Government of Tripura

Pig Breeding Policy

Animal Resources Development Department
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Pig Breeding Policy, Tripura State.

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1. Introduction

Pigs currently available in the state are the result of indiscriminate breeding within and between various breeds such as Large White Yorkshire, Landrace, Hampshire, indigenous non-descript etc. These breeds/crossbreds have been developed without following any systematic and scientific breeding programme. These crossbred pigs in Tripura do not perform well even under optimum feed situations. It means that there are huge gap of information regarding the genetic potential of available breeds/ crossbreds and the feeding and management systems that are required to support and extract best potential productive and reproductive performance from the existing pig population.

To address the above issue and to develop pig breeds/crossbreds that are appropriate, adaptable and productive in Tripura, a scientific way of assessing the profile of existing breeds, correlating them with production performance and identifying the right breed(s) for Tripura are very much required.

This can rightly contribute in framing a breeding policy for the state.

Aimed at improving the economic trait of the existing swine population of the state in the interest of the common farmers’ economic sustainability through piggery; the Government of Tripura, Department of Animal Resources Development, do hereby develop a pig breeding policy known as the “Pig Breeding Policy of Tripura”.

2. Jurisdiction and definition

It shall be called the “Pig Breeding Policy of Tripura” which shall become effective from the date of its approval by the Council of Ministers and follow up notification.

The “Pig Breeding Policy of Tripura” shall be effective all over the state of Tripura.

Definition:

Breed: A group of animals related by descent and similar in most characters like general appearance, features, size, configuration, etc. are said to belong to a ‘BREED’

Animal Breeding: The science of animal breeding is defined as the application of the principles of genetics and biometry to improve the efficiency of production in farm animals. Animal breeding in this case- contextually, is producing improved breeds of domesticated pigs by improving their genotypes through selective mating.

Indigenous Pigs as Mali & Dome: Any or all the animals classified under the term, swine that has been inherently in existence indigenous within the state and reared as domestic pigs by the people of Tripura.

3. State profile

3 (a) Geographic, agro-climatic conditions and demographic pattern

Tripura is a landlocked state in North East India, where the seven contiguous states – Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura – are collectively known as the Seven Sister States. Spread over 10,491.69 km² (4,050.86 sq mi), Tripura is the third-smallest among the 29 states in the country, behind Goa and Sikkim. It
extends from 22°56'N to 24°32'N, and 91°09'E to 92°20'E. Its maximum extent measures about 184 km (114 mi) from north to south, and 113 km (70 mi) east to west. Tripura is bordered by the country of Bangladesh to the west, north and south; and the Indian states of Assam to the north east and Mizoram to the east.

The physiographic is characterized by hill ranges, valleys and plains. The state has five anticlinal ranges of hills running north to south, from Boromura in the west, through Atharamura, Longtharai and Shakhan, to the Jampui Hills in the east. The state has a tropical savanna climate. The undulating topography leads to local variations, particularly in the hill ranges. The four main seasons are winter, from December to February; pre-monsoon or summer, from March to April; monsoon, from May to September; and post-monsoon, from October to November. Like most of the Indian subcontinent, Tripura lies within the Indomalaya ecozone. Tripura hosts three different types of ecosystems: mountain, forest and freshwater.

The topography, climate and socio-economic conditions makes the people to depend more on Animal Husbandry activities mainly because of traditional agriculture in hilly areas allows only about 30% of the land in the State. Heavy rainfall in sloppy hills not only causes soil erosion but also makes it acidic by removing the soluble basic part of the soil by the solvent action of the run-off water and loss of productivity.

Tripura ranks second only to Assam as the most populous state in North East India. According to the provisional results of 2011 census of India, Tripura has a population of 3,671,032 with 1,871,867 males and 1,799,165 females. It constitutes 0.3 per cent of India's population. The sex ratio of the state is 961 females per thousand males, higher than the national ratio 940. The density of population is 350 persons per square kilometre. The literacy rate of Tripura in 2011 was 87.75 per cent, higher than the national average 74.04 per cent, and third best among all the states.

Administrative division of Tripura consists of 8 Districts, 23 Sub-Divisions, 58 Blocks, and 1118 Gram Panchayat /Village Committee.

Tripura is located in a geographically disadvantageous location as only one major highway connects it with the rest of India i.e. the National Highway 44 (NH-44), this holds back the economic growth of the state. The national highway begins at Sabroom in south Tripura, heads north to Agartala - the capital of city, and then moves east to Manu and then turns northeast to enter the state of Assam.

The National Highway 44 is frequently referred as the lifeline of Tripura. The highway is a single lane road. As a hilly state, it is typically dependent on roads for transportation. The overall length of roads in Tripura is 16,931 km. As of 2010, the national highways make up of 448 km and the state highways consist of 689 km.

