8.478 ± 0.069
S.N.F. % in milk	9.910 ± 0.039
Total solids % in milk	17.675 ± 0.088

4.3: DAIRY DEVELOPMENT PROGRAMME:

There are 3(three) Dairy Plants and 3(three) Chilling Plants in the State, namely, (a) Central Dairy at Mawiong, Shillong with 10,000 liters capacity per day. This Dairy is intended to be strengthened to 20,000 litres capacity during the current year. (b) Dairy Plant, Jowai with 8000 litres capacity, (c) Dairy Plant, Ganol (Tura) with 8000 litres capacity, (d) Chilling Plant, (2000 liters) Gangdubi (East Garo Hills), and Chilling Plant (2000 liters), Nongstoin (West Khasi Hills).

Procurement and distribution of milk are now taken over by Govt. agencies in the three districts as follows:

(a). District Milk Procurement and Marketing Agency (DMPMA), Shillong

(b). District Implementing Agency (DIA), Jowai

(c). District Society for Integrated Dairy Development (DSIDD), Tura.

4.4: INTENSIVE CATTLE DEVELOPMENT PROJECT:

The available breedable cattle and buffalo populations in the State are as shown in the Table–18 and are to be covered by the project for their improvement and productivity enhancement.

TABLE–18: DISTRICTWISE AVAILABILITY OF BREEDABLE CATTLE AND BUFFALO COW POPULATION

Districts	Exotic Cattle	Crossbred Cattle	Indigenous Cattle	Buffaloes
East Khasi Hills	Nil	5320	7182	24
West Khasi Hills	Nil	168	26,526	255
Ri-Bhoi District	Nil	6902	14,621	457
Jaintia Hills	Nil	617	16,737	208
East Garo Hills	Nil	35	35,556	148
West Garo Hills	Nil	534	74,982	1,260
South Garo Hills	Nil	0	8,786	8
TOTAL	**Nil**	**13,576**	**1,84,390**	**2,360**

The role of ICDPs of the state is to cover these breedable cattle and buffaloes to reproduce for increasing the number of productive animals with higher genetic merit. As per updated data on31stDecember 2016, various animal breeding activities are as follows:

(i). The Semen production scenario in the State is shown in Table–19 below.

TABLE– 19: SEMEN PRODUCTION (Doses)

Breed	2014-15	2015-16
HF	22387	28826
Jersey	19550	20886
Purchased	-	-
TOTAL	**41937**	**49712**

(ii) A.I. Coverage (2015-16): 26,146 Nos. (Crossbred =24,138 Nos.; Local =8 Nos);
Calf born through A.I. – 11,554 Nos.(44 percent).

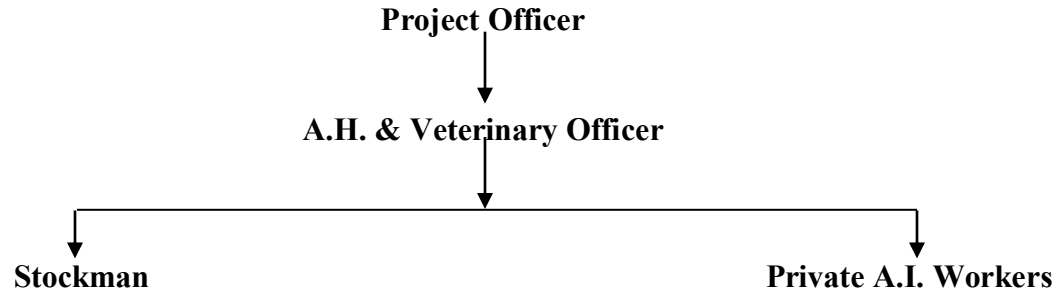
(iii). Mortality of calves were 9 percent. The major causes are lack of proper management and Calf diarrhoea.

(iv). The production of liquid nitrogen in the State was 15,514 Litres in 2015-16 and no procurement from outside the State was made.

(v) The bulls of HF and Jersey pure/crossbred used for Natural Service (NS) where AI facilities are not available have been procured from Govt. farms and private farmers. In this process, a population of about 16,500 numbers of cows (ratio of 1 bull per 100 cows) were covered. All the eleven Districts of the State having 4, 86,061 numbers of basic/ foundation stocks of indigenous cows have been taken care of.

(vi) The number of breeding bulls for Natural Service (NS) distributed in the State is 264.

Present network of Artificial Insemination (A.I) service – by flowchart.



The estimated number of tested breeding bulls required for production of required semen-doses in the state is 20 at present.

Distribution of Bull/Calves/Cows Grant-in-Aid: The objective of the Scheme is for rearing of cross bred Heifers /Calves for Dairy farming with 50 percent subsidy to provide incentive to farmers to take up Dairy farming to generate self-employment to the people and increase in production of Milk.

Scheme for Educated Un-employed Youth: Scheme for educated un-employed youth is to generate employment through Dairy farming with 50 percent subsidy.

Performance of exotic Jersey and Holstein Friesian (HF) breeds of cattle: As far as performance of Jersey and Holstein Friesian (HF) is concerned, both the breeds and their crosses with indigenous local cattle performed very well in the State of Meghalaya. However, in the Districts of West Khasi Hills, Ri-Bhoi and Garo Hills, farmers prefer Jersey crossbreds. In other areas, cattle owners prefer HF over Jersey because of its larger size, higher milk yield and better feed conversion efficiency. Some cattle breeders maintain Jersey cattle in their stock just to elevate the fat percentage by mixing the milk produced from both HF and Jersey cows.

4.6: FODDER DEVELOPMENT SCENARIO/PROGRAMME:

One of the most important constraints in increasing animal production is non availability of required quantity of nutritious green fodder. The milk production by animals with high genetic

potential depends greatly on feeding of quality green fodder. The farmers are unable to divert their lands for cultivation of fodder. As a result of which the dairy cows having the capacity of producing more milk also could not be exploited to augment production. The green fodder comprises of leguminous and non-leguminous plants, trees, shrubs, roots, leaf etc. The state has 950 hectares of land covered by natural forest, which is a reservoir of all natural trees and grasses. Fodder cultivation in the state in scientific footings is negligible. Most of the farmers are unaware of quality fodder cultivation and depend on natural or low quality fodder. The vast and typical forest areas of the state comprise of hilly terrain and lands holding of the individuals are fragmented. Due to small land holding the cultivation of fodder is done in a very low scale, the dry fodder production is not sufficient and the cost of collection of dry fodder is also very high. The cultivation of Paddy, Maize, Teosinte etc. are done and harvested at early stage and fed directly to the animals. If the cultivations are done in an extensive manner with scientific technique there is hope of production of green as well as dry fodder in a large scale in these areas.

4.6.1: Fodder Farms: There are 5 fodder farms/reserves maintained by the Department, located one each in Jaintia Hills District, East Khasi Hills and Ri-Bhoi Districts and 2 in West Garo Hills.

4.6.2: Type of indigenous and improved fodders:

Some of the indigenous fodders available in the state are bamboo leaves, jackfruit leaves, local grass, jungle leaves etc. The improved fodder cultivated are Hybrid oat, maize, Napier, Cowpea, soybeans, para grass, *guinea* grass, sorghum, *stylosanthesehamata, Cenchrus*grass etc. Different types of fodders produced by the state are depicted in Table 21.

TABLE – 21: FODDER PRODUCTION IN THE STATE

Year	**Variety of crops**	**Quantity produced** (in Quintal)
2005-06	Oat kent	9535.12
2006-07	Surghum (syndexchari) Maize	4112.3 5,354.6
2007-08	Surghum (syndexchari) Conchrus Gaur Oat kent Stylosanthes	3,541 250.08 289.73 2,328.82 752.5
2008-09	Surghum (syndexchari) Surghum (red chari)	1,478.4 211
2009-10	Maize Oat kent	10,524 8,524

4.7: FEED SCENARIO/PROGRAMME:

4.7.1: Production, supply & distribution of mixed feed:

As per Census 2007, annual requirement of feed for livestock was supposed to be 16, 54,598 tonnes and requirement of maize alone for livestock consumption was calculated as 6, 61,839 tonnes, whereas production within the State during 2009-10 was 25,566 tonnes (that to basically for human consumption only). Animal feed on an average constituted of 70 percent of Maize and hence the big gap in between availability and the requirement of maize is a major constraints in animal feed supply. Besides that various ingredients of compounded feed (concentrates) for animals are constituted of residues of agricultural produce or their by-products.

The State has produced the following agricultural products for human consumption; the residues only are being utilized for feeding of animals:

TABLE – 22: AGRICULTURAL PRODUCTS IN MEGHALAYA (IN TONNES)

Sl.no.	Crops	2008-2009	2009-2010	2010-2011	2011-2012
1	2	3	4	5	6
1	**Total Rice**	**203862**	**204129**	**207021**	**222731**
2	Wheat	739	718	704	710
3	Maize	25716	26167	26500	27029
4	Other Cereal	2051	1889	1695	1755
	Total Cereals	**232368**	**232903**	**235920**	**252225**
5	**Total Pulses**	**3233**	**3229**	**3278**	**3699**
	Total Foodgrain	**235601**	**236132**	**239198**	**255924**
6	Sesamum	891	853	852	867
7	Castor	17	15	12	16
8	Rapeseed and Mustard	4906	4872	4859	4902
9	Linseed	43	36	39	41
	Total Oilseed	**5857**	**5776**	**5762**	**5826**
10	Sugarcane	250	206	180	199
	Chillies	1423	1394	1415	1474
	Turmeric	10046	9895	10058	10512

	Arecanut	17400	19396	20501	21751
Sl.no.	**Crops**	**2008-2009**	**2009-2010**	**2010-2011**	**2011-2012**
11	Potato	161138	162445	164647	165670
12	Sweet Potato	15909	14053	13241	13701
13	Tapioca	21773	21152	21792	22046
14	Soyabean	1163	1179	1186	1231
15	Ginger	50286	54009	56622	58132
16	Pineapple	102506	103432	104130	106168
17	Citrus Fruits	37702	39070	38817	39315
18	Banana	74314	78822	79954	82125
19	Papaya	4564	4541	4729	4951

*** : In bales of 170 Kgs each**
**** : In bales of 180 Kgs each**
Source: Directorate of Economics and Statistics, Meghalaya.

