Office of the Chief Executive Officer
Tripura Livestock Development Agency
Astabal, Agartala, West Tripura.

No.F.72/TECH/TLDA/2019/1817-1828 Dated, Agartala, the 30/12/2021.

NOTIFICATION

The Govt. in ARDD is pleased to notify the "State Breeding Policy for livestock & poultry",2021 in the State of Tripura for improvement of genetic potentiality of local cattle, buffaloes, sheep, goat, poultry & duck population in the state through selection & other breeding methods, for conservation of livestock & poultry bio-diversity & for characterization, registration & utilization of local cattle, buffaloes, sheep, goat, poultry & duck for ensuring increase in production and productivity.

The objective of "State Breeding Policy for Livestock & Poultry", 2021 is aimed at:

1. Formulation of pro-livestock & poultry farmer breeding policy and programme based on resource availability, agro-climatic condition, land topography, level of management, marketing facilities etc.
2. Promotion of animal bio-diversity –conservation & genetic improvement of Cattle, Buffaloes, Sheep, Goat, Poultry & Duck population in the state.
3. Stoppage in propagation of poor germplasm and indiscriminate breeding in the State.
4. Evolving of sound breeding practices for fast genetic improvement of livestock and poultry vis-a-vis increased individual productivity to ensure better returns for the livestock & poultry farmers.

The "State Breeding Policy for livestock & poultry",2021 is enclosed at Annexure-1 and hosted on ARD Deptt. Website (https://ardd.tripura.gov.in.).

This has the approval of the Government vide U.O.No. 1463/Secy./ARD Dept., Dated 21/09/2021.

The policy shall come into force with immediate effect from the date of publication of this notification in the official Gazette.

28/12/21

(Smt. P. Das)
Joint Secretary to the
Government of Tripura
O/C
24/12/21

To,
All Concerned
_____for information and needful action.

Copy to:

1. PS to the Principal Secretary of the Hon'ble Chief Minister, Govt. of Tripura.
2. PS to the Hon'ble Minister of ARDD, Govt. of Tripura.
3. PS to the Chief Secretary, Govt. of Tripura.
4. PS to the Secretary, ARDD, Govt. of Tripura.
5. The Joint Secretary, GA(C&C) Department, Govt. of Tripura.
6. The Director of ARDD, PN Complex, Agartala.

STATUS REPORT ON

LIVESTOCK AND POULTRY DEVELOPMENT

VIS - A - VIS

BREEDING STRATEGIES IN TRIPURA

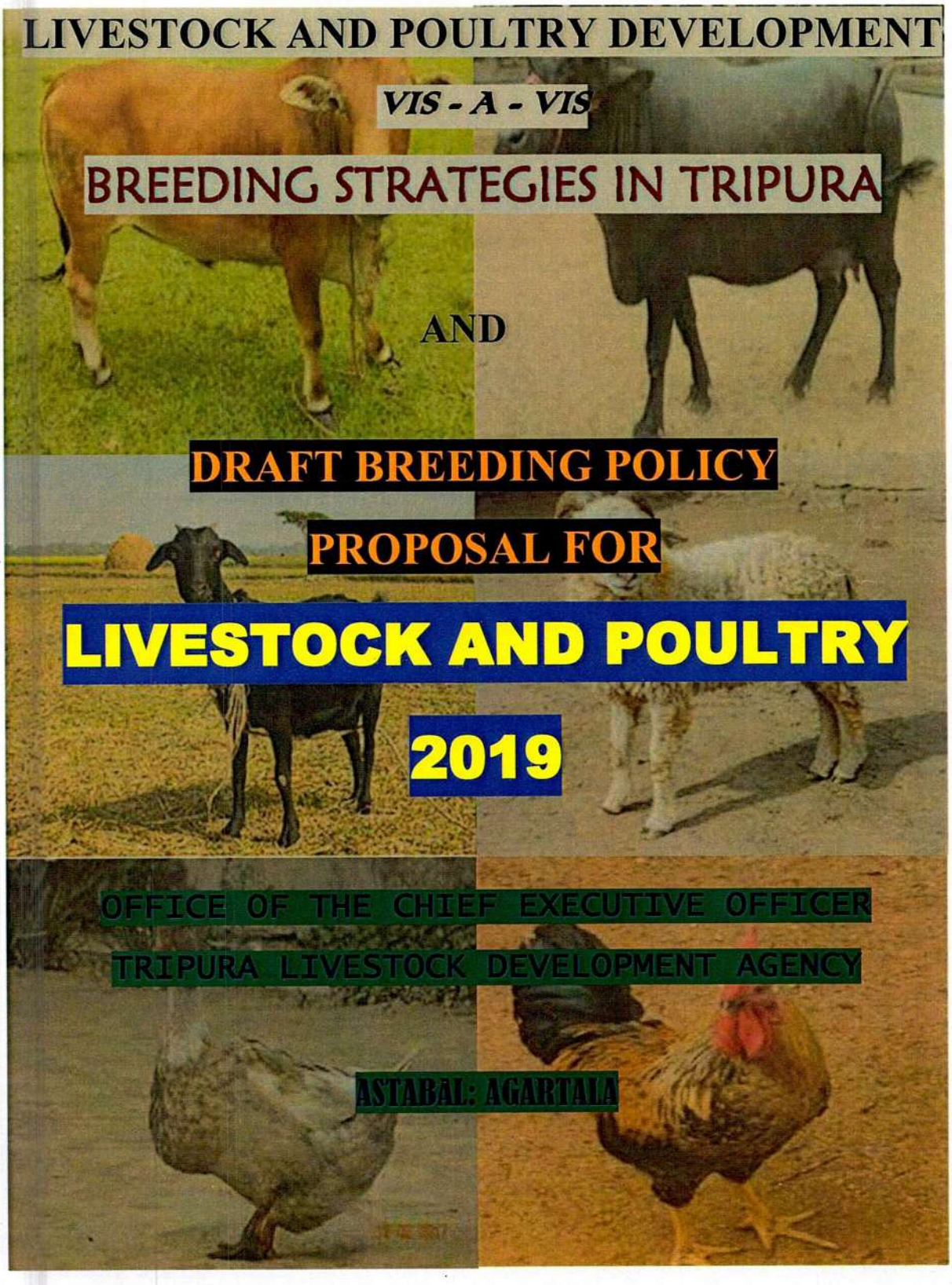
AND

DRAFT BREEDING POLICY

PROPOSAL FOR

LIVESTOCK AND POULTRY

2019



OFFICE OF THE CHIEF EXECUTIVE OFFICER

TRIPURA LIVESTOCK DEVELOPMENT AGENCY

ASTABAL: AGARTALA

PREFACE

The animal Husbandry plays an important role in supplying animal origin protein Viz. milk, meat, egg, other by-products and value added products in the state of Tripura. On the other hand it also helps in the socio-economic growth of the state through income and employment generation. The per capita availability of meat is beyond the national average however in case of milk and egg it is somewhat lesser than the national average. There is every scope for all-round development of this sector as 95% of the state people belong to non-vegetarian group. The livestock and poultry rearing is traditionally part and parcel of the livelihood both in rural and urban Tripura. Though previously this sector was treated as secondary/supplementary sector in terms of income generation but over the years this sector has established its place as primary sector along with agri and other allied sector. Tripura, being a industry deficient state, livestock and poultry husbandry may be a source of employment generation to the vast unemployed youth of the state.

Though this sector has achieved major growth over the years, but for sustainable development of this sector proper breeding strategies both for livestock and poultry are very much needed. At present, the state has no breeding policy for cattle, buffalo, goat, sheep, poultry and duck except pig. Thus it is high time to formulate a suitable farmer's friendly breeding policy for livestock and poultry of the state.

The state has taken a decision to formulate the breeding policy for livestock and poultry and a committee has been constituted with seven members to draft the policy proposal of the Breeding policy for Livestock and Poultry. The committee after several deliberations has formulated a draft proposal for breeding policy in cattle, buffalo, goat, sheep, poultry and duck.

Dr. B.K. Joshi, former Head of Division, NDRI, Karnal and Member, State Planning Board was nominated as an Advisor for drafting the policy proposals. He has helped whole heartedly in formulating the proposal and participated in several deliberations to chalk out a farmer friendly breeding policy. The committee is indebted to him for his kind and generous act in this regard.

All the committee members took a lot of pain to draft the policy which will definitely help the farmers of the state to rear livestock and poultry with proper scientific knowledge as per policy guidelines and thus will be able to double their income from this sector as targeted.

All thanks goes to the committee members for their relentless efforts in drafting the proposal.

The draft proposal as prepared is placed before the authority for kind acceptance if agreed/ approved.

(D.K. Chakma)
Chairman
Breeding Policy Formulation Committee

INDEX

STATUS REPORT ON CATTLE DEVELOPMENT AND PROPOSED BREEDING POLICY IN TRIPURA

INTRODUCTION

Tripura is one of the important states in North Eastern (NE) region of India. The Erstwhile princely state of Tripura gained its Statehood in the year 1972. Tripura was merged with India on 15th October, 1949 and declared as "C" Category State under Indian Constitution on 26th January, 1950. It is surrounded by our neighboring country Bangladesh by three sides, and is connected to the mainland of country by National Highway No.44 (Presently No.8) through Assam, NE Frontier Railway and also by Air.

Although, Tripura is situated in remotest part of India but is one of the most significant and important state in India due to its enriched natural flora and fauna.

Geographically, Tripura is a small state but very much thickly populated. At present human population in Tripura is projected to be around 40 Lakh. There is no major industry in Tripura although there is scope for industrial development basing on rubber, natural gas, bamboo etc. Tripura is second highest rubber producing state in India after Kerala. Due to this reason, agriculture and allied sectors play major role in employment generation in the state. Livestock & Poultry rearing has become a primary sector of income generation for the people due to very small per capita land holding. Dairy sector plays an important role in socio-economic growth in the state, especially, for the unemployed youth, small & marginal farmers.

Amongst all animal origin proteins, milk is considered to be the most ideal one as an individual item of food. Considering high growth rate of human population in Tripura it is felt necessary to adopt rational planning to supplement the increased demand of milk.

As there is high demand of milk in Tripura efforts have been taken to augment the production and productivity. The major milk producing species in India are cattle and buffalo. In contrast to all Indian scenarios, the only milch animal species in Tripura is cattle. Buffalo population in the state is insignificant. Cattle and buffalo account for 55% of the total output value of the livestock sector. Livestock sector especially cattle rearing can generate massive employment opportunities particularly in creating rural self employment scope with the lowest possible investment compared to other sectors.

In India, livestock sector contributes 4.6% GDP (2016-17) and 25.6% of total Agriculture GDP. It also provides employment to about 8.8% of the population in India. In Tripura also, Animal Husbandry plays major role in employment generation and socio- economic growth of both urban & rural people and has established itself as a primary sector along with agriculture & other Agri-allied sectors.

Analyzing all the critical factors, it is envisaged that rearing of milch cattle is the most economically sustainable venture in Tripura amongst all species of domesticated animals. The main task is needed to be focused on improvement of genetic make-up of local poor yielding animals through introduction of high yielding germplasm of genetically superior animals and advance technology along with expansion of available infrastructure, strengthening the delivery system of breeding inputs & services to the livestock owners at their doorsteps.

TRIPURA AT A GLANCE

State Profile:

Tripura erstwhile Princely State merged with the Indian Union after independence on 15th October, 1949 & became a Union Territory w.e.f. 1st November 1956. Ministry was formed for the first time in Tripura on 1st July, 1963. Tripura became a fully fledged State on 21st January, 1972.

Geographical Distribution:

Tripura is the third smallest State of the country, located in the North Eastern Region. The State is surrounded by the neighboring country, Bangladesh on its South, West & North. The length of its international border with Bangladesh is about 836 km. (i.e. about 84% of its total border) while it shares 53 km. border with Assam & 109 km. border with Mizoram.

Forest area is over 60% of its total land use statistics leaving behind only 27% land available for agricultural cultivation. Mostly up-land/ tilla land & hilly altitude is varying from 15 to 940 meters above sea level. Tripura is well connected with the rest of the country by road, rail & airways.

The State has 8-Districts, 23-Sub-Divisions, 58-Blocks and 01-Tripura Tribal Areas Autonomous District Council (TTAADC) created under 6th schedule of the Constitution. It has 3-tier Panchayet system in non-ADC areas & Village council/committees in TTAADC areas. There are 591 Grampanchayets, 35 Panchayet Samities & 8 Zillaparishads in the state along with 587 Village Committees & 40 Block Advisory Committees in TTAADC areas.

Agro- Climatic condition and Topography:

The state is having tropical climate with adequate rainfall in monsoons. The state is situated between latitudes 22^0 56/ & 24^0 32/ North and longitudes 90^0 09/ & 92^0 20/ East. Total geographical area is 10491.69 sq. km. having a diverse range of topography which is divided into three regions i.e. Hill ranges, undulating plateau land and Low-lying alluvial land/ plain land.

Population Status:

Tripura is the 2nd most populous state in North Eastern Region after Assam. As per Census, 2011, population was **36, 73, 917** out of which 18, 74,376 are males and 17, 99,541 are females. It has population density with a ranking of 18th at All India level & 2nd at North Eastern level. The population density in Tripura is 350 persons per sq. km .as against National density of 382 (Census, 2011).

The Total population comprises 31.75% Scheduled Tribes (11,66,813), 17.8% Scheduled Castes (6,54,918) and the rest 50.45% are of Others category. Out of the total ST population the male comprises 5, 88,327 and that for the female is 5, 78,486. There are 19 ethnic groups of Tribes in Tripura. Among the SC population 3, 34,370 are male and 3, 20,548 are of female category. The Sex ratio in Tripura is 948 females: 1000 males.

Seasonality of major livestock activities and Marketing:

All livestock and poultry are reared throughout the year. Marketing of animal and their produce is also done throughout the year. It is to be noted here that, all livestock based activities can be started in any season during the year. The average lactation length of cow is 6-7 months and thus rearing of a minimum of two cows per family for providing regular income is practiced in most of the villages. The seasonality of major livestock activities pursued in villages in terms of production and marketing season is given below in tabular form:-

Table 1: The Seasonality of major livestock activities and Marketing

Type of Livestock	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct	Nov.	Dec	Jan.	Feb.
Cattle rearing	P	P	P	P	P	P	P	P	P	P	P	P
	M	M	M	M	M	M	M	M	M	M	M	M
Goat rearing	P	P	P	P	P	P	P	P	P	P	P	P
	M	M	M	M	M	M	M	M	M	M	M	M
Pig rearing	P	P	P	P	P	P	P	P	P	P	P	P
	M	M	M	M	M	M	M	M	M	M	M	M
Poultry rearing	P	P	P	P	P	P	P	P	P	P	P	P
	M	M	M	M	M	M	M	M	M	M	M	M

SOCIAL CULTURE IN TRIPURA & RELATIONSHIP WITH ANIMAL HUSBANDRY

The diverse ethno-linguistic groups of Tripura have given rise to a composite culture. The state's "scheduled tribes", historically disadvantaged groups of people recognized by the country's constitution, consist of 19 ethnic groups with many sub-groups having diverse languages and cultures.

The major tribal groups are Debbarma, Jamatia, Reang, Tripura, Noatia, and other tribal groups such as Murasing, Chakma, Halam, Garo, Kuki, Mizo, Uchoi, Dhamai, Roaza, Mogh Munda, Oraon and Santhal who migrated in Tripura as tea laborers. Bengali people represent the largest ethno-linguist community of the state.