3 (b) Livelihood

Agriculture forms a primary sector of the economy of Tripura. More than 75% of the state's total workforce is dependent on agriculture for their subsistence. In fact, about 24.3 % of the state's net area is reserved for agricultural purposes of which, about 2.5 lakh hectares fall under the net cultivated area. Paddy is the principal crop that is reaped in Tripura.
Production of Milk, Meat and Egg in the state during 2015-16 was 152.232 MT, 37,356 MT and 21.61 Crore, respectively. Livestock rearing is a year round activity and as production volume is quite low compared to demand.

Pigs reared in villages are of mixed breed and pure breeds are almost impossible to locate. Villagers procure piglets locally. Households in the villages find it difficult to provide feed due to which pig rearing is confined to backyard activity with 1-2 pigs. Pigs are slaughtered by the households itself for self-consumption, mostly during festivals. Sales are reared and take place only to meet financial exigencies. Excess pork is sold at the rate of Rs 250-300/Kg among the villagers by the households directly.

3 (c) Pig statistics

The State pig population as per the XIXth Livestock Census 2012 is 3, 68,121, of which 58.71% (2, 16,137) are crossbreds and 41.29% (1, 51,984) are indigenous. District-wise pig population is given in Table 1 (exotic/crossbred) and 2 (indigenous).

Table 1: Details of Pigs for Exotic/Crossbreds (CB)/Indigenous (ND)

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Name of the District</th>
<th>CB</th>
<th>ND</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>West</td>
<td>25,165</td>
<td>12,702</td>
<td>37,867</td>
</tr>
<tr>
<td>2.</td>
<td>Khowai</td>
<td>33,768</td>
<td>20,533</td>
<td>54,301</td>
</tr>
<tr>
<td>3.</td>
<td>Sepahijala</td>
<td>24,989</td>
<td>16,301</td>
<td>41,290</td>
</tr>
<tr>
<td>4.</td>
<td>Gomoti</td>
<td>35,096</td>
<td>17,893</td>
<td>52,989</td>
</tr>
<tr>
<td>5.</td>
<td>South</td>
<td>29,793</td>
<td>20,005</td>
<td>49,798</td>
</tr>
<tr>
<td>6.</td>
<td>Dhalai</td>
<td>33,977</td>
<td>28,328</td>
<td>62,305</td>
</tr>
<tr>
<td>7.</td>
<td>Unokoti</td>
<td>8,223</td>
<td>9457</td>
<td>17,680</td>
</tr>
<tr>
<td>8.</td>
<td>North</td>
<td>25,126</td>
<td>26,765</td>
<td>51,891</td>
</tr>
<tr>
<td><strong>STATE TOTAL</strong></td>
<td><strong>2,16,137</strong></td>
<td><strong>1,51,984</strong></td>
<td><strong>3,38,121</strong></td>
<td></td>
</tr>
</tbody>
</table>

3 (d) Pig rearing system

Pigs are the most common and preferred livestock species in Tripura and reared by the weaker section of the total population particularly in the rural and hilly areas. Piggery itself contributes 30-35% of the total meat production in the state. Traditionally, the tribal populations are rearing pigs. Besides, the non-tribal has now been taken up pig farming as primary source of income. The majority of households rear pigs (mostly 1 or 2 pigs), mainly for fattening purposes as a good source of animal origin protein.

Pig rearing occupies an important position in the farming system in Tripura as it is closely interlinked with the other agricultural operation performed by the tribal people for livelihood. The production system in the villages is very traditional, mainly based on indigenous local pigs with feeding systems primarily based on jungle forages and kitchen waste.

Feeding of balanced concentrate feed to pigs is popular now a day's, the concentrates readily available in the market. Some farmers buy a couple of feed ingredients, maize, wheat bran or rice polish, from the local feed stall and fed it to pigs with any additional farm and kitchen waste. However, they hardly buy any protein rich feed ingredients or mineral and vitamin mixture. This is possibly because pig producers lack knowledge of pig nutrition together with financial constraints.

These traditional feeds provide inadequate nutrition to support acceptable growth rates and maintain good health. In addition collecting forages is a major cause of forest degradation. Also, collection of forages and fuel wood places an enormous burden on women who are traditionally responsible for these activities.
3 (e) Characteristics of major pig breeds

(i) Large White Yorkshire (Pure bred): Most extensively used exotic breed in our State originated from United Kingdom. The Large White Yorkshire is widely used in outdoor systems. The breed is known for having an excellent F.C.R. (feed conversion ratio) and pigs are capable of achieving high daily live weight gain. The Large White Yorkshire pigs are characterized by their charming vertical ears, a little dished face, pink skins, white colour and long deep sides. Large White Yorkshire breed is well built with a high proportion of lean pork. Average litter size is around 11-12 piglets/litter. Sows are milky and having good mothering ability. Mature boars weigh about 300-450 kg while average sow weighs from 230 to 320 kg. The breed is widely used in crossbreeding programs. Considering the popularity and performance experienced at farmers’ field, this can be imported as per government norms for development of nucleus herd in Govt. as well as in Pvt. Sectors.