YIELD RATE OF SOME IMPORTANT CROPS

(Kgs/Hectares)

Sl.no.	**Crops**	**2008-2009**	**2009-2010**	**2010-2011**	**2011-2012**
1	**2**	**3**	**4**	**5**	**6**
1	Rice				
a	Autumn	1287	1284	1304	1331
b	Winter	1839	1837	1862	1973
c	Spring	3654	3674	3705	4223
	Total Rice	**1887**	**1887**	**1912**	**2046**
2	Maize	1502	1521	1534	1561
3	Rapeseed and Mustard	682	680	679	681
4	Jute	1576	1594	1593	1600
	Potato	9109	9171	9310	9351

Source: Directorate of Economics and Statistics, Meghalaya.

There is no organized and scientific approach made so far for production of compounded feed or balanced concentrate ration in the state except in few government and privately owned

feed mills. These feed ingredients are collected from neighbouring states where the cost is very high in comparison to other states, which ultimately lead to high production cost of animal feed.

The state has no commercial production of any feed ingredient required for livestock and hence depends solely on the supply from outside the state with high cost and that too without any guarantee of regular supply and quality.

4.7.2: Feed Mill:

There are 2 Government Feed Mills and 4 Feed Mills at private sector in the State. Various types of compounded feed made available by the existing feed mills are (i) Pig feed – Starter feed, Grower feed and Finisher feed, (ii) Cattle Feed – Calf feed, Milch Cattle feed, (iii) Poultry : (a). Broiler-Starter and Finisher feed, (b) Layers-Chick, Grower and Layer, (iv) Sheep and goat feed, and (v) Rabbit feed. The average feed production by the feed mills are as below: **Govt. Feed Mill**: Pig Feed - 30 Tonnes, Cattle Feed - 20 Tonnes, Poultry : Layers - 5.7 Tonnes, Broiler- 4 Tonnes and Rabbitfeed - 0.3 Tonnes.**Private Feed Mill:**Poultry - 315 Tonnes, Pig Feed -114.7 Tonnes, Cattle Feed - 11.1 Tonnes and Goat Feed - 0.5 Tonnes.

Table 23 below shows the quantum of feed supplied to Government livestock farms and feed subsidy distributed by the Department to the selected beneficiaries.

TABLE – 23: SUPPLY/DISTRIBUTION OF FEED [in quintal]

Animal	**2006 – 07**	**2007 – 08**	**2008-09**	**2009-10**
1. Cattle	4881.77	3161.10	2936.69	3064.33
2. Poultry	1798.31	1738.05	4002.36	3669.75
3. Rabbit	120.10	52.60	48.38	38.87
4. Pig	3420.62	3342.92	4215.90	4305.52
5. Feed subsidy	310.40	3342.92	1610.87	N.A
Grand Total	**10531.20**	**11637.59**	**12814.20**	**11078.47**

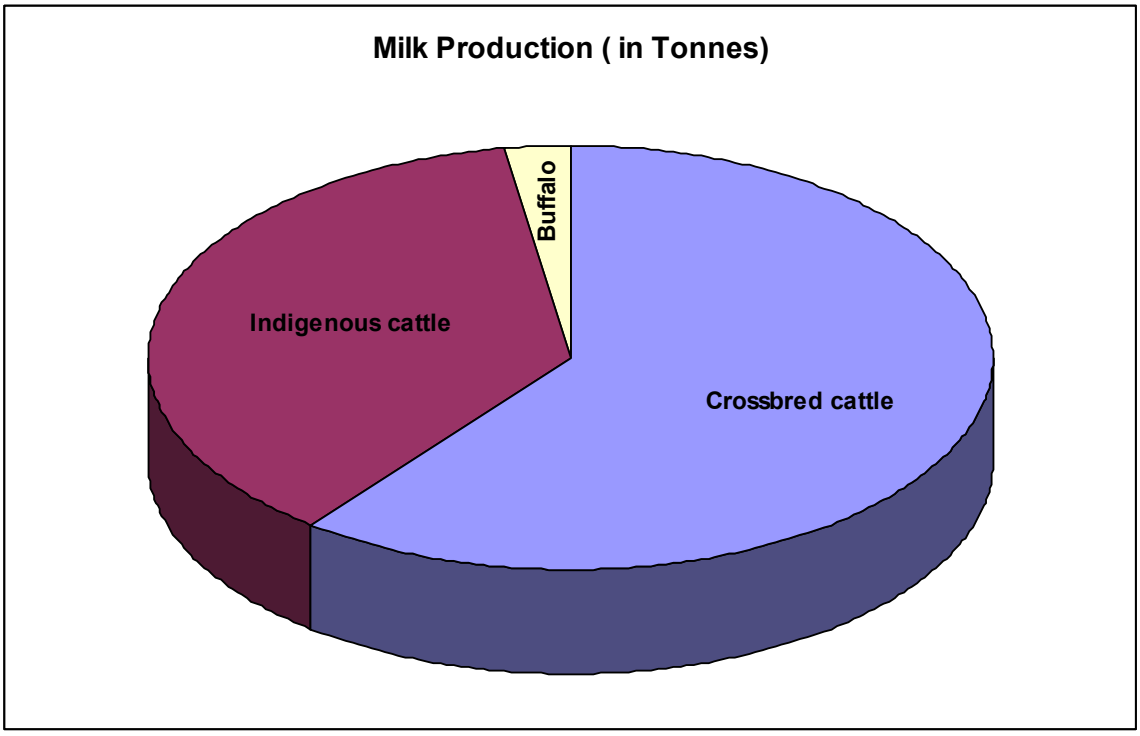
Chapter-5

LIVESOCK PRODUCTION SCENARIO IN THE STATE OF MEGHALYA

5.1: MILK PRODUCTION SCENARIO:

As per the Estimation Report of Sample Survey for the State of Meghalaya during the year 2015–2016, the milk production in the state is as follows:

Animal	Milk Production (Tonnes)	% Contribution
(a). Cross-bred cattle	49,574	59.07
(b). Indigenous cattle	32,668	38.93
(c). Buffalo	1,682	2.00
Total	**83,924**	**100 %**



The per capita availability of milk in the state is 77.5g per day per person which is far below the national average and the minimum requirement recommended by ICMR (300g per day per person). A big gap in milk production exists in the state which needs to be bridged as soon as possible by adopting strategic planning for maximizing production in the state. In order to meet the growing demand for milk and milk products in the state, it is necessary to increase the

productivity of the livestock. Productivity enhancement of the animals enables higher production and also higher returns to the farmers engaged in livestock production activities. The projected production of milk in the state of Meghalaya by next five years is approximately 100 thousand tonnes.It is expected that the demand for milk and milk product will be higher on account of changing food habits and increased purchasing power of the people.

5.2: CATTLE DEVELOPMENT SCENARIO OF THE STATE:

5.2.1: Indian and exotic breeds of cattle introduced in the state and its impact:

The base cattle population of the State of Meghalaya is comprised of indigenous nondescript animals. The average per day milk yield of indigenous cattle of the State in a lactation length of about 180 - 260 days is only about 327 ml. Genetic up gradation of indigenous cattle has been the priority for augmenting productivity. Therefore several exotic breeds of cattle were introduced since pre independence period in the state from time to time such as Holstein Friesian, Ayrshire, Jersey etc. As the artificial insemination service was not readily available, bulls were maintained and scattered around the state and were used for breeding. Although the contribution of some Indian cattle breeds had also great impact in enhancing milk production but people became fascinated by the exotic breeds mainly Jersey and Holstein Friesian which became very popular amongst the farmers. The impact of introducing these breeds led to the concept of initiating Integrated Cattle Development Project. However, in spite of introduction of the exotic cattle breeds, the indigenous cattle which are poor yielder but hardy are still very popular in low input production system. This is due to many good quality traits of indigenous cattle such as disease resistance, draught power and sustainability under the existing agro climatic conditions.

5.2.2: Cattle Improvement programme, Artificial Insemination, Natural Service:

In Meghalaya at present there are 18,162 numbers of breedable female crossbred cattle, 1,44,130breedable female indigenous cattle and 4,710 numbers of breedable female buffaloes which needs to be provided with appropriate breeding support. This entire breedable bovine population cannot be covered with artificial insemination services due to remote location, inadequate infrastructure and free-range management system as commonly practiced in the State. It is anticipated to cover about 60 percent of total breedable cattle and buffalo population through AI and remaining 40 percent through natural service only. Under the National Project for Cattle and Buffalo Breeding (NPCBB) attempt has been made to provide the AI centres with frozen semen straws equipped with cryocans for better service. In spite of some constraint a sizable

number of animals could be artificially inseminatedin2015-16.Efforts have been made to increase the number of artificial insemination covering both crossbred and local cattle of the State.

Right from 1st five year plan, Natural service centres known as 'cattle upgrading centres' were established to upgrade the local indigenous breeds through natural service with graded bulls for augmenting production and productivity. Each of these centres was provided with a breeding bull and the centre was also functioning as a first aid centre including castration, vaccination works under the supervision of the Veterinary officer from the nearby dispensary. Under NPCBB programme, it was proposed to equip 118 numbers of dispensaries with AI facilities and trained 118 numbers of private AI workers. The Remaining interior areas were considered for strengthening to extend facility for natural service for which provision of 415 numbers of breeding bulls needs to be provided.

5.2.3: Requirements for augmenting productivity and maximizing production:

The important requirements to augment productivity and production in cattle and buffaloes are good breeds (Genotypes) of animals, provision of optimum environment to exploit the improved genotypes through optimum feeding and nutrition, proper management/housing, intensive health care and disease control. Post-harvest processing, value addition, marketing and organized trading are required for sustainability of the venture. To achieve these, formulation of the breeding policies, production of quality/proven breedable stock and their management, production and supply of good quality feeds, feed ingredients and fodder, application of newer and advanced tools and technologies, organized Marketing networks, value addition of animal products, infrastructure facilities which includes farm facilities for station breeding of animals for seed stock production, Hospital, dispensaries, Polyclinics, Diagnostic laboratories and others to provide health care support, A.I. centres, information technology and communication systems, extension works for transfer of technology and feedback, Human Resource Development, issue identification and policies for planning and development, implementation of plans and programmes, monitoring and evaluation and measurements of progress and target achievements.