According to 2011 Census, Hinduism is the majority religion and is being practiced by 83.40 per cent of the population. Muslims make up 8.60 per cent of the population followed by Christians 4.35 per cent, and Buddhists 3.41 per cent. Christianity is chiefly followed by members of the Lushai, Kuki, Garo, Tripuri, Halam tribes and according to 2017 census has 1, 59,882 adherents.

Bengali is the most widely spoken language. Kokborok is a prominent language among the Tripura tribes. Several other languages such as Mog, Odia, Bishnupriya Manipuri, Manipuri, Halam, Garo and Chakma belonging to Indo-European and Sino-Tibetan families are spoken in the state.

Music and dance are integral to the culture of the state. Some local musical instruments are the *sarinda*, *chongpreng* (both string instruments), and *sumui* (a type of flute). Each indigenous community has its own repertoire of songs and dances performed during weddings, religious occasions, and other festivities.

The Tripuri and Jamatia people perform Garia dance during the Garia Puja. Jhum dance (also called Tangbiti dance), Lebang Bumani dance, Mamita dance, and Mosak Sulmani dance are other Tripuri dance forms. The Jhum dance is performed with joy and festivity after harvesting the agri-produces of Jhum Cultivation with special mention about Animal Husbandry Practices. A Kokborok Drama named as Mosuk Sulmani has also mentions about hunting ofanimals which ascertains animal hunting etc. as a long time tradition in tribal culture which further instigated domestication of animals for their livelihood. A combination of folk song festival known as Jadukolija is also having some special mentions of Agriculture and Animal Husbandry. In this festival just like Qawali songs two different groups performs songs in "questions and answer patterns" wherein different Animal Husbandry related points along with the socio-culture are chanted.

Reang community, the second largest scheduled tribe of the state, is noted for its Hojagiri dance that is performed by young girls balanced on earthen pitchers. Biju dance is performed by the Chakmas during the Biju festival (the last day of the month of *Chaitra* in Hindu calendar). Other dance forms include Wangala dance of the Garo people, Hai-hak dance of the Halam branch of Kuki people, and Sangrai dance and Owa dance of the Mog. Alongside such traditional music, mainstream Indian musical elements such as Indian classical music and dance, Rabindra Sangeet are also practiced.

Hindus believe that *Tripura Sundari* is the patron Goddess of Tripura and an aspect of *Shakti*. Durga Puja, Kali Puja, Dolyatra, Ashokastami and the worship of the *Chaturdasha* Deities are important festivals in the state. Some festivals represent confluence of different regional traditions, such as Ganga Puja, Garia Puja, Kharchi Puja and Ker Puja.

Traditionally the tribes of Tripura are dependent on Jhum Cultivation, Animal Husbandry and Agro- forestry for their livelihood. Most of the tribes have a type of mixed farming system where they used to keep 1-2 Pig, 2-3 Cattle, 4-5 goats and a sizeable flock of poultry birds along with Jhum cultivation.

The culture of the people of Tripura is not complete without Animal Husbandry. All the social and religious gatherings like weddings and other festivals are accompanied by music and dance pertaining to their own Tribal community and animal is one of the components in most of the occasions. Since the people of Tripura belong to blend of various tribal communities, they follow different customs and traditions. When the marriage is finalized the guests are served with rice, rice beer and especially pork. At the birth of a child as a matter of thanks giving to God, several Pujas are performed and animal & bird sacrifices are done to please the Deity. Even after death a fowl is sacrificed near the feet of deceased before the cremation on the next day. In ancient times, the traditional costume of male and female were decorated with green feathers of Parrot's & Hen's wings and skins of different animals etc. as gathered through hunting. The cuisine of the people of Tripura is mostly having the preparation of Dry Fish, Bamboo Shoots, Pork and Chicken. Traditionally the occupation of the tribal people was Livestock rearing along with Jhum Cultivation. Since long they are rearing cattle, pig, goat and poultry for their livelihood. Rearing of Pig and Poultry for production of Pork & Chicken is part and parcel of their traditional culture right from cradle to graves among the tribal people.

In most of the tribal festivities like Garia, Wangala, Mamita, Mosak Sulmani, Lebang Bumani, Owa, Hai-hak, Sangrai, Ker, Kharchi etc. animals and birds are sacrificed to the God for the welfare and peace of the community. For most of the dance, the attire is made of different collections like feather, skin etc. from the animal origin. Thus, the livestock and poultry rearing is an important component of agrarian culture of Tribal population in Tripura since long.

On the other hand, as the state of Tripura is dominated by the Bengalis, the prevailing Bengali culture is also a component of the society. The tribal populations in urban areas are slowly getting influenced by their culture like literature, music and cuisine. It is an age old tradition in different festivities amongst Bengali to sacrifice goat, pigeon etc. to please the God. Many a times, bull calves, male kids, pigeons etc. are offered and let loose in the name of God (especially in the name of LORD SHIVA) as an age old tradition.

Milk and milk products (Ghee, Curd, etc.) along with cow dung & urine constitutes the holy 'Panchagabya' which is part and parcel in all Pujas of Hindu Bengali and Tribal Community. Apart from this, milk and milk products as a whole is offered to please the God as 'Prasadam'. In most of the Hindu temples of Tripura the 'Peda' a milk by-products constitutes the main 'Prasadam'. In Makar Sankranti (Uttarayan) and Chaitra Sankranti the cattle are being worshipped by the Hindu Bengali people and other Hindu communities of Tripura thinking cattle as 'Deity'. Cooked chevon are even many a time offered to the Deities as 'Prasadam'.

Many a times it has been seen that good quality cows, heifers, bullocks, goat, pigs etc. are offered as gift to the newly married couple for wellbeing of their upcoming future life and income generation.

All these above facts represent a long term bonding between social culture and traditional animal husbandry practices amongst the people of Tripura.

Economy Profile:

Tripura is primarily an agrarian state. About 42% of the population are dependent on Agriculture & allied activities. Rice is the major crop. Per capita income was Rs.105044 in 2017-18 (Provisional) with new base of 2011-12.

There is increasing trend in the per capita income of the State on the basis of 2011-12 as the base year. Per capita income rose steadily from Rs.47, 079 in 2011-12 to Rs.52, 434 in 2012-13 and to Rs.61, 570 in 2013-14 and to Rs.69, 474 in 2014-15, to Rs.83, 680 in 2015-16, to Rs. 91266 in 2016-17 and to Rs.105044 in 2017-18 (Provisional).

The increasing trend in the growth of per capita income of the people corresponds directly to the higher purchasing capacity of the people. It is well established fact that the higher purchase capacity of the people is indirectly related to the improvement in the standard of living. The improvement in standard of living definitely creates opportunities/ options to the people to purchase and consume animal origin protein like milk, meat and egg etc. in more quantities as per nutritional recommendations. This has created opportunity for producing more quantities of animal origin protein in the state. There are 566 nos. of markets in Tripura wherein livestock and poultry products are sold. To keep pace with the increase in the demand for animal origin protein, the livestock and Poultry sector has grown tremendously over the years. This positive trend in production-demand ratio has created opportunity for livestock & poultry sector to grow further in near future.

Being an agrarian State, the state economy is mostly dependent on agriculture and allied sectors like Animal Husbandry, Fisheries etc. It has been found that 85% of the community is engaged in Livestock farming followed by 68% in Agriculture and 46% in Non-farm activities to sustain their family needs (MART Study under NERLP, 2011). The 95% of total operational land holding in the state is below 2 hectare and account for 75% of the operated area. Average size of land holding has declined from 1.25 hectare in 1976 to 0.5 hectare in 2015-16.

Due to continuous decline trend in operational land holding, Livestock rearing is done throughout the year in the state mainly as supplementary source of income and to certain extent as primary source of income.

Performances of GSDP (Gross State Domestic Product) from Agriculture & allied sectors with 2011-12 bases:

The contribution of the livestock sector to the State Gross Domestic Product shows increasing trend over the years which indicate positive growth of this sector.

Table 2:- Estimates of GSDP for 2011-12 to 2017-18 for Tripura from Agriculture & allied sectors with new base of 2011-12 at current prices.

Sl. No.	Industry/Enterprise	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18(P)
1.	Agriculture, Forestry & Fishing	511201	567087	702979	799825	1134780	249313	1517974
2.	Crops	318959	339064	375086	397591	622218	669672	780067
3.	Livestock	33664	42223	70541	88176	92760	122687	160773
4.	Forestry & Logging	109763	119262	133116	145096	245404	273883	333650
5.	Fishing	48815	66538	124236	168961	174398	183071	243483

(P)= Provisional

SOCIO- ECONOMIC SCENARIO

Around 74% of the state's population lives in rural areas. The state scores well in terms of literacy (95.16%, as per ISI, Kolkata report, 2013), birth rate (13.7 per 1000, SRS, 2016), death rate (5.5 per 1000, SRS, 2016) and infant mortality rate (24 per 1000, based on 3 years period of 2014 to 2016). The natural growth rate is 8.2% as against All India rates of 14.0% (2016). State's economy achieved annual growth rate of 9.3% in real terms during 2017-18 (provisional). The work participation rate (WPR) stood at 39.99% in 2011 out of which WPR among rural population was 41.14% & that among urban population was 36.76%. The percentage distribution of different categories of workers according to economic classification as per Census, 2011 was 22.90% Cultivators, 18.74% Agri-laborers, 1.79% Mfg. Processing Services workers etc. and 56.56% other sector workers.

Livelihood based Animal Husbandry:

Animal Husbandry plays an important role for income generation in rural & peri-urban areas for small and marginal farmers, agri-labourers, landless labourers and is a supplementary/primary source of income as per-capita operational land holding size is very much poor in the state. Thus, the socio-economic culture is mostly dependent on livestock and poultry farming. The table mentioned below will give an idea about involvement of rural people (in %) in different trades of Animal Husbandry sector. The percentage of household engaged as shown in the table indicates the importance of livestock and poultry farming in the state. Goat and Cattle rearing constitute about 43% of household involvement whereas poultry rearing involves about 22% of household. The piggery, goatery and poultry rearing along with cattle rearing (with 2-3 cattle) are very much common as a part of integrated farming along with Fishery.

Table 3:- Major livestock activities pursued by villagers and % of households engaged in them

Type of Livestock	Availability in percentage of villages	Percent of household involved
1. Cattle rearing	90%	18%
2. Goatery	70%	25%
3. Piggery	30%	3%
4. Poultry	100%	22%
5. Fishery	100%	12%

Source: Field survey conducted by MART, Noida, April, 2011 under NERLP

It is found that livestock rearing is done in all villages in the state (Field survey, MART, 2011). Piggery, Backyard Poultry and Goatery are done as subsidiary activity on a small scale only. Cattle rearing are also done in almost all villages and villagers keep two to three cattle only. Similarly goat rearing is also done in almost all villages and some families are engaged exclusively in goat trading. Piggery is done in few villages especially in TTAADC areas and very much popular among tribal community.

GENESIS OF LIVESTOCK AND POULTRY DEVELOPMENT IN TRIPURA

Planned development of Cattle was started in Tripura with the 1st five year plan under the Programme Key Village Scheme along with other Indian States & Union Territories. Key Village Scheme in Tripura was primarily aimed-

a) To increase Milk production.
b) To improve the quantity & supply of draught animals for Agriculture.
c) To supply milk to fulfill the larger urban demand.

The strategies for achieving this goal under Key Village Scheme was:-

a) Selective breeding of Indigenous Cattle in the state for both milk and draft purpose &
b) Compulsory castration of scrub bulls.

Upgradation of ND cattle was started at the end of 1952 with Artificial Insemination using liquid semen of Tharparkar bull which was collected & processed in Tripura. The first AI was introduced in Jirania Block and during the period 1952-1958 A.I. was extended to Udaipur, Dharmanagar, Belonia & Kailasahar by establishing 5 AI centers at Agartala, Udaipur, Dharmanagar, Kailasahar & Belonia. These 5 AI centers have many Sub-centers named as "Stockman Sub centre". Each AI centre was named as Key Village & the whole project was called as Key Village Scheme. Each of these 5 AI centers was equipped with liquid semen production & processing laboratory maintaining 4 nos. of Tharparkar breeding bulls each. The Tharparkar bull semen was collected, processed & distributed to the sub centers for AI work.

During 3rd five year plan, the major emphasis was concentrated on increase in milk production through crossbreeding and with this perspective, Jersey Bull semen was first introduced in Tripura in 1964 (at Bishalgarh VD) procuring Jersey Bull liquid semen from Guwahati under "Hill Cattle Development Scheme" which was later on extended to Charilam & Bisramganj. The use of Tharparkar bull semen was also continued along with Jersey bull semen during this period. Subsequently, indigenous Cattle breed, Red Sindhi was introduced. The use Tharparkar, Red Sindhi and Jersey bull semen resulted in positive impact to certain extent in grading up of local non-descript cattle.

In 1967, Jersey bulls were first brought to Tripura from Central Cattle Breeding Farm for semen production, processing & distribution for AI work.

The Regional Exotic Cattle Breeding Farm (RECBF) was established in the year 1974 at Radha Kishore Nagar with twenty five (25) nos. of Jersey female calves. The aim was to produce good quality Breeding Bulls and semen for crossbreeding of local cattle. The other objective of the farm was to supply milk under Agartala Milk Supply Scheme. In 1978 28 nos. of HF x Hariana CB female calves were brought from IVRI, Bareilly to examine the productivity of the animals in the state of Tripura. The Farm was established with the fund provided by North Eastern Council. Along with RECBF a Regional Fodder Seed Production and Demonstration Farm was established under NEC Project in the year 1978-79 with an aim to produce seeds of different fodder, grasses, legumes etc. for distribution to the farmers. The other units of the RECBF were Feed Mixing Plant for production of finished ration for cattle, duck, rabbit and poultry etc., Regional Exotic Duck Breeding Farm and Rabbit breeding Farm. Subsequently, Goat Breeding farm was established in the same complex.

Later on, considering the inadequacy of Key Village Scheme, the **"Intensive Cattle Development Project"** was started Nationwide and the ICDP became flagship project of every State & Union Territories. The ICDP-I was started at Agartala in 1974 & the ICDP-II was started Dharmanagar in 1979. The coverage areas for ICDP-I were undivided West & South districts and the ICDP-II covers undivided North & Dhalai Districts. The use of pure Jersey bull semen was started in the project area of ICDP-I & II and the Tharparkar bulls those were used for liquid semen production were shifted outside of the project area. The main target of the project was to increase the milk production and productivity in local cattle through Grading-up.

Tripura Co-operative Milk Producers Union Limited (TCMPUL) got its co-operative registration in March'1982 and started functioning w.e.f. 22nd Dec' 1982. It started working as a Dairy Plant since Aug'1983. The TCMPUL presently named as GCMPUL procures milk from the co-operative bodies on the basis of two axis formula like AMUL i.e. on the basis of Fat% and SNF % in the milk. The GCMPUL management is now controlled by an elected body headed by a Chairman.

In the year 1983, both Tripura Milk Union and the AH Deptt. started using frozen semen for AI for the first time by procuring frozen semen straw & LN_2 from Kolkata. In the year, 1987 (6^{th} July), the 1^{st} LN_2 Plant was established at R.K. Nagar & LN_2 production was started for preservation of frozen semen straws.

