

# **1. Overview of the Piggery Sector**

## **1.1 Introduction**

Animal husbandry and livestock sectors are critical for rural livelihood and economic development of the country. India possesses one of the largest livestock wealth in the world and a quarter of the agricultural gross domestic product is contributed by the livestock sector. Among the livestock species, pig finds an important place as it being reared by socio-economically weaker sections of the society. Pig as compared to other livestock species has a great potential to contribute to faster economic return to the farmers, because of certain inherent traits like high fecundity, better-feed conversion efficiency, early maturity and short generation interval. Pig farming also requires small investment on buildings and equipments. It has immense potential to ensure nutritional and economic security for the weaker sections of the society.

## 1.2 Sector Information

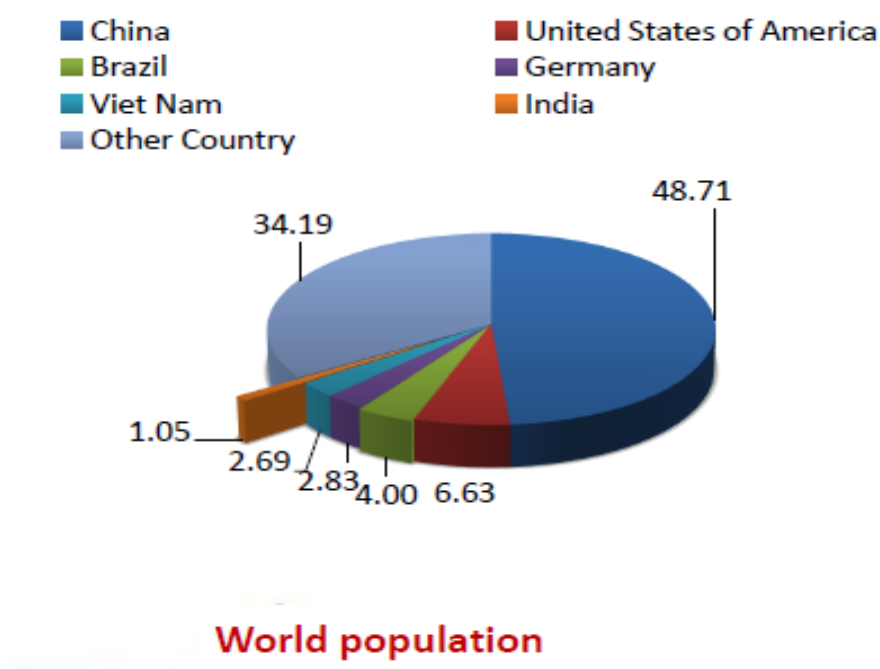
In India Pig Farming sector is highly un-organised and some of the salient features are following

- 1.2.1 In India, 70% of the pig population is reared under traditional small holder, low-input demand driven production system, except for limited number of semi-commercial pig farms in Kerala, Punjab and Goa. The typical production system consists of a simple pigsty and feeding comprises locally available grains, vegetables and agricultural by-products along with kitchen waste.
- 1.2.2 Pork consumption being popular among select populations, improved pig husbandry programmes and pig-based integrated fish farming have significantly contributed in the poverty alleviation strategies of the Government.
- 1.2.3 Distribution of pig population across the country is not uniform, for instance, thick population of pigs is recorded in the eastern (2.8 million) and north-eastern (4.5 million) states; highest population is in Asom (2 million), followed by Uttar Pradesh (1.35 million), West Bengal (0.82 million), Jharkhand (0.73 million) and Nagaland (0.70 million). Most of the pig population is again in the tribal belts of the country where the people are non-vegetarian.
- 1.2.4 Breeding Level : Over 20% of the pigs kept in India are crossed with exotic breeds, but with a large amount of inbreeding because of non-systematic breeding and selection. In nutshell, the pig rearing is still unorganized venture that requires science and technology driven support to make it a vibrant enterprise.

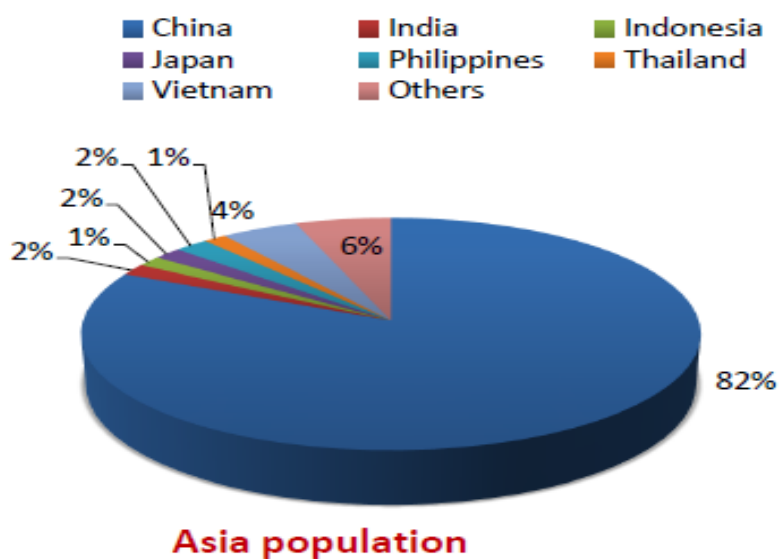
### 1.3 Demographics

The total pigs in the country have decreased by 7.54% over the previous census and the total pigs in the country are 10.29 million numbers in 2012. The total Pigs contribute around 2.01% of the total livestock population. Out of the total population, number of males are 4.96 million (3.68 million indigenous and 1.28 million exotic) and 5.33 million are females (4.16 million indigenous and 1.17 million exotic).

#### 1.3.1 World Population: 977.02 million (FAO, 2014)



### 1.3.2 Asia Population



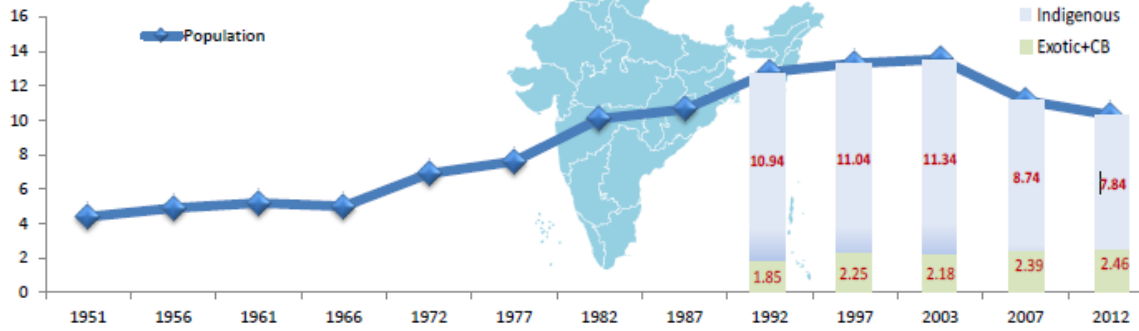
### 1.3.3 India Population

The total livestock population consisting of Cattle, Buffalo, Sheep, Goat, pig, Horses & Ponies, Mules, Donkeys, Camels, Mithun and Yak in the country is 512.05 million numbers in 2012. The total livestock population has decreased by about 3.33% over the previous census.