The mission and targets of the proposed cattle breeding policy are to increase productivity, and conservation of indigenous animal genetic resources besides strategies to provide superior semen for AI as per the breeding policy and expansion of infrastructure like ICDP centres, AI networking along with bull testing/selection facilities and extension of advanced technologies for cost effective production, processing of milk and manufacture of milk products.

Chapter –6

6.1: BOVINE (CATTLE AND BUFFALO) BREEDING POLICY

The productivity enhancement of bovine populations of Meghalaya for milk is envisaged by improving genetic potential of the animals and improving their overall management system.

Although the state has been adopting cattle development through crossbreeding, there is persistent shortage of genetically improved cows with higher productivity in the state. The demand for improved cows and crossbreds has gone up substantially, because of various beneficiary oriented programmes initiated by the Department of Animal Husbandry & Veterinary as well as the Dept. of Rural Development in Block levels. The Department of Animal Husbandry and Veterinary is responsible for all the activities relating to livestock production, breeding, health, feeds and fodder production, planning, administration and policy implementation. Besides procuring frozen from best quality proven bulls, the cattle breeding farms of the state are also expected to produce and supply breeding bulls for AI as well as natural service.

6.1.1: OBJECTIVES OF THE CATTLE/BOVINE BREEDING POLICY:

Cattle breeding policy for the State of Meghalaya has been recommended with the following objectives:

(A) Genetic improvement for productivity enhancement of Meghalaya indigenous/nondescript cattle by crossbreeding with exotic breed(s) and grading up by Indian cattle breed to a desired inheritance level.

(B) Improvement and Conservation of Indigenous cattle of the state through selective breeding.

(C) Establish and maintain pure germ-plasm pool of exotic and Indian breeds suitable for the state to meet the present and future requirements.

(D) Maintenance of crossbred/graded animals produced by Artificial Insemination at farmers' field ensuring that the crossbreds produced and propagated are adapted to local environmental conditions and emerging climatic challenge.

(E) Expansion of infrastructure and support mechanisms to propagate the improved and elite germ-plasm.

(F) Strengthen support mechanism and development of the sector in respect of reproduction technology, Artificial Insemination (AI), feeding, housing and health care besides processing and marketing of the produce with value addition.

Accordingly the Bovine breeding policies recommended for the state of Meghalaya are as are as follows to fulfill the objectives laid down:

6.2: OBJECTIVE-A: GENETIC IMPROVEMENT FOR PRODUCTIVITY ENHANCEMENT OF MEGHALAYA INDIGENOUS/NONDESCRIPT CATTLE BY CROSSBREEDING WITH EXOTIC BREED(S) AND GRADING UP BY INDIAN CATTLE BREED TO A DESIRED INHERITANCE LEVEL.

6.2.1: Breeding strategies:

Genetic improvement of indigenous cattle of Meghalaya using bulls of improved exotic/Indian breed is recommended as the major strategy to increase productivity of milk in elite, large commercial and Government farm's cattle herds and in field where resources to maintain the crossbreds are provided and available. Artificial insemination (A.I.) using frozen semen from proven/selected bulls will be the main tool for breeding. Cross breeding and upgrading of the germ plasm available in the state are advocated for different livestock production system of the state based on the infrastructure and other input availability. Zone/location specific strategies to implement the policy are also suggested. Selective breeding for conservation and improvement of indigenous cattle of Meghalaya for their good quality type characteristics, body size, disease resistance etc. are also recommended. Despite all efforts to propagate the animals through A.I., a large number of the cattle population may not be possible to cover under A.I. due to topography and transport bottlenecks of the state and hence these animals may have to be provided with natural services (NS). As such making available good quality breeding bulls for natural service in all those localities will be produced.

Crossbreeding programme significantly increase the milk production as well as play an important role in white revolution. For the purpose, superior frozen semen doses at organized farms/semen stations will be needed to cover large cattle population of the state. Along with crossbreeding programme, it's time to conserve the indigenous animals for further successful and effective crossbreeding.

6.2.2 : Choice of breeds of cattle for breeding in Meghalaya:

The Indigenous/Nondescript cattle of the state are the basic foundation stock for improvement of their genetics and production potentiality. These cattle are largely reared under Extensive (low input low output production) production system. The animals although produce very little quantity of milk in comparison to improved Indian breeds of cattle, but they have traits

of better adaptability in the harsh environment and in extensive production system besides disease resistance. They also produce milk with higher butterfat content.

(a) Exotic cattle breeds for crossbreeding with Indigenous cattle: In the context of Meghalaya, Jersey and Holstein Friesian had been the breeds of choice for crossbreeding with the indigenous cattle. HF and Jersey may be the exotic breed of choice in the foreseeable future too because of their high milk yield and reasonably good butter fat percentage and high breeding efficiency and lifetime production and low age at sexual maturity.

Although, Holstein Friesian yields more milk than Jersey, the performance of HF half-bred will largely depend on feed and fodder availability and better management. In hilly terrain where ambient temperature is relatively low HF inheritance may be infused to enhance milk yield. Besides, progressive farmers with better knowledge of scientific cattle management and possessing means to provide better housing, feeding and health coverage can go for HF half-bred. As per the existing strategy in force, Jersey and Holstein-Friesian breeds are used as exotic breeds in varying proportions of inheritance level. Jersey breed because of its smaller size, high fat content in milk, heat tolerance and disease resistance is preferred for breeding of the small sized non-descript cattle. Shortage of roughage, high cost of concentrate feeds, the preference and economic advantage, the Jersey will continue to be the breed of choice in the state. However, for farmers and areas where feeding is less expensive and more roughage based, Holstein-Friesian would be suitable and preferable. Considering all these aspects in the state, it is proposed that Jersey and Holstein-Friesian will be used as exotic breeds for genetic improvement of the indigenous cattle of Meghalaya through cross breeding.

(b) Indian cattle breed for grading up of Indigenous/Nondescript: Sahiwal and Red Sindhi are the Indian cattle breeds of choice preferred in Meghalaya for grading up of the indigenous/nondescript cattle to develop as a multipurpose animal including milch and draught purpose.

6.2.3 : Level of inheritance in various crossbreds:

(a) Exotic (Jersey/ Holstein Friesian) inheritance level: Fifty per cent exotic inheritance level in the crossbreds with indigenous cattle is considered to be the most ideal for growth, reproduction and milk yield under the prevailing conditions of Meghalaya. The higher level of exotic inheritance of 75 percent or more in crossbreds demands relatively more feed and fodder, improved management and are prone to many tropical diseases which results in loss of general adaptability making the animal difficult to withstand the physiological stress of production and

reproduction. Considering the nature and quantum of inputs offered by the farmers these limitations will have to be overcome now by switching over to intensive or semi-intensive management system for increased level of exotic inheritance beyond 50 percent. It has also to be supported by proper animal health care and management inputs in the populations with higher exotic inheritance level in field.

(b) Grading up of Indigenous cattle using Indian breed: The Indian improved cattle breed adopted for the state viz, Red Sindhi, Sahiwal will be used for grading up of the indigenous nondescript cattle of the state for attaining maximum possible inheritance level of the Indian breed. This will improve the genetics of the indigenous cattle as a multipurpose animal for milk, work etc. and to attain maximum productivity without losing the good quality genes for disease resistance and adaptability.

(d) Production of multiple breed cross (Exotic, Indian breed, Meghalaya Indigenous): Multiple breed (usually three breeds) crosses with inheritance of Red Sindhi/Sahiwal and Jersey/HF in Indigenous cattle will also be produced exclusively by using high grade semen from within or outside the country for higher productivity and for adoption of climate resilient cattle husbandry.

6.2.4: Area of coverage by different breeds in various zones:

The areas of coverage in the state for use of Jersey/ HF/Indian breed will be as determined by the state Department as per suitability, feasibility, adoption criteria and choice of farmers in different specified areas/zones/districts of Meghalaya and breeding plans will be developed and followed for different zone of the state as per requirement. The levels of inheritance of different breeds of exotic and/or Indian breed are suggested. For instance, in zone I, II and III, exotic HF is recommended while in zones IV and V Jersey breed would be adopted for crossbreeding while in East and Ri-Bhoi district both the breeds may be utilized. In all the districts, grading up of indigenous/nondescript cattle by using Red Sindhi or Sahiwal breed to produce multipurpose crossbreds has been recommended. However, looking into the quality and type of indigenous cattle availability in all the zones, selective breeding amongst the Meghalaya indigenous cattle in field situation is also suggested to improve their inherent production potentiality and for conservation of the precious genes of adaptability and disease resistance *in situ*.

Holstein Friesian (HF)/Jersey inheritance will be promoted in defined geographic zones/areas/herds where fodder production and its availability is more promising with a well-developed milk marketing channel, in town areas having higher market demand for milk, and in

areas of high elevation with congenial climate and also in areas where sizable number of improved (graded) animals already exist with HF/Jersey inheritance.

Prerequisites for breeding policy involving Holstein Friesian/Jersey:

1. There are three strategies for implementation of this policy:

(i) Use of frozen semen of proven bulls procured or imported from within the country/abroad for A.I.

(ii) Rearing and production of Jersey/HF- bulls in the state Cattle Breeding farm(s), their evaluation/testing and production of semen for A.I. or distribution of bulls in different areas for natural mating till A.I. facilities are developed in remote areas.

(iii) Procurement of good quality crossbred F_1 bull calves from the farmers' herd, selection of the superior bulls through pedigree records/progeny testing or other reliable and feasible selection methods and use for inter-se mating.

6.2.5: OPEN NUCLEUS BREEDING SYSTEM (ONBS):

This system envisages formation of a nucleus population of breedable animals of exceptionally high genetic merit. Nucleus herds of HF/Jersey/Half-breds/Indian breeds/indigenous cattle may be established in the stations/farms located in or around district/zonal headquarters where infrastructure, manpower and other facilities are readily available or can be developed with minimum effort. The outstanding breedable males are to be let out and/or frozen semen from the nucleus herd to the farmer or breeders in the neighbouring areas to bring about genetic improvement of their animals.

