

A way forward

for revitalizing pig farming in Nagaland

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The challenges faced by North Eastern region in general and Nagaland in particular for food and nutritional security due to fast growing population need an integrated approach for livestock farming. Piggery is most preferred and potential source of meat production and more efficient feed converter. Apart from providing meat, it is also a source of bristles and manure. Scientific pig farming on commercial scale will provide employment opportunities to unemployed youth and supplementary income to improve their living standards. Pig is a biological machine that converts kitchen waste, industrial waste, pasture and other feeds into protein for human consumption. In the North Eastern Region of India, pig rearing is a way of life and the system of pig production in the region is unique. Pig farming is interwoven with the traditional tribal culture and socioeconomic life. The tribal farmers of the region practice almost a zero input pig production system. Every village tribesman rears two to three pigs in backyard condition. Black colour pigs are preferred over white pig in Nagaland. Rearing of pig for fattening purpose is preferred than for breeding purpose. Although, pork is essential ingredient of tribal people's diet, but the pig husbandry has been a neglected sector.

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IN spite of the excellent opportunities available for development of pig husbandry on commercial scale, the state is deficit to the tune of almost more than 50% in pork. The total pig population in the country is 9.06 million, which declined by over 12.03% over the previous census. Share of pigs in total livestock in India is only 1.69%. However, in North East India as a whole, pig population has increased by almost 8% mainly due to increase in pig population of Assam and Meghalaya. North East India accounts for 46.83% of total pig population of the country.

In Nagaland, known for highest per capita consumption of pork in India, the pig population is declining continuously and currently the state is having only four lakhs of pig which accounts for 72% of total livestock of the state. The pig population in

Nagaland has decreased by almost 34% since 2007. The state imports pigs for consumption mainly from Assam, West Bengal, Uttar Pradesh, Bihar, Haryana and Punjab.

Total meat production in the country is 8.11 million tonnes and pig meat contributes only 4.98% (0.40 million tons). In Nagaland, pork accounts for almost 49% of total meat production. Pig farming in Nagaland is a non-professional sector, characterized by smallholdings of few animals, with low inputs, outdated technologies, and poor biosecurity, which all translate into low outputs and productivity. The main reason for non development of pig farming is general backwardness of the state in infrastructure, non-availability of quality germplasm, poor animal husbandry service, high cost of feed, and poor productivity of indigenous breed. Also, there is absence of credit

flow in the pig husbandry sector.

Why to go for pig farming?

- **High demand:** There is high demand of pork in the state. As the per capita consumption of pork is highest in Nagaland and availability of pork is less, therefore, there is

Table 1. Pig population in different states of India

State	Population (million) 2012	Population (million) 2019	Per cent change
Assam	1.64	2.10	28.30
Jharkhand	0.96	1.28	32.69
Meghalaya	0.54	0.71	29.99
West Bengal	0.65	0.54	-16.63
Chhattisgarh	0.44	0.53	20.01
Uttar Pradesh	1.33	0.41	-69.37
Nagaland	0.50	0.40	-19.65
Bihar	0.65	0.34	-47.14
Karnataka	0.30	0.32	6.25
Mizoram	0.25	0.29	19.26

Source: 20th Livestock Census 2019

Table 2. Pig population in North East India of India

State	Population (thousand) 2012	Population (thousand) 2019	Per cent change
Arunachal Pradesh	356	271	-23.88
Assam	1639	2099	28.30
Manipur	277	235	-15.16
Meghalaya	543	706	29.99
Mizoram	245	292	19.18
Nagaland	504	405	-19.65
Sikkim	30	27	-10.00
Tripura	363	206	-43.25
Total	3957	4241	8.00 (approximately)

Source: 20th Livestock Census 2019

ready made market for the same. The price of two month old piglet ranging from ₹ 3,500-4,500 depending upon the place. Purchasing of piglets and adult animal is done directly from farm due to huge demand.