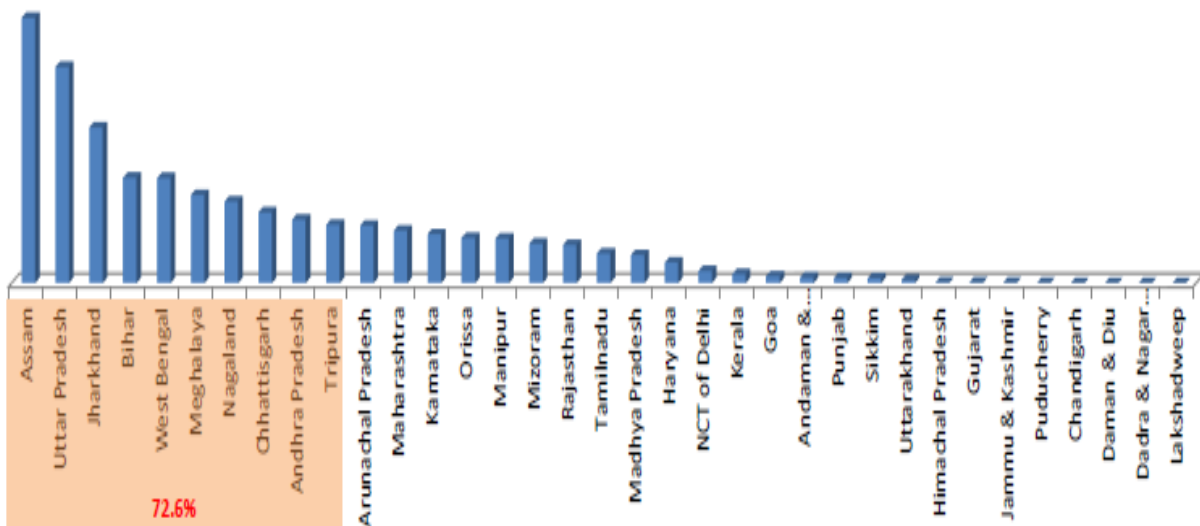
ALL INDIA LIVESTOCK CENSUS (in thousands)			
	2007	2012	% Change
<b>Pigs</b>			
v Exotic/Crossbred			
· Male	1,209	1,283	6.12
· Female	1,180	1,174	-0.51
v Total Exotic/Crossbred	2,389	2,456	2.8
v Indigenous			
· Male	4,134	3,681	-10.96
· Female	4,610	4,156	-9.85
v Total Indigenous	8,744	7,837	-10.37
<b>Total Pigs</b>	11,133	10,294	-7.54

### 1.3.4 Trends in the Population

➤ 2% of total livestock of India (512.05 million)



### 1.3.5 Pig population in different States



### 1.3.6 Change of Population



As per Census data, there is a change in population of indigenous and crossbred/exotic pigs in India. The majority of the pig population in India is of indigenous breeds (76 percent) though population of cross-bred and exotic pigs increased by 12.7 percent from year 2003 to 2012. The trends shows that the major share of the pig population is indigenous pigs, the level of population was almost steady from 1992 census. However crossbred pigs were 14% in 1992 and reached to 23.86% in 2012.

## **1.4 Breeding Policy in India**

### **1.4.1 Recognition and Conservation of Indigenous Germplasm: Guidelines**

1. Breed registration: All the states will take necessary steps for breed registration of indigenous germplasm in collaboration with ICAR-NRC on Pig and ICAR-NBAGR, Karnal.
2. Nucleus breeding farm for such type of indigenous registered germplasm need to establish in its breeding tract separately. Breeding pyramid should be followed for indigenous prized germplasm also.
3. Prized animals may be collected from farmers' field/state/central Govt. farm to the nucleus herd.
4. Pedigreed animals should be propagated only to interested farmers who want to keep local germplasm.
5. No crossbreeding should be allowed to farmers' field for these prized animals.
6. Separate rates and incentive from the state department may be provided to such farmers.
7. Most of the indigenous germplasm are smaller in size with less litter performance. However, in specific cases, indigenous animals with higher litter size and body weight, if available, may be used for upgradation of non-descript animals with proper plan.

Different pig breeds have been adapted to the most diverse climatic conditions in country which however are low producers. The indigenous pig has been the basis used for pig production for a long period of time.



### 1.4.2 Indigenous breeds of pigs

The majority of the pig population in India is of indigenous breeds (76 percent) though population of cross-bred and exotic pigs increased by 12.7 percent from year 2003 to 2012. The exotic breed mainly comprises Hampshire, Large White York Shire, Duroc, Landrace, and Tamworth while some of the popular indigenous pig breeds include *Ghungroo*, *Niang Megha*, *Ankamali*, *Agonda Goan*, and *Tany-Vo*.

Sl.No	Name of the Breed	Home Tract
1.	Ghoongroo	West Bengal
2.	Zovawk	Mizoram
3.	Niang Megha	Meghalaya
4.	Tenyi Vo	Nagaland
5.	Agonda Goan	Goa
6.	Nicobari	Andaman & Nicobar
7.	Doom	Assam

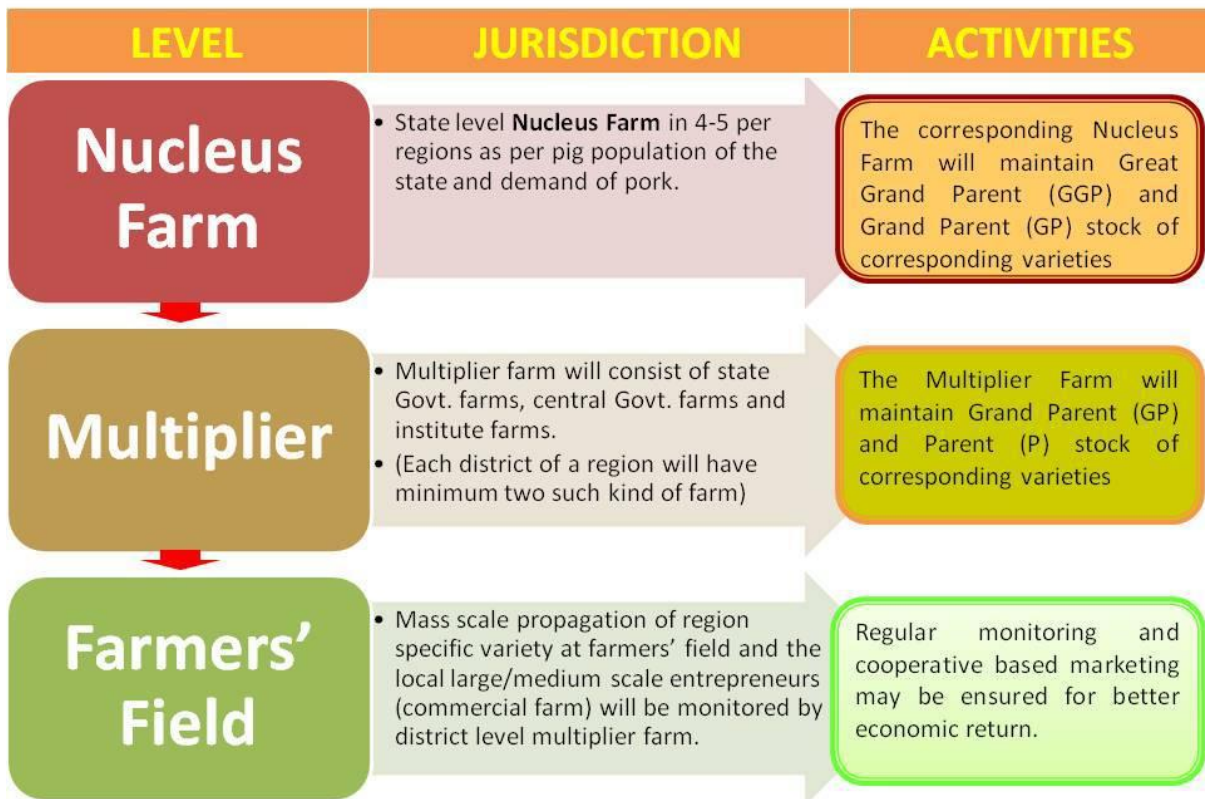
Source-(NBAGR)