This system is useful under the conditions prevailing in the state of Meghalaya where field progeny testing and Artificial Insemination have not yielded much success for want of necessary infrastructure and lack of field performance recording.

Plan of work for ONBS:

1. Screening of the unrecorded base population for identifying some outstanding females.
2. Collection of the outstanding females to form a nucleus herd which would be used as test group of animals.
3. Production of semen from good quality bulls and A.I. of the cows/heifers in participating herds in field and production of progeny.
4. Efforts may be made to super ovulate the elite animals from the outstanding herds and *in vitro* fertilization with semen of superior sires.

5. Transfer of the resulting embryos to the test group in the nucleus herd as well as to the females in the unrecorded base population.
6. The best males are to be selected on the basis of their own performance as well as on dams' and siblings' performances. They are then to be extensively used in the field.
7. The female offspring are next considered as potential elite females to donate embryos by Multiple Ovulation and Embryo Transfer (MOET) for the following cycle after their appraisal against elite cows already present in the nucleus herd and used upon for MOET.

ONBS can be used as an alternate way of testing young bulls at an early age of about 3-4 years instead of 7 years in conventional breeding plans. ONBS can be followed for genetic improvement of both purebred and crossbred population. In Meghalaya, ONBS can be tried for genetic improvement of crossbred population for which some nucleus herds of about 200 animals are to be established in three zones of the State considering the magnitude of the crossbred population. The animals collected from the field after their screening as outstanding animals will form these nucleus herds. In the Nucleus herds, besides other, facilities for proper recording systems must be there so that the best males can be selected on the basis of available records of their Dam, sibling and own records. Simultaneously, a system should also be there for recording of at least these females' progenies, which would be collected and used as replacement stock in the field. To start with, if facilities are developed, ONBS can be initiated in cattle breeding tracts in and around Department headquarters.

6.2.6: BREEDING POLICY FOR DRAUGHT/DUAL PURPOSE:

Draught animal power (DAP) is an excellent example of mass application of appropriate technology. It is ideal for small farmers of less than 4 hectares. DAP is also appropriate for small-scale transportation (about 1 tone over short distance). The energy output of a draught animal is dependent on the breed, size, weight, nutrition level etc. In Meghalaya, due to its topography and lesser adoption of mechanized agriculture, the role of draft animals becomes very important.

The male progeny of indigenous cattle under selection which are adapted for work in the prevailing topography of the land and climate can fulfil the demand of draught power. The Jersey/ HF/Indian breed and Meghalaya indigenous half-bred/graded bullocks can be trained to perform in such conditions. However, the exotic crossbreds may exhibit more stress during summer season limiting their work performance. The large numbers of crossbred bulls with Jersey/ HF inheritance, to be produced as a result of the implementation of cattle improvement programme for milk, will be used as draught animals. One of the options for production of draft/dual purpose

animals is the up gradation of indigenous cattle by use of sires of outstanding Indian breed viz. Red Sindhi or Sahiwal. Such an up gradation programme will aim at increasing both draught and milk production ability.

6.2.7: BREEDING POLICY FOR BUFFALO

The buffalo population of the state is concentrated primarily in valleys and plain areas of the states. The animals are of either indigenous or resembled to swamp buffaloes of Assam. Though, in regard to milk yield, these buffaloes are not at par with those of improved riverine breeds, milk of these buffaloes is very rich in fat and protein content. Whole milk and milk products of these buffaloes are always valued for quality. The buffaloes are also good draught and meat animal. These buffaloes are distinctly different from the riverine breeds not only in behaviours but also in respect of chromosome number. In spite of this difference, they are interbreeding.

The Buffalo breeding policy of Meghalaya will fulfil three basic requirements as follows:

(i) Augment production of milk with high fat percentage in buffalo dominated areas.

(ii) Conservation of indigenous buffalo germplasm.

(iii) Meeting the draught and meat animal requirement of the State and export.

In the light of the above observations, the buffalo breeding policy for milk production for the state is proposed as under.

6.2.8: Crossbreeding of Indigenous/Swamp buffaloes with Murrah breed:

In absence of sufficient data on the performance and fertility status of Riverine x Swamp crossbred buffalo in Meghalaya, the approach to such a crossbreeding programme has to be cautiously implemented. Therefore, initially such a crossbreeding programme will be taken up in limited scale using the bulls of organized elite herds of Murrah and crossing them to indigenous/swamp females. AI using Murrah semen procured from Grade A semen station of the country will also be started. The F_1 and subsequent generations will be mated *inter se*. Data on production and reproduction performance of the crosses will be collected and analysed besides the fertility status of the F_1 animals to proceed further and to design the breeding plans.

The future of this crossbreeding programme will rest on the performance of the crossbreds under farm and field conditions. In order to implement the suggested breeding policy for buffaloes, the following points need to be considered for appropriate action so that the policy can be implemented in its true spirit.

(i) Production of indigenous/swamp buffalo breeding bulls, their selection and evaluation for straight breeding.

(ii) Standardization and implementation of Artificial Insemination (A.I.) in buffalo for breeding with Assisted Reproduction techniques including collection and preservation of semen.

(iii) Distribution of selected bulls of indigenous/swamp buffalo in different herds for natural service where A.I. facility does not exist.

(iv) Identification of Govt. L/S farms and programme for rearing of pure Murrah buffalo breed.

(v) Identification and Field performance recording system has be introduced and monitored.

6.2.9: PLAN OF BREEDING:

The zone wise breeding approaches for cattle and buffaloes are presented in Table below:

			FIRST CROSSING		SUBSEQUENT CROSSING	
	Zone	**BULLS**	**Target/Foundation Population (Breedable cows/heifers)**	**BULLS**	**Target Population (Breedable cows/heifers)**	**Method of Breeding**
CATTLE		HF	Indigenous cattle (ML)	HF X ML	CROSS BRED (50:50)	Cross breeding and Selection/Interse
		JERSEY	Indigenous cattle (ML)	JERSEY	CROSS BRED (50:50)	Cross breeding and Selection/Interse
		JERSEY/HF	ML	J X ML/HFXML/Sahiwal/Red Sindhi/Graded	CROSS BRED(50:50)/ Sahiwal/ Red SindhiGraded	*nterse-mating*/Grading up.
		ML	ML	ML	ML	Selective breeding for mprovement and conservation.
		ML/Graded bulls with good draught traits	ML	ML/Graded selected bulls with good draught traits	ML	Selective breeding for mprovement of draught power.
		Sahiwal/ Red Sindhi/	ML	Sahiwal/ Red Sindhi	CROSS BRED Graded	Grading up for dual/multipurpose(Draft,milch etc.) animals
BUFFALO	***Available zones***	Indigenous/ Swamp/ Murrah	Indigenous / Swamp/ Murrah	Indigenous/ Swamp/ Murrah	INDIGENOUS/SWAMP/ Murrah CROSS	PURE BREEDING/ UPGRADING

6.2.10: Selection of Male (Sire) and Female (Dam) for breeding:

For attaining high and economic levels of milk production and its further improvement it is important that the farmers should get rid of their surplus and uneconomical animals. Selection of males and females for mating to produce their next generation of offspring is therefore will be made. Genetic improvement can be brought about by judicious selection of both sires and dams. Selection of females is normally restricted because of low replacement rate required to maintain the size of the herd whereas only a small fraction of males required for breeding, which greatly exceeds gains attainable through selection of females. An accurate evaluation of males for their genetic merit for milk production and intensive selection of genetically superior sires is the key to all livestock improvement programmes. AI with frozen semen will facilitate production and dissemination at a faster pace of germplasm of high genetic merit bulls that is by higher intensity of selection. Therefore, either scientific selection of males on the basis of their pedigree and subsequently on the basis of their progeny performance will be made in Cattle breeding farms and/or frozen semen from such males will be procured from within the country or abroad for doing artificial insemination of the selected cows. Besides that an appropriate milk production based criteria for culling of females on the basis of low milk production will be made with an index based on expected producing ability (EPA). It is important to minimize involuntary culling on the basis of reasons other than milk production which could by realized through proper management practices thereby effecting high intensity of selection for milk production.

6.2.11: Work plan under Meghalaya State Implementing Agency (MSIA), ICDPs:

For execution of the breeding policy, detailed work plan and technical programme will be framed by the Meghalaya State Implementing Agency (MSIA) and Intensive Cattle Development Project (ICDP) of the Department of AH & Veterinary. The ICDP Centres, Govt. Cattle Breeding farms have been identified and recommended for developing infrastructure required for Semen stations and laboratories, and for rearing of outstanding elite cows and bulls for production of germ plasm locally. The main centres to be located in the state capital establishing a network of nucleus herds, semen centres and AI facilities in different districts and zones. Male calves born of the elite class may be identified, selected and purchased as per requirement on weaning and enlisted for future use.

6.3: OBJECTIVE-B: IMPROVEMENT AND CONSERVATION OF INDIGENOUS CATTLE THROUGH SELECTIVE BREEDING.

Conservation of Meghalaya Indigenous cattle:

The native cattle available in the state of Meghalaya are not yet described as a breed. These indigenous cattle are very small in body size as compared other Indian cattle and cattle breeds and produce every little quantity of milk in comparison to improved Indian breeds of cattle. Native cattle of the state are reared mostly under Extensive (low input low output production) production system and they have traits of better adaptability in the harsh environment and management conditions besides having resistance to many diseases. They also produce milk with higher butterfat content. That is why these animals need to be conserved for conserving the genes of these traits for posterity. At the same time they also need to be improved in their production potentiality.

Therefore Selective breeding with selection of bulls and dams with higher yield and generating nucleus stocks of indigenous cattle for use in field is recommended with a well laid down mating system. Selective breeding of the indigenous cattle are suggested in its breeding tracts in order to conserve the native indigenous cattle of Meghalaya retaining the traits of disease resistance, adaptability to harsh environment and management conditions and also to improve their production potentiality to utilize as a good foundation stock for crossbreeding with improved breed, This would be followed in areas where there is no alternative to the extensive production system at present due to obvious reasons.