- **High feed efficiency:** The pig has got highest feed conversion efficiency except broilers i.e. they produce more live weight gain from a given weight of feed. Dressing percentage in pig meat is 65-80% and in NEH region, tribal people consume every part of pig except bone. The pig can utilise wide variety of feed stuffs viz. grains, forages, damaged feeds and garbage and convert them into valuable nutritious meat. Pig farming provides quick returns since the marketable weight of fatteners can be achieved with in a period of 8-9 months.
- **Highly prolific:** Pigs are highly prolific with shorter generation interval. This is the only food animal which is litter bearing. A female pig can be bred as early as 8-9 months of age and can farrow twice in a year. Average piglets weaned per sow per year are 22-26. Economical productive life of a pig is five to six year in which it can farrow eight to ten times.
- **Pig-fish integrated farming system:** It has special significance in NEH region, as it can improve the socio-economic status of weaker rural communities, especially the tribals who traditionally raise pigs and can take up fish-pig farming easily. The pig dung acts as excellent pond fertilizer and raises the biological productivity of the pond and

consequently increases fish production. Some of the fishes feed directly on the pig excreta which contains 70% digestible food for the fish. No supplementary feed is required for the fish culture, which normally accounts for 60% of the total input cost in conventional fish culture.

- Pork is nutritious with high fat and low water content and has got better energy value than that of other meats. It is rich in vitamins like thiamin, niacin and riboflavin.
- As there is push for organic farming in NEH region, pigs manure can be used as fertilizer for agriculture farms and fish ponds. Pigs store fat rapidly for which there is an increasing demand from poultry feed, soap, paints and other chemical industries.

Starting a pig farm: The steps for starting a pig farm are discussed here.

a) Selection of Breeding Gilt

- Gilts selected should have at least 12 teats so as to accommodate a large litter.
- Gilts should be selected from second and third farrowing.
- Gilts to be selected from sows, which wean 9-10 or more piglets per litter and are known to be good mothers and first farrowing at one year of age and farrowing interval of seven month.
- Select breeding gilts at weaning period (45 days), further selection should be done 5-6 months of age.
- Select fast growing piglets. These will likely consume less feed per unit live weight gain.
- The selected gilts should have good body confirmation i.e. strong legs, sound feet etc.
- Gilt selected for breeding purpose should not have hernia, atresia ani, supernumerary and inverted teats, and fat deposited at base of teats.

b) Selection of Breeding Boar

- Boar and female pig should not be selected from a single farrowing for the same farm.
- Boar to have sound feet with good, full hams, uniform curve at the back and of good length. It should not be selected from litter in which any

of the piglets have genetic defects like umbilical hernia, scrotal hernia, atresia ani etc.

- Select biggest from the litter. Boar should have at least 12 nicely placed rudimentary teats.
- Boar to be selected from sows, which wean 8-10 or more piglets per litter and are known to be good mothers.
- Selection to be done before castration i.e. at 6 weeks and further selection is done at 5-6 months
- Boar must be at least 8 months old at first service.
- In villages, where only one breeding boar is kept, it should be replaced or exchanged every year to avoid in-breeding.

Breeding practices

Pure-breeding: It is breeding among purebred animals of the same breed. The progeny will have the same genetic makeup as of their parents. This is done to identify and propagate superior genes for use in commercial production primarily in crossbreeding programs as well as to propagate and identify superior females for maintaining valuable genetic material.

Inbreeding: Mating between individuals of the same breed but which are more closely related than the average of the breed. This could be between as close individuals as full sibs or sire – daughter, or mother – son. The effect of inbreeding is the concentration of common genes in the offspring. Many undesirable traits e.g. hernia and cryptorchidism involve recessive genes thus inbreeding perpetuates their expression phenotypically. Inbreeding causes decrease in growth rate, litter size and increases mortality. Inbred sows are inferior in milking and mothering ability. It delays sexual maturity in gilts and boars. Inbred boars have less sexual libido. This is a common practices in remote villages in NEH region which decreases the productivity of farm and further discourages the farmers for pig farming