Use of liquid semen for A.I. work has been stopped completely since 2008 in the state. Later on, an effort was taken up to establish a Frozen Semen Laboratory at Dewanpasa, Dharmanagar but due to certain technical problems the laboratory could not be developed.

Tripura Livestock Development Agency was established on 4^{th} July, 2009 with a view to look after the Cattle & Buffalo development work under **NPCBB**. The existing infrastructure and manpower of earlier ICDP-I and II are utilized for the functioning of TLDA. The Governing body has been formed with 8 members under the Presidentship of Hon'ble Minister, ARDD. The TLDA caters the activities related to Cattle & Buffalo Development. It was established with following objectives:

a. To improve the production and productivity in cattle and buffaloes through improvement of genetic merit of local cattle & buffaloes.
b. To uplift the socio-economic status of livestock farmers through increased income generation from livestock rearing.
c. To bring awareness & advice the farmers on scientific cattle & buffalo rearing and AI work.
d. To work intensively for the development cattle and buffaloes in the state.

The brief activities of TLDA:

1. Up gradation of Non-descriptive cattle and buffalo of the state through Artificial Insemination. Natural mating through improved bull in remote areas where AI facility is scarce.
2. The activities are conducted as per guideline of Govt. of India pertaining to **NPCBB** under the umbrella of **Rashtriya Gokul Mission (RGM)**.
3. Supply of AI logistics like Frozen Semen straw, LN_2, all AI equipments in all the AI institutions and private AI workers in the state.
4. Regular training of professionals and AI workers outside and inside the state for skill up gradation.
5. Refresher training for private AI workers inside the state.

6. Training of newly inducted private AI workers.
7. Organization of fertility management and awareness camps including milk yield competition and calf rallies on regular basis throughout the state.
8. Implementation of State Plan Scheme: 'Supply of Calf growth meal' to the female calf born out of AI on subsidized rate to encourage the owner as well as improvement of animal health.
9. Strengthening of 'A.I. Programme' and implementation of NEC Project viz. 'Distribution of Pregnant Heifers among the farmers'.
10. Regular follow up of AI, pregnancy diagnosis and calf births by field professionals on regular basis.

Rashtriya Gokol Mission (RGM) was introduced in the year 2016-17. With a view to extend AI work at farmers' doorstep, private AI workers are being trained & provided with all AI logistic support as per RGM guide lines. 1(one) Private AI Worker/DSAI Worker has been allotted per Gram Panchayet/ Village Committee in the state which will definitely increase the AI coverage in the state in near future. TLDA is implementing different programmes like NPBB-IB, NMBP, KKA, NAIP under RGM, State plan scheme i.e. HRS and CB heifer distribution scheme under NEC Project.

Since its inception, TLDA has been monitoring cattle development programme in the state and much progress has been noticed in milk production, productivity in target animals and per capita availability of milk. Although, success has been achieved in enhancing milk production over last few years due to up-gradation/ cross breeding programmes taken up by the TLDA under NPCBB & RGM but still there is an ample scope for further development through formulation of State Breeding Policy for Cattle & Buffaloes, re-fixation of AI target, introduction of sexed semen technology for AI, induction of cattle from outside states, revamping procurement of milk, value addition & marketing system.

AVAILABLE ANIMAL GENETIC RESOURCES IN TRIPURA

In Tripura, the Livestock and Poultry are reared traditionally since long. The main purposes for rearing the different species of livestock and poultry are:

Cattle : - Milk, Draught and Dung production for agriculture operation.
Buffalo: - Draft and Milk (Household milk production for self consumption).

Sheep : - Mutton Production.

Goat : - Chevon, Skin and Milk (for household consumption and nourishment of kids).

Pig : - Pork Production.

Poultry: - Chicken and Egg production.

Duck : - Egg and Meat Production.

The district wise livestock population shows distribution of different species of livestock in 8 districts of Tripura which is important to chalk out policy decision for further improvement in terms of production and productivity.

Table 4: District wise Livestock population as per Livestock Census, 2012 (GOI, Final)

District	Cattle			Buffalo	Sheep	Goat	Pig		
	CB	ND	Total				Imp.	Desi	Total
West	34495	83808	118303	483	893	80912	25170	12650	37820
Sepahijala	24396	114506	138902	815	295	67031	24929	15828	40757
Khowai	10731	120057	130788	411	116	80021	31972	19595	51567
Gomati	23291	102573	125864	1648	274	75862	34915	17870	52785
South	11843	137674	149517	394	63	96090	29584	19361	48945
Unakoti	4737	61439	66176	2725	382	39454	8265	9457	17722
North	13434	92319	105743	2457	916	84247	24831	25002	49833
Dhalai	10180	103311	113491	1873	171	87305	33977	28328	62305
Total	133107	815687	948794	10806	3110	610922	213643	148091	361734

Table 5: Growth rate ratio of Cattle and Buffalo population in 2018-19 in comparison to 2012 Census

District	ND Cattle (2012)	Yearly 2018-19 ND cattle			CB Cattle (2012)	Yearly 2018-19 CB cattle			Buffalo (2012)	Yearly 2018-19 Buffalo		
		SA-1	SA-2	Avg.		SA-1	SA-2	Avg.		SA-1	SA-2	Avg.
West	83808	1.11	1.15	1.13	34495	1.19	1.19	1.19	483	1.29	1.34	1.32
Sepahijala	114506	1.10	1.10	1.10	24396	1.17	1.17	1.17	815	1.15	1.12	1.14
Khowai	120057	1.10	1.10	1.10	10731	1.18	1.18	1.18	411	1.15	1.20	1.18
Gomati	102573	1.10	1.10	1.10	23291	1.17	1.17	1.17	1648	1.14	1.14	1.14
South	137674	1.09	1.09	1.09	11843	1.17	1.18	1.18	394	1.14	1.16	1.15
Unakoti	61439	1.09	1.09	1.09	4737	1.16	1.16	1.16	2725	1.14	1.14	1.14
North	92319	1.09	1.09	1.09	13434	1.16	1.16	1.16	2457	1.15	1.14	1.14
Dhalai	103311	1.09	1.09	1.09	10180	1.15	1.15	1.55	1873	1.17	1.17	1.17

Note: SA-1 & SA-2 denotes Sample Survey 1 & 2 reports

The growth rate ratio of cattle and buffaloes studied through various sample surveys in 2018-19 indicates positive growth in all the surveys in comparison to livestock census, 2012.

Table 6: Trend of Cattle Population in Tripura (As per Livestock Census, 2012)

Year	Crossbred cattle	Indigenous cattle	Total cattle
1992	108000	841000	949000
1997	73000	1155000	1228000
2003	68000	1073000	1141000
2007	79320	875070	954390
2012	133110	815690	948790

The above table indicates trend of crossbreed and Indigenous cattle population in Tripura over the years as per different Livestock census.

Choice of Cattle Breed for Grading-up and Crossbreeding:

Exotic breeds like Jersey & Holstein Friesian have been utilized for improving the genetic makeup of the non-descript indigenous cattle of Tripura i.e. for crossbreeding programme. However, Jersey has been found well accepted to the farmers, owing to their adaptability & production capacity under the Agro-Climatic condition of the state compared to Holstein Friesian breed of cattle.

Though the milk yield in HF is more but requires more intensive managemental practices and proper nutrition and thus could be reared in peri-urban areas and by resourceful farmers. Indigenous cattle breed like Tharparkar, Gir, Red Sindhi & Sahiwal were utilized for up-gradation of non-descript indigenous low producing cattle of the state in different stages since the adoption of Key Village Scheme. At present, Sahiwal breed is being utilized for upgradation programme under RGM.

Gir/ Tharparkar breed may also be utilized on the basis of farmer's choice for breed improvement programme in the state. The table mentioned below also indicates that Jersey is preferred crossbred cattle among the farmers.

Table 7: Break up of CB & Indigenous cattle (%) in Tripura in comparison to national data

Type of cattle	% in Tripura	% in India
Jersey Crossbreds	13.1%	Crossbred=20.10%
Holstein Friesian Crossbreds	0.9%	
Non descript (Indigenous cattle)	86%	10.5%
Graded	-	59.3%
Exotic	-	0.70%
Indigenous	-	9.4%

Table 8: Percentage share for different livestock in Tripura

Sl.No.	Type of Animal	Percentage share (18th Census)	Percentage share (19th Census)
1.	Cattle	51.04%	49.00%
2.	Goat	33.86%	31.57%
3.	Pig	14.12%	18.70%
4.	Buffalo	0.75%	0.56%
5.	Sheep	0.21%	0.17%

Table 9: Breed wise Bovine Population (As per livestock census, 2012)

Breed	Total Population	Female Population	Breedable Population
Indigenous (ND)	815687	502894	398174
Cross bred	133107	99812	75205
Buffalo (ND)	10806	6518	4144

(Female population =female under 1 year+ female 1to 3 years+ female over 3 years)

Table 10: District wise breedable bovine population

The breedable population comprises total number of sexually mature heifers, dry and milch cows and other non-pregnant cows. District wise breedable population is detailed as below.

Sl. No.	Name of the District	Breedable Bovine Population (Livestock Census, 2012)			
		Non- descript	Crossbreed	Buffalo	Total
1.	West	45951	21053	225	67229
2.	Sepahijala	56764	13530	263	70557
3.	Khowai	53287	5963	76	59326
4.	Gomati	50474	14820	785	66079
5.	South	75520	6405	158	82083
6.	Unakoti	30854	2220	1508	34582
7.	North	39946	6043	276	46265
8.	Dhalai	45378	5171	853	51402
	Total=	**398174**	**75205**	**4144**	**477523**

Table 11: Number of Households and Households Enterprises owning Livestock/ Poultry Birds in rural & urban areas (As per livestock census, 2012)

Area	No. of household	Number of Households and Households Enterprises rearing different Livestock & Poultry					
		Cattle	Buffalo	Goat	Sheep	Pig	Backyard Poultry bird
Rural	783012	308077	3753	160075	715	180005	339937
Urban	186429	11630	77	3442	179	1665	13650

Table 12: Distribution of Bovines by sex (As per Livestock Census, 2012)

State	Male			Female			Total Bovine		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Tripura	346135	4241	350376	582301	26923	609224	928436	31164	959600

Major cattle rearing operations are generally practiced in rural areas and cattle development activities have been marginalized in urban areas.

Table 13: Distribution of Livestock & Poultry (As per Livestock Census, 2012)

State	Rural		Urban		Total (Rural + Urban)	
	Livestock	Poultry	Livestock	Poultry	Livestock	Poultry
Tripura	18,88,782	40,92,513	47,397	1,80,220	19,36,179	42,72,733

The above table indicates major livestock and poultry rearing are practiced in the rural areas of Tripura whereas the data for urban areas is somewhat less which may be due to speedy urbanization and increase in urban population leading to less per capita land holding.

Table 14: Species wise distribution of Livestock and Poultry (as per Livestock Census, 2012)

Livestock species	Type	Rural	Urban	Total
Cattle	CB	1,18,626	14,481	1,33,107
	ND	7,99,154	16,533	8,15,687
Buffalo		10,656	150	10,806
Sheep		2,425	685	3,110
Goat		5,98,954	11,968	6,10,922
Pig	CB	2,11,347	2,296	2,13,643
	ND	1,47,607	1,284	1,48,891
Backyard Poultry		24,10,364	61,912	24,72,276
Ducks		7,12,204	30,307	7,42,511

Table 15: Comparative statement of Livestock census and growth pattern

Particulars	Cattle			Buffalo	Sheep	Goat	Poultry		Total Poultry
	CB	ND	Total				Fowl	Duck	
15th Livestock census, 1992	1,08,000	8,41,000	9,49,000	20,000	5,000	4,29,000	19,76,000	6,21,000	25,97,000
16th Livestock census, 1997	73,000	11,55,000	12,28,000	18,000	6,000	6,39,000	26,77,000	9,18,000	35,95,000
17th Livestock census, 2003	68,000	10,73,000	11,41,000	20,000	3,000	4,72,000	22,71,000	7,01,000	29,72,000
18th Livestock census, 2007	79,317	8,75,069	9,54,386	14,257	3,685	6,33,052	24,89,593	7,47,395	32,36,988
19th Livestock census, 2012	1,33,107	8,15,687	9,48,794	10,806	3,110	6,10,922	24,72,276	7,42,511	32,79,165
Difference	(+) 53,790	(-) 59,382	(-) 5,592	(-) 3,451	(-) 575	(-) 22,130	(-) 17,317	(-) 4,884	(-) 22,201
*Yearly growth rate	(+) 13.56	(-) 1.36	(-) 0.12	(-) 4.84	(-)3.12	(-) 0.70	(-) 0.14	(-) 0.13	(-) 0.14

*Yearly growth rate denotes the comparison between the 18th and 19th Livestock Census

The above table indicates, either increase/decrease in growth pattern of different Livestock and Poultry species over the years. 17th Livestock census, 2003 onwards there is descending trend of growth pattern in cattle population.

Table 16: Milk production over the years

Year	Milk yield	% increase or decrease	Year	Milk yield	% increase or decrease
2001-02	77690	-	2010-11	105233	4.51
2002-03	80625	3.77	2011-12	110300	4.81
2003-04	82672	2.53	2012-13	118042	7.01
2004-05	85519	3.44	2013-14	129700	9.87
2005-06	87000	1.73	2014-15	141000	8.71
2006-07	88683	1.93	2015-16	152400	8.08
2007-08	91312	2.96	2016-17	159590	4.71
2008-09	95598	4.69	2017-18	174260	9.19
2009-10	100690	5.32	2018-19	183515	5.31

Milk production data of the last18 years indicate an ascending trend which is due to efforts taken up under 10 years' perspective plan and intensive action plan implemented under ICDP, NPCBB & RGM. In 2002-03, 2005-06, 2010-11, 2014-15, 2015-16, 2016-17 & 2018-19 the growth in production is less than the preceding year but overall trend is ascending i.e. positive growth.

Table 17: Per Capita Availability of Milk (up to 2017-18)

Year	Per capita availability	Year	Per capita availability	Year	Per capita availability
2001-02	67.93 gm/day	2007-08	71.23 gm/day	2013-14	94.01 gm/day
2002-03	67.51 gm/day	2008-09	73.41 gm/day	2014-15	101.03 gm/day
2003-04	68.59 gm/day	2009-10	76.08 gm/day	2016-17	114.00 gm/day
2004-05	69.89 gm/day	2010-11	78.53 gm/day	2017-18	124.00 gm/day
2005-06	70.03 gm/day	2011-12	82.32 gm/day	2018-19	129.00 gm/day
2006-07	70.30 gm/day	2012-13	86.82 gm/day		

The per capita availability of milk in the state over the last 17 years shows ascending trend which indicates positive growth in milk production and productivity.

CONSTRAINTS IN MILK PRODUCTION IN THE STATE

The problems and constraints in milk production in the state of Tripura are manifold which are needed to be addressed promptly and adequately to bring in rapid improvement. The major constraints are:

1. Non- availability of well recognized Indigenous milch breed of cattle and buffalo in the state and use of high pedigree and Progeny Tested bulls of Indigenous milch breeds.
2. Inadequate production of animal feed ingredients.
3. Lack of agricultural by-products, like Rice/ Wheat bran, Rice polish, Oil cakes, Oil meals, Dal chunies, Pulses etc.
4. Less availability of land for green fodder cultivation.
5. Lack of planned scientific breeding and husbandry practices.
6. Poor feeding and management practices in dairy farming are still in vogue in rural households. Livestock are maintained under unhygienic conditions with suboptimal feed, fodder and medicine.
7. Poor marketing of dairy animals & dairy products at local level.
8. Lack of cooperative society for collection of milk & milk products.
9. Less awareness & training among the livestock keepers.
10. Lack of milk processing and value addition of milk.
11. Lack of cold storage, chilling plant and other related infrastructure.