Surveying breed population dynamics of indigenous cattle, performance levels of these cattle with their genetic and phenotypic data has been recommended to chalk out for recognition of these unique cattle as a registered breed and to develop comprehensive breed conservation programme.

6.4: OBJECTIVE-C: ESTABLISHMENT AND MAINTENANCE OF PURE GERM-PLASM POOL OF EXOTIC AND INDIAN BREEDS SUITABLE FOR THE STATE TO MEET THE PRESENT AND FUTURE REQUIREMENTS.

In order to execute the Breeding Policy for grading-up of indigenous cattle and buffaloes, crossbreeding in identified areas, hilly and resource rich areas, selective breeding and

maintenance of introduced well defined Indian breeds of cattle and buffalo and for replacing surplus draught with dual-purpose/milch animals establishment and maintenance of pure germ plasm of required breeds are envisaged and recommended as follows.

Pure breeding of Indian breed of cattle (Red Sindhi/Sahiwal):

It has been suggested that the Red Sindhi, and Sahiwal breed may be introduced and reared as a purebred in the state. A purebred stock of at least one Indian breed mentioned above may be raised with special funding from Govt. of India or the state.

Production/Raising of Bulls in the state:

Establishment of elite herds of chosen breeds as bull production/raising farms may be continued in the state for generation of purebred/crossbred/graded young bulls to produce semen locally or to distribute and use them for natural mating where A.I. facilities could not be created so far. Pure/crossbred bulls thus produced will have to be evaluated continuously by using pedigree/performance records. The half-bred bulls for evaluation may also be obtained from the farmers herd on the merit of pedigree performance. Number of young bulls put to test and numbers finally selected for the purpose will be worked out from time to time as per the need and availability of infrastructure, manpower and other required facilities. The young bulls of different categories of pure or crossbreds for evaluation will be produced locally in the state to avoid genetic slippage and to overcome the problem of genotype-environment interaction in selection/ranking of bulls.

Introduction and Pure breeding of Murrah breed:

Two outstanding riverine breeds of buffalo viz. Murrah and Surti were found to have performed satisfactorily under organized farm environment in some of the agro-climatic regions of North East India. Trained farm entrepreneurs and well to do farmers will be encouraged to rear Murrah buffaloes in scientific manner under intensive or semi-intensive system of management. The State Govt. will maintain at least one elite herd of Murrah buffalo as a source of improved germplasm. Initially this may be started by establishment of a buffalo nucleus herd in the district having highest concentration of buffaloes and other facilities.

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The Cattle breeding farm located at Upper Shillong use to maintain germ plasm pool of HF exotic breed while the Regional crossbred cattle breeding farm produces and raise the crossbreds of these two exotic breeds with indigenous cattle and maintains a stock of pure Sahiwal cattle. All these five farms will further be developed with required infrastructure and

strengthening of herd size. The RCBF, Kyrdemkulai and Buffalo farm, Songsak will be expanded to breed and raise Indian breeds (Sahiwal and Red Sindhi) and Murrah buffaloes respectively. Initially a stock of about 100 good quality animals true to their breed characteristics will be procured from their home tract and from reputed institution(s) to establish and improve the foundation stock to multiply. Frozen semen of these two breeds and buffalo will also be procured from Grade A certified Semen station of the country for utilization to increase their population/herd size and also to utilize in the grading up programme of indigenous cattle of Meghalaya and also in crossbreeding.

Selective breeding of indigenous/swamp buffalo:

Improvement in genetic potential of indigenous/swamp buffaloes of Meghalaya will be sought through selection and pure breeding for higher productivity of milk. For this, few elite herds of these buffaloes will be established. Basis of selection of the breeding animals in these herds mainly will be type consolidation, milk yield and quality traits. Emphasis will be on achieving maximum genetic gain by way of selection of breeding bulls and their extensive use by A.I. or natural service in absence of A.I. facilities.

The breeding bulls will be selected based on their dam/progeny and/or siblings' performance. Young bulls born in the elite herd or born in the farmers' herd will be selected on the basis of conformation, general health and pedigree records. Number of young bulls to be selected for inclusion in test mating and the number of tested bulls to be finally selected will be worked out on the basis of requirements, infrastructure availability or creation of needed facilities.

6.5: OBJECTIVE-D: MAINTENANCE OF CROSSBRED/GRADED ANIMALS PRODUCED BY ARTIFICIAL INSEMINATION AT FARMERS' FIELD ENSURING THAT THE CROSSBREDS PRODUCED AND PROPAGATED ARE ADAPTED TO LOCAL ENVIRONMENTAL CONDITIONS AND EMERGING CLIMATIC CHALLENGE.

Indigenous breeds of cattle are observed to be more resilient to climate change. Although crossbreed cattle are more productive under normal environment, lack of adequate fodder and rising temperatures have an adverse impact on the quantity of milk they produce. However, in Meghalaya it has been observed that the crossbreds of exotic Jersey and indigenous as well as HF and indigenous cattle are equally capable in production of milk provided they are raised with

sufficient quantity of green fodder and good quality concentrate ration along with adequate health cover. Therefore the exotic breeds of cattle chosen for the adoption for crossbreeding in the changing scenario of climatic conditions in Meghalaya have proven to be more adaptive to changes in the environment and climate variations.
Besides that the approach of conservation and management of indigenous cattle in the wake of climate change has been a primary mission under the breeding policy not only to conserve the desirable genes but also to introgress these qualities in crossbreds for better productivity as well as for adoption to climate change effects and hence the cattle breeders and farmers can sustain their income by adopting to these methods of breeding for developing resistance to adverse effects of climate change. Therefore maintenance of crossbreds or graded animals in field conditions has been recommended coupled with data recording for selection of breeding of the animals.

Climate resilient cattle breeding will be done by creating awareness amongst farmers regarding mitigation of greenhouse gases using improved feeding practices and culling of unproductive/surplus animals to reduce emission of greenhouse gases. This will also be achieved by adoption of cclimate change measures like cchanges in feeding regime such as increasing the number of feeding (up to 6-8 times/ day), providing more palatable, high quality and low fiber diet, maintaining energy diet by adding fat in the ration(3-5%), proportionate increase of green fodder and supplementation of electrolytes improved milk yield and acid-base balance in heat stressed dairy cows. Changes in grazing time and duration by developing suitable green pasture is also suggested. The use of heat tolerant breeds in the policy is envisaged to make Genetic Modification in production of dairy cattle in the changing scenario of climate.

Field data recording:

For genetic improvement of cattle and buffalo population of the state, use of outstanding bulls of superior breeding merit is essential. For evaluation of the breeding worth of bulls, besides the performance records of their dams and sires, cows inseminated and the male and female progenies produced by each bull are to be given identification numbers using suitable tags/microchips/RFID in the field for keeping their records in regard to various production and reproduction traits. Besides that some information on the status of the farmers and management systems followed by them will also be recorded.

All information in regards to the A.I. records, bull records, calving records, health records are to be maintained at the A.I. centres. It is important to note that the farmers maintain their

female progeny covered under the project at least up to completion of their first lactation. Appropriate formats for keeping certain records of the dam and progeny are to be maintained by the farmers also.

Some important information to be recorded is as follows:

On the farmer house:

- Occupation and education of the farmer, Land-holding and area devoted to fodder production,
- Number of animals - age and species wise,
- Housing system of animals, Management - stall feeding or grazing, and
- Identification of animals.

On animals:

Data on Dams:

- Lactation number, Date of A.I., Date of conception, Date of calving, Sex of calf,
- Test day milk yield at monthly intervals,
- Fat percentage in milk.

Data on progeny:

- Date of birth, Pedigree of the animal, Date of insemination, Date of conception, Date of calving.
- Milk production at monthly interval,
- Quantity and type of fodder and concentrate at monthly interval.

To implement ONBS, all breeding farms are to be associated with field herds.

Milk recording system:

Milk recording in the field may be done by the Integrated Sample Survey (ISS) workers and/or casual milk recorders on contract basis at monthly interval on test progenies and in dams of the progenies and bull mothers etc. both in morning and evening. At least one milk recording on each test progeny should be done in the presence of senior technical staff. Milk records will be compiled by the milk recorder and sent to the executing centre with one copy to the owner of the field animals.

All the female progeny born will have to be identified by alphanumeric code by ear-tag or microchips or RFID.

6.6: OBJECTIVE-E: EXPANSION OF INFRASTRUCTURE AND SUPPORT MECHANISMS TO PROPAGATE THE IMPROVED AND ELITE GERM-PLASM.

Infrastructure available and expansion envisaged:

The available infrastructure network in different districts of Meghalaya in respect of number of ICDPs, Stockman and AI centres, Cattle and buffalo breeding farms, Fodder seed production and demonstration farms, Feed mill, Dairy and chilling plants, Bulk milk coolers (BMC) etc. needs to be widened with their establishment in every district for implementation of the breeding policy. There is a strong need of developing these infrastructures in all the districts of the state and hence it is recommended that the number of ICDPs may be increased to 4 (four)to begin with from existing 2 (two) for coverage of wider areas under Artificial insemination programme. Similarly the number of AI centers may also be increased substantially and also in uncovered districts which will have an impact on coverage of more and more number of breedable cows and heifers in the state.

Due to the obvious reason of various constraints for establishing large commercial cattle and buffalo farms for production of milk as the source of animal protein, extensive livestock production system is the viable option not only for animal production but also for sustainable income generation and rural livelihood. Accordingly, it is targeted to provide self-employment for unemployed youths by way of establishing Animal/Dairy Husbandry based farming and entrepreneurship activities, which will also ensure higher per capita availability of animal protein in the states. Farmers in the rural backyard especially women will also be empowered economically as downstream beneficiaries by engaging themselves in the process of enhancing the milk and various value added products.