### 1.4.3 Cross Breeding: - Crossbred to be propagated in different region:

Sl No	Region	Breeds
1	Northern India	1.Large White Yorkshire 2.Large White Yorkshire cross 3. Landrace cross
2	Northeastern India	1.Hampshire cross 2.Large white Yorkshire specifically for Mizoram and Tripura 3.Triple cross with Duroc as terminal sire 4.Large Black cross
3	Eastern India	1.Hampshire cross 2.Tamworth cross (specifically Jharkhand)

4	Central India	1. Landrace cross 2. Large white Yorkshire cross
5	Southern India	1. Large white Yorkshire cross 2. Triple cross with Duroc as terminal sire
6	Western India	1. Large white Yorkshire cross

### BREEDING POLICY (crossbreeding)



#### 1.4.4 Breeding with Exotic Germplasm:

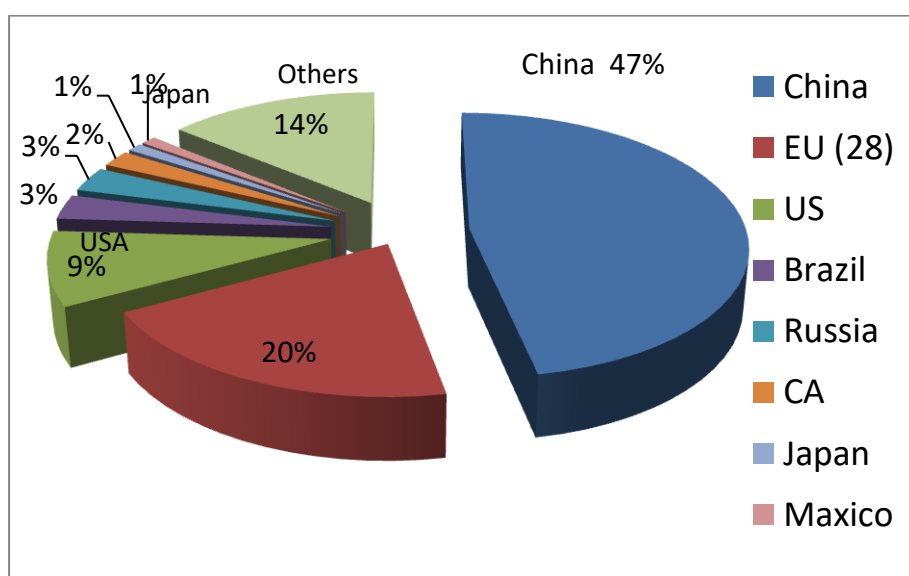
1. Import of exotic germplasm, specifically, Hampshire, Large White Yorkshire, Duroc, Landrace and Large Black from reputed source after all bio-security checking. Preference may be given to the first three breeds for import.

2. Import may be done for live animal instead of frozen semen, as the success rate of frozen semen is very low.
3. Developed breed-specific nucleus herd of imported germplasm for subsequent use in crossbreeding programme.

## 1.5 Pork Meat Scenario in India

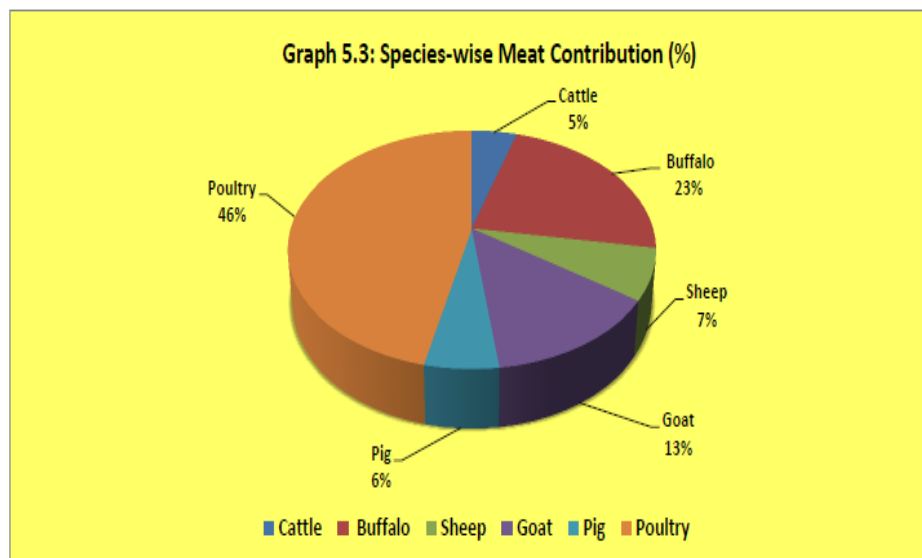
**1.5.1 Regulatory status:** In India, domestic meat production and processing is governed by the ‘Meat Food Products Order’ (MFPO), 1973. This order establishes sanitary and hygienic standards for slaughter houses and sets residue levels for meat products. Until recently, the MFPO was managed by the Ministry of Food Processing Industries (MoFPI) However, with the creation of the Food Safety and Standards Authority of India (FSSAI), the MFPO was brought under the umbrella of the Food Safety and Standard Regulations, which is overseen by FSSAI.

**1.5.2 Pork production:** Pork production in India is limited, representing only 9% of the country’s animal protein sources. Production is concentrated mainly in the northeastern corner of the country and consists primarily of backyard and informal sector producers. According to 19th Livestock Census of India (2012), the total swine population, while small, has grown consistently over the past 50 years. However, in the most recent decade, the population has declined to approximately 10 million head from a high of 14 million in 2003, as indicated by the 17th Livestock Census of India.



(Figure :World Production break down, and India included in 14% of others.)

**1.5.3 Present Pork Meat Production:** The meat production in the country as per 2014-15 data was 6.6 million tons with a per capita availability of 4.94 kg. Of this, Pig contributed 9%. The total meat production in 2014-15 by Pig was 464.11 thousand tons.