Cross breeding: Mating two individuals from different breeds thus introducing into the progeny a gene

combination that is different from that existing in either parent or in the breed of either parent. Cross breeding can involve two or more breeds, depending on the desired result. The sole purpose of cross breeding is to take advantage of the observed improvement in performance of the progeny above that of either parent - hybrid vigour or heterosis. It leads to good litter size and high growth rate. Rani breed of pig is a cross of Gunghroo and Hampshire. This breed has been developed specifically for NEH region. Rani pig has good mothering ability, fast growth rate, adaptability in different agroclimatic zone and bears good litter.

Reproduction

Heat detection – Heat detection is most important thing in a breeding farm for successful breeding. Heat

Table 3. Meat production from different species of animal in Nagaland (2018-19)

Species	Number of animals slaughtered for meat production	Meat production (tonnes)	Average meat yield per animal (kg)	Per cent contribution in total meat production
Cattle	78150	9670	123.73	29.96
Buffalo	26840	4350	162.07	13.48
Goat	42190	660	15.64	2.04
Pig	199000	15770	79.24	48.86
Poultry	687920	1830	2.66	5.66
Total	10,34,100	32,280		100

detection should be done two times in a day *i.e.* in the morning and evening. In the sow, heat lasts for 48-72 hours and in gilt it last for 48 hours. The sign of heat are more pronounced in sow as compared to gilt due to priming of brain. In the initial stage of heat, pig will be restless; vulva turns red and is swollen along with white mucus discharge. In the second stage, which

is real breeding or mating period, vulva becomes less red and swollen along with slimy mucus discharge, and tendency to mount and be mounted by others. The sow or gilt will stand still when pressure is applied to her back (back pressure test). This is the optimal time for mating. In the last stage, the sow/gilt will not stand still when pressure is applied to her back. The swelling of

Success Story

Mr Seve Vadeo, a 28 year unemployed youth, has taken the arduous task of pig farming. He is a graduate from Delhi University. After seeing the scenario of pig farming in Nagaland, he decided to take it as a challenge against all the prevailing odds in 2016. He has around five acre of waste land in Sethekima village in Dimapur district. He got the required training on pig farming from ICAR Research Complex for NEH Region, Nagaland Centre. ICAR Nagaland Centre also supported him under tribal sub plan by providing parent stock. He started his pig farm with 40 Rani piglets. The training centre ICAR Nagaland Centre served as milestone for his never ending journey towards success. Then onwards, he took a keen interest in pigs and worked hard. His business began to grow and he purchased more pigs from his profit. He has learnt the art of making profit out of the business and from then he never looked back. For him breeding units are more profitable than fattening pigs, so he is engaged in selling piglets besides growing fatter for meat and their products. According to him, pigs and pig shed should be kept clean always which is displayed by the impeccable cleanliness level at his farm. He learnt artificial insemination (AI) in pig at ICAR Nagaland Centre. He is doing AI in his farm by himself and he has disposed off the breeding male. Through adoption of AI, he observed a significant improvement in the breeding and growth rate of the finishers. With the help of ICAR Nagaland Centre and Atal Incubation Centre, he is planning to set up his own AI station, so that he can supply the semen of improved breed to the farmers. In addition, he is also selling piglets, breeding pigs and live adult pigs in Nagaland. Although his initial turnover is less as he is in initial phase of his business but his dedication and determination has created a positive environment among the educated youth of Nagaland to take up the pig farming as business. Thus, the success story of Mr Seve Vadeo has demonstrated that an individual's entrepreneurial potential can convert dreams of farmers into reality.



Mr Seve Vadeo at his pig farm at Sethekima village in Dimapur district, Nagaland

the vulva disappears. A general rule to follow for breeding is bred gilt on day of observation of heat and sow on second day of heat. Two mating should be followed at interval of 12 hours.