Fig: Large White Yorkshire

The Large White Yorkshire can be used in a crossbreeding program in a variety of ways:

- Terminal sire on rare breeds - Produces a lean, fast growing pig more suited to the commercial market.
- Maternal sire on Landrace/rare breeds - The Large White adds prolificacy, leanness and conformation to a maternal breeding program.
- Commercial sire line - There is strains of Large White that have been specifically bred and selected to be terminal sires for intensive systems.

However pedigree lines must be maintained in order to achieve the hybrid vigor.

(ii) Landrace (Pure bred): Landrace are white in colour. Their ears droop and slant forward with its top edges nearly parallel to the bridge of a straight nose. Landrace, which are noted for their ability to farrow and raise large litters and extensively used for cross breeding in Tripura. The breed is originated from United States of America. Landrace are known for their length of body, high percentage of carcass weight. Landrace are prolific sows that farrow large number of piglets and which are exceptionally heavy milkers. They are noted for having the higher litter size, average live weight of matured male is 310 – 400 kg and female is 250 – 330 kg. The breed is having high prolificacy, average litter size of 11 with a good weaning rate. For efficient utilization of this breed in crossbreeding programme, import of this germplasm to the state from other parts of India as well as abroad is required. Besides the Govt. sector, this breed can also be maintained in the Pvt. Sector as nucleus herd.
(iii) **Hampshire (Pure bred):** The Hampshire Breed has been developed in the United States of America and is now one of the world’s most important popular breed. The Hampshire is a black hog with a white band around the body at the shoulder including the front legs and feet. The head, tail, and back legs are black. The ears are erect and the face is longer and straighter compared to other breeds. Hampshire sows are very prolific, have extra longevity, and make good mothers. They have been used extensively in crossbreeding because of their good carcass quality - popular for their lean, meaty carcasses. They were noted and criticized for their large size, but admired for their prolificacy, hardy, vigour, foraging ability and outstanding carcass qualities. Sows give birth to a large litter of 10 piglets with 1 kg birth weight, but some sows have been known to have litters of up to 16 piglets. A boar weighs 230 kg to 340 kg and sows around 200 kg to 290 kg. For efficient utilization of this breed in crossbreeding programme, import of this germplasm to the state from other parts of India as well as abroad is required. Besides the Govt. sector, this breed can also be maintained in the Pvt. Sector as nucleus herd.

(iv) **The indigenous variety of pigs i.e. Mali & Dome:** Available in Tripura are smaller in size with poor feed conversion abilities. Average adult body weight is about 45 Kg & litter size is 4 to 5. The main objective of the Government is to enhance pig production of the state by upgrading the local variety of pigs through cross breeding with the exotic pigs. Adult body weight of the improved crossbred variety increased up to 70 to 80 kg with higher litter size. Carcass weight was found to be 56 to 70 % of live weight.
Fig: Mali & Dome.

4. Status and infrastructure facility of Animal Resources Development Department, Govt. of Tripura

<table>
<thead>
<tr>
<th>Sl. no.</th>
<th>Name of the Institutions</th>
<th>Name of the District</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>West</td>
<td>Khowai</td>
</tr>
<tr>
<td>1</td>
<td>District Deputy Director Office</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Block Level Asstt. Director Office</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Veterinary Hospital</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Veterinary Dispensary</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Veterinary Sub-Centre</td>
<td>87</td>
<td>49</td>
</tr>
<tr>
<td>6</td>
<td>Disease Investigation Laboratory</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>Veterinary Medicine Store</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>Veterinary Training Institute</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>Cattle Breeding Farm</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>Poultry Farm</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>Pig Breeding Farm</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>Duck Breeding Farm</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>Goat Breeding Farm</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>Rabbit Breeding Farm</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>Fodder Farm</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

The Animal Resources Development Department is currently maintaining 10 piggery farms with the following objectives:

a) To maintain swine breeds of superior germplasm aimed at up-grading local animals at farmer level to enhance productivity and production.
b) Utilise as demonstration farm to progressive piggery farmers
c) Generate revenue for the State.
d) Also proliferation of exotic variety to augment pork production of the state.
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the Farm</th>
<th>Name of the District</th>
<th>Name of the Breed</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pig Breeding Farm, Howaibari.</td>
<td>Khowai</td>
<td>Landrace Large White Yorkshire</td>
<td>60 Sow</td>
</tr>
<tr>
<td>2</td>
<td>Exotic Pig Breeding Farm, Debipur</td>
<td>Sepahijala</td>
<td>Landrace Large White Yorkshire</td>
<td>150 Sow</td>
</tr>
<tr>
<td>3</td>
<td>Pig Breeding Farm, B.C.Manu</td>
<td>South Tripura</td>
<td>Large White Yorkshire</td>
<td>80 Sow</td>
</tr>
<tr>
<td>4</td>
<td>Pig Breeding Farm, Jalefa</td>
<td>South Tripura</td>
<td>Large White Yorkshire</td>
<td>30 Sow</td>
</tr>
<tr>
<td>5</td>
<td>Pig Breeding Farm, Nalicherra</td>
<td>Dhalai</td>
<td>Large White Yorkshire Mali</td>
<td>60 Sow</td>
</tr>
<tr>
<td>6</td>
<td>REPB Farm, Nalkata</td>
<td>Dhalai</td>
<td>Large White Yorkshire</td>
<td>150 Sow</td>
</tr>
<tr>
<td>7</td>
<td>Pig Breeding Farm, Kanchanpur, TTAADC</td>
<td>Unokoti</td>
<td>Large White Yorkshire Dome</td>
<td>80 Sow</td>
</tr>
<tr>
<td>8</td>
<td>Pig Breeding Farm, Nabincharra, TTAADC</td>
<td>North Tripura</td>
<td>Large White Yorkshire</td>
<td>30 Sow</td>
</tr>
<tr>
<td>9</td>
<td>Pig Breeding Farm, Belbari, TTAADC</td>
<td>West</td>
<td>Large White Yorkshire Hampshire Landrace</td>
<td>150 Sow</td>
</tr>
<tr>
<td>10</td>
<td>Pig Breeding Farm, B.C.Manu, TTAADC</td>
<td>South Tripura</td>
<td>Large White Yorkshire</td>
<td>100 Sow</td>
</tr>
</tbody>
</table>

5. Constraints and limitations

Pork is a good source of animal origin protein most favoured non-vegetarian people of Tripura. Pigs are the most common and preferred livestock species in Tripura and reared by the weaker section of the total population particularly in the rural and hilly areas. Piggery itself contributes 35% of the total meat production in the state. Traditionally, the tribal populations are rearing pigs. Besides, the non-tribal has now been taken up pig farming as primary source of income. The majority of households rear pigs (mostly 1 or 2 pigs), mainly for fattening purposes as a good source of animal origin protein. Tripura with a swine population of 3,38,121 (19th Livestock Census, 2012); pork contributes 35% of the total meat requirement.

Several reasons have been identified for the failure on account of pig farmers’ inability to produce. The existing pig population generally reared by most in Tripura are non-descript. The genetic potential of these animals are yet to be determined like that of a recognised breed of swine possessing defined productive trait. Pig farmers of the state generally do not practice systematic breeding. In general, 1-2 breeding boars are being reared in most of the villages and propagation is done through such boars confined to that particular village only. There are many villages without breeding boars and the villagers procure piglets from other places. Male piglets are castrated at an early age as most farmers prefer to rear fatteners rather than for breeding purpose. There is a high preference for male piglets and the sale for females is a problem for the producer. Generally the rearing period ranges from 12-14 months before slaughter. Fattened pigs weighing 100-120 kg are slaughtered within the villages by farmers to meet financial exigency and otherwise, most slaughter takes place during festivals, marriages and other customary related occasions. Pork is sold at rates ranging from Rs 250-300 per kg varying from place to place. The margin of profit has been estimated to be ranging from Rs. 4,000 - 5,000 per animal of one year age. Thus, the pigs produced in the villages do not reach the markets located in the urban areas consisting of larger consumers in proportion.

Piggery in Tripura is become a profitable commercial venture particularly for the small holder farming community. All over the state, pigs are reared under confined housing.
system. This necessitates stall feeding requiring a farmer to provide nutritionally balanced ration for optimal production and productivity. The traditional practice is to feed pigs mostly with forages such as wild leaves, shrubs, herbs collected from locally available areas combined with kitchen and garden wastes. Such greens are available in wet season and scarce in winter. Concentrate feed ingredients available in local markets are expensive to the common farmers. Tapioca generally grown in backyards tuber is harvested for pig feeding. The practice of growing sweet potato as pig feed is getting popular among the farmers. Rice bran as rice milling by-products are available in plenty and invariably used as pig feed.

This, however, will require creating awareness and provide technical support for processing and utilization with optimal mixing ratio. It is also a common practice to cook pig feeds and fed as a wet slop which has been observed to be nutritionally inadequate.

The availability of Swine Fever Vaccine easily at farmers’ convenience is also an issue that discourage farmers to upscale their piggy holding as Swine Fever is endemic to Tripura state. While the traditional system of rearing and feeding system needs improvement at farmer level; one of the most important constraints is the non-availability of quality pigs with defined economic trait.

The local indigenous animals exist maintaining their inherent characteristics naturally. It is understood that the indigenous pigs are not economically viable for commercial production. However, certain heritable traits such as the early sexual maturity and prolificacy; mothering ability and low Back Fat Thickness (BFT) would be worth considering for preservation and value production as organic pork.