**1.5.4 Processed Pork:-** The Indian market for processed pork products is small, and the majority of this market is supplied through imports. Although there are some local companies which manufacture processed products such as sausages and bacon, quantities are limited and the industry is small. According to MoFPI, there are 3600 slaughter houses in India, although the majority of these facilities do not export. There is a small number of abattoirs in India which meet international standards. However, these facilities do not process pork meat.

## **1.6 Pork consumption:**

Indian pork consumption can be divided into two segments:

- 1.6.1** The vast majority takes place in the informal sector in the form of locally raised fresh pork meat. This meat is not widely distributed in the organized retail sector. Given cultural perceptions and consumer perceptions about pork meat, consumption of fresh local meat is limited to north eastern India where pork consumption is more prevalent.
- 1.6.2** The second segment of the pork market deals with high-value imported products. These products include cured meats such as sausages, ham, bacon and canned meat products, as well as small quantities of frozen meat. They are typically found in most leading Indian hotels catering to international business travellers and tourists. Additionally, there is demand for imported pork products amongst well-travelled Indian consumers and foreigners residing in India. Processed products such as sliced meats, hams, bacon and sausage can be found in specialty shops and high-end restaurants.
- 1.6.3** In the next ten years, it is predicted that the total consumption of meat in India will double from its present numbers. As per capita income of individuals rises, they tend to spend on improving their lifestyle and food consumption habits. Pork consumption is negligible in India, with the exception of the north-east while it is a major item elsewhere. In the European Union, 42.6 kg pork is consumed per person every year, while in the US, 29.7 kgs are consumed. Pork is a staple for Chinese, and so over 35 kg are consumed per person per year.

## **1.7 Regional Pork Demand**

India's States and regions are diverse in terms of economic factors affecting food demand, including population, income, and urbanization.

**1.7.1 North-East India:** The eight states in North East India (Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura) are ethnically and culturally akin to South East Asia and are amongst the poorest in India with a much higher proportion of the population below the poverty line (35%) than the national average (26%). For the majority tribal population, livestock keeping – especially pig keeping - is integral to their way of life in the NE Region. There is a growing demand for pork due to increasing per capita income, urbanization and changes in lifestyle and food habits. Much of this demand is met from imports from other states in India and from Myanmar. North East India has much higher pork consumption than the rest of the country. Of these states, Nagaland has the highest per capita consumption. The tribal population in particular appears to consume more pork on average than other groups. Traders in both Assam and Nagaland reported that the demand for pork was increasing along with prices.

**1.7.2 South India:** Goa, Karnataka, Andhra Pradesh, Tamilnadu, Kerala, Bangalore -States are meat-eaters and small Christian sectors also consume pork. - Pork is a popular meat in Goa and the eastern states of India. - It is eaten by the Portuguese Christians in Goa.

**1.7.3 Kolkata (West Bengal)** - Community of immigrants and descendants; Chinese population of 7000. So the demand of pork meat is high.

## **1.8 Trade (Import and Export) of Pork and Pork Products**

**1.8.1** With a high proportion of Muslims and vegetarians in the population, pork consumption per person in India is negligible. However, demand from the hotel, restaurant and institutional sector as well in high-end retailers helped to push up imports to 527 metric tons (581 US tons) last year. Imported products included pork belly, chops, loin, tenderloin, neck, shoulder, spare ribs, bacon, ham, salami and sausages.

**1.8.2** The market for imported pork products in India is limited to the Hotel, Restaurant and Institutional sector (HRI), as well as other niche and specialty markets. Indian pork imports consist almost entirely of processed products. A small portion of these imports include imports of high quality frozen pork meat.

**1.8.3** In recent years, the major suppliers of pork to India have been Belgium, Sri Lanka, Spain, Italy, and the Netherlands, according to FAS. In 2015, pig meat products also came in from the UK and Germany. The basic tariff on imports of pork and pork products is 30 percent. Major suppliers of pork meat to India are the Belgium, Germany, Sri Lanka, Netherlands, Italy and Spain.

### **1.8.4 Import of Pork Products in 2014-15 (Source: DoC/APEDA)**

<b>Commodity</b>	<b>Quantity in MT</b>	<b>Value (in Rs. Cr.)</b>
<b>0203 Meat of Swine, Fresh, Chilled or Frozen</b>	<b>113.0</b>	<b>4.72</b>
<b>0204 Meat of Sheep or Goats, Fresh, Chilled or Frozen</b>	<b>59.2</b>	<b>5.13</b>
<b>0207 Meat and Edible Offal of the Poultry, Fresh Chilled or Frozen</b>	<b>3.22</b>	<b>0.82</b>
<b>0208 Other Meat and Edible Meat Offal, Fresh, Chilled or Frozen</b>	<b>46.4</b>	<b>1.93</b>



### 1.8.5 Export of Pork Products (Source: DoC/APEDA)

S.No.	Country	Values in Rs. Lacs		
		2015-2016	2016-2017	%Growth
1.	BELGIUM	402.20	649.15	61.40
2.	ITALY	130.02	133.38	2.59
3.	GERMANY		128.12	
4.	UK	134.49	85.31	-36.57
5.	DENMARK		22.25	
6.	SPAIN		18.76	
7.	SRI LANKA DSR	33.79	8.58	-74.62
8.	AUSTRIA		2.29	
9.	THAILAND	2.30		
10.	KOREA RP	0.13		
11.	NETHERLAND	37.65		
	<b>Total</b>	<b>740.57</b>	<b>1,047.84</b>	<b>41.49</b>
	<b>India's Total</b>	<b>249,029,808.12</b>	<b>257,742,165.86</b>	<b>3.50</b>
	<b>%Share</b>	<b>0.0003</b>	<b>0.0004</b>	

## **2. Issues of the Piggery Sector**

## 2.1 SWOT Analysis of Piggery in India

<p><b>Strength</b></p> <ul style="list-style-type: none"> <li>• High Profitability and Revenue</li> <li>• Piggeries can be established in relatively small areas.</li> <li>• Feed costs are much lower than other meat production costs.</li> <li>• The demand for pork meat has increased significantly over the years due to the high prices and unavailability of red meat substitutes.</li> <li>• Regulatory compliance</li> <li>• The turnaround production time is quicker than red meat production. It is becoming a meat of choice.</li> </ul>	<p><b>Weakness</b></p> <ul style="list-style-type: none"> <li>• Cultural taboos</li> <li>• Low level of Breed upgradation.</li> <li>• Non-availability of Concentrate feed.</li> <li>• Weak supply chain and marketing facilities</li> <li>• Meat processing infrastructure</li> <li>• More labor intensive than other meat industry.</li> <li>• Absence of National Traceability Program</li> </ul>
<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Growing demand</li> <li>• Venture capital</li> <li>• Value addition and export</li> <li>• Medium for poverty alleviation.</li> <li>• Self employment</li> <li>• Industry with tremendous growth potential.</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>• Diseases</li> <li>• Volatile cost and revenue</li> <li>• Regulations</li> <li>• Very susceptible to world conditions and cheap imports.</li> </ul>

## **2.2 Inherent merits of Pig farming Sector**

In comparison to other livestock species, pig rearing has higher potential to contribute to more economic gain for small, marginal farmers or rural poor belonging to the lowest socioeconomic strata due to its following advantages:

- 1) Better feed conversion efficiency of pigs i.e. they attain more unit weight gain per kg of feed consumed as compared to other meat producing animals except broilers.
- 2) Higher fecundity in pigs – Sows produce 6 - 12 piglets in each farrowing.
- 3) Pigs reach sexual maturity at an early age. A sow can be bred as early as 8 - 9 months of age and can farrow twice in a year under optimal management conditions.
- 4) Pigs have shorter generation interval as compared to other classes of livestock
- 5) Offers quick returns since the market weight of 60-90 kg can be achieved in a period of 7-10 months.
- 6) One of the few livestock animals where nearly all parts of the animal can be consumed by the farm family and/or sold.
- 7) Converts damaged feeds which are either not edible or not very palatable to human beings into valuable nutritious meat.
- 8) Apart from providing meat, it is also a source of bristles and manure
- 9) Can survive and grow on wide variety of feed stuff viz. grains, vegetables, fruits, fodder, sugarcane, kitchen waste.
- 10) Piggery employment opportunities to seasonally employed rural farmers and supplement income to improve their living standards
- 11) Require little initial investment on building and gear.
- 12) Pigs can be raised for their entire lifetime in enclosure as they do not contribute to loss of grazing lands (Mpofu and Makuza, 2003).

- 13) Pig products range from primary commodities such as pork, to processed food products such as sausages and smoked hams to cooked salted ears, eaten as snack foods.
- 14) Demand for pig's fat in poultry feed, soap, paints and other chemical industries.
- 15)** The small scale pig sector has seemingly greater potential to reduce poverty.

### 2.3 Gap Analysis

The per capita consumption of meat in developed/industrialized countries is much higher compared with developing countries. Consumption of meat in the USA is 124 kg per capita per year (340 g/day). The global average meat consumption is 38 kg per year (104 g/day).

Countries whose population consumes the least amount of meat are located in Africa and Asia. The ten lowest-ranking countries in meat consumption consume 3–5 kg per capita per year. However, in case of India, it is much less in comparison to even African countries such as Ethiopia, where the average annual meat consumption per capita is estimated to be 8 kg/year as compared to India's per capita meat availability being only 4.94 kg per year. Thus it is apparent that there exists a huge gap of meat availability between India (4.94 kg per year) and the global average of 38 kg per year.

Analysed from the point of required nutrition, as per WHO standards, the daily requirement of protein is 63 gm per day. In average Indian diet conditions, 50.75 gm per day per person (approx.) for the vegetarian population, and about 55.25 gm per day per person (approx.) for the non-vegetarian population is available. Notwithstanding this, the average deficit of protein requirement is approximately 12.25 gm for vegetarian and 7.75 gm for non-vegetarian.

Moreover, by 2050, it is expected that the population in India would increase by 34% and to fulfill the dietary recommended levels of the livestock products by Indian Council for Medical Research (ICMR) for a population of 1.7 billion people, the livestock sector should produce 186.2 million tons of milk, 18.7 million tons of meat and 306 billion eggs per annum. This means that the current level of production, the milk, meat and eggs would have to increase by 1.5, 3 and 4.7 times respectively. Fulfilling the feed demand of this huge livestock from same resource base of land and water is going to be a huge challenge. Therefore, rather than increasing the number of animals, improving

the genetics through breed improvement programme might be a better strategy to address the required demand for animal protein.

## 2.4 Challenges

According to the FAO, animal protein production will grow at least 3 times by 2050, and meats (poultry, swine, and beef) will double while fish production will be multiplied by almost 10 times. An increase in intensification is inevitable, because arable land cannot be increased in proportion. The key challenge will be to produce sustainable food and, of course, sustainable feed to raise our animals, with limited availability of resources and with the need to reduce pressure on the environment. The main Challenges of Swine Production in India are summarised as follows:

1. Absence of sufficient number of breeder farmers throughout the country is a major constraint leading to lesser availability of quality pigs for fattener farmers and market.
2. Tendency of the pig grower to raise pig to marketable age on zero to negligible inputs and lesser preference of the consumers for pork from the local pigs etc.
3. Religious taboo attached with pork consumption is also a weakness for which marketing of pork has to be confined to a selective group.
4. Over 20% of the pigs kept in India are crossed with exotic breeds, but with a large amount of inbreeding because of non-systematic breeding and selection. In nutshell, the pig rearing is still unorganized venture that requires science and technology driven support to make it a vibrant enterprise. The various stakeholders require promotion at various levels such as technology, entrepreneurship development, and financial support to bring Indian pig farming at global level. Further, the shrinking resources in terms of land availability, water as well as threats from the changing environment being conducive for emergence of new diseases are gradually expected to limit the capacity for pork production optimization.



## **2.5 Strategies to address the Challenges**

In order to attain the objectives, the Key Strategies in the National Action Plan are the overall improvement in the following factors,

1. Reducing the Cost of Production.
2. Increase in per Animal Productivity.
3. Increase return to household
4. Marketing.
5. Disease Control and Prevention.

### **2.5.1 Reducing the Cost of production**

In Pig industry cost of production can be reduced by the following ways

- 1) Precision Feeding
- 2) Utilization of feed resource (Non-conventional, Monsoon herbage)
- 3) Adoption of scientific rearing practices
- 4) Effective and planned health management
- 5) Sustainable use of resources/ agricultural by products

**Precision feeding**-When determining a diet for a pig population the goal has traditionally been to reduce the costs of the diets while maintaining the minimum nutrient requirements to promote growth. This method has led to expensive nutrients like phosphorus and nitrogen to be under used because while some pigs in a herd require high amounts of P and N, some pigs in the same herd do not require as much, and therefore do not digested nutrients and excrete them. This is problematic for two reasons, the excretion causes inefficiency in feed use because costly nutrients are essentially wasted and when the slurry with high amounts of P and N is spread over a field it saturates the soil and water systems which is considered bad for the environment. Precision feeding is proposed as a way to make feeding more efficient and less

harmful to the environment. By giving each pig specific diets that meet their individual nutrient requirements for the day reduces the amount of excreted nutrients thus saving money and protecting soils and water systems.

### **2.5.2 Increase per animal productivity**

The productivity of the Pigs can be upgraded by the following ways:

- 1) Breed improvements / superior germplasm
- 2) Higher growth efficiency
- 3) Balance feeding, Higher feed efficiency
- 4) Higher reproductive efficiency, improve fertility
- 5) Reduced morbidity and mortality through focused veterinary health programmes.
- 6) Integrated approaches in rearing

### **2.5.3 Increase return to household**

The income from the Pig and Pork sector can be increased through the following ways:

- 1) Value addition of different Pork Meat Products.
- 2) Establishment of Processing plants / cold chain
- 3) Diversified animal produce (Organic & hygienic)
- 4) Waste management
- 5) Employment generation

### **Potential & Scope of Value Addition**

- 1) **Meat processing and value addition are key for the prosperity of meat industry.** So along with the production increase we can equip the farmers for value addition of products to get maximum profit.