Manpower requirements:

Support in terms of human resource will be required to implement the policies and programmes and manage the livestock breeding and development scenario in the state. Required number of officers and staff in each farm has to be placed for various categories such as Farm Manager, Animal Breeder and reproduction specialists, Assistant Farm Manager, all having the required qualifications and training in related fields. Livestock Supervisor, Veterinary Field Assistants for Farm, Laboratory, fodder field, feed mill, health care etc. will have to be also provided besides the required number of Farm, Animal and laboratory attendants, office staff etc.

Feeds and Fodder development:

Indigenous fodders be identified which are relished by the cattle and buffaloes in the state and strategies formulated for fodder development accordingly. Plans for cultivation of perennial fodders such as Napier, Guinea, Para, and combo signal etc. in large scale will be made. Maize cultivation in a massive scale in the state is recommended to become self-sufficient in its requirement not only as fodder but also as a vital and important feed ingredient for concentrate feed. As part of the policy, recommendations have been made to ensure adequate supply of fodder for cattle and buffaloes. Fodder production units will be established at all the Govt. Cattle and Buffalo farms and the fodder produced at these farms will be supplied to the crossbreeding areas that will be identified across the state.

Proper balanced nutrition with concentrate feeds and green fodder are highly essential for full expression of the genetic potential of the animal. Small land holding size limits cultivation of fodder in the state as almost the entire land is put under crop/grain production for human consumption. As the compound feed manufacturing unit in the whole of the NE India is very scanty, utilization of nonconventional feed resources could not be maximized locally. Therefore it is recommended for establishment of more numbers of compounded feed manufacturing unit in the government sector.

6.7: OBJECTIVE-F: STRENGTHEN SUPPORT MECHANISM AND DEVELOPMENT OF THE SECTOR IN RESPECT OF REPRODUCTION TECHNOLOGY, ARTIFICIAL INSEMINATION (AI), FEEDING, HOUSING AND HEALTH CARE BESIDES PROCESSING AND MARKETING OF THE PRODUCE WITH VALUE ADDITION.

In order to execute the breeding policy the following important technologies to be adopted for achieving the targets within a reasonable time frame:

Artificial Insemination (A.I.), Reproductive biotechnology: The scientific selection procedures and the breeding systems will ever remain the most potent tools for cattle improvement. The modern reproductive biotechnology can make these tools even more effective by increasing the reproductive efficiency of breeding animals. Besides extensive use of Artificial Insemination (A.I.), other technologies available for use in animal improvement strategies such as

cryopreservation of semen and embryo, Multiple Ovulation and Embryo Transfer Technology (MOET) etc. will be gradually introduced in the state. For A.I. best of the best proven bulls identified by progeny testing will be used for large-scale insemination of cows.

Embryo Transfer Technology (ETT) by which fertilized ova are collected from a female called donor and transferred for development to term to another female called recipient. The main objective of ETT is the improvement of animal population through better utilization of superior females. The technique will allow expansion of desirable gene pool for the females for breed improvement. Using current technology of Multiple Ovulation and Embryo Transfer Technology (MOET), it is feasible to obtain large number of calves from a single cow over a period of one year. The intensity of genetic selection of females can thus be enhanced by MOET, since it is possible to obtain several daughters from a single mating of a superior dam using recipients of a lesser genetic value as foster mothers. The techniques of A.I. and MOET will provide means of efficient use of superior males (bulls) with much higher selection intensity for breeding and highly meritorious females to propagate improved progenies.

Use of frozen semen from selected Bulls/Sires for AI:A bull is said to be *half the herd*. The success of the cattle breeding policy will depend on the genetic worth of the breeding bulls from which semen is collected for Artificial insemination. In absence of selection of bulls, degeneration and dilution of characteristics is inevitable due to segregation of genes. There is a necessity to produce and test bulls locally in the environment in which their progeny are to perform to avoid genetic slippage and to improve the genetic potential. However, production of progeny tested bulls and establishment of bull mother farms for regular production of bulls of highest merit are very costly and time consuming proposition which may not be feasible for the state to pursue alone. In order to use the outstanding bulls/sires of the chosen breeds, frozen semen from certified Grade- A Semen station(s) of the country/abroad will be procured for breeding of cattle in the state. Frozen semen will be procured from the bulls of higher genetic merit as evident from their records of breeding value/PD from the source of procurement. The infusion of superior germplasm from exotic donor breeds of Jersey/Holstein Friesian should be a continuous process to widen the genetic base. The breeding value of bulls thus introduced should preferably be above the bulls in service.

Extensive use of top ranking tested bulls will be ensured through a well-conceived A.I. programme. For this the already available infrastructure facilities of the state Animal Husbandry and Veterinary department will be revamped and put to use to the maximum extent possible.

Also, large-scale procurement/production of semen doses from top bulls and their cryopreservation will be ensured. This will meet the farmers' demand of quality semen year round, and also help in preserving valuable germplasm for posterity.

Covering more population under AI network and providing AI service at farmers doorsteps is recommended drawing suitable targeted plans.

Pregnancy diagnosis and Identification:

All the breedable females will be bred through Artificial Insemination using semen from identified bulls of Grade-A semen station. Proper records of A.I., pregnancy diagnosis (PD) and calves born will be maintained. Each animal covered under the evaluation programme will be registered and issued a card where all information in regard to that animal will be recorded and maintained at the A.I. centre as well as at the executing centre. Heat detection kits may be supplied for use by the veterinary officers and farmers.

Wherever, natural mating has to be advocated for want of appropriate A.I. facilities and infrastructure, records pertaining to the bulls introduced, their pedigree records etc. have to be maintained by the govt. institutions. At the same time, castration of the unwanted bulls and their culling has also to be done to get the desired level of genetic gain in production.

Advanced GIS technology may also be used in field data recording with traceability of the milch animals. RFID method will be practiced for identification and record keeping of the outstanding animals.

Animal Health, Disease Control and Bio-security measures:

- Disease surveillance and monitoring for incidence of diseases in animals may be strengthened. Regular reporting may be made for control of important diseases for sustainable production.
- Periodical health care and vaccination camps may be organized in the field/livestock rearing areas.
- Interstate check post may be strengthened to provide strict vigilance with facilities for screening of the animals before certification for movement.
- Some of the important facilities to be created in order to prevent disease incidence and to tighten the bio-security measures are: Setting up of check gate and quarantine stations at the point of entry to Meghalaya, Regular vaccination against prevailing and other emerging diseases in pigs (FMD, CSF etc.), cattle (FMD, HS, BQ etc.) and other

livestock, Standard operating protocol to prevent spread of diseases and infection, and Postmortem facilities and incinerator.

Animal production/performance data and Health information system:

- Data collection and performance recording system may be developed and meticulously followed in the farms and field. Farmers may be made aware of the importance of data recording and trained from time to time along with other training programmes.
- The Department may adopt a policy to collect information in regards to different aspects of animal production, animal health, developmental activities etc. through MIS technology. Under this Animal Production and Health Information System, a computer based networking system may be established enabling faster flow of information. The network is to cover all the districts of the state.
- The Department of A.H. & Veterinary may also launch and update its own website to provide access to vital information and activities pertaining to the department and the programmes. The computer network facilities and the website will help the farmers, breeders, planners, veterinarians and others providing easy information access for successful implementation of the policies.

Feeds and Feeding:

Feeding a balanced diet and providing abundant supplies of cool and clean water will help to optimize feed and nutrient use in cattle and buffaloes. Proper feeding of dairy cattle should envisage minimum wastage of nutrients and maximum returns in respect of milk produced.A concentrate mixture made up of protein supplements such as oil cakes, energy sources such as cereal grains (maize), laxative feeds such as brans (rice bran, wheat bran, gram husk) etc. is generally used. Mineral mixture containing major and all the trace elements should be included at a level of 2 percent. Feeding schedule with specified composition of ration may be used for different categories of animals to achieve optimum productivity.

Post-harvest Processing and Value addition:

Some of the areas of dairy industry to be toned up in the near future by adoption of newer and differentiated technologies and equipment include:

1. Raw milk handling: The raw milk handling needs to be elevated in terms of physicochemical and microbiological properties of the milk in a combined manner. The

use of clarification and bactofugation in raw milk processing can aid better the quality of the milk products.

2. Milk processing: Better operational ratios are required to amend the yields and abridge wastage, lessen fat/protein losses during processing, control production costs, save energy and broaden shelf life. The adoption of GMP (Good Manufacturing Practices) and HACCP (Hazard Analysis Critical Control Points) would help produce milk products adapting to the international standards.
3. Packaging: This area can be improved using the range of packing machines for the manufacture of butter, cheese and alike. Better packaging can assist in retaining the nutritive value of products packed and thus broaden the shelf life. A cold chain distribution system is required for proper storage and transfer of dairy products.
4. Value-added products: There's vast scope for value-added products like desserts, puddings, custards, sauces, mousse, stirred yoghurt, nectars and sherbets to capture the dairy market.

The Indian dairy industry has aimed at better management of the national resources to enhance milk production and upgrade milk processing involving new innovative technologies. Impetus may be given to the small scale as well as large scale industries to handle the animal products for value addition with a well knit and organized marketing system.

Marketing/disposal of animals:

- An organized marketing system with required facilities may be developed in collaboration with all concerned agencies and corporations.
- Development of organized marketing network may be made for disposal of the farm produce by the farmers.
- Incentive price may be fixed by the Government for the animal products in the State so that the farmers get remunerative price for economic farming and earn their livelihood.
- Proper guidance in the marketing procedures is felt essential and hence Government may initiate a Livestock and Poultry corporation to deal with all these matters.

Training and capacity building:

Human resource development and management must get priority in the state so that the qualified and trained manpower can be increased and utilized effectively to handle the policies successfully. In order to properly implement and execute the breeding policy, suitable human

resources are to be placed in various positions and regular training has to be imparted in the state or outside for the followings:

- Training/refreshers course for field veterinary officers on different areas of breeding, reproduction, management, nutrition, health cover etc. may be conducted/organized for effective implementation of the policy.
- Training of trainers and officers on Breeding management, Farm management, Traceability, Food safety, Value addition and value chain in pig industry, Artificial Insemination(AI) technology, Semen processing and preservation, Health and disease management, Training for Para-vets on Training boars for semen collection, Disease management, Farm management, Feed processing etc.
- Training and refreshers' courses periodically for the Para veterinarians, entrepreneurs and farmers.
- Training for community level workers on awareness creation and community mobilization, Awareness and training for farmers on care and management of pigs, marketing, food quality and safety including zoonosis.
- Training of farmers, unemployed youths, women, SHG members on management practices and technology providing suitable package of practice on breeding, feeding, management, marketing etc. to be provided.
- A package of practice on management and control of diseases for different categories of animals may be evolved and suggested for field application.