The genetic potential of the available swine population is still questionable requiring upgradation. The department had made several attempts to improve the available breed by introducing recognised breed of pigs such as the Hampshire, Large White Yorkshire and Landrace sourced from available stock within the country and even by importing Landrace breed from outside the country. However, a positive impact could not be created due to the non-existence of a breeding policy at that time.

A breeding policy therefore, is the need of the hour to harness the best out of the available swine population of the state. Identification of pigs with better genetic make up for selective breeding is required in order to achieve optimal production and productivity.

**Demand of smallholders on genetic material and breeding services:**

There were very few studies on demand of smallholders on pig genetic material and breeding services so far, especially in our State. Some of the observations on the Common demands on genetic materials and breeding services from all investigated villages are given below:

- All farmers wanted to improve their knowledge on pig breeds and breeding operations. So far, they just learned from their experience themselves about the performance of the pig breeds available in their places under local husbandry condition. Farmers had no idea about the potential of these breeds, no comparison with other breeds, and no information on AI activities. These resulted in a high demand on training courses on pig breed, and breeding activities as well as AI operation with support from government.

- Techniques in raising and management of breeding sows and boars and breed selection, including castration techniques were demanded by farmers in all villages in order to be active in supplies of breeding pigs and breeding services as well as piglets for fattening.
The accessibility to trusted sources of suitable breeding gilts and boars are desired by farmers in all villages. Higher growth rate of crossbred pigs to reduce the time of selling finished pigs to less than one year was expected by all pig keepers. Reduction in feed consumption ratio of crossbred pigs was also much concerned by farmers. Black pigs (or not much white colour) were preferred by almost all pig keepers.

Constraints of smallholder pig farmers include:

1. Diseases - farmers did not want to increase production scale because of epidemic fear of swine fever.
2. Vaccination – Once a year, but many farmers did not want it because they thought that vaccination caused sickness in pigs including diarrhoea.
3. Concentrate feed is not available and costly.
4. Poor housing.
5. Difficulty in getting vaccine, vet medicine, veterinary service.
6. Local pigs need free ranging but currently this is forbidden. Free ranging practice is discouraged in many villages due to better sense of cleanliness; also availability of better performing pigs could be the reason for marked decline in the indigenous pig population.
7. Lack of capital to invest in good breeding pigs and feed. Farmers in some midland villages have given up keeping Local indigenous pigs due to very low growth rate even though meat is very tasty, whereas the pork price is same with that of larger sized breeds.
8. Large sized crossbred pigs were more fatty, pork not as tasty as smaller size and local pigs.
9. Exotic and cross bred pigs have proven feed conversion efficiency, better growth rate and litter size, but when it comes to consumer's preference of pork; it is the indigenous pig meat because of its flavour and juiciness.
10. Farmers in midland and highland still lacked experience in keeping crossbreds.

Potentials of smallholder pig production reported include:

1. Pig keeping as bank saving; sale of pigs as additional income generation to meet basic requirement such as treatment, tuition fee, kitchen and other household needs; easy to borrow money - pigs can be used as collateral (for school fee, can borrow money before selling pigs).
2. Family labour utilization; Women at home raise poultry and pigs.
3. High local demand on piglets and pork of all breeds.
4. Availability of local feed (vegetable, leaves).
5. In some midland and highland villages, pigs are also needed for engagement, heritage property.

6. Policy development process

The government of Tripura constituted a committee to formulate a draft pig breeding policy realizing the importance of having a sound breeding policy for pigs in the State, made decision authorizing the Department of ARD to frame the breeding policy through a participatory process. The Department led the process with the support and expertise available from the department including retired experts of the department, College of Veterinary Science & AH, R. K. Nagar, Agartala & ICAR-NRC on Pig.

7. Expert committee meeting

The expert committee, constituted by the Government of Tripura, after detailed deliberations, prepared the draft breeding policy with a detailed technical programme for its implementation, which was presented before key officials (including the Secretary) of ARD Department, Government of Tripura.
8. OUTLINE OF PIG BREEDING POLICY FOR THE STATE OF TRIPURA

8.1. OBJECTIVES

The pig breeding policy of Tripura aims to:

a) Genetic improvement of local/non-descript pig population of the state by cross breeding and gradually replacing the non-descript population with crossbred germplasm of desired level of exotic inheritance.
b) To conserve the indigenous pig germplasm of Tripura.
c) To maintain pure germplasm of exotic breeds to fulfil the requirement of Tripura.
d) To make sure that the procured exotic pig breeds are locally acclimatized as well as promising to local climatic challenges.
e) To develop existing breeding infrastructure.
f) To reinforce supportive mechanism particularly feeding, management, housing and health care to assist the above.