Even though, the above constraints pose problems in targeted milk production but the growth rate is promising over the years which envisages huge demand for milk and milk products

So, considering the present status of milk production it has become extremely necessary to formulate a suitable and livestock keeper friendly Cattle Breeding Policy in Tripura with agro-ecological region specific and production system based approach for sustainable development of the dairy sector.

Table 18: BREEDING INFRASTRUCTURE

AVAILABLE BREEDING INFRASTRUCTURE IN THE STATE		
Sl. No.	**Infrastructure**	**Particulars**
1.	No. of Semen Stations/Source of Semen	Procured from SAG, Ahmedabad, Gujrat
2.	No. of Bull Mother Farms	1 No.
3.	No. of Semen Depots/Banks	4 Nos.
4.	LN_2 Production Unit/ LN_2 Procurement Arrangement	1 No. Also, LN_2 procured from outside the state (Assam)
5.	LN_2 Distribution Arrangement	LN_2 distributed all over the state through hired vehicle
6.	AI Technician Training Institute and Accreditation Status	1 No. (Proposal has been submitted to DADHF, GOI for accreditation)
7.	No. of Govt. Veterinary Hospitals and Dispensaries providing AI services	76
8.	No. of Veterinary First Aid centers providing AI services	360
9.	No. of Private AI Technician	176, Another 36 nos. have been included

In the year 1987, the first LN_2 Plant in the state was established at R.K. Nagar and later on another two plants were established with a view to preserve the FS Straws procured from outside state. At present two plants are functioning with production capacity of 90,000 Lts. of LN_2. The total requirement for the state is 2.20 Lakh Lts. and thus, the remaining 1.30 Lakh Lts. are procured through outsourcing. To achieve self sufficiency in LN_2 production in the state, a project proposal with an estimated cost 11.60 Crore for establishing another three numbers of LN_2 Plants in three Districts Viz. West Tripura, Gomati and North Tripura has been submitted to the DAHDF, GOI.

Doorstep AI Work:

The Doorstep AI Workers are trained exclusively on A.I. for three months as per RGM guidelines and provided with AI logistics (BA_3 Cryocan, AI equipments, Bi-Cycle for conveyence etc.). After the training they start working in their respective areas under the supervision of local Veterinary Dispensary. The Department provides FS Straw @ Rs. 15/- per straw and LN_2, AI equipments etc. free of cost. They have been permitted to collect service charges from the cattle owner @ Rs. 60/- for 1st A.I, Rs. 50/- for 2nd AI, Rs. 40/- for 3rd AI and no charge beyond 3rd AI which is mandatorily be referred to the Concerned Veterinary Officer. The unemployed youth having at least Madhyamik (10th) Examination Passed qualification are selected primarily from GP/VC areas through PRI bodies. The month-wise scrutiny of their works is done by the local VOs and also by the superior authorities. As per RGM norms the DSAIWs are given incentive @ Rs. 100/- per calf born. They are also included in the mass vaccination, mass castration, livestock census and other sample survey works as and when needed.

Table 19: District-wise A.I. Institution and functional DSAIW in Tripura

Sl. No	District	No. of Dept. AI Institution	No. of functional DSAIW	Sl. No	District	No. of Dept. AI Institution	No. of functional DSAIW
1	West	81	53	5	South	52	09
2	Sepahijala	85	34	6	Unakoti	36	07
3	Khowai	50	18	7	North	49	16
4	Gomati	44	25	8	Dhalai	39	14

Strategies to Improve Skill of DSAIW for more A.I. coverage:

- To improve the AI coverage in the state of Tripura, more nos. of Private AI workers are to be selected & trained in accredited AI training Institute.
- In addition to new inclusion of private AI workers, the existing AI workers are needed to be given "Refresher training" on regular interval so that they become more skilled in catering AI services and thus more accuracy in AI works could be achieved which will certainly increase the conception rate in candidate animals.
- Infrastructure of the Artificial Insemination Training Institute (AITI) needs to be strengthened.

Table 20: AI performance in the state (Last 3 years)

Year	AI Done at Vety. Institute	Calf Born	AI done by DSAIW	Calf born
2016-17	87484	34225	80766	26778
2017-18	69870	32217	82883	32665
2018-19	68378	29227	81516	29823

It is fact that the number of AI done in different Veterinary Institutions are in declining trend over the years which is due to increase in the AI coverage by doorstep AI worker at doorstep of farmers, inadequate manpower in the institutes, reluctance of the owners to bring the animals to the institutes due to massive urbanization etc.

RASTRIYA GOKUL MISSION

(An activity of Tripura Livestock Development Agency (TLDA) under NPCBBDD-IB)

Objectives of the Project:

As per guidelines of GOI, the implementation of RGM was started in the state of Tripura during the year 2014-15 with the following objectives:

1. For development, Characterization & conservation of local non-descript Indigenous Cattle, so as to bring National recognition as an indigenous cattle genetic resource of Tripura State in future.
2. To upgrade non-descript Indigenous Cattle using registered indigenous breed i.e. **Sahiwal/ Gir/ Tharparkar**.
3. To enhance the milk production & productivity in Indigenous Cattle.
4. To undertake breed development programme for indigenous cattle breed so as to improve the genetic makeup and increase the stock.
5. To distribute disease free high genetic merit bulls of indigenous breeds for natural services.

With a view to the above objectives, the implementation of RGM was started both for the development of Indigenous breed within the state as well as for their upgradation in a focused and scientific manner. The SIA for the implementation of RGM in Tripura is TLDA. During the year 2017-18 Rs. 389 Lakh was received from GOI as a 1st Phase allocation. For successful implementation, some components applicable to the state of Tripura were incorporated in the re-appropriation proposal as because there is so far no Registered Cattle Breed in Tripura. During 2018-19 and 2019-20 1081.98 Lakh was received as 2nd Phase and 3rd Phase allocation.

The Department has taken initiative to characterize the cattle population having similar body type characteristics both phenotypically & genotypically under RGM for which plan fund of Rs.66 lakh has been earmarked under the project "Characterization of Indigenous Cattle in Tripura" which will facilitate further recognition of Indigenous cattle population as registered cattle breed.

Components of RGM Project:

Following components are being implemented-

- Establishment of Gokul Gram at R.K. Nagar.
- Strengthening of bull mother farm at RK Nagar to conserve high genetic merit Indigenous breed.

- Field Performance Recording (FPR) under INAPH.
- Organization of milk yield competitions and calf rallies for encouraging the farmers at field level to utilize A.I. as a means of genetic improvement of local cattle.
- Organization of training programme for technical and non- technical personnel working at the Institute/institutions engaged in cattle development.
- Distribution of disease free high genetic merit bulls for natural service.
- Incentive to farmers maintaining elite indigenous cattle.

Achievements under RGM

The following table indicates different achievements in terms of AI, Calf born, Private AI workers training, refresher training of AI workers, fertility management camp etc. from the introduction of RGM in Tripura i.e from 2016-17 to 2019-20 (up to Sept'2019).

Table 21: Achievements Under RGM In Tripura

Year	DIFFERENT ACHIVMENTS UNDER RGM IN TRIPURA									
	AI			Calf Born			DSAIW Trained	Fertility Manage-ment Camps	Refresher Training of DSAI Workers	Refresher Training of Existing AI Workers
	ND	CB	Total AI	Male	Female	Total Calf Born				
2016-17	81723	86527	168250	30233	30770	61003	31	400	0	49 nos.
2017-18	71827	80926	152753	32185	32697	64882	36	500	194 Nos	50 nos.
2018-19	69730	80182	149912	29708	29343	59051	0	500	0	50 nos.
2019-20 (upto Sept.)	31937	42448	74385	12494	12777	25271	50	212	0	0

The total breedable cattle population in the state is 4, 73,379 (both ND and CB) as per Livestock Census, 2012. The present target A.I. for the year 2019-20 is 1.80 Lakh. which has been fixed on the basis of previous years' performance i.e. 1.50 Lakh. Both Institutional and doorstep A.I work needs to be improved to achieve the target for which special efforts are to be taken by the Vets, Para-Vets, and Doorstep A.I workers. The fixed target once achieved will definitely help in improving the production and productivity in cattle of the state.

Table 22: DSAIW activities from 2016-17 to September '19 of 2019 -20 (Under RGM)

DSAIW Activities from 2016-17 to September 2019-20					
District	**No. of DSAIW**	**AI PERFORMANCE**			
		2016-17	**2017-18**	**2018-19**	**2019-20 (up to Sept.)**
West	53	28921	27679	29253	14581
Sepahijala	34	23555	23013	21476	11477
Khowai	18	7124	7243	6971	3845
Gomati	25	8907	11640	9943	3795
South	9	3638	3944	2717	827
Unakoti	7	331	375	564	276
North	16	3152	3586	4505	2724
Dhalai	14	5138	5403	6087	3184
TOTAL	176	80766	82883	81516	40709
Avg. AI Performance per DSAIW per year		458.89	470.92	463.15	231.3

Strategies to Improve performance of DSAIW:

The private AI Workers i.e. Door Step AI Workers needs to perform more nos. of AI so that AI coverage in the State could be increased. The monthly target should be given to the DSAI workers. At present, average AI coverage per DSAI worker per year is **450** which need to be increased by at least **1200** AIs per DSAIW per year. Thus, necessary strategy needs to be worked out to improve their skills and performances. In this direction, following strategies are planned-

a. Fixation of yearly AI target for individual DSAI worker (1200 AI per DSAIW per year).
b. Assessment of their performances on monthly basis.
c. Awarding incentive on the basis of AI performances. Specific norms would be decided to award Incentives. Different slabs of Incentives with corresponding number of AIs performed by a DSAI worker would be worked out.
d. More emphasis on monitoring of AI done by the DSAI worker through regular follow-up and monitoring of pregnancy diagnosis and calf born at field level.
e. Assigning AI works only to DSAI Workers and restraining them from other works particularly treatment of animal etc. through enactment of necessary rules by the Govt. which will help in maximizing AI coverage in the state. Enhancing skill of AI workers ultimately will help in increasing production & productivity.
f. Proper animal identification and performance recording of data as per INAPH format. Emphasis needs to be given to bring these animals under Insurance coverage.

GOKUL GRAM

As per guideline of GOI, Gokul Gram is to be implemented in the states where Indian Dairy Breeds recognized by the National Bureau of Animal Genetics & Resources (NBAGR), Karnal are available for their improvement and preservation.

As there is no existence of recognized Indian Dairy Breed of Cattle in Tripura, it has got limited scope in the state. Another objective of the project is to upgrade the local Cattle which the state is already practicing under National Programme for Bovine Breeding (NPBB). Under this programme, germplasm (Frozen semen) of one Indian Dairy Breed viz. Sahiwal have been procured for upgradation of local ND cattle.

However, there is option that ND cattle may also be included in the Gokul Gram development for conservation to the tune of 40%. Accordingly, steps are taken for implementation of this project in Tripura.

In Tripura, One Gokul Gram will be established at R.K. Nagar area under West Tripura District wherein local indigenous cattle will be selected for extension of project activities. It is to be noted here that indigenous cattle (ND) population is predominant in the adjacent villages. The work is in progress under the technical guidance of College of Vety. Science and A.H., R.K. Nagar. The detail of project is given in tabular form.

Table 23: Infrastructure Development for Gokul Gram

GOKUL GRAM			
Sl. No.	**Activities**	**Fund (Rs. In lakh)**	**Remarks**
1	Construction of cattle shed to house 30 nos. local indigenous cattle for upgradation with Sahiwal Breed.	48.00	The Project is being implemented by the College of Vety. Science & A.H., RK Nagar. Land dispute resolved site has been selected & finalized, tender for construction work has been called. This herd along with the surrounding area will be subsequently formed in the shape of Gokul Gram.
2	Procurement of 30 nos. of local non-descript indigenous cattle (ND) for up gradation purpose with transportation.	10.00	
3	Demarcation of boundary	34.00	
4	Development of Fodder (04 ha.), Creation of silo pit, Creation of shed for protecting silo pit, Purchase of chaff cutter, purchase of agricultural implements	11.60	
Total		**103.60**	

VETERINARY SERVICES AND ANIMAL HEALTH

The Department of ARD extends health coverage, vaccination against infectious and contagious diseases in Livestock and Poultry and other related activities through different field Institution like Vety. Hospital, Vety. Dispensary, Vety. First Aid Center/ Stockman Sub-Centre under the supervision of Block and District Administration of the Department. Apart from this, field Programmes at the doorstep of farmers are taken up for mass awareness on clinical and A.I. activities including different A.H. Practices. The yearly data on achievements has been depicted in tabular form.

Table 24: Annual Performance report on Health coverage

Sl. No.	Particulars	Achievement				
		2006-07	2011-12	2015-16	2017-18	2018-19
01	Animal Health Coverage (Animal + per 100 birds is considered as an treatment)	4,97,177	5,88,732	6,06,603	5,31,260	640099
02	Vaccination other than FMD (Nos.)	11,24,671	50,41,435	68,96,597	41,57,916	5779436
03	Vaccination against F.M.D. (Nos.)	1,50,102	6,12,679	5,93,362	6,99,796	881605
04	No. of Veterinary Hospitals/ Dispensary					76
05	No. of Vety. First Aid Center					458

Source: - Animal Resource Development Department, Tripura

ACCESS OF VETERINARY SERVICES:

The availability of infrastructure and support services in Tripura is as follows.

1. Availability within the village - 60%
2. Availability in nearby location - 40%
3. Distance travel to access the Vety. Services (in Km.) - 2-12

Source: Field survey conducted by MART, Noida, April, 2011 under NERLP

Table 25: Economic value of Animal Wealth and its products over the Year 2017-18

Estimated Livestock Population & Valuation during the year 2017-18						
Species	**Sl. No.**	**Estimated Livestock Population as on 2017-18**			**Valuation (In Rs.) Unit Cost**	**Value (Rs. in Lakh)**
Cattle	A	C.B. Male	Adult	17499	21,550	3771.09
	B		Young	21284	12,275	2612.64
			Total CB Male	38783	33825	6383.73
	C	C.B. Female	Adult	63468	32,350	20531.96
	D		Young	54034	23,550	12724.89
			Total CB Female	117502	55900	33256.85
		Total CB Cattle		156285	89725	39640.58
	E	ND Male	Adult	234857	15,750	36990.02
	F		Young	111630	8,650	9656.02
			Total ND Male	346488	24400	46646.04
	G	ND Female	Adult	319501	20,650	65976.86
	H		Young	237331	15,250	36193.04
			Total ND Female	556832	35900	102169.89
		Total ND Cattle		903319	60300	148815.93
Buffalo	I	Buffalo Male	Adult	3338	15,575	519.85
	J		Young	1715	9,585	164.42
			Total Buffalo Male	5053	25160	684.27
	K	Buffalo Female	Adult	5053	30785	1555.59
	L		Young	3397	15525	527.32
			Total Buffalo Female	8450	46310	2082.90
		Total Buffalo		13503	71470	2767.17
Pig	M	Pig	CB Pig	217916	10,500	22881.18
	N		ND Pig	153274	10,500	16093.77
			Total Pig(CB+ND)	371190	21000	38974.95
Others	O	Total Sheep		3142	1,500	47.13
	P	Total Goat		687414	1,600	10998.62
	Q	Total Poultry(Fowl)		5429695	220	11945.33
	R	Total Duck		1150819	250	2877.05
Total						**256066.76**

Source: - Animal Resource Development Department, Tripura.