Extension Network:

- The success of any project like genetic improvement of livestock and poultry in a state would largely depend on proper execution of the programmes and peoples participation besides farmers' acceptance. The extension network of the state A.H. & Veterinary Department has to play a vital role in this regard. The information wing of the department must organize programmes from time to time to disseminate the information and technical knowhow to the people.
- Improvement in extension network of the state utilizing modern ICT and mobile technology, Entrepreneurship development and farmers training must be carried out on priority to implement the policies and improve the livestock and poultry production scenario of the State.

- Awareness programmes should be undertaken at regular interval with the aid of Information and Communication Technology (ICT), audio-visual display, film shows, distribution of pamphlets, radio talk, display boards, shows, fairs etc.
- Awareness about mixed/integrated and organic farming may be made amongst the farming community through various extension networks.
- A package of practice on management and control of diseases for different categories of animals may be evolved and suggested for field application.

Livestock Insurance:

- The department should initiate a comprehensive livestock insurance scheme in collaboration with appropriate agencies to extend the benefit of insurance cover of the valuable animals reared by the farmers. The animals purchased by the farmers under Bank loan/DRDA scheme are generally insured by the Insurance Companies. The Department of A.H. & Veterinary should streamline the entire issue of livestock insurance to protect farmers' interest.

Follow up action by a group of experts in an effective way:

- Effective follow up action will be taken up by the Department to monitor the progress of implementation of policies and achievements made. A Technical Committee may be constituted for the said purpose by the Government.

Collaboration:

- In order to be successful in implementation of the breeding policies close collaboration of the Department of A H & Veterinary of Meghalaya with different other States of North Eastern Region; National Research Centres on Pig, ICAR, located in the NE Region; ICAR complex, Barapani; NBAGR, Karnal, Agricultural Universities located in the region, etc. would be made as and when required.

Chapter 7

7.1: ADDITIONAL RECOMMENDATIONS TO IMPLEMENT THE POLICIES

The following additional recommendations are made for implementation of the Bovine Breeding policy:

(1) Required fund for proper implementation of the policy and development of infrastructure may be allocated and provided as per the programmes.

(2) The proposed breeding policies for the state of Meghalaya will be implemented by the A.H. & Veterinary Department. Any effort for Bovine development by individuals, public organizations and non-government organizations etc. must be in conformity and within the purview of the proposed policies. The policy will be mandatory for the state of Meghalaya.

(3) In order to develop a pool of improved germ plasm of bovine breeds as envisaged in the policy, provisions may be made for procurement/import of breeding stock/semen from national and international organizations/sources.

(4) A technical committee may be constituted to monitor and evaluate the implementation of the policy. This committee will also act in the advisory capacity.

(5) Each cattle/Buffalo breeding farm will have a Farm Advisory committee to see the progress of the farm and provide suggestions from time to time.

(6) Artificial Insemination may be carried out by the veterinarians or trained technicians (Para veterinarian) under the supervision of the qualified veterinarians.

(7) The scrub bulls are to be castrated in the areas covered under A.I. programme in cattle.

(8) The A.H. & Veterinary Dept. Meghalaya will carry out farmers' awareness programme on the policies and record keeping system. Necessary formats for keeping records in farms/stations and also in field by the farmers be developed and distributed.

7.2: WORK/ACTION PLANS TO BE PREPARED BY THE DEPARTMENT

For implementation of the policies, detailed work/action plans with appropriate time frame may be prepared in accordance with the guidelines of the policies by the experts and State Departmental officials for the followings:

(1) Establishment of new as well as revamping of existing Cattle/Buffalo Breeding farms as per need of the policy.

(2) Action plan for identifying the areas where a specific breeding plan and breed(s) to be introduced in different districts/zones/agro-climatic zones/production systems.

(3) Detail plans for breeding and evaluation of breeding bullsas well as females,Selection of males and females for milk yield and adaptive traits.

(4) Work plan for semen production in different production centres and distribution, Producing/importing requisite number of semen doses of superior germplasm.

(5) Breeding plans for straight/cross breeding of buffalo with selection.

(6) Plan for implementation of data and milk recording system.

(7) Open Nucleus Breeding System (ONBS) plans in designated areas for cattle.

(8) Establishment of elite herd(s) of indigenous cattle for their conservation.

(9) Plan for production and use of indigenous/cross bred bullocks as draught animals.

(10) Scheme for adoption of MOET in designated areas.

(11) Farmers training, training of unemployed youths and women, awareness camp for implementation of the policy, data recording system in field, etc.

(12) Animal production and health information system, computerization, data bank and networking, website updating.

(13) Scheme for Livestock Insurance, credit, etc.

(14) Restriction/check in movement of animals from and to the State by crossing state and international boundaries.

CONCLUSION

The Meghalaya Bovine Breeding Policy has been framed to augment productivity of Cattle and Buffaloes of the state for higher production of milk, meat and other animal products and sustainable adoption of suitable breeding and production systems for economic upliftment of the farming community and boosting the livestock industry for attaining self-sufficiency in animal protein requirements of the people of the state. This policy will be mandatory for the state and once implemented will raise production and contribute towards sustainable animal husbandry practice of the farmers and provide income generation and assured livelihood to the people including farmers, youths and women of the state. Besides recommending strategies for bovine and pig genetic improvement, some important recommendations have also been made for development of work plans as per need for fruitful implementation of the policies. The implementation of the policy would improve the livestock production system with better

adaptability of the genetically improved animals under changing climatic condition and management needs. It is also expected that once implemented the breeding policy will gradually minimize the gap between production and demand of the milk, meat and other animal products in the state and ultimately lead the state towards self-sufficiency. The programmes developed as per the policy recommendations will be supported by appropriate production system ensuring optimum and economic feeding and management of the animals, adequate animal health care and disease control, assured organized market for animal products, adequate post-harvest processing and value addition of animal products for sustainability of livestock farming and economic upliftment of farming families as a whole. The policy once implemented will raise production and contribute towards sustainable animal husbandry practices, enhance rural livelihood, industrialize the dairy sectors thereby enhancing Gross Domestic Product (GDP) growth of the state of Meghalaya.

ANNEXURE - I

GOVERNMENT OF MEGHALAYA
ANIMAL HUSBANDRY & VETERINARY DEPARTMENT
::::::::::::::::
ORDERS BY THE GOVERNOR
NOTIFICATION

Dated Shillongthe 15th April, 2008

No. **VET(SCH)206/2000/222** – The Governor of Meghalaya is pleased to re-constitute the Technical Committee for framing of Breeding Policy for Cattle and Buffalo of the State under Centrally Sponsored Scheme 'National Project on Cattle and Buffalo Breeding' with the following members and until further orders.

1.	Dr.Dharmeswar Das Dean-cum-Joint Director (Academic) IVRI-Izatnagar, Bareilly, U.P.	-	Chairman
2.	Director of A.H & Veterinary Department, Meghalaya, Shillong	-	Member
3.	Joint Director (AHP) A.H & Veterinary Department, Meghalaya, Shillong	-	Member
4.	Joint Director (Hq) A.H & Veterinary Department, Meghalaya, Shillong	-	Member
5.	Deputy Director (Hq) A.H & Veterinary Department, Meghalaya, Shillong	-	Member
6.	Deputy Director (Planning) A.H & Veterinary Department, Meghalaya, Shillong	-	Member Convener

The Terms of reference are :-

1. The Committee will formulate breeding policy for Cattle and Buffaloes in the State of Meghalaya to augment milk production and sustainable growth.
2. Formulate breeding policy for improved draft and meat production through production of quality germplasm of Cattle and Buffaloes.
3. The Committee may visit any farm and places within the State to form a database while formulating the policy.
4. The Committee may recommend other necessary action plans require to be adopted for implementing the policies.

Sd/- D.K.Dkhar, IAS
Commissioner & Secretary to the Govt. of Meghalaya
A.H & Veterinary Department.

Memo No.**VET(SCH)206/2000/222-A** Dated Shillongthe 15th April, 2008

Copy to :-

1. Dr.Dharmeswar Das, Dean-cum-Joint Director (Academic), IVRI, Izatnagar, Bareilly, U.P.
2. Director of A.H & Veterinary Department, Meghalaya, Shillong.
3. Joint Director(AHP), A.H & Veterinary Department, Meghalaya, Shillong.
4. Joint Director(Hq), A.H & Veterinary Department, Meghalaya, Shillong.
5. Deputy Director(Hq), A.H & Veterinary Department, Meghalaya, Shillong.
6. Deputy Director (Planning), A.H & Veterinary Department, Meghalaya, Shillong.
7. Financial Adviser, A.H & Veterinary Department, Meghalaya, Shillong.
8. Office Copy.

By Orders. Etc.,
Sd/-
Under Secretary to the Govt. of Meghalaya
A.H & Veterinary Department, Shillong.

ANNEXURE- II

GOVERNMENT OF MEGHALAYA
ANIMAL HUSBANDRY & VETERINARY DEPARTMENT
ORDERS BY THE GOVERNOR
NOTIFICATION

Dated Shillongthe6th November, 2008

No. **VET(SCH)206/2000/277**– In pursuance to this Department's Notification No. VET(SCH)206/2000/222 dt.15.4.2008, the Governor of Meghalaya is pleased to re-constitute the Technical Committee for framing of Breeding Policy for Cattle and Buffalo of the State under Centrally Sponsored Scheme 'National Project on Cattle and Buffalo Breeding' with the following members and until further orders.