How to induce heat (Recommended practices)

Remove the sow from the piglets early (at 4 - 6 weeks of age) and all at once. Take the sow to a house with dry sows. After weaning, a sow will come into fertile heat within 7-10 days. Put the sow close to a boar, in a way that makes direct contact (hear, see, smell) possible. Also, boar parading in the farm in the morning and evening will stimulate the heat induction in female pigs. Bring the sow to the boar, or place the sow in a pen next to the boar. Put the sow with the boar for a short period every day when the heat is expected. Always take the sow to the boar. Put the sow and boar together just before feeding. Spray the sow's (or gilt's) pen with boar urine every morning for 3-5 days. Boar urine can also be sprayed on the female body including nose and head. Put the sows in groups (stress stimulates heat). Transportation of gilt or sow from one farm to another or from one shed to another will induce the heat in non pregnant animals. If there are heat problems, change the type of feed for a few days. Maintain a good climate; see to it that there is sufficient light in the house. Sows should not be too fat or too thin when they are served.

Future plan for self-sufficiency in Nagaland

1. Make functional the pig breeding farm in 11 districts of Nagaland.
2. Keep the improved germplasm of pig in these farms as per pig breeding policy of the state.
3. Keep the 200 breedable sows in each farm, with a target of producing 4,000 piglets of improved breed per year. This will produced around 44,000 of piglets in the state in one year.
4. These piglets should be given to second line breeder in public private partnership mode. In each district, there should be minimum five second line breeder with capacity of 100 breedable sows and production target of 2,000 piglets per year. Hence 55 second line breeder in the state will be produced around 1,10,000 piglets per year. These piglets should be given to farmers for breeding or fattening purpose.
5. *Strengthening of feed production:* The state is producing maize in huge quantity but there is no feed meal available in the state. Majority of livestock feed is coming from out of the state. So, efforts should be put in place for setting of modern feed processing plant in the state. With the current pig population, there is need of two lakh tonnes of feed per annum.
6. *Strengthening of health sector:* As the state is surrounded on its eastern border with Myanmar, where there are reports of

spreading of African swine fever in pig. There are high chances of trans-boundary diseases. Vaccine for the same is very scarcely available in the state and also there is general lack of awareness among farmers regarding this. Now, a tissue culture vaccine for swine fever has been developed at ICAR-IVRI, which should be made available in the state. Similarly, porcine reproductive and respiratory syndrome is frequently occurring in Mizoram and main source of it is Myanmar. Quarantine facility has to be strengthened in the state.

Pig husbandry has a great scope in NEH region. It has to be developed on industrial scale. Also, there is great potential for export to South-east Asian countries. In the contemporary scenario, pig production has to be economical and environmental friendly. But, currently the pig husbandry is in dire need of holistic development particularly in NEH region. The germplasm has to be improved and improved production technologies have to be implemented. There is need to establish the modern farm with less impact on carbon footprint. All the stakeholders have to put their combined efforts so that the farmers will get the benefit.

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Pig Farming — Few facts

Pig farming is the raising and breeding of domestic pigs as livestock, and is a branch of animal husbandry. Pigs are farmed principally for food (e.g. pork, bacon, gammon) and skins. Pigs are amenable to many different styles of farming: intensive commercial units, commercial free range enterprises, or extensive farming (being allowed to wander around a village, town or city, or tethered in a simple shelter or kept in a pen outside the owner's house). Historically, farm pigs were kept in small numbers and were closely associated with the residence of the owner, or in the same village or town. They were valued as a source of meat and fat, and for their ability to convert inedible food into meat, and were often fed household food waste when kept on a homestead. Pigs have been farmed to dispose of municipal garbage on a large scale.

The following factors can influence the type of pig farms in any given region:

- Available food supply suitable for pigs
- The ability to deal with manure or other outputs from the pig operation
- Local beliefs or traditions, including religion
- The breed or type of pig available to the farm
- Local diseases or conditions that affect pig growth or fecundity
- Local requirements, including government zoning and/or land use laws
- Local and global market conditions and demand.