The economic valuation of the animal products and contribution to the state economy over the years 2017-18 as estimated by the Dept. of ARD shows total output value of Rs.219407.91 Lakh which indicates animal husbandry is a major component of the state economy and on this basis the Govt. of Tripura declares this sector as 2nd Primary sector after Agriculture. To achieve and improve the targeted production of milk, meat and egg the Govt. of Tripura has given importance on these sectors with specific mission so that the positive trend as achieved over the years could be strengthen further **(Annexure-1).**

The ISS survey conducted during the year 2016-17, 2017-18 and 2018-19 for different samples for estimating the growth pattern of milk, meat and egg production in the state shows positive trend and thus at par with the production the per capita availability of this animal origin protein in the state has also shown ascending trend **(Annexure-2).**

INTERVENTIONS AT GOVERNMENT LEVEL TO ACHIEVE THE TARGETED PRODUCTION OF MILK, EGG AND MEAT:

Milk Sector:

- Increasing the number of crossbred population through intensification of Artificial Insemination
- Setting up of credit linked mini/micro dairy unit.
- Organization of fertility management, animal health, dairy cattle judging and milking competitions, calf rallies and awareness camps.
- Mass Deworming Programme and supply of mineral mixture for female cattle.
- Popularization of castration of stray/ scrub bulls.
- Incentivizing "Door Step AI Workers".
- Training of AI workers and provision of logistic support for AI service at farmers' doorstep.
- Supply of breeding bulls (Indian dairy breed/crossbred) in TTAADC area for coverage through natural service.
- Induction of high yielding variety of milch cattle from outside state.
- Development of perennial fodder crops through convergence of fund under MGNREGA.
- Cultivation of Azolla as animal feed supplement through convergence with MGNREGA.
- Capacity building of farmers on managerial aspect of milch cattle.
- Development of pasture land through convergence of fund under MGNREGA.
- Introduction and adoption of Sexed Semen Technology.
- Dairy Entrepreneurship development through DED scheme
- Strengthening of Milk Procurement and processing system through Co-operative System.
- Strengthening milk and milk product marketing system and value addition.
- Encouraging Private-Public Partnership participation in production, processing, value addition & marketing of the finished milk products and by-products.
- Animal identification & proper Data Recording through NADRS & INAPH.

Egg Sector:

- **Encouraging commercial layer farming by private entrepreneurs.**
- Establishment of Block Level Brooder Houses and satellite Hatcheries & Proper Monitoring.
- Massive promotion of back yard poultry including Patta-holders under FRA.
- Introduction of Low Input Technology (LIT) poultry birds.

Meat Sector:

- Setting up of beneficiary oriented Piggery demonstration unit for pig multiplication including Patta- holders under FRA.
- Tuber /Tapioca cultivation through convergence of fund under MGNREGA in FRA & other areas.
- Improving productivity of Goats under Conventional small holder/ Pastoral System.
- Infrastructure establishment for production and multiplication of genetically superior germplasm of Pig and their dissemination, pork processing and value addition through Private-Public Partnership participation.

FEEDS AND FODDER DEVELOPMENT

This is one of the most vital areas of the department to focus upon in strengthening infrastructure for making available adequate quantities of feed and fodders to exploit optimum potential of Livestock and Poultry Production. The state is in deficit of all important feed ingredients particularly the grains and oil-cakes for which the state is entirely dependent on outsourcing. Under the feeds & fodder development programme cultivation of green fodder and grasses are undertaken and grazing facilities are developed for the milch animals. For development of fodder production in farmers land in the block level, programmes have also been adopted involving panchayats (PRIs) as well as under MGNREGA.

There are seven Fodder Seed production Farms under State Government- i) R. K. Nagar Fodder Farm ii) Devipur Fodder Farm iii) B. C. Manu Fodder Farm, iv) Nalicherra Fodder Farm v) Nalkata Fodder Farm vi) SPF Gandhigram Fodder Farm and vii) Hawaibari Fodder Farm.

Table 26: Details of fodder development activities in 2017-18 under Government Farms and in farmer's field

Sl No	Items	Unit	Achievement 2017-18
1.	Area under fodder crops in Government farms :		
	(i) Kharif/ perennial	In Ha.	23.04
	(ii) Rabi/ annual	In Ha.	0.96
	(iii) Area under pasture;	In Ha.	40
	(iv) Area under Tapioca plantation	In Ha.	10.0
2.	Production of Fodder in Govt. Farms.		
	(i) Green fodder production	In Mt.	1282.755
	(ii) Dry fodder production	In Mt.	19.742
	(iii) Azolla production	In Mt.	0.5172
	(iv) Raw Tapioca production	In Mt.	11.47
	(v) Azolla production	In Mt.	0.5172
	(vi) Silage production	In Mt.	360
	(vii) Hay production	In Mt.	19.472
3.	Other Achievement in Govt. Farms.		
	(i) Green fodder supplied)	In Mt.	1282.755
	(ii) Dry fodder supplied	In Mt.	19.742
	(iii) Distribution of perennial cuttings annually	in Lakh	1.525
	(iv) Distribution of Tapioca cuttings annually	in Lakh	0.45
	(v) Silage supplied	In Mt.	217.207
	(vi) Revenue earned (by cash selling)	Rs. In Lakh	2.14467
	(vii) Revenue earned (by Supply value	Rs. In Lakh	39.8542
4.	Achievement in Farmers field.		
	(i) Tapioca	In Ha.	0.64
	(ii) Tapioca production(expected)	In Mt.	12.8
	(iii) Perennial fodder plantation	In Ha.	4.64
	(iv) Perennial fodder production(expected)	In Mt.	278.4
	(v) Fodder minikit distribution	In Nos.	1000
	(vi) Seed distribution under minikit distribution	In Mt.	4.0
	(vii) Area covered under minikit distribution	In Ha.	80
	(viii) Seasonal fodder production	In Mt.	1600
	(ix) Azolla cultivation unit	In Nos.	10
	(x) Demonstration programme on enrichment of straw by urea & molasses	In Nos.	820

Source: - Animal Resource Development Department, Tripura.

Enrichment of Paddy straw for Nutritional Supplementation:

The paddy straw is the only dry fodder component for livestock especially cattle in the state. However, the paddy straw is nutritionally poor for proximate principles i.e Carbohydrate, Protein, Fat and different major and trace Minerals etc. which may be enriched through different techniques so that the animals may get sufficient Carbohydrate, Protein, Fat etc. for growth and production. One of the most important techniques is enrichment through Urea + Molasses + Mineral + Mixture treatment.

With a view to improve Carbohydrate, protein, mineral content in the paddy straw through Urea-Molasses treatment, efforts has been taken up by the ARD Deptt. to popularize the method among the interested farmers. In this direction, a certain nos. of selected beneficiaries are trained and supplied with requisite inputs every year. Through this concerted effort, this method of improving nutrient content in paddy straw is becoming popular day by day in the state. This method of enrichment has been included under RKVY and project is being implemented over the years in the state **(ANNEXURE-3).**

Fodder Seed Cultivation under NLM:

To make available different fodder seeds in the state for seasonal cultivation different projects are being implemented in Tripura with a view to curtail the deficit in fodder production. The National Livestock Mission is one such project under which Maize Seed production scheme is being implemented along with other fodder like Tapioca, Combo-Napier etc. Under this project the beneficiaries are selected by the PRI bodies as per target and scheme is implemented through NLM fund. The seed produced after successful implementation is purchased by the Dept. of ARD and the beneficiary also keeps a certain quantity along with them for further cultivation. The scheme is implemented since introduction of NLM in the state **(ANNEXURE-3).**

Table 27.A: Requirements, Availability and Shortage of different Feed Ingredients for Livestock and Poultry Birds, etc. of Tripura State

Name of Feed Ingredient	Estimated requirement in the state	Availability in the state	Estimated Shortage in the State	Deficit in %
Yellow Maize	160066 MT	Nil	160066 MT	100%
Broken Wheat	123012 MT	Nil	123012 MT	100%
Wheat Bran	101822.4 MT	Nil	101822.4 MT	100%
Rice Bran	32328 MT	10000 MT	22328 MT	69.06%
Rice Polish	54453.6 MT	250 MT	54203.6 MT	99.54%
Broken Rice	21564 MT	30500 MT	-	Surplus by 41.43%
Soyabean Mill	98035 MT	Nil	98035 MT	100%
MOC(Exp.)	43128 MT	Nil	43128 MT	100%
Sunflower Cake	21564 MT	Nil	21564 MT	100%
Cotton Seed oil Cake	21564 MT	Nil	21564 MT	100%
Dry Fish	19929.6 MT	Nil	19929.6 MT	100%
GNC(Ext.)	13032 MT	Nil	13032 MT	100%
Dry Fodder (Paddy Straw)	**643380 MT**	**482500 MT**	**160880 MT**	**25%**

Table 27.B: Requirements, Availability and Shortage of different Feed Supplements, Minerals, Vitamins etc. for Livestock and Poultry Birds, etc. in Tripura State

Name of Feed Ingredient	Requirement for ARDD	Availability	Shortage/Demand of ARDD in Tripura State	Deficit in %
Oyster Shell Grit	4952.16 MT	Nil	4952.16 MT	100%
Mineral Mixture	9817.2 MT	Nil	9817.2 MT	100%
Toxin Binder Powder	479.16 MT	Nil	479.16 MT	100%
Choline Chloride Powder	329.04 MT	Nil	263.88 MT	100%
Vit.-AD3K	172.8 MT	Nil	172.8 MT	100%
Vit.-B1,B2,B6 Powder	107.64 MT	Nil	107.64 MT	100%
Pre-biotic/ Metabolite Powder	215.28 MT	Nil	215.28 MT	100%
Lysine Powder	113.76 MT	Nil	113.76 MT	100%
Methionine Powder	113.76 MT	Nil	113.76 MT	100%

Both the tables as indicated above show the position of requirement, availability and deficit percentage of different feed ingredients for concentrate mixture, dry fodder, feed supplements, minerals and vitamins etc. for Livestock and Poultry in the state. For most of the feed ingredients except Broken Rice, Rice Bran and Rice Polish (to some extent) the deficit is 100%. The deficit for Rice Bran which is a major component of finished ration is 69.06%. As Feed ingredients are required for preparation of balanced ration for Livestock and Poultry, specific strategy is need to be taken for production of feed ingredients like Maize, Oilseeds and Pulses etc. in the state. The area specific soil study for presence of minerals is to be studied so that specific minerals may be supplemented in the ration at the time of computation.

LAND USE STATISTICS IN TRIPURA

The land use pattern in the state indicates that permanent pasture & other grazing land, cultivable waste land, current fallow land & other than current fallow land could be utilized for fodder production which will reduce the deficit and help in increasing milk production in the state.

Table 28: The Land Use Statistics of the State for the year 2015-16 & 2017-18

Sl. No.	Indicator	2015-16	2016-17	2017-18	2018-19
1.	Geographical Area	1049169	1049169	1049169	1049169
2.	Forest Area	629426	629426	629426	629426
3.	Land Not Available for Agricultural Use	146920	147413	147979	1,45,389
4.	Land under Miscellaneous tree Crops	10684	10525	10423	11,695
5.	Permanent pasture & other grazing land	1077	944	944	1,345
6.	Cultivable Waste land	2878	2878	2878	3,020
7.	Current Fallow	1096	898	890	1,495
8.	Fallow Land Other than Current fallow	1635	1595	1534	1,729
9.	Net Cropped area	255450	255490	255095	255070
10.	Gross cropped Area	485677	490540	486770	4,74498
11.	Cultivable Land	272823	272330	271764	-
12.	Land under Fodder Crops	-	-	-	3000
13.	Land under permanent pasture-grazing land	-	-	-	5000

Source: - Agriculture Department, Tripura and IGFRI report, 2019.

Table 29: Estimates of green fodder availability and deficit/surplus status

Sl. No.	Attribute	Estimates (In thousand Tonnes)
1	Cultivated land	548.6
2	Cultivable wasteland	1.2
3	Source fallow land	1.2
4	Pasture land	6
5	Forest	247.2
6	Total green fodder availability	804.2
7	Total green fodder requirement	1916.1
8	Percent availability	42
9	Percent Deficit (-)/Surplus(+)	-58

Source: Indian Fodder Scenario: Redefining State wise Status (2019). All India Coordinated Research Project on Forage Crops and utilization, Jhansi, UP.

The green fodder availability in the state from all sources as attributed in Sl. No. 1 to 5 is 804200 MT as against total requirement of fodder i.e. 1916100 MT. Thus, the deficit is 58% which needs to be addressed with much importance for improvement of production and productivity in livestock especially in cattle.

SUITABLE TECHNOLOGIES FOR ENHANCING FODDER PRODUCTION

- Adoption of promising forages varieties.
- Forage based crop intensification (Round the year forage productions).
- Targeting forage production from non-arable lands (alternate land use systems, ALUs).
- Introducing perennial cultivated grasses on farm bunds along with irrigation channels/farm boundaries/terraces.
- Fodder Seed production.
- Conservation of fodder, popularization of baling, feed block technology and management of crop residues.
- Extension strategies for revitalizing fodder production.

SHORT TERM AND LONG TERM STRATEGY TO SORT OUT SHORTAGE OF FEEDS AND FODDER

1. Development of community pasture in fallow and cultivable waste Land.
2. Cultivation of fodder and development of pastureland in the land of Patta-holders under FRA.
3. Steps to be taken for cultivation of fodder in Reserve forest areas.
4. Steps to be taken for cultivation of Maize, Wheat, Soyabean, Mustard, Sesame, Ground nut etc. through Agriculture Dept. for easy availability of grains/oil cakes.
5. Efforts to be taken to establish feed manufacturing plants at least one in each district through PPP Model for reducing the production cost of balanced ration.
6. Mass awareness among the farmers to cultivate fodders along with cash crops during Inter-cropping period.
7. Moringa cultivation has been taken up by the Department of ARD in the year 2019-20 as a short and long term strategy to use it as **a green fodder supplement** for augmentation of milk production.
8. Forage Production may be done by utilizing non-arable land through alternate land use system in which Combo Napier/ Guinea grass / Stylo/ Cowpea may be included in horti-pasture and silvi-pasture.
9. Due to limited cultivated area under fodder crops, only available option is to catalyze vertical increase in the fodder production through a) Crop intensification for round the year fodder production & b) Fodder utilization & conservation: Silage/hay making, making leaf meal.
10. Non-competitive land can be used for cultivation of fodder along with plantation crops/ orchards. Guinea grass can be included with Rubber plantation in the orchard till tapping starts i.e up to 7 years.
11. Fodder on field boundary like Moringa, Subabul, NB hybrid etc. may be an option to fill the deficit of fodder.
12. Azolla cultivation requires minimum investment and floor space requirement but a good source of protein required for milk production.
13. Steps to be taken to popularize the method of **Urea Molasses treatment of Paddy straw** to improve protein contain and availability for growth of animals & further augmentation of milk yield. Efforts need to be taken to encourage Private-Public Partnership participation to establish manufacturing unit to prepare blocks/ bails of Urea Molasses treated paddy Straw as a readily available source of feed supplementation to the farmers.