1.	Dr.Dharmeswar Das Dean-cum- Director (Academic) IVRI-Izatnagar, Bareilly, U.P.	-	Chairman
2.	Director of A.H & Veterinary Department, Meghalaya, Shillong	-	Member
3.	Joint Director (AHP) A.H & Veterinary Department, Meghalaya, Shillong	-	Member
4.	Joint Director (Hq) A.H & Veterinary Department, Meghalaya, Shillong	-	Member
5.	Deputy Director (Hq) A.H & Veterinary Department, Meghalaya, Shillong	-	Member
6.	Deputy Director (Planning) A.H & Veterinary Department, Meghalaya, Shillong	-	Member Convener

The Terms of reference are :-

1. The Committee will formulate breeding policy for Cattle and Buffaloes,Pig,Sheep,Goat and Poultry in the State of Meghalaya to augment milk,Meat and Eggs production and sustainable growth.
2. Formulate breeding policy for improved draft and meat production through production of quality germplasm of Cattle and Buffaloes.
3. The Committee may visit any farm and places within the State to form a database while formulating the policy.
4. The Committee may recommend other necessary action plans require to be adopted for implementing the policies.

Sd/- P.Naik, IAS
Commissioner & Secretary to the Govt. of Meghalaya
A.H & Veterinary Department.

Memo No.**VET(SCH)206/2000/277-A** Dated Shillongthe6th November, 2008

Copy to :-

1. The Commissioner & Secretary to the Govt.ofMeghalaya.A.H& Veterinary Department.
2. Dr.Dharmeswar Das, Dean-cum-Joint Director (Academic), IVRI, Izatnagar, Bareilly, U.P.
3. Director of A.H & Veterinary Department, Meghalaya, Shillong.
4. Joint Director(AHP), A.H & Veterinary Department, Meghalaya, Shillong.
5. Joint Director(Hq), A.H & Veterinary Department, Meghalaya, Shillong.
6. Deputy Director(Hq), A.H & Veterinary Department, Meghalaya, Shillong.
7. Deputy Director (Planning), A.H & Veterinary Department, Meghalaya, Shillong.
8. Financial Adviser, A.H & Veterinary Department, Meghalaya, Shillong.
9. Director of Printing &Stationary,Meghala,Shillong for favour of publication inthe Gazette.
10. Office Copy.

By Orders. Etc.,
Sd/-
Under Secretary to the Govt. of Meghalaya
A.H & Veterinary Department, Shillong.

ANNEXURE-VII

MINUTES OF THE MEETING ON PIG BREEDING POLICY HELD ON THE 5TH JANUARY 2017 IN THE OFFICE CHAMBER OF THE DIRECTOR A.H & VETERINARY,MEGHALAYA,SHILLONG

Officers present:

1. Dr D.Das, Chairman,Technical Committee on Breeding Policy,Meghalaya
2. Dr B.Rijal, Director A.H & Veterinary
3. Dr K.Kharmihpen,Joint Director(AHP)
4. Dr C.Shilla,Deputy Director(Pl) & Member Convener
5. Dr(Mrs)G.Kynwir,Deputy Director(AHP)
6. Shri S.Kurbah,Joint Director(Stat)
7. Dr(Mrs)A.Pakyntein,DVO,Shillong
8. Dr(Mrs)S.M.Kharbudon,DVO,Jowai
9. Dr K.B.Sahkhar,Asstt.Director(LC)
10. Dr M.Tongper,Asstt.Director(VIO)
11. Dr(Mrs)A.Laloo,Asstt.Director,ICDP
12. Dr P.R.Joshi,Asstt.Director(RP)
13. Dr(Mrs)W.N.War,Asstt.Director(FD)

At the outset Dr B.Rijal, Director AH & Veterinary welcome all officers to the meeting and expresses his extreme gratefulness to all especially Dr D.Das, Chairman,Technical Committee who has come all the way from Guwahati inspite of a short notice. Highlighting on the purpose of the meeting, he impressed upon everyone to share their views and thought, and later on called upon the Chairman-Technical Committee to initiate the discussion and presentation.

In his short introduction, Dr D.Das, Chairman-Technical Committee gave a brief account of the Pig Breeding Policy for the State of Meghalaya prepared on the basis of the National Guidelines provided by the Government of India. He also reminded, that the draft on Livestock and Poultry Breeding Policies for Meghalaya has been submitted to the Government from the year 2012.

The Chairman then presented a power point presentation on the Pig Breeding Policy for detail discussion and sought updated datas on livestock census and other statistical datas, which was agreed by the department to provide the same at the earliest possible time to enable to fine tune the policy for further discussion in the next meeting, before it could be finalized for submission to the higher level.

The Chairman further suggested the Department to examine the draft in depth and make appropriate and suitable suggestion for implementation of the Policy in the State.

Following discussion and suggestion on the draft, the meeting concluded with a vote of thanks from the chair.

Sd/-Dr DharmeswarDas,PhD
Chairman-Technical Committee
Livestock & Poultry Breeding Policies

ANNEXURE-VIII

MINUTES OF THE SPECIAL MEETING ON CATLLE & PIG BREEDING POLICY HELD ON THE 30TH MARCH 2017 IN THE OFFICE CHAMBER OF THE DIRECTOR A.H & VETERINARY,MEGHALAYA,SHILLONG

Officers present:

1. Dr D.Das, Chairman,Technical Committee on Breeding Policy,Meghalaya
2. Dr B.Rijal, Director A.H & Veterinary
3. Dr K.Kharmihpen,Joint Director(AHP)
4. Dr B.K.Mawthoh,Joint Director(Admn)
5. Dr C.Shilla,Deputy Director(Pl) & Member Convener
6. Dr(Mrs)G.Kynwir,Deputy Director(AHP)
7. Shri S.Kurbah,Joint Director(Stat)
8. Dr(Mrs)B.Rapthap,DeputyDirector,IDP-Upper Shillong
9. Dr.J.Langstang,DeputyDirector,RPBF,Kyrdemkulai
10. Dr K.B.Sahkhar,Asstt.Director(LC)
11. Dr M.Tongper,Asstt.Director(VIO)
12. Dr(Mrs)A.Laloo,Asstt.Director,ICDP
13. Dr(Mrs)W.N.War,Asstt.Director(FD)

Welcoming all Officers to the meeting, Dr B.Rijal, Director AH & Veterinary expresses his gratitude with special mention to Dr D.Das, Chairman,Technical Committee who has come all the way from Guwahati. The purpose of the meeting was then highlighted to everyone with a request that all can participate and share their views and suggestion. Later he invited the Chairman-Technical Committee to give a brief account on the Breeding Policy that includes Cattle & Pig and make presentation accordingly.

While making presentation on the Breeding Policy, Dr D.Das, Chairman-Technical Committee mentioned that Cattle Breeding Policy also requires to be discussed as requested by the department besides Pig Breeding Policy.

During a power point presentation, a thorough discussion was made on specific paras concerning Cattle and Pig Breeding section, which was recorded accordingly for finalising the draft.

Before concluding the meeting and interaction, the Chairman suggested the Department to have another round of discussion tomorrow the 31st March 2017, and in the meantime the department will arrange the draft incorporating all suggestion.

The meeting concluded with a vote of thanks from the chair.

Sd/-Dr DharmeswarDas,PhD
Chairman-Technical Committee
Livestock & Poultry Breeding Policies

ANNEXURE-IX

MINUTES OF THE MEETING OF THE TECHNICAL COMMITTEE ON CATLLE & PIG BREEDING POLICY HELD ON THE 31st MARCH 2017 IN THE OFFICE CHAMBER OF THE DIRECTOR A.H & VETERINARY,MEGHALAYA,SHILLONG

Officers present:

1. Dr D.Das, Chairman,Technical Committee on Breeding Policy,Meghalaya
2. Dr B.Rijal, Director A.H & Veterinary
3. Dr K.Kharmihpen,Joint Director(AHP)
4. Dr B.K.Mawthoh,Joint Director(Admn)
5. Dr C.Shilla,Deputy Director(Pl) & Member Convener
6. Dr(Mrs)G.Kynwir,Deputy Director(AHP)
7. Shri S.Kurbah,Joint Director(Stat)
8. Dr K.B.Sahkhar,Asstt.Director(LC)
9. Dr M.Tongper,Asstt.Director(VIO)

The meeting was chaired by Dr D.Das, Chairman,Technical Committee. In his brief address, the Chairman expresses his happiness that the document on Cattle and Pig Breeding Policy has reached this level, in which he appreciated the department for the diligent work.

The corrected copy of the document was presented to the Committee for information of everyone and was explained of the content accordingly. A thorough discussion ensued in both cattle and Pig section. Finally it was agreed to make submission of the Breeding Policy to the authority concern.

The meeting concluded with a vote of thanks to and from the chair.

Sd/-Dr DharmeswarDas,PhD
Chairman-Technical Committee
Livestock & Poultry Breeding Policies

ANNEXURE-X

GOVERNMENT OF MEGHALAYA
DIRECTORATE OF ANIMAL HUSBANDRY & VETERINARY::SHILLONG
email: meghvety@gmail.Com Ph-0364-2548388/2547456

No.MVD/DEV-16/CSS/2017/104 Dated Shillong the 22nd March 2017

From: Dr B.Rijal
Director A.H & Veterinary
Meghalaya,Shillong

To: Dr D.Das,PhD
Chairman,Technical Committee on Breeding Policy-Meghalaya

Sub: **Breeding Policy**

Sir,

Following a discussion of the Technical Committee Meeting on Breeding Policy held on the 5th January 2017 in my office chamber, a one day workshop was also conducted on the 13th January 2017 with officers of the department to share views and suggestion for preparation of the Breeding Policy. Considering all materials relevant with the Policy, I am submitting herewith the whole text of Breeding Policy for your kind perusal and necessary action. Should you require more inputs to be incorporated, we would be glad to share the same accordingly.

In the above connection, kindly convey your convenient date and time to hold another round of discussion to finalize the draft Breeding Policy.

Yours faithfully

(Dr B.Rijal)
Director A.H & Veterinary
Meghalaya,Shillong

Memo No.MVD/DEV-16/CSS/2017/104 Dated Shillong the 22nd March 2017

Copy to:

The Deputy Secretary to the Government of Meghalaya, AH & Veterinary Deptt., for kind information.

Director A.H & Veterinary
Meghalaya,Shillong