- 2) There are many new value-added products in the pork industry, with most focusing on increasing quality and optimizing convenience. Hence, we may give more importance for the production of value added products.
- 3) Pig bristles or hair is usually discarded as animal wastes during slaughter. More often these bristles are either burnt or dump down in surrounding and causing environmental pollution is a big problem. The reason is that the hair take lot of time to bio-degrade in nature. Pig bristles and hair can be transformed into different brushes and combs according to their strength and physical & mechanical properties. The pig bristles are natural, durable, stable, and flexible as compared to synthetic bristles. Thus high quality end products could be produced from these pig bristles and would be sold to International market.
- 4) **Waste Management:-**In India, majority of the waste, in the meat industry is produced during slaughtering. Slaughter house waste consists of the portion of a slaughtered animal that cannot be sold as meat or used in meat-products. Such waste includes bones, tendons, skin, the contents of the gastro-intestinal tract, blood and internal organs. In India, the slaughter house waste management system is very poor and several measures are being taken for the effective management of wastes generated from slaughter houses.
- 5) **Consumer Oriented Programmes :** Shelf life enhancement employing novel processing and packaging options will be critical to address the issues of production of quality products for wider marketing network. Newer healthful and functional ingredients such as fruits, vitamins, bioactive peptides & natural antioxidants, and probiotics could be incorporated into product formulation to enhance value and offer consumers. Under this we can promote Self Help Groups, Women SHGs ,Youth Entrepreneurship programmes by including in the existing category of EDEG like schemes.

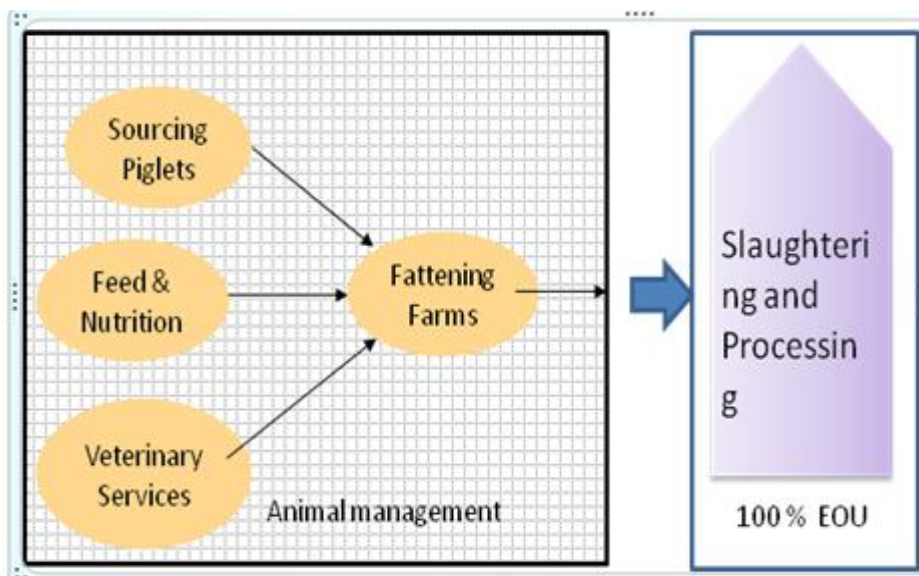
6) Employment generation :- The Entrepreneurship in the Pig farming can be increased by several folds through different ways, such as

- i. Bank credit and insurance cover
- ii. Organised marketing & infrastructure development
- iii. Farmers Cooperatives / Contract farming
- iv. Subsidy on input for livestock rearing

#### 2.5.4 Marketing

Meat production and supply of meat for local consumption is the most neglected sector in the country. Meat is sold in open premises leading to contamination from dirt, dust, flies and other pollutants. The traditional production systems and the unhygienic practices have ruined and flawed the image of the Indian meat industry. Indian meat industry on scientific and modern lines is need for benefiting livestock producers, processors, finally consumers.

- Development of adequate market infrastructure with basic requirements is must for marketing.
- Because of the unorganized nature of the sector farmer is not getting good price.



- 1. Setting up of State of Art- Abattoir cum meat processing plants:** In India, there are very few modern state of art mechanized abattoir cum meat processing plants in various states for slaughtering of Pigs. To meet the increased requirement we need more scientifically designed abottairs and meat processing plants in the country.
- 2. Setting up cold storages:** Meat is nutrient dense food which makes it perishable commodity. In order to improve keeping quality of meat, cold chain is of crucial importance during transport as well as storage till it reaches to consumers. The Government should support setting up cold storages, supply/value chain and 100% export oriented slaughter houses in the country.

#### **2.5.5 Disease Control and Prevention**

Occurrence of diseases causes heavy economic losses in terms of livestock health and production. Advances in animal health are expected to play a major role in the progress of livestock industry. Control of animal diseases assumes prime importance in the crucial time of shifting of animal agriculture from extensive to intensive and commercial system of management. Presence and accumulation of infectious agents in the environment lead to reduction in quality and quantity of animal products. Strategic control and eradication of economically important diseases will result in enhancing Pig production in the country. In India, the last few decades have seen a general reduction in the burden of livestock diseases, except PPR as a result of more effective drugs and vaccines and improvements in diagnostic technologies and services.

#### **Plans/Suggestions for implementation**

1. Health Improvement Scheme wherein we could include components like supply of feed and supplements, periodic health checkups and

monitoring, awareness programmes, disease diagnosis and treatment programs etc...

2. The present allotment of funds under Health Care may be increased and this money should be used for vaccination, deworming etc.
3. Provide first aid /emergency management training to progressive farmers/paravets/animal handlers.
4. Distribution of Feed Supplements and Deworming Programmes
5. Farrowing Pig Nutritional Care Programmes which includes Calcium Supplementation, Nutritional Feed Programmes to the Pregnant and Lactating Pigs.

### **3. National Action Plan**

### 3.1 Objective of National Action Plan

The main objective of the **National Action Plan** is to double the Pork production. This will increase the income of the Pig rearing farmer / entrepreneur so as to achieve the Honourable Prime Minister's plan for doubling the farmer's income. Since Indian pigs are of low productive indigenous breeds with high potential, this doubling of production can be envisaged by incorporation of superior germplasm of high genetic merit through import and eventually, to fetch an increase in the income of the pig farmer.

The present shortfall of pork in the country is about 0.48 million tonne or in other words there is a deficit of 48.38%. There is an urgent need to narrow the gap by scientific pig farming along with post-slaughter pork processing and development of products with improved shelf-life to promote the pork industry in India.

This becomes a greater challenge, as there exists a low productivity index among Indian pig breeds with respect to potential growth rates and mature weight which may be considered as a gap to fulfilling the meat demand. So, major objective of National Action Plan is to double the meat production to meet the domestic production and to get more access to Export markets. So the objectives of National Action Plan are,

1. To increase the production and productivity of Piggery sector.
2. To meet the domestic requirement of pork and to tap the export potential of the sector.
3. Organization of sector and Development of Agri-preneurship



### 3.2 Physical target of National Action Plan.

<b>Production parameter</b>	<b>Production of Pork in 2015-16 (Lakh T)</b>	<b>Target of Production by 2022 (Lakh T)</b>	<b>Total No. of Pig required to slaughter(@50%, to achieve targeted production (@ 100 kg meat/pig)</b>	<b>Total No. of Pigs to be produced.</b>
<b>Pig Meat/Pork</b>	<b>3.9</b>	<b>7.8 (double)</b>	<b>78 million</b>	<b>156 million</b>

The plan envisages, increasing the pork production to 7.8 Lac Tonnes from the 73.11 % of the non-descript population, anticipated to be achieved through cross breeding using exotic boar semen through Artificial Insemination and there by doubling the pork production.