MARKETING OF MILK AND MILK BY-PRODUCTS

1. THROUGH CO-OPERATIVE SOCIETIES

A. Gomati Cooperative Milk Producers' Union Ltd (GCMPUL):

The main target of the scheme since inception was to re-vitalize milk cooperative sectors for processing and distribution of milk and also to make proper arrangement towards proper milk marketing system with a view to assure fetching justified remuneration on selling of milk by actual producers. At present GCMPUL collects milk from five districts of Tripura through 108 nos. of MPCS. The district wise distribution of MPCS is as follows:-

i) West Tripura = 37 nos. ii) Sepahijala = 39 nos. iii) Khowai = 19 nos.
iv) South Tripura = 06 nos v) Gomati = 07 nos.

At present, GCMPUL collects 8000 liters (approx.) milk per day.

Table 30: The following were the achievement in 2017-18 & 2018-19 (up to Nov.'19)

SL. No.	Name of the Item	Unit	Achievement	
			2017-18	2018-19 (up to Nov.'19)
1.	No. of MPCS functioning at present	In Nos.	105	108
2.	Procurement of milk from			
	i)MPCS	In Kg	20,66,073.31	19,79,000.00
	ii) Government Farm	In Kg	79,048.50	-
3.	Marketing of milk	In Lts.	45,13,437.60	14500 lts /day
4.	Supply of milch ration	In MT.	2,169.03	-
5.	BMCS	In Nos.	02 (5000 lts.)	05(proposed-2000 lts. each)

The **GCMPUL** also has the facility of producing value added products like, Ice-Cream, Misti Dahi (Sweet-Curd), Paneer, Ghee etc. There is another co-operative society namely **'Uttarayan'** which is located at Dharmanagar, North Tripura District & was involved in collection, processing & marketing of milk and milk by-products. However, at present, this Co-operative is not functioning due to certain problems. Efforts have been initiated to make it functional again. Another milk processing plant under GCMPUL is coming up in Mohanpur Sub-Division of West Tripura District. At present there is no private agency for processing and marketing of milk and milk by-products in Tripura. The collection is only 1.5% or so per day out of total milk production and there is much scope for improving the collection at least up to 10%. The proposed BMCs and second processing plant once come into existence will definitely increase the collection and processing of milk by GCMPUL in near future.

B. Uttarayan co-operative at North Tripura District:

Another co-operative union for procurement of milk and processing was established at Dewanpasa, Dharmanagar in North Tripura District in the year 2005 under the supervision of TCMPUL (Presently named as GCMPUL). At that time the objective was to collect milk from the farmers through societies (in and around Dharmanagar Sub-Division) and to sell processed milk in the Dharmanagar town area. After that in 2009 the unit was taken over by the Deptt. of ARD and the unit successfully run up up to the month of December' 2012 under the control of the Department. In the year 2013 a Managing Committee under the control of a Board of Directors was formed and since then this committee took over the unit naming it as 'Uttarayan'. At that time total daily collection of milk from 22 nos. of Milk Co-operative societies was 500-550 lts. and production was 1,400 lts. after necessary value addition with Skimmed Milk and Butter Fat. The Uttarayan successfully run up to 2015. After that, the Department of ARD stopped sanctioning its share and in the long run the unit failed to sustain on its own fund. Although several efforts were taken to rejuvenate the unit to its past status but no positive result was achieved. At present the unit is not functioning. However efforts have been made to hand over this unit to the private entrepreneurs/ industrial units under PPP model. Effort is in process to invite AMUL to run the unit in full fledged manner so that the procurement system of milk in entire North and Unakoti District could be given new vista.

C. Tridha Milk Producer Company Ltd. under TATA Trust at Dhalai District:

The Memorandum of Understating (MoU) was made on 9th July 2019 between Tata Trusts and Government of Tripura to implement the multiple livelihood and non-livelihood projects for the people of Tripura. Dairy development project is one of them under livelihood project which has been implemented in 2 blocks such as Durgachowmuhani and Salema Block under Dhalai District.

The Government of Tripura has handed over a land of 2 acres for establishing the milk processing plant located at Kalachari G/P of Durgachowmuhani Block. A connecting road (1.14 km long) between main PWD road and Dairy Plant has already been constructed by PWD, Government of Tripura.

The project aims at promoting dairy as a sustainable livelihood for the rural small and marginalized woman dairy farmers. The budget outlay of the project is Rs. 809.85 lakh which is being funded by TATA Trusts and the project period is 3 years.

The key achievements of the project are as follows –

- Milk processing plant was established with the capacity of **5000 liters/day** which is to be expandable to **10,000 liters/day.**
- Machinery of the plant has been installed and 2 trials have been attempted successfully.
- A company was established in the name of **Tridha Milk Producer Company Ltd.** on 10th April, 2018.
- Logo of the company was finalized.
- **20 milk collection unit/pouring points have been identified and the equipments have been procured. Installation of the equipments will be done before plant operation.**
- **874 farmers have been enrolled and 84 dairy groups have been formed.**
- Effluent treatment plant (ETP), Reverse Osmosis (RO) plant and 100 KVA capacity of transformers have been installed at plant site.
- Revolving fund has been sanctioned to 200 farmers for purchasing high yielding cattle.
- 381 woman farmers have been trained on herd management activities of dairy farming in collaboration with Deptt. of ARD, Dhalai, Tripura.
- 36 cattle have been brought under cattle insurance.
- 263 numbers of cattle have already been inseminated and the conception rate is around 50%.

The plant is expected to be made operational by 1st quarter of 2020.

2. MARKET ACCESS AT VILLAGE LEVEL

Except milk, other livestock and livestock products are sold by the farmers. Milk is produced mainly for self-consumption purpose and consume within the village itself. Other livestock are reared mainly for selling purpose and only small quantities are consumed within the village itself. The state is still a importer for milk (in powder form) and egg. The table given below shows the marketable surplus for major livestock activities pursued by villagers.

Table 31: Status of Animal Products Marketing in Villages

Livestock	Volume consumed in village (%)	Marketable surplus in village
Cow Milk	85	15
Poultry	19	81
Goat	10	90
Pig	5	95

Dairy Entrepreneur Development Scheme (DEDS) under NABARD is a popular scheme for cattle development in Tripura and the progressive farmers have taken this venture for establishing Micro, Mini, and Medium dairy farm. Over the years a good number of Micro, Mini, and Medium dairy farms have been established in different Districts of Tripura and functioning successfully.

At present the Government has given special emphasis on this scheme with new target to include more numbers of farmers/ unemployed youths. So far, 1228 applications for different categories of Dairy Units (Micro, Mini, and Medium) have been received from farmers by the Department and accordingly processed for necessary sanction of the scheme by the Nationalized Banks. So far 301 numbers of applications have been sanctioned for bank loan under DEDS in different districts and necessary procurement of milch cows as well as establishment of Dairy Units as per DEDS guideline is in process.

The high yielding animals are being procured from outside the state under this scheme which will definitely increase the milk production in the state as wells as create opportunity for more income generation.

3. SELLING SYSTEM AT VILLAGE LEVEL

Milk production is low in villages and the entire surplus quantity available is sold within the village itself. Thus there is a good scope of improving cattle productivity by extending proper extension services, technical inputs and income generation from this sector may be given boost. The prices of various livestock commodities mainly depend upon villager's understanding of supply and demand pattern, timing of sale, and place of sale, sale directly to consumers or through channel partners. Similarly, for milk which is sold within the village itself the price variation ranged between Rs. 30 to 40 per litre. Organizing pool for collective procurement of inputs and marketing, adoption of better animal management and rearing practices, marketing information and field based hand holding support can help poor farmers realize higher return from livestock activities. Live goat, pig and poultry are mainly sold to traders and to some extent in local markets. In case of broiler birds, the traders regulate the sale prices in the state.

Once the dairy units under DEDS are established successfully, new steps need to be taken to revamp the procurement, marketing and value addition system. The private entrepreneurs those are interested in establishing milk processing unit in the State may be invited to establish their unit under PPP model which will help in proper marketing of milk produced in the state.

LIVELIHOOD BASED ANIMAL HUSBANDRY BUSINESS

Table 32: Major livestock activities pursued by villagers and % of households engaged

Type of Livestock	Availability in percentage of villages	Percent of household involved
1. Cattle	90%	18%
2. Goat	70%	25%
3. Pig	30%	3%
4. Poultry	100%	22%
5. Fish	100%	12%

Source: Field survey conducted by MART, Noida, April, 2011 under NERLP

It is found that livestock rearing is done in all villages in the state. Piggery, backyard poultry and goat rearing are done as subsidiary activity on a small scale only. Cattle rearing are also done in almost all villages and villagers keep two to three cattle only. Similarly goat rearing is also done in almost all villages and some families are engaged exclusively in goat trading. Piggery is done in few villages especially in TTAADC areas and very much popular among tribal communities.

MAIN OBJECTIVES-CATTLE DEVELOPMENT

1. To bring all breedable female cattle & buffalo under organized breeding programmes through artificial insemination using frozen semen technology throughout the state and natural service by genetically superior indigenous bulls on cows & heifers of remote/ inaccessible areas.

2. To undertake breed improvement programme by grading up of local non-descript cattle and buffaloes so as to improve their genetic potentiality.

3. To provide improved breeding inputs in breeding programmes like up-gradation and crossbreeding of local non- descript cattle & buffalo, already produced crossbred cattle population and improved indigenous cattle in the state for further enhancement of milk production.

4. To arrange delivery of improved artificial insemination services at the farmers doorstep.

STRATEGIES FOR ACHIVING CATTLE AND BUFFALO DEVELOPMENT

- Up-gradation for enhancing productivity of local poor yielding non-descript cattle & buffaloes in farmer's house through application of artificial insemination technique.
- Improving farmers' participation in milk production by both household and organized dairy farming.
- Extension of AI service to increase A.I. coverage and cover 50% (approx.) of breedable cattle and buffaloes.
- By converting stationery artificial insemination (A.I) service into mobile doorstep (A.I) service by employing trained, educated, un-employed youth.
- By providing adequate quantity of feed & fodder through augmenting production of feed ingredients (maize, wheat, oilcakes, soyabean etc) and fodder (combo Napier, Stylo) etc.
- By providing veterinary services for treating reproductive disorders and other common diseases.
- By ensuring appropriate breeding policy for higher productivity.
- The entire cattle & buffalo development programme of the state will be aimed to implement through organization of small scale dairy farming in private sector & through augmentation of household production of milk by cattle & buffaloes.
- The overall strategy of increasing milk production in the state will be to encourage household small holding milch cattle rearing and small dairy farming by farmers/ unemployed youths.
- The strategy to be aimed at enhancing productivity in cattle & buffaloes.

THE MAIN FEATURES OF THE PRESENT BREEDING STRATEGY

- Genetic improvement of ND cattle population of the state with pure breed Jersey and also incorporating Sahiwal, HF inheritance in the crossbreds.
- Maintenance of exotic inheritance level up to 50% usually in the field and higher exotic inheritance level up to 75% in organized/commercial farms as well as for farmers with high input and high output production system.
- Crossbreeding of F_1 cattle using Jersey X Sahiwal crossbreed and Holstein Friesian X Sahiwal semen for production of suitable genotypes for adoption in the state and also for commercial dairy sector.
- Upgradation of ND cattle with recognized indigenous breed like Sahiwal
- Genetic upgradation of ND buffaloes of the state with Murrah breed.

THE MAIN FEATURES OF THE PROPOSED BREEDING STRATEGY

- Genetic improvement of non-descript cattle population of the state with introduction of exotic pure bred Jersey and Holstein Friesian germplasm.
- Grading up of non-descript cattle by using genetically superior indigenous milch cattle breeds i.e. Sahiwal, Gir, Tharparkar etc. under low-input-low output production system.
- Maintenance of exotic inheritance level up to 50% in crossbred usually under field condition with medium input-medium output production system and higher exotic inheritance level up to 75% in organized/commercial farms as well as at progressive and rich resourceful farmers herd under high input- high output production system.
- Inter-se mating of F_1 crossbred cattle using semen of Jersey X Indigenous milch cattle crossbreed and Holstein Friesian X Indigenous milch cattle crossbreed bulls for production of suitable genotypes for adoption in the state.
- Identification, characterization, evaluation & conservation of a cattle population group having similar phenotypical characteristics and performance attributes existing in the local non-descript indigenous cattle population, so as to bring national recognition as an indigenous cattle genetic resource of Tripura State in future.
- Genetic upgradation of non-descript buffaloes of the state with Murrah breed.

POINTS TO BE CONSIDERED FOR FORMULATION OF BREEDING POLICY

1. Grading up of non-descript native cattle with indigenous recognized cattle breed and crossbreeding non-descript cattle with purebred exotic cattle on the basis of availability of resources with the farmer, agro ecology and livestock production system.

2. Fixation of level of exotic inheritance.

3. Scientific approach for rearing the cattle and buffalo to get the targeted goal.

4. Gainful approach to overcome the shortage of feeds and fodder resources.

5. Long term and short term strategies for improving production, procurement, value addition and marketing system.

6. National production performance standard of breed (Dam's lactation yield, Fat%, SNF %, protein% etc.) should be taken into consideration in formulation breeding policy.

Table 33: Minimum Standards for FS Production

Breed	Dam's Lactation yield (Kgs)		
	First	Best	Fat %
Pure HF	4500	5600	3.5
Pure Jersey	3000	3750	5.0
Sahiwal	2400	3000	4.0
Red Sindhi	2000	2500	4.5
Gir	2400	3000	4.5
Tharparkar	2000	2500	4.0
Murrah	2400	3000	7.0
Mehsana	2400	3000	7.0

N.B. - Dam's milk yield for F_1 crosses will be as that of the indigenous dam. i.e. Gir, Sahiwal, Kankrej, Red Sindhi, etc. Source- **DAHDF**

SALIENT POINTS OF NATIONAL CATTLE BREEDING POICY

The National Cattle Breeding Policy recommends-

1. Optimum level of exotic inheritance to be ranged from ½ (50%) to 5/8 (62.5%) in almost all crossbreeding projects in India.
2. For the crossbreeding programme using the exotic and other indigenous breed, the strategies were as follows involving two or three breed crossing.

a. Two Breed Crossing can be achieved through back crossing or Inter-se mating. In back crossing, the cross of ***Bos taurus*** and ***Bos indicus*** produces F_1 with 50 per cent exotic inheritance. On backcrossing of F_1 population to the exotic breed, the exotic level was increased to 75 per cent in the next generation. i.e, in F_2.

b. To bring it to 5/8 (62.5%) level, the F_2 population was again planned to cross with F_1 having exotic inheritance of 50 per cent. The animals were then improved by mass selection.

c. In inter-se mating, **the *Bos taurus*** and ***Bos indicus*** produces F_1 population with 50% exotic level and subsequently the selective mating among F_1 population continue to maintain the exotic level of about 50 to 62.5 per cent This was followed in most of the crossbreeding projects of the country.

3. For three breed crossing, the level of 50 % from one exotic breed, 25% exotic level from another breed and 25% local or indigenous breed has been advised in some regions.

STRATEGIES FOR INCREASING MILK PRODUCTION AND PRODUCTIVITY IN TRIPURA

(Short term and Long term goal)

Major focus should be given on increasing the per animal productivity and optimizing input availability. With this direction following steps may be taken as a short term as well as long term goal which are enlisted below.