8.2. LOCATION / PRODUCTION SYSTEM WISE RECOMMENDED BREEDING POLICY FOR THE STATE OF TRIPURA

The policy promulgated will be different in different locations in the state considering availability of feed resources, farmer preference, demand, and so on.

8.2.1 In rural farms (characterized by availability of indigenous breed/ poor quality cross bred pigs reared under open ranging/tethering/penning system and managed by smallholders for subsistence purpose with a little or no purchased feed inputs)

Breeding policy recommendation: For this type of farmers /production system, the proposed policy is to conserve meritorious Indigenous germplasm of our State in their native breeding tracts by establishing nucleus breeding herd.

8.2.2 Rural farms (characterized by availability of crossbred pigs reared under intensive /semi-intensive system and managed by smallholders partly for commercial purpose under low input-low output system)

Breeding policy recommendation: For this type of production system, the policy is to promote cross breeding of Local stock (female) with Large White Yorkshire or Landrace or Hampshire (male) with 50% level of exotic inheritance. The breed of choice will be according to farmer’s preference and demand.

8.2.3 Urban/ peri-urban and well accessible rural farms (characterized by availability of good quality crossbred or poor quality exotic pigs reared under intensive system and managed by progressive farmers, mainly for commercial purpose under high input- high output system)

Policy recommendation: For this type of farming system the suggested policy is to promote pure Large White Yorkshire/Landrace / Hampshire or their crosses.

Due to preference of black colour pig in certain ethnic community and recent experience of use of Hampshire in crossbreeding programme by other north-eastern states, parent stock of this breed need to be developed within the state. Besides maintaining pure breed Hampshire farm, this will be extensively used for crossbreeding programme of the state.
8.3. Breeding plan

The breeding plan will follow the breeding pyramid in nucleus breeding scheme (NBS) as shown in Fig 1 and 2.

**Figure 1: Breeding pyramid**

[Image of breeding pyramid]

**Figure 2: Breeding Policy**

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>JURISDICTION</th>
<th>ACTIVITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nucleus Farm</strong></td>
<td>State level Nucleus Farm in 2-3 per regions as per pig population of the state and demand of pork</td>
<td>The correspondence Nucleus Farm will maintain Great Grand Parent (GGP) and Grand Parent (GP) stock of corresponding varieties</td>
</tr>
<tr>
<td><strong>Multiplier</strong></td>
<td>Multiplier farm will consist of state Govt. farms, central Govt. farms and institute farms. (Each district of a region will have minimum two such kind of farm)</td>
<td>The Multiplier Farm will maintain Grand Parent (GP) and Parent (P) stock of corresponding varieties</td>
</tr>
<tr>
<td><strong>Farmers’ Field</strong></td>
<td>Mass scale propagation of region specific variety at farmers’ field and the local large/medium scale entrepreneurs (commercial farm) will be monitored by district level multiplier farm.</td>
<td>Regular monitoring and cooperative based marketing may be ensured for better economic return</td>
</tr>
</tbody>
</table>

SCHEMATIC DIAGRAM FOR PIG BREEDING POLICY OF TRIPURA
Closed Nucleus Breeding Scheme (CNBS) will be followed for superior exotic germplasm whereas Open Nucleus Breeding Scheme (ONBS) will be followed for indigenous local pig and crossbred animals.

- Selected superior quality boar of Indigenous pigs from nucleus herd will be given to farmers in the rural locations for breeding their Indigenous animals.

- Purebred i.e. 100% exotic inheritance of Large White Yorkshire/Landrace/Hampshire boar from nucleus herd will be given to commercial /industrial /progressive farmers for breeding their animals and to multiplier farms to produce 50% exotic inheritance crossbreds

- Selected 50% exotic inheritance boar produced in multiplier farms will be supplied to farmers to breed their local animals or for rearing for commercial purpose. Towards enhancing the number of good quality piglet production per year and to meet the growing demand:
  - Some of the existing Government farms will be converted to multiplier farms.
  - Private entrepreneurs will be encouraged to start multiplier farms for producing 50% crossbreds of Large White Yorkshire/ Landrace/Hampshire.

**BREEDING WITH EXOTIC GERMLASM:**

1. Import of exotic pure germplasm of Large White Yorkshire, Landrace and Hampshire from reputed source after all bio-security checking.
2. Import of live animal may be done instead of frozen semen, as the success rate of frozen semen is quite low as experienced in recent breeding programme by using frozen semen in few Indian States.
3. Established breed specific nucleus herd of imported exotic pure germplasm for subsequent use in crossbreeding programme.

8.4. TECHNICAL BREEDING PROGRAMME

8.4.1 EXOTIC NUCLEUS HERDS

Nucleus herds (Large White Yorkshire/ Landrace/ Hampshire / Indigenous pig) will be established in a phase manner under organized government farm to carry out pig development programme in the state as detailed below:

(a) To establish a nucleus herd (parent stock) of minimum 100 Dam lines of Large White Yorkshire/ Landrace / Hampshire separately, 150 female and 15 male piglets of each breed will be procured from pedigreed herd from different location of organized farms.