To achieve the targeted production of 7.8 lac tonnes of pork, the requirement of animals for slaughtering is estimated to be 78 million animals. To get these number of animals for slaughtering, we need to produce about 156 million animals. Under this National Action Plan, it is anticipated that the above mentioned target can be achieved through the import of 19, 34,600 number exotic boar semen doses. (refer annexure I)

### **3.3 Key Strategies**

**3.3.1 To increase the production and productivity of Piggery sector and to Increase the High Genetic merit Population** the National Action Plan envisages the Genetic Improvement of Non-Descript Pigs by Cross Breeding with High Genetic merit exotic germplasm. In this case, through Artificial Insemination by importing 19, 34,600 number of exotic boar semen doses.

#### **Suggested Action Plan**

Breed Improvement becomes a greater challenge, as there exists a low productivity index among Indian pig breeds with respect to potential growth rates and mature weight which may be considered as a gap to fulfilling the meat demand. Hence, it is suggested to extend the breed improvement programme with the use of genetically high quality semen through Artificial Insemination, throughout India. This will help to increase the income of the Pig rearing farmer / entrepreneur/ NGO / Cooperative Society, etc so as to achieve the Honourable Prime Minister's plan for doubling the farmer's income.

To achieve the targets of production, it is envisaged to import exotic germplasm of high merit value. These would be inseminated to the selected sows to get the desired population and pork production.

**3.3.2 To meet the domestic requirement of pork and to tap the export potential of the sector, the following are key strategies**

(1) Marketing and Processing by convergence with schemes of MOFPI, APEDA etc..

#### **3 3.3 Organization of sector and Development of Agri-preneurship**

The Entrepreneurship in the Pig farming can be increased by several folds through different Livestock Farmers Groups/Breeder's Association suggested to be in line with ATMA farmer groups with 20 farmers in each group. Also, one

of the main goals of Piggery development is to increase the export of pork. To tap the international markets, we need to keep the sanitary and Phyto-sanitary requirements of the country, wherein “traceability “of the animal product is mandatory. So, these commodity based/farming based groups will help for the tagging and other identification procedures. These groups will also help for the co-ordination of the marketing and value addition of the products as well as the animals.

Under the National Livestock Mission, sub-mission on skill development, technology transfer and extension 7.4.1 Component (I) - IEC Support for Livestock Extension Component (III)-Livestock Farmers Groups/Breeder’s Association, for which the state could explore to avail.

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### 3.2 Physical target of National Action Plan.

<b>Production parameter</b>	<b>Production of Pork in 2015-16 (Lakh T)</b>	<b>Target of Production by 2022 (Lakh T)</b>	<b>Total No. of Pig required to slaughter (@50%</b>	<b>Total No. of Pigs to be produced.</b>
<b>Pig Meat/Pork</b>	<b>3.9</b>	<b>7.8 (double)</b>	<b>78 million</b>	<b>156 million</b>

### National Action Plan on Pig

S. No.	States/ UTs	Total Breedable Female ( in no.)	Total non descript breedable female(73 .11 % of total BF)	Current pork productio n(in Kg.)	Targetted meat productio n by 2022(in kg)	Required no. of Pigs for slaughteri ng@ 100 kg meat/pig	Required No. of Pigs to be produced @50% AI success rate	Total No. of Females reqd.	Total no. of semen doses to be imported
1	Andhra Pradesh	131229	95942	2570000	5140000	51400	102800	6425	12850
2	Arunachal Pradesh	77264	56488	4870000	9740000	97400	194800	12175	24350
3	Assam	244964	179093	17490000	34980000	349800	699600	43725	87450
4	Bihar	150432	109981	72480000	1.45E+08	1449600	2899200	181200	362400
5	Chhattisgarh	120580	88156	1650000	3300000	33000	66000	4125	8250
6	Goa	10757	7864	910000	1820000	18200	36400	2275	4550
8	Haryana	25160	18394	7130000	14260000	142600	285200	17825	35650
11	Jharkhand	255671	186921	17620000	35240000	352400	704800	44050	88100
12	Karnataka	108927	79637	22130000	44260000	442600	885200	55325	110650
13	Kerala	1698	1241	14410000	28820000	288200	576400	36025	72050
14	Madhya Pradesh	50274	36755	1500000	3000000	30000	60000	3750	7500
15	Maharashtra	94977	69438	17020000	34040000	340400	680800	42550	85100
16	Manipur	21837	15965	6610000	13220000	132200	264400	16525	33050
17	Meghalaya	104576	76456	11390000	22780000	227800	455600	28475	56950
18	Mizoram	8617	6300	7500000	15000000	150000	300000	18750	37500
19	Nagaland	27762	20297	17140000	34280000	342800	685600	42850	85700
20	Odisha	77671	56785	8740000	17480000	174800	349600	21850	43700
21	Punjab	4034	2949	860000	1720000	17200	34400	2150	4300
22	Rajasthan	72103	52715	12870000	25740000	257400	514800	32175	64350
23	Sikkim	440	322	270000	540000	5400	10800	675	1350
24	Tamil Nadu	46459	33966	2880000	5760000	57600	115200	7200	14400
25	Telangana	0	0	2980000	5960000	59600	119200	7450	14900
26	Tripura	36541	26715	11230000	22460000	224600	449200	28075	56150

27	Uttar Pradesh	330899	241920	90910000	1.82E+08	1818200	3636400	227275	454550
28	Uttarakhand	3887	2842	3130000	6260000	62600	125200	7825	15650
29	West Bengal	158181	115646	30260000	60520000	605200	1210400	75650	151300
30	A&N Islands	5864	4287	370000	740000	7400	14800	925	1850
<b>Total</b>		<b>2186491</b>	<b>1598544</b>	<b>3.88E+08</b>	<b>7.75E+08</b>	<b>7738400</b>	<b>15476800</b>	<b>967300</b>	<b>1934600</b>

**Technical assumptions**

- |                                   |   |                                       |
|-----------------------------------|---|---------------------------------------|
| 1 Littersize/farrowing=10 numbers | 4 | No of farrowing /year/female=2        |
| 2 mortality rate of piglets=20%   | 5 | Cost of import of semen/dose=510 Rs/- |
| 3 AI success rate=50%             | 6 | Average meat production/pig=100 kg    |

**annexure-I**

Total price implication for importing semen (Rs. In lakhs) over 5 years
65.535
124.185
445.995
1848.24
42.075
23.205
181.815
449.31
564.315
367.455
38.25
434.01
168.555
290.445
191.25
437.07
222.87
21.93
328.185
6.885
73.44
75.99
286.365

2318.205
79.815
771.63
9.435
<b>9866.46</b>



S. No.	States/ UTs	Pig-Adult Slaughtered (Thousand )	Pig-Young Slaughtered (Thousand )	Total Pig (Thousand )	Pig-Adult Meat (Thousand tonne)	Pig-Young Meat (Thousand tonne)	Total Meat (Thousand tonne)	Value Indian Rupee in crore	Value in US Million \$
1	Andhra Pradesh	36.28	35.68	71.96	1.64	0.93	2.57	38.55	5.93
2	Arunachal Pradesh	77.94	4.83	82.77	4.68	0.19	4.87	73.05	11.24
3	Assam	401.75	145.69	547.44	12.92	4.57	17.49	262.35	40.36
4	Bihar	1973.46	1135.39	3108.85	55.47	17.01	72.48	1087.20	167.26
5	Chhattisgarh	57.96	0.00	57.96	1.65	0.00	1.65	24.75	3.81
6	Goa	53.50	0.00	53.50	0.91	0.00	0.91	13.65	2.10
7	Gujarat	10.34	0.00	10.34	0.23	0.00	0.23	3.45	0.53
8	Haryana	106.37	51.12	157.49	5.68	1.45	7.13	106.95	16.45
9	Himachal Pradesh	2.80	0.00	2.80	0.12	0.00	0.12	1.80	0.28
10	Jammu & Kashmir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	Jharkhand	261.85	187.02	448.87	12.36	5.26	17.62	264.30	40.66
12	Karnataka	408.66	54.20	462.86	21.29	0.84	22.13	331.95	51.07
13	Kerala	188.22	4.89	193.11	14.12	0.29	14.41	216.15	33.25
14	Madhya Pradesh	24.56	22.00	46.56	0.93	0.57	1.50	22.50	3.46
15	Maharashtra	435.99	0.00	435.99	17.02	0.00	17.02	255.30	39.28
16	Manipur	99.75	58.00	157.75	5.42	1.19	6.61	99.15	15.25
17	Meghalaya	262.75	0.00	262.75	11.39	0.00	11.39	170.85	26.28
18	Mizoram	86.10	0.14	86.24	7.48	0.02	7.50	112.50	17.31
19	Nagaland	215.81	0.00	215.81	17.14	0.00	17.14	257.10	39.55
20	Odisha	246.00	0.00	246.00	8.74	0.00	8.74	131.10	20.17
21	Punjab	15.23	0.00	15.23	0.86	0.00	0.86	12.90	1.98
22	Rajasthan	177.60	71.27	248.87	10.72	2.15	12.87	193.05	29.70
23	Sikkim	4.75	0.00	4.75	0.27	0.00	0.27	4.05	0.62
24	Tamil Nadu	44.78	24.00	68.78	2.32	0.56	2.88	43.20	6.65
25	Telangana	69.69	42.53	112.22	2.28	0.70	2.98	44.70	6.88
26	Tripura	130.96	77.10	208.06	7.73	3.50	11.23	168.45	25.92
27	Uttar Pradesh	2604.77	181.40	2786.17	85.70	5.21	90.91	1363.65	209.79
28	Uttarakhand	67.68	0.00	67.68	3.13	0.00	3.13	46.95	7.22
29	West Bengal	952.34	0.00	952.34	30.26	0.00	30.26	453.90	69.83

30	A&N Islands	6.66	0.00	6.66	0.37	0.00	0.37	5.55	0.85
31	Chandigarh	6.56	0.00	6.56	0.30	0.00	0.30	4.50	0.69
32	D.& N. Haveli	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	Daman & Diu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	Delhi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	Lakshadweep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	Puducherry	0.08	0.00	0.08	0.00	0.00	0.00	0.00	0.00
<b>Total</b>		<b>9031.22</b>	<b>2095.25</b>	<b>11126.47</b>	<b>343.11</b>	<b>44.44</b>	<b>387.55</b>	<b>5813.25</b>	<b>894.35</b>

Total Breedable Female (in no.)	73.11 % non descript breedable female	Total Meat production at present (Thousand tonne)	Total meat in Kg.	Total meat production target (Double)	Total No. of Pig reqd. (@ 100 kg meat/pig)	Total No. of Pigs to be produced	Total No. of Females reqd.	Total no. of semen to be imported	Total price implication for importing semen (Rs. In lakhs)
131229	95942	2.57	2570000	5140000	51400	102800	6425	12850	65.54
77264	56488	4.87	4870000	9740000	97400	194800	12175	24350	124.19
244964	179093	17.49	17490000	34980000	349800	699600	43725	87450	446.00
150432	109981	72.48	72480000	144960000	1449600	2899200	181200	362400	1848.24
120580	88156	1.65	1650000	3300000	33000	66000	4125	8250	42.08
10757	7864	0.91	910000	1820000	18200	36400	2275	4550	23.21
929	679	0.23	230000	460000	4600	9200	575	1150	5.87
25160	18394	7.13	7130000	14260000	142600	285200	17825	35650	181.82
542	396	0.12	120000	240000	2400	4800	300	600	3.06
361	264	0.00	0	0	0	0	0	0	0.00
255671	186921	17.62	17620000	35240000	352400	704800	44050	88100	449.31
108927	79637	22.13	22130000	44260000	442600	885200	55325	110650	564.32
1698	1241	14.41	14410000	28820000	288200	576400	36025	72050	367.46
50274	36755	1.50	1500000	3000000	30000	60000	3750	7500	38.25
94977	69438	17.02	17020000	34040000	340400	680800	42550	85100	434.01
21837	15965	6.61	6610000	13220000	132200	264400	16525	33050	168.56
104576	76456	11.39	11390000	22780000	227800	455600	28475	56950	290.45
8617	6300	7.50	7500000	15000000	150000	300000	18750	37500	191.25
27762	20297	17.14	17140000	34280000	342800	685600	42850	85700	437.07
77671	56785	8.74	8740000	17480000	174800	349600	21850	43700	222.87
4034	2949	0.86	860000	1720000	17200	34400	2150	4300	21.93
72103	52715	12.87	12870000	25740000	257400	514800	32175	64350	328.19
440	322	0.27	270000	540000	5400	10800	675	1350	6.89
46459	33966	2.88	2880000	5760000	57600	115200	7200	14400	73.44
0	0	2.98	2980000	5960000	59600	119200	7450	14900	75.99
36541	26715	11.23	11230000	22460000	224600	449200	28075	56150	286.37
330899	241920	90.91	90910000	181820000	1818200	3636400	227275	454550	2318.21
3887	2842	3.13	3130000	6260000	62600	125200	7825	15650	79.82
158181	115646	30.26	30260000	60520000	605200	1210400	75650	151300	771.63

5864	4287	0.37	370000	740000	7400	14800	925	1850	9.44
8	6	0.30	300000	600000	6000	12000	750	1500	7.65
0	0	0.00	0	0	0	0	0	0	0.00
4	3	0.00	0	0	0	0	0	0	0.00
13651	9980	0.00	0	0	0	0	0	0	0.00
0	0	0.00	0	0	0	0	0	0	0.00
192	140	0.00	0	0	0	0	0	0	0.00
<b>2186491</b>	<b>1598544</b>	<b>387.55</b>	<b>387550000</b>	<b>775100000</b>	<b>7751000</b>	<b>15502000</b>	<b>968875</b>	<b>1937750</b>	<b>9882.53</b>