Short term Strategies:

1. Grading up of non-descript cattle with well defined and registered improved indigenous milch breeds and crossbreeding of non-descript low producing cattle using exotic dairy cattle breeds (Jersey/HF) maintaining area specific exotic type and magnitude of inheritance separately for urban, peri-urban and rural areas. The preferred exotic breed may be Jersey and HF in restricted cases with relatively rich input resources and adequate marketing of milk. The preferred indigenous breed for upgradation of local cattle may be Sahiwal, Gir and Tharparkar.
2. Identification, characterization, evaluation, conservation, documentation and registration of indigenous cattle genetic resources of the state must be explored.
3. Expanding breeding services thus increasing outreach of A.I. on the doorsteps of the farmers in the state.
4. Facilitating availability of breeding inputs like establishment of breeding services providers, establishment of nucleus herd/bull mother farm/young bull rearing centre and frozen semen bank.
5. Proper performance data recording and animal identification involving insurance agencies and other stakeholders.
6. Introduction of sexed semen technology in selected A.I pockets for faster growth as well as for increasing productivity.
7. Improving reproductive efficiency by sorting out major reproductive problems through management of transition period, clinical intervention of disorders during productive stage, changes in BCS (body condition scoring) and conception rate, post-partum follow up etc.
8. Advancing age at sexual maturity, enhancing conception rate in heifers, strategic feeding, providing area specific mineral mixture and meeting demand for feeds and fodder through introduction of forage crop on fallow land, community wasteland, forest areas, fallow land, common grazing lands etc.
9. Ration balancing and comprehensive reproductive management programme, quality milk production, control of mastitis and other production related disease problems.
10. Supporting the existing low input production system for improving productivity and income generation so as to improve socio-economic status of a vast majority of the livestock keepers most of which are women, small and marginal farmers.

11. Improvement of infrastructure facilities both for A.I. and animal health approach, manpower provision etc.

12. No livestock genetic resources including live animals and their germplasm (semen, embryo etc). other than those specified in State Breeding Policy should be introduced or inducted in the state from outside states without prior permission of the Government.

13. Cattle induction process has to be done as per the policy provision of the Govt.

14. The germplasm to be inducted into the state must be free from all important communicable diseases.

15. Provision for proper screening for communicable diseases and quarantine facilities must be created in strategic location.

16. Indiscriminate breeding should be banned.

17. Efforts should be made to produce feed ingredients like maize, oilseed cakes, and soyabean meal etc. in the state in co-ordination with Deptt. of Agriculture, Horticulture and Forest which will help in reducing the deficit.

18. Major emphasis would be given on green fodder production in the perennial pasture & other grazing lands, cultivable waste land, current fallow and fallow land other than current fallow land.

19. Department of ARD has already taken initiative to select AI pockets in the state on the basis of total cattle population in 26 Blocks and Municipal areas and mapping has already been done with a view to give special emphasis on A.I. coverage. These areas have been selected on the basis of total cattle population ranging between 5000 to 20,000 numbers and past AI performances. These areas will be given special importance/drive for more AI coverage with both conventional non-sexed and sexed semen for more coverage of animals as per target. All necessary logistic support for AI, trained and skilled manpower, infrastructural access as well as fund provision would have to be made available for successful implementation of this initiative. The list of selected Blocks & MC areas under different Districts with total cattle population has been summarized in Table no. 4 of **ANNEXURE-4.**

20. On pilot project basis, **Sexed Semen Technology** covering six VH/VD areas of West Tripura has been submitted to the Govt. of Tripura with a project cost of Rs. 75 Lakh. Moreover another project proposal for introduction of sexed semen technology en masse in 5 Districts out of 8 districts in Tripura has been submitted to the GOI with a project cost of Rs. 62.60 Crores and GOI has given positive consideration on the project. Assessing the success rate of pilot project, the technology would be spread over to all 8 districts along with conventional A.I. with non-sexed semen and cattle induction from outside states. These will help in improving the genetic constitution of indigenous cattle as per targeted goal and also help in increasing the milk production.

21. Presumptive requirement of frozen semen straws along with conception rate, No. of AI per calf born etc.

Assumptions:

A. (In case of conventional AI)

a. No. of AIs/Conception : 2.5

b. AIs/Calf born (loss @ 10% procedural loss) : 0.50

c. Total no. of AIs/ calf born (male or female) : 3.0

d. Total no. of AIs/ only female calf born : 6.0

In case of non-sexed semen, on an average, 50% of total calf born will be male and rest 50% will be female.

Table 34: Year wise Target/Achievements of Female Calf Born out of AI with Non-Sexed Semen

Sl.No.	Year	Yearly target	Yearly Actual Coverage/ Assumed coverage	Achieved/Projected female Calf Born
1.	2018-19	1,80,000	1,49,912	29343
2.	2019-20	1,80,000	1,80,000	30,000
3.	2020-21	1,90,000	1,90,000	32,000
4.	2021-22	2,05,000	2,05,000	34,000
5.	2022-23	2,20,000	2,20,000	36,500

Assumptions: Target during 2020-21

B. (In case of sex sorted semen)

a. No. of AIs/Conception : 2.5

b. AIs/Calf born (loss @ 10% due to male calf born) : 0.25

c. Total no. of AsI/ female calf born (a+ b) : 2.75

d. No. of AIs with sexed semen/female calf : 3.5

(c + other procedural losses)

Table 35: Year wise target/Achievements of Female Calf Born out of AI with Sexed Semen

Sl.No.	Year	Yearly target	Yearly Actual Coverage/ Assumed coverage	Achieved/Projected female Calf Born
1.	2018-19	Nil	Nil	Nil
2.	2019-20	5,000 (Pilot study)	5,000	1400
3.	2020-21	25,000	25,000	7,000
4.	2021-22	35,000	35,000	10,000
5.	2022-23	50,000	50,000	14,500

Table 36: Projected year-wise female calf born

Year	Calf born	Remarks
2019-20	30,000	On an average 1.25 Lakh. Heifer would be added to the total Population and would be available for enhanced milk production with high genetic merit.
2020-21	32,000	
2021-22	34,000	
2022-23	36,500	

Long Term Strategies:

1. Productivity enhancement path for future should be directed towards
    - Accelerated genetic improvement using advanced breeding methods, plans and programmes.
    - Adoption of advanced reproduction technologies.
    - Strategic feeding.
    - Controlling mastitis, ketosis, FMD and other diseases.
    - Addressing the reproduction related problems.

All these above factors would focus towards enhanced production and productivity vis a vis increase employment and income generation.

2. Improvement of infrastructure facilities both for A.I. and clinical approach, manpower provision etc.

3. Proper research and development initiative on issues pertaining to livestock sector for improving production and productivity, biosecurity and profitability

4. Faster multiplication of superior germplasm and large scale dissemination using ETT, IVF and other emerging reproductive technologies.

5. Estrous synchronization as per standard protocol and timed AI would be introduced in the hilly inaccessible areas of TTAADC to increase AI coverage and improve the milk production in the TTAADC areas.

6. Frozen semen production laboratory is to be established for production of 'A' Grade Frozen Semen from proven bulls for Artificial Insemination Programme in the state.

7. Gokul Gram would be established in other 07 Districts of the state as per RGM Guideline to improve upon the genetic makeup of the local indigenous cattle.

8. Digitization of data recording would be done intensively as per INAPH Guidelines for assessing the performance.

9. Conservation of local germplasm for maintaining the existing biodiversity.

10. Setting up of Bull mother farm, establishment of Field Performance Testing (FPT), setting up of Breeder Societies and 'Gopalan Sangh' as per RGM guidelines.

11. Encouraging private entrepreneurs to establish Dairy Processing Plants and Large Dairy Farm in the state either on PPP model or on their own.

12. Concerted efforts should be given to produce maize, oilseed & pulses, and soyabean in the state in coordination with Deptt. of Agriculture, Horticulture and Forest to create composite feed and fodder bank.

13. Large scale use of **Sexed Semen Technology** covering almost all the important AI pockets in the state.

OBJECTIVES FOR PROPOSED BREEDING POLICY

1. To formulate pro livestock keeper breeding policy and programmes based on resource availability and agro-climatic condition, land topography, level of management, marketing facilities etc.
2. To promote animal biodervisity-conservation & genetic improvement of indigenous non-descript cattle and buffalo in the state. To avoid indiscriminate breeding and to stop propagation of poor germplasm.
3. To fix minimum production standards (Dam's standard lactation yield, fat%, SNF%, protein % etc.) for using semen of breeding bulls.
4. To identify genetic merit of scrub and stray breeding bulls and keep them out of breeding programme through castration as well through introduction of sexed semen technology.
5. To evolve sound breeding practices with the aim of fast genetic improvement of livestock vis- a- vis increased productivity per animal to ensure better returns of the animal keepers.
6. To make region specific recommendation based on livestock production system, for choice of breed, levels of exotic inheritance in crossbreed cattle:
    a. To support the existing low input production system for improving productivity & income so as to improve socio economic status of vast majority of Cattle and Buffalo keepers of the state.
    b. To increase availability of feed & fodder resources to meet the requirement and to attain optimal productivity.
    c. To encourage establishment & growth of self supporting financially viable medium & large commercial dairy units capable of adopting latest dairy production and processing technologies.
    d. To strengthen existing animal health coverage through prevention, control & eradication of various diseases.

BASICS OF THE CATTLE BREEDING POLICY

(A) Policy for Milk Production:

Crossbreeding of low producing non-descript indigenous cattle by exotic dairy cattle breed like Jersey and Holstein Friesian through A.I. Programme using conventional and sex sorted semen.

1. Breeding Policy using Jersey breed:

Level of Exotic inheritance	
50%	**62.5%- even up to 75%**
➢ This will apply to the entire state preferably rearing cattle with medium input- medium output production system. ➢ Large scale production of half-bred (50 percent Jersey and 50 percent non-descript indigenous cattle) will be the main goal.	➢ This will be done in a limited scale ➢ On farmer herds where there is adequate availability of green fodder and feeds, good milk marketing channel, progressive entrepreneurs with knowledge and capability for providing better management i.e. high input–high output production system of rearing.

2. Breeding Policy using Holstein Friesian:

- ➢ Holstein Friesian inheritance may be infused as desired by the farmer rearing dairy animals under high input–high output production system in defined geographic areas/herds with superior management or in areas of high elevation with congenial agro-climate condition wherein fodder production and its availability is more and a well developed milk market is available.
- ➢ The level of inheritance of Holstein Friesian (HF) in the crossbred will be restricted within the range of 50% to 75% by inter-se mating of the crossbreds.

3. Breeding policy using indigenous dairy cattle breeds:

- ➢ Grading Up of non-descript animals in the State with indigenous milch breed like, Sahiwal, Gir and Tharparkar breed.
- ➢ The use of Indigenous milch breed will be as per desire of the farmers and on the basis of prevailing agro-climatic condition, available resources under low input–low output production system.

4. **Breeding policy for F_1 Crossbred Population:**

- Under medium input-medium output animal production system, it is advisable to restrict exotic inheritance between 50% and 62.5% in crossbred cattle. Therefore, the F1 crossbred females should be bred with the semen of genetically superior progeny tested crossbred males having exotic inheritance between 50% and 75%.
- Under high input- high output animal production system mostly adopted by resource rich farmers in milk shed areas around peri-urban towns, higher levels of exotic inheritance between 62.5% and 75% can be sustained. The F_1 females in the field should be bred with the semen of genetically superior progeny tested males of exotic breeds with high progeny test index to produce progeny with 75% exotic inheritance. Further, the progeny tested superior crossbred males having exotic inheritance between 50% and 75% through *inter-se mating* can be used to sustain the exotic level between 62.5% and 75%.
- Crossbreeding of F_1 Generation using Jersey X Sahiwal or Gir or Tharparkar and HF X Sahiwal or Gir or tharparkar semen for production of suitable genotypes for adoption in the state.
- Jersey CB cattle (F_1) will be bred with Jersey X Sahiwal or Gir or Tharparkar (50%) maintaining 50% exotic inheritance and Holstein crossbred cattle will be bred with HF X Sahiwal or Gir or Tharparkar (50%) maintaining 50% exotic inheritance.
- Crossbreeding with HF inheritance would be restricted to the resource-rich areas only.

(B) Breeding policy for draftability/Bullock power:

The policy option for improvement of draft power in the state is as below.

Policy for using indigenous (ND) bullock:

The policy aimed at improving the draftability of indigenous cattle by selective breeding for conservation of germplasm with a view to support the traditional system of draft animals' utilization. Grading up of local cattle using improver indigenous breeds will increase both draftability and productivity of cattle.

PROPOSED CATTLE BREEDING POLICY

Keeping in view of all the history and genesis of cattle development programmes in the state, prevailing Agro-Climatic condition, resources with the farmers and considering the interest & welfare of the farmers the Proposed Breeding Policy is aimed in the following directions-

1. The native cattle will be genetically improved by continuous grading up with indigenous breeds like Sahiwal, Gir and Tharparkar. This will be applicable in the areas where feed and fodder resources are scarce and farmers are rearing their stock under low input- low output production system.
2. Non- Descript cattle will be genetically improved through crossbreeding with purebred exotic cattle preferably Jersey Breed where the farmers are under Medium Input- Medium Output to High Input- High Output production system.
3. For already existing CB population the propose breeding policy is as follows
    a. The Jersey Crossbred having Jersey inheritance can be genetically improved by Jersey CB semen or HF CB semen depending upon choice of farmers as well as on resource availability.
    b. The level of exotic inheritance (Jersey or HF) usually should be 50% on the farmers herd under Medium Input- Medium Output production system and the exotic inheritance level may go up to 75% in case of resource rich farmers herd i.e. High Input- High Output production system.

4. National production performance standard of breed (Dam's lactation yield, Fat %, SNF %) included for Grading-up and crossbreeding programme should be maintained to quantify the performances in the progenies.

5. Efforts will be taken to identify, characterize and evaluate the local cattle genetic resources in the state and explore new population/type/breed of cattle for further conservation/utilization/Breed registration and to be maintained further through selective breeding.

6. Preference of using semen of proven Progeny Tested Bull may be given for inseminating identified elite cows for the production of good quality young bull calves.

On the basis of above Proposed Breeding Policy, a **'Region-wise Breeding Policy'** for the state has been prepared keeping the different agro-climatic condition of the state and other related parameters which is mentioned below.

REGION-WISE BREEDING POLICY FOR IMPROVING PRODUCTION AND PRODUCTIVITY

The state can be divided broadly into 3 agro-climatic regions/zones.

1. Hill ranges,
2. Undulating plateau land and
3. Low-lying alluvial land/ plain land (region may be sub-divided into Rural, Peri-urban and Urban areas)

The region wise breeding policy will be aimed at improving the genetic resources of cattle population in those areas on the basis of prevailing agro-climatic condition, A.H. input resources etc.

1. Breeding policy in the Hilly areas:

Most of the cattle populations in the hilly areas are of Non-descript type. The available amenities like road connectivity, animal health coverage, AI facility, AH input availability etc. are very poor. The inhabitants in these areas are mostly from Tribal Communities who traditionally rear ND cattle on available resources without much care and management. Considering these above facts, the policy will be aimed at

i) Grading up of the local ND cattle with Indigenous breed viz. Sahiwal, Gir and Tharparkar through AI or natural services.

ii) As per desire of the farmers crossbreeding with Jersey up to 50% exotic inheritance may be aimed in certain areas with adequate resources.

iii) Selective breeding of the local Indigenous Cattle (ND) to conserve the germplasm.