(b) The preferable age of the piglet at procurement should be 2-3 months of age having body weight 12 kg and free from any deformities.

(c) The piglets will be identified by using different scientific method or any locally adapted technique and data will be recorded precisely.

(d) Out of 150 gilts, 120 will be selected for breeding to ensure 100 farrowing.

(e) Allotment of boar will be made in such a way that inbreeding could be avoided for a considerable period of time.
(f) Weaning of piglets will be practiced preferably at 40-45 days of age.

(g) Recording of data on regular basis on reproductive parameters i.e. age at sexual maturity, age at first farrowing, litter traits and growth.

(h) The breeding sow will be maintained up to 3rd or 4th farrowing. The replacement stock for both male and female will be selected preferably from 2nd crop piglets on the basis of litter traits of dams, weaning weight, body weight gain and number of functional teats (14) of individual.

(i) The first, third and fourth crop piglets will be made available to multiplier farms/entrepreneurs either for cross breeding or pure breeding. Excess piglets from 2nd crop should also be sold.

(j) Provision should be made to replace all sire lines after checking rate of inbreeding of the herd from new external sources after considerable period of time.

(k) Nucleus herd(s) of Indigenous local pig will be established under organized Government sector after getting them phenotypically and genetically characterized and registered. In this case, apart from conservation in the farm, to encourage conservation of particular indigenous pig in their respective breeding tract with suitable supportive mechanisms as well as incentives will be given to the farmers.

(l) Implementation of the policy will ensure involvement of women and underprivileged rural farmers in production and marketing of pig and pork products.

8.4.2. MULTIPLIER AND FARMERS’ FARMS

Multiplier farms will be established under public/private sector to produce 50% crosses of Large White Yorkshire x Local, Landrace x Local and Hampshire x Local, besides multiplication of pure line Large White Yorkshire, Landrace, Hampshire and Indigenous local pig. The technical programme to establish the multiplier farms will include:

(a) Minimum 30 Multipliers Farm in total (10 for Large White Yorkshire Cross, 10 for Landrace and 10 for Hampshire Cross) should be established separately for available exotic pig breeds.

(b) The minimum herd size for Indigenous Sows will be varied from 30 to 50.

(c) The exotic boar of either Large White Yorkshire or Landrace or Hampshire will be introduced for production of 50% exotic-50% indigenous (Half-bred) in the ratio 1: 4

(d) Intersire mating will be adopted in the multipliers farm to maintain 50% exotic inheritance level.

(e) To avoid inbreeding among the Multipliers Farms, exchange of breeding boar will be practiced.

(f) The Progenies of such farms will be supplied to Commercial Farms or 2nd line of Multipliers for production of 50% exotic-50% indigenous pigs.

(g) Excess animals other than breeding stock will be slaughtered or marketed.
8.5. SELECTION OF BREEDING / REPLACEMENT STOCK

It is advised to the nucleus breeding farm management to design selection criteria. The following protocols may be used for selection of breeding animals:

1) Selection of males to be made in two stages:
   - In the first stage, select two male piglets from each litter at weaning age.
   - In the second stage, select two males against each sire line at the age of six months to make the total number to 20 males with a target to utilize 10 boars of the 10 sire lines for breeding purpose.

2) Selection of females to be done in two stages:
   - In the first stage select 3 female piglets from each litter at weaning age.
   - In the second stage select 15 females against each sire line considering not more than two gilts per dam, at the age of six months to make the total number to 150 females for breeding to ensure 100 farrowings.

3) Identification and Traceability
   - A systematic process of identification, registration and recording of animals will be made to keep track of the individual animals.
   - A specific system should develop for pig disease surveillance and monitoring.
   - On successful operationalization of the above, attempts will be made to implement a sound system to keep track of the value chain in respect of germplasm and food safety.

8.6. SELLING / CULLING OF ANIMALS

- Physically as well as genetically inferior quality male should be castrated prior selling.
- Selected surplus superior quality males should be sold preferably to existing boar rearers to replace their inferior quality stock.
- Animals for breeding should be certified by the Department, by following guidelines (to be developed by the State Farm Advisory Committee).
- Sows completed 3rd or 4th farrowing should be sold.
- Un-productive and infertile sows should be eliminated from each generation.
- Animal along with its family with specific genetic disorders should be eliminated from the breeding programme.

9. SUPPORTIVE SYSTEM

9.1. Infrastructure

The following infrastructure will be required for implementation of the pig breeding policy:

(a) Nucleus herds, consisting of exotic breeds viz. Large white Yorkshire/Landrace/Hampshire at different locations of the state.
(b) Similarly, nucleus herd of Indigenous local pig need to be established in the respective native breeding tract(s).
(c) Development of sheds for farrowing, grower, replacement and parent stock.
(d) Portable water plant and distribution system to individual pen need to be established.
(e) Sewage disposal as well as treatment plant needs to be developed.
(f) Boar shed constructed specific to each breed at each farm.
(g) Provision of semen collection amenities, semen processing laboratory with semen bank and establishment of satellite centres need to establish as per the requirement of the state.
(h) Feed plant as well as feed storage room needs to be established as per the requirement of the state.
(i) Provision may be kept for import/purchase of advanced machinery for feeding and watering.
(j) Development/provision of infrastructure at farmers’ field for climate resilient housing for pigs.
(k) Establishment of a bacon factory in the State would reduce the transportation cost by rail and boost piggery in the State.
(l) Value addition of pork and pork-products should be promoted for better profitability of the farmers.
(m) Cooperative based market chain.
(n) Provision for production of feed crops.

9.2. **Subsidies and other financial support:**

(a) Easy bank credit facility.
(b) One time subsidy for small holders purchasing breeding boars.
(c) Annual subsidies for using AI services.
(d) One time subsidy for AI service providers.
(e) One time subsidy for waste management system.
(f) Price subsidies for indigenous pork producers.
(g) Subsidies for infrastructure development.

9.3. **DISEASE CONTROL AND BIO-SECURITY**

(a) Provision for specific quarantine facilities for import of animals at the entry of the state.
(b) Regular vaccination against prevailing (FMD, CSF) and other emerging diseases.
(c) Standard operating protocol will be followed to prevent spread of diseases and infection.
(d) Post-mortem facilities and incinerator.

9.4. **MANPOWER**

Support in terms of human power will be required to manage the whole system as detailed below:

(a) Farm Superintendent preferably with specialization in Animal Genetics and Breeding/Livestock Production and Management or minimum 5 years of experience in related activity.
(b) In-charge preferably with specialization in Animal Genetics and Breeding/ Livestock Production and Management or a B.V.Sc & A.H. degree with training in related field.
(c) Laboratory Assistants trained in related field from a recognized institute.
(d) Veterinary Field Assistant.
(e) Lab attendant (Grade IV).
(f) Other staff as per requirement
9.5. CAPACITY BUILDING

Training to be imparted the following key staff members to manage the technical programme and properly implement the breeding policy:

(a) Training of trainers for officers on:
   - Farm management
   - Breeding management
   - Semen processing and Artificial Insemination (A.I.) technology as per the requirement
   - Health and disease management

(b) Training for Paravets on:
   - Training boars for semen collection
   - Disease management
   - Farm management

(c) Training for community level workers on:
   - AI technique
   - Awareness creation and community mobilization

(d) Training for farmers on:
   - Breeding, feeding, health care, management
   - Marketing
   - Food quality and safety including zoonoses

10. IMPLEMENTATION OF THE POLICY IN TRIPURA:

Tripura is having significant effect of piggery in livelihood of the population. The state will work upon as per their requirement within the frame-work of this policy considering following facts, approval and notification by the government, the operationalization process needs to be initiated prior to implementation.

The following activities shall require for implementing the pig breeding policy in our State:

(a) Implementation strategy, project report and work Plan.
(b) Allocation/Mobilization of resources.
(c) Constitution of Expert Advisory Committee.
(d) Constitution of Farm Advisory Committee.
(e) Establishment of infrastructure.
(f) Deployment of manpower.
(g) Capacity building /training.
(h) Import of exotic germplasm from reputed international source.
(i) Sourcing of required indigenous germplasm.
(j) Development of own feed resources and through linkages/purchase.
(k) Set up multiplier farms under government/private sector.
(l) Setting up of delivery mechanism to supply good quality germplasm (piglets, semen) from the nucleus herd/multiplier farms to the farmers through government network and private entrepreneurs.
(m) Incentivized castration of inferior male pigs in the field.
(n) Incentivized conservation/rearing of indigenous germplasm.
(o) Target to encourage the entrepreneurs and private/commercial pig farmers.
(p) Establish data collection mechanism for performance evaluation in the field and for impact assessment.
(q) Target to improve the integration and position of local farmers and entrepreneurs into a Pig-production and marketing value chain.
(r) The policy will be reviewed the improvement of piggery sector of the state after five years for necessary modification, if required.

11. Conclusion

Implementation of pig breeding policy for the state will not only target socio-economically weak communities including women folk in terms of their sustainable livelihood security but also address the issues of pig production system under changing climatic scenario by improved production and productivity. It is also expected to mitigate the current demand supply gap and open avenues for development of entrepreneurship and export of pork and pork products.

As the pig rearing system is dynamic and pig population structure is expected to change over a period of time, the present breeding policy requires to be reviewed after a minimum period of five years.

REFERENCE:

Nagaland Pig Breeding policy, Department of Animal Husbandry & Veterinary Services Nagaland: Kohima, Government of Nagaland.