2. Breeding policy in the Undulating plateau land:

Most of the cattle populations in these areas are of non-descript type. In certain areas crossbreed population with low productivity is also available. The inhabitants of these areas are mostly small, marginal and landless farmers with poor/nil operational land holding. Although animal health coverage & AI facility are available but AH input availability and resources are very much poor. Considering these facts the Breeding Policy would be aimed at

i) Grading up of the local non-descript cattle with Indigenous breed viz. Sahiwal, Gir and Tharparkar through AI.

ii) Crossbreeding with Jersey/HF up to 50% exotic inheritance through A.I.

iii) Crossbreeding with HF may be undertaken in certain areas with plentiful resources and rich economic condition of the farmers.

iv) Selective breeding of the local non-descript indigenous cattle to conserve the germplasm in certain pockets/breeding tracts.

v) Jersey CB cattle (F_1) will be bred with Jersey X Sahiwal or Gir or Tharparkar (50%) maintaining 50% exotic inheritance and Holstein CB cattle will be bred with HF X Sahiwal or Gir or Tharparkar (50%) maintaining 50% exotic inheritance.

3. Breeding policy in the Low-lying alluvial land/ plain land:

This region may be sub-divided into rural, peri-urban and urban areas. These areas have both local indigenous and a sizeable population of crossbred cattle. The available facilities like animal health and AI coverage etc. are better in comparison to the other two regions. The breeding for these areas may be aimed at as follows:

a. Rural Areas-

i) Grading up of local non-descript indigenous cattle with indigenous breeds like Sahiwal, Gir and Tharparkar through AI.

ii) Crossbreeding with Jersey up to 50% exotic inheritance through A.I.

iii) Crossbreeding with HF may be undertaken in certain areas with adequate resources and rich economic status of the farmers.

iv) Selective breeding of the local indigenous cattle group identified as its native cattle breed after characterization and evaluation.

v) Crossing of F_1 progeny with Jersey X Sahiwal/ Gir/ Tharparkar (50%) or with HF X Sahiwal/ Gir/Tharparkar (50%) maintaining 50% exotic inheritance as applicable.

b. Peri-Urban/ Urban Areas-

i) Crossbreeding of local non-descript cattle with Jersey/HF up to 50-75% exotic inheritances through A.I. on the basis of available resources and economic status of the farmers.

ii) Inter-se breeding of F_1 progeny with progeny tested or pedigree selected Jersey X Sahiwal/ Gir/ Tharparkar (50%) or with HF x Sahiwal/ Gir/Tharparkar (50%) breeding bulls maintaining 50% exotic inheritance.

RECOMMENDATIONS FOR IMPLEMENTATIONS OF BREEDING POLICY

For effective implementations of cattle breeding policy in the state of Tripura the following recommendations are to be followed mandatorily-

1. The proposed cattle breeding policy for the state of Tripura would be implemented by the Animal Resources Development Department, Govt. of Tripura for improvement of cattle in the state. Any effort for cattle improvement by individual, public organization and Non Government Organization must be in conformity and within the purview of the proposed policy. Thus, the policy will be mandatory for the state of Tripura.
2. A technical committee will be constituted to monitor and evaluate the implementation of the policy having advisory capacity.
3. The Deptt. of ARD, Govt. of Tripura will arrange farmers awareness programme on the proposed policy and animal identification and performance recording system. Necessary format for keeping records in the station including Govt. farms and also in the field by the farmers be developed and distributed as per INAPH through unique Animal ID & Animal health Card. Data recording and digitization.
4. Training/ Refresher training for field Veterinary Officers on different aspects of breeding, reproduction, management, nutrition, health care etc. may be conducted/ organized for effective implementation of the policy.
5. Indiscriminate breeding should be banned once the proposed policy is promulgated.
6. No Cattle and its germplasm will be inducted in the state without prior permission of the Government. **'Bovine Act'** needs to be introduced in the state through enactment by the Govt. of Tripura as like other states for overall control on monitoring and coordinating Cattle Development Programme and for checking the fraudulent breeding practices.
7. Necessary legislation for implementation of the breeding policy should be enacted.
8. All the laws related to prevention of cruelty to animals, breeding, experiments etc. should be followed as per the guidelines of CPCSEA (Committee for the purpose of Control and Supervision of Experiment on Animals), Government of India.
9. The proposed cattle breeding policy shall remain open to be revisited as and when felt necessary.
10. It is fact that the maximum cattle population exists in the TTAADC areas but these are reared under free range system and thus despite several efforts taken the A.I. coverage is very less which can be improved by utilizing the technique of **estrous synchronization** as per standard protocol and timed A.I. Thus, A.I. Coverage will be increased and shall improve the production and productivity of the local indigenous cattle in the long run.

11. At Present, the facility of **ETT and IVF technology** is not available in Tripura. However, with the extension of all logistic supports (establishment of sophisticated laboratory having modern equipments with requirement of trained manpower in the field of Reproductive Biotechnology) this technology may be taken up as a pilot project before utilizing it en masse.

12. At present **frozen semen production laboratory** is not available in Tripura except three frozen semen banks with the facility of preserving frozen semen straws in LN_2 for field Institutions. A regional frozen semen production laboratory has been established in Barpeta District of Assam with a view to supply quality semen to all the North-Eastern states including Tripura. Considering the demand, frozen semen production laboratory with requisite logistic support for producing A-grade semen need to be established as a long term strategy.

13. Efforts would be taken to expedite the establishment of Gokul Gram and strengthening of Bull mother farm, establishment of Field Performance Testing (FPT), setting up of Breeder Societies and 'Gopalan Sangh as per RGM guidelines.

14. The frozen semen straws with more than the standards fixed for semen quality and pedigree performance parameters for A.I. programme in the state are to be collected from frozen semen banks duly accredited by the Govt. of India.

15. Government will act as a facilitator for private entrepreneurs for promoting dairy and dairy based industry on commercial scale.

16. A nucleus herd of one or two indigenous cattle breed may be established for production of quality bulls of high genetic merit for Natural service especially for inaccessible areas under TTAADC. This shall help in faster genetic upgradation of low producing cattle in those areas.

17. Cattle Insurance programme under Livestock insurance programme of CSS would be given concerted thrust for risk coverage of valuable animals of the farmers. The Deptt. of ARD, Govt. of Tripura will arrange farmers awareness programme for the successful implementation of this project.

18. Under the Breeding Policy, targets would be fixed by the Deptt. of ARD Govt. of Tripura on the following points for speedy improvement in the genetic merit of indigenous cattle.

a) Proportion of population to be improved/up-graded, using indigenous cattle breeds.
b) Proportion of population needs to be conserved.
c) Proportion of population needs to be crossed with Exotic breeds along with the level of exotic inheritance to be maintained.

CONCLUSION

With a view to increase the production as well as overall productivity of cattle in the state, the proposed breeding policy in cattle has been prepared as above with necessary recommendations and placed before the Govt. of Tripura for necessary acceptance if agreed/approved.

ANNEXURE-I

Table 1: Economic value of animal products and contribution to the state economy over the year 2017-18

Sl. No.	Item	Quantity	Unit Price (In Rs.)	Value (Rs. in Lakh.)	%of Total
1.	Milk (in Ltrs.)	174259852	46	80159.53	36.53
2.	Meat (Chevon) (in Kg)	1824511	610	11129.52	5.07
3.	Meat Pig (in Kg)	13632091	280	38169.86	17.40
4.	Meat from Fowl & Duck (in Kg)	173084	380	657.72	0.30
5.	Meat from Broiler,(in Kg	29628378	200	59256.76	27.01
6.	Eggs (Hen) in Nos.	207409008	11	22814.99	10.40
7.	Eggs (Duck) in Nos.	54699081	12	6563.89	2.99
8.	Skin (Sheep & Goat) in Nos.	655650	100	655.65	0.30
Total output Value				**219407.91**	**100.00**

Source: - Animal Resource Development Department, Tripura.

ANNEXURE-II

Table 2 a: **ISS Estimate on production of milk, meat and egg for the year 2016-17, 2017-18 and 2018-19**
(The tables indicate the impact of growth on Milk, Meat and Egg production in the state)

Name of the District	Year	Milk (in Kg)	Eggs (in Nos.)	Meat (in Kg)
West	2016-17	33218403.28	32429398.64	8441952.21
Sepahijala	2016-17	25110871.53	33265968.31	6034658.97
Khowai	2016-17	16508595.76	28657859.82	4235523.11
Gomati	2016-17	23620453.49	29782498.64	5590401.28
South	2016-17	22407635.00	49749037.73	5128314.12
Unakoti	2016-17	9238319.90	11147150.60	2953247.00
North	2016-17	14632072.04	23217763.31	3496050.27
Dhalai	2016-17	13979365.26	21176149.40	3805187.48
Grand Total of the state		158715716.26	229425826.45	39685334.44
Per capita availability of milk is 113.03 gm/day during the year 2016-17 **Per capita availability of local egg is 59.63 nos. (approx.)/year during the year 2016-17** **Per capita availability of meat is 10.32 Kg (approx.)//Year during the year 2016-17**				

Table 2 b: **ISS Estimate on production of milk, meat and egg for the year 2016-17, 2017-18 and 2018-19**

Name of the District	Year	Milk (in Kg)	Eggs (in Nos.)	Meat (in Kg)
West	2017-18	37387224.552	37461071.223	9172809.809
Sepahijala	2017-18	27070404.148	38730774.465	6961944.282
Khowai	2017-18	18009706.559	31924332.461	4930179.860
Gomati	2017-18	25043243.005	33395880.806	6452344.709
South	2017-18	24089642.990	58038855.055	6040446.065
Unakoti	2017-18	10432800.776	12421202.014	3505540.646
North	2017-18	16351542.191	25938416.483	3941943.080
Dhalai	2017-18	15879040.507	24197556.461	4252855.174
Grand Total of the state		174263604.728	262108088.968	45258063.625
Per capita availability of milk is 123.00 gm/day during the year 2017-18 **Per capita availability of local egg is 67.40 nos. (approx.)/year during the year 2017-18** **Per capita availability of meat is 11.64 Kg (approx.)//Year during the year 2017-18**				

Table 2 c: **ISS Estimate on production of milk, meat and egg for the year 2016-17, 2017-18 and 2018-19**

Name of the District	Year	Milk (in MT)	Eggs (Nos. in Crores)	Meat (in MT)
West	2018-19	36718	3.94	10010
Sepahijala	2018-19	28947	4.09	7459
Khowai	2018-19	19110	3.36	5242
Gomati	2018-19	26735	3.49	6866
South	2018-19	25940	6.12	6316
Unakoti	2018-19	11204	1.31	3773
North	2018-19	17642	2.73	4242
Dhalai	2018-19	17219	2.56	4491
Grand Total of the state		183515	27.60	48400
Per capita availability of milk is 129.00 gm/day during the year 2018-19 **Per capita availability of local egg is 71 nos. /year during the year 2018-19** **Per capita availability of meat is 12.45 Kg //Year during the year 2018-19**				

ANNEXURE-III

Table 3: Achievement of fodder development activities in the farmers' field under RKVY during 2017-18

Particulars	"Fodder (maize) seed production/ Procurement & distribution" under National Livestock Mission (free distribution)		Enrichment of paddy straw by urea under State Budget
Name of the District	Achievement (Beneficiary In Nos.)	Area Covered (In Ha.)	Physical Achievement (Beneficiary In Nos.)
West	260	20.8	110
Sepahijala	80	6.4	140
Khowai	60	4.8	100
Gomati	90	7.2	100
South	165	13.2	150
North	150	12	100
Unakoti	30	2.4	60
Dhalai	165	13.2	60
Total	1000	80	820
Remarks	Maize minkits distributed at free of cost @ 4 Kg. per unit. Total fund involvement Rs.2.604 Lakh against procurement cost of minikits along with transportation.		Expenditure: Rs.700.00 per unit for total 820 units targeted and fund involvement Rs.5.74 Lakh against distribution of polythene sheet, buckets, urea, molasses and training kit to the beneficiaries.

Source: - Animal Resource Development Department, Tripura.

ANNEXURE-IV

Table 4: List of selected Blocks & MC areas under different Districts with cattle population

District	Block	Total Cattle		
		ND	CB	Total
Khowai	Khowai	13733	2562	16,295
	Kalyanpur	16562	1246	17,808
	Teliamura	13919	3252	17,171
West Tripura	Mohanpur	9530	1716	11,246
	Bamutia	4855	3046	7,901
	Jirania	4343	2545	6,888
	Old Agartala	4416	3805	8,221
	Dukli	8914	6451	15,365
	AMC Agartala	3331	6194	9,525
Sepahijala	Bishalgarh (BL) & NP	16456	7756	24,212
	Charilam	5851	3618	9,469
	Nalchar	10671	2626	13,297
	Kathalia	14008	1506	15,514
Dhalai	Salema	13792	1877	15,669
	Durga chowmuhani	13199	3664	16,863
Gomati	Matabari	12873	3222	16,095
	Tepania	7695	4482	12,172
	Kakraban	10748	5482	16,230
	Amarpur	11792	1774	13,566
	Karbook	9330	1750	11,080
South Tripura	Bokafa	10117	1075	11,192
	Jolaibari	15552	1842	17,394
	B.C. Nagar	10157	1246	11,403
	Satchand	18779	1708	20,487
North Tripura	Kalacherra	9191	2330	11,521
	Jubarajnagar	12508	3942	16,450

ANNEXURE-V

CATTLE BREEDS IN INDIA

India has **43** recognized Cattle breeds (NBAGR) & is classified on the basis of the utility as follows.

Indigenous cattle breed in India as per their utility:

- **Milch Breeds:** - Sahiwal, Gir, Tharparkar & Red Sindhi=**04 Nos.**
- **Dual Purpose breeds:** - Binjharpuri, Deoni, Hariana, Kankrej, Krishna-Valley, Malvi, Mewati, Ongole, Rathi, Konkan-Kapila, Lakhimi, Belahi, Gangatiri, Badri & Ladakhi = **15 Nos.**
- **Draft Breeds:-** Amritmahal, Bachaur, Bargur, Dangi, Gaolao, Ghumusari, Hallikar, Kangayam, Kenkatha, Kharier, Kherigarh, Khillar, Kosali, Malnad- Gidda, Motu, Nagori, Nimari, Ponwar, Punganur, Pullikulum, Red- Kandhari, Siri, Umblachery, Vechur, =**24 Nos.**

Region wise Cattle Breeds in India:

- **North India:** Sahiwal, Red Sindhi, Hariana, Ponwar, Kherigarh, Mewati, Kenkatha, Gangatiri, Belahi, Badri & Ladakhi.
- **Western India:** Gir, Tharparkar, Kankrej, Rathi, Deoni, Nagauri, Khillar, Dangi, Red Khandari, Konkan-Kapila.
- **East &North-Eastern Region:** Binjharpuri, Bachaur, Siri, Motu, Khariar, Ghumsuri and Lakhimi.
- **Central India:** Cattle-Malvi, Nimari, Gaolao, Kosali.

  Southern India: Ongole, Krishna-Valley, Punganur, Hallikar, Bargur, Vechur, Amritmahal, Kangayam, Umblachery, Malnad- Gidda, Pullikulum.

No recognized cattle breed is available in Tripura. Most of the Cattle population in Tripura is non-descript Indigenous Cattle which are low yielders. The Department has taken initiative to characterize the breed both phenotypically & genotypically. The work is already in